



10/25/12

Technical Report for

XTO Energy

PCU 197-36A

1203-02

Accutest Job Number: D40074

Sampling Date: 10/17/12

Report to:

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Total number of pages in report: 138



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.


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Laboratory Director

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Certifications: CO, ID, NE, NM, ND (R-027) (PW), UT (NELAP CO00049), TX (T104704511-12-1)

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Test results relate only to samples analyzed.

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Sample Summary

XTO Energy

Job No: D40074

PCU 197-36A
Project No: 1203-02

| Sample Number | Collected Date | Time By | Received | Matrix Code | Type | Client Sample ID |
|---------------|----------------|----------|----------|-------------|------|------------------|
| D40074-1 | 10/17/12 | 10:00 DS | 10/19/12 | SO | Soil | FW SUBLINER COMP |
| D40074-1A | 10/17/12 | 10:00 DS | 10/19/12 | SO | Soil | FW SUBLINER COMP |

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: XTO Energy**Job No** D40074**Site:** PCU 197-36A**Report Date** 10/25/2012 4:24:21 P

On 10/19/2012, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.1 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D40074 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:** V5V1478

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40002-1MS, D40002-1MSD were used as the QC samples indicated.

Extractables by GCMS By Method SW846 8270C BY SIM

Matrix: SO**Batch ID:** OP6857

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D40113-1MS, D40113-1MSD 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:** GGB991

- All samples were analyzed within the recommended method holding time.
- Sample(s) D40085-1MS, D40085-1MSD 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:** OP6840

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) D40087-1MS, D40087-1MSD 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: MP8723

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40074-1AMS, D40074-1AMSD, D40074-1ASDL were used as the QC samples for the metals analysis.

Matrix: SO

Batch ID: MP8718

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40074-1MS, D40074-1MSD, D40074-1SDL were used as the QC samples for the metals analysis.
- The matrix spike duplicate (MSD) recovery(s) of Barium, Nickel, Zinc are outside control limits. Probable cause due to matrix interference or sample non-homogeneity.
- The serial dilution RPD(s) for Cadmium, Silver, Barium, Chromium, Nickel, Zinc are outside control limits for sample MP8718-SD1. Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020A

Matrix: SO

Batch ID: MP8719

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40074-1MS, D40074-1MSD, D40074-1SDL were used as the QC samples for the metals analysis.

Metals By Method SW846 7471B

Matrix: SO

Batch ID: MP8720

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D39936-1MS, D39936-1MSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method ASTM D1498-76M

Matrix: SO

Batch ID: GN17345

- Sample(s) D40111-1DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

Wet Chemistry By Method SM19 2540B M

Matrix: SO

Batch ID: GN17331

- The data for SM19 2540B M meets quality control requirements.

Wet Chemistry By Method SW846 3060/7196A M

Matrix: SO

Batch ID: R14926

- The data for SW846 3060/7196A M meets quality control requirements.
- D40074-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

Wet Chemistry By Method SW846 3060A/7196A

Matrix: SO

Batch ID: GP8472

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40002-1DUP, D40002-1MS, D40002-1MSD were used as the QC samples for the Chromium, Hexavalent analysis.

Wet Chemistry By Method SW846 9045D**Matrix:** SO**Batch ID:** GN17347

- The following samples were run outside of holding time for method SW846 9045D: D40074-1

Wet Chemistry By Method USDA HANDBOOK 60**Matrix:** SO**Batch ID:** MP8723

- D40074-1A 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

Page 1 of 1

Job Number: D40074
Account: XTO Energy
Project: PCU 197-36A
Collected: 10/17/12



| Lab Sample ID | Client Sample ID | Result/ Qual | RL | MDL | Units | Method |
|---------------|------------------|-----------------|----|-----|-------|--------|
|---------------|------------------|-----------------|----|-----|-------|--------|

D40074-1 FW SUBLINER COMP

| | | | | | |
|----------------------------------|----------|--------|--------|----------|--------------------|
| Fluoranthene | 0.0080 J | 0.0089 | 0.0046 | mg/kg | SW846 8270C BY SIM |
| Pyrene | 0.0075 J | 0.0089 | 0.0046 | mg/kg | SW846 8270C BY SIM |
| TPH-DRO (C10-C28) | 46.6 | 14 | 9.2 | mg/kg | SW846-8015B |
| Arsenic | 5.8 | 0.11 | | mg/kg | SW846 6020A |
| Barium | 429 | 1.1 | | mg/kg | SW846 6010C |
| Chromium | 62.2 | 1.1 | | mg/kg | SW846 6010C |
| Copper | 11.0 | 1.1 | | mg/kg | SW846 6010C |
| Lead | 8.4 | 5.4 | | mg/kg | SW846 6010C |
| Nickel | 19.9 | 3.2 | | mg/kg | SW846 6010C |
| Zinc | 37.8 | 3.2 | | mg/kg | SW846 6010C |
| Specific Conductivity | 588 | 1.0 | | umhos/cm | SM2510B-1997 MOD |
| Chromium, Trivalent ^a | 62.2 | 2.1 | | mg/kg | SW846 3060/7196A M |
| Redox Potential Vs H2 | 95.0 | | | mv | ASTM D1498-76M |
| pH | 9.34 | | | su | SW846 9045D |

D40074-1A FW SUBLINER COMP

| | | | | | |
|--------------------------------------|------|-----|--|-------|------------------|
| Calcium | 31.0 | 2.0 | | mg/l | SW846 6010C |
| Magnesium | 9.88 | 1.0 | | mg/l | SW846 6010C |
| Sodium | 92.6 | 2.0 | | mg/l | SW846 6010C |
| Sodium Adsorption Ratio ^b | 3.71 | | | 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

Accutest Laboratories

Report of Analysis

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| | | | |
|--------------------------|------------------|------------------------|----------|
| Client Sample ID: | FW SUBLINER COMP | Date Sampled: | 10/17/12 |
| Lab Sample ID: | D40074-1 | Date Received: | 10/19/12 |
| Matrix: | SO - Soil | Percent Solids: | 93.4 |
| Method: | SW846 8260B | | |
| Project: | PCU 197-36A | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 5V24286.D | 1 | 10/19/12 | BD | n/a | n/a | V5V1478 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|--------|----------------|--------------|------------------|
| Run #1 | 5.05 g | 5.0 ml | 100 ul |
| Run #2 | | | |

Purgeable Aromatics

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|-----------|----------------|--------|-------|-------|-------|---|
| 71-43-2 | Benzene | ND | 0.057 | 0.028 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.11 | 0.057 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.11 | 0.022 | mg/kg | |
| 1330-20-7 | Xylene (total) | ND | 0.23 | 0.11 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|------------|-----------------------|--------|--------|---------|
| 2037-26-5 | Toluene-D8 | 95% | | 64-130% |
| 460-00-4 | 4-Bromofluorobenzene | 99% | | 62-131% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 103% | | 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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| | | | |
|--------------------------|-------------------------------|------------------------|----------|
| Client Sample ID: | FW SUBLINER COMP | Date Sampled: | 10/17/12 |
| Lab Sample ID: | D40074-1 | Date Received: | 10/19/12 |
| Matrix: | SO - Soil | Percent Solids: | 93.4 |
| Method: | SW846 8270C BY SIM SW846 3546 | | |
| Project: | PCU 197-36A | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | 3G11782.D | 1 | 10/24/12 | DC | 10/24/12 | OP6857 | E3G555 |
| 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 | 0.0089 | 0.0046 | mg/kg | |
| 120-12-7 | Anthracene | ND | 0.0089 | 0.0046 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 0.0089 | 0.0046 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 0.0089 | 0.0046 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 0.0089 | 0.0046 | mg/kg | |
| 207-08-9 | Benzo(k)fluoranthene | ND | 0.0089 | 0.0046 | mg/kg | |
| 218-01-9 | Chrysene | ND | 0.0089 | 0.0046 | mg/kg | |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | 0.0089 | 0.0046 | mg/kg | |
| 206-44-0 | Fluoranthene | 0.0080 | 0.0089 | 0.0046 | mg/kg | J |
| 86-73-7 | Fluorene | ND | 0.0089 | 0.0046 | mg/kg | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | 0.0089 | 0.0046 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.012 | 0.011 | mg/kg | |
| 129-00-0 | Pyrene | 0.0075 | 0.0089 | 0.0046 | mg/kg | J |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|-----------|----------------------|--------|--------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 82% | | 10-159% |
| 321-60-8 | 2-Fluorobiphenyl | 75% | | 19-131% |
| 1718-51-0 | Terphenyl-d14 | 84% | | 18-150% |

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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| | | | | | |
|--------------------------|------------------|--|--|------------------------|----------|
| Client Sample ID: | FW SUBLINER COMP | | | Date Sampled: | 10/17/12 |
| Lab Sample ID: | D40074-1 | | | Date Received: | 10/19/12 |
| Matrix: | SO - Soil | | | Percent Solids: | 93.4 |
| Method: | SW846 8015B | | | | |
| Project: | PCU 197-36A | | | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | GB18145.D | 1 | 10/20/12 | SK | n/a | n/a | GGB991 |
| 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) | ND | 11 | 5.7 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 85% | | 60-140% | | |

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

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| | | | | | |
|--------------------------|------------------------|--|--|------------------------|----------|
| Client Sample ID: | FW SUBLINER COMP | | | Date Sampled: | 10/17/12 |
| Lab Sample ID: | D40074-1 | | | Date Received: | 10/19/12 |
| Matrix: | SO - Soil | | | Percent Solids: | 93.4 |
| Method: | SW846-8015B SW846 3546 | | | | |
| Project: | PCU 197-36A | | | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------|----|-----------|------------|------------------|
| Run #1 | FD18795.D | 1 | 10/22/12 | AV | 10/22/12 | OP6840 | GFD949 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.2 g | 2.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
| | TPH-DRO (C10-C28) | 46.6 | 14 | 9.2 | mg/kg | |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits | | |
| 84-15-1 | o-Terphenyl | 100% | | 43-136% | | |

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

| | | | |
|--------------------------|------------------|------------------------|----------|
| Client Sample ID: | FW SUBLINER COMP | Date Sampled: | 10/17/12 |
| Lab Sample ID: | D40074-1 | Date Received: | 10/19/12 |
| Matrix: | SO - Soil | Percent Solids: | 93.4 |
| Project: | PCU 197-36A | | |

Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic | 5.8 | 0.11 | mg/kg | 5 | 10/23/12 | 10/25/12 JB | SW846 6020A ³ | SW846 3050B ⁵ |
| Barium | 429 | 1.1 | mg/kg | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3050B ⁴ |
| Cadmium | < 1.1 | 1.1 | mg/kg | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3050B ⁴ |
| Chromium | 62.2 | 1.1 | mg/kg | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3050B ⁴ |
| Copper | 11.0 | 1.1 | mg/kg | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3050B ⁴ |
| Lead | 8.4 | 5.4 | mg/kg | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3050B ⁴ |
| Mercury | < 0.086 | 0.086 | mg/kg | 1 | 10/24/12 | 10/24/12 JB | SW846 7471B ² | SW846 7471B ⁶ |
| Nickel | 19.9 | 3.2 | mg/kg | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3050B ⁴ |
| Selenium | < 5.4 | 5.4 | mg/kg | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3050B ⁴ |
| Silver | < 3.2 | 3.2 | mg/kg | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3050B ⁴ |
| Zinc | 37.8 | 3.2 | mg/kg | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3050B ⁴ |

- (1) Instrument QC Batch: MA2927
(2) Instrument QC Batch: MA2928
(3) Instrument QC Batch: MA2930
(4) Prep QC Batch: MP8718
(5) Prep QC Batch: MP8719
(6) Prep QC Batch: MP8720

RL = Reporting Limit

Report of Analysis

| | | | |
|--------------------------|------------------|------------------------|----------|
| Client Sample ID: | FW SUBLINER COMP | Date Sampled: | 10/17/12 |
| Lab Sample ID: | D40074-1 | Date Received: | 10/19/12 |
| Matrix: | SO - Soil | Percent Solids: | 93.4 |
| Project: | PCU 197-36A | | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|----------------------------------|--------|-----|----------|----|----------------|-----|--------------------|
| prep: DEPT.OF AG, BOOK N9 | | | | | | | |
| Specific Conductivity | 588 | 1.0 | umhos/cm | 1 | 10/24/12 | JD | SM2510B-1997 MOD |
| Chromium, Hexavalent | < 1.0 | 1.0 | mg/kg | 1 | 10/19/12 | KB | SW846 3060A/7196A |
| Chromium, Trivalent ^a | 62.2 | 2.1 | mg/kg | 1 | 10/24/12 14:02 | JB | SW846 3060/7196A M |
| Redox Potential Vs H2 | 95.0 | | mv | 1 | 10/22/12 | JD | ASTM D1498-76M |
| Solids, Percent | 93.4 | | % | 1 | 10/22/12 | SWT | SM19 2540B M |
| pH | 9.34 | | su | 1 | 10/22/12 15:10 | JD | SW846 9045D |

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

RL = Reporting Limit

Report of Analysis

Client Sample ID: FW SUBLINER COMP
Lab Sample ID: D40074-1A
Matrix: SO - Soil
Project: PCU 197-36A

Date Sampled: 10/17/12
Date Received: 10/19/12
Percent Solids: 93.4

SAR Metals Analysis

| Analyte | Result | RL | Units | DF | Prep | Analyzed By | Method | Prep Method |
|-----------|--------|-----|-------|----|----------|-------------|--------------------------|----------------------------|
| Calcium | 31.0 | 2.0 | mg/l | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3010A/M ² |
| Magnesium | 9.88 | 1.0 | mg/l | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3010A/M ² |
| Sodium | 92.6 | 2.0 | mg/l | 1 | 10/23/12 | 10/24/12 JB | SW846 6010C ¹ | SW846 3010A/M ² |

(1) Instrument QC Batch: MA2927
(2) Prep QC Batch: MP8723

RL = Reporting Limit

4.2
4

Report of Analysis

| | | | |
|--------------------------|------------------|------------------------|----------|
| Client Sample ID: | FW SUBLINER COMP | Date Sampled: | 10/17/12 |
| Lab Sample ID: | D40074-1A | Date Received: | 10/19/12 |
| Matrix: | SO - Soil | Percent Solids: | 93.4 |
| Project: | PCU 197-36A | | |

General Chemistry

| Analyte | Result | RL | Units | DF | Analyzed | By | Method |
|--------------------------------------|--------|----|-------|----|----------------|----|------------------|
| Sodium Adsorption Ratio ^a | 3.71 | | ratio | 1 | 10/24/12 11:42 | JB | 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

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D40074

Client: KRW CONSULTING

Immediate Client Services Action Required: No

Date / Time Received: 10/19/2012 12:15:00 P

No. Coolers: 1

Client Service Action Required at Login: No

Project: XTO PCU 197-36A

Airbill #'s: HDCO

| 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"/> |
| 2. Cooler temp verification: | | | Infrared gun |
| 3. Cooler media: | | | Ice (bag) |

| 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: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V1478-MB | 5V24278.D | 1 | 10/19/12 | BD | n/a | n/a | V5V1478 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D40074-1

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|-----------|----------------|--------|-----|-----|-------|---|
| 71-43-2 | Benzene | ND | 50 | 19 | 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 | 97% 61-130% |
| 460-00-4 | 4-Bromofluorobenzene | 88% 53-131% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98% 62-130% |

Blank Spike Summary

Page 1 of 1

Job Number: D40074

Account: XTOKRWR XTO Energy

Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V1478-BS | 5V24279.D | 1 | 10/19/12 | BD | n/a | n/a | V5V1478 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D40074-1

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|-----------|----------------|----------------|--------------|----------|--------|
| 71-43-2 | Benzene | 50 | 53.6 | 107 | 70-130 |
| 100-41-4 | Ethylbenzene | 50 | 54.3 | 109 | 70-130 |
| 108-88-3 | Toluene | 50 | 52.6 | 105 | 70-130 |
| 1330-20-7 | Xylene (total) | 150 | 169 | 113 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|------------|-----------------------|------|---------|
| 2037-26-5 | Toluene-D8 | 98% | 61-130% |
| 460-00-4 | 4-Bromofluorobenzene | 94% | 53-131% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102% | 62-130% |

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D40002-1MS | 5V24281.D | 1 | 10/19/12 | BD | n/a | n/a | V5V1478 |
| D40002-1MSD | 5V24282.D | 1 | 10/19/12 | BD | n/a | n/a | V5V1478 |
| D40002-1 | 5V24280.D | 1 | 10/19/12 | BD | n/a | n/a | V5V1478 |

The QC reported here applies to the following samples:

Method: SW846 8260B

D40074-1

| CAS No. | Compound | D40002-1 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|-----------|----------------|-------------------|---|----------------|-------------|---------|--------------|----------|-----|-------------------|
| 71-43-2 | Benzene | ND | | 5250 | 5420 | 103 | 5440 | 104 | 0 | 70-134/30 |
| 100-41-4 | Ethylbenzene | ND | | 5250 | 5350 | 102 | 5360 | 102 | 0 | 70-137/30 |
| 108-88-3 | Toluene | 165 | J | 5250 | 5210 | 96 | 5230 | 96 | 0 | 70-130/30 |
| 1330-20-7 | Xylene (total) | 268 | J | 15800 | 16800 | 105 | 16900 | 106 | 1 | 61-131/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D40002-1 | Limits |
|------------|-----------------------|------|------|----------|---------|
| 2037-26-5 | Toluene-D8 | 96% | 97% | 95% | 61-130% |
| 460-00-4 | 4-Bromofluorobenzene | 101% | 100% | 97% | 53-131% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 99% | 97% | 101% | 62-130% |

* = Outside of Control Limits.

GC/MS Volatiles

Raw Data

7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5101912.S\
Data File : 5V24286.D
Acq On : 19 Oct 2012 4:16 pm
Operator : BRETD
Sample : D40074-1
Misc : MS4834,V5V1478,5.045,,100,5,1
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Oct 23 13:56:17 2012
Quant Method : C:\msdchem\1\METHODS\V5AP1442TVH1442.M
Quant Title : 8260
QLast Update : Fri Sep 07 10:53:51 2012
Response via : Initial Calibration

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|----------------------------|--------|------|----------|-------|-------|----------|
| 2) Pentafluorobenzene | 11.647 | 168 | 147687 | 50.00 | ug/l | 0.00 |
| 35) 1,4-Difluorobenzene | 12.446 | 114 | 196950 | 50.00 | ug/l | 0.00 |
| 53) Chlorobenzene-d5 | 15.095 | 117 | 202699 | 50.00 | ug/l | 0.00 |
| 74) 1,4-Dichlorobenzene-d4 | 17.070 | 152 | 151225 | 50.00 | ug/l | 0.00 |

| System Monitoring Compounds | | | | | | |
|-----------------------------|--------|-------|----------|----------|------|---------|
| 33) 1,2-Dichloroethane-d4 | 12.024 | 102 | 14655 | 51.73 | ug/l | 0.00 |
| Spiked Amount | 50.000 | Range | 70 - 130 | Recovery | = | 103.46% |
| 61) Toluene-d8 | 13.851 | 98 | 229552 | 47.75 | ug/l | 0.00 |
| Spiked Amount | 50.000 | Range | 70 - 130 | Recovery | = | 95.50% |
| 69) 4-Bromofluorobenzene | 16.043 | 95 | 108686 | 49.64 | ug/l | 0.00 |
| Spiked Amount | 50.000 | Range | 70 - 130 | Recovery | = | 99.28% |

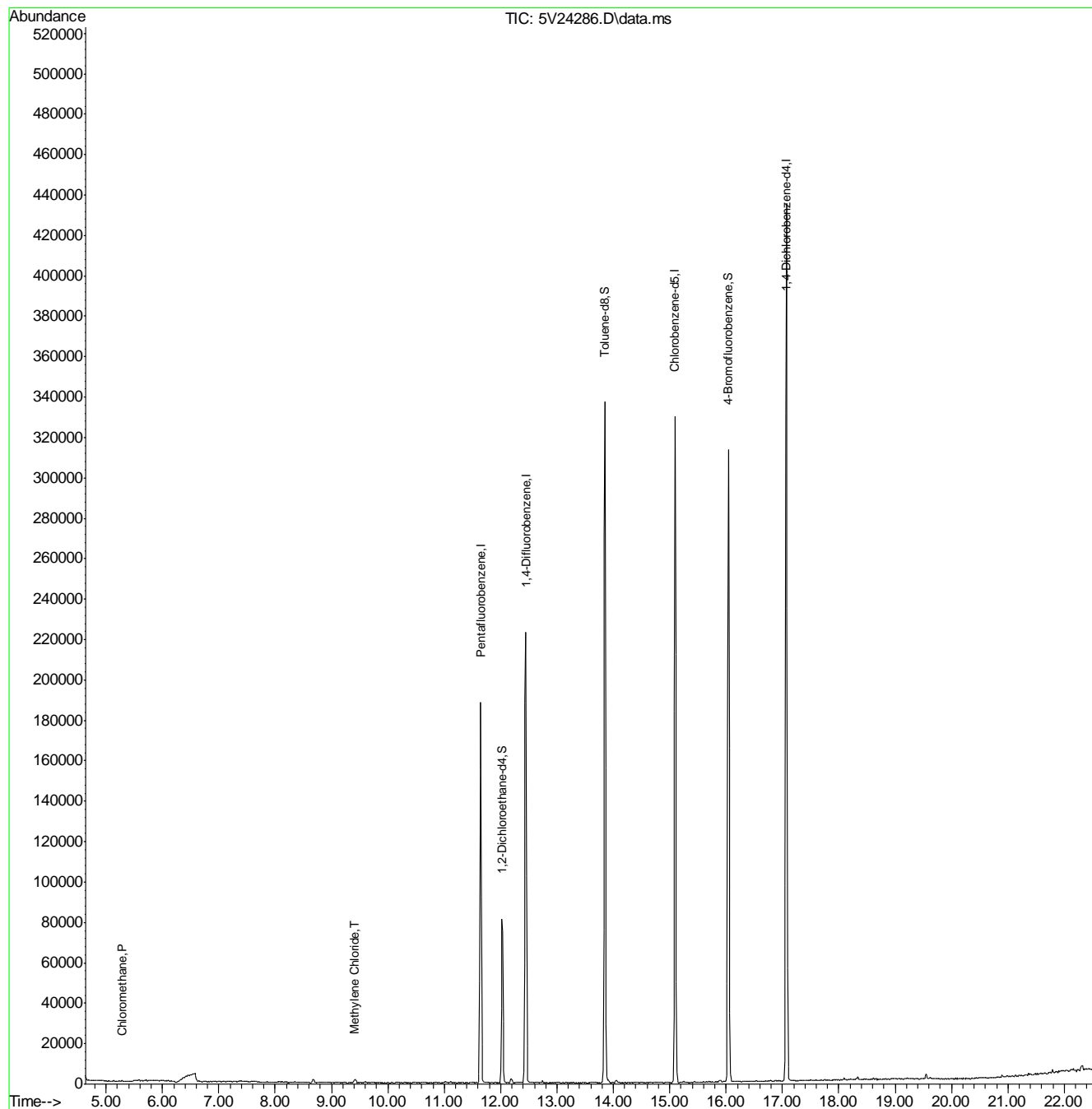
| Target Compounds | | | | | | Qvalue |
|------------------------|-------|----|------|------|------|--------|
| 4) Chloromethane | 5.276 | 50 | 478 | 0.25 | ug/l | # 43 |
| 17) Methylene Chloride | 9.409 | 84 | 1515 | 0.87 | ug/l | 87 |

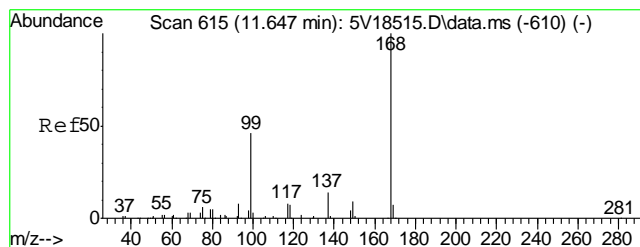
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5101912.S\
Data File : 5V24286.D
Acq On : 19 Oct 2012 4:16 pm
Operator : BRETD
Sample : D40074-1
Misc : MS4834,V5V1478,5.045,,100,5,1
ALS Vial : 11 Sample Multiplier: 1

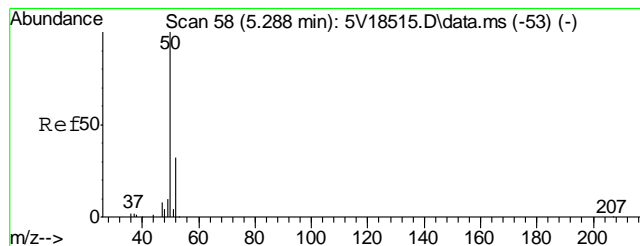
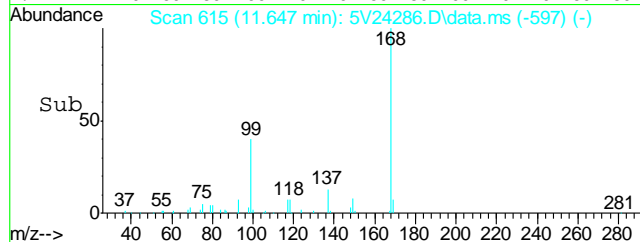
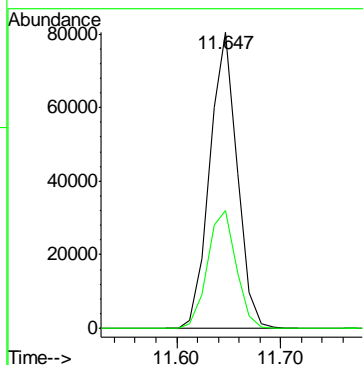
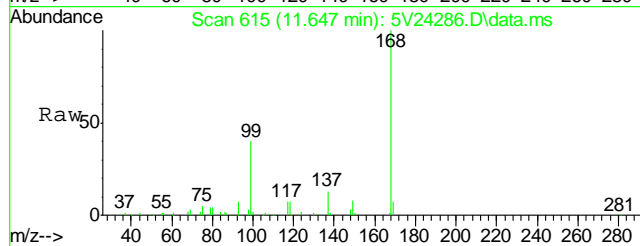
Quant Time: Oct 23 13:56:17 2012
Quant Method : C:\msdchem\1\METHODS\V5AP1442TVH1442.M
Quant Title : 8260
QLast Update : Fri Sep 07 10:53:51 2012
Response via : Initial Calibration





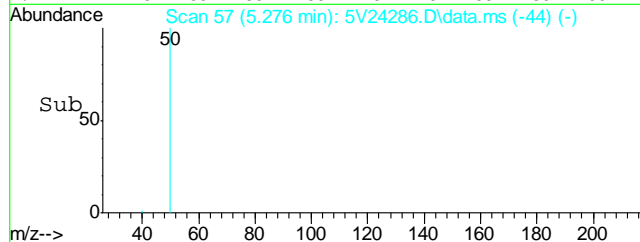
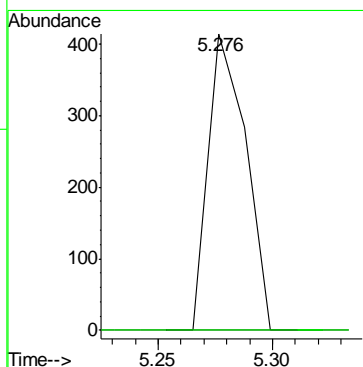
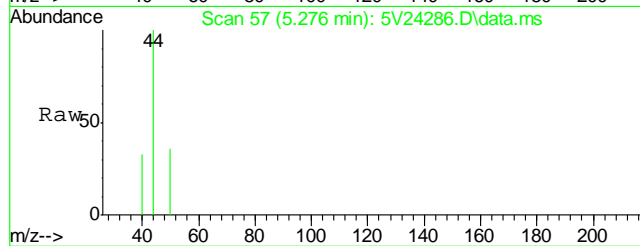
#2
Pentafluorobenzene
Concen: 50.00 ug/l
RT: 11.647 min Scan# 615
Delta R.T. 0.000 min
Lab File: 5V24286.D
Acq: 19 Oct 2012 4:16 pm

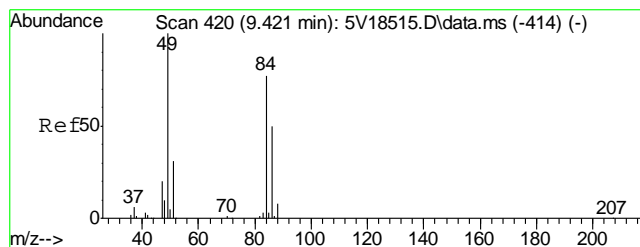
Tgt Ion: 168 Resp: 147687
Ion Ratio Lower Upper
168 100
99 41.4 37.4 56.2



#4
Chloromethane
Concen: 0.25 ug/l
RT: 5.276 min Scan# 57
Delta R.T. 0.000 min
Lab File: 5V24286.D
Acq: 19 Oct 2012 4:16 pm

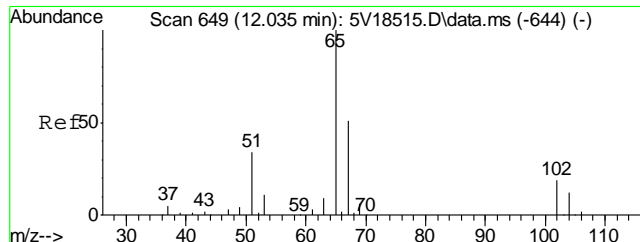
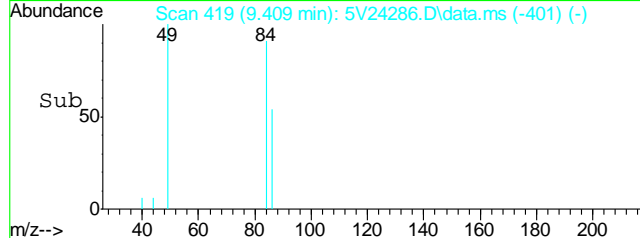
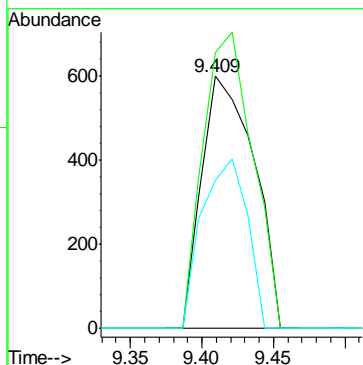
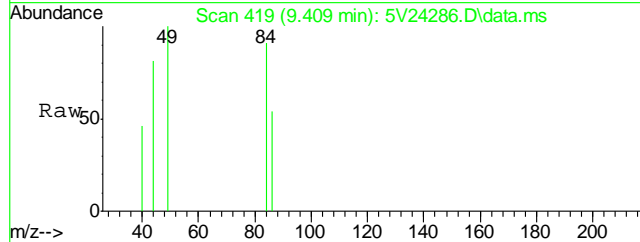
Tgt Ion: 50 Resp: 478
Ion Ratio Lower Upper
50 100
52 0.0 12.1 52.1#





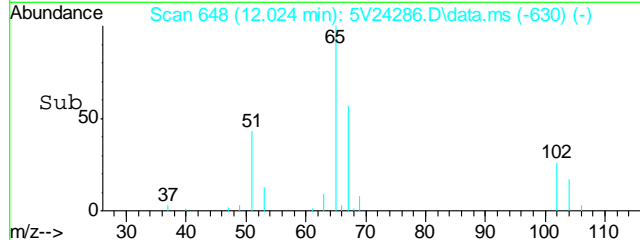
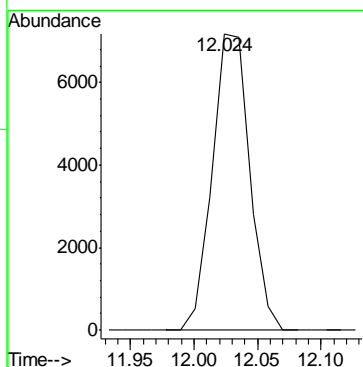
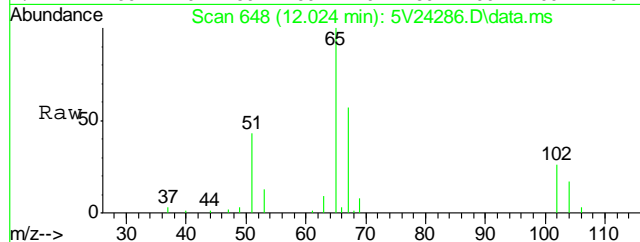
#17
Methylene Chloride
Concen: 0.87 ug/l
RT: 9.409 min Scan# 419
Delta R.T. 0.000 min
Lab File: 5V24286.D
Acq: 19 Oct 2012 4:16 pm

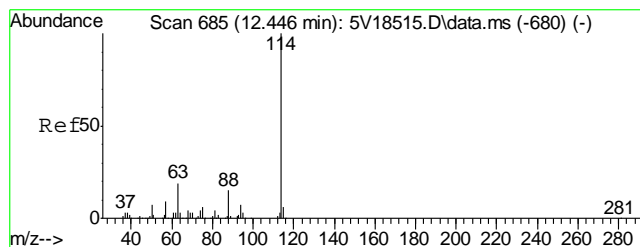
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 84 | 100 | | |
| 49 | 111.5 | 110.4 | 150.4 |
| 86 | 58.2 | 44.0 | 84.0 |



#33
1,2-Dichloroethane-d4
Concen: 51.73 ug/l
RT: 12.024 min Scan# 648
Delta R.T. 0.000 min
Lab File: 5V24286.D
Acq: 19 Oct 2012 4:16 pm

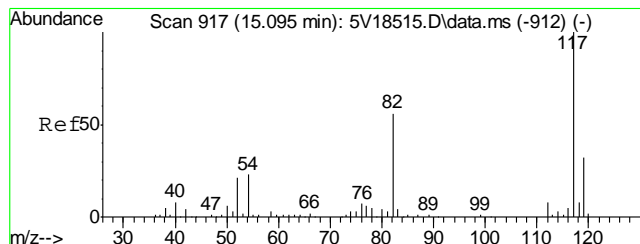
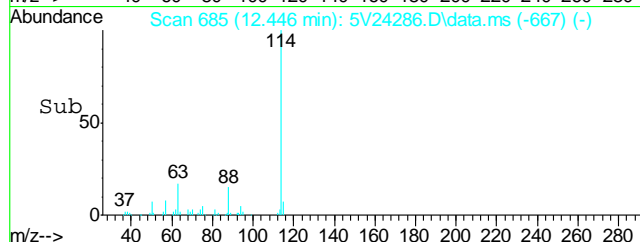
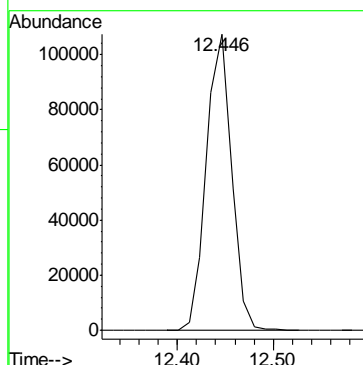
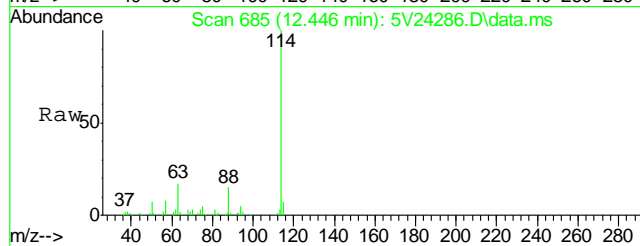
Tgt Ion: 102 Resp: 14655





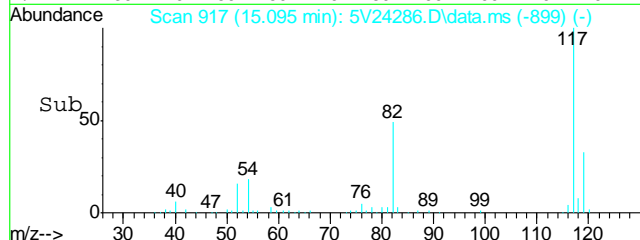
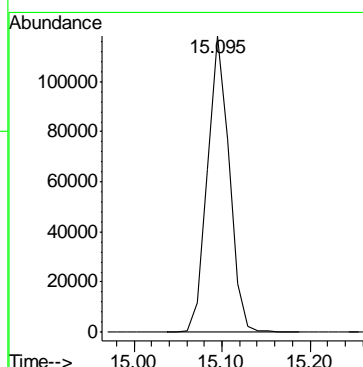
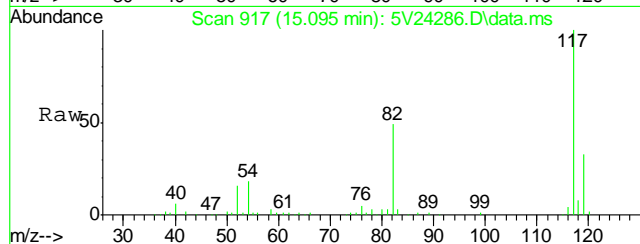
#35
1,4-Difluorobenzene
Concen: 50.00 ug/l
RT: 12.446 min Scan# 685
Delta R.T. 0.000 min
Lab File: 5V24286.D
Acq: 19 Oct 2012 4:16 pm

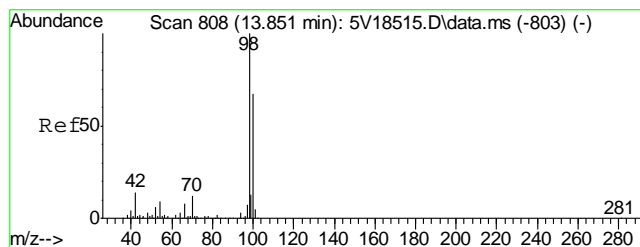
Tgt Ion:114 Resp: 196950



#53
Chlorobenzene-d5
Concen: 50.00 ug/l
RT: 15.095 min Scan# 917
Delta R.T. 0.000 min
Lab File: 5V24286.D
Acq: 19 Oct 2012 4:16 pm

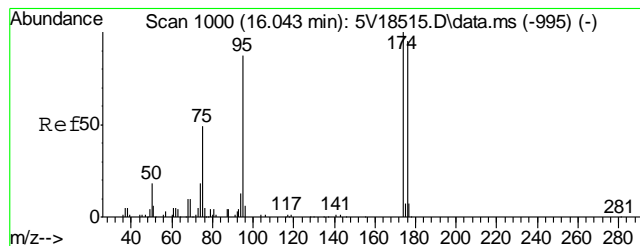
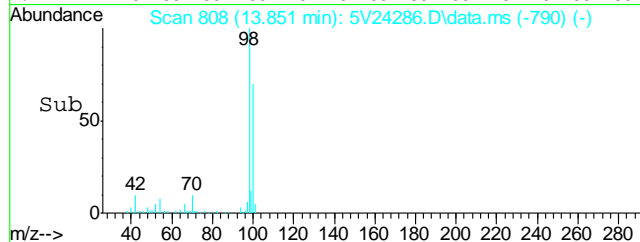
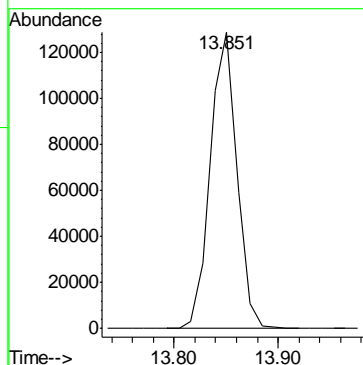
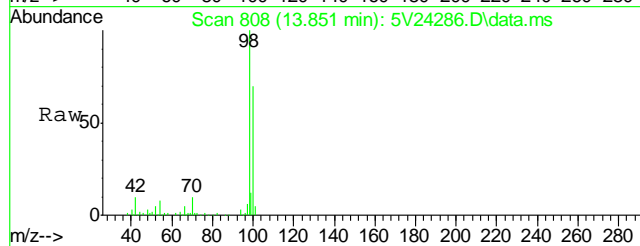
Tgt Ion:117 Resp: 202699





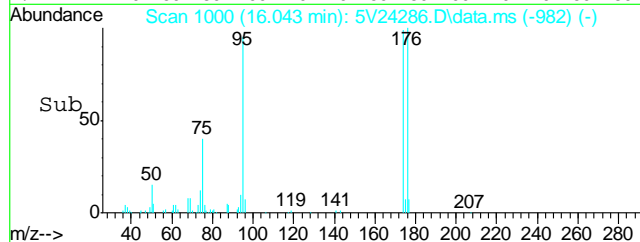
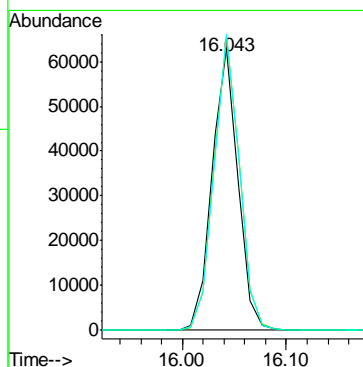
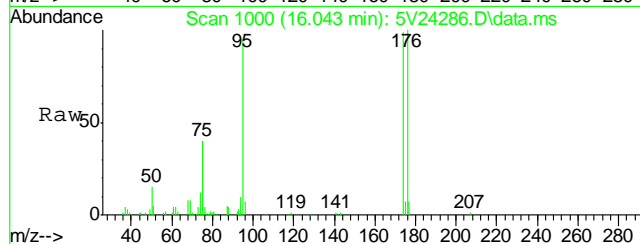
#61
Toluene-d8
Concen: 47.75 ug/l
RT: 13.851 min Scan# 808
Delta R.T. 0.000 min
Lab File: 5V24286.D
Acq: 19 Oct 2012 4:16 pm

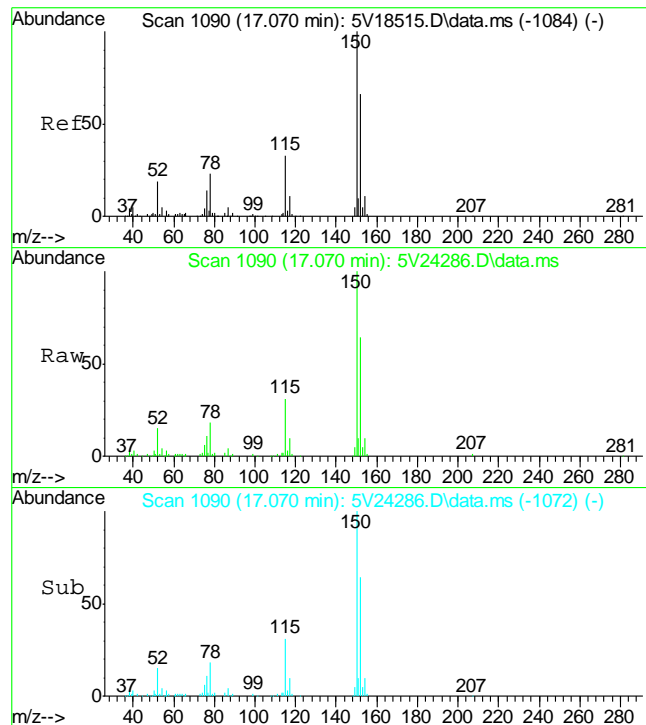
Tgt Ion: 98 Resp: 229552



#69
4-Bromofluorobenzene
Concen: 49.64 ug/l
RT: 16.043 min Scan# 1000
Delta R.T. 0.000 min
Lab File: 5V24286.D
Acq: 19 Oct 2012 4:16 pm

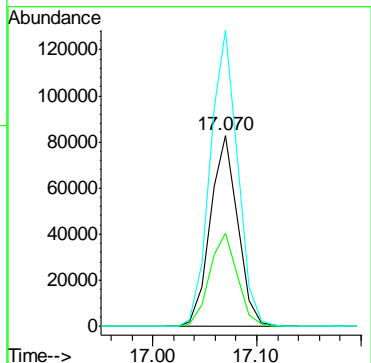
Tgt Ion: 95 Resp: 108686
Ion Ratio Lower Upper
95 100
174 103.4 77.1 117.1
176 102.9 73.4 113.4





#74
1,4-Dichlorobenzene-d4
Concen: 50.00 ug/l
RT: 17.070 min Scan# 1090
Delta R.T. 0.000 min
Lab File: 5V24286.D
Acq: 19 Oct 2012 4:16 pm

| | | | |
|-----------|-------|-------|--------|
| Tgt Ion: | 152 | Resp: | 151225 |
| Ion Ratio | Lower | Upper | |
| 152 | 100 | | |
| 115 | 49.4 | 41.4 | 62.0 |
| 150 | 156.3 | 153.9 | 230.9 |



7.1.1
7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5101912.S\
Data File : 5V24278.D
Acq On : 19 Oct 2012 11:42 am
Operator : BRETD
Sample : MB
Misc : MS4834,V5V1478,5.00,,100,5,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Oct 23 13:41:01 2012
Quant Method : C:\msdchem\1\METHODS\V5AP1442TVH1442.M
Quant Title : 8260
QLast Update : Fri Sep 07 10:53:51 2012
Response via : Initial Calibration

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|----------------------------|--------|------|----------|-------|-------|----------|
| 2) Pentafluorobenzene | 11.647 | 168 | 155729 | 50.00 | ug/l | 0.00 |
| 35) 1,4-Difluorobenzene | 12.446 | 114 | 209195 | 50.00 | ug/l | 0.00 |
| 53) Chlorobenzene-d5 | 15.095 | 117 | 209311 | 50.00 | ug/l | 0.00 |
| 74) 1,4-Dichlorobenzene-d4 | 17.070 | 152 | 141646 | 50.00 | ug/l | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---------------------------|--------|-------|----------|----------|------|--------|
| 33) 1,2-Dichloroethane-d4 | 12.024 | 102 | 14685 | 49.16 | ug/l | 0.00 |
| Spiked Amount | 50.000 | Range | 70 - 130 | Recovery | = | 98.32% |
| 61) Toluene-d8 | 13.851 | 98 | 240469 | 48.44 | ug/l | 0.00 |
| Spiked Amount | 50.000 | Range | 70 - 130 | Recovery | = | 96.88% |
| 69) 4-Bromofluorobenzene | 16.043 | 95 | 99177 | 43.87 | ug/l | 0.00 |
| Spiked Amount | 50.000 | Range | 70 - 130 | Recovery | = | 87.74% |

Target Compounds

| | | | | | Qvalue |
|-----------------|--------|-----|------|------|----------|
| 91) Naphthalene | 19.559 | 128 | 1808 | 0.22 | ug/l 100 |

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

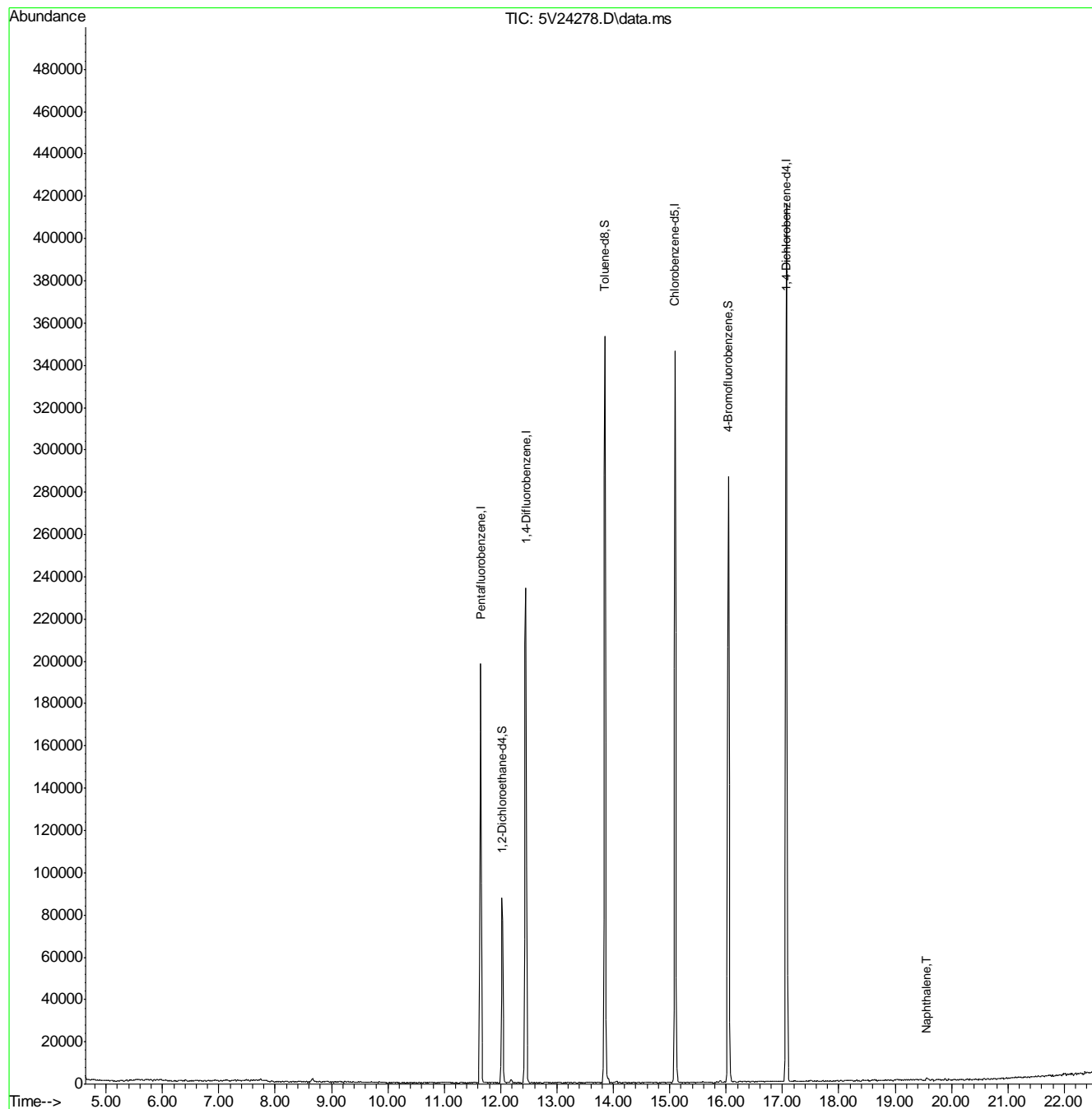
7.2.1

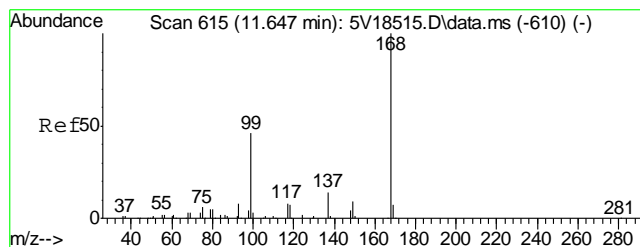
7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5101912.S\
Data File : 5V24278.D
Acq On : 19 Oct 2012 11:42 am
Operator : BRETD
Sample : MB
Misc : MS4834,V5V1478,5.00,,100,5,1
ALS Vial : 3 Sample Multiplier: 1

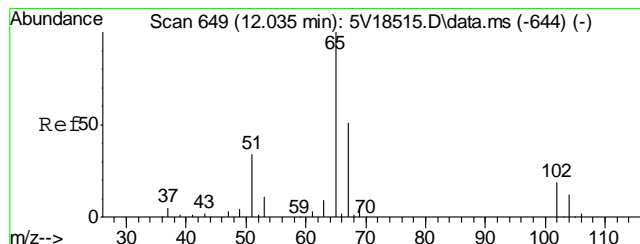
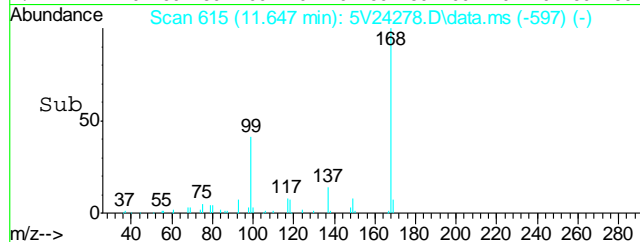
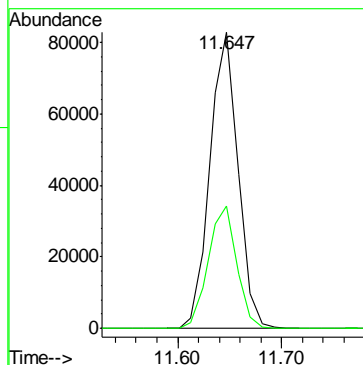
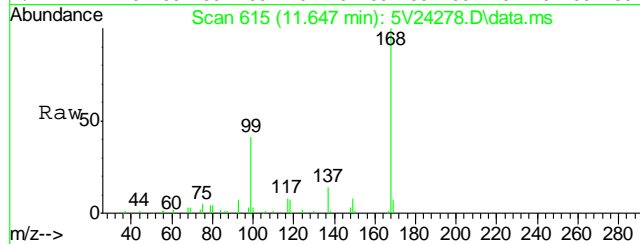
Quant Time: Oct 23 13:41:01 2012
Quant Method : C:\msdchem\1\METHODS\V5AP1442TVH1442.M
Quant Title : 8260
QLast Update : Fri Sep 07 10:53:51 2012
Response via : Initial Calibration





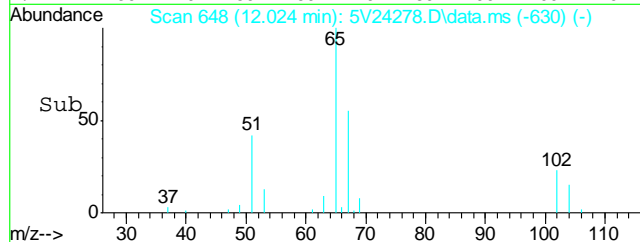
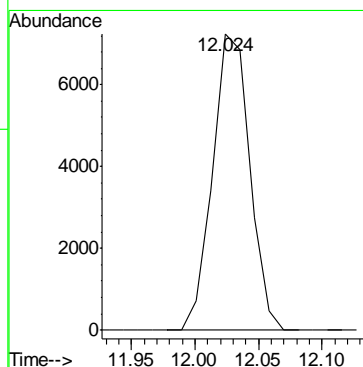
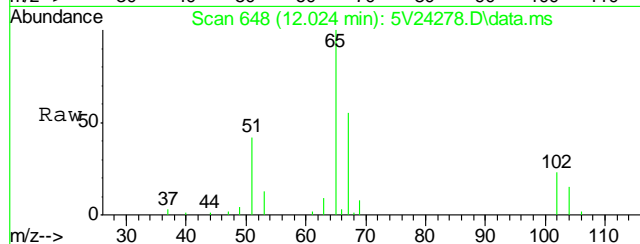
#2
Pentafluorobenzene
Concen: 50.00 ug/l
RT: 11.647 min Scan# 615
Delta R.T. 0.000 min
Lab File: 5V24278.D
Acq: 19 Oct 2012 11:42 am

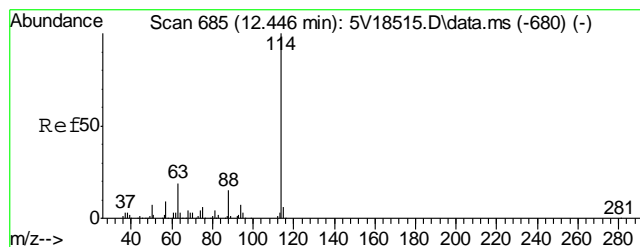
Tgt Ion:168 Resp: 155729
Ion Ratio Lower Upper
168 100
99 41.9 37.4 56.2



#33
1,2-Dichloroethane-d4
Concen: 49.16 ug/l
RT: 12.024 min Scan# 648
Delta R.T. 0.000 min
Lab File: 5V24278.D
Acq: 19 Oct 2012 11:42 am

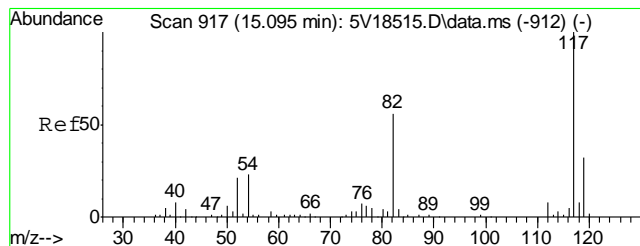
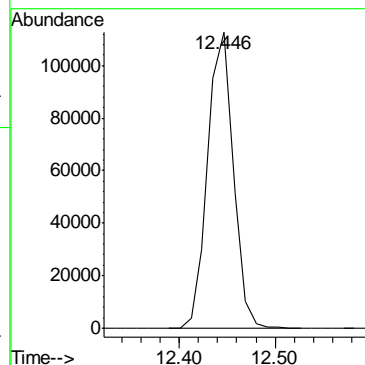
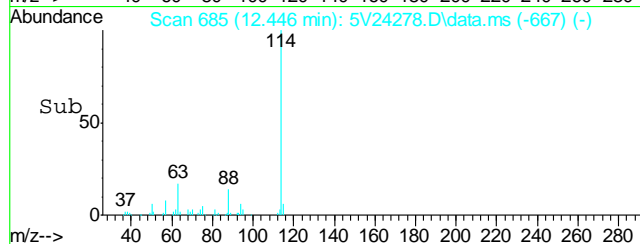
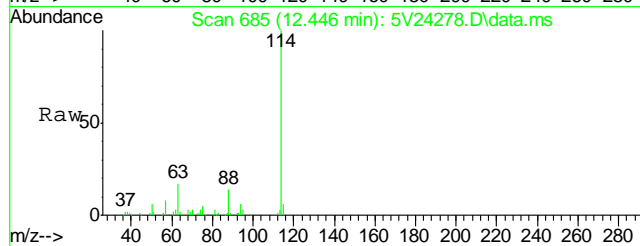
Tgt Ion:102 Resp: 14685





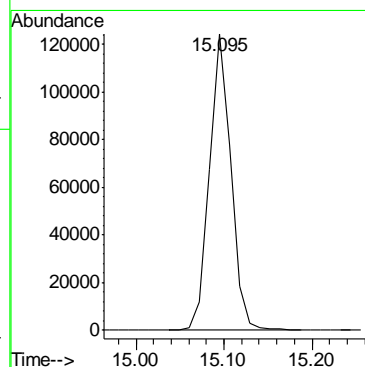
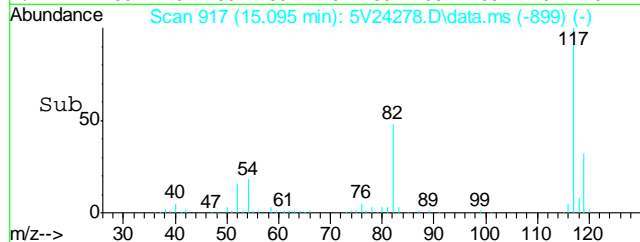
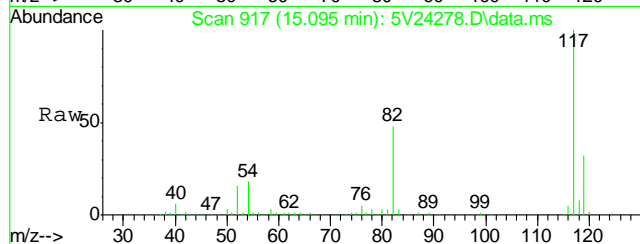
#35
1,4-Difluorobenzene
Concen: 50.00 ug/l
RT: 12.446 min Scan# 685
Delta R.T. 0.000 min
Lab File: 5V24278.D
Acq: 19 Oct 2012 11:42 am

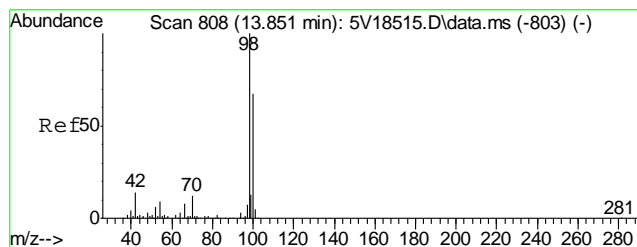
Tgt Ion:114 Resp: 209195



#53
Chlorobenzene-d5
Concen: 50.00 ug/l
RT: 15.095 min Scan# 917
Delta R.T. 0.000 min
Lab File: 5V24278.D
Acq: 19 Oct 2012 11:42 am

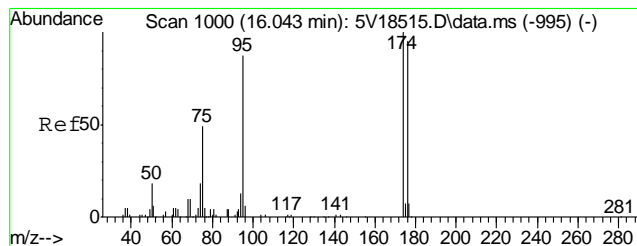
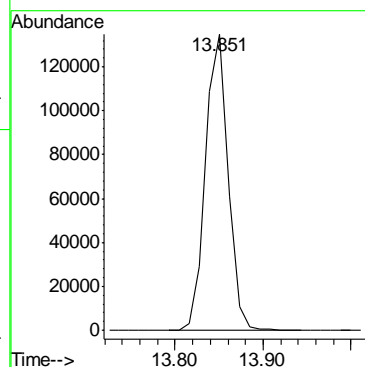
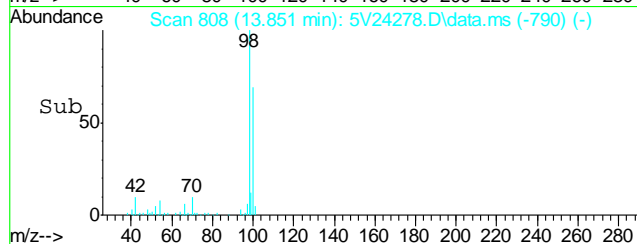
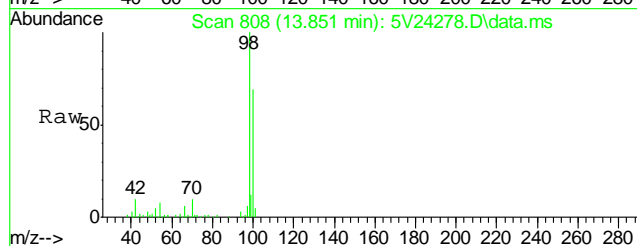
Tgt Ion:117 Resp: 209311





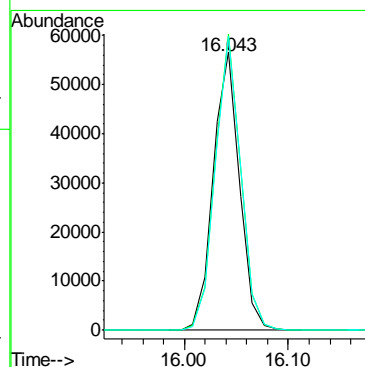
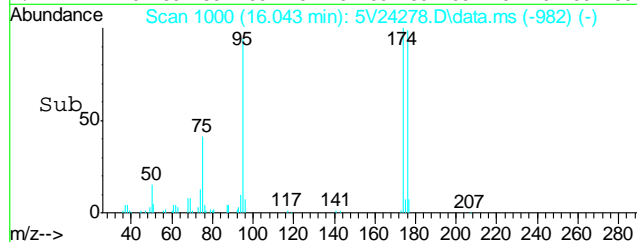
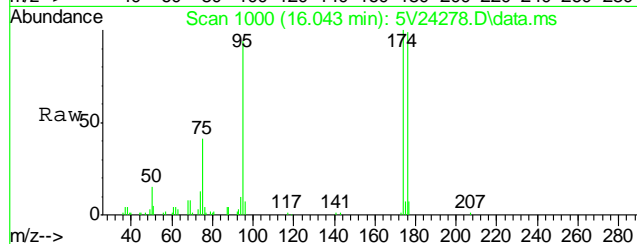
#61
Toluene-d8
Concen: 48.44 ug/l
RT: 13.851 min Scan# 808
Delta R.T. 0.000 min
Lab File: 5V24278.D
Acq: 19 Oct 2012 11:42 am

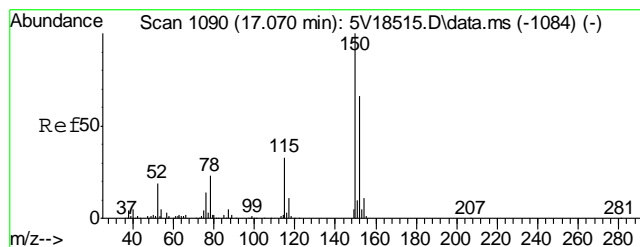
Tgt Ion: 98 Resp: 240469



#69
4-Bromofluorobenzene
Concen: 43.87 ug/l
RT: 16.043 min Scan# 1000
Delta R.T. 0.000 min
Lab File: 5V24278.D
Acq: 19 Oct 2012 11:42 am

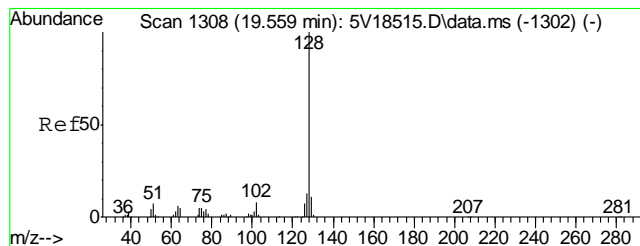
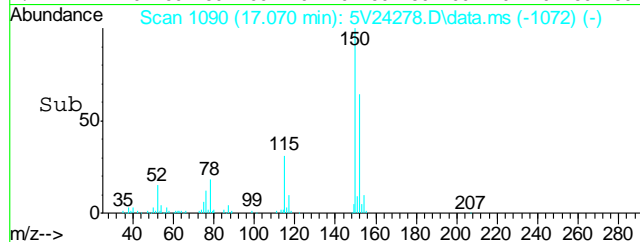
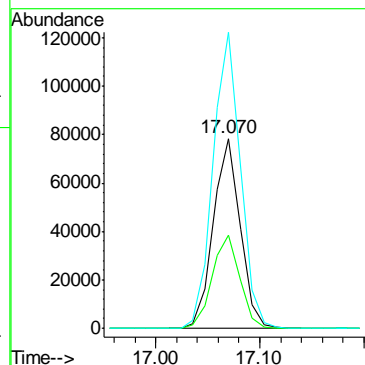
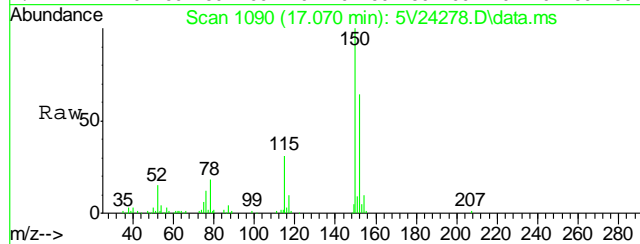
Tgt Ion: 95 Resp: 99177
Ion Ratio Lower Upper
95 100
174 104.1 77.1 117.1
176 102.9 73.4 113.4





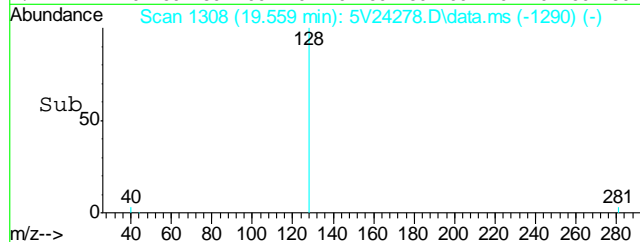
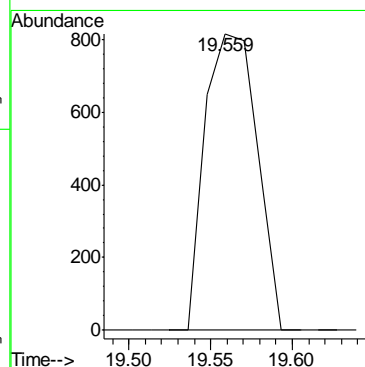
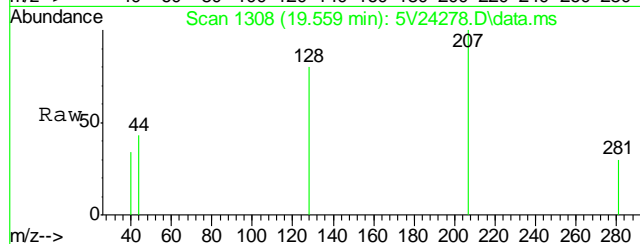
#74
1,4-Dichlorobenzene-d4
Concen: 50.00 ug/l
RT: 17.070 min Scan# 1090
Delta R.T. 0.000 min
Lab File: 5V24278.D
Acq: 19 Oct 2012 11:42 am

| | | | |
|-----------|-------|-------|--------|
| Tgt Ion: | 152 | Resp: | 141646 |
| Ion Ratio | Lower | Upper | |
| 152 | 100 | | |
| 115 | 49.9 | 41.4 | 62.0 |
| 150 | 158.4 | 153.9 | 230.9 |



#91
Naphthalene
Concen: 0.22 ug/l
RT: 19.559 min Scan# 1308
Delta R.T. 0.000 min
Lab File: 5V24278.D
Acq: 19 Oct 2012 11:42 am

Tgt Ion:128 Resp: 1808



GC/MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Page 1 of 1

Job Number: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| OP6857-MB | 3G11777.D | 1 | 10/24/12 | DC | 10/24/12 | OP6857 | E3G555 |

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

D40074-1

| 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 | |
| 50-32-8 | Benzo(a)pyrene | 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 | |
| 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 | 4.3 | 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 | 96% 10-159% |
| 321-60-8 | 2-Fluorobiphenyl | 81% 19-131% |
| 1718-51-0 | Terphenyl-d14 | 101% 18-150% |

8.1.1

8

Blank Spike Summary

Page 1 of 1

Job Number: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| OP6857-BS | 3G11778.D | 1 | 10/24/12 | DC | 10/24/12 | OP6857 | E3G555 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D40074-1

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|----------|------------------------|----------------|--------------|----------|--------|
| 83-32-9 | Acenaphthene | 83.3 | 69.4 | 83 | 68-130 |
| 120-12-7 | Anthracene | 83.3 | 76.4 | 92 | 67-130 |
| 56-55-3 | Benzo(a)anthracene | 83.3 | 74.3 | 89 | 65-130 |
| 50-32-8 | Benzo(a)pyrene | 83.3 | 78.5 | 94 | 62-130 |
| 205-99-2 | Benzo(b)fluoranthene | 83.3 | 70.1 | 84 | 44-130 |
| 207-08-9 | Benzo(k)fluoranthene | 83.3 | 80.3 | 96 | 56-131 |
| 218-01-9 | Chrysene | 83.3 | 83.6 | 100 | 70-130 |
| 53-70-3 | Dibenzo(a,h)anthracene | 83.3 | 70.2 | 84 | 55-130 |
| 206-44-0 | Fluoranthene | 83.3 | 72.8 | 87 | 70-130 |
| 86-73-7 | Fluorene | 83.3 | 72.4 | 87 | 70-130 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 83.3 | 72.6 | 87 | 56-130 |
| 91-20-3 | Naphthalene | 83.3 | 71.6 | 86 | 70-130 |
| 129-00-0 | Pyrene | 83.3 | 81.7 | 98 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|-----------|----------------------|-----|---------|
| 4165-60-0 | Nitrobenzene-d5 | 88% | 10-159% |
| 321-60-8 | 2-Fluorobiphenyl | 74% | 19-131% |
| 1718-51-0 | Terphenyl-d14 | 94% | 18-150% |

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP6857-MS | 3G11780.D | 1 | 10/24/12 | DC | 10/24/12 | OP6857 | E3G555 |
| OP6857-MSD | 3G11781.D | 1 | 10/24/12 | DC | 10/24/12 | OP6857 | E3G555 |
| D40113-1 | 3G11779.D | 1 | 10/24/12 | DC | 10/24/12 | OP6857 | E3G555 |

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D40074-1

| CAS No. | Compound | D40113-1 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|----------|------------------------|-------------------|---|----------------|-------------|---------|--------------|----------|-----|-------------------|
| 83-32-9 | Acenaphthene | ND | | 96.1 | 88.4 | 92 | 82.5 | 86 | 7 | 25-151/30 |
| 120-12-7 | Anthracene | ND | | 96.1 | 95.6 | 100 | 96.0 | 100 | 0 | 39-159/30 |
| 56-55-3 | Benzo(a)anthracene | ND | | 96.1 | 102 | 106 | 107 | 111 | 5 | 39-168/30 |
| 50-32-8 | Benzo(a)pyrene | ND | | 96.1 | 97.3 | 101 | 102 | 106 | 5 | 32-144/30 |
| 205-99-2 | Benzo(b)fluoranthene | ND | | 96.1 | 91.8 | 96 | 98.8 | 103 | 7 | 24-163/30 |
| 207-08-9 | Benzo(k)fluoranthene | ND | | 96.1 | 88.6 | 92 | 92.2 | 96 | 4 | 10-188/30 |
| 218-01-9 | Chrysene | 5.6 | J | 96.1 | 103 | 101 | 103 | 101 | 0 | 43-150/30 |
| 53-70-3 | Dibenzo(a,h)anthracene | ND | | 96.1 | 82.4 | 86 | 82.7 | 86 | 0 | 21-152/30 |
| 206-44-0 | Fluoranthene | ND | | 96.1 | 101 | 105 | 117 | 121 | 15 | 36-157/30 |
| 86-73-7 | Fluorene | 8.5 | J | 96.1 | 107 | 103 | 96.4 | 91 | 10 | 10-182/30 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | ND | | 96.1 | 88.3 | 92 | 88.9 | 92 | 1 | 20-154/30 |
| 91-20-3 | Naphthalene | 46.3 | | 96.1 | 133 | 90 | 99.1 | 55 | 29 | 10-163/30 |
| 129-00-0 | Pyrene | ND | | 96.1 | 109 | 113 | 124 | 129 | 13 | 25-180/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D40113-1 | Limits |
|-----------|----------------------|-----|-----|----------|---------|
| 4165-60-0 | Nitrobenzene-d5 | 87% | 74% | 73% | 10-159% |
| 321-60-8 | 2-Fluorobiphenyl | 75% | 66% | 63% | 19-131% |
| 1718-51-0 | Terphenyl-d14 | 85% | 80% | 82% | 18-150% |

* = Outside of Control Limits.

GC/MS Semi-volatiles

Raw Data

6

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\102412\
 Data File : 3g11782.D
 Acq On : 24 Oct 2012 4:55 pm
 Operator : DONC
 Sample : D40074-1
 Misc : OP6857,E3G555,30.04,,,1,1
 ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 25 14:38:19 2012
 Quant Method : C:\msdchem\1\METHODS\SIMPE3G553.M
 Quant Title : PAHSIM BASE
 QLast Update : Mon Oct 22 14:22:49 2012
 Response via : Initial Calibration

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|----------------------|--------|------|----------|--------|-------|----------|
| 1) Naphthalene-d8 | 5.789 | 136 | 188986 | 4.0000 | ug/mL | 0.00 |
| 6) Acenaphthene-d10 | 7.507 | 164 | 109629 | 4.0000 | ug/mL | 0.00 |
| 15) Phenanthrene-d10 | 8.988 | 188 | 190322 | 4.0000 | ug/mL | 0.00 |
| 19) Chrysene-d12 | 11.623 | 240 | 136087 | 4.0000 | ug/mL | 0.00 |
| 24) Perylene-d12 | 13.025 | 264 | 99525 | 4.0000 | ug/mL | 0.00 |

System Monitoring Compounds

| | | | | | | |
|----------------------|----------------|-----|------------|---------|-------|-------|
| 2) Nitrobenzene-d5 | 5.103 | 82 | 849587 | 40.8577 | ug/mL | 0.00 |
| Spiked Amount 50.000 | Range 25 - 135 | | Recovery = | 81.72% | | |
| 7) 2-Fluorobiphenyl | 6.834 | 172 | 1731087 | 37.6509 | ug/mL | -0.01 |
| Spiked Amount 50.000 | Range 25 - 135 | | Recovery = | 75.30% | | |
| 21) Terphenyl-d14 | 10.578 | 244 | 788707 | 41.7513 | ug/mL | 0.00 |
| Spiked Amount 50.000 | Range 25 - 135 | | Recovery = | 83.50% | | |

Target Compounds

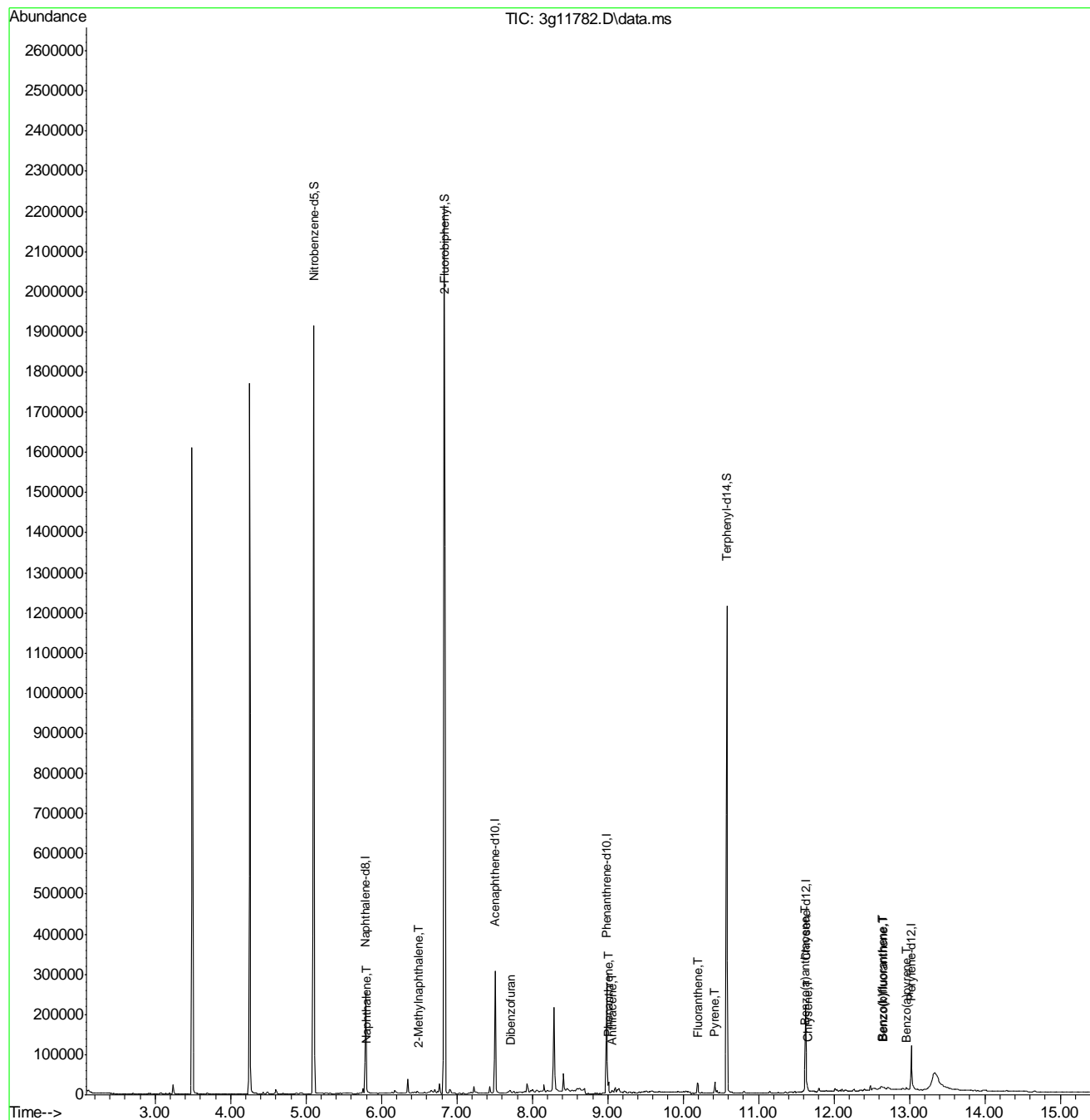
| | | | | | | Qvalue |
|----------------------------|--------|-----|-------|--------|--------|--------|
| 3) N-Nitrosodimethylamine | 2.451 | 74 | 47 | N.D. | | |
| 4) N-Nitrosodi-propylamine | 0.000 | 70 | 0 | N.D. d | | |
| 5) Naphthalene | 5.801 | 128 | 2489 | 0.0510 | ug/mL | 89 |
| 8) 2-Methylnaphthalene | 6.487 | 142 | 2227 | 0.0650 | ug/mL | 90 |
| 9) 1-Methylnaphthalene | 6.574 | 142 | 875 | N.D. | | |
| 10) Acenaphthylene | 6.976 | 152 | 439 | N.D. | | |
| 11) Acenaphthene | 7.531 | 154 | 847 | N.D. | | |
| 12) Dibenzofuran | 7.708 | 168 | 3769 | 0.0676 | ug/mL | 99 |
| 13) Fluorene | 0.000 | 166 | 0 | N.D. d | | |
| 14) Diphenylamine | 0.000 | 169 | 0 | N.D. d | | |
| 16) Phenanthrene | 9.011 | 178 | 17555 | 0.2548 | ug/mL | 86 |
| 17) Anthracene | 9.059 | 178 | 5778m | 0.0858 | ug/mL | |
| 18) Fluoranthene | 10.191 | 202 | 16879 | 0.2255 | ug/mL | 94 |
| 20) Pyrene | 10.420 | 202 | 14923 | 0.2094 | ug/mL | 92 |
| 22) Benzo(a)anthracene | 11.610 | 228 | 6888 | 0.1136 | ug/mL | 73 |
| 23) Chrysene | 11.650 | 228 | 7049 | 0.1108 | ug/mL | 89 |
| 25) Benzo(b)fluoranthene | 12.636 | 252 | 5646m | 0.0955 | ug/mL | |
| 26) Benzo(k)fluoranthene | 12.657 | 252 | 3400m | 0.0961 | ug/mL | |
| 27) Benzo(a)pyrene | 12.962 | 252 | 3745 | 0.0665 | ug/mL# | 78 |
| 28) Indeno(1,2,3-cd)pyrene | 14.287 | 276 | 1914 | N.D. | | |
| 29) Dibenz(a,h)anthracene | 14.308 | 278 | 528 | N.D. | | |
| 30) Benzo(g,h,i)perylene | 14.665 | 276 | 1936 | N.D. | | |

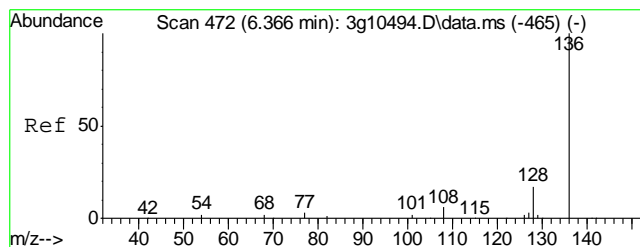
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\102412\
Data File : 3g11782.D
Acq On : 24 Oct 2012 4:55 pm
Operator : DONC
Sample : D40074-1
Misc : OP6857,E3G555,30.04,,,1,1
ALS Vial : 9 Sample Multiplier: 1

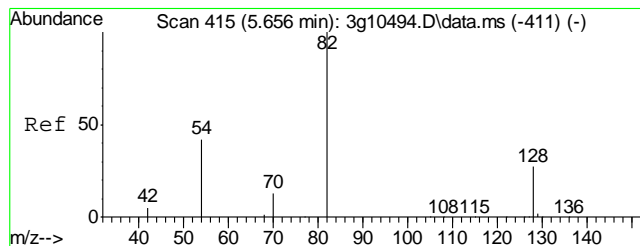
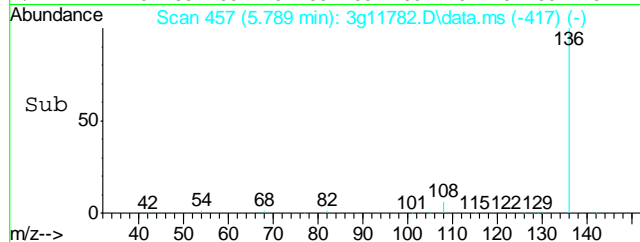
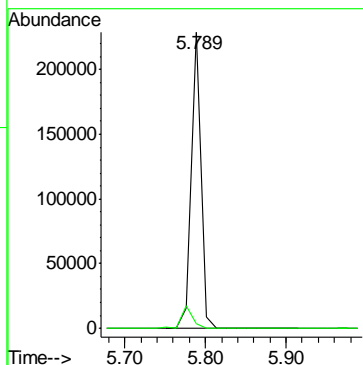
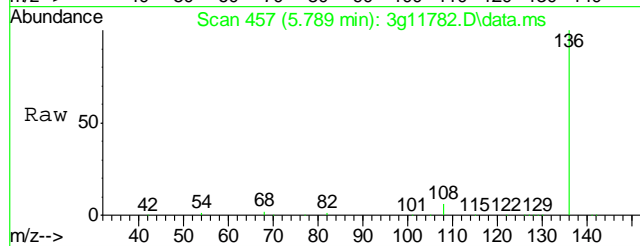
Quant Time: Oct 25 14:38:19 2012
Quant Method : C:\msdchem\1\METHODS\SIMPE3G553.M
Quant Title : PAHSIM BASE
QLast Update : Mon Oct 22 14:22:49 2012
Response via : Initial Calibration





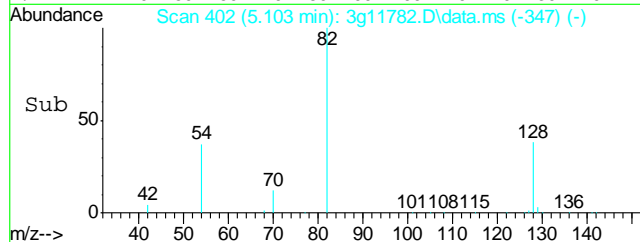
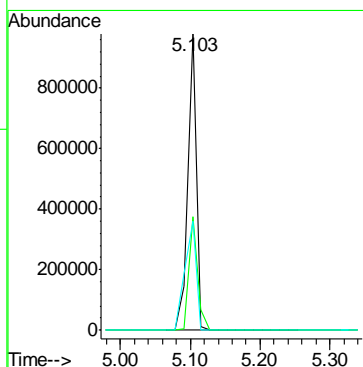
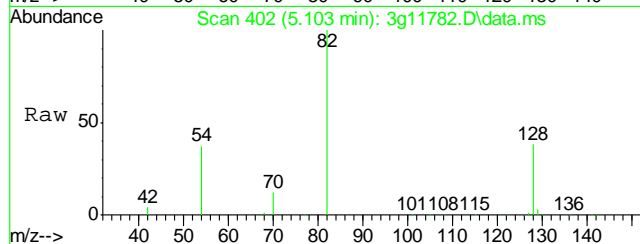
#1
Naphthalene-d8
Concen: 4.0000 ug/mL
RT: 5.789 min Scan# 457
Delta R.T. 0.000 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

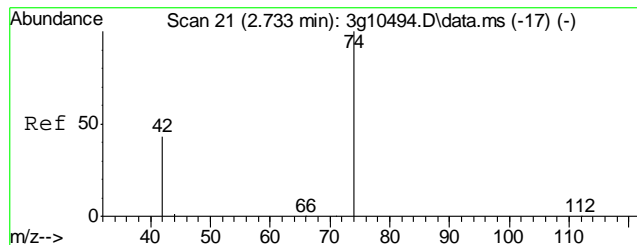
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 136 | 100 | | |
| 68 | 8.5 | 0.0 | 29.7 |



#2
Nitrobenzene-d5
Concen: 40.8577 ug/mL
RT: 5.103 min Scan# 402
Delta R.T. 0.001 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

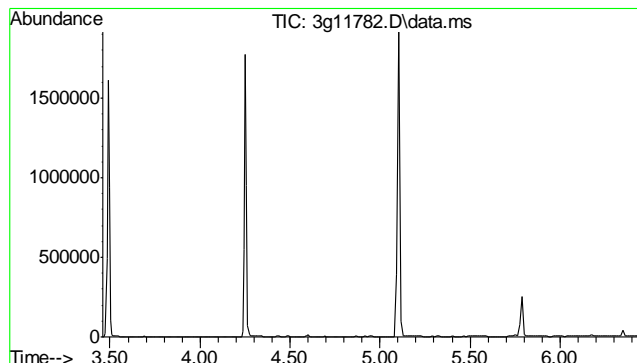
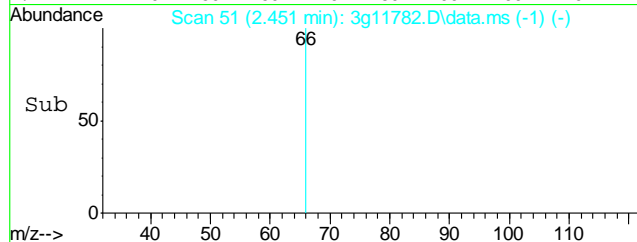
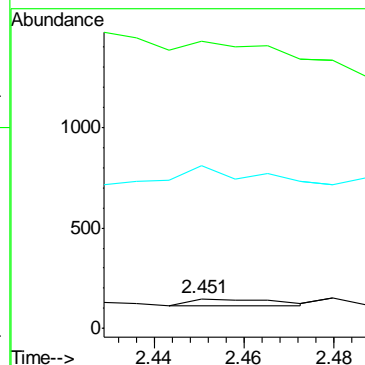
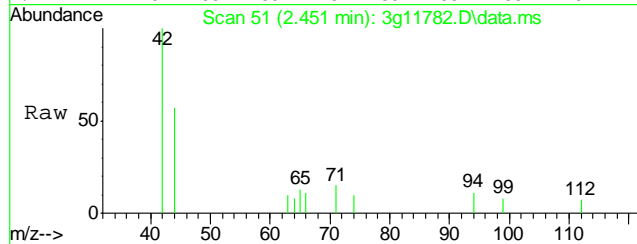
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 82 | 100 | | |
| 128 | 39.5 | 17.4 | 57.4 |
| 54 | 48.3 | 28.5 | 68.5 |





#3
N-Nitrosodimethylamine
Concen: Below ug/mL
RT: 2.451 min Scan# 51
Delta R.T. -0.029 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

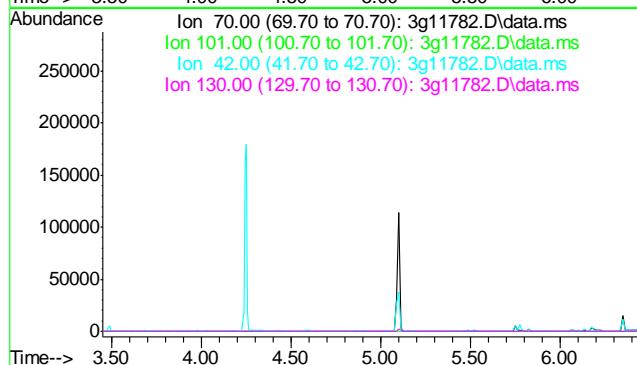
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 74 | 100 | | |
| 42 | 0.0 | 51.1 | 91.1# |
| 44 | 223.4 | 0.0 | 23.9# |

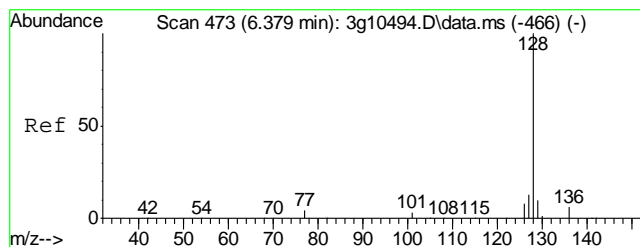


#4
N-Nitrosodi-propylamine
Concen: N.D. ug/mL
Expected RT: 4.95 min

Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

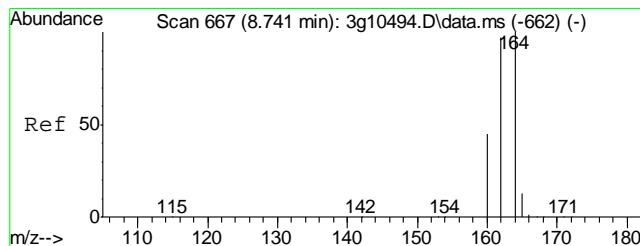
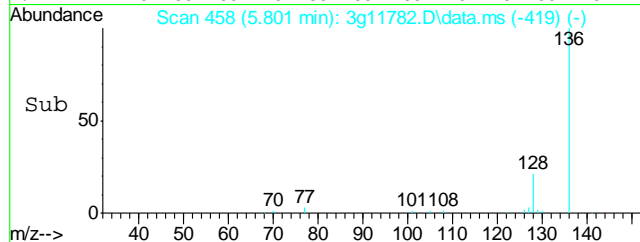
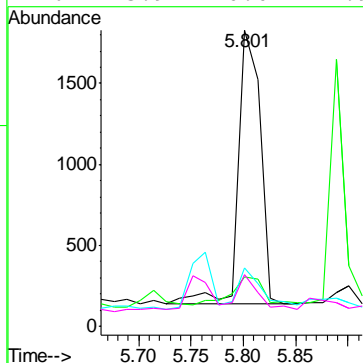
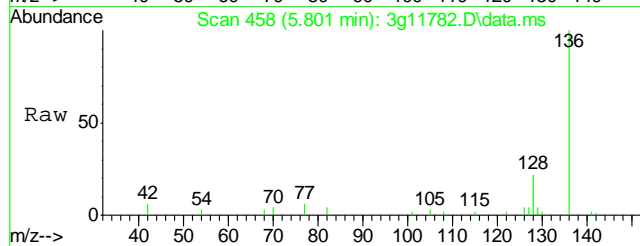
| Tgt Ion | Sig | Exp Ratio |
|---------|------|-----------|
| 70 | 100 | |
| 101 | 9.5 | |
| 42 | 58.9 | |
| 130 | 21.7 | |





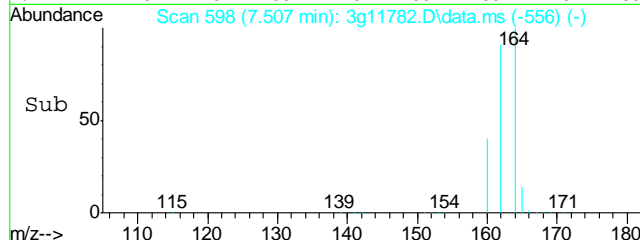
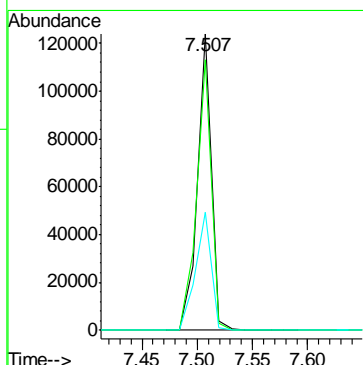
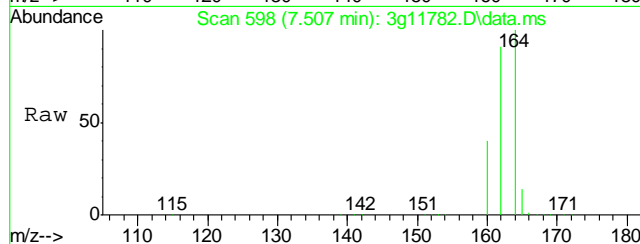
#5
Naphthalene
Concen: 0.0510 ug/mL
RT: 5.801 min Scan# 458
Delta R.T. -0.012 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

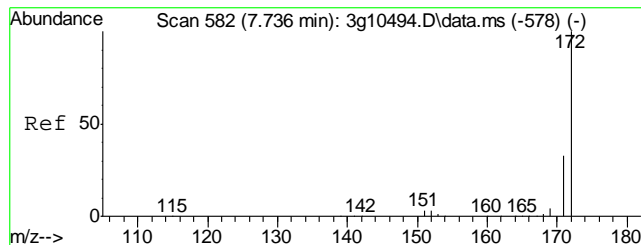
| | | | |
|-----------|-------|-------|------|
| Tgt Ion: | 128 | Resp: | 2489 |
| Ion Ratio | Lower | Upper | |
| 128 | 100 | | |
| 129 | 14.4 | 0.0 | 30.9 |
| 127 | 16.4 | 0.0 | 33.3 |
| 126 | 13.9 | 0.0 | 27.9 |



#6
Acenaphthene-d10
Concen: 4.0000 ug/mL
RT: 7.507 min Scan# 598
Delta R.T. 0.000 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

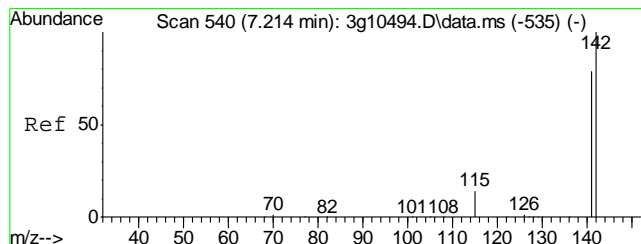
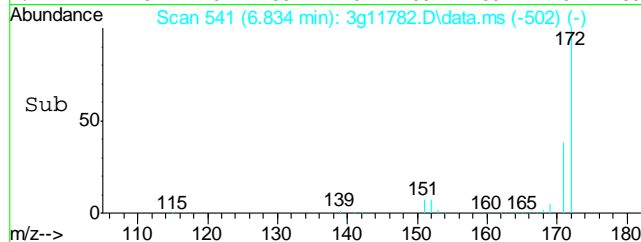
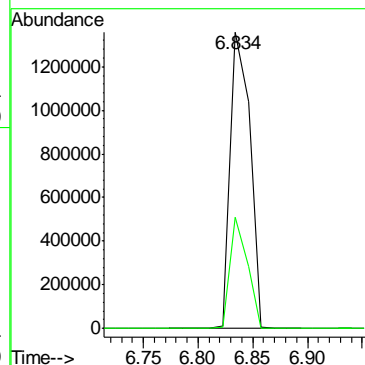
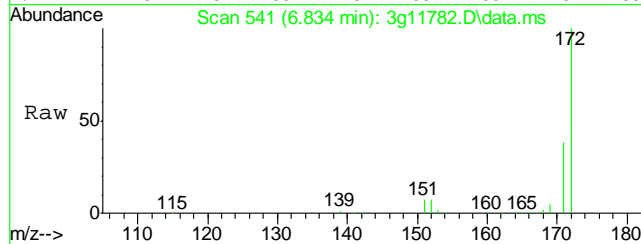
| | | | |
|-----------|-------|-------|--------|
| Tgt Ion: | 164 | Resp: | 109629 |
| Ion Ratio | Lower | Upper | |
| 164 | 100 | | |
| 162 | 96.0 | 75.5 | 115.5 |
| 160 | 44.9 | 24.4 | 64.4 |





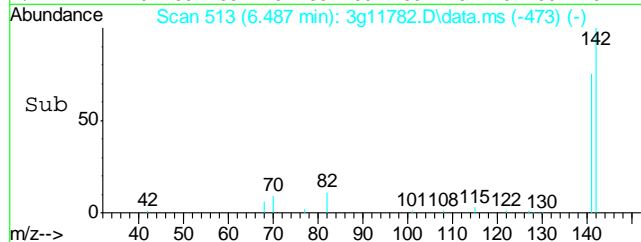
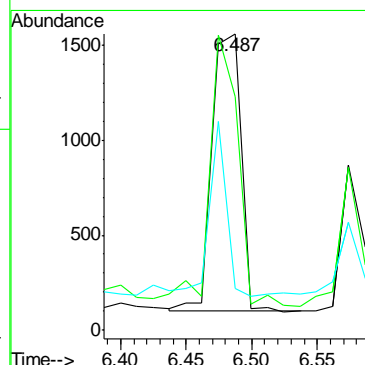
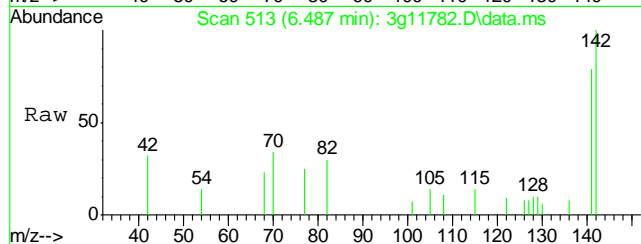
#7
2-Fluorobiphenyl
Concen: 37.6509 ug/mL
RT: 6.834 min Scan# 541
Delta R.T. -0.012 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

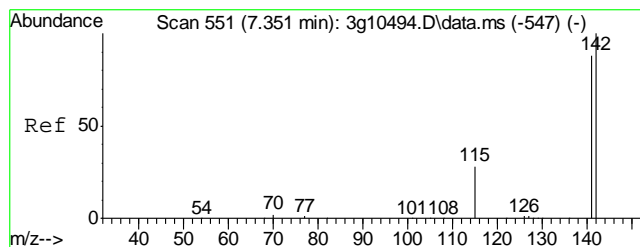
Tgt Ion: 172 Resp: 1731087
Ion Ratio Lower Upper
172 100
171 33.1 13.4 53.4



#8
2-Methylnaphthalene
Concen: 0.0650 ug/mL
RT: 6.487 min Scan# 513
Delta R.T. 0.000 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

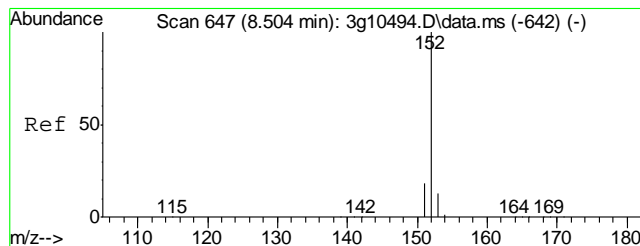
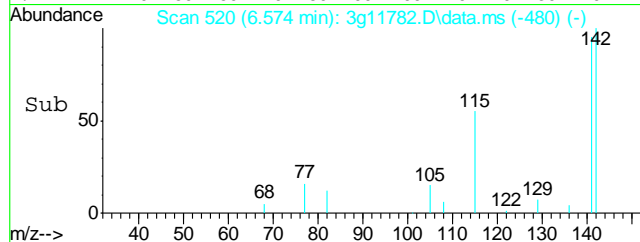
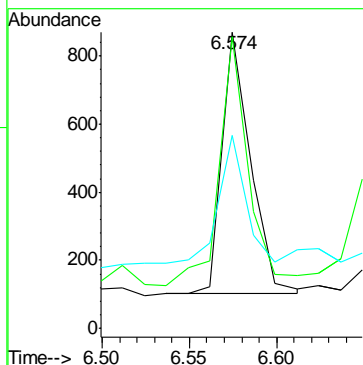
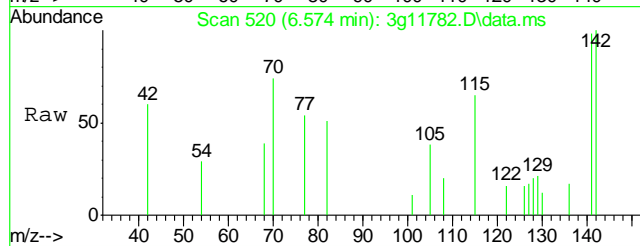
Tgt Ion: 142 Resp: 2227
Ion Ratio Lower Upper
142 100
141 96.4 63.5 103.5
115 42.0 20.6 60.6





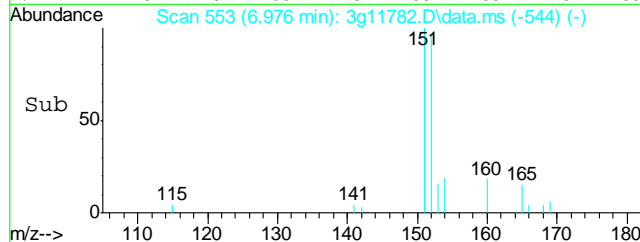
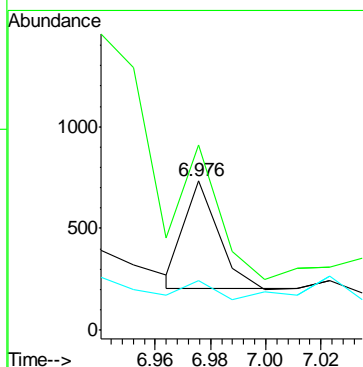
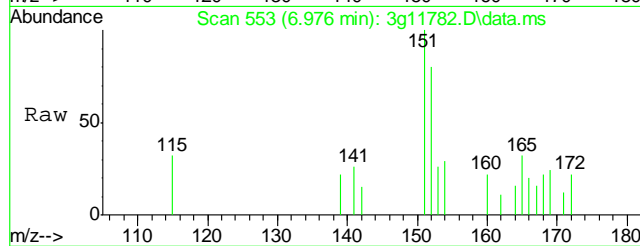
#9
1-Methylnaphthalene
Concen: Below ug/mL
RT: 6.574 min Scan# 520
Delta R.T. 0.000 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

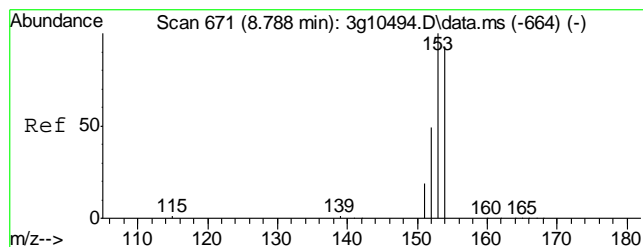
| | | | |
|-----------|-------|-------|-------|
| Tgt Ion: | 142 | Resp: | 875 |
| Ion Ratio | Lower | Upper | |
| 142 | 100 | | |
| 141 | 97.9 | 68.7 | 108.7 |
| 115 | 50.5 | 21.1 | 61.1 |



#10
Acenaphthylene
Concen: Below ug/mL
RT: 6.976 min Scan# 553
Delta R.T. -0.390 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

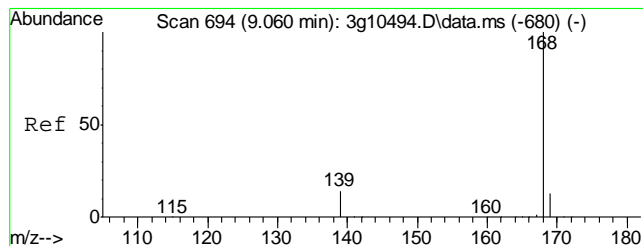
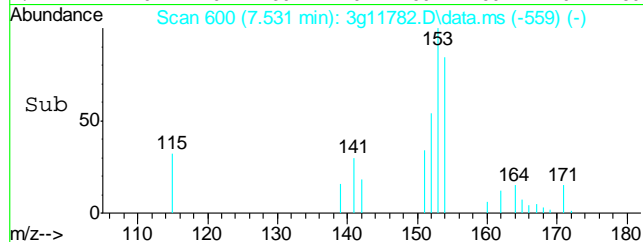
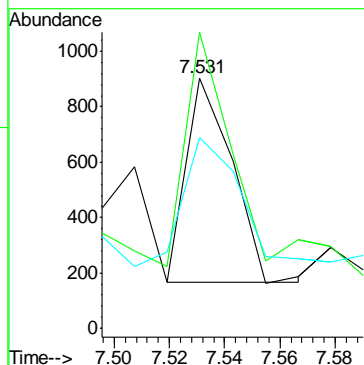
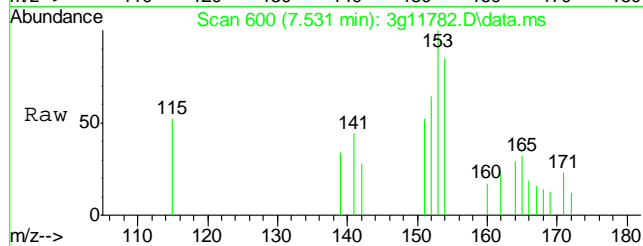
| | | | |
|-----------|-------|-------|------|
| Tgt Ion: | 152 | Resp: | 439 |
| Ion Ratio | Lower | Upper | |
| 152 | 100 | | |
| 151 | 27.1 | 0.0 | 39.2 |
| 153 | 28.7 | 0.0 | 33.0 |





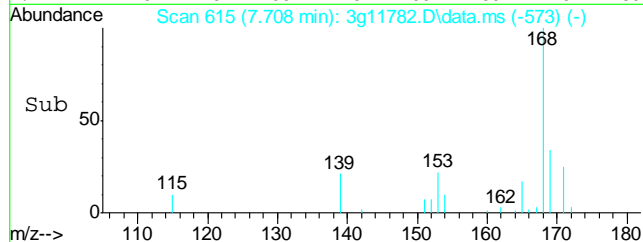
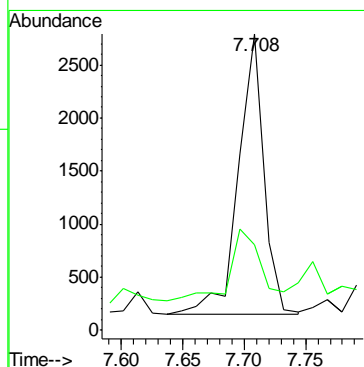
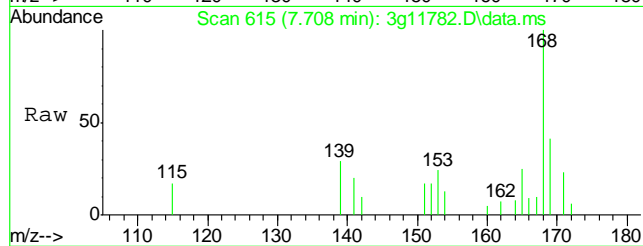
#11
Acenaphthene
Concen: Below ug/mL
RT: 7.531 min Scan# 600
Delta R.T. -0.012 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

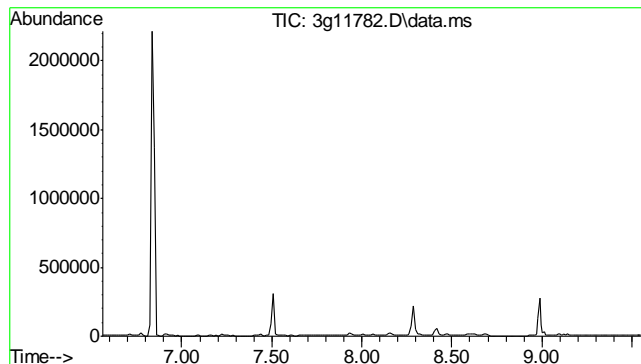
Tgt Ion:154 Resp: 847
Ion Ratio Lower Upper
154 100
153 99.5 86.3 126.3
152 77.7 31.9 71.9#



#12
Dibenzofuran
Concen: 0.0676 ug/mL
RT: 7.708 min Scan# 615
Delta R.T. 0.000 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

Tgt Ion:168 Resp: 3769
Ion Ratio Lower Upper
168 100
139 31.4 10.8 50.8

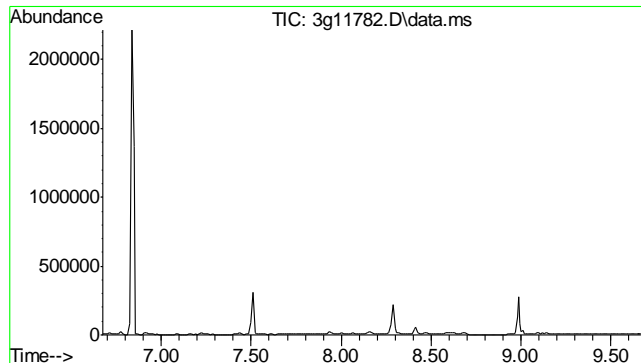
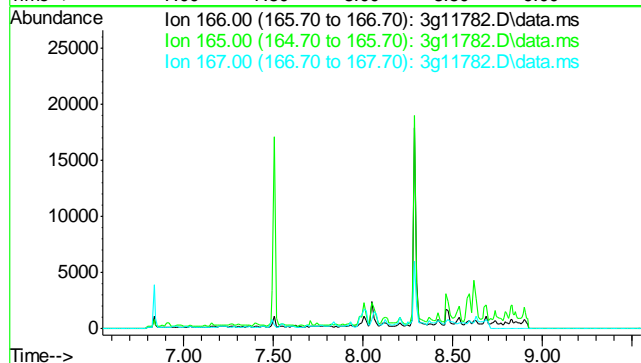




#13
Fluorene
Concen: N.D. ug/mL
Expected RT: 8.05 min

Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

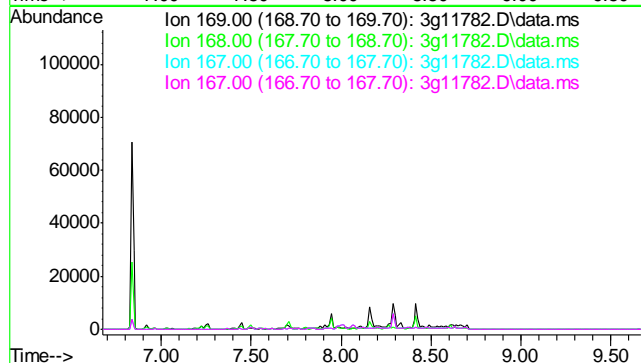
| | |
|----------|-----------|
| Tgt Ion: | 166 |
| Sig | Exp Ratio |
| 166 | 100 |
| 165 | 90.7 |
| 167 | 13.3 |

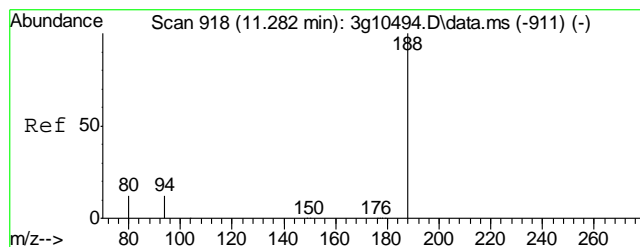


#14
Diphenylamine
Concen: N.D. ug/mL
Expected RT: 8.17 min

Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

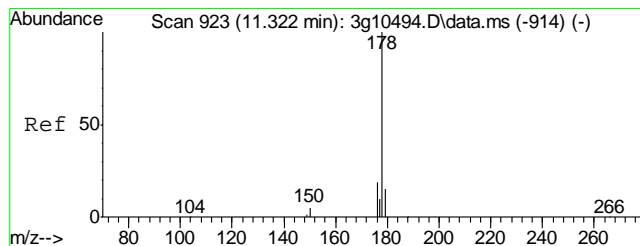
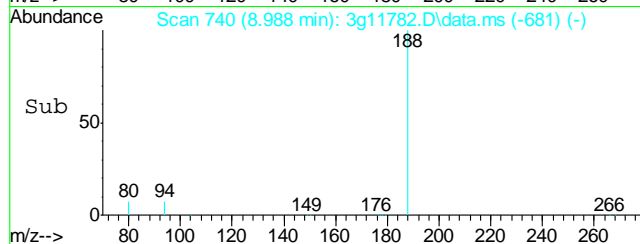
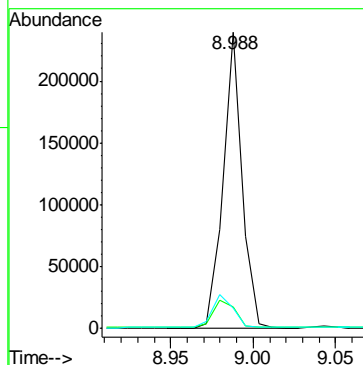
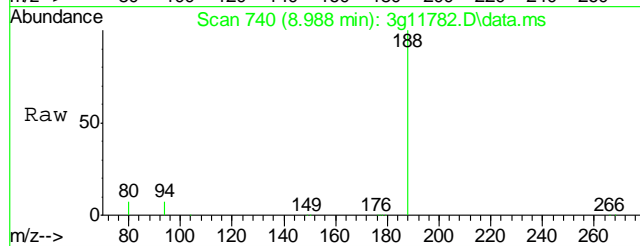
| | |
|----------|-----------|
| Tgt Ion: | 169 |
| Sig | Exp Ratio |
| 169 | 100 |
| 168 | 60.5 |
| 167 | 32.9 |
| 167 | 32.9 |





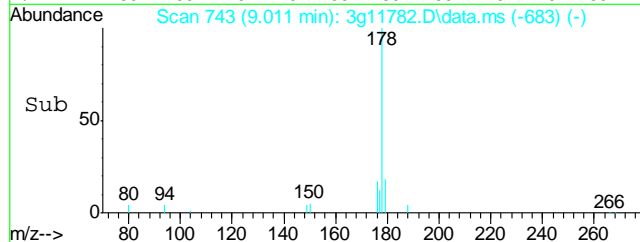
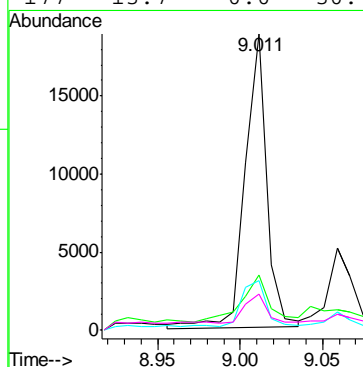
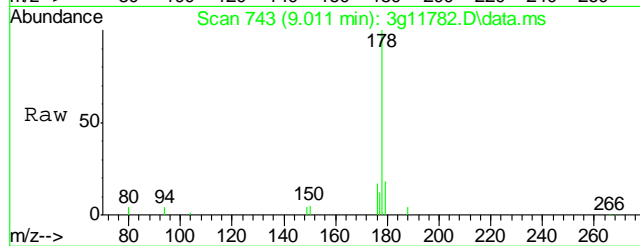
#15
Phenanthrene-d10
Concen: 4.0000 ug/mL
RT: 8.988 min Scan# 740
Delta R.T. 0.000 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

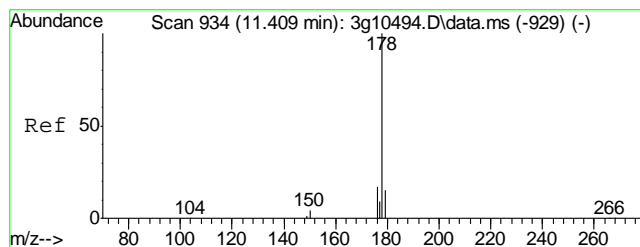
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 188 | 100 | | |
| 94 | 11.1 | 0.0 | 33.6 |
| 80 | 12.6 | 0.0 | 35.0 |



#16
Phenanthrene
Concen: 0.2548 ug/mL
RT: 9.011 min Scan# 743
Delta R.T. 0.000 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

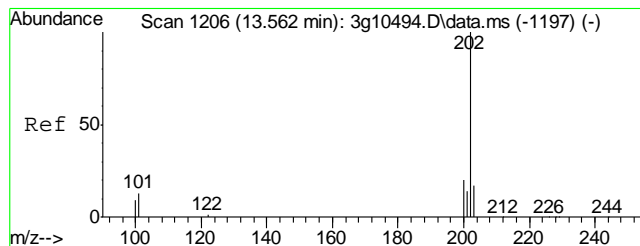
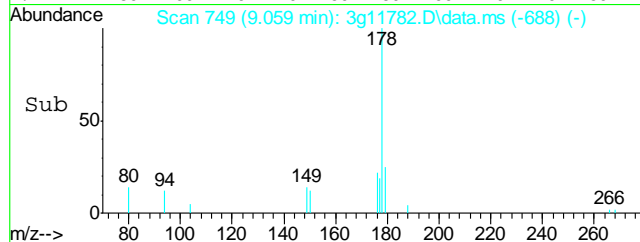
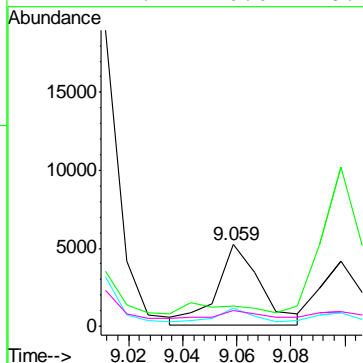
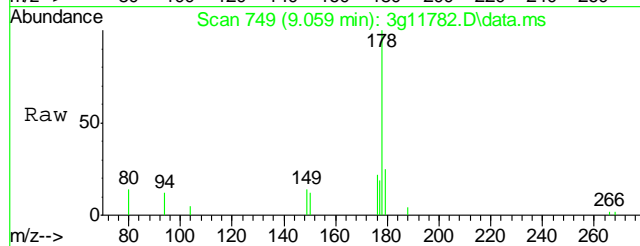
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 178 | 100 | | |
| 179 | 27.1 | 0.0 | 35.2 |
| 176 | 21.1 | 0.0 | 38.9 |
| 177 | 13.7 | 0.0 | 30.4 |





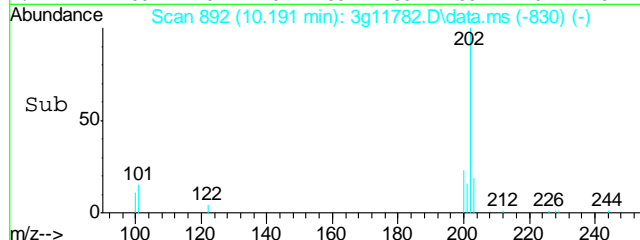
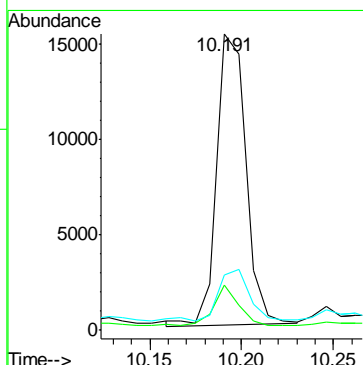
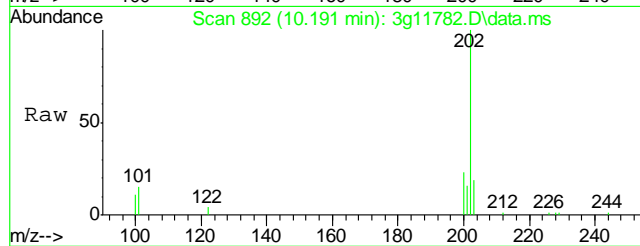
#17
 Anthracene
 Concen: 0.0858 ug/mL m
 RT: 9.059 min Scan# 749
 Delta R.T. -0.008 min
 Lab File: 3g11782.D
 Acq: 24 Oct 12 4:55 pm

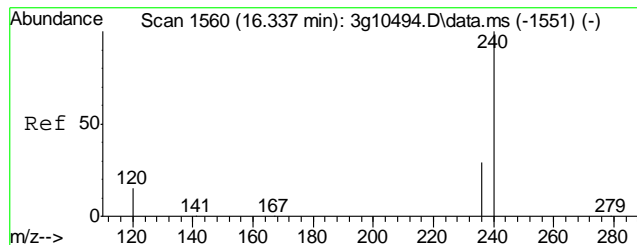
| | |
|--------------|-------------|
| Tgt Ion: 178 | Resp: 5778 |
| Ion Ratio | Lower Upper |
| 178 100 | |
| 179 82.2 | 0.0 35.2# |
| 176 64.0 | 0.0 38.0# |
| 177 41.7 | 0.0 28.8# |



#18
 Fluoranthene
 Concen: 0.2255 ug/mL
 RT: 10.191 min Scan# 892
 Delta R.T. -0.008 min
 Lab File: 3g11782.D
 Acq: 24 Oct 12 4:55 pm

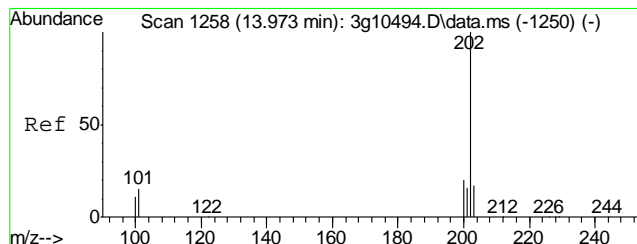
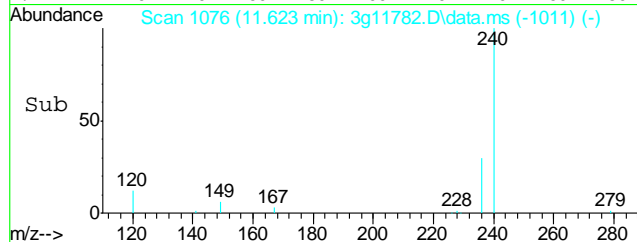
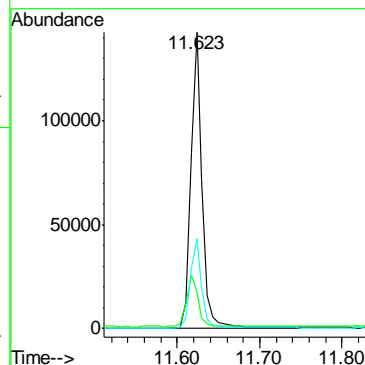
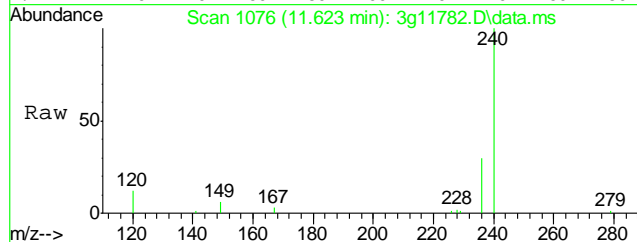
| | |
|--------------|-------------|
| Tgt Ion: 202 | Resp: 16879 |
| Ion Ratio | Lower Upper |
| 202 100 | |
| 101 13.8 | 0.0 32.6 |
| 203 20.7 | 0.0 37.3 |





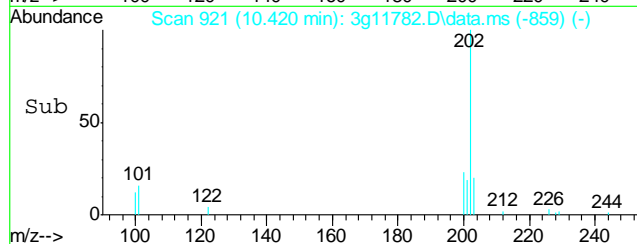
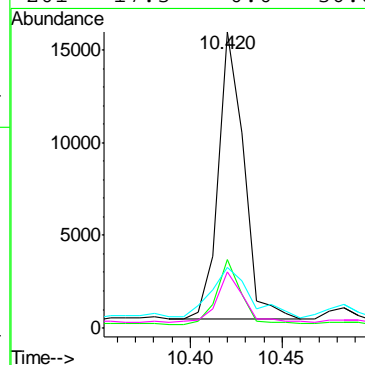
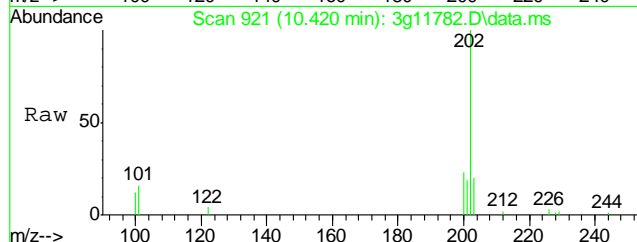
#19
Chrysene-d12
Concen: 4.0000 ug/mL
RT: 11.623 min Scan# 1076
Delta R.T. -0.006 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

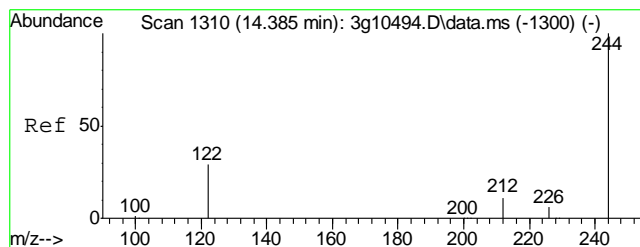
| | | | |
|-----------|-------|-------|--------|
| Tgt Ion: | 240 | Resp: | 136087 |
| Ion Ratio | Lower | Upper | |
| 240 | 100 | | |
| 120 | 17.6 | 0.0 | 38.0 |
| 236 | 30.6 | 11.4 | 51.4 |



#20
Pyrene
Concen: 0.2094 ug/mL
RT: 10.420 min Scan# 921
Delta R.T. -0.008 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

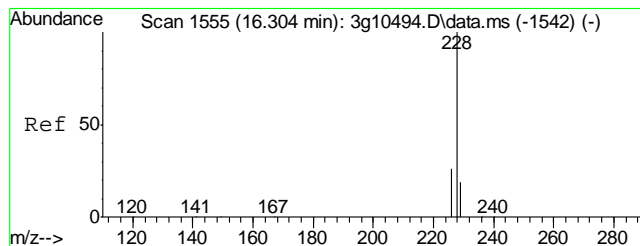
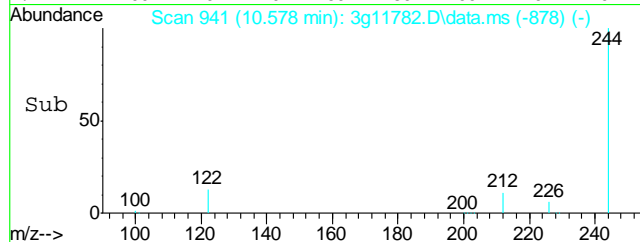
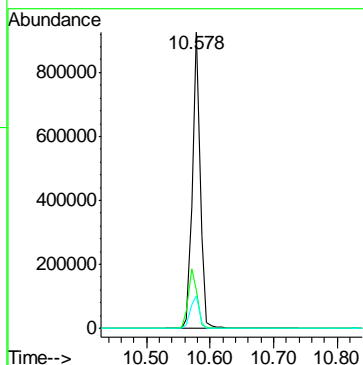
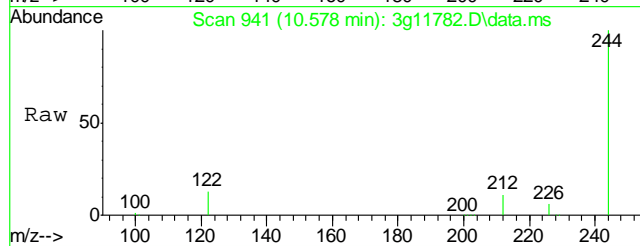
| | | | |
|-----------|-------|-------|-------|
| Tgt Ion: | 202 | Resp: | 14923 |
| Ion Ratio | Lower | Upper | |
| 202 | 100 | | |
| 200 | 21.3 | 0.6 | 40.6 |
| 203 | 27.4 | 0.0 | 37.7 |
| 201 | 17.3 | 0.0 | 36.8 |





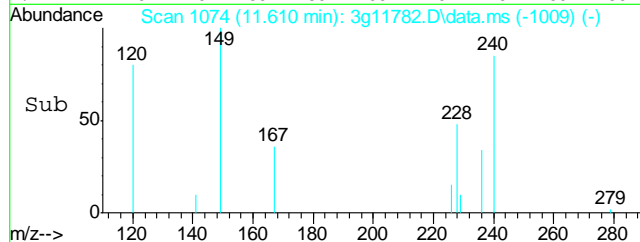
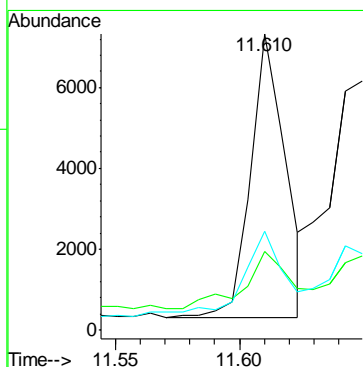
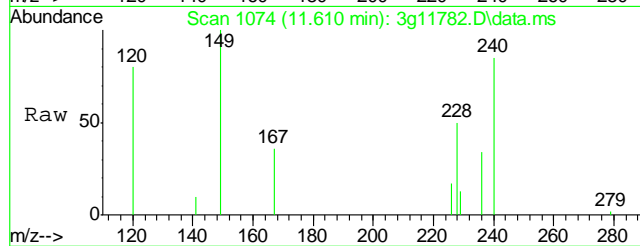
#21
Terphenyl-d14
Concen: 41.7513 ug/mL
RT: 10.578 min Scan# 941
Delta R.T. 0.000 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

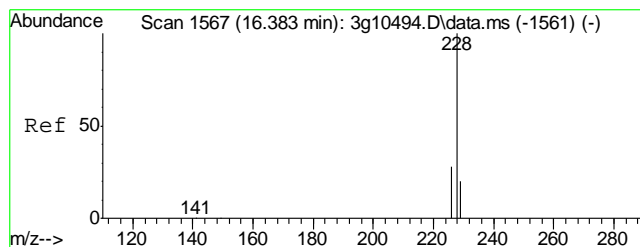
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 244 | 100 | | |
| 122 | 22.5 | 4.2 | 44.2 |
| 212 | 12.4 | 0.0 | 32.4 |



#22
Benzo(a)anthracene
Concen: 0.1136 ug/mL
RT: 11.610 min Scan# 1074
Delta R.T. -0.006 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

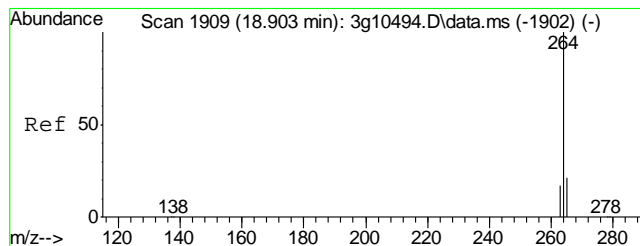
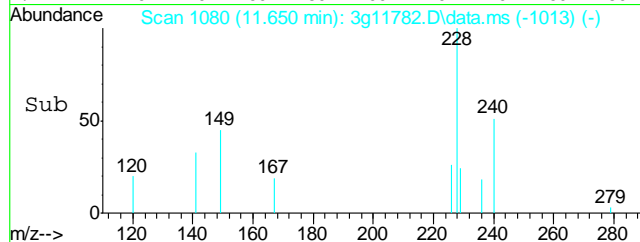
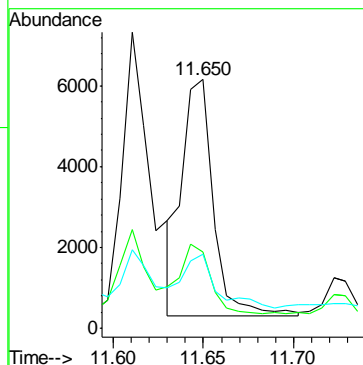
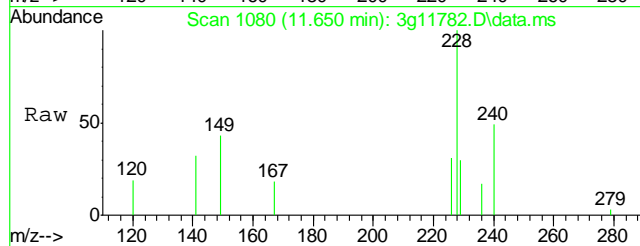
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 228 | 100 | | |
| 229 | 30.7 | 0.0 | 39.5 |
| 226 | 41.1 | 6.7 | 46.7 |





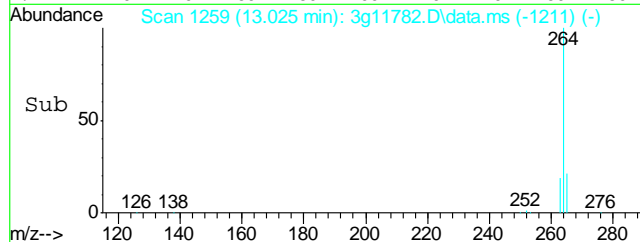
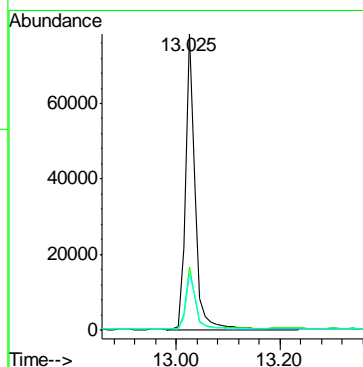
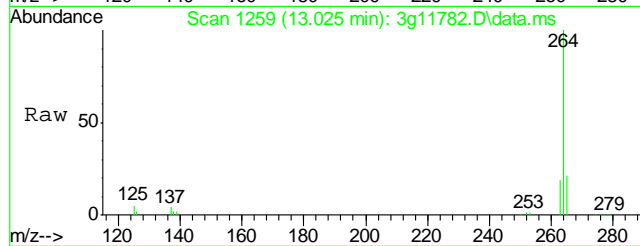
#23
Chrysene
Concen: 0.1108 ug/mL
RT: 11.650 min Scan# 1080
Delta R.T. 0.000 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

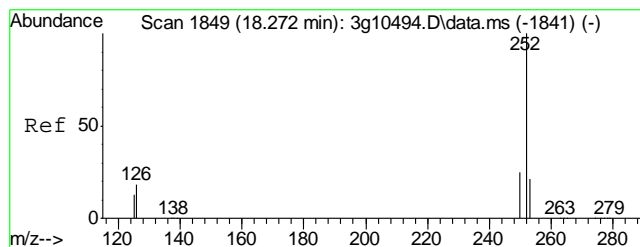
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 228 | 100 | | |
| 226 | 34.1 | 9.0 | 49.0 |
| 229 | 25.3 | 0.0 | 39.4 |



#24
Perylene-d12
Concen: 4.0000 ug/mL
RT: 13.025 min Scan# 1259
Delta R.T. 0.000 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

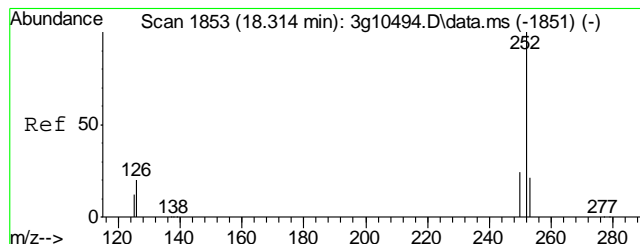
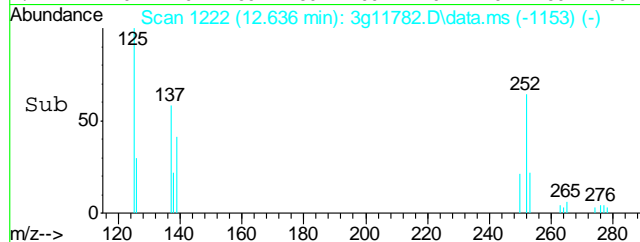
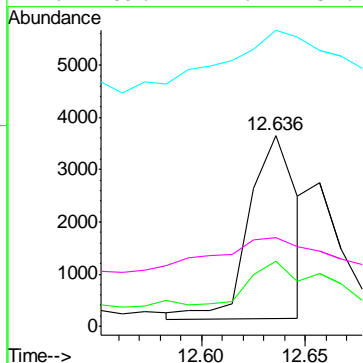
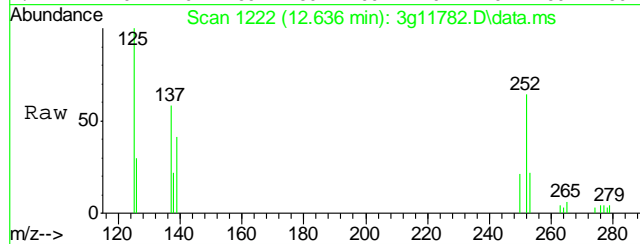
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 264 | 100 | | |
| 265 | 21.0 | 0.8 | 40.8 |
| 263 | 20.0 | 0.2 | 40.2 |





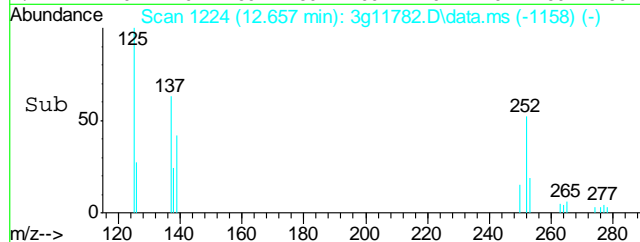
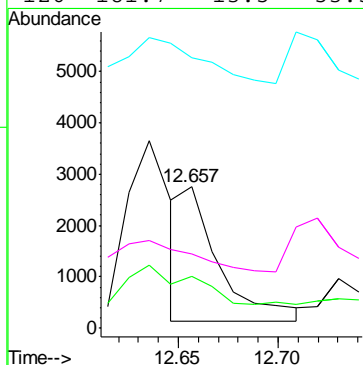
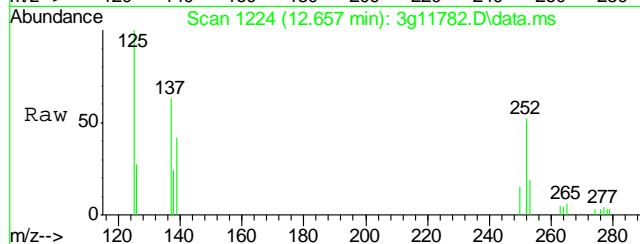
#25
Benzo(b)fluoranthene
Concen: 0.0955 ug/mL m
RT: 12.636 min Scan# 1222
Delta R.T. 0.001 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

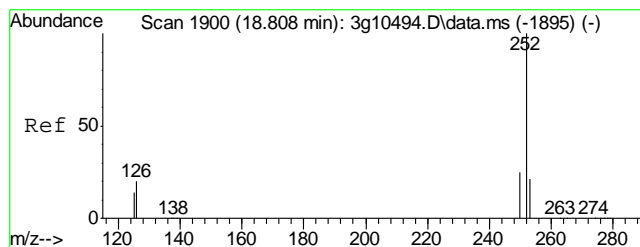
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 252 | 100 | | |
| 253 | 43.3 | 1.3 | 41.3# |
| 125 | 0.0 | 2.4 | 42.4# |
| 126 | 109.4 | 12.4 | 52.4# |



#26
Benzo(k)fluoranthene
Concen: 0.0961 ug/mL m
RT: 12.657 min Scan# 1224
Delta R.T. -0.009 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

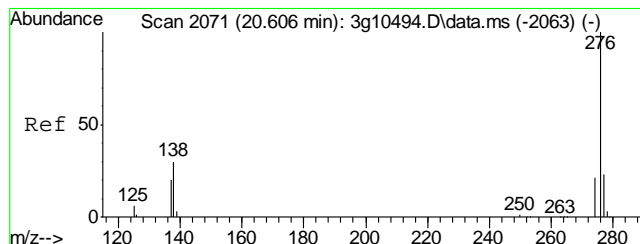
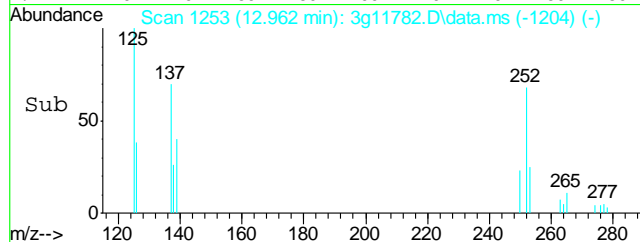
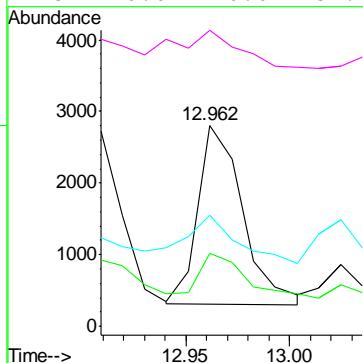
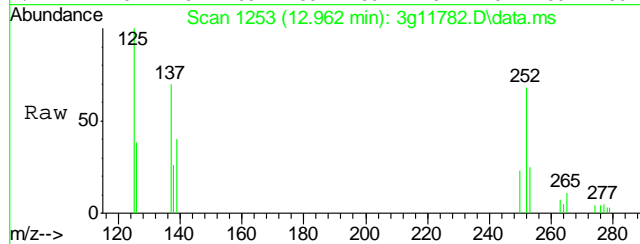
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 252 | 100 | | |
| 253 | 71.9 | 2.0 | 42.0# |
| 125 | 0.0 | 3.1 | 43.1# |
| 126 | 181.7 | 13.5 | 53.5# |





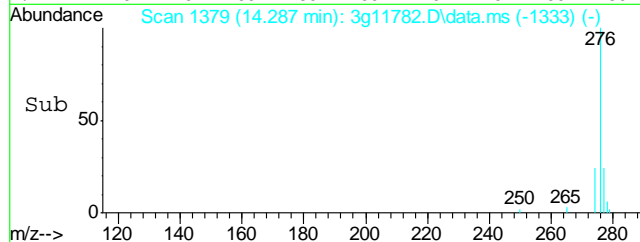
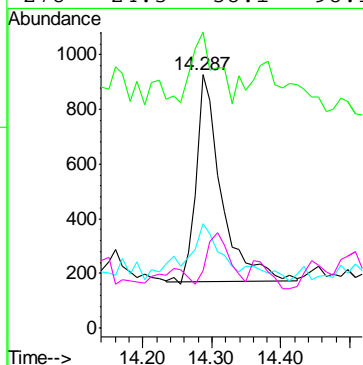
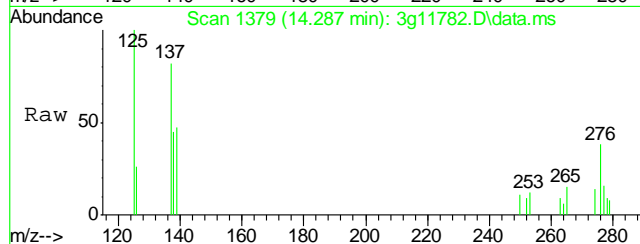
#27
Benzo(a)pyrene
Concen: 0.0665 ug/mL
RT: 12.962 min Scan# 1253
Delta R.T. -0.009 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

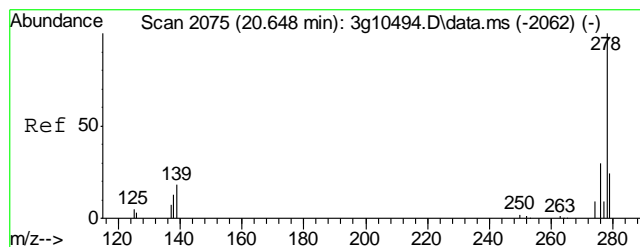
| | | | |
|-----------|------|-------|-------|
| Tgt Ion: | 252 | Resp: | 3745 |
| Ion Ratio | 100 | Lower | Upper |
| 252 | 100 | | |
| 253 | 26.9 | 1.3 | 41.3 |
| 126 | 28.4 | 0.0 | 36.5 |
| 125 | 0.0 | 0.0 | 32.0 |



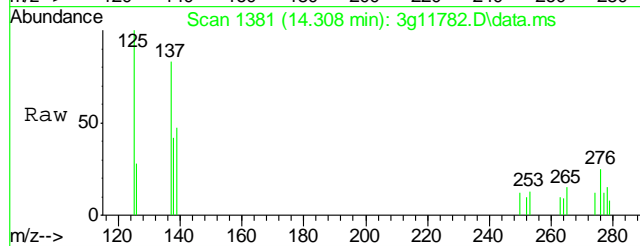
#28
Indeno(1,2,3-cd)pyrene
Concen: Below ug/mL
RT: 14.287 min Scan# 1379
Delta R.T. -0.020 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm

| | | | |
|-----------|------|-------|-------|
| Tgt Ion: | 276 | Resp: | 1914 |
| Ion Ratio | 100 | Lower | Upper |
| 276 | 100 | | |
| 138 | 31.2 | 12.2 | 52.2 |
| 277 | 26.4 | 4.9 | 44.9 |
| 278 | 24.3 | 58.1 | 98.1# |

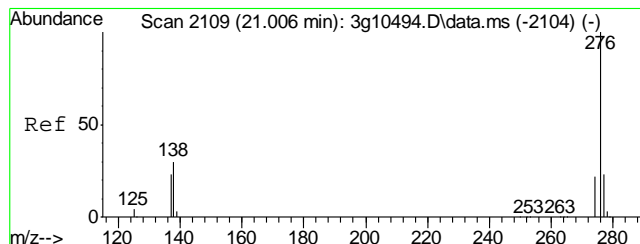
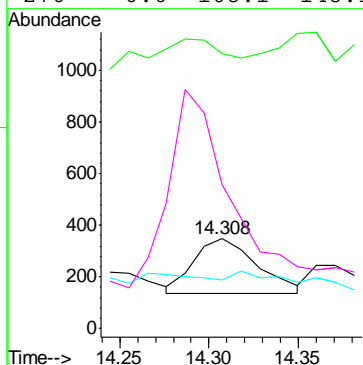
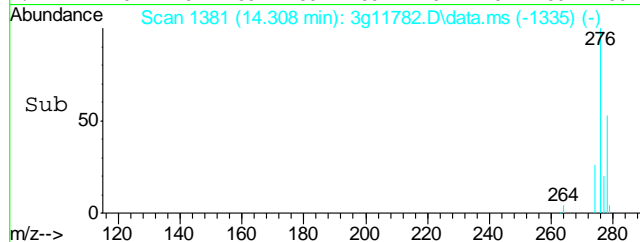




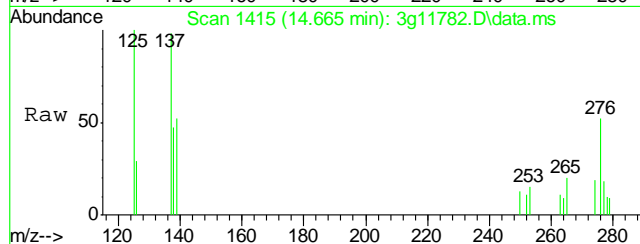
#29
Dibenz(a,h)anthracene
Concen: Below ug/mL m
RT: 14.308 min Scan# 1381
Delta R.T. -0.020 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm



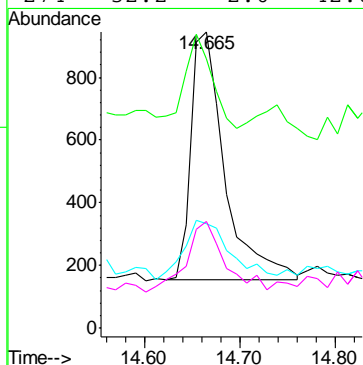
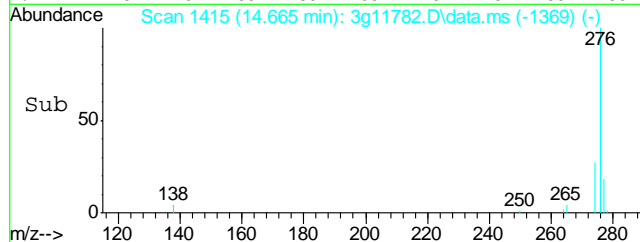
Tgt Ion: 278 Resp: 528
Ion Ratio Lower Upper
278 100
139 67.4 4.7 44.7#
279 0.0 3.2 43.2#
276 0.0 108.1 148.1#



#30
Benzo(g,h,i)perylene
Concen: Below ug/mL
RT: 14.665 min Scan# 1415
Delta R.T. -0.021 min
Lab File: 3g11782.D
Acq: 24 Oct 12 4:55 pm



Tgt Ion: 276 Resp: 1936
Ion Ratio Lower Upper
276 100
138 30.5 7.7 47.7
277 32.2 3.4 43.4
274 32.2 2.0 42.0



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\102412\
 Data File : 3g11777.D
 Acq On : 24 Oct 2012 2:54 pm
 Operator : DONC
 Sample : OP6857-MB
 Misc : OP6857,E3G555,30.00,,,1,1
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 24 15:52:15 2012
 Quant Method : C:\msdchem\1\METHODS\SIMPE3G553.M
 Quant Title : PAHSIM BASE
 QLast Update : Mon Oct 22 14:22:49 2012
 Response via : Initial Calibration

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|----------------------|--------|------|----------|--------|-------|----------|
| 1) Naphthalene-d8 | 5.789 | 136 | 191564 | 4.0000 | ug/mL | 0.00 |
| 6) Acenaphthene-d10 | 7.507 | 164 | 106058 | 4.0000 | ug/mL | 0.00 |
| 15) Phenanthrene-d10 | 8.987 | 188 | 187553 | 4.0000 | ug/mL | 0.00 |
| 19) Chrysene-d12 | 11.623 | 240 | 127266 | 4.0000 | ug/mL | 0.00 |
| 24) Perylene-d12 | 13.024 | 264 | 83899 | 4.0000 | ug/mL | 0.00 |

System Monitoring Compounds

| | | | | | | |
|----------------------|----------------|-----|------------|---------|-------|-------|
| 2) Nitrobenzene-d5 | 5.103 | 82 | 1011161 | 47.9735 | ug/mL | 0.00 |
| Spiked Amount 50.000 | Range 25 - 135 | | Recovery = | 95.94% | | |
| 7) 2-Fluorobiphenyl | 6.834 | 172 | 1794762 | 40.3502 | ug/mL | -0.01 |
| Spiked Amount 50.000 | Range 25 - 135 | | Recovery = | 80.70% | | |
| 21) Terphenyl-d14 | 10.578 | 244 | 893283 | 50.5647 | ug/mL | 0.00 |
| Spiked Amount 50.000 | Range 25 - 135 | | Recovery = | 101.12% | | |

Target Compounds

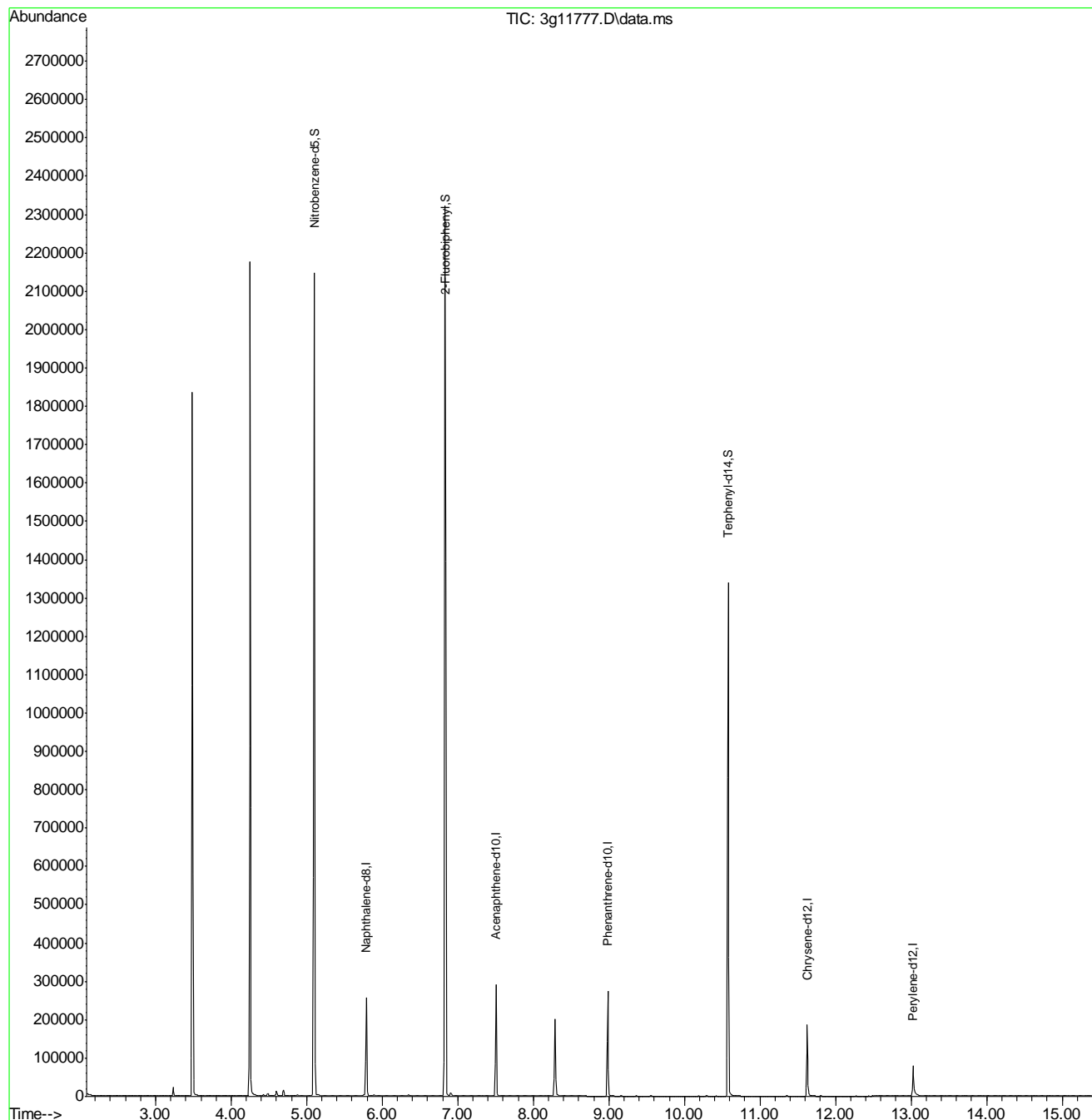
| | | | | | Qvalue |
|----------------------------|--------|-----|-----|------|--------|
| 3) N-Nitrosodimethylamine | 2.450 | 74 | 19 | N.D. | |
| 4) N-Nitrosodi-propylamine | 0.000 | 70 | 0 | N.D. | d |
| 5) Naphthalene | 5.801 | 128 | 600 | N.D. | |
| 8) 2-Methylnaphthalene | 6.474 | 142 | 515 | N.D. | |
| 9) 1-Methylnaphthalene | 6.574 | 142 | 249 | N.D. | |
| 10) Acenaphthylene | 7.366 | 152 | 67 | N.D. | |
| 11) Acenaphthene | 7.188 | 154 | 95 | N.D. | |
| 12) Dibenzofuran | 7.708 | 168 | 167 | N.D. | |
| 13) Fluorene | 0.000 | 166 | 0 | N.D. | d |
| 14) Diphenylamine | 0.000 | 169 | 0 | N.D. | d |
| 16) Phenanthrene | 9.011 | 178 | 564 | N.D. | |
| 17) Anthracene | 9.059 | 178 | 184 | N.D. | |
| 18) Fluoranthene | 10.420 | 202 | 287 | N.D. | |
| 20) Pyrene | 10.420 | 202 | 287 | N.D. | |
| 22) Benzo(a)anthracene | 11.616 | 228 | 720 | N.D. | |
| 23) Chrysene | 11.616 | 228 | 720 | N.D. | |
| 25) Benzo(b)fluoranthene | 12.635 | 252 | 407 | N.D. | |
| 26) Benzo(k)fluoranthene | 0.000 | 252 | 0 | N.D. | d |
| 27) Benzo(a)pyrene | 12.961 | 252 | 127 | N.D. | |
| 28) Indeno(1,2,3-cd)pyrene | 14.297 | 276 | 118 | N.D. | |
| 29) Dibenz(a,h)anthracene | 14.318 | 278 | 88 | N.D. | |
| 30) Benzo(g,h,i)perylene | 14.676 | 276 | 228 | N.D. | |

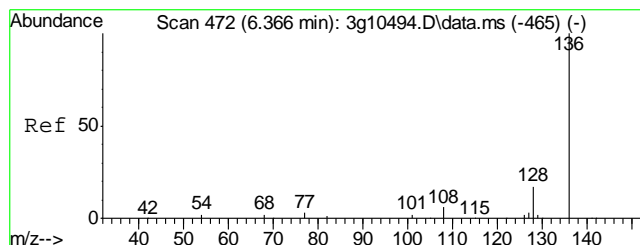
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\102412\
Data File : 3g11777.D
Acq On : 24 Oct 2012 2:54 pm
Operator : DONC
Sample : OP6857-MB
Misc : OP6857,E3G555,30.00,,,1,1
ALS Vial : 4 Sample Multiplier: 1

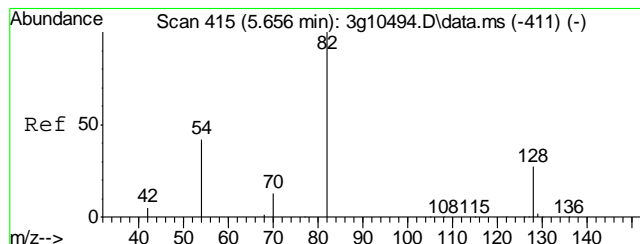
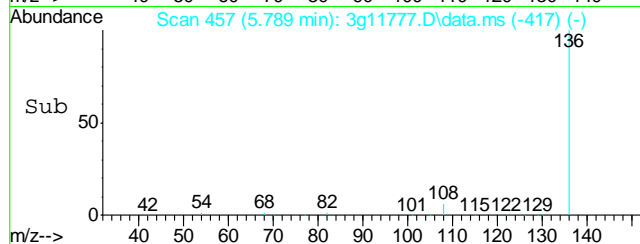
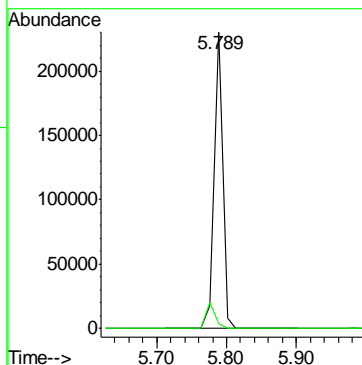
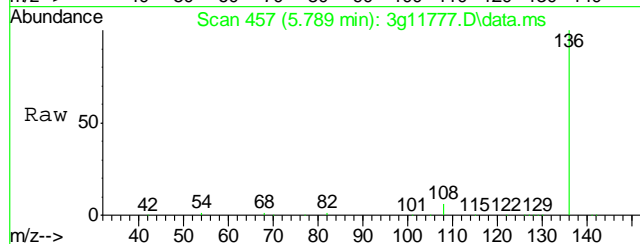
Quant Time: Oct 24 15:52:15 2012
Quant Method : C:\msdchem\1\METHODS\SIMPE3G553.M
Quant Title : PAHSIM BASE
QLast Update : Mon Oct 22 14:22:49 2012
Response via : Initial Calibration





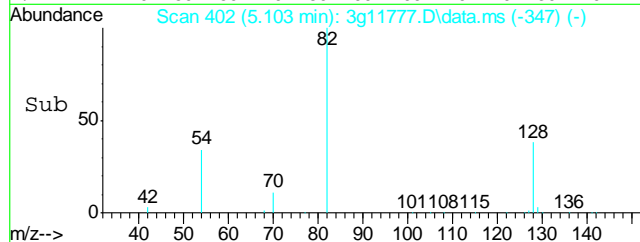
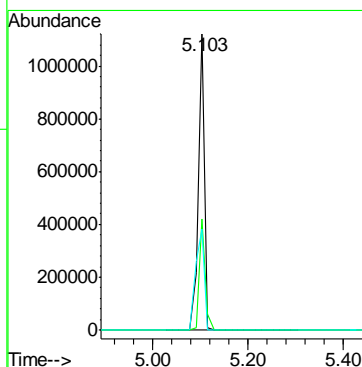
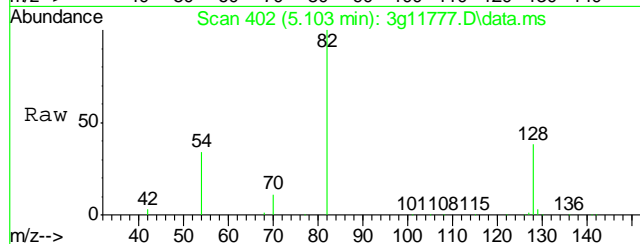
#1
Naphthalene-d8
Concen: 4.0000 ug/mL
RT: 5.789 min Scan# 457
Delta R.T. 0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

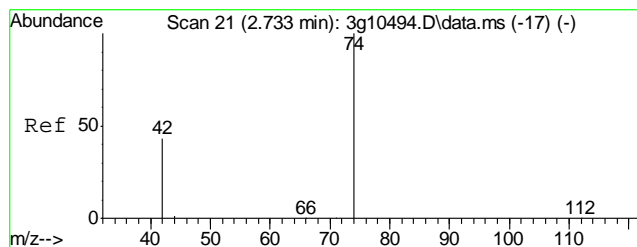
| | | | |
|-----------|-------|-------|--------|
| Tgt Ion: | 136 | Resp: | 191564 |
| Ion Ratio | Lower | Upper | |
| 136 | 100 | | |
| 68 | 9.5 | 0.0 | 29.7 |



#2
Nitrobenzene-d5
Concen: 47.9735 ug/mL
RT: 5.103 min Scan# 402
Delta R.T. 0.001 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

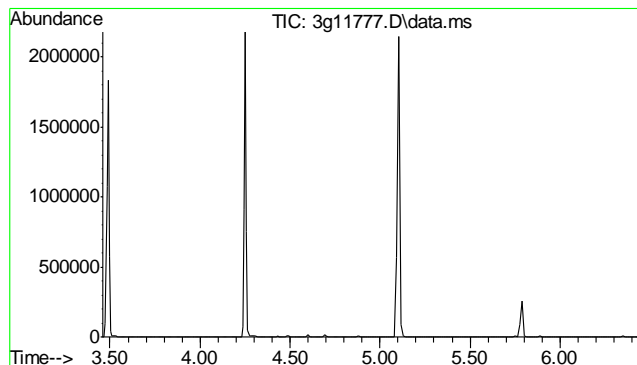
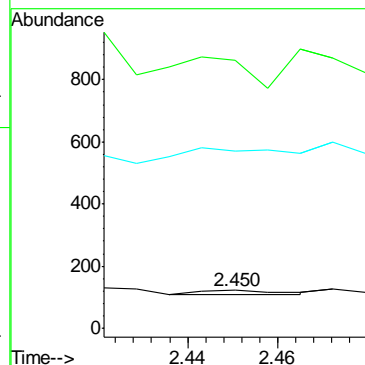
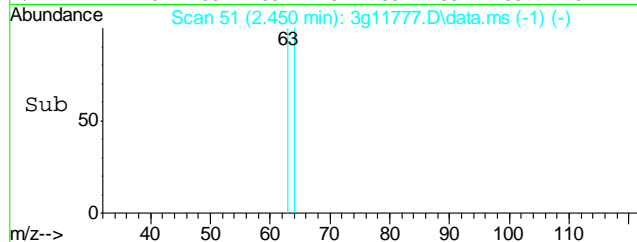
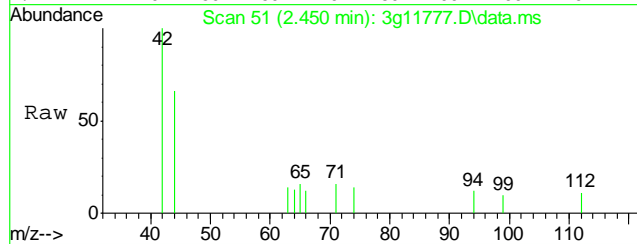
| | | | |
|-----------|-------|-------|---------|
| Tgt Ion: | 82 | Resp: | 1011161 |
| Ion Ratio | Lower | Upper | |
| 82 | 100 | | |
| 128 | 36.1 | 17.4 | 57.4 |
| 54 | 47.8 | 28.5 | 68.5 |





#3
N-Nitrosodimethylamine
Concen: Below ug/mL
RT: 2.450 min Scan# 51
Delta R.T. -0.029 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

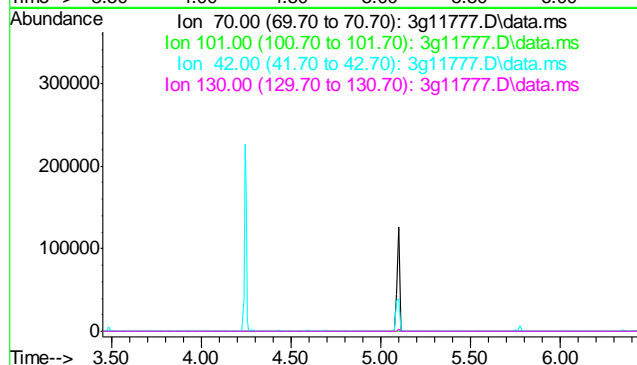
Tgt Ion: 74 Resp: 19
Ion Ratio Lower Upper
74 100
42 0.0 51.1 91.1#
44 763.2 0.0 23.9#

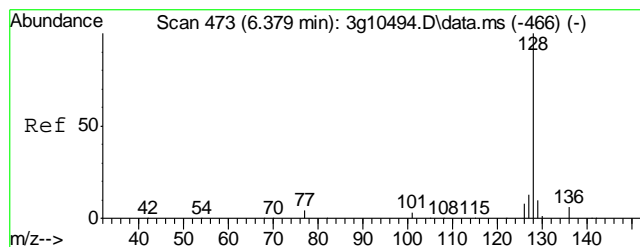


#4
N-Nitrosodi-propylamine
Concen: N.D. ug/mL
Expected RT: 4.95 min

Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

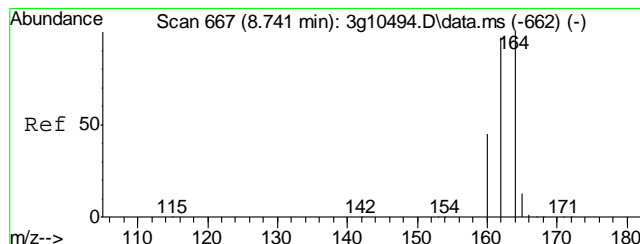
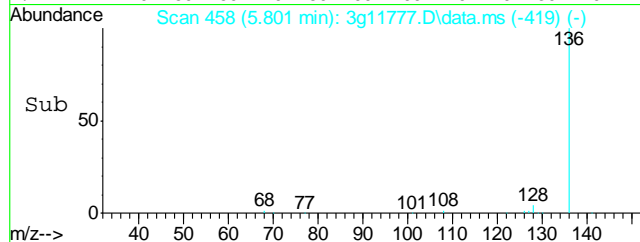
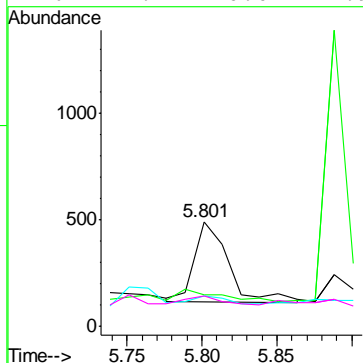
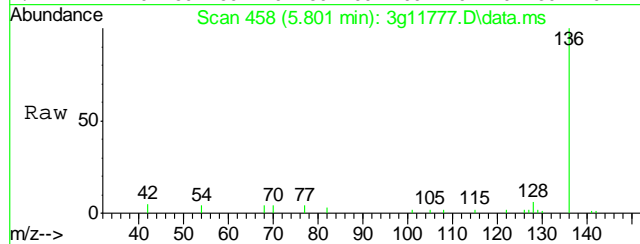
Tgt Ion: 70
Sig Exp Ratio
70 100
101 9.5
42 58.9
130 21.7





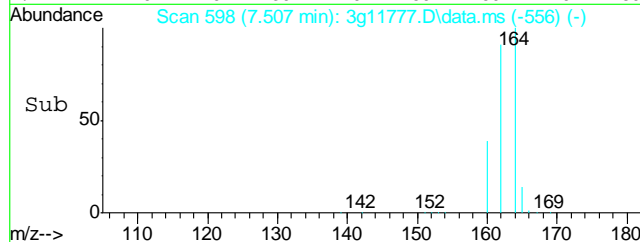
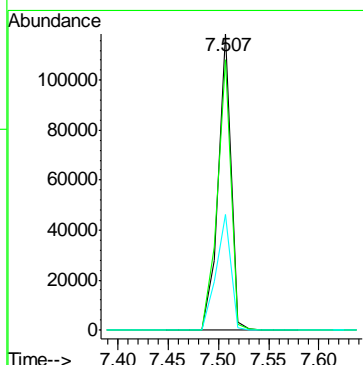
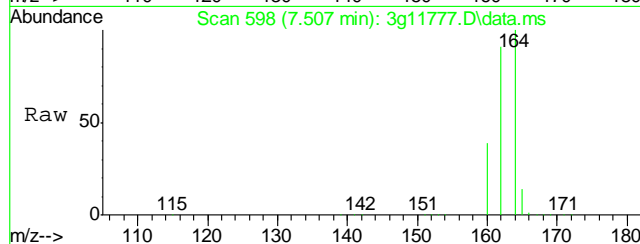
#5
Naphthalene
Concen: Below ug/mL
RT: 5.801 min Scan# 458
Delta R.T. -0.012 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

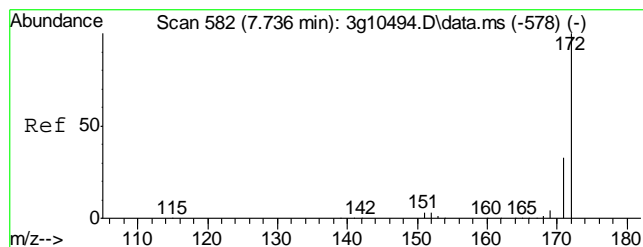
| Tgt Ion | 128 | Resp | 600 |
|-----------|------|------|-----|
| Ion Ratio | 100 | | |
| Lower | 0.0 | | |
| Upper | 30.9 | | |
| 129 | 30.7 | | |
| 127 | 11.8 | | |
| 126 | 21.7 | | |



#6
Acenaphthene-d10
Concen: 4.0000 ug/mL
RT: 7.507 min Scan# 598
Delta R.T. -0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

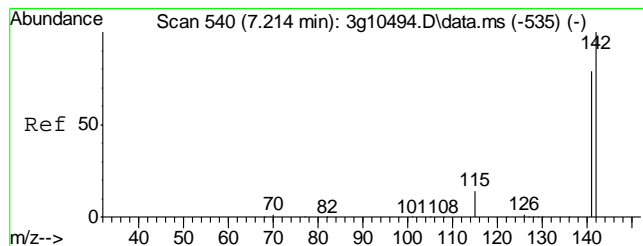
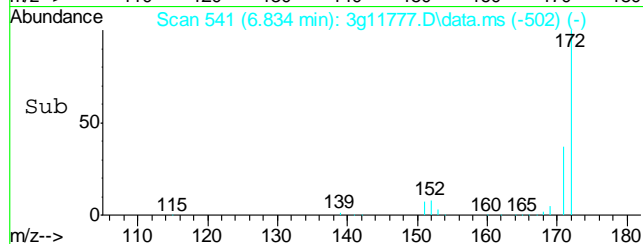
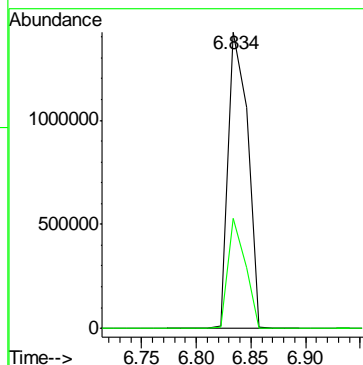
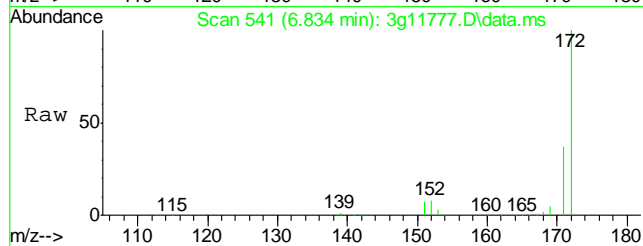
| Tgt Ion | 164 | Resp | 106058 |
|-----------|-------|------|--------|
| Ion Ratio | 100 | | |
| Lower | 75.5 | | |
| Upper | 115.5 | | |
| 162 | 96.4 | | |
| 160 | 44.5 | | |





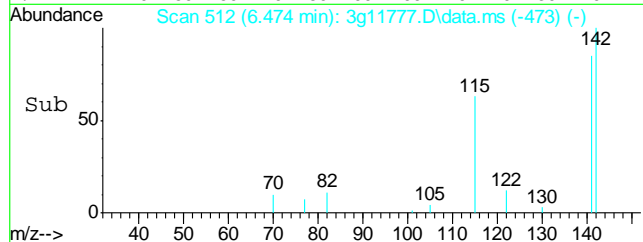
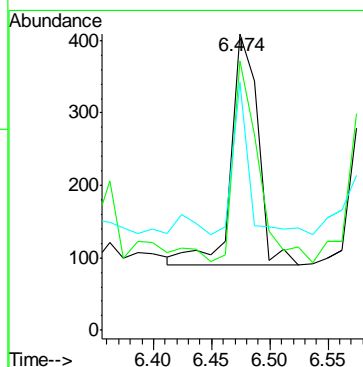
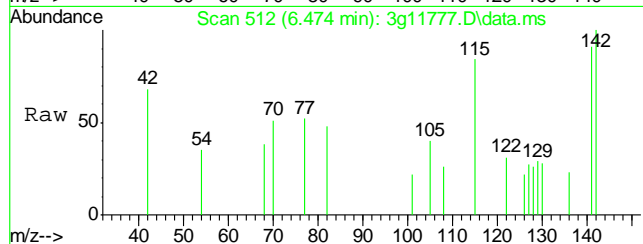
#7
2-Fluorobiphenyl
Concen: 40.3502 ug/mL
RT: 6.834 min Scan# 541
Delta R.T. -0.012 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

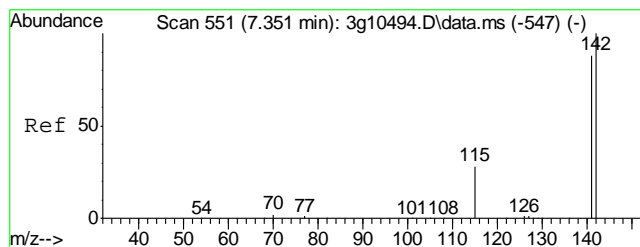
Tgt Ion:172 Resp: 1794762
Ion Ratio Lower Upper
172 100
171 33.1 13.4 53.4



#8
2-Methylnaphthalene
Concen: Below ug/mL
RT: 6.474 min Scan# 512
Delta R.T. -0.012 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

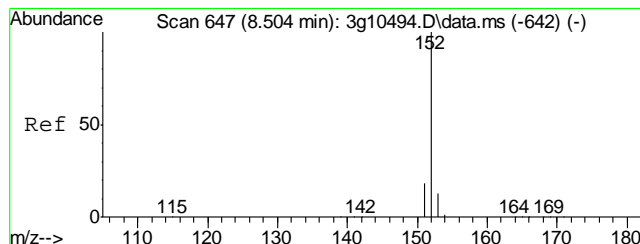
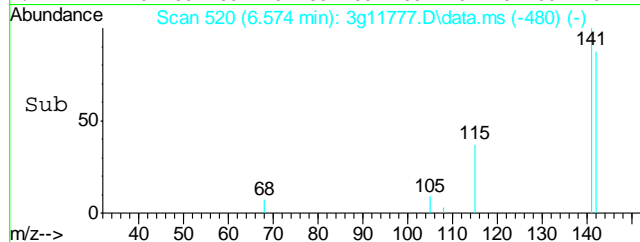
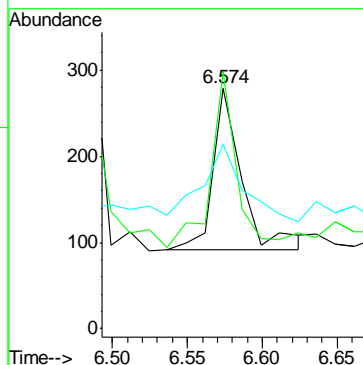
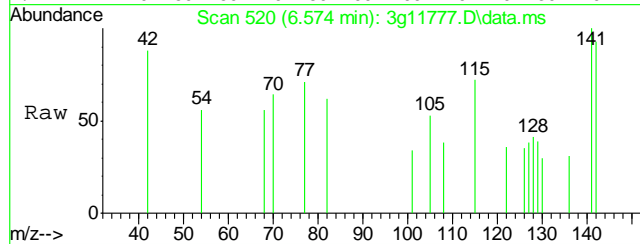
Tgt Ion:142 Resp: 515
Ion Ratio Lower Upper
142 100
141 79.0 63.5 103.5
115 0.0 20.6 60.6#





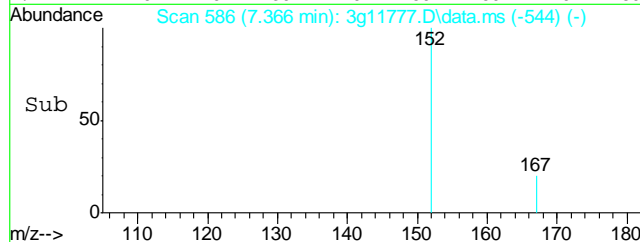
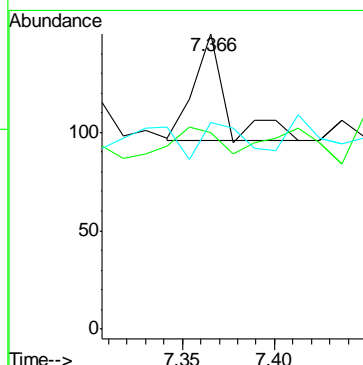
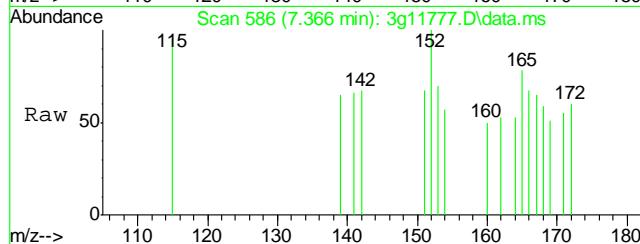
#9
1-Methylnaphthalene
Concen: Below ug/mL
RT: 6.574 min Scan# 520
Delta R.T. 0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

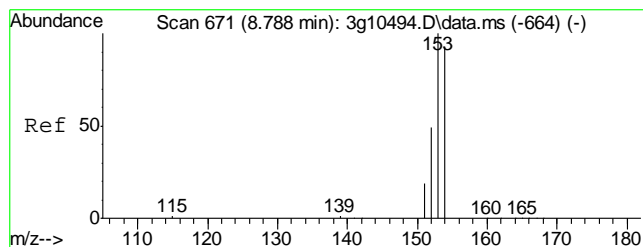
Tgt Ion:142 Resp: 249
Ion Ratio Lower Upper
142 100
141 98.0 68.7 108.7
115 0.0 21.1 61.1#



#10
Acenaphthylene
Concen: Below ug/mL
RT: 7.366 min Scan# 586
Delta R.T. 0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

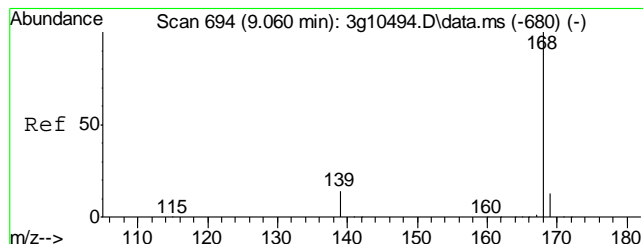
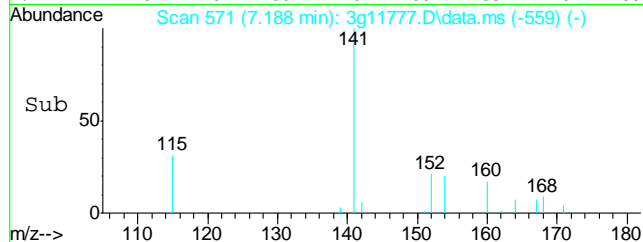
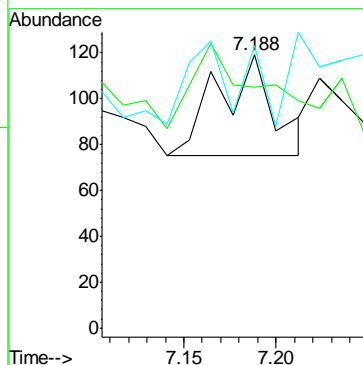
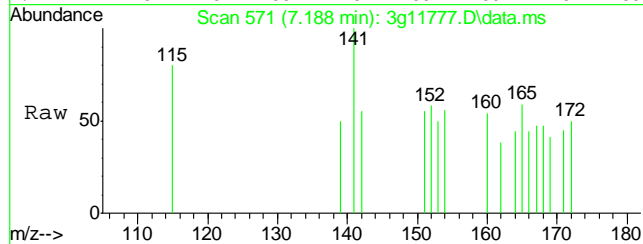
Tgt Ion:152 Resp: 67
Ion Ratio Lower Upper
152 100
151 41.8 0.0 39.2#
153 49.3 0.0 33.0#





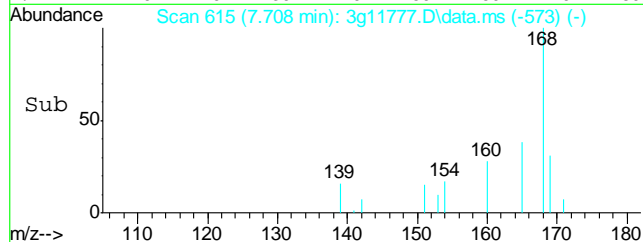
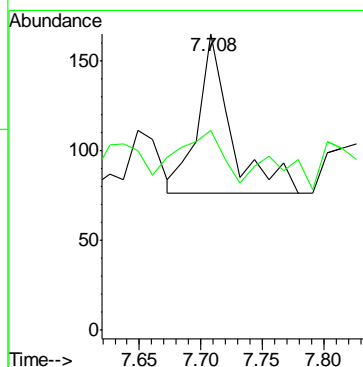
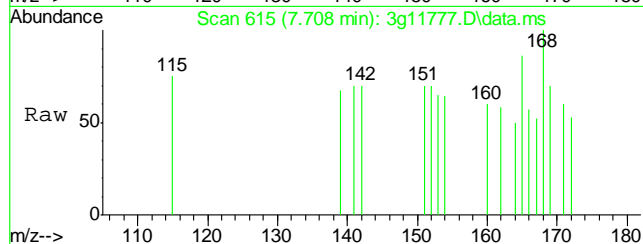
#11
Acenaphthene
Concen: Below ug/mL
RT: 7.188 min Scan# 571
Delta R.T. -0.354 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

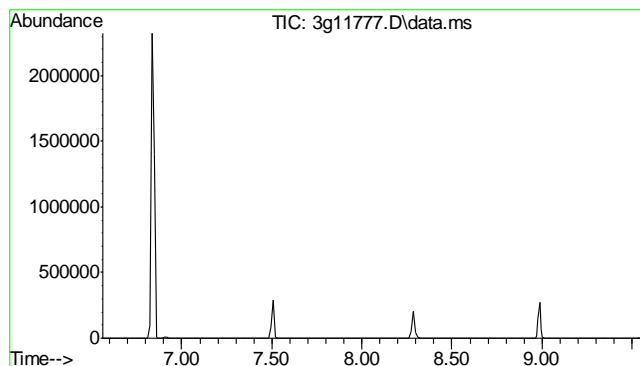
| | | | |
|-----------|-------|-------|-------|
| Tgt Ion: | 154 | Resp: | 95 |
| Ion Ratio | Lower | Upper | |
| 154 | 100 | | |
| 153 | 98.9 | 86.3 | 126.3 |
| 152 | 50.5 | 31.9 | 71.9 |



#12
Dibenzofuran
Concen: Below ug/mL
RT: 7.708 min Scan# 615
Delta R.T. 0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

| | | | |
|-----------|-------|-------|------|
| Tgt Ion: | 168 | Resp: | 167 |
| Ion Ratio | Lower | Upper | |
| 168 | 100 | | |
| 139 | 41.9 | 10.8 | 50.8 |

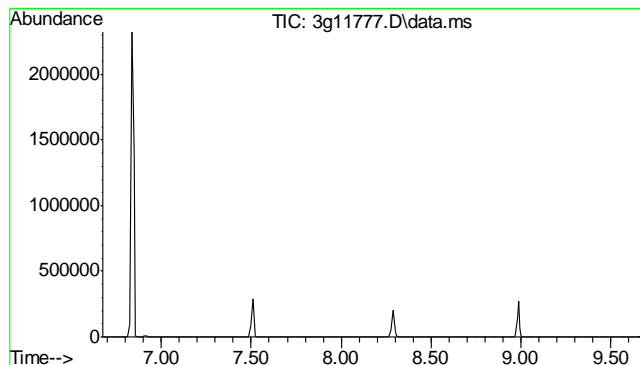
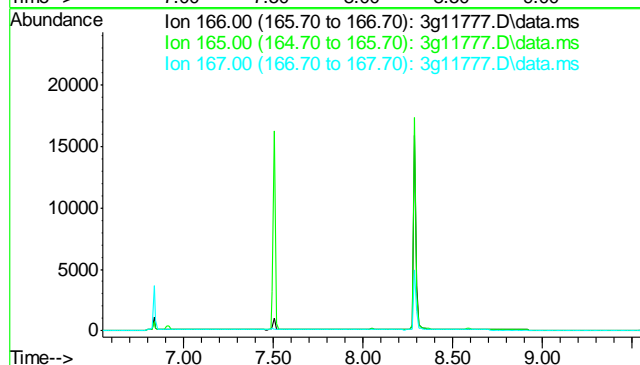




#13
Fluorene
Concen: N.D. ug/mL
Expected RT: 8.05 min

Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

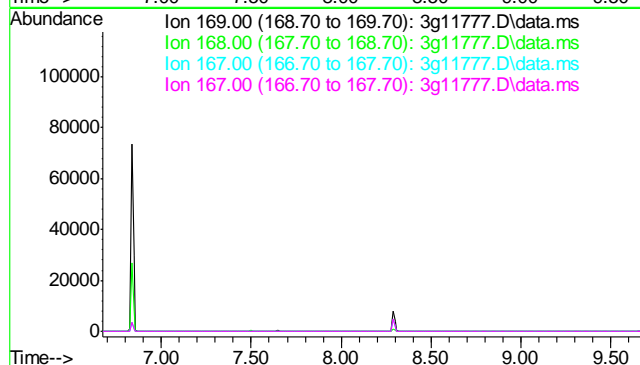
| Tgt Ion: | 166 |
|----------|-----------|
| Sig | Exp Ratio |
| 166 | 100 |
| 165 | 90.7 |
| 167 | 13.3 |

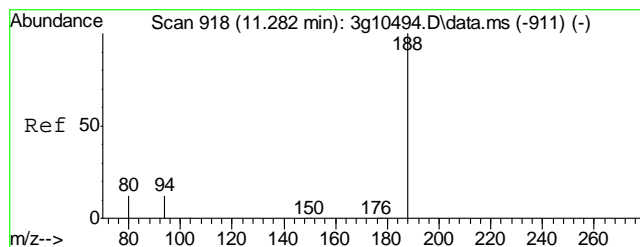


#14
Diphenylamine
Concen: N.D. ug/mL
Expected RT: 8.17 min

Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

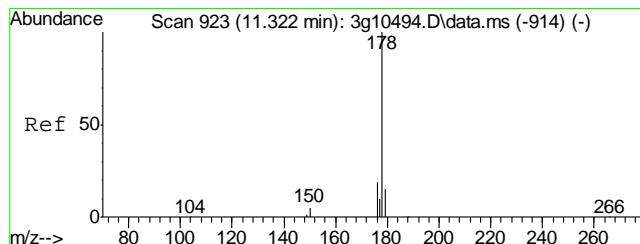
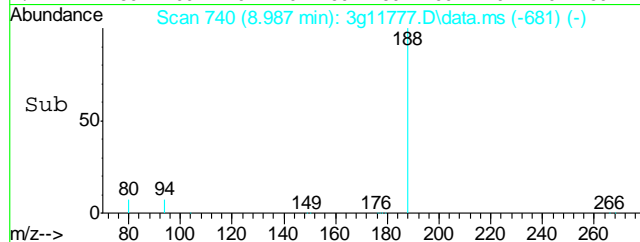
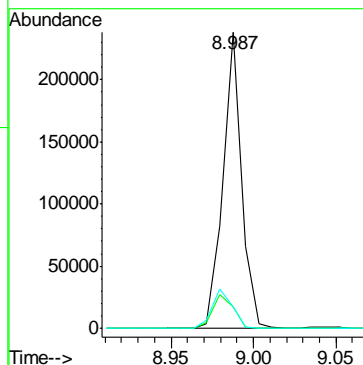
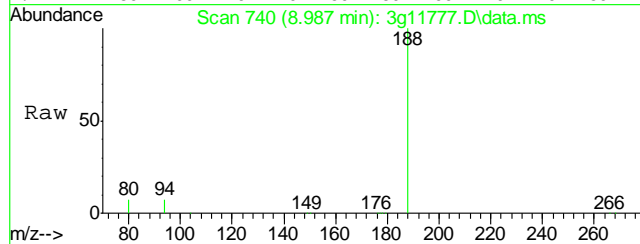
| Tgt Ion: | 169 |
|----------|-----------|
| Sig | Exp Ratio |
| 169 | 100 |
| 168 | 60.5 |
| 167 | 32.9 |
| 167 | 32.9 |





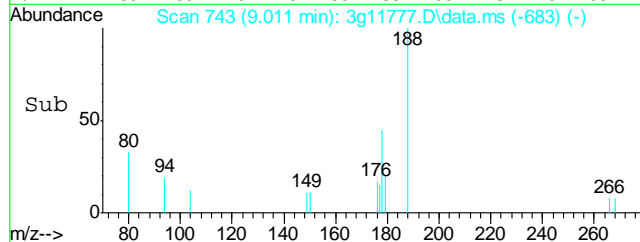
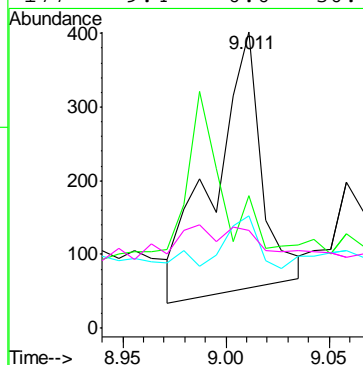
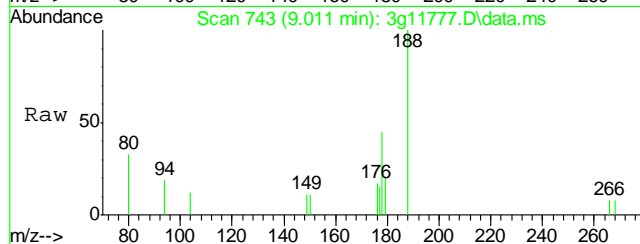
#15
Phenanthrene-d10
Concen: 4.0000 ug/mL
RT: 8.987 min Scan# 740
Delta R.T. 0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

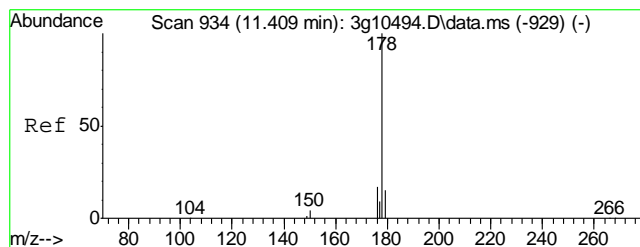
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 188 | 100 | | |
| 94 | 12.7 | 0.0 | 33.6 |
| 80 | 14.1 | 0.0 | 35.0 |



#16
Phenanthrene
Concen: Below ug/mL
RT: 9.011 min Scan# 743
Delta R.T. -0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

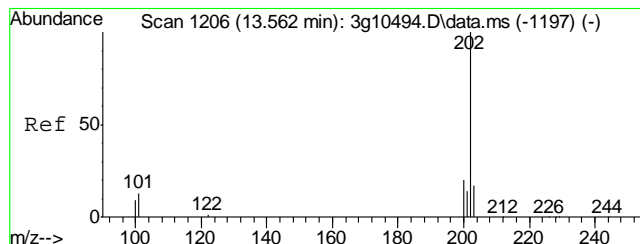
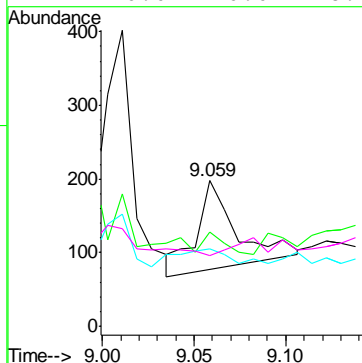
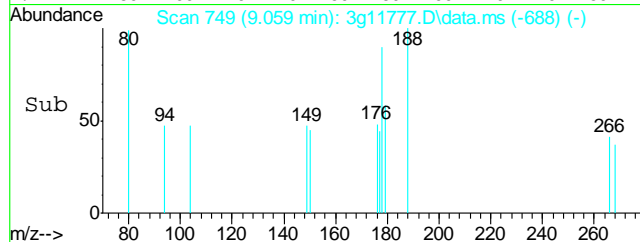
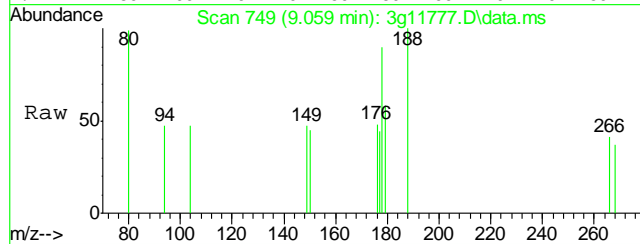
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 178 | 100 | | |
| 179 | 158.0 | 0.0 | 35.2# |
| 176 | 19.0 | 0.0 | 38.9 |
| 177 | 9.4 | 0.0 | 30.4 |





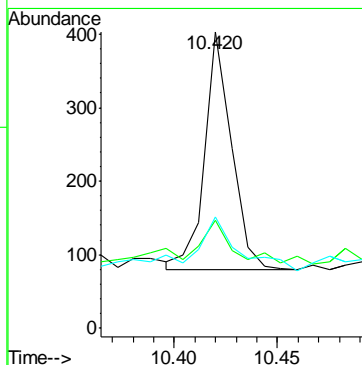
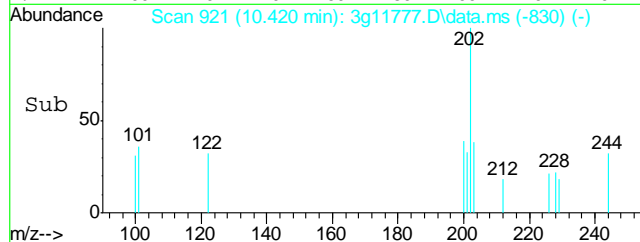
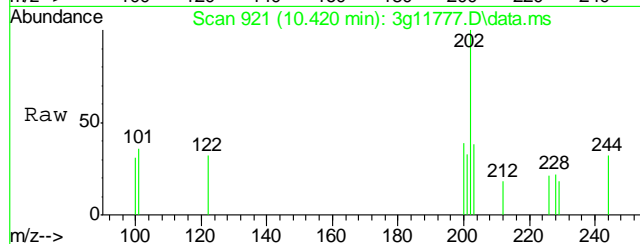
#17
Anthracene
Concen: Below ug/mL
RT: 9.059 min Scan# 749
Delta R.T. -0.008 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

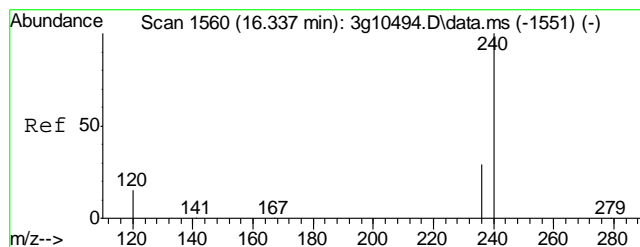
| Tgt Ion | 178 | 179 | 176 | 177 |
|---------|-----|------|------|------|
| Resp: | 184 | 0.0 | 0.0 | 0.0 |
| Ratio | 100 | 0.0 | 0.0 | 0.0 |
| Lower | | 0.0 | 0.0 | 0.0 |
| Upper | | 35.2 | 38.0 | 28.8 |



#18
Fluoranthene
Concen: Below ug/mL
RT: 10.420 min Scan# 921
Delta R.T. 0.222 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

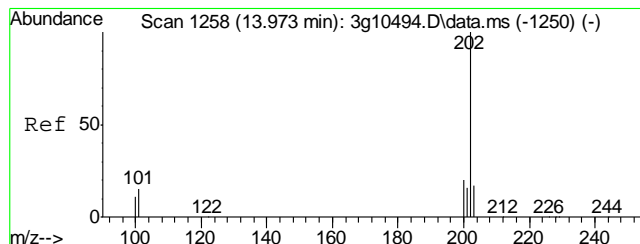
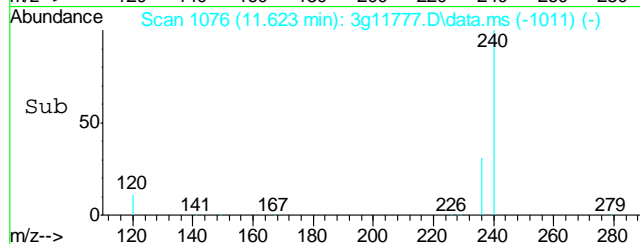
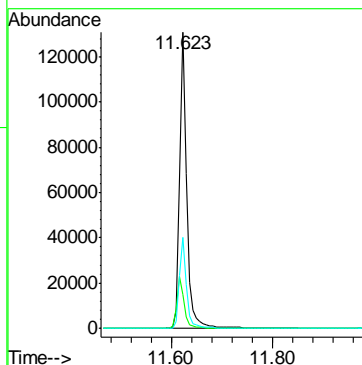
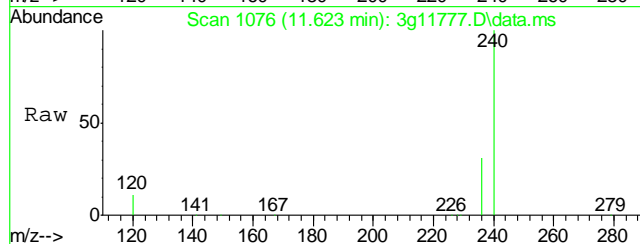
| Tgt Ion | 202 | 203 |
|---------|------|------|
| Resp: | 287 | |
| Ratio | 100 | |
| Lower | 0.0 | 0.0 |
| Upper | 32.6 | 37.3 |





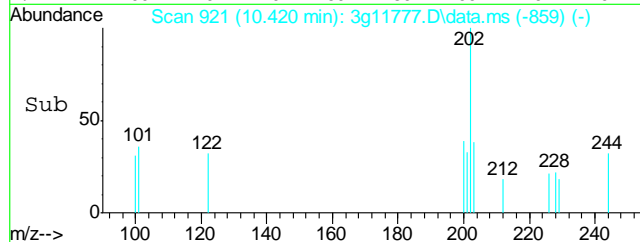
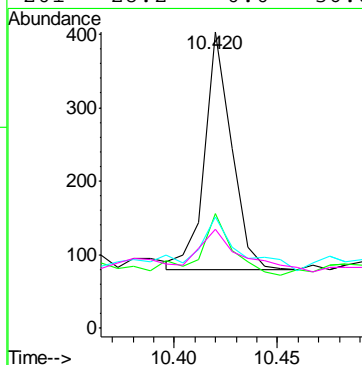
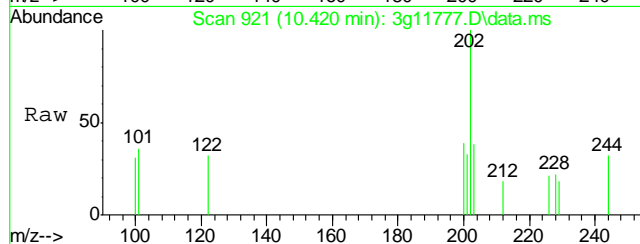
#19
Chrysene-d12
Concen: 4.0000 ug/mL
RT: 11.623 min Scan# 1076
Delta R.T. -0.007 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

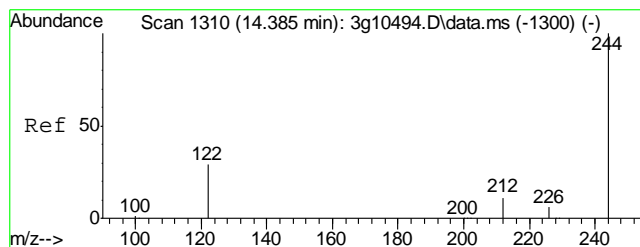
| | | | |
|-----------|-------|-------|--------|
| Tgt Ion: | 240 | Resp: | 127266 |
| Ion Ratio | Lower | Upper | |
| 240 | 100 | | |
| 120 | 17.4 | 0.0 | 38.0 |
| 236 | 30.8 | 11.4 | 51.4 |



#20
Pyrene
Concen: Below ug/mL
RT: 10.420 min Scan# 921
Delta R.T. -0.008 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

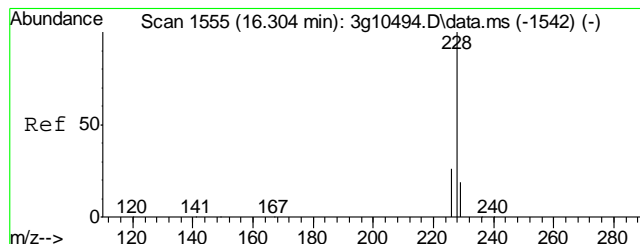
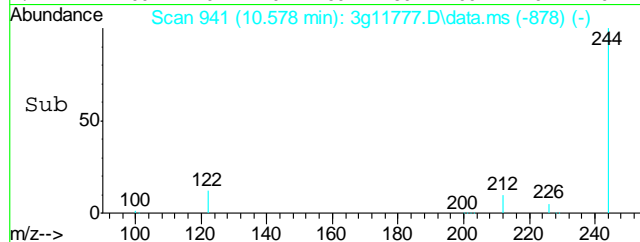
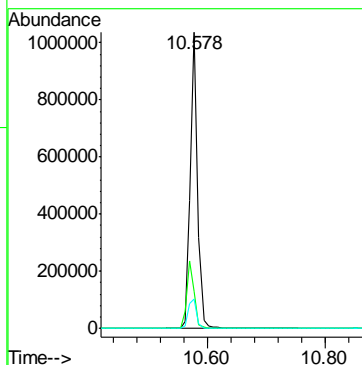
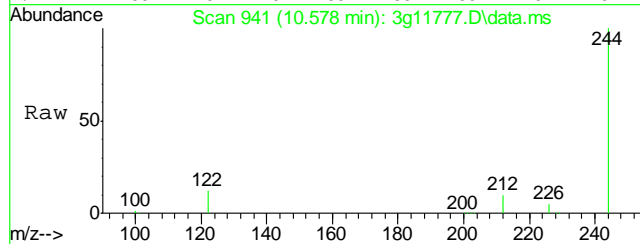
| | | | |
|-----------|-------|-------|------|
| Tgt Ion: | 202 | Resp: | 287 |
| Ion Ratio | Lower | Upper | |
| 202 | 100 | | |
| 200 | 26.8 | 0.6 | 40.6 |
| 203 | 30.7 | 0.0 | 37.7 |
| 201 | 28.2 | 0.0 | 36.8 |





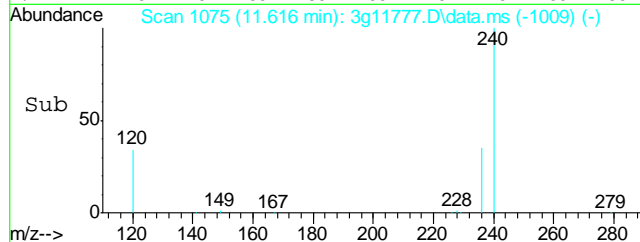
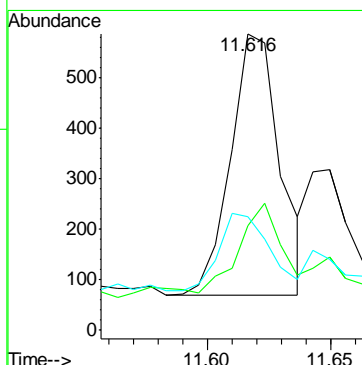
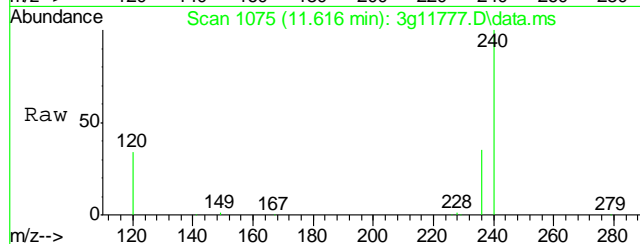
#21
Terphenyl-d14
Concen: 50.5647 ug/mL
RT: 10.578 min Scan# 941
Delta R.T. 0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

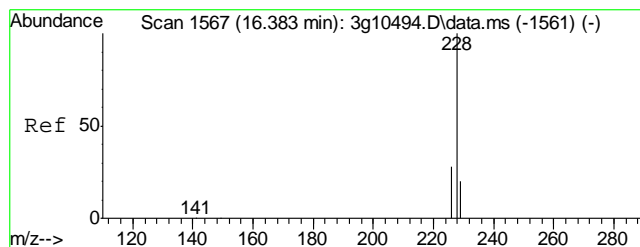
| | |
|--------------|---------------|
| Tgt Ion: 244 | Resp: 893283 |
| Ion Ratio | Lower Upper |
| 244 | 100 |
| 122 | 23.5 4.2 44.2 |
| 212 | 11.7 0.0 32.4 |



#22
Benzo(a)anthracene
Concen: Below ug/mL
RT: 11.616 min Scan# 1075
Delta R.T. 0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

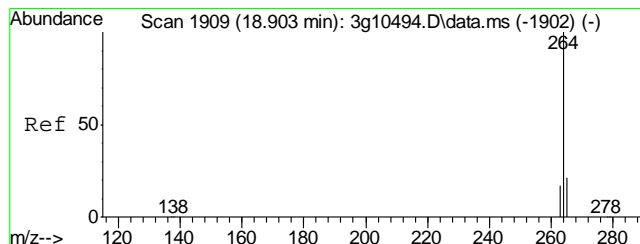
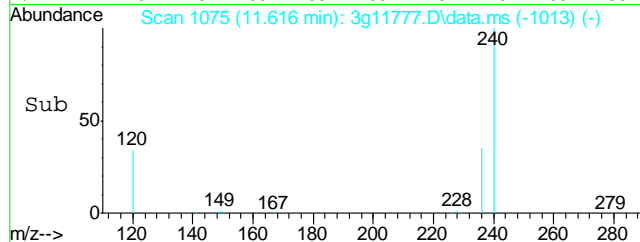
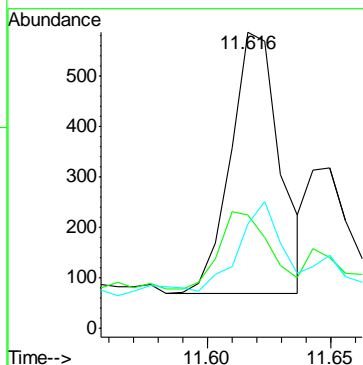
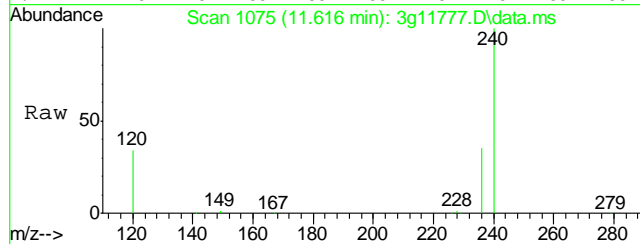
| | |
|--------------|----------------|
| Tgt Ion: 228 | Resp: 720 |
| Ion Ratio | Lower Upper |
| 228 | 100 |
| 229 | 48.9 0.0 39.5# |
| 226 | 30.3 6.7 46.7 |





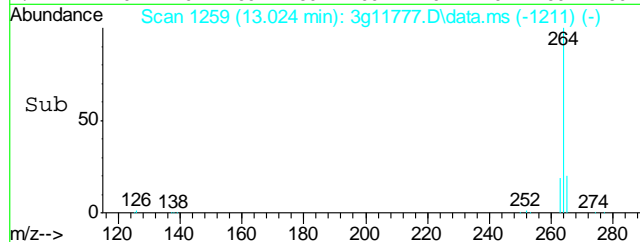
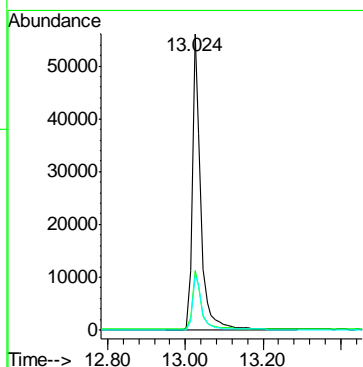
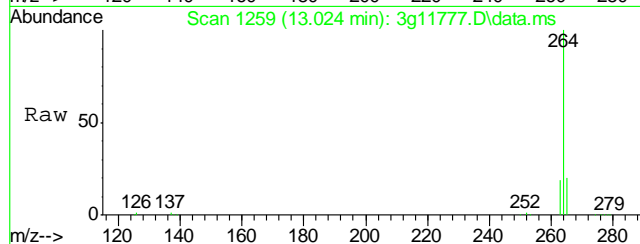
#23
Chrysene
Concen: Below ug/mL
RT: 11.616 min Scan# 1075
Delta R.T. -0.033 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

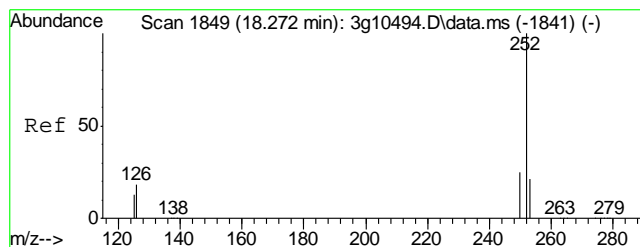
| | |
|--------------|---------------|
| Tgt Ion: 228 | Resp: 720 |
| Ion Ratio | Lower Upper |
| 228 | 100 |
| 226 | 30.3 9.0 49.0 |
| 229 | 48.9 0.0 39.4 |



#24
Perylene-d12
Concen: 4.0000 ug/mL
RT: 13.024 min Scan# 1259
Delta R.T. 0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

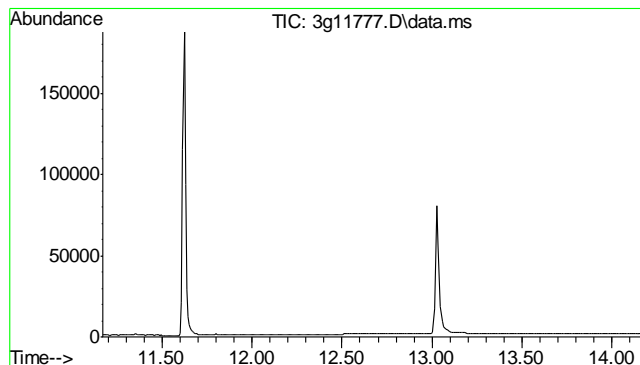
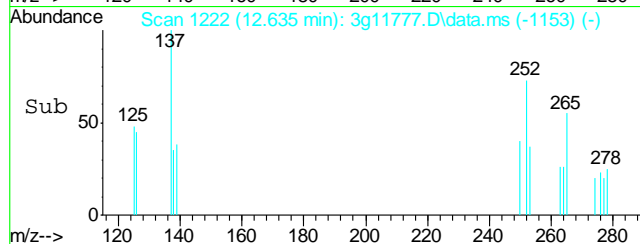
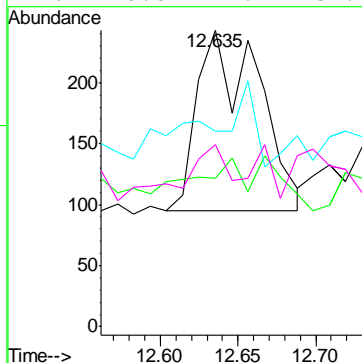
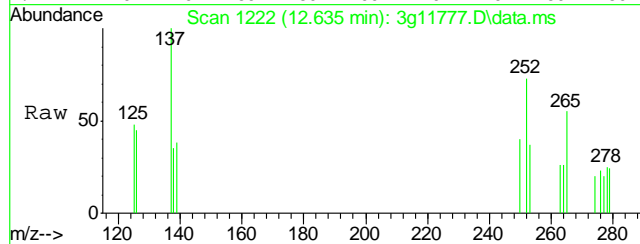
| | |
|--------------|---------------|
| Tgt Ion: 264 | Resp: 83899 |
| Ion Ratio | Lower Upper |
| 264 | 100 |
| 265 | 20.5 0.8 40.8 |
| 263 | 20.5 0.2 40.2 |





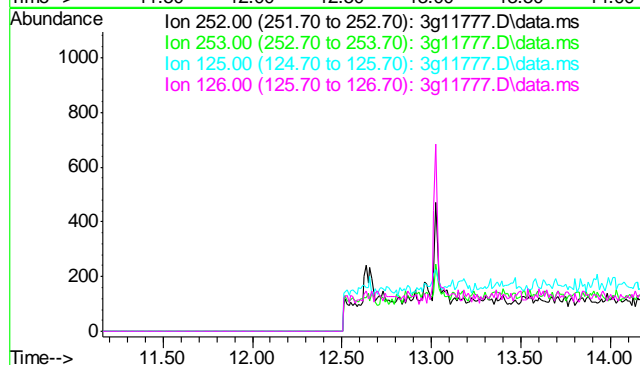
#25
Benzo(b)fluoranthene
Concen: Below ug/mL
RT: 12.635 min Scan# 1222
Delta R.T. 0.000 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

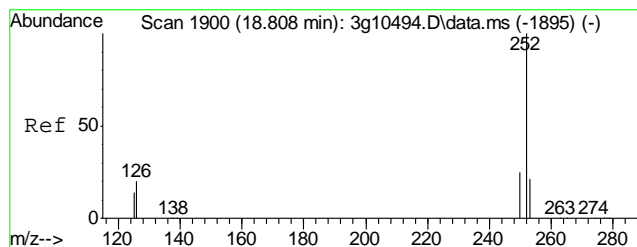
| Tgt Ion | Ratio | Lower | Upper |
|---------|-------|-------|-------|
| 252 | 100 | | |
| 253 | 12.8 | 1.3 | 41.3 |
| 125 | 0.0 | 2.4 | 42.4# |
| 126 | 0.0 | 12.4 | 52.4# |



#26
Benzo(k)fluoranthene
Concen: N.D. ug/mL
Expected RT: 12.67 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

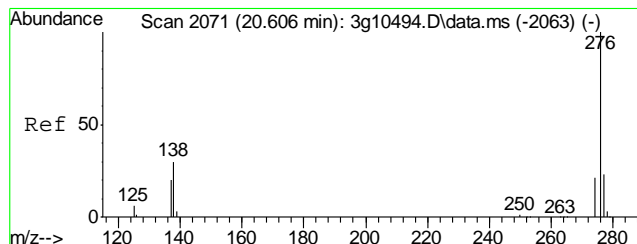
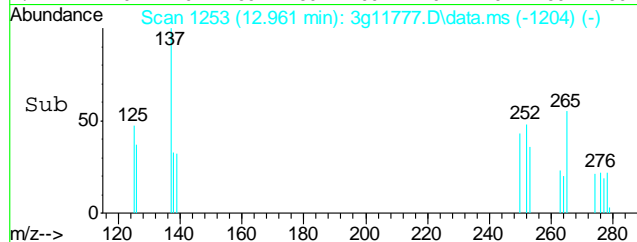
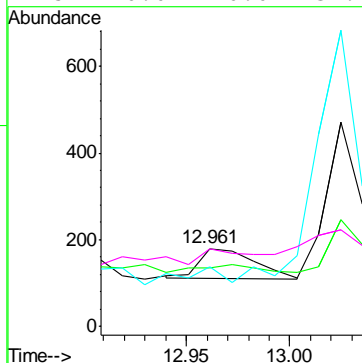
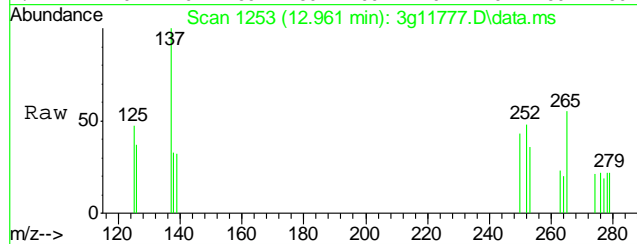
| Tgt Ion | Sig | Exp Ratio |
|---------|-----|-----------|
| 252 | 100 | |
| 253 | | 22.0 |
| 125 | | 23.1 |
| 126 | | 33.5 |





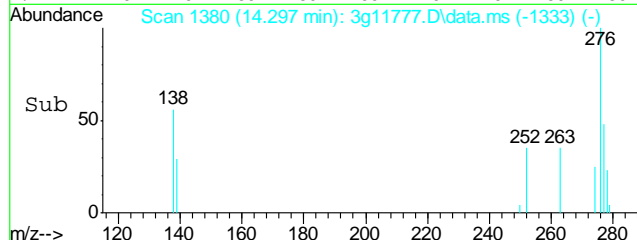
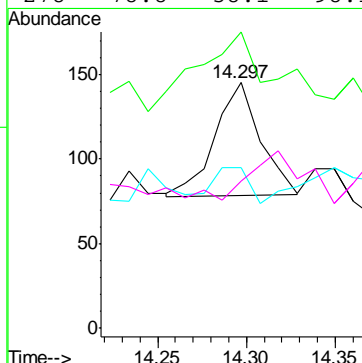
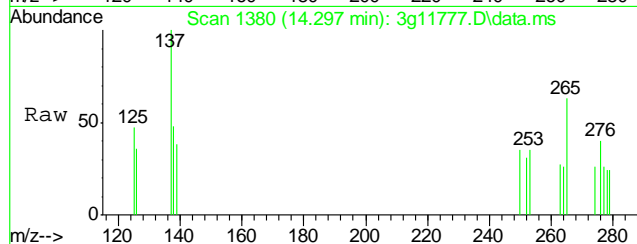
#27
Benzo(a)pyrene
Concen: Below ug/mL
RT: 12.961 min Scan# 1253
Delta R.T. -0.010 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

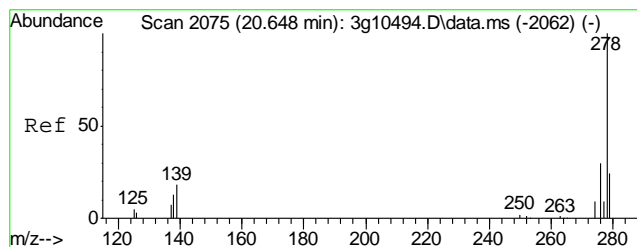
| Tgt Ion | 252 | 253 | 126 | 125 |
|---------|-----|-------|------|------|
| Resp: | 127 | 0.0 | 0.0 | 0.0 |
| Ratio | 100 | 0.0 | 0.0 | 0.0 |
| Lower | | 1.3 | 0.0 | 0.0 |
| Upper | | 41.3# | 36.5 | 32.0 |



#28
Indeno(1,2,3-cd)pyrene
Concen: Below ug/mL
RT: 14.297 min Scan# 1380
Delta R.T. -0.010 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

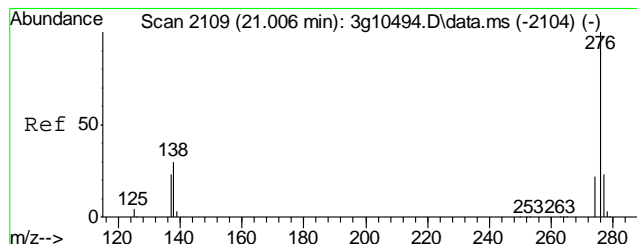
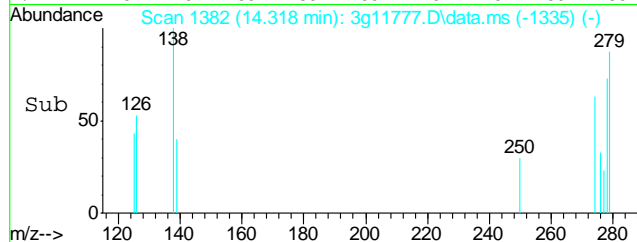
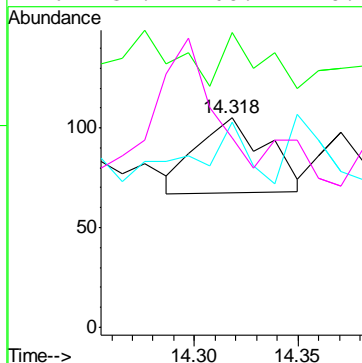
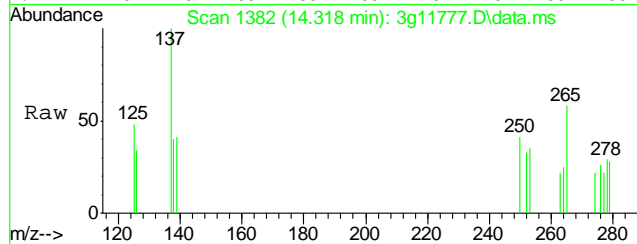
| Tgt Ion | 276 | 138 | 277 | 278 |
|---------|-----|-------|------|------|
| Resp: | 118 | 119.5 | 25.4 | 78.8 |
| Ratio | 100 | 119.5 | 25.4 | 78.8 |
| Lower | | 12.2 | 4.9 | 58.1 |
| Upper | | 52.2# | 44.9 | 98.1 |





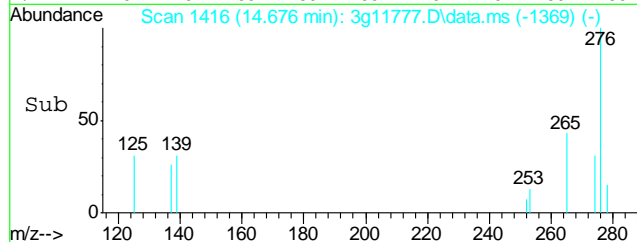
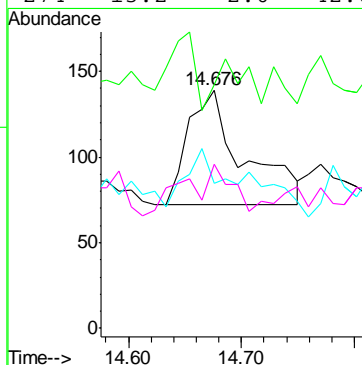
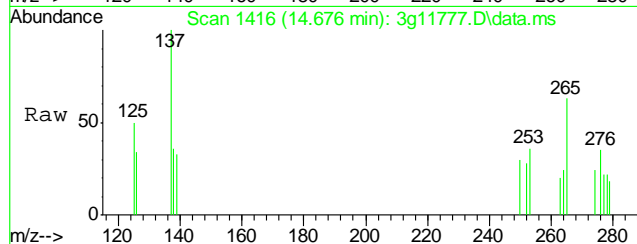
#29
Dibenzo(a,h)anthracene
Concen: Below ug/mL
RT: 14.318 min Scan# 1382
Delta R.T. -0.010 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

Tgt Ion: 278 Resp: 88
Ion Ratio Lower Upper
278 100
139 39.8 4.7 44.7
279 61.4 3.2 43.2#
276 134.1 108.1 148.1



#30
Benzo(g,h,i)perylene
Concen: Below ug/mL
RT: 14.676 min Scan# 1416
Delta R.T. -0.010 min
Lab File: 3g11777.D
Acq: 24 Oct 12 2:54 pm

Tgt Ion: 276 Resp: 228
Ion Ratio Lower Upper
276 100
138 19.3 7.7 47.7
277 30.7 3.4 43.4
274 13.2 2.0 42.0



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: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| | | | | | | | |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
| GGB991-MB | GB18134.D | 1 | 10/19/12 | SK | n/a | n/a | GGB991 |

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

D40074-1

| 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 | 90% 60-140% |

10.1.1
10

Blank Spike Summary

Job Number: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| GGB991-BS | GB18135.D | 1 | 10/19/12 | SK | n/a | n/a | GGB991 |

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

D40074-1

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|------------------|----------------|--------------|----------|--------|
| | TPH-GRO (C6-C10) | 110 | 125 | 114 | 70-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|----------|------------------------|------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 105% | 60-140% |

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| D40085-1MS | GB18137.D | 1 | 10/19/12 | SK | n/a | n/a | GGB991 |
| D40085-1MSD | GB18138.D | 1 | 10/19/12 | SK | n/a | n/a | GGB991 |
| D40085-1 | GB18136.D | 1 | 10/19/12 | SK | n/a | n/a | GGB991 |

The QC reported here applies to the following samples:

Method: SW846 8015B

D40074-1

| CAS No. | Compound | D40085-1 mg/kg | Q | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|------------------|-------------------|---|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-GRO (C6-C10) | ND | | 127 | 145 | 114 | 143 | 113 | 1 | 70-130/30 |

| CAS No. | Surrogate Recoveries | MS | MSD | D40085-1 | Limits |
|----------|------------------------|------|------|----------|---------|
| 120-82-1 | 1,2,4-Trichlorobenzene | 104% | 100% | 85% | 60-140% |

* = Outside of Control Limits.

GC Volatiles

Raw Data



Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\101912\GB18145.D\FID1A.CH Vial: 14
Signal #2 : Y:\1\DATA\101912\GB18145.D\FID2B.CH
Acq On : 20 Oct 2012 12:31 am Operator: StephK
Sample : D40074-1, 50X Inst : GC/MS Ins
Misc : GC3184,GGB991,5.045,,100,5,1 Multiplr: 1.00
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E
Quant Time: Oct 22 09:21:03 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)
Title : 8015B/8021B TVH/BTEX
Last Update : Mon Oct 22 09:19:58 2012
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

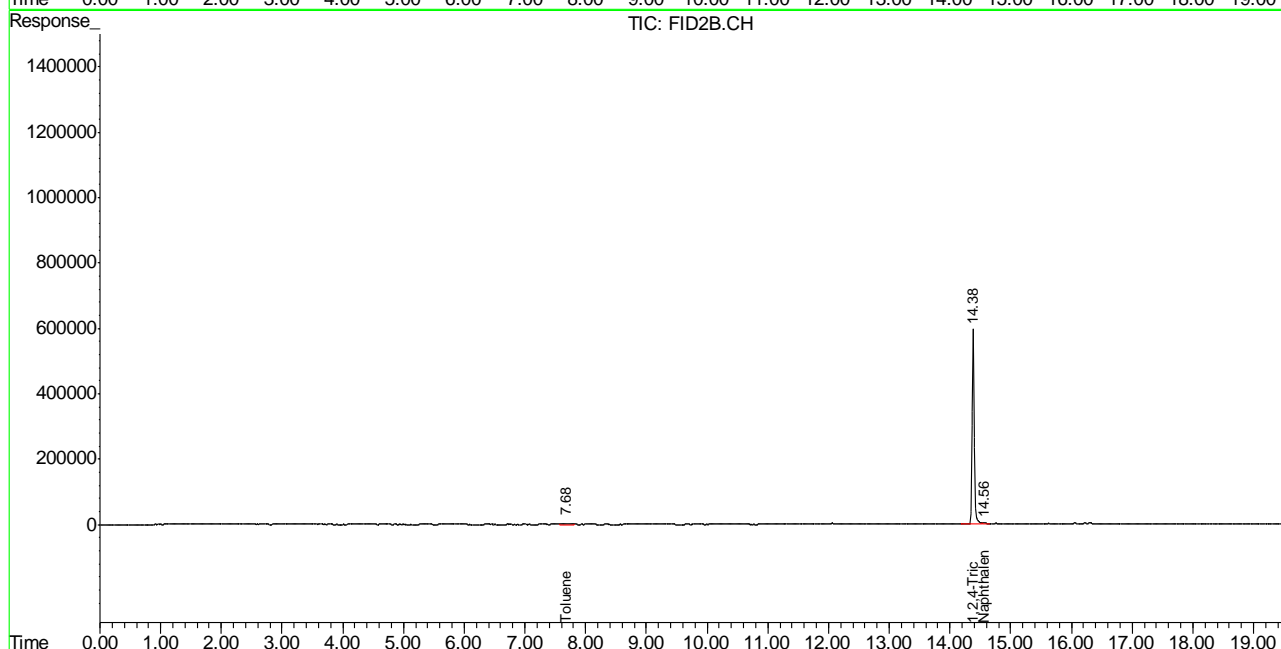
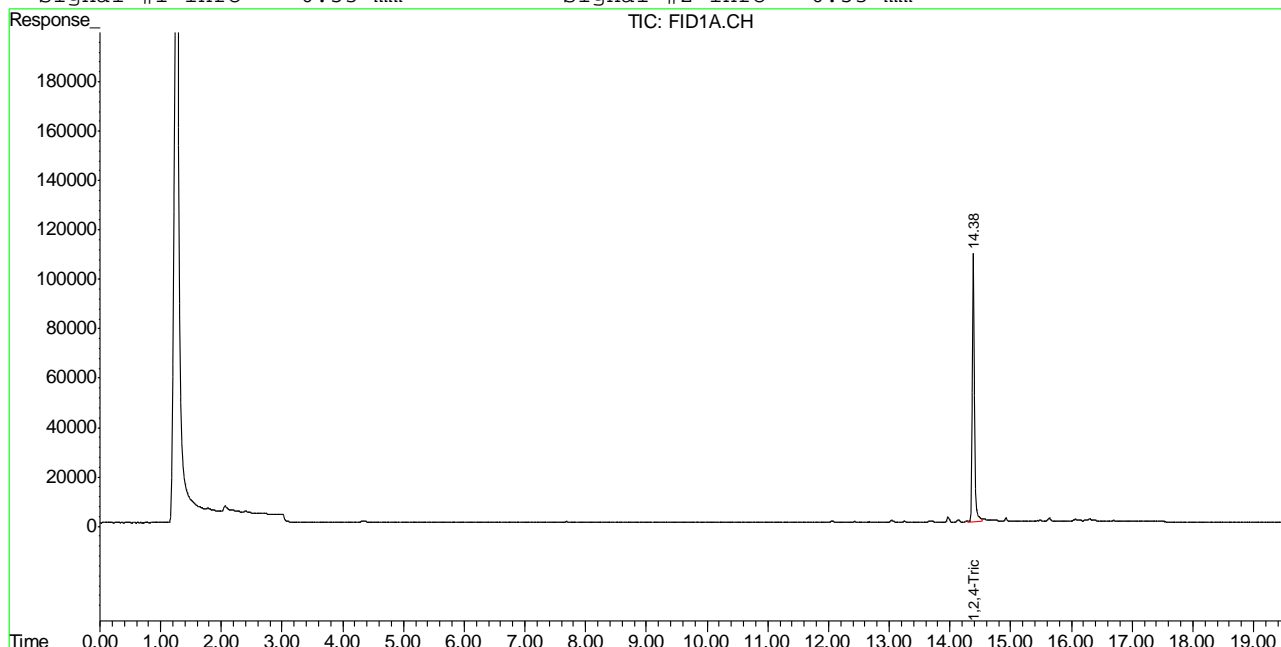
| Compound | | R.T. | Response | Conc | Units |
|-----------------------------|----------------------------|-------|----------|--------|--------|
| ----- | | | | | |
| System Monitoring Compounds | | | | | |
| 2) S | 1,2,4-Trichlorobenzene | 14.38 | 2664801 | 85.045 | % |
| 10) S | 1,2,4-Trichlorobenzene (P) | 14.38 | 14346389 | 88.271 | % |
| Target Compounds | | | | | |
| 1) H | TVH-Gasoline | 7.23 | 3704623 | <MDL | 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 | 7.68 | 84540 | 0.213 | ug/L |
| 7) T | Ethylbenzene | 0.00 | 0 | N.D. | ug/L d |
| 8) T | m,p-Xylene | 0.00 | 0 | N.D. | ug/L d |
| 9) T | o-Xylene | 0.00 | 0 | N.D. | ug/L d |
| 11) T | Naphthalene | 14.56 | 181283 | 0.919 | ug/L |

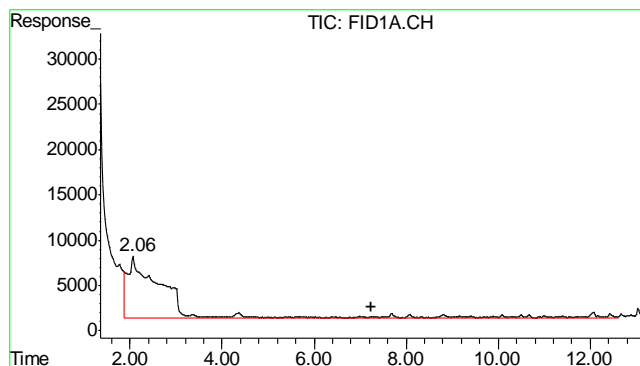
Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\101912\GB18145.D\FID1A.CH Vial: 14
 Signal #2 : Y:\1\DATA\101912\GB18145.D\FID2B.CH
 Acq On : 20 Oct 2012 12:31 am Operator: StephK
 Sample : D40074-1, 50X Inst : GC/MS Ins
 Misc : GC3184,GGB991,5.045,,100,5,1 Multiplr: 1.00
 IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E
 Quant Time: Oct 22 8:36 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)
 Title : 8015B/8021B TVH/BTEX
 Last Update : Mon Oct 22 09:19:58 2012
 Response via : Multiple Level Calibration
 DataAcq Meth : TVB4.M

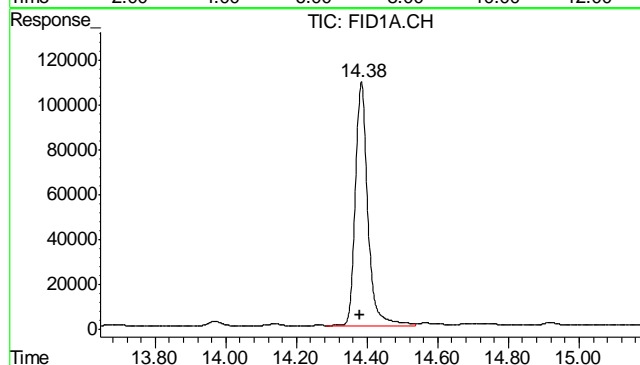
Volume Inj. :
 Signal #1 Phase : DB-624 Signal #2 Phase: DB-624
 Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm





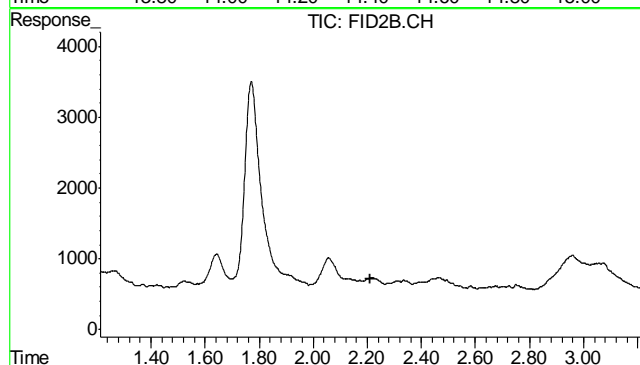
#1 TVH-Gasoline

R.T.: 7.230 min
Delta R.T.: 0.000 min
Response: 3704623
Conc: N.D.



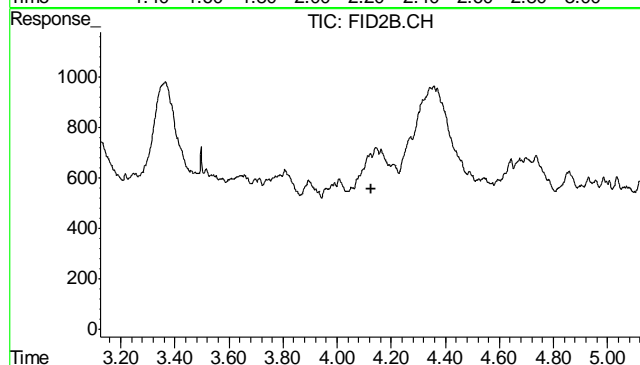
#2 1,2,4-Trichlorobenzene

R.T.: 14.384 min
Delta R.T.: 0.003 min
Response: 2664801
Conc: 85.04 %



#4 Methyl-t-butyl-ether

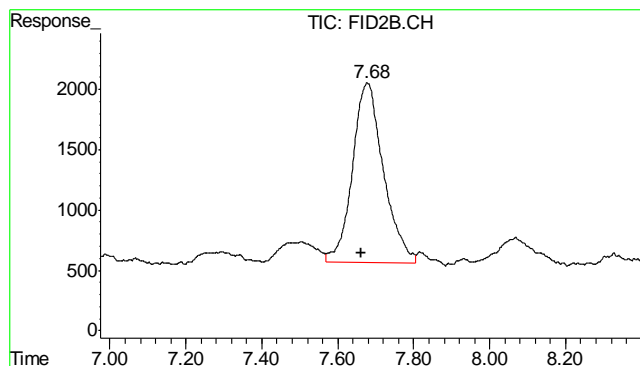
R.T.: 0.000 min
Exp R.T.: 2.212 min
Response: 0
Conc: N.D.



#5 Benzene

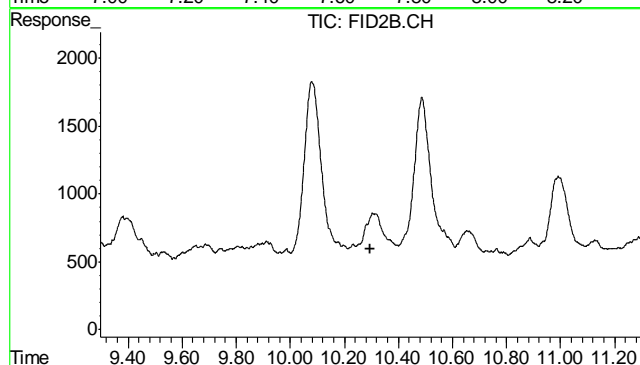
R.T.: 0.000 min
Exp R.T.: 4.124 min
Response: 0
Conc: N.D.

11.1.1
11



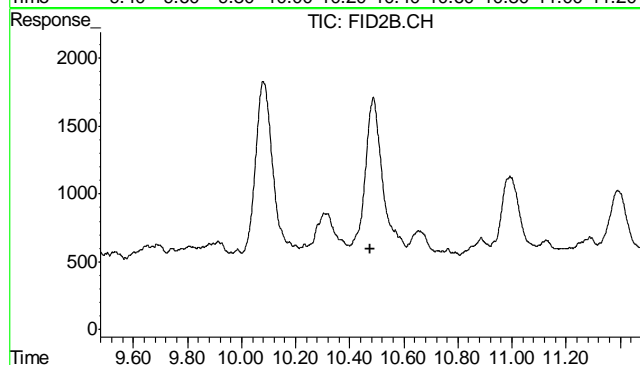
#6 Toluene

R.T.: 7.678 min
Delta R.T.: 0.016 min
Response: 84540
Conc: 0.21 ug/L



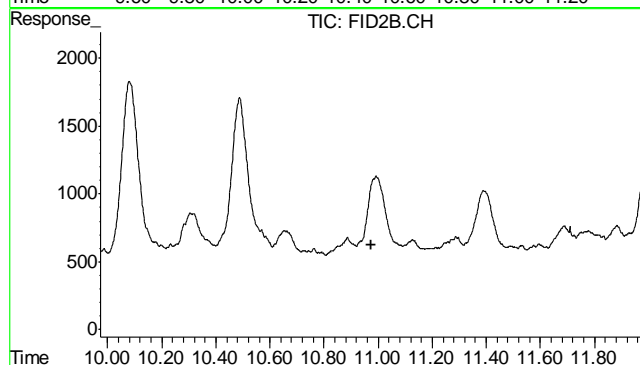
#7 Ethylbenzene

R.T.: 0.000 min
Exp R.T.: 10.297 min
Response: 0
Conc: N.D.



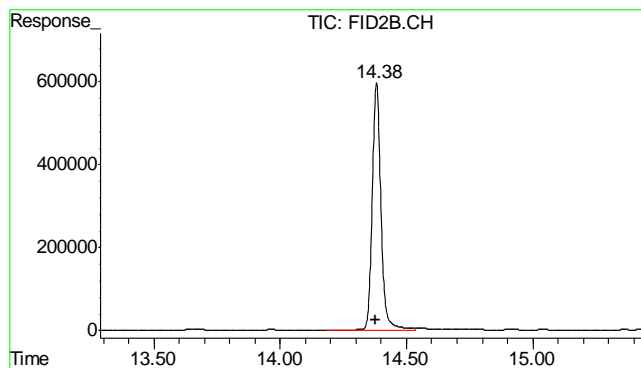
#8 m,p-Xylene

R.T.: 0.000 min
Exp R.T.: 10.477 min
Response: 0
Conc: N.D.



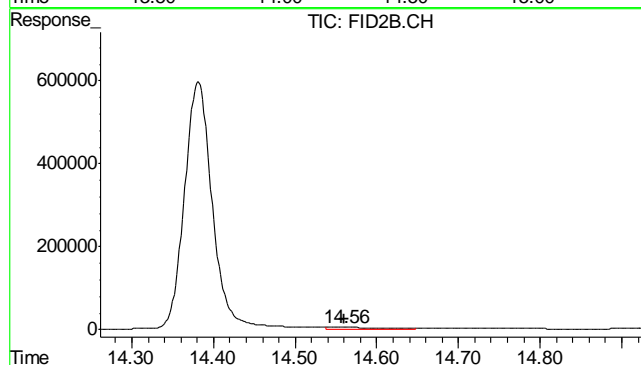
#9 o-Xylene

R.T.: 0.000 min
Exp R.T.: 10.973 min
Response: 0
Conc: N.D.



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

R.T.: 14.381 min
 Delta R.T.: 0.003 min
 Response: 14346389
 Conc: 88.27 %



#11 Naphthalene

R.T.: 14.560 min
 Delta R.T.: 0.000 min
 Response: 181283
 Conc: 0.92 ug/L

11.1.1

Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\101912\GB18134.D\FID1A.CH Vial: 3
 Signal #2 : Y:\1\DATA\101912\GB18134.D\FID2B.CH
 Acq On : 19 Oct 2012 6:01 pm Operator: StephK
 Sample : MB Inst : GC/MS Ins
 Misc : GC3184,GGB991,5.000,,100,5,1 Multiplr: 1.00
 IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E
 Quant Time: Oct 22 09:20:19 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)
 Title : 8015B/8021B TVH/BTEX
 Last Update : Mon Oct 22 09:19:58 2012
 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 | 14.38 | 2826101 | 90.193 | % |
| 10) S | 1,2,4-Trichlorobenzene (P) | 14.38 | 15101478 | 92.916 | % |
| Target Compounds | | | | | |
| 1) H | TVH-Gasoline | 7.23 | 4187229 | <MDL | 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 | 7.67 | 124783 | 0.315 | ug/L |
| 7) T | Ethylbenzene | 0.00 | 0 | N.D. | ug/L d |
| 8) T | m,p-Xylene | 0.00 | 0 | N.D. | ug/L d |
| 9) T | o-Xylene | 0.00 | 0 | N.D. | ug/L d |
| 11) T | Naphthalene | 14.56 | 188086 | 0.953 | ug/L |

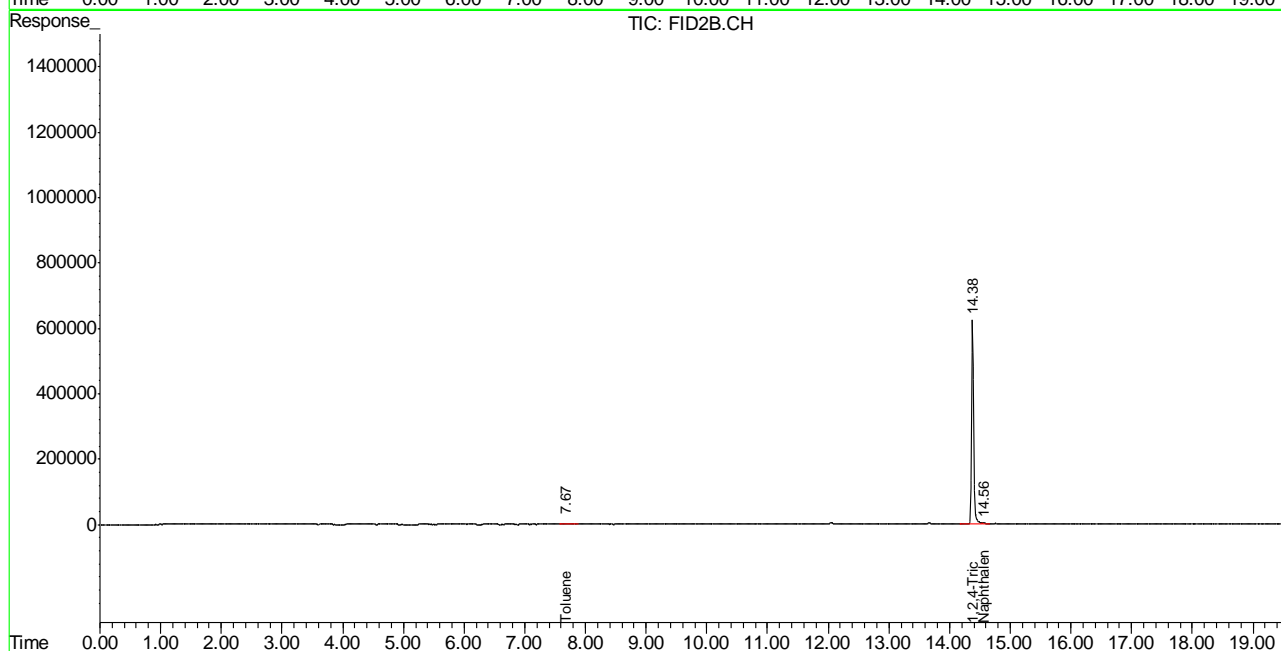
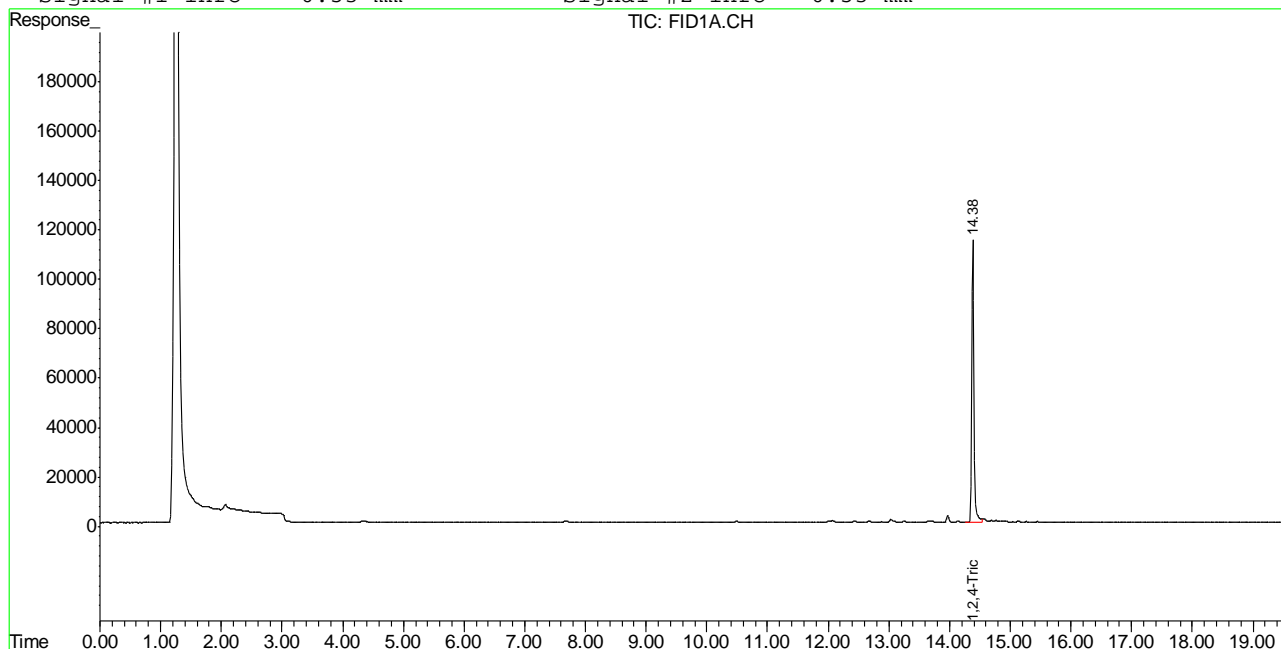
(f)=RT Delta > 1/2 Window (m)=manual int.
 GB18134.D TB868GB868SOIL.M Mon Oct 22 09:30:00 2012 GC

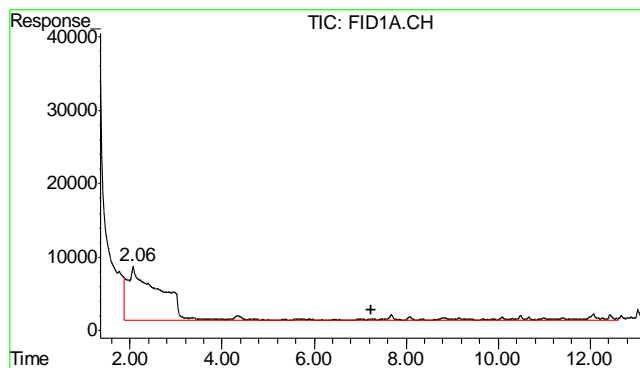
Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\101912\GB18134.D\FID1A.CH Vial: 3
Signal #2 : Y:\1\DATA\101912\GB18134.D\FID2B.CH
Acq On : 19 Oct 2012 6:01 pm Operator: StephK
Sample : MB Inst : GC/MS Ins
Misc : GC3184,GGB991,5.000,,100,5,1 Multiplr: 1.00
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E
Quant Time: Oct 22 8:35 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)
Title : 8015B/8021B TVH/BTEX
Last Update : Mon Oct 22 09:19:58 2012
Response via : Multiple Level Calibration
DataAcq Meth : TVB4.M

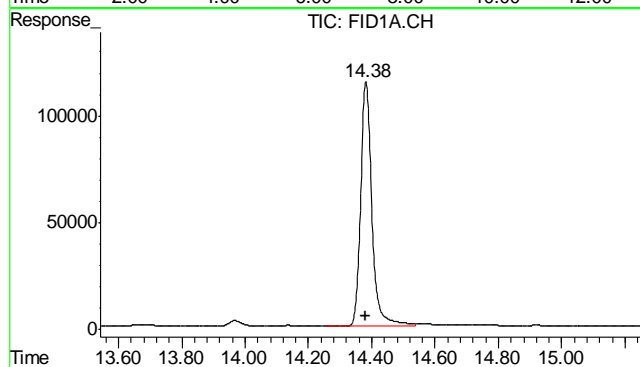
Volume Inj. :
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm





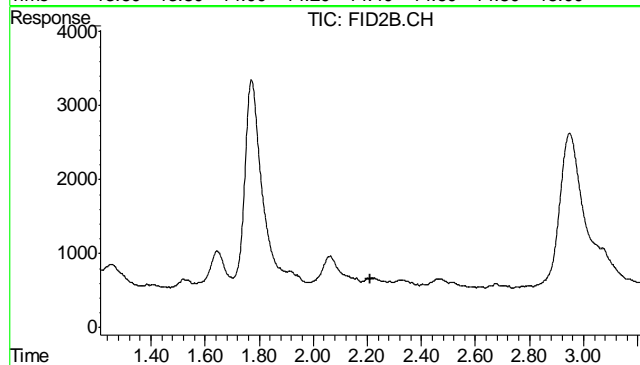
#1 TVH-Gasoline

R.T.: 7.230 min
Delta R.T.: 0.000 min
Response: 4187229
Conc: N.D.



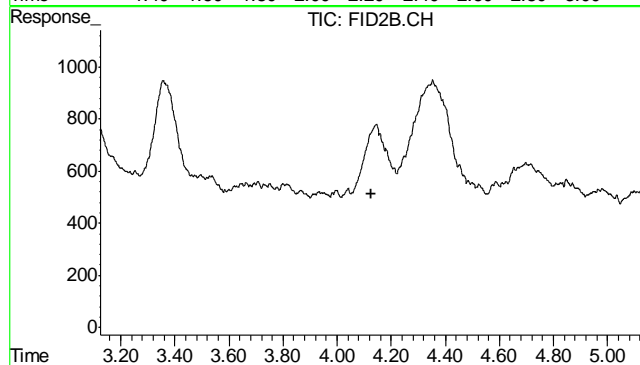
#2 1,2,4-Trichlorobenzene

R.T.: 14.382 min
Delta R.T.: 0.001 min
Response: 2826101
Conc: 90.19 %



#4 Methyl-t-butyl-ether

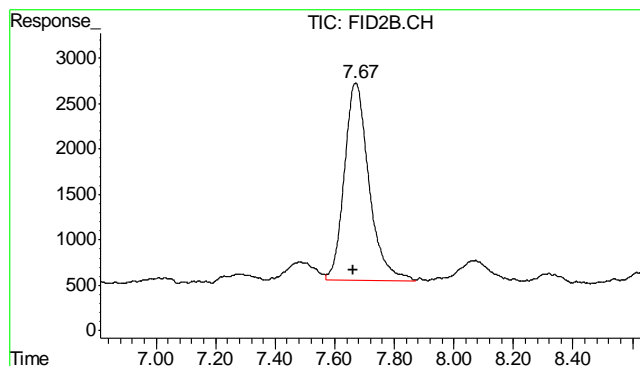
R.T.: 0.000 min
Exp R.T.: 2.212 min
Response: 0
Conc: N.D.



#5 Benzene

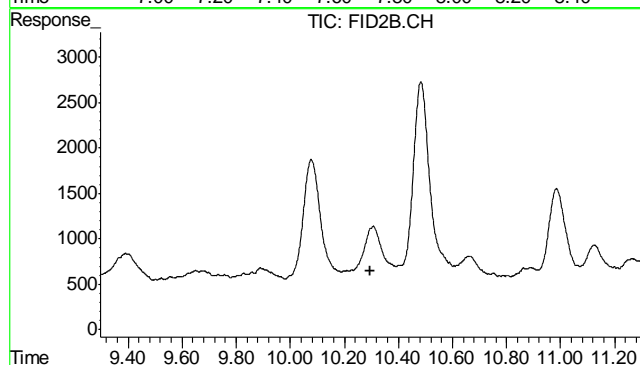
R.T.: 0.000 min
Exp R.T.: 4.124 min
Response: 0
Conc: N.D.

11.21
11



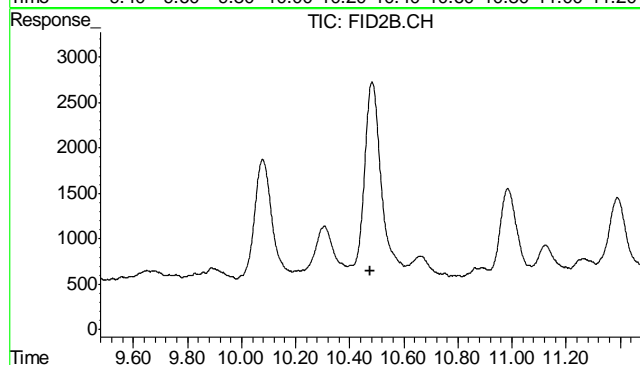
#6 Toluene

R.T.: 7.671 min
Delta R.T.: 0.009 min
Response: 124783
Conc: 0.31 ug/L



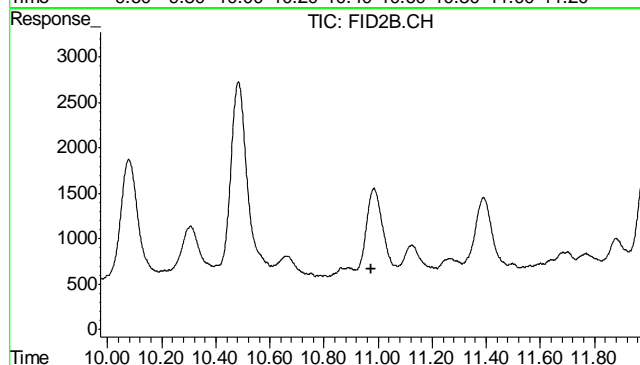
#7 Ethylbenzene

R.T.: 0.000 min
Exp R.T.: 10.297 min
Response: 0
Conc: N.D.



#8 m,p-Xylene

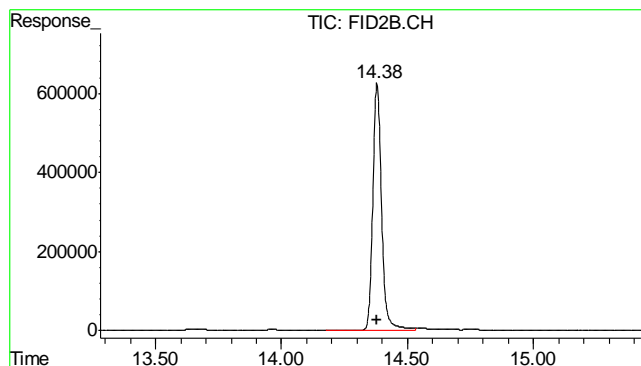
R.T.: 0.000 min
Exp R.T.: 10.477 min
Response: 0
Conc: N.D.



#9 o-Xylene

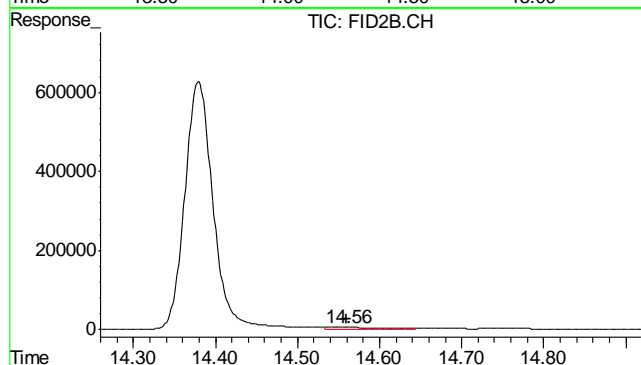
R.T.: 0.000 min
Exp R.T.: 10.973 min
Response: 0
Conc: N.D.

11.21
11



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

R.T.: 14.380 min
Delta R.T.: 0.002 min
Response: 15101478
Conc: 92.92 %



#11 Naphthalene

R.T.: 14.559 min
Delta R.T.: -0.001 min
Response: 188086
Conc: 0.95 ug/L

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: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| OP6840-MB | FD18785.D | 1 | 10/22/12 | AV | 10/22/12 | OP6840 | GFD949 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D40074-1

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|-------------------|--------|----|-----|-------|---|
| | TPH-DRO (C10-C28) | ND | 13 | 8.7 | mg/kg | |

| CAS No. | Surrogate Recoveries | Limits |
|---------|----------------------|-------------|
| 84-15-1 | o-Terphenyl | 94% 43-136% |

12.1.1
12

Blank Spike Summary

Page 1 of 1

Job Number: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-----------|-----------|----|----------|----|-----------|------------|------------------|
| OP6840-BS | FD18786.D | 1 | 10/22/12 | AV | 10/22/12 | OP6840 | GFD949 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D40074-1

| CAS No. | Compound | Spike mg/kg | BSP mg/kg | BSP % | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
| | TPH-DRO (C10-C28) | 667 | 657 | 99 | 58-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl | 101% | 43-136% |

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: D40074
Account: XTOKRWR XTO Energy
Project: PCU 197-36A

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP6840-MS | FD18787.D | 1 | 10/22/12 | AV | 10/22/12 | OP6840 | GFD949 |
| OP6840-MSD | FD18788.D | 1 | 10/22/12 | AV | 10/22/12 | OP6840 | GFD949 |
| D40087-1 | FD18803.D | 1 | 10/23/12 | AV | 10/22/12 | OP6840 | GFD949 |

The QC reported here applies to the following samples:

Method: SW846-8015B

D40074-1

| CAS No. | Compound | D40087-1 mg/kg | Q | Spike mg/kg | MS mg/kg | MS % | MSD mg/kg | MSD % | RPD | Limits Rec/RPD |
|---------|-------------------|-------------------|---|----------------|-------------|---------|--------------|----------|-----|-------------------|
| | TPH-DRO (C10-C28) | 675 | | 736 | 1390 | 97 | 1420 | 101 | 2 | 20-183/43 |

| CAS No. | Surrogate Recoveries | MS | MSD | D40087-1 | Limits |
|---------|----------------------|-----|-----|----------|---------|
| 84-15-1 | o-Terphenyl | 89% | 92% | 85% | 43-136% |

* = Outside of Control Limits.

GC Semi-volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\OCT\FD102212\FD18795.D Vial: 20
Acq On : 10-22-2012 09:32:19 PM Operator: ashleyv
Sample : D40074-1 Inst : FID5
Misc : OP6840,GFD949,30.17,,,2,1 Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Oct 23 14:42:25 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)
Title : 8015B TEH
Last Update : Mon Oct 22 10:08:28 2012
Response via : Initial Calibration
DataAcq Meth : DRO_FR.M

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

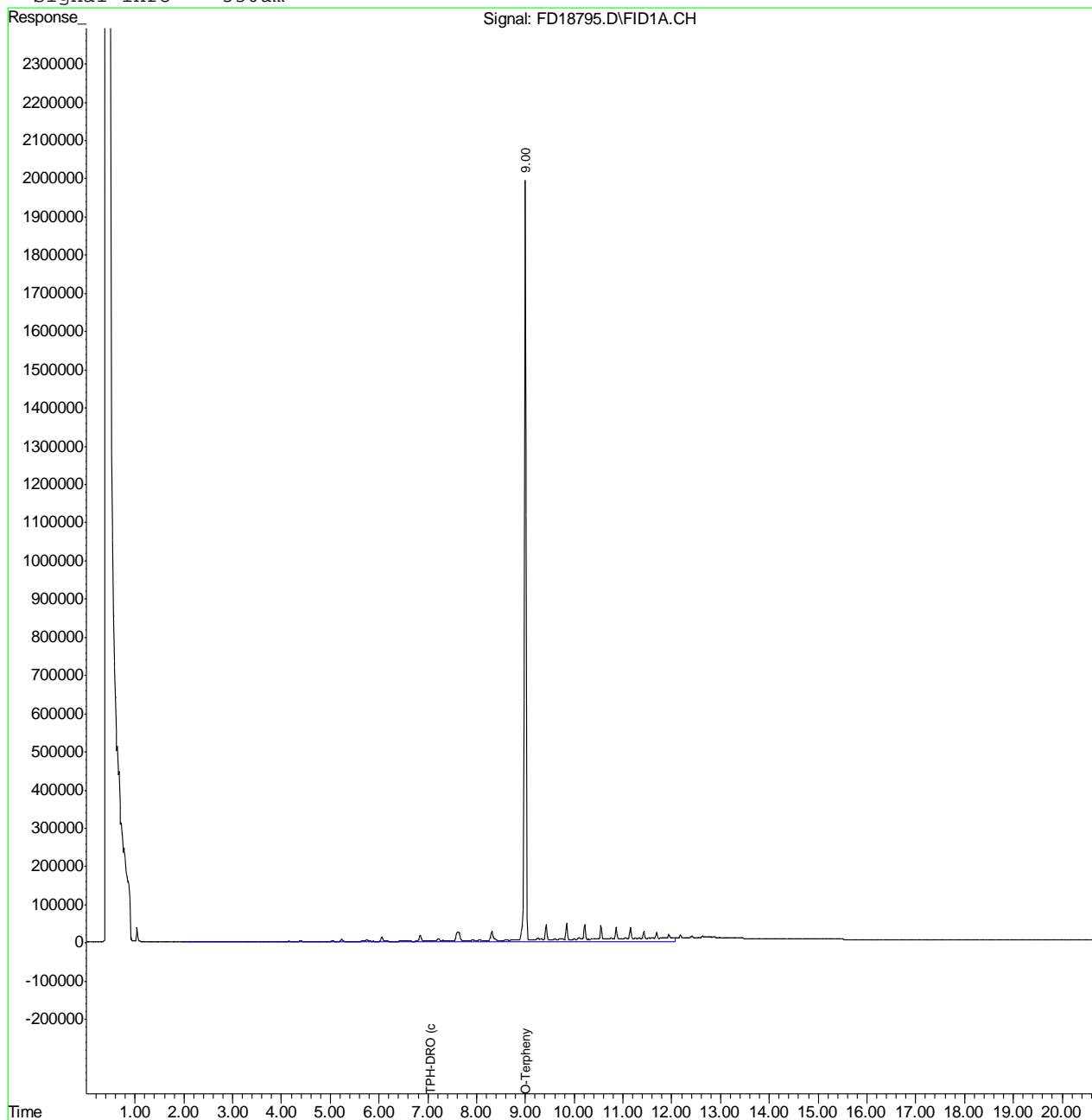
| Compound | R.T. | Response | Conc Units |
|-----------------------------|------|----------|---------------|
| ----- | | | |
| System Monitoring Compounds | | | |
| 1) S O-Terphenyl | 9.00 | 47261505 | 1000.486 mg/L |
| Target Compounds | | | |
| 2) H TPH-DRO (c10-c28) | 7.08 | 25262756 | 656.086 mg/L |

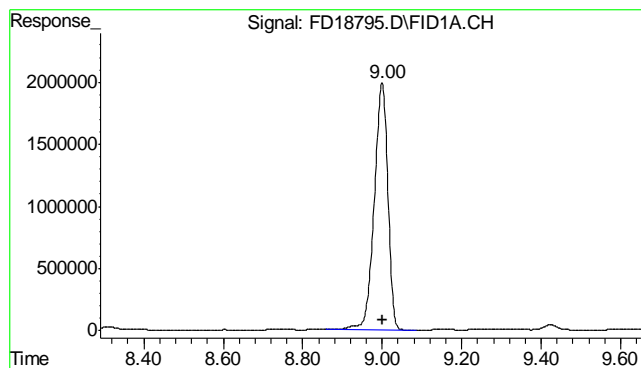
Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\OCT\FD102212\FD18795.D Vial: 20
Acq On : 10-22-2012 09:32:19 PM Operator: ashleyv
Sample : D40074-1 Inst : FID5
Misc : OP6840,GFD949,30.17,,,2,1 Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Oct 23 14:56 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)
Title : 8015B TEH
Last Update : Mon Oct 22 10:08:28 2012
Response via : Multiple Level Calibration
DataAcq Meth : DRO_FR.M

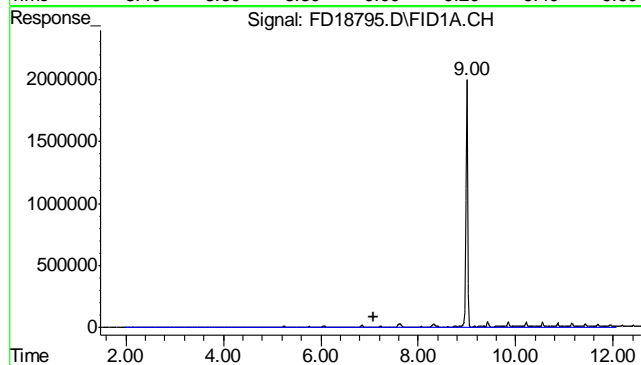
Volume Inj. : 1ul
Signal Phase : RTX-5
Signal Info : 530um





#1 O-Terphenyl

R.T.: 9.000 min
 Delta R.T.: 0.000 min
 Response: 47261505
 Conc: 1000.49 mg/L



#2 TPH-DRO (c10-c28)

R.T.: 7.075 min
 Delta R.T.: 0.000 min
 Response: 25262756
 Conc: 656.09 mg/L m

Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\OCT\FD102212\FD18785.D Vial: 10
Acq On : 10-22-2012 05:06:18 PM Operator: ashleyv
Sample : OP6840-MB Inst : FID5
Misc : OP6840,GFD949,30.00,,,2,1 Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Oct 23 14:42:15 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)
Title : 8015B TEH
Last Update : Mon Oct 22 10:08:28 2012
Response via : Initial Calibration
DataAcq Meth : DRO_FR.M

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

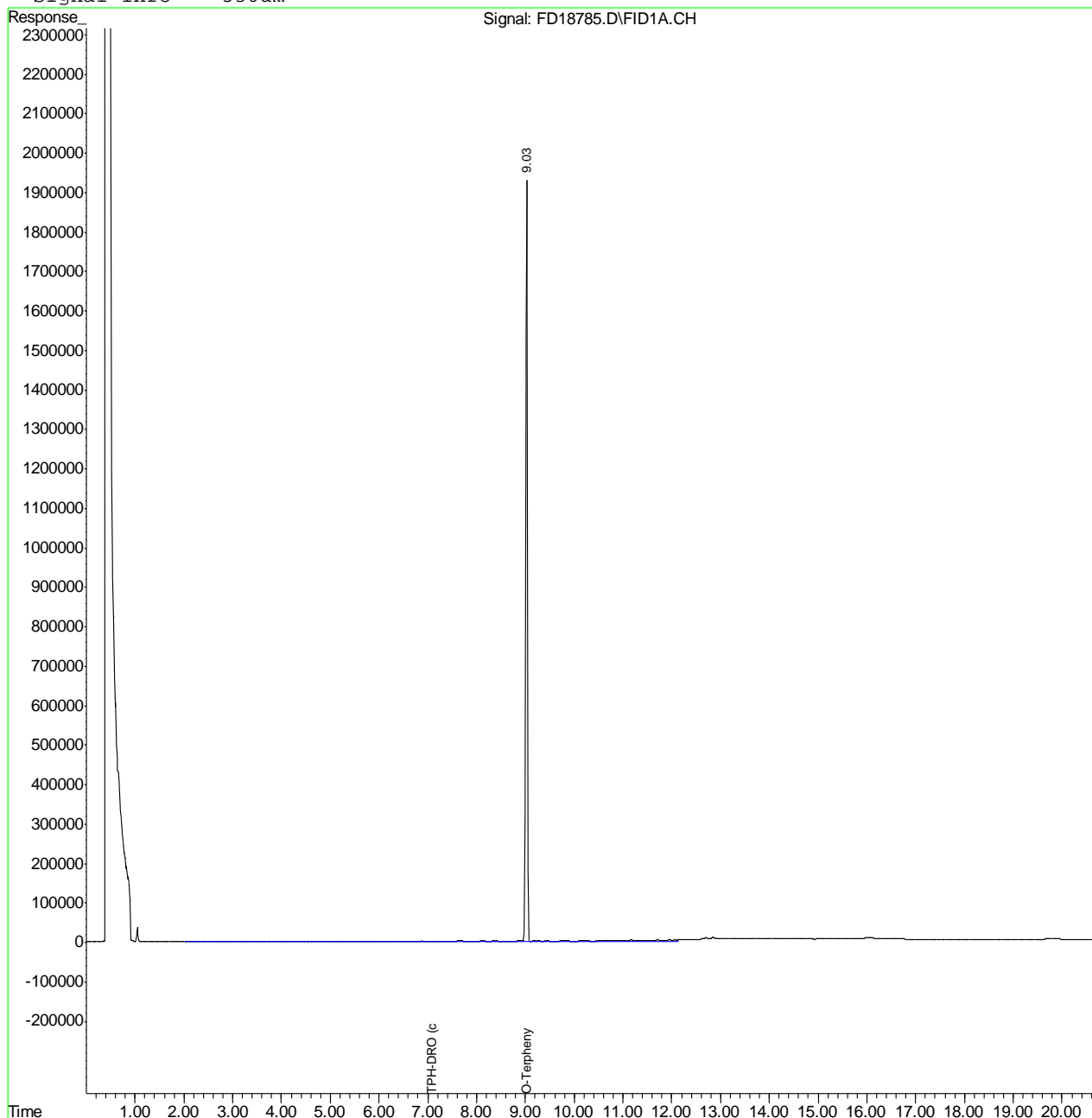
| Compound | R.T. | Response | Conc Units |
|-----------------------------|------|----------|--------------|
| ----- | | | |
| System Monitoring Compounds | | | |
| 1) S O-Terphenyl | 9.03 | 44481703 | 941.640 mg/L |
| Target Compounds | | | |
| 2) H TPH-DRO (c10-c28) | 7.08 | 3854394 | 100.100 mg/L |

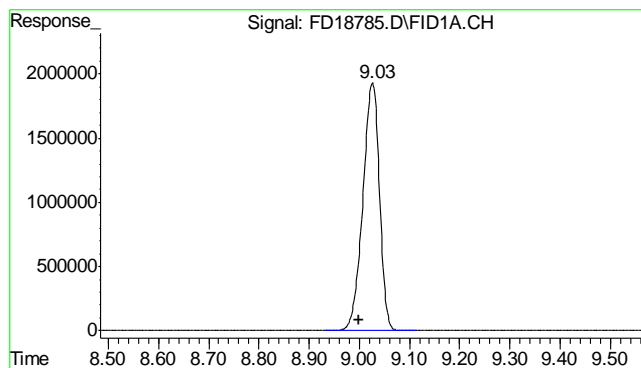
Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\OCT\FD102212\FD18785.D Vial: 10
Acq On : 10-22-2012 05:06:18 PM Operator: ashleyv
Sample : OP6840-MB Inst : FID5
Misc : OP6840,GFD949,30.00,,,2,1 Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Oct 23 14:42 2012 Quant Results File: DRO-GFD823F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD823F.M (Chemstation Integrator)
Title : 8015B TEH
Last Update : Mon Oct 22 10:08:28 2012
Response via : Multiple Level Calibration
DataAcq Meth : DRO_FR.M

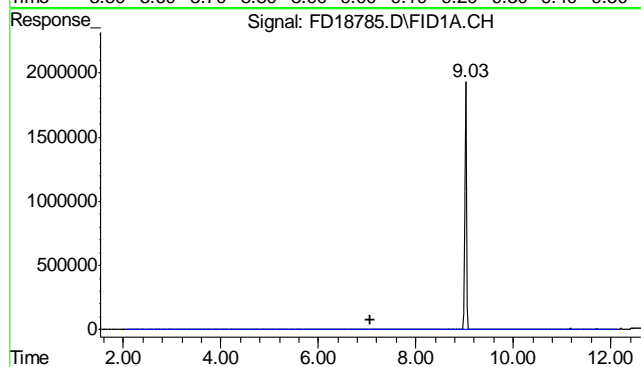
Volume Inj. : 1ul
Signal Phase : RTX-5
Signal Info : 530um





#1 O-Terphenyl

R.T.: 9.026 min
Delta R.T.: 0.026 min
Response: 44481703
Conc: 941.64 mg/L



#2 TPH-DRO (c10-c28)

R.T.: 7.075 min
Delta R.T.: 0.000 min
Response: 3854394
Conc: 100.10 mg/L 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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8718
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 10/23/12

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|------|------|-----------|-------|
| Aluminum | 10 | .96 | .57 | | |
| Antimony | 3.0 | .17 | .12 | | |
| Arsenic | 2.5 | .44 | .56 | | |
| Barium | 1.0 | .01 | .11 | 0.040 | <1.0 |
| Beryllium | 1.0 | .13 | .15 | | |
| Boron | 5.0 | .1 | .06 | | |
| Cadmium | 1.0 | .06 | .036 | 0.020 | <1.0 |
| Calcium | 40 | .54 | 9 | | |
| Chromium | 1.0 | .03 | .03 | 0.020 | <1.0 |
| Cobalt | 0.50 | .04 | .07 | | |
| Copper | 1.0 | .12 | .15 | -0.040 | <1.0 |
| Iron | 7.0 | .12 | .87 | | |
| Lead | 5.0 | .19 | .24 | -0.020 | <5.0 |
| Lithium | 0.20 | .05 | .054 | | |
| Magnesium | 20 | .65 | .98 | | |
| Manganese | 0.50 | .12 | .022 | | |
| Molybdenum | 1.0 | .21 | .08 | | |
| Nickel | 3.0 | .05 | .026 | 0.010 | <3.0 |
| Phosphorus | 10 | 1.4 | 1.9 | | |
| Potassium | 200 | 6.1 | 7 | | |
| Selenium | 5.0 | .48 | .36 | -0.050 | <5.0 |
| Silicon | 5.0 | .29 | .37 | | |
| Silver | 3.0 | .04 | .06 | 0.040 | <3.0 |
| Sodium | 40 | .59 | 1.9 | | |
| Strontium | 5.0 | .004 | .017 | | |
| Thallium | 1.0 | .29 | .53 | | |
| Tin | 5.0 | 1.2 | 2 | | |
| Titanium | 1.0 | .01 | .038 | | |
| Uranium | 5.0 | .22 | .26 | | |
| Vanadium | 1.0 | .02 | .036 | | |
| Zinc | 3.0 | .05 | .37 | 0.33 | <3.0 |

Associated samples MP8718: D40074-1

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8718
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8718
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 10/23/12

| Metal | D40074-1 Original MS | | Spikelot ICPALL2 | % Rec | QC Limits |
|------------|-------------------------|------|---------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | anr | | | | |
| Barium | 429 | 648 | 204 | 107.4 | 75-125 |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | 0.14 | 42.7 | 51 | 83.5 | 75-125 |
| Calcium | | | | | |
| Chromium | 62.2 | 105 | 51 | 83.9 | 75-125 |
| Cobalt | | | | | |
| Copper | 11.0 | 57.1 | 51 | 90.4 | 75-125 |
| Iron | | | | | |
| Lead | 8.4 | 93.1 | 102 | 83.1 | 75-125 |
| Lithium | | | | | |
| Magnesium | | | | | |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | 19.9 | 60.1 | 51 | 78.8 | 75-125 |
| Phosphorus | anr | | | | |
| Potassium | | | | | |
| Selenium | 0.0 | 85.4 | 102 | 83.8 | 75-125 |
| Silicon | | | | | |
| Silver | 0.17 | 18.3 | 20.4 | 88.9 | 75-125 |
| Sodium | | | | | |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | 37.8 | 79.6 | 51 | 82.0 | 75-125 |

Associated samples MP8718: D40074-1

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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8718
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

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

14.1.2
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8718
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 10/23/12

| Metal | D40074-1 Original | MSD | Spikelet ICPAL2 | % Rec | MSD RPD | QC Limit |
|------------|----------------------|------|--------------------|-----------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | anr | | | | | |
| Barium | 429 | 744 | 210 | 150.0N(a) | 13.8 | 20 |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | 0.14 | 43.1 | 52.5 | 81.9 | 0.9 | 20 |
| Calcium | | | | | | |
| Chromium | 62.2 | 103 | 52.5 | 77.7 | 1.9 | 20 |
| Cobalt | | | | | | |
| Copper | 11.0 | 56.7 | 52.5 | 87.1 | 0.7 | 20 |
| Iron | | | | | | |
| Lead | 8.4 | 92.5 | 105 | 80.1 | 0.6 | 20 |
| Lithium | | | | | | |
| Magnesium | | | | | | |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | 19.9 | 59.1 | 52.5 | 74.7N(a) | 1.7 | 20 |
| Phosphorus | anr | | | | | |
| Potassium | | | | | | |
| Selenium | 0.0 | 86.2 | 105 | 82.1 | 0.9 | 20 |
| Silicon | | | | | | |
| Silver | 0.17 | 18.4 | 21 | 86.8 | 0.5 | 20 |
| Sodium | | | | | | |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | 37.8 | 75.9 | 52.5 | 72.6N(b) | 4.8 | 20 |

Associated samples MP8718: D40074-1

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8718
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 recovery indicates possible matrix interference.
- (b) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D40074
 Account: XTOKRWR - XTO Energy
 Project: PCU 197-36A

QC Batch ID: MP8718
 Matrix Type: SOLID

Methods: SW846 6010C
 Units: mg/kg

Prep Date: 10/23/12

| Metal | BSP Result | Spikelot ICPALL2 | % Rec | QC Limits |
|------------|---------------|---------------------|-------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | anr | | | |
| Barium | 194 | 200 | 97.0 | 80-120 |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | 43.6 | 50 | 87.2 | 80-120 |
| Calcium | | | | |
| Chromium | 46.2 | 50 | 92.4 | 80-120 |
| Cobalt | | | | |
| Copper | 43.6 | 50 | 87.2 | 80-120 |
| Iron | | | | |
| Lead | 90.4 | 100 | 90.4 | 80-120 |
| Lithium | | | | |
| Magnesium | | | | |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | 43.6 | 50 | 87.2 | 80-120 |
| Phosphorus | anr | | | |
| Potassium | | | | |
| Selenium | 88.0 | 100 | 88.0 | 80-120 |
| Silicon | | | | |
| Silver | 18.6 | 20 | 93.0 | 80-120 |
| Sodium | | | | |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | 43.4 | 50 | 86.8 | 80-120 |

Associated samples MP8718: D40074-1

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8718
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8718
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date: 10/23/12

| D40074-1 | | QC | |
|------------|----------|---------|---------------|
| Metal | Original | SDL 1:5 | %DIF Limits |
| Aluminum | | | |
| Antimony | | | |
| Arsenic | anr | | |
| Barium | 4010 | 4660 | 16.3*(a) 0-10 |
| Beryllium | | | |
| Boron | | | |
| Cadmium | 1.30 | 0.00 | 100.0(b) 0-10 |
| Calcium | | | |
| Chromium | 581 | 659 | 13.4*(a) 0-10 |
| Cobalt | | | |
| Copper | 102 | 101 | 1.4 0-10 |
| Iron | | | |
| Lead | 78.5 | 75.0 | 4.5 0-10 |
| Lithium | | | |
| Magnesium | | | |
| Manganese | | | |
| Molybdenum | | | |
| Nickel | 185 | 216 | 16.5*(a) 0-10 |
| Phosphorus | anr | | |
| Potassium | | | |
| Selenium | 0.00 | 0.00 | NC 0-10 |
| Silicon | | | |
| Silver | 1.60 | 4.50 | 181.3(b) 0-10 |
| Sodium | | | |
| Strontium | | | |
| Thallium | | | |
| Tin | | | |
| Titanium | | | |
| Uranium | | | |
| Vanadium | | | |
| Zinc | 353 | 434 | 22.8*(a) 0-10 |

Associated samples MP8718: D40074-1

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

14.1.4
14

SERIAL DILUTION RESULTS SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8718
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

(a) Serial dilution indicates possible matrix interference.

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8719
Matrix Type: SOLID

Methods: SW846 6020A
Units: mg/kg

Prep Date: 10/23/12

| Metal | RL | IDL | MDL | MB raw | final |
|------------|-------|--------|-------|-----------|-------|
| Aluminum | 25 | .22 | .31 | | |
| Antimony | 0.20 | .0018 | .0075 | | |
| Arsenic | 0.10 | .006 | .06 | 0.0051 | <0.10 |
| Barium | 1.0 | .0065 | .037 | | |
| Beryllium | 0.10 | .016 | .09 | | |
| Boron | 20 | 1.2 | 1.2 | | |
| Cadmium | 0.050 | .014 | .021 | | |
| Calcium | 200 | 7.9 | 8 | | |
| Chromium | 1.0 | .033 | .19 | | |
| Cobalt | 0.10 | .0012 | .015 | | |
| Copper | 1.0 | .017 | .065 | | |
| Iron | 20 | .8 | 5 | | |
| Lead | 0.25 | .0011 | .024 | | |
| Magnesium | 50 | .44 | .85 | | |
| Manganese | 0.50 | .0043 | .02 | | |
| Molybdenum | 0.50 | .018 | .018 | | |
| Nickel | 1.0 | .0049 | .011 | | |
| Phosphorus | 30 | 1.4 | 3.6 | | |
| Potassium | 100 | 9.8 | 10 | | |
| Selenium | 0.20 | .029 | .14 | | |
| Silver | 0.050 | .0009 | .0065 | | |
| Sodium | 250 | 1.5 | 2.3 | | |
| Strontium | 10 | .036 | .036 | | |
| Thallium | 0.10 | .00095 | .0095 | | |
| Tin | 5.0 | .023 | .34 | | |
| Titanium | 1.0 | .044 | .1 | | |
| Uranium | 0.25 | .00085 | .001 | | |
| Vanadium | 2.0 | .12 | .21 | | |
| Zinc | 5.0 | .033 | .35 | | |

Associated samples MP8719: D40074-1

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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8719
Matrix Type: SOLID

Methods: SW846 6020A
Units: mg/kg

Prep Date: 10/23/12

| Metal | D40074-1 Original MS | Spikelot ICPALL2 | % Rec | QC Limits |
|------------|-------------------------|---------------------|-------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 5.8 | 109 | 102 | 101.2 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 MP8719: D40074-1

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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8719
Matrix Type: SOLID

Methods: SW846 6020A
Units: mg/kg

Prep Date: 10/23/12

| Metal | D40074-1 Original | MSD | Spikelot ICPALL2 | % Rec | MSD RPD | QC Limit |
|------------|----------------------|-----|---------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | 5.8 | 118 | 105 | 106.9 | 7.9 | 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 MP8719: D40074-1

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8719
Matrix Type: SOLID

Methods: SW846 6020A
Units: mg/kg

Prep Date: 10/23/12

| Metal | BSP Result | Spikelot ICPALL2 | % Rec | QC Limits |
|------------|---------------|---------------------|-------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | 99.6 | 100 | 99.6 | 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 MP8719: D40074-1

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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8719
Matrix Type: SOLID

Methods: SW846 6020A
Units: ug/l

Prep Date: 10/23/12

| Metal | D40074-1 | | | QC | |
|------------|----------|----------|------|--------|--|
| | Original | SDL 5:25 | %DIF | Limits | |
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | 54.3 | 53.7 | 1.2 | 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 MP8719: D40074-1

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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8720
Matrix Type: SOLID

Methods: SW846 7471B
Units: mg/kg

Prep Date: 10/24/12

| Metal | RL | IDL | MDL | MB | |
|---------|------|-------|-------|---------|-------|
| | | | | raw | final |
| Mercury | 0.10 | .0011 | .0009 | 0.00013 | <0.10 |

Associated samples MP8720: D40074-1

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: D40074
 Account: XTOKRWR - XTO Energy
 Project: PCU 197-36A

QC Batch ID: MP8720
 Matrix Type: SOLID

Methods: SW846 7471B
 Units: mg/kg

Prep Date: 10/24/12

| Metal | D39936-1 | | Spikelot | | QC | |
|---------|----------|------|----------|-------|--------|--|
| | Original | MS | HGWSR1 | % Rec | Limits | |
| Mercury | 0.049 | 0.87 | 0.785 | 104.6 | 75-125 | |

Associated samples MP8720: D40074-1

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: D40074
 Account: XTOKRWR - XTO Energy
 Project: PCU 197-36A

QC Batch ID: MP8720
 Matrix Type: SOLID

Methods: SW846 7471B
 Units: mg/kg

Prep Date: 10/24/12

| Metal | D39936-1 | | Spikelot | | MSD | QC |
|---------|----------|------|----------|-------|-----|----|
| | Original | MSD | HGWSR1 | % Rec | | |
| Mercury | 0.049 | 0.79 | 0.772 | 96.0 | 9.6 | |

Associated samples MP8720: D40074-1

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: D40074
 Account: XTOKRWR - XTO Energy
 Project: PCU 197-36A

QC Batch ID: MP8720
 Matrix Type: SOLID

Methods: SW846 7471B
 Units: mg/kg

Prep Date: 10/24/12

| Metal | BSP Result | Spikelot HGWSR1 | % Rec | QC Limits |
|---------|---------------|--------------------|-------|--------------|
| Mercury | 0.43 | 0.4 | 107.5 | 80-120 |

Associated samples MP8720: D40074-1

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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8723
Matrix Type: AQUEOUS

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

Prep Date: 10/23/12

| Metal | RL | IDL | MDL | MB raw | final |
|------------|------|-----|-----|-----------|-------|
| Aluminum | 500 | 48 | 130 | | |
| Antimony | 150 | 8.5 | 18 | | |
| Arsenic | 130 | 22 | 42 | | |
| Barium | 50 | .5 | 9 | | |
| Beryllium | 50 | 6.5 | 16 | | |
| Boron | 250 | 5 | 22 | | |
| Cadmium | 50 | 3 | 3 | | |
| Calcium | 2000 | 27 | 80 | 11.0 | <2000 |
| Chromium | 50 | 1.5 | 2.8 | | |
| Cobalt | 25 | 2 | 2.1 | | |
| Copper | 50 | 6 | 15 | | |
| Iron | 350 | 6 | 100 | | |
| Lead | 250 | 9.5 | 15 | | |
| Lithium | 10 | 2.5 | | | |
| Magnesium | 1000 | 33 | 110 | -13 | <1000 |
| Manganese | 25 | 6 | 6 | | |
| Molybdenum | 50 | 11 | 11 | | |
| Nickel | 150 | 2.5 | 2.9 | | |
| Phosphorus | 500 | 70 | 300 | | |
| Potassium | 5000 | 310 | 750 | | |
| Selenium | 250 | 24 | 55 | | |
| Silicon | 250 | 15 | | | |
| Silver | 150 | 2 | 4.9 | | |
| Sodium | 2000 | 30 | 490 | 127 | <2000 |
| Strontium | 25 | .2 | 7.5 | | |
| Thallium | 50 | 15 | 43 | | |
| Tin | 250 | 60 | | | |
| Titanium | 50 | .5 | | | |
| Uranium | 250 | 11 | 23 | | |
| Vanadium | 50 | 1 | 2.4 | | |
| Zinc | 150 | 2.5 | 12 | | |

Associated samples MP8723: D40074-1A

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8723
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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8723
Matrix Type: AQUEOUS

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

Prep Date: 10/23/12

| Metal | D40074-1A Original MS | | Spikelot ICPAL2 | % Rec | QC Limits |
|------------|--------------------------|--------|--------------------|-------|--------------|
| Aluminum | | | | | |
| Antimony | | | | | |
| Arsenic | | | | | |
| Barium | | | | | |
| Beryllium | | | | | |
| Boron | | | | | |
| Cadmium | | | | | |
| Calcium | 31000 | 171000 | 125000 | 112.0 | 75-125 |
| Chromium | | | | | |
| Cobalt | | | | | |
| Copper | | | | | |
| Iron | | | | | |
| Lead | | | | | |
| Lithium | | | | | |
| Magnesium | 9880 | 144000 | 125000 | 107.3 | 75-125 |
| Manganese | | | | | |
| Molybdenum | | | | | |
| Nickel | | | | | |
| Phosphorus | | | | | |
| Potassium | | | | | |
| Selenium | | | | | |
| Silicon | | | | | |
| Silver | | | | | |
| Sodium | 92600 | 225000 | 125000 | 105.9 | 75-125 |
| Strontium | | | | | |
| Thallium | | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Uranium | | | | | |
| Vanadium | | | | | |
| Zinc | | | | | |

Associated samples MP8723: D40074-1A

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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8723
Matrix Type: AQUEOUS

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

Prep Date:

Metal

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8723
Matrix Type: AQUEOUS

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

Prep Date: 10/23/12

| Metal | D40074-1A Original | MSD | SpikeLot ICPALL2 | % Rec | MSD RPD | QC Limit |
|------------|-----------------------|--------|---------------------|-------|------------|-------------|
| Aluminum | | | | | | |
| Antimony | | | | | | |
| Arsenic | | | | | | |
| Barium | | | | | | |
| Beryllium | | | | | | |
| Boron | | | | | | |
| Cadmium | | | | | | |
| Calcium | 31000 | 170000 | 125000 | 111.2 | 0.6 | 20 |
| Chromium | | | | | | |
| Cobalt | | | | | | |
| Copper | | | | | | |
| Iron | | | | | | |
| Lead | | | | | | |
| Lithium | | | | | | |
| Magnesium | 9880 | 144000 | 125000 | 107.3 | 0.0 | 20 |
| Manganese | | | | | | |
| Molybdenum | | | | | | |
| Nickel | | | | | | |
| Phosphorus | | | | | | |
| Potassium | | | | | | |
| Selenium | | | | | | |
| Silicon | | | | | | |
| Silver | | | | | | |
| Sodium | 92600 | 227000 | 125000 | 107.5 | 0.9 | 20 |
| Strontium | | | | | | |
| Thallium | | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Uranium | | | | | | |
| Vanadium | | | | | | |
| Zinc | | | | | | |

Associated samples MP8723: D40074-1A

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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8723
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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8723
Matrix Type: AQUEOUS

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

Prep Date: 10/23/12

| Metal | BSP Result | Spikelot ICPALL2 | % Rec | QC Limits |
|------------|---------------|---------------------|-------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 139000 | 125000 | 111.2 | 80-120 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 131000 | 125000 | 104.8 | 80-120 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 135000 | 125000 | 108.0 | 80-120 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP8723: D40074-1A

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8723
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: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8723
Matrix Type: AQUEOUS

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

Prep Date: 10/23/12

| Metal | D40074-1A Original SDL 1:5 | | %DIF | QC Limits |
|------------|-------------------------------|-------|------|--------------|
| Aluminum | | | | |
| Antimony | | | | |
| Arsenic | | | | |
| Barium | | | | |
| Beryllium | | | | |
| Boron | | | | |
| Cadmium | | | | |
| Calcium | 6210 | 6080 | 2.0 | 0-10 |
| Chromium | | | | |
| Cobalt | | | | |
| Copper | | | | |
| Iron | | | | |
| Lead | | | | |
| Lithium | | | | |
| Magnesium | 1980 | 1990 | 0.5 | 0-10 |
| Manganese | | | | |
| Molybdenum | | | | |
| Nickel | | | | |
| Phosphorus | | | | |
| Potassium | | | | |
| Selenium | | | | |
| Silicon | | | | |
| Silver | | | | |
| Sodium | 18500 | 18700 | 0.9 | 0-10 |
| Strontium | | | | |
| Thallium | | | | |
| Tin | | | | |
| Titanium | | | | |
| Uranium | | | | |
| Vanadium | | | | |
| Zinc | | | | |

Associated samples MP8723: D40074-1A

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

14.4.4
14

SERIAL DILUTION RESULTS SUMMARY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

QC Batch ID: MP8723
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

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

| Analyte | Batch ID | RL | MB Result | Units | Spike Amount | BSP Result | BSP %Recov | QC Limits |
|-----------------------|----------------|-----|--------------|----------|-----------------|---------------|---------------|--------------|
| Chromium, Hexavalent | GP8472/GN17313 | 1.0 | 0.0 | mg/kg | 40.0 | 177 | 102.0 | 80-120% |
| Specific Conductivity | GP8517/GN17378 | | | umhos/cm | 9989 | 9920 | 93.3 | 90-110% |
| pH | GN17347 | | | su | 8.00su | 7.98 | 99.8 | 99.3-100.7% |

Associated Samples:
Batch GP8472: D40074-1
Batch GP8517: D40074-1
Batch GN17347: D40074-1
(*) Outside of QC limits

15.1
15

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

| Analyte | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------------|----------------|-----------|-------|-----------------|------------|-----|-----------|
| Chromium, Hexavalent | GP8472/GN17313 | D40002-1 | mg/kg | 0.0 | 0.0 | 0.0 | 0-20% |
| Redox Potential Vs H2 | GN17345 | D40111-1 | mv | 25.1 | 27.3 | 8.4 | 0-20% |

Associated Samples:
Batch GP8472: D40074-1
Batch GN17345: D40074-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|----------------------|----------------|-----------|-------|-----------------|--------------|-----------|------|-----------|
| Chromium, Hexavalent | GP8472/GN17313 | D40002-1 | mg/kg | 0.0 | 173.0 | 33.9 | 85.0 | 75-125% |

Associated Samples:

Batch GP8472: D40074-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D40074
Account: XTOKRWR - XTO Energy
Project: PCU 197-36A

| Analyte | Batch ID | QC Sample | Units | Original Result | Spike Amount | MSD Result | RPD | QC Limit |
|----------------------|----------------|-----------|-------|-----------------|--------------|------------|-----|----------|
| Chromium, Hexavalent | GP8472/GN17313 | D40002-1 | mg/kg | 0.0 | 40.0 | 34.3 | 1.0 | |

Associated Samples:
Batch GP8472: D40074-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

15.4
15