New Jersey
ACCUTEST LABORATORIES

01/09/13

# Technical Report for

## Aquaterra Technologies, Inc.

Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

AOI-7

Accutest Job Number: JB22549

Sampling Date: 11/30/12

Report to:

Langan Engineering & Environmental

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ATTN: Kristin Ward

Total number of pages in report: **370**

ACCREDITED IN ACCORDANCE WITH nelac

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

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Laboratory Director

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Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, OH VAP (CL0056), PA, RI, SC, TN, VA, WV

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# Sample Summary

Aquaterra Technologies, Inc.

**Job No:** JB22549

Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
Project No: AOI-7

| Sample Number | Collected Date | Time | By | Received | Matrix Code | Type | Client Sample ID |
|---|---|---|---|---|---|---|---|
| JB22549-1 | 11/30/12 | 08:00 | LM | 11/30/12 | SO | Soil | BH-12-54_3' |
| JB22549-2 | 11/30/12 | 08:30 | LM | 11/30/12 | SO | Soil | BH-12-55_2.5' |
| JB22549-3 | 11/30/12 | 09:00 | LM | 11/30/12 | SO | Soil | BH-12-55_1.5' |
| JB22549-4 | 11/30/12 | 11:40 | LM | 11/30/12 | SO | Soil | BH-12-53_2.5' |
| JB22549-5 | 11/30/12 | 12:30 | LM | 11/30/12 | SO | Soil | BH-12-48_3' |
| JB22549-6 | 11/30/12 | 13:00 | LM | 11/30/12 | SO | Soil | BH-12-49_2.5' |

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

# CASE NARRATIVE / CONFORMANCE SUMMARY

| | | | |
|---|---|---|---|
| **Client:** | Aquaterra Technologies, Inc. | **Job No** | JB22549 |
| **Site:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, P | **Report Date** | 12/18/2012 9:48:15 A |

On 11/30/2012, 6 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 4.2 C. Samples were intact and chemically preserved, unless noted below. An Accutest Job Number of JB22549 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

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:** VA7126

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB22507-18MS, JB22507-18MSD were used as the QC samples indicated.
- Matrix Spike Recovery(s) for 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Ethylbenzene, Xylene (total) are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- Matrix Spike Duplicate Recovery(s) for 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- Matrix Spike Recovery(s) for Toluene are outside control limits. Outside control limits due to matrix interference.
- RPD(s) for MS/MSD for 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Ethylbenzene, Toluene, Xylene (total) are outside control limits for sample JB22507-18MSD. Outside control limits due to matrix interference.
- Sample(s) JB22549-1 have surrogates outside control limits. Outside control limits due to matrix interference.

**Matrix:** SO **Batch ID:** VE8685

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB22611-2MS, JB22611-2MSD were used as the QC samples indicated.
- Sample(s) JB22549-1 have surrogates outside control limits. Outside control limits due to matrix interference.
- JB22549-4: Dilution required due to matrix interference.
- JB22549-1 for Toluene-D8: Outside control limits due to matrix interference.

**Matrix:** SO **Batch ID:** VE8686

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB22502-3MS, JB22502-3MSD were used as the QC samples indicated.
- Sample(s) JB22549-1 have surrogates outside control limits. Outside control limits due to matrix interference.

**Matrix:** SO **Batch ID:** VO5810

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB23049-4MS, JB23049-4MSD were used as the QC samples indicated.
- Sample(s) JB22549-1 have surrogates outside control limits. Outside control limits due to matrix interference.

## Extractables by GCMS By Method SW846 8270D

| **Matrix:** SO | **Batch ID:** OP61971 |
|---|---|

- All samples were extracted within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB22549-1MS, JB22549-1MSD were used as the QC samples indicated.
- JB22549-2: Dilution required due to viscosity of extract matrix
- JB22549-4: Dilution required due to viscosity of extract matrix
- JB22549-5: Dilution required due to viscosity of extract matrix

## Metals By Method SW846 6010C

| **Matrix:** SO | **Batch ID:** MP68389 |
|---|---|

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB22562-1SDL, JB22562-1MS, JB22562-1MSD were used as the QC samples for metals.
- Matrix Spike Duplicate Recovery(s) for Lead are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- RPD(s) for MS/MSD for Lead are outside control limits for sample MP68389-S2. High rpd due to possible sample nonhomogeneity.
- JB22549-1 for Lead: Elevated detection limit due to dilution required for high interfering element.
- JB22549-6 for Lead: Elevated detection limit due to dilution required for high interfering element.

## Wet Chemistry By Method ASTM 4643-00

| **Matrix:** SO | **Batch ID:** GN76632 |
|---|---|

- The data for ASTM 4643-00 meets quality control requirements.

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest'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.

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

# Summary of Hits

**Job Number:** JB22549
**Account:** Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
**Collected:** 11/30/12



| Lab Sample ID<br>Analyte | Client Sample ID | Result/<br>Qual | RL | MDL | Units | Method |
|---|---|---|---|---|---|---|
| **JB22549-1** | **BH-12-54_3'** | | | | | |
| Benzene | | 0.340 | 0.066 | | mg/kg | SW846 8260B |
| Toluene | | 0.569 | 0.066 | | mg/kg | SW846 8260B |
| Ethylbenzene | | 5.98 | 0.066 | | mg/kg | SW846 8260B |
| Xylene (total) | | 17.2 | 0.066 | | mg/kg | SW846 8260B |
| Naphthalene | | 4.58 | 0.33 | | mg/kg | SW846 8260B |
| Isopropylbenzene | | 2.24 | 0.33 | | mg/kg | SW846 8260B |
| 1,2,4-Trimethylbenzene | | 34.9 | 3.3 | | mg/kg | SW846 8260B |
| 1,3,5-Trimethylbenzene | | 9.72 | 0.33 | | mg/kg | SW846 8260B |
| Anthracene | | 0.932 | 0.038 | | mg/kg | SW846 8270D |
| Benzo(a)anthracene | | 1.35 | 0.038 | | mg/kg | SW846 8270D |
| Benzo(a)pyrene | | 1.04 | 0.038 | | mg/kg | SW846 8270D |
| Benzo(b)fluoranthene | | 1.32 | 0.038 | | mg/kg | SW846 8270D |
| Benzo(g,h,i)perylene | | 0.709 | 0.038 | | mg/kg | SW846 8270D |
| Chrysene | | 1.43 | 0.038 | | mg/kg | SW846 8270D |
| Fluorene | | 0.890 | 0.038 | | mg/kg | SW846 8270D |
| Phenanthrene | | 2.73 | 0.038 | | mg/kg | SW846 8270D |
| Pyrene | | 3.35 | 0.038 | | mg/kg | SW846 8270D |
| Lead [a] | | 190 | 4.9 | | mg/kg | SW846 6010C |
| **JB22549-2** | **BH-12-55_2.5'** | | | | | |
| Anthracene [b] | | 0.265 | 0.073 | | mg/kg | SW846 8270D |
| Benzo(a)anthracene [b] | | 0.612 | 0.073 | | mg/kg | SW846 8270D |
| Benzo(a)pyrene [b] | | 0.599 | 0.073 | | mg/kg | SW846 8270D |
| Benzo(b)fluoranthene [b] | | 0.701 | 0.073 | | mg/kg | SW846 8270D |
| Benzo(g,h,i)perylene [b] | | 0.557 | 0.073 | | mg/kg | SW846 8270D |
| Chrysene [b] | | 0.718 | 0.073 | | mg/kg | SW846 8270D |
| Fluorene [b] | | 0.100 | 0.073 | | mg/kg | SW846 8270D |
| Phenanthrene [b] | | 0.792 | 0.073 | | mg/kg | SW846 8270D |
| Pyrene [b] | | 0.928 | 0.073 | | mg/kg | SW846 8270D |
| Lead | | 313 | 2.5 | | mg/kg | SW846 6010C |
| **JB22549-3** | **BH-12-55_1.5'** | | | | | |
| Anthracene | | 0.0370 | 0.037 | | mg/kg | SW846 8270D |
| Benzo(a)anthracene | | 0.118 | 0.037 | | mg/kg | SW846 8270D |
| Benzo(a)pyrene | | 0.120 | 0.037 | | mg/kg | SW846 8270D |
| Benzo(b)fluoranthene | | 0.125 | 0.037 | | mg/kg | SW846 8270D |
| Benzo(g,h,i)perylene | | 0.116 | 0.037 | | mg/kg | SW846 8270D |
| Chrysene | | 0.124 | 0.037 | | mg/kg | SW846 8270D |
| Phenanthrene | | 0.0855 | 0.037 | | mg/kg | SW846 8270D |
| Pyrene | | 0.185 | 0.037 | | mg/kg | SW846 8270D |
| Lead | | 112 | 2.2 | | mg/kg | SW846 6010C |

# Summary of Hits

**Job Number:** JB22549
**Account:** Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
**Collected:** 11/30/12



| Lab Sample ID<br>Analyte | Client Sample ID | Result/<br>Qual | RL | MDL | Units | Method |
|---|---|---|---|---|---|---|
| **JB22549-4** | **BH-12-53_2.5'** | | | | | |
| Toluene [c] | | 0.148 | 0.066 | | mg/kg | SW846 8260B |
| Ethylbenzene [c] | | 0.164 | 0.066 | | mg/kg | SW846 8260B |
| Xylene (total) [c] | | 0.942 | 0.066 | | mg/kg | SW846 8260B |
| Naphthalene [c] | | 0.989 | 0.33 | | mg/kg | SW846 8260B |
| 1,2,4-Trimethylbenzene [c] | | 1.86 | 0.33 | | mg/kg | SW846 8260B |
| 1,3,5-Trimethylbenzene [c] | | 0.474 | 0.33 | | mg/kg | SW846 8260B |
| Anthracene [b] | | 0.409 | 0.080 | | mg/kg | SW846 8270D |
| Benzo(a)anthracene [b] | | 0.914 | 0.080 | | mg/kg | SW846 8270D |
| Benzo(a)pyrene [b] | | 0.921 | 0.080 | | mg/kg | SW846 8270D |
| Benzo(b)fluoranthene [b] | | 0.895 | 0.080 | | mg/kg | SW846 8270D |
| Benzo(g,h,i)perylene [b] | | 0.839 | 0.080 | | mg/kg | SW846 8270D |
| Chrysene [b] | | 1.31 | 0.080 | | mg/kg | SW846 8270D |
| Fluorene [b] | | 0.297 | 0.080 | | mg/kg | SW846 8270D |
| Phenanthrene [b] | | 1.25 | 0.080 | | mg/kg | SW846 8270D |
| Pyrene [b] | | 1.81 | 0.080 | | mg/kg | SW846 8270D |
| Lead | | 510 | 2.3 | | mg/kg | SW846 6010C |
| **JB22549-5** | **BH-12-48_3'** | | | | | |
| Anthracene [b] | | 0.820 | 0.084 | | mg/kg | SW846 8270D |
| Benzo(a)anthracene [b] | | 0.800 | 0.084 | | mg/kg | SW846 8270D |
| Benzo(a)pyrene [b] | | 1.02 | 0.084 | | mg/kg | SW846 8270D |
| Benzo(b)fluoranthene [b] | | 0.717 | 0.084 | | mg/kg | SW846 8270D |
| Benzo(g,h,i)perylene [b] | | 1.14 | 0.084 | | mg/kg | SW846 8270D |
| Chrysene [b] | | 1.60 | 0.084 | | mg/kg | SW846 8270D |
| Fluorene [b] | | 0.217 | 0.084 | | mg/kg | SW846 8270D |
| Phenanthrene [b] | | 1.25 | 0.084 | | mg/kg | SW846 8270D |
| Pyrene [b] | | 2.10 | 0.084 | | mg/kg | SW846 8270D |
| Lead | | 1530 | 2.9 | | mg/kg | SW846 6010C |
| **JB22549-6** | **BH-12-49_2.5'** | | | | | |
| Anthracene | | 0.0698 | 0.036 | | mg/kg | SW846 8270D |
| Benzo(a)anthracene | | 0.260 | 0.036 | | mg/kg | SW846 8270D |
| Benzo(a)pyrene | | 0.278 | 0.036 | | mg/kg | SW846 8270D |
| Benzo(b)fluoranthene | | 0.263 | 0.036 | | mg/kg | SW846 8270D |
| Benzo(g,h,i)perylene | | 0.226 | 0.036 | | mg/kg | SW846 8270D |
| Chrysene | | 0.305 | 0.036 | | mg/kg | SW846 8270D |
| Phenanthrene | | 0.201 | 0.036 | | mg/kg | SW846 8270D |
| Pyrene | | 0.410 | 0.036 | | mg/kg | SW846 8270D |
| Lead [a] | | 107 | 4.3 | | mg/kg | SW846 6010C |

# Summary of Hits

**Job Number:** JB22549
**Account:** Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
**Collected:** 11/30/12



| Lab Sample ID<br>Analyte | Client Sample ID | Result/<br>Qual | RL | MDL | Units | Method |
|---|---|---|---|---|---|---|

(a) Elevated detection limit due to dilution required for high interfering element.
(b) Dilution required due to viscosity of extract matrix
(c) Dilution required due to matrix interference.

New Jersey

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## Sample Results

Report of Analysis

Accutest LabLink@706732 12:17 09-Jan-2013

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-54_3' | | |
| **Lab Sample ID:** | JB22549-1 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8260B SW846 5035 | **Percent Solids:** | 79.1 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | E197687.D | 1 | 12/09/12 | OTR | 12/01/12 18:00 | n/a | VE8685 |
| Run #2 | E197705.D | 1 | 12/10/12 | OTR | 12/01/12 18:00 | n/a | VE8686 |

| | Initial Weight | Final Volume | Methanol Aliquot |
|---|---|---|---|
| Run #1 | 6.0 g | 5.0 ml | 100 ul |
| Run #2 | 6.0 g | 5.0 ml | 10.0 ul |

**PA Leaded Gasoline and Aviation Gas list**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | 0.340 | 0.066 | mg/kg | |
| 108-88-3 | Toluene | 0.569 | 0.066 | mg/kg | |
| 100-41-4 | Ethylbenzene | 5.98 | 0.066 | mg/kg | |
| 1330-20-7 | Xylene (total) | 17.2 | 0.066 | mg/kg | |
| 91-20-3 | Naphthalene | 4.58 | 0.33 | mg/kg | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.066 | mg/kg | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.066 | mg/kg | |
| 98-82-8 | Isopropylbenzene | 2.24 | 0.33 | mg/kg | |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | 0.066 | mg/kg | |
| 95-63-6 | 1,2,4-Trimethylbenzene | 34.9 [a] | 3.3 | mg/kg | |
| 108-67-8 | 1,3,5-Trimethylbenzene | 9.72 | 0.33 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 91% | 88% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 85% | 86% | 70-122% |
| 2037-26-5 | Toluene-D8 | 159% [b] | 96% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 125% | 91% | 66-132% |

(a) Result is from Run# 2
(b) Outside control limits due to matrix interference.

ND = Not detected
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 LabLink@706732 12:17 09-Jan-2013

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-54_3' | | |
| **Lab Sample ID:** | JB22549-1 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8270D SW846 3550C | **Percent Solids:** | 79.1 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | M90250.D | 1 | 12/13/12 | OYA | 12/12/12 | OP61971 | EM3656 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 33.2 g | 1.0 ml |
| Run #2 | | |

**BN Special List**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 120-12-7 | Anthracene | 0.932 | 0.038 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 1.35 | 0.038 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 1.04 | 0.038 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 1.32 | 0.038 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.709 | 0.038 | mg/kg | |
| 218-01-9 | Chrysene | 1.43 | 0.038 | mg/kg | |
| 86-73-7 | Fluorene | 0.890 | 0.038 | mg/kg | |
| 85-01-8 | Phenanthrene | 2.73 | 0.038 | mg/kg | |
| 129-00-0 | Pyrene | 3.35 | 0.038 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 4165-60-0 | Nitrobenzene-d5 | 104% | | 21-122% |
| 321-60-8 | 2-Fluorobiphenyl | 79% | | 30-117% |
| 1718-51-0 | Terphenyl-d14 | 92% | | 31-129% |

ND = Not detected
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:** | BH-12-54_3' | | |
| **Lab Sample ID:** | JB22549-1 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| | | **Percent Solids:** | 79.1 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed | By | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead [a] | 190 | 4.9 | mg/kg | 2 | 12/08/12 | 12/13/12 | ND | SW846 6010C [1] | SW846 3050B [2] |

(1) Instrument QC Batch: MA30049
(2) Prep QC Batch: MP68389

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

Accutest LabLink@706732 12:17 09-Jan-2013

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-55_2.5' | | |
| **Lab Sample ID:** | JB22549-2 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8260B SW846 5035 | **Percent Solids:** | 82.9 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | A189674.D | 1 | 12/11/12 | OTR | 12/01/12 18:00 | n/a | VA7126 |
| Run #2 | | | | | | | |

| | Initial Weight |
|---|---|
| Run #1 | 5.7 g |
| Run #2 | |

**PA Leaded Gasoline and Aviation Gas list**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | ND | 0.0011 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.0011 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.0011 | mg/kg | |
| 1330-20-7 | Xylene (total) | ND | 0.0011 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.0053 | mg/kg | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.0011 | mg/kg | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.0011 | mg/kg | |
| 98-82-8 | Isopropylbenzene | ND | 0.0053 | mg/kg | |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | 0.0011 | mg/kg | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 0.0053 | mg/kg | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 0.0053 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 98% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 89% | | 70-122% |
| 2037-26-5 | Toluene-D8 | 101% | | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 98% | | 66-132% |

ND = Not detected
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





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-55_2.5' | | |
| **Lab Sample ID:** | JB22549-2 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8270D SW846 3550C | **Percent Solids:** | 82.9 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | M90276.D | 2 | 12/14/12 | OYA | 12/12/12 | OP61971 | EM3657 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 33.2 g | 1.0 ml |
| Run #2 | | |

**BN Special List**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 120-12-7 | Anthracene | 0.265 | 0.073 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.612 | 0.073 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.599 | 0.073 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.701 | 0.073 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.557 | 0.073 | mg/kg | |
| 218-01-9 | Chrysene | 0.718 | 0.073 | mg/kg | |
| 86-73-7 | Fluorene | 0.100 | 0.073 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.792 | 0.073 | mg/kg | |
| 129-00-0 | Pyrene | 0.928 | 0.073 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 4165-60-0 | Nitrobenzene-d5 | 61% | | 21-122% |
| 321-60-8 | 2-Fluorobiphenyl | 79% | | 30-117% |
| 1718-51-0 | Terphenyl-d14 | 92% | | 31-129% |

(a) Dilution required due to viscosity of extract matrix

ND = Not detected
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:** | BH-12-55_2.5' | | |
| **Lab Sample ID:** | JB22549-2 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| | | **Percent Solids:** | 82.9 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed | By | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 313 | 2.5 | mg/kg | 1 | 12/08/12 | 12/12/12 | GT | SW846 6010C [1] | SW846 3050B [2] |

(1) Instrument QC Batch: MA30027
(2) Prep QC Batch: MP68389

RL = Reporting Limit

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# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-55_1.5' | | |
| **Lab Sample ID:** | JB22549-3 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8260B SW846 5035 | **Percent Solids:** | 85.7 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | O131788.D | 1 | 12/08/12 | DPP | 12/01/12 18:00 | n/a | VO5810 |
| Run #2 | | | | | | | |

| | Initial Weight |
|---|---|
| Run #1 | 6.9 g |
| Run #2 | |

**PA Leaded Gasoline and Aviation Gas list**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | ND | 0.00085 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.00085 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.00085 | mg/kg | |
| 1330-20-7 | Xylene (total) | ND | 0.00085 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.0042 | mg/kg | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.00085 | mg/kg | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.00085 | mg/kg | |
| 98-82-8 | Isopropylbenzene | ND | 0.0042 | mg/kg | |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | 0.00085 | mg/kg | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 0.0042 | mg/kg | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 0.0042 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 91% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 93% | | 70-122% |
| 2037-26-5 | Toluene-D8 | 87% | | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 87% | | 66-132% |

ND = Not detected
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





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-55_1.5' | | |
| **Lab Sample ID:** | JB22549-3 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8270D SW846 3550C | **Percent Solids:** | 85.7 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | M90274.D | 1 | 12/14/12 | OYA | 12/12/12 | OP61971 | EM3657 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 31.8 g | 1.0 ml |
| Run #2 | | |

**BN Special List**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 120-12-7 | Anthracene | 0.0370 | 0.037 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.118 | 0.037 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.120 | 0.037 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.125 | 0.037 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.116 | 0.037 | mg/kg | |
| 218-01-9 | Chrysene | 0.124 | 0.037 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.037 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.0855 | 0.037 | mg/kg | |
| 129-00-0 | Pyrene | 0.185 | 0.037 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 4165-60-0 | Nitrobenzene-d5 | 58% | | 21-122% |
| 321-60-8 | 2-Fluorobiphenyl | 73% | | 30-117% |
| 1718-51-0 | Terphenyl-d14 | 81% | | 31-129% |

ND = Not detected
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:** | BH-12-55_1.5' | | |
| **Lab Sample ID:** | JB22549-3 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| | | **Percent Solids:** | 85.7 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed | By | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 112 | 2.2 | mg/kg | 1 | 12/08/12 | 12/12/12 | GT | SW846 6010C [1] | SW846 3050B [2] |

(1) Instrument QC Batch: MA30027
(2) Prep QC Batch: MP68389

RL = Reporting Limit

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# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-53_2.5' | | |
| **Lab Sample ID:** | JB22549-4 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8260B SW846 5035 | **Percent Solids:** | 82.9 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | E197689.D | 1 | 12/09/12 | OTR | 12/01/12 18:00 | n/a | VE8685 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume | Methanol Aliquot |
|---|---|---|---|
| Run #1 | 5.4 g | 5.0 ml | 100 ul |
| Run #2 | | | |

**PA Leaded Gasoline and Aviation Gas list**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | ND | 0.066 | mg/kg | |
| 108-88-3 | Toluene | 0.148 | 0.066 | mg/kg | |
| 100-41-4 | Ethylbenzene | 0.164 | 0.066 | mg/kg | |
| 1330-20-7 | Xylene (total) | 0.942 | 0.066 | mg/kg | |
| 91-20-3 | Naphthalene | 0.989 | 0.33 | mg/kg | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.066 | mg/kg | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.066 | mg/kg | |
| 98-82-8 | Isopropylbenzene | ND | 0.33 | mg/kg | |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | 0.066 | mg/kg | |
| 95-63-6 | 1,2,4-Trimethylbenzene | 1.86 | 0.33 | mg/kg | |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.474 | 0.33 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 92% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 91% | | 70-122% |
| 2037-26-5 | Toluene-D8 | 93% | | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 92% | | 66-132% |

(a) Dilution required due to matrix interference.

ND = Not detected
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





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-53_2.5' | | |
| **Lab Sample ID:** | JB22549-4 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8270D SW846 3550C | **Percent Solids:** | 82.9 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | M90277.D | 2 | 12/14/12 | OYA | 12/12/12 | OP61971 | EM3657 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 30.3 g | 1.0 ml |
| Run #2 | | |

**BN Special List**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 120-12-7 | Anthracene | 0.409 | 0.080 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.914 | 0.080 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.921 | 0.080 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.895 | 0.080 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.839 | 0.080 | mg/kg | |
| 218-01-9 | Chrysene | 1.31 | 0.080 | mg/kg | |
| 86-73-7 | Fluorene | 0.297 | 0.080 | mg/kg | |
| 85-01-8 | Phenanthrene | 1.25 | 0.080 | mg/kg | |
| 129-00-0 | Pyrene | 1.81 | 0.080 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 4165-60-0 | Nitrobenzene-d5 | 63% | | 21-122% |
| 321-60-8 | 2-Fluorobiphenyl | 69% | | 30-117% |
| 1718-51-0 | Terphenyl-d14 | 76% | | 31-129% |

(a) Dilution required due to viscosity of extract matrix

ND = Not detected
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:** | BH-12-53_2.5' | | |
| **Lab Sample ID:** | JB22549-4 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| | | **Percent Solids:** | 82.9 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed | By | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 510 | 2.3 | mg/kg | 1 | 12/08/12 | 12/12/12 | GT | SW846 6010C [1] | SW846 3050B [2] |

(1) Instrument QC Batch: MA30027
(2) Prep QC Batch: MP68389

RL = Reporting Limit

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# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-48_3' | | |
| **Lab Sample ID:** | JB22549-5 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8260B SW846 5035 | **Percent Solids:** | 74.1 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | O131789.D | 1 | 12/08/12 | DPP | 12/01/12 18:00 | n/a | VO5810 |
| Run #2 | | | | | | | |

| | Initial Weight |
|---|---|
| Run #1 | 5.4 g |
| Run #2 | |

**PA Leaded Gasoline and Aviation Gas list**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | ND | 0.0012 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.0012 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.0012 | mg/kg | |
| 1330-20-7 | Xylene (total) | ND | 0.0012 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.0062 | mg/kg | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.0012 | mg/kg | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.0012 | mg/kg | |
| 98-82-8 | Isopropylbenzene | ND | 0.0062 | mg/kg | |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | 0.0012 | mg/kg | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 0.0062 | mg/kg | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 0.0062 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 94% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98% | | 70-122% |
| 2037-26-5 | Toluene-D8 | 86% | | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 92% | | 66-132% |

ND = Not detected
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 LabLink@706732 12:17 09-Jan-2013

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-48_3' | | |
| **Lab Sample ID:** | JB22549-5 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8270D SW846 3550C | **Percent Solids:** | 74.1 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 [a] | M90278.D | 2 | 12/14/12 | OYA | 12/12/12 | OP61971 | EM3657 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 32.0 g | 1.0 ml |
| Run #2 | | |

**BN Special List**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 120-12-7 | Anthracene | 0.820 | 0.084 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.800 | 0.084 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 1.02 | 0.084 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.717 | 0.084 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 1.14 | 0.084 | mg/kg | |
| 218-01-9 | Chrysene | 1.60 | 0.084 | mg/kg | |
| 86-73-7 | Fluorene | 0.217 | 0.084 | mg/kg | |
| 85-01-8 | Phenanthrene | 1.25 | 0.084 | mg/kg | |
| 129-00-0 | Pyrene | 2.10 | 0.084 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 4165-60-0 | Nitrobenzene-d5 | 62% | | 21-122% |
| 321-60-8 | 2-Fluorobiphenyl | 63% | | 30-117% |
| 1718-51-0 | Terphenyl-d14 | 77% | | 31-129% |

(a) Dilution required due to viscosity of extract matrix

ND = Not detected
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:** | BH-12-48_3' | | |
| **Lab Sample ID:** | JB22549-5 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| | | **Percent Solids:** | 74.1 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed | By | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 1530 | 2.9 | mg/kg | 1 | 12/08/12 | 12/12/12 | GT | SW846 6010C [1] | SW846 3050B [2] |

(1) Instrument QC Batch: MA30027
(2) Prep QC Batch: MP68389

RL = Reporting Limit

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# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-49_2.5' | | |
| **Lab Sample ID:** | JB22549-6 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8260B SW846 5035 | **Percent Solids:** | 89.9 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | A189673.D | 1 | 12/11/12 | OTR | 12/01/12 18:00 | n/a | VA7126 |
| Run #2 | | | | | | | |

| | Initial Weight |
|---|---|
| Run #1 | 6.7 g |
| Run #2 | |

**PA Leaded Gasoline and Aviation Gas list**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | ND | 0.00083 | mg/kg | |
| 108-88-3 | Toluene | ND | 0.00083 | mg/kg | |
| 100-41-4 | Ethylbenzene | ND | 0.00083 | mg/kg | |
| 1330-20-7 | Xylene (total) | ND | 0.00083 | mg/kg | |
| 91-20-3 | Naphthalene | ND | 0.0042 | mg/kg | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.00083 | mg/kg | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.00083 | mg/kg | |
| 98-82-8 | Isopropylbenzene | ND | 0.0042 | mg/kg | |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | 0.00083 | mg/kg | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 0.0042 | mg/kg | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 0.0042 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 94% | | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 87% | | 70-122% |
| 2037-26-5 | Toluene-D8 | 100% | | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 100% | | 66-132% |

ND = Not detected
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 LabLink@706732 12:17 09-Jan-2013

# Report of Analysis





| | | | |
|---|---|---|---|
| **Client Sample ID:** | BH-12-49_2.5' | | |
| **Lab Sample ID:** | JB22549-6 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| **Method:** | SW846 8270D SW846 3550C | **Percent Solids:** | 89.9 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

| | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Run #1 | M90275.D | 1 | 12/14/12 | OYA | 12/12/12 | OP61971 | EM3657 |
| Run #2 | | | | | | | |

| | Initial Weight | Final Volume |
|---|---|---|
| Run #1 | 30.6 g | 1.0 ml |
| Run #2 | | |

**BN Special List**

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 120-12-7 | Anthracene | 0.0698 | 0.036 | mg/kg | |
| 56-55-3 | Benzo(a)anthracene | 0.260 | 0.036 | mg/kg | |
| 50-32-8 | Benzo(a)pyrene | 0.278 | 0.036 | mg/kg | |
| 205-99-2 | Benzo(b)fluoranthene | 0.263 | 0.036 | mg/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | 0.226 | 0.036 | mg/kg | |
| 218-01-9 | Chrysene | 0.305 | 0.036 | mg/kg | |
| 86-73-7 | Fluorene | ND | 0.036 | mg/kg | |
| 85-01-8 | Phenanthrene | 0.201 | 0.036 | mg/kg | |
| 129-00-0 | Pyrene | 0.410 | 0.036 | mg/kg | |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits |
|---|---|---|---|---|
| 4165-60-0 | Nitrobenzene-d5 | 58% | | 21-122% |
| 321-60-8 | 2-Fluorobiphenyl | 68% | | 30-117% |
| 1718-51-0 | Terphenyl-d14 | 92% | | 31-129% |

ND = Not detected
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:** | BH-12-49_2.5' | | |
| **Lab Sample ID:** | JB22549-6 | **Date Sampled:** | 11/30/12 |
| **Matrix:** | SO - Soil | **Date Received:** | 11/30/12 |
| | | **Percent Solids:** | 89.9 |
| **Project:** | Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA | | |

**Metals Analysis**

| Analyte | Result | RL | Units | DF | Prep | Analyzed | By | Method | Prep Method |
|---|---|---|---|---|---|---|---|---|---|
| Lead [a] | 107 | 4.3 | mg/kg | 2 | 12/08/12 | 12/13/12 | ND | SW846 6010C [1] | SW846 3050B [2] |

(1) Instrument QC Batch: MA30049
(2) Prep QC Batch: MP68389

(a) Elevated detection limit due to dilution required for high interfering element.

RL = Reporting Limit

New Jersey

ACCUTEST LABORATORIES



## Misc. Forms

# Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

ACCUTEST LABORATORIES SLL

# CHAIN OF CUSTODY

2235 Route 130, Dayton, NJ 08810
Tel: 732-329-0200 FAX: 732-329-3499/3480
www.accutest.com

PAGE 1 OF 1

FED-EX Tracking #: 
Bottle Order Control #: 
Accutest Quote #: 
Accutest Job #: JB22549

**Client / Reporting Information**

Company Name: Aquaterra Technologies Inc
Street Address: 122 So Church Street
City: West Chester State: PA Zip: 19382
Project Contact: Tiffany Durso E-mail: TD@Aquaterra-Tech.com
Phone #: 484 889 7347 Fax #:
Sampler(s) Name(s): Luke Mokrycki Phone #: 484 832 7476

**Project Information**

Project Name: PH Refinery AOI-7 Soil Samples
Street:
City: Philadelphia State: PA
Project #: AOI-7
Client Purchase Order #:
Project Manager: Jim Oppenheim

Billing Information ( if different from Report to)
Company Name:
Street Address:
City State Zip:
Attention:

**Requested Analysis ( see TEST CODE sheet)**

**Matrix Codes**

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

| Accutest Sample # | Field ID / Point of Collection | MEOH/DI Vial # | Collection Date | Collection Time | Sampled by | Matrix | # of bottles | HCl | NaOH | HNO3 | H2SO4 | NONE | DI Water | MEOH | ENCORE | LEAD | VOLATILE ORGANIC COMPOUNDS: 8260B | 1,2 Dichloroethane, 1,2,4 Trimethylbenzene, 1,3,5 Trimethylbenzene, Benzene, Chloroform, Ethylbenzene, Ethylene Dibromide, methyl tertiary butyl ether, Toluene, Xylenes (total) | SEMI VOLATILE ORGANIC COMPOUNDS 8270C: Anthracene, Benzo(A) anthracene, Benzo (ghi) perylene, Benzo (a) pyrene, Benzo (b) fluoranthene, Chrysene, Fluorene, Naphthalene, Phenanthrene, Pyrene | | | | LAB USE ONLY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -1 | BH-12-54_3' | 3 | 11/30/12 | 0800 | LM | SO | 4 | | | | | 1 | | | 3 | | | | | | | | |
| -2 | BH-12-55_2.5' | | | 0830 | | | | | | | | 1 | | | 3 | | | | | | | | 0918 |
| -3 | BH-12-55_1.5' | | | 0900 | | | | | | | | 1 | | | 3 | | | | | | | | 1425 |
| -4 | BH-12-53_2.5' | | | 1140 | | | | | | | | 1 | | | 3 | | | | | | | | 1303 |
| -5 | BH-12-48_3' | | | 1230 | | | | | | | | 1 | | | 3 | | | | | | | | |
| -6 | BH-12-49_2.5' | 5 | | 1300 | | | | | | | | 1 | | | 3 | | | | | | | | |

**Turnaround Time ( Business days)**

- [x] Std. 15 Business Days
- [ ] Std. 10 Business Days ( by Contract only)
- [ ] 10 Day *RUSH*
- [ ] 5 Day *RUSH*
- [ ] 3 Day *EMERGENCY*
- [ ] 2 Day *EMERGENCY*
- [ ] 1 Day *EMERGENCY*

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Rec'd at Exton Service Center 11/30

**Data Deliverable Information**

- [ ] Commercial "A" (Level 1)
- [x] Commercial "B" ( Level 2)
- [ ] FULLT1 ( Level 3+4 )
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

**Comments / Special Instructions**

3 ENCORES @ 11/30/12

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

| Relinquished by Sampler: | Date Time: | Received By: | Relinquished By: | Date Time: | Received By: |
|---|---|---|---|---|---|
| 1 Luke Mokrycki | 11/30/12 1530 | 1 Aquaterra Sample Holding Fridge | 2 ~~[illegible]~~ | 11/30/12 1630 | 2 |
| Relinquished by Sampler: 3 | Date Time: 11/30/12 1900 | Received By: 3 | Relinquished By: 4 | Date Time: | Received By: 4 |
| Relinquished By: 5 | Date Time: | Received By: 5 | Custody Seal # | [ ] Intact [ ] Not intact | Preserved where applicable [ ] On Ice [x] Cooler Temp. 4.2°C |

7 Bs

5.1 5

**JB22549: Chain of Custody**
**Page 1 of 3**

# Accutest Laboratories Sample Receipt Summary

**Accutest Job Number:** JB22549 **Client:** **Project:**

**Date / Time Received:** 11/30/2012 **Delivery Method:** **Airbill #'s:**

**Cooler Temps (Initial/Adjusted):** #1: (4.2/4.2); 0

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

| Cooler Temperature | Y | N |
|---|---|---|
| 1. Temp criteria achieved: | ☑ | ☐ |
| 2. Cooler temp verification: | | |
| 3. Cooler media: | Ice (Bag) | |
| 4. No. Coolers: | 1 | |

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

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

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

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

Comments

Accutest Laboratories
V:732.329.0200
2235 US Highway 130
F: 732.329.3499
Dayton, New Jersey
www/accutest.com



**JB22549: Chain of Custody**
**Page 2 of 3**

## Job Change Order: JB22549_12/12/2012

| | | | |
|---|---|---|---|
| **Requested Date:** | 12/12/2012 | **Received Date:** | 11/30/2012 |
| **Account Name:** | Aquaterra Technologies, Inc. | **Due Date:** | 12/14/2012 |
| **Project** | Sun-Philadelphia Refinery, 3144 Passyunk | **Deliverable:** | COMMB |
| **CSR:** | KB | **TAT (Days):** | 2 |

**Sample #:**
JB22549-ALL

**Change:** Please upgrade deliverable to REDT2

**Above Changes Per:** Client / Kristen Ward

**Date:** 12/12/2012

To Client: This Change Order is confirmation of the revisions, previously discussed with the Accutest Client Service

Page 1 of 1

# Internal Sample Tracking Chronicle

Aquaterra Technologies, Inc.

**Job No:** JB22549

Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
Project No: AOI-7



| Sample Number | Method | Analyzed | By | Prepped | By | Test Codes |
|---|---|---|---|---|---|---|
| JB22549-1 Collected: 30-NOV-12 08:00 By: LM Received: 30-NOV-12 By: TH BH-12-54_3' | | | | | | |
| JB22549-1 | SW846 8260B | 09-DEC-12 05:10 | OTR | | | V8260PALGTMB |
| JB22549-1 | SW846 8260B | 10-DEC-12 14:57 | OTR | | | V8260PALGTMB |
| JB22549-1 | ASTM 4643-00 | 13-DEC-12 | KP | | | %SOL |
| JB22549-1 | SW846 6010C | 13-DEC-12 17:06 | ND | 08-DEC-12 | NS | PB |
| JB22549-1 | SW846 8270D | 13-DEC-12 20:06 | OYA | 12-DEC-12 | MP | B8270PALO |
| JB22549-2 Collected: 30-NOV-12 08:30 By: LM Received: 30-NOV-12 By: TH BH-12-55_2.5' | | | | | | |
| JB22549-2 | SW846 8260B | 11-DEC-12 07:50 | OTR | | | V8260PALGTMB |
| JB22549-2 | SW846 6010C | 12-DEC-12 00:36 | GT | 08-DEC-12 | NS | PB |
| JB22549-2 | ASTM 4643-00 | 13-DEC-12 | KP | | | %SOL |
| JB22549-2 | SW846 8270D | 14-DEC-12 19:36 | OYA | 12-DEC-12 | MP | B8270PALO |
| JB22549-3 Collected: 30-NOV-12 09:00 By: LM Received: 30-NOV-12 By: TH BH-12-55_1.5' | | | | | | |
| JB22549-3 | SW846 8260B | 08-DEC-12 18:04 | DPP | | | V8260PALGTMB |
| JB22549-3 | SW846 6010C | 12-DEC-12 00:42 | GT | 08-DEC-12 | NS | PB |
| JB22549-3 | ASTM 4643-00 | 13-DEC-12 | KP | | | %SOL |
| JB22549-3 | SW846 8270D | 14-DEC-12 18:37 | OYA | 12-DEC-12 | MP | B8270PALO |
| JB22549-4 Collected: 30-NOV-12 11:40 By: LM Received: 30-NOV-12 By: TH BH-12-53_2.5' | | | | | | |
| JB22549-4 | SW846 8260B | 09-DEC-12 06:11 | OTR | | | V8260PALGTMB |
| JB22549-4 | SW846 6010C | 12-DEC-12 00:49 | GT | 08-DEC-12 | NS | PB |
| JB22549-4 | ASTM 4643-00 | 13-DEC-12 | KP | | | %SOL |
| JB22549-4 | SW846 8270D | 14-DEC-12 20:05 | OYA | 12-DEC-12 | MP | B8270PALO |
| JB22549-5 Collected: 30-NOV-12 12:30 By: LM Received: 30-NOV-12 By: TH BH-12-48_3' | | | | | | |
| JB22549-5 | SW846 8260B | 08-DEC-12 18:34 | DPP | | | V8260PALGTMB |
| JB22549-5 | SW846 6010C | 12-DEC-12 00:55 | GT | 08-DEC-12 | NS | PB |
| JB22549-5 | ASTM 4643-00 | 13-DEC-12 | KP | | | %SOL |
| JB22549-5 | SW846 8270D | 14-DEC-12 20:35 | OYA | 12-DEC-12 | MP | B8270PALO |

# Internal Sample Tracking Chronicle

Aquaterra Technologies, Inc.

**Job No:** JB22549

Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
Project No: AOI-7



| Sample Number | Method | Analyzed | By | Prepped | By | Test Codes |
|---|---|---|---|---|---|---|
| JB22549-6 BH-12-49_2.5' | Collected: 30-NOV-12 13:00 By: LM | | Received: 30-NOV-12 By: TH | | | |
| JB22549-6 | SW846 8260B | 11-DEC-12 07:06 | OTR | | | V8260PALGTMB |
| JB22549-6 | ASTM 4643-00 | 13-DEC-12 | KP | | | %SOL |
| JB22549-6 | SW846 6010C | 13-DEC-12 17:12 | ND | 08-DEC-12 | NS | PB |
| JB22549-6 | SW846 8270D | 14-DEC-12 19:06 | OYA | 12-DEC-12 | MP | B8270PALO |

# Accutest Internal Chain of Custody



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
**Received:** 11/30/12

| Sample.Bottle Number | Transfer FROM | Transfer TO | Date/Time | Reason |
|---|---|---|---|---|
| JB22549-1.1 | Secured Storage | Adam Scott | 12/08/12 06:40 | Retrieve from Storage |
| JB22549-1.1 | Adam Scott | Secured Staging Area | 12/08/12 06:41 | Return to Storage |
| JB22549-1.1 | Secured Staging Area | Rinku Patel | 12/08/12 08:18 | Retrieve from Storage |
| JB22549-1.1 | Rinku Patel | Nida Saleem | 12/08/12 08:18 | Custody Transfer |
| JB22549-1.1 | Nida Saleem | Secured Storage | 12/08/12 11:20 | Return to Storage |
| JB22549-1.1 | Secured Storage | Patrick Fringer | 12/12/12 10:04 | Retrieve from Storage |
| JB22549-1.1 | Patrick Fringer | Secured Storage | 12/12/12 13:12 | Return to Storage |
| JB22549-1.1 | Secured Storage | Max Ponce | 12/12/12 15:05 | Retrieve from Storage |
| JB22549-1.1 | Max Ponce | Secured Storage | 12/13/12 00:26 | Return to Storage |
| JB22549-1.1 | Secured Storage | Alfredo Crespo | 12/13/12 10:21 | Retrieve from Storage |
| JB22549-1.1 | Alfredo Crespo | Krimesh Patel | 12/13/12 10:25 | Custody Transfer |
| JB22549-1.1 | Krimesh Patel | Secured Storage | 12/13/12 16:41 | Return to Storage |
| JB22549-1.1 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-1.1.1 | Nida Saleem | Metals Digestion | 12/08/12 11:19 | Digestate from JB22549-1.1 |
| JB22549-1.1.1 | Nida Saleem | Metals Digestate Storage | 12/08/12 11:21 | Return to Storage |
| JB22549-1.1.1 | Metals Digestion | Nida Saleem | 12/08/12 11:21 | Digestate from JB22549-1.1 |
| JB22549-1.1.2 | Max Ponce | Organics Prep | 12/12/12 15:10 | Extract from JB22549-1.1 |
| JB22549-1.1.2 | Organics Prep | Max Ponce | 12/13/12 00:24 | Extract from JB22549-1.1 |
| JB22549-1.1.2 | Max Ponce | Extract Storage | 12/13/12 00:24 | Return to Storage |
| JB22549-1.1.2 | Extract Storage | Olga Azarihn | 12/13/12 16:54 | Retrieve from Storage |
| JB22549-1.1.2 | Olga Azarihn | GCMSM | 12/13/12 16:54 | Load on Instrument |
| JB22549-1.1.2 | GCMSM | Olga Azarihn | 12/14/12 10:18 | Unload from Instrument |
| JB22549-1.1.2 | Olga Azarihn | Extract Freezer | 12/14/12 10:18 | Return to Storage |
| JB22549-1.3 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-1.3 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-1.3 | Secured Storage | Dipa Patel | 12/07/12 09:56 | Retrieve from Storage |
| JB22549-1.3 | Dipa Patel | Secured Storage | 12/07/12 18:26 | Return to Storage |
| JB22549-1.3 | Secured Storage | Oksana Treglazova | 12/10/12 15:03 | Retrieve from Storage |
| JB22549-1.3 | Oksana Treglazova | Secured Storage | 12/10/12 15:03 | Return to Storage |
| JB22549-1.3 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-1.4 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-1.4 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-1.4 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-1.5 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-1.5 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-1.5 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-2.1 | Secured Storage | Adam Scott | 12/08/12 06:40 | Retrieve from Storage |
| JB22549-2.1 | Adam Scott | Secured Staging Area | 12/08/12 06:41 | Return to Storage |

# Accutest Internal Chain of Custody



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
**Received:** 11/30/12

| Sample.Bottle Number | Transfer FROM | Transfer TO | Date/Time | Reason |
|---|---|---|---|---|
| JB22549-2.1 | Secured Staging Area | Rinku Patel | 12/08/12 08:18 | Retrieve from Storage |
| JB22549-2.1 | Rinku Patel | Nida Saleem | 12/08/12 08:18 | Custody Transfer |
| JB22549-2.1 | Nida Saleem | Secured Storage | 12/08/12 11:20 | Return to Storage |
| JB22549-2.1 | Secured Storage | Patrick Fringer | 12/12/12 10:04 | Retrieve from Storage |
| JB22549-2.1 | Patrick Fringer | Secured Storage | 12/12/12 13:12 | Return to Storage |
| JB22549-2.1 | Secured Storage | Max Ponce | 12/12/12 15:05 | Retrieve from Storage |
| JB22549-2.1 | Max Ponce | Secured Storage | 12/13/12 00:26 | Return to Storage |
| JB22549-2.1 | Secured Storage | Alfredo Crespo | 12/13/12 10:21 | Retrieve from Storage |
| JB22549-2.1 | Alfredo Crespo | Krimesh Patel | 12/13/12 10:25 | Custody Transfer |
| JB22549-2.1 | Krimesh Patel | Secured Storage | 12/13/12 16:41 | Return to Storage |
| JB22549-2.1 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-2.1.1 | Nida Saleem | Metals Digestion | 12/08/12 11:19 | Digestate from JB22549-2.1 |
| JB22549-2.1.1 | Nida Saleem | Metals Digestate Storage | 12/08/12 11:21 | Return to Storage |
| JB22549-2.1.1 | Metals Digestion | Nida Saleem | 12/08/12 11:21 | Digestate from JB22549-2.1 |
| JB22549-2.1.2 | Max Ponce | Organics Prep | 12/12/12 15:10 | Extract from JB22549-2.1 |
| JB22549-2.1.2 | Organics Prep | Max Ponce | 12/13/12 00:24 | Extract from JB22549-2.1 |
| JB22549-2.1.2 | Max Ponce | Extract Storage | 12/13/12 00:24 | Return to Storage |
| JB22549-2.1.2 | Extract Storage | Olga Azarihn | 12/14/12 13:15 | Retrieve from Storage |
| JB22549-2.1.2 | Olga Azarihn | GCMSM | 12/14/12 13:15 | Load on Instrument |
| JB22549-2.1.2 | GCMSM | Kristi Schollenberger | 12/15/12 13:33 | Unload from Instrument |
| JB22549-2.1.2 | Kristi Schollenberger | Extract Freezer | 12/15/12 13:33 | Return to Storage |
| JB22549-2.3 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-2.3 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-2.3 | Secured Storage | Dipa Patel | 12/07/12 09:56 | Retrieve from Storage |
| JB22549-2.3 | Dipa Patel | Secured Storage | 12/07/12 18:26 | Return to Storage |
| JB22549-2.3 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-2.4 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-2.4 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-2.4 | Secured Storage | Oksana Treglazova | 12/10/12 15:41 | Retrieve from Storage |
| JB22549-2.4 | Oksana Treglazova | GCMSA | 12/10/12 15:41 | Load on Instrument |
| JB22549-2.4 | GCMSA | Oksana Treglazova | 12/11/12 11:24 | Unload from Instrument |
| JB22549-2.4 | Oksana Treglazova | Secured Storage | 12/11/12 11:24 | Return to Storage |
| JB22549-2.4 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-2.5 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-2.5 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-2.5 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-3.1 | Secured Storage | Adam Scott | 12/08/12 06:40 | Retrieve from Storage |
| JB22549-3.1 | Adam Scott | Secured Staging Area | 12/08/12 06:41 | Return to Storage |

# Accutest Internal Chain of Custody



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
**Received:** 11/30/12

| Sample.Bottle Number | Transfer FROM | Transfer TO | Date/Time | Reason |
|---|---|---|---|---|
| JB22549-3.1 | Secured Staging Area | Rinku Patel | 12/08/12 08:18 | Retrieve from Storage |
| JB22549-3.1 | Rinku Patel | Nida Saleem | 12/08/12 08:18 | Custody Transfer |
| JB22549-3.1 | Nida Saleem | Secured Storage | 12/08/12 11:20 | Return to Storage |
| JB22549-3.1 | Secured Storage | Patrick Fringer | 12/12/12 10:04 | Retrieve from Storage |
| JB22549-3.1 | Patrick Fringer | Secured Storage | 12/12/12 13:12 | Return to Storage |
| JB22549-3.1 | Secured Storage | Max Ponce | 12/12/12 15:05 | Retrieve from Storage |
| JB22549-3.1 | Max Ponce | Secured Storage | 12/13/12 00:26 | Return to Storage |
| JB22549-3.1 | Secured Storage | Alfredo Crespo | 12/13/12 10:21 | Retrieve from Storage |
| JB22549-3.1 | Alfredo Crespo | Krimesh Patel | 12/13/12 10:25 | Custody Transfer |
| JB22549-3.1 | Krimesh Patel | Secured Storage | 12/13/12 16:41 | Return to Storage |
| JB22549-3.1 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-3.1.1 | Nida Saleem | Metals Digestion | 12/08/12 11:19 | Digestate from JB22549-3.1 |
| JB22549-3.1.1 | Nida Saleem | Metals Digestate Storage | 12/08/12 11:21 | Return to Storage |
| JB22549-3.1.1 | Metals Digestion | Nida Saleem | 12/08/12 11:21 | Digestate from JB22549-3.1 |
| JB22549-3.1.2 | Max Ponce | Organics Prep | 12/12/12 15:10 | Extract from JB22549-3.1 |
| JB22549-3.1.2 | Organics Prep | Max Ponce | 12/13/12 00:24 | Extract from JB22549-3.1 |
| JB22549-3.1.2 | Max Ponce | Extract Storage | 12/13/12 00:24 | Return to Storage |
| JB22549-3.1.2 | Extract Storage | Olga Azarihn | 12/14/12 13:15 | Retrieve from Storage |
| JB22549-3.1.2 | Olga Azarihn | GCMSM | 12/14/12 13:15 | Load on Instrument |
| JB22549-3.1.2 | GCMSM | Kristi Schollenberger | 12/15/12 13:33 | Unload from Instrument |
| JB22549-3.1.2 | Kristi Schollenberger | Extract Freezer | 12/15/12 13:33 | Return to Storage |
| JB22549-3.3 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-3.3 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-3.3 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-3.4 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-3.4 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-3.4 | Secured Storage | Dipa Patel | 12/07/12 16:31 | Retrieve from Storage |
| JB22549-3.4 | Dipa Patel | GCMSO | 12/07/12 16:31 | Load on Instrument |
| JB22549-3.4 | GCMSO | Dipa Patel | 12/10/12 11:16 | Unload from Instrument |
| JB22549-3.4 | Dipa Patel | | 12/10/12 11:16 | Depleted |
| JB22549-3.5 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-3.5 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-3.5 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-4.1 | Secured Storage | Adam Scott | 12/08/12 06:40 | Retrieve from Storage |
| JB22549-4.1 | Adam Scott | Secured Staging Area | 12/08/12 06:41 | Return to Storage |
| JB22549-4.1 | Secured Staging Area | Rinku Patel | 12/08/12 08:18 | Retrieve from Storage |
| JB22549-4.1 | Rinku Patel | Nida Saleem | 12/08/12 08:18 | Custody Transfer |
| JB22549-4.1 | Nida Saleem | Secured Storage | 12/08/12 11:20 | Return to Storage |

# Accutest Internal Chain of Custody



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
**Received:** 11/30/12

| Sample.Bottle Number | Transfer FROM | Transfer TO | Date/Time | Reason |
|---|---|---|---|---|
| JB22549-4.1 | Secured Storage | Patrick Fringer | 12/12/12 10:04 | Retrieve from Storage |
| JB22549-4.1 | Patrick Fringer | Secured Storage | 12/12/12 13:12 | Return to Storage |
| JB22549-4.1 | Secured Storage | Max Ponce | 12/12/12 15:05 | Retrieve from Storage |
| JB22549-4.1 | Max Ponce | Secured Storage | 12/13/12 00:26 | Return to Storage |
| JB22549-4.1 | Secured Storage | Alfredo Crespo | 12/13/12 10:21 | Retrieve from Storage |
| JB22549-4.1 | Alfredo Crespo | Krimesh Patel | 12/13/12 10:25 | Custody Transfer |
| JB22549-4.1 | Krimesh Patel | Secured Storage | 12/13/12 16:41 | Return to Storage |
| JB22549-4.1 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-4.1.1 | Nida Saleem | Metals Digestion | 12/08/12 11:19 | Digestate from JB22549-4.1 |
| JB22549-4.1.1 | Nida Saleem | Metals Digestate Storage | 12/08/12 11:21 | Return to Storage |
| JB22549-4.1.1 | Metals Digestion | Nida Saleem | 12/08/12 11:21 | Digestate from JB22549-4.1 |
| JB22549-4.1.2 | Max Ponce | Organics Prep | 12/12/12 15:10 | Extract from JB22549-4.1 |
| JB22549-4.1.2 | Organics Prep | Max Ponce | 12/13/12 00:24 | Extract from JB22549-4.1 |
| JB22549-4.1.2 | Max Ponce | Extract Storage | 12/13/12 00:24 | Return to Storage |
| JB22549-4.1.2 | Extract Storage | Olga Azarihn | 12/14/12 13:15 | Retrieve from Storage |
| JB22549-4.1.2 | Olga Azarihn | GCMSM | 12/14/12 13:15 | Load on Instrument |
| JB22549-4.1.2 | GCMSM | Kristi Schollenberger | 12/15/12 13:33 | Unload from Instrument |
| JB22549-4.1.2 | Kristi Schollenberger | Extract Freezer | 12/15/12 13:33 | Return to Storage |
| JB22549-4.3 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-4.3 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-4.3 | Secured Storage | Dipa Patel | 12/07/12 09:56 | Retrieve from Storage |
| JB22549-4.3 | Dipa Patel | Secured Storage | 12/07/12 18:26 | Return to Storage |
| JB22549-4.3 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-4.4 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-4.4 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-4.4 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-4.5 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-4.5 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-4.5 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-5.1 | Secured Storage | Adam Scott | 12/08/12 06:40 | Retrieve from Storage |
| JB22549-5.1 | Adam Scott | Secured Staging Area | 12/08/12 06:41 | Return to Storage |
| JB22549-5.1 | Secured Staging Area | Rinku Patel | 12/08/12 08:18 | Retrieve from Storage |
| JB22549-5.1 | Rinku Patel | Nida Saleem | 12/08/12 08:18 | Custody Transfer |
| JB22549-5.1 | Nida Saleem | Secured Storage | 12/08/12 11:20 | Return to Storage |
| JB22549-5.1 | Secured Storage | Patrick Fringer | 12/12/12 10:04 | Retrieve from Storage |
| JB22549-5.1 | Patrick Fringer | Secured Storage | 12/12/12 13:12 | Return to Storage |
| JB22549-5.1 | Secured Storage | Max Ponce | 12/12/12 15:05 | Retrieve from Storage |
| JB22549-5.1 | Max Ponce | Secured Storage | 12/13/12 00:26 | Return to Storage |

# Accutest Internal Chain of Custody



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
**Received:** 11/30/12

| Sample.Bottle Number | Transfer FROM | Transfer TO | Date/Time | Reason |
|---|---|---|---|---|
| JB22549-5.1 | Secured Storage | Alfredo Crespo | 12/13/12 10:21 | Retrieve from Storage |
| JB22549-5.1 | Alfredo Crespo | Krimesh Patel | 12/13/12 10:25 | Custody Transfer |
| JB22549-5.1 | Krimesh Patel | Secured Storage | 12/13/12 16:41 | Return to Storage |
| JB22549-5.1 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-5.1.1 | Nida Saleem | Metals Digestion | 12/08/12 11:19 | Digestate from JB22549-5.1 |
| JB22549-5.1.1 | Nida Saleem | Metals Digestate Storage | 12/08/12 11:21 | Return to Storage |
| JB22549-5.1.1 | Metals Digestion | Nida Saleem | 12/08/12 11:21 | Digestate from JB22549-5.1 |
| JB22549-5.1.2 | Max Ponce | Organics Prep | 12/12/12 15:10 | Extract from JB22549-5.1 |
| JB22549-5.1.2 | Organics Prep | Max Ponce | 12/13/12 00:24 | Extract from JB22549-5.1 |
| JB22549-5.1.2 | Max Ponce | Extract Storage | 12/13/12 00:24 | Return to Storage |
| JB22549-5.1.2 | Extract Storage | Olga Azarihn | 12/14/12 13:15 | Retrieve from Storage |
| JB22549-5.1.2 | Olga Azarihn | GCMSM | 12/14/12 13:15 | Load on Instrument |
| JB22549-5.1.2 | GCMSM | Kristi Schollenberger | 12/15/12 13:33 | Unload from Instrument |
| JB22549-5.1.2 | Kristi Schollenberger | Extract Freezer | 12/15/12 13:33 | Return to Storage |
| JB22549-5.3 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-5.3 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-5.3 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-5.4 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-5.4 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-5.4 | Secured Storage | Dipa Patel | 12/07/12 16:31 | Retrieve from Storage |
| JB22549-5.4 | Dipa Patel | GCMSO | 12/07/12 16:31 | Load on Instrument |
| JB22549-5.4 | GCMSO | Dipa Patel | 12/10/12 11:16 | Unload from Instrument |
| JB22549-5.4 | Dipa Patel | | 12/10/12 11:16 | Depleted |
| JB22549-5.5 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-5.5 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-5.5 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-6.1 | Secured Storage | Adam Scott | 12/08/12 06:40 | Retrieve from Storage |
| JB22549-6.1 | Adam Scott | Secured Staging Area | 12/08/12 06:41 | Return to Storage |
| JB22549-6.1 | Secured Staging Area | Rinku Patel | 12/08/12 08:18 | Retrieve from Storage |
| JB22549-6.1 | Rinku Patel | Nida Saleem | 12/08/12 08:18 | Custody Transfer |
| JB22549-6.1 | Nida Saleem | Secured Storage | 12/08/12 11:20 | Return to Storage |
| JB22549-6.1 | Secured Storage | Patrick Fringer | 12/12/12 10:04 | Retrieve from Storage |
| JB22549-6.1 | Patrick Fringer | Secured Storage | 12/12/12 13:12 | Return to Storage |
| JB22549-6.1 | Secured Storage | Max Ponce | 12/12/12 15:05 | Retrieve from Storage |
| JB22549-6.1 | Max Ponce | Secured Storage | 12/13/12 00:26 | Return to Storage |
| JB22549-6.1 | Secured Storage | Alfredo Crespo | 12/13/12 10:21 | Retrieve from Storage |
| JB22549-6.1 | Alfredo Crespo | Krimesh Patel | 12/13/12 10:25 | Custody Transfer |
| JB22549-6.1 | Krimesh Patel | Secured Storage | 12/13/12 16:41 | Return to Storage |

# Accutest Internal Chain of Custody



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA
**Received:** 11/30/12

| Sample.Bottle Number | Transfer FROM | Transfer TO | Date/Time | Reason |
|---|---|---|---|---|
| JB22549-6.1 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-6.1.1 | Nida Saleem | Metals Digestion | 12/08/12 11:19 | Digestate from JB22549-6.1 |
| JB22549-6.1.1 | Nida Saleem | Metals Digestate Storage | 12/08/12 11:21 | Return to Storage |
| JB22549-6.1.1 | Metals Digestion | Nida Saleem | 12/08/12 11:21 | Digestate from JB22549-6.1 |
| JB22549-6.1.2 | Max Ponce | Organics Prep | 12/12/12 15:10 | Extract from JB22549-6.1 |
| JB22549-6.1.2 | Organics Prep | Max Ponce | 12/13/12 00:24 | Extract from JB22549-6.1 |
| JB22549-6.1.2 | Max Ponce | Extract Storage | 12/13/12 00:24 | Return to Storage |
| JB22549-6.1.2 | Extract Storage | Olga Azarihn | 12/14/12 13:15 | Retrieve from Storage |
| JB22549-6.1.2 | Olga Azarihn | GCMSM | 12/14/12 13:15 | Load on Instrument |
| JB22549-6.1.2 | GCMSM | Kristi Schollenberger | 12/15/12 13:33 | Unload from Instrument |
| JB22549-6.1.2 | Kristi Schollenberger | Extract Freezer | 12/15/12 13:33 | Return to Storage |
| JB22549-6.3 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-6.3 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-6.3 | Secured Storage | Dipa Patel | 12/07/12 09:56 | Retrieve from Storage |
| JB22549-6.3 | Dipa Patel | Secured Storage | 12/07/12 18:26 | Return to Storage |
| JB22549-6.3 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-6.4 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-6.4 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-6.4 | Secured Storage | Oksana Treglazova | 12/10/12 15:41 | Retrieve from Storage |
| JB22549-6.4 | Oksana Treglazova | GCMSA | 12/10/12 15:41 | Load on Instrument |
| JB22549-6.4 | GCMSA | Oksana Treglazova | 12/11/12 11:24 | Unload from Instrument |
| JB22549-6.4 | Oksana Treglazova | Secured Storage | 12/11/12 11:24 | Return to Storage |
| JB22549-6.4 | Dave Hunkele | | 01/07/13 05:18 | Disposed |
| JB22549-6.5 | Secured Storage | Frank Zhu | 12/01/12 17:26 | Retrieve from Storage |
| JB22549-6.5 | Frank Zhu | Secured Storage | 12/01/12 17:26 | Return to Storage |
| JB22549-6.5 | Dave Hunkele | | 01/07/13 05:18 | Disposed |

New Jersey
ACCUTEST LABORATORIES



# GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (BFB)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

# Method Blank Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VO5810-MB1 | O131780.D | 1 | 12/08/12 | DPP | n/a | n/a | VO5810 |

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

JB22549-3, JB22549-5

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | ND | 1.0 | ug/kg | |
| 106-93-4 | 1,2-Dibromoethane | ND | 1.0 | ug/kg | |
| 107-06-2 | 1,2-Dichloroethane | ND | 1.0 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 1.0 | ug/kg | |
| 98-82-8 | Isopropylbenzene | ND | 5.0 | ug/kg | |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | 1.0 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 5.0 | ug/kg | |
| 108-88-3 | Toluene | ND | 1.0 | ug/kg | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 5.0 | ug/kg | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 5.0 | ug/kg | |
| 1330-20-7 | Xylene (total) | ND | 1.0 | ug/kg | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 90% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 92% | 70-122% |
| 2037-26-5 | Toluene-D8 | 87% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 85% | 66-132% |

# Method Blank Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VE8685-MB | E197676.D | 1 | 12/08/12 | OTR | n/a | n/a | VE8685 |

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

JB22549-1, JB22549-4

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | ND | 50 | ug/kg | |
| 106-93-4 | 1,2-Dibromoethane | ND | 50 | ug/kg | |
| 107-06-2 | 1,2-Dichloroethane | ND | 50 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 50 | ug/kg | |
| 98-82-8 | Isopropylbenzene | ND | 250 | ug/kg | |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | 50 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 250 | ug/kg | |
| 108-88-3 | Toluene | ND | 50 | ug/kg | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 250 | ug/kg | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 250 | ug/kg | |
| 1330-20-7 | Xylene (total) | ND | 50 | ug/kg | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 94% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% | 70-122% |
| 2037-26-5 | Toluene-D8 | 93% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 97% | 66-132% |

| CAS No. | Tentatively Identified Compounds | R.T. | Est. Conc. | Units | Q |
|---|---|---|---|---|---|
| | Total TIC, Volatile | | 0 | ug/kg | |

# Method Blank Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VE8686-MB | E197701.D | 1 | 12/10/12 | OTR | n/a | n/a | VE8686 |

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

JB22549-1

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 250 | ug/kg | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 88% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 90% | 70-122% |
| 2037-26-5 | Toluene-D8 | 92% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 87% | 66-132% |

| CAS No. | Tentatively Identified Compounds | R.T. | Est. Conc. | Units | Q |
|---|---|---|---|---|---|
| | Total TIC, Volatile | | 0 | ug/kg | |

# Method Blank Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VA7126-MB | A189659.D | 1 | 12/10/12 | OTR | n/a | n/a | VA7126 |

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

JB22549-2, JB22549-6

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | ND | 1.0 | ug/kg | |
| 106-93-4 | 1,2-Dibromoethane | ND | 1.0 | ug/kg | |
| 107-06-2 | 1,2-Dichloroethane | ND | 1.0 | ug/kg | |
| 100-41-4 | Ethylbenzene | ND | 1.0 | ug/kg | |
| 98-82-8 | Isopropylbenzene | ND | 5.0 | ug/kg | |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | 1.0 | ug/kg | |
| 91-20-3 | Naphthalene | ND | 5.0 | ug/kg | |
| 108-88-3 | Toluene | ND | 1.0 | ug/kg | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 5.0 | ug/kg | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 5.0 | ug/kg | |
| 1330-20-7 | Xylene (total) | ND | 1.0 | ug/kg | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 95% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% | 70-122% |
| 2037-26-5 | Toluene-D8 | 99% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 98% | 66-132% |

| CAS No. | Tentatively Identified Compounds | R.T. | Est. Conc. | Units | Q |
|---|---|---|---|---|---|
| | Total TIC, Volatile | | 0 | ug/kg | |

# Blank Spike Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VO5810-BS | O131781.D | 1 | 12/08/12 | DPP | n/a | n/a | VO5810 |

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

JB22549-3, JB22549-5

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | 50 | 45.4 | 91 | 76-117 |
| 106-93-4 | 1,2-Dibromoethane | 50 | 47.4 | 95 | 77-122 |
| 107-06-2 | 1,2-Dichloroethane | 50 | 52.1 | 104 | 68-134 |
| 100-41-4 | Ethylbenzene | 50 | 43.7 | 87 | 74-119 |
| 98-82-8 | Isopropylbenzene | 50 | 42.5 | 85 | 71-119 |
| 1634-04-4 | Methyl Tert Butyl Ether | 50 | 110 | 110 | 72-124 |
| 91-20-3 | Naphthalene | 50 | 46.7 | 93 | 60-127 |
| 108-88-3 | Toluene | 50 | 43.9 | 88 | 77-121 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 50 | 44.0 | 88 | 72-118 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 50 | 42.9 | 86 | 69-118 |
| 1330-20-7 | Xylene (total) | 150 | 131 | 87 | 76-119 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 93% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 94% | 70-122% |
| 2037-26-5 | Toluene-D8 | 88% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 85% | 66-132% |

* = Outside of Control Limits.

# Blank Spike Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VE8685-BS | E197677.D | 1 | 12/09/12 | OTR | n/a | n/a | VE8685 |

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

JB22549-1, JB22549-4

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | 2500 | 2510 | 100 | 76-117 |
| 106-93-4 | 1,2-Dibromoethane | 2500 | 2550 | 102 | 77-122 |
| 107-06-2 | 1,2-Dichloroethane | 2500 | 2480 | 99 | 68-134 |
| 100-41-4 | Ethylbenzene | 2500 | 2400 | 96 | 74-119 |
| 98-82-8 | Isopropylbenzene | 2500 | 2400 | 96 | 71-119 |
| 1634-04-4 | Methyl Tert Butyl Ether | 5000 | 4740 | 95 | 72-124 |
| 91-20-3 | Naphthalene | 2500 | 2040 | 82 | 60-127 |
| 108-88-3 | Toluene | 2500 | 2470 | 99 | 77-121 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 2500 | 2410 | 96 | 72-118 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 2500 | 2350 | 94 | 69-118 |
| 1330-20-7 | Xylene (total) | 7500 | 7150 | 95 | 76-119 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 96% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 92% | 70-122% |
| 2037-26-5 | Toluene-D8 | 92% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 93% | 66-132% |

* = Outside of Control Limits.

# Blank Spike Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VE8686-BS | E197702.D | 1 | 12/10/12 | OTR | n/a | n/a | VE8686 |

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

JB22549-1

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|---|---|---|---|---|---|
| 95-63-6 | 1,2,4-Trimethylbenzene | 2500 | 2370 | 95 | 72-118 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 91% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 87% | 70-122% |
| 2037-26-5 | Toluene-D8 | 92% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 88% | 66-132% |

* = Outside of Control Limits.

# Blank Spike Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| VA7126-BS | A189660.D | 1 | 12/11/12 | OTR | n/a | n/a | VA7126 |

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

JB22549-2, JB22549-6

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|---|---|---|---|---|---|
| 71-43-2 | Benzene | 50 | 48.3 | 97 | 76-117 |
| 106-93-4 | 1,2-Dibromoethane | 50 | 52.5 | 105 | 77-122 |
| 107-06-2 | 1,2-Dichloroethane | 50 | 55.6 | 111 | 68-134 |
| 100-41-4 | Ethylbenzene | 50 | 47.2 | 94 | 74-119 |
| 98-82-8 | Isopropylbenzene | 50 | 41.3 | 83 | 71-119 |
| 1634-04-4 | Methyl Tert Butyl Ether | 100 | 97.0 | 97 | 72-124 |
| 91-20-3 | Naphthalene | 50 | 54.7 | 109 | 60-127 |
| 108-88-3 | Toluene | 50 | 47.8 | 96 | 77-121 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 50 | 43.2 | 86 | 72-118 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 50 | 42.7 | 85 | 69-118 |
| 1330-20-7 | Xylene (total) | 150 | 143 | 95 | 76-119 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 94% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 96% | 70-122% |
| 2037-26-5 | Toluene-D8 | 104% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 87% | 66-132% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| JB23049-4MS | O131782.D | 1 | 12/08/12 | DPP | n/a | n/a | VO5810 |
| JB23049-4MSD | O131783.D | 1 | 12/08/12 | DPP | n/a | n/a | VO5810 |
| JB23049-4 | O131785.D | 1 | 12/08/12 | DPP | n/a | n/a | VO5810 |

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

JB22549-3, JB22549-5

| CAS No. | Compound | JB23049-4 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | ND | | 59.2 | 61.2 | 103 | 58.6 | 99 | 4 | 44-130/21 |
| 106-93-4 | 1,2-Dibromoethane | ND | | 59.2 | 62.3 | 105 | 59.5 | 101 | 5 | 41-139/21 |
| 107-06-2 | 1,2-Dichloroethane | ND | | 59.2 | 68.3 | 115 | 65.1 | 110 | 5 | 43-139/19 |
| 100-41-4 | Ethylbenzene | ND | | 59.2 | 60.3 | 102 | 57.2 | 97 | 5 | 29-137/25 |
| 98-82-8 | Isopropylbenzene | ND | | 59.2 | 59.3 | 100 | 54.6 | 92 | 8 | 27-138/26 |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | | 59.2 | 73.9 | 125 | 72.1 | 122 | 2 | 51-128/20 |
| 91-20-3 | Naphthalene | ND | | 59.2 | 61.5 | 104 | 56.0 | 95 | 9 | 10-152/31 |
| 108-88-3 | Toluene | ND | | 59.2 | 60.8 | 103 | 57.6 | 97 | 5 | 40-135/22 |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | | 59.2 | 61.1 | 103 | 56.1 | 95 | 9 | 17-142/28 |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | | 59.2 | 60.8 | 103 | 54.9 | 93 | 10 | 20-140/27 |
| 1330-20-7 | Xylene (total) | ND | | 178 | 182 | 103 | 172 | 97 | 6 | 28-139/25 |

| CAS No. | Surrogate Recoveries | MS | MSD | JB23049-4 | Limits |
|---|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 92% | 93% | 91% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 92% | 90% | 91% | 70-122% |
| 2037-26-5 | Toluene-D8 | 88% | 88% | 87% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 86% | 84% | 86% | 66-132% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| JB22611-2MS | E197678.D | 1 | 12/09/12 | OTR | n/a | n/a | VE8685 |
| JB22611-2MSD | E197679.D | 1 | 12/09/12 | OTR | n/a | n/a | VE8685 |
| JB22611-2 | E197681.D | 1 | 12/09/12 | OTR | n/a | n/a | VE8685 |

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

JB22549-1, JB22549-4

| CAS No. | Compound | JB22611-2 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | ND | | 2950 | 2960 | 100 | 3000 | 102 | 1 | 44-130/21 |
| 106-93-4 | 1,2-Dibromoethane | ND | | 2950 | 3100 | 105 | 3080 | 104 | 1 | 41-139/21 |
| 107-06-2 | 1,2-Dichloroethane | ND | | 2950 | 2840 | 96 | 2850 | 96 | 0 | 43-139/19 |
| 100-41-4 | Ethylbenzene | 500 | | 2950 | 3320 | 95 | 3320 | 95 | 0 | 29-137/25 |
| 98-82-8 | Isopropylbenzene | 139 | | 2950 | 2950 | 95 | 3010 | 97 | 2 | 27-138/26 |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | | 2950 | 2900 | 98 | 2890 | 98 | 0 | 51-128/20 |
| 91-20-3 | Naphthalene | 1300 | | 2950 | 3960 | 90 | 4060 | 93 | 2 | 10-152/31 |
| 108-88-3 | Toluene | 133 | | 2950 | 3060 | 99 | 3090 | 100 | 1 | 40-135/22 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 4360 | | 2950 | 6770 | 82 | 6810 | 83 | 1 | 17-142/28 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 1240 | | 2950 | 3810 | 87 | 3890 | 90 | 2 | 20-140/27 |
| 1330-20-7 | Xylene (total) | 3100 | | 8860 | 11300 | 93 | 11300 | 93 | 0 | 28-139/25 |

| CAS No. | Surrogate Recoveries | MS | MSD | JB22611-2 | Limits |
|---|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 95% | 96% | 89% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 91% | 91% | 90% | 70-122% |
| 2037-26-5 | Toluene-D8 | 93% | 93% | 93% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 93% | 94% | 93% | 66-132% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| JB22502-3MS | E197710.D | 1 | 12/10/12 | OTR | n/a | n/a | VE8686 |
| JB22502-3MSD | E197711.D | 1 | 12/10/12 | OTR | n/a | n/a | VE8686 |
| JB22502-3 | E197707.D | 1 | 12/10/12 | OTR | n/a | n/a | VE8686 |

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

JB22549-1

| CAS No. | Compound | JB22502-3 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | | 2710 | 3480 | 128 | 3560 | 131 | 2 | 17-142/28 |

| CAS No. | Surrogate Recoveries | MS | MSD | JB22502-3 | Limits |
|---|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 92% | 92% | 87% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 88% | 88% | 86% | 70-122% |
| 2037-26-5 | Toluene-D8 | 92% | 91% | 91% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 89% | 90% | 85% | 66-132% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| JB22507-18MS | A189661.D | 1 | 12/11/12 | OTR | n/a | n/a | VA7126 |
| JB22507-18MSD | A189662.D | 1 | 12/11/12 | OTR | n/a | n/a | VA7126 |
| JB22507-18 | A189664.D | 1 | 12/11/12 | OTR | n/a | n/a | VA7126 |

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

JB22549-2, JB22549-6

| CAS No. | Compound | JB22507-18 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | 6.9 | | 71.5 | 63.7 | 79 | 69.7 | 88 | 9 | 44-130/21 |
| 106-93-4 | 1,2-Dibromoethane | ND | | 71.5 | 58.4 | 82 | 61.7 | 86 | 5 | 41-139/21 |
| 107-06-2 | 1,2-Dichloroethane | ND | | 71.5 | 64.4 | 90 | 63.0 | 88 | 2 | 43-139/19 |
| 100-41-4 | Ethylbenzene | 149 | | 71.5 | 137 | -17* [a] | 195 | 64 | 35* [b] | 29-137/25 |
| 98-82-8 | Isopropylbenzene | 27.3 | | 71.5 | 73.7 | 65 | 94.5 | 94 | 25 | 27-138/26 |
| 1634-04-4 | Methyl Tert Butyl Ether | ND | | 71.5 | 58.5 | 82 | 62.6 | 88 | 7 | 51-128/20 |
| 91-20-3 | Naphthalene | 179 | | 71.5 | 230 | 71 | 260 | 113 | 12 | 10-152/31 |
| 108-88-3 | Toluene | 109 | | 71.5 | 111 | 3* [b] | 140 | 43 | 23* [b] | 40-135/22 |
| 95-63-6 | 1,2,4-Trimethylbenzene | 704 | E | 71.5 | 591 | -158* [a] | 902 | 277* [a] | 42* [b] | 17-142/28 |
| 108-67-8 | 1,3,5-Trimethylbenzene | 208 | | 71.5 | 209 | 1* [a] | 329 | 169* [a] | 45* [b] | 20-140/27 |
| 1330-20-7 | Xylene (total) | 779 | | 215 | 607 | -80* [a] | 892 | 53 | 38* [b] | 28-139/25 |

| CAS No. | Surrogate Recoveries | MS | MSD | JB22507-18 | Limits |
|---|---|---|---|---|---|
| 1868-53-7 | Dibromofluoromethane | 91% | 93% | 92% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 92% | 91% | 85% | 70-122% |
| 2037-26-5 | Toluene-D8 | 105% | 103% | 102% | 81-127% |
| 460-00-4 | 4-Bromofluorobenzene | 87% | 89% | 89% | 66-132% |

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

* = Outside of Control Limits.

# Instrument Performance Check (BFB)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** VA7086-BFB
**Lab File ID:** A188627.D
**Instrument ID:** GCMSA
**Injection Date:** 11/07/12
**Injection Time:** 10:02

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 14.95 - 40.0% of mass 95 | 8525 | 17.3 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 23163 | 47.0 | | Pass |
| 95 | Base peak, 100% relative abundance | 49283 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 3209 | 6.51 | | Pass |
| 173 | Less than 2.0% of mass 174 | 0 | 0.00 | (0.00) [a] | Pass |
| 174 | 50.0 - 120.0% of mass 95 | 44427 | 90.1 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 3412 | 6.92 | (7.68) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 43253 | 87.8 | (97.4) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 2907 | 5.90 | (6.72) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VA7086-IC7086 | A188628.D | 11/07/12 | 11:11 | 01:09 | Initial cal 0.5 |
| VA7086-IC7086 | A188629.D | 11/07/12 | 11:45 | 01:43 | Initial cal 1 |
| VA7086-IC7086 | A188630.D | 11/07/12 | 12:16 | 02:14 | Initial cal 2 |
| VA7086-IC7086 | A188631.D | 11/07/12 | 12:47 | 02:45 | Initial cal 5 |
| VA7086-IC7086 | A188632.D | 11/07/12 | 13:19 | 03:17 | Initial cal 10 |
| VA7086-IC7086 | A188633.D | 11/07/12 | 13:50 | 03:48 | Initial cal 20 |
| VA7086-ICC7086 | A188634.D | 11/07/12 | 14:22 | 04:20 | Initial cal 50 |
| VA7086-IC7086 | A188636.D | 11/07/12 | 15:25 | 05:23 | Initial cal 200 |
| VA7086-IC7086 | A188639.D | 11/07/12 | 16:59 | 06:57 | Initial cal 100 |
| VA7086-ICV7086 | A188642.D | 11/07/12 | 19:21 | 09:19 | Initial cal verification 50 |

# Instrument Performance Check (BFB)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** VA7126-BFB
**Lab File ID:** A189656.D
**Instrument ID:** GCMSA
**Injection Date:** 12/10/12
**Injection Time:** 22:14

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 14.95 - 40.0% of mass 95 | 9213 | 17.6 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 24704 | 47.1 | | Pass |
| 95 | Base peak, 100% relative abundance | 52413 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 3469 | 6.62 | | Pass |
| 173 | Less than 2.0% of mass 174 | 0 | 0.00 | (0.00) [a] | Pass |
| 174 | 50.0 - 120.0% of mass 95 | 51261 | 97.8 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 4232 | 8.07 | (8.26) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 49549 | 94.5 | (96.7) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 3188 | 6.08 | (6.43) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VA7126-CC7086 | A189657.D | 12/10/12 | 22:43 | 00:29 | Continuing cal 50 |
| VA7126-MB | A189659.D | 12/10/12 | 23:43 | 01:29 | Method Blank |
| VA7126-BS | A189660.D | 12/11/12 | 00:12 | 01:58 | Blank Spike |
| JB22507-18MS | A189661.D | 12/11/12 | 00:42 | 02:28 | Matrix Spike |
| JB22507-18MSD | A189662.D | 12/11/12 | 01:26 | 03:12 | Matrix Spike Duplicate |
| JB22507-18 | A189664.D | 12/11/12 | 02:25 | 04:11 | (used for QC only; not part of job JB22549) |
| ZZZZZZ | A189666.D | 12/11/12 | 03:24 | 05:10 | (unrelated sample) |
| ZZZZZZ | A189667.D | 12/11/12 | 03:54 | 05:40 | (unrelated sample) |
| ZZZZZZ | A189668.D | 12/11/12 | 04:38 | 06:24 | (unrelated sample) |
| ZZZZZZ | A189669.D | 12/11/12 | 05:08 | 06:54 | (unrelated sample) |
| ZZZZZZ | A189670.D | 12/11/12 | 05:37 | 07:23 | (unrelated sample) |
| ZZZZZZ | A189671.D | 12/11/12 | 06:07 | 07:53 | (unrelated sample) |
| ZZZZZZ | A189672.D | 12/11/12 | 06:37 | 08:23 | (unrelated sample) |
| JB22549-6 | A189673.D | 12/11/12 | 07:06 | 08:52 | BH-12-49_2.5' |
| JB22549-2 | A189674.D | 12/11/12 | 07:50 | 09:36 | BH-12-55_2.5' |

# Instrument Performance Check (BFB)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** VE8647-BFB
**Lab File ID:** E196781.D
**Instrument ID:** GCMSE
**Injection Date:** 11/12/12
**Injection Time:** 10:00

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 7473 | 20.8 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 18645 | 52.0 | | Pass |
| 95 | Base peak, 100% relative abundance | 35877 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 2347 | 6.54 | | Pass |
| 173 | Less than 2.0% of mass 174 | 0 | 0.00 | (0.00) [a] | Pass |
| 174 | 50.0 - 120.0% of mass 95 | 28685 | 80.0 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 2341 | 6.53 | (8.16) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 27698 | 77.2 | (96.6) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 1886 | 5.26 | (6.81) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VE8647-IC8647 | E196782.D | 11/12/12 | 11:35 | 01:35 | Initial cal 0.5 |
| VE8647-IC8647 | E196783.D | 11/12/12 | 12:05 | 02:05 | Initial cal 1 |
| VE8647-IC8647 | E196784.D | 11/12/12 | 12:36 | 02:36 | Initial cal 2 |
| VE8647-IC8647 | E196785.D | 11/12/12 | 13:06 | 03:06 | Initial cal 5 |
| VE8647-IC8647 | E196786.D | 11/12/12 | 13:36 | 03:36 | Initial cal 10 |
| VE8647-IC8647 | E196787.D | 11/12/12 | 14:06 | 04:06 | Initial cal 20 |
| VE8647-ICC8647 | E196788.D | 11/12/12 | 14:36 | 04:36 | Initial cal 50 |
| VE8647-IC8647 | E196789.D | 11/12/12 | 15:06 | 05:06 | Initial cal 100 |
| VE8647-IC8647 | E196790.D | 11/12/12 | 15:36 | 05:36 | Initial cal 200 |
| VE8647-ICV8647 | E196793.D | 11/12/12 | 17:07 | 07:07 | Initial cal verification 50 |

# Instrument Performance Check (BFB)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** VE8685-BFB
**Lab File ID:** E197673.D
**Instrument ID:** GCMSE
**Injection Date:** 12/08/12
**Injection Time:** 22:07

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 7686 | 20.7 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 19132 | 51.4 | | Pass |
| 95 | Base peak, 100% relative abundance | 37210 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 2441 | 6.56 | | Pass |
| 173 | Less than 2.0% of mass 174 | 0 | 0.00 | (0.00) [a] | Pass |
| 174 | 50.0 - 120.0% of mass 95 | 29117 | 78.3 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 2348 | 6.31 | (8.06) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 28464 | 76.5 | (97.8) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 1895 | 5.09 | (6.66) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VE8685-CC8647 | E197674.D | 12/08/12 | 22:37 | 00:30 | Continuing cal 50 |
| VE8685-MB | E197676.D | 12/08/12 | 23:38 | 01:31 | Method Blank |
| VE8685-BS | E197677.D | 12/09/12 | 00:08 | 02:01 | Blank Spike |
| JB22611-2MS | E197678.D | 12/09/12 | 00:38 | 02:31 | Matrix Spike |
| JB22611-2MSD | E197679.D | 12/09/12 | 01:08 | 03:01 | Matrix Spike Duplicate |
| JB22611-2 | E197681.D | 12/09/12 | 02:09 | 04:02 | (used for QC only; not part of job JB22549) |
| ZZZZZZ | E197682.D | 12/09/12 | 02:39 | 04:32 | (unrelated sample) |
| ZZZZZZ | E197683.D | 12/09/12 | 03:10 | 05:03 | (unrelated sample) |
| ZZZZZZ | E197686.D | 12/09/12 | 04:40 | 06:33 | (unrelated sample) |
| JB22549-1 | E197687.D | 12/09/12 | 05:10 | 07:03 | BH-12-54_3' |
| JB22549-4 | E197689.D | 12/09/12 | 06:11 | 08:04 | BH-12-53_2.5' |
| ZZZZZZ | E197691.D | 12/09/12 | 07:11 | 09:04 | (unrelated sample) |
| ZZZZZZ | E197692.D | 12/09/12 | 07:41 | 09:34 | (unrelated sample) |
| ZZZZZZ | E197693.D | 12/09/12 | 08:11 | 10:04 | (unrelated sample) |

# Instrument Performance Check (BFB)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** VE8686-BFB
**Lab File ID:** E197698.D
**Instrument ID:** GCMSE
**Injection Date:** 12/10/12
**Injection Time:** 11:02

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 5803 | 21.6 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 14099 | 52.6 | | Pass |
| 95 | Base peak, 100% relative abundance | 26826 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 1898 | 7.08 | | Pass |
| 173 | Less than 2.0% of mass 174 | 0 | 0.00 | (0.00) [a] | Pass |
| 174 | 50.0 - 120.0% of mass 95 | 22258 | 83.0 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 1804 | 6.72 | (8.10) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 21741 | 81.0 | (97.7) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 1495 | 5.57 | (6.88) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VE8686-CC8647 | E197699.D | 12/10/12 | 11:34 | 00:32 | Continuing cal 20 |
| VE8686-MB | E197701.D | 12/10/12 | 12:42 | 01:40 | Method Blank |
| VE8686-BS | E197702.D | 12/10/12 | 13:12 | 02:10 | Blank Spike |
| ZZZZZZ | E197703.D | 12/10/12 | 13:57 | 02:55 | (unrelated sample) |
| ZZZZZZ | E197704.D | 12/10/12 | 14:27 | 03:25 | (unrelated sample) |
| JB22549-1 | E197705.D | 12/10/12 | 14:57 | 03:55 | BH-12-54_3' |
| ZZZZZZ | E197706.D | 12/10/12 | 15:28 | 04:26 | (unrelated sample) |
| JB22502-3 | E197707.D | 12/10/12 | 15:58 | 04:56 | (used for QC only; not part of job JB22549) |
| ZZZZZZ | E197708.D | 12/10/12 | 16:28 | 05:26 | (unrelated sample) |
| ZZZZZZ | E197709.D | 12/10/12 | 16:58 | 05:56 | (unrelated sample) |
| JB22502-3MS | E197710.D | 12/10/12 | 17:29 | 06:27 | Matrix Spike |
| JB22502-3MSD | E197711.D | 12/10/12 | 17:59 | 06:57 | Matrix Spike Duplicate |
| ZZZZZZ | E197712.D | 12/10/12 | 18:29 | 07:27 | (unrelated sample) |
| ZZZZZZ | E197713.D | 12/10/12 | 18:59 | 07:57 | (unrelated sample) |
| ZZZZZZ | E197714.D | 12/10/12 | 19:30 | 08:28 | (unrelated sample) |
| ZZZZZZ | E197715.D | 12/10/12 | 20:00 | 08:58 | (unrelated sample) |
| ZZZZZZ | E197716.D | 12/10/12 | 20:30 | 09:28 | (unrelated sample) |
| ZZZZZZ | E197717.D | 12/10/12 | 21:00 | 09:58 | (unrelated sample) |
| ZZZZZZ | E197718.D | 12/10/12 | 21:31 | 10:29 | (unrelated sample) |

# Instrument Performance Check (BFB)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** VO5808-BFB
**Lab File ID:** O131721.D
**Instrument ID:** GCMSO
**Injection Date:** 12/05/12
**Injection Time:** 10:50

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 6359 | 16.7 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 17771 | 46.6 | | Pass |
| 95 | Base peak, 100% relative abundance | 38141 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 2611 | 6.85 | | Pass |
| 173 | Less than 2.0% of mass 174 | 0 | 0.00 | (0.00) [a] | Pass |
| 174 | 50.0 - 120.0% of mass 95 | 35267 | 92.5 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 2165 | 5.68 | (6.14) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 34485 | 90.4 | (97.8) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 2240 | 5.87 | (6.50) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VO5808-IC5808 | O131722.D | 12/05/12 | 11:23 | 00:33 | Initial cal 1 |
| VO5808-IC5808 | O131723.D | 12/05/12 | 11:53 | 01:03 | Initial cal 2 |
| VO5808-IC5808 | O131724.D | 12/05/12 | 12:23 | 01:33 | Initial cal 5 |
| VO5808-IC5808 | O131725.D | 12/05/12 | 12:53 | 02:03 | Initial cal 10 |
| VO5808-IC5808 | O131726.D | 12/05/12 | 13:23 | 02:33 | Initial cal 20 |
| VO5808-ICC5808 | O131727.D | 12/05/12 | 13:53 | 03:03 | Initial cal 50 |
| VO5808-IC5808 | O131728.D | 12/05/12 | 14:23 | 03:33 | Initial cal 100 |
| VO5808-IC5808 | O131729.D | 12/05/12 | 14:53 | 04:03 | Initial cal 200 |
| VO5808-IC5808 | O131731.D | 12/05/12 | 15:53 | 05:03 | Initial cal 0.5 |
| VO5808-ICV5808 | O131732.D | 12/05/12 | 16:23 | 05:33 | Initial cal verification 50 |

# Instrument Performance Check (BFB)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** VO5810-BFB
**Lab File ID:** O131777.D
**Instrument ID:** GCMSO
**Injection Date:** 12/08/12
**Injection Time:** 10:21

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 12043 | 16.4 | | Pass |
| 75 | 30.0 - 60.0% of mass 95 | 33293 | 45.3 | | Pass |
| 95 | Base peak, 100% relative abundance | 73480 | 100.0 | | Pass |
| 96 | 5.0 - 9.0% of mass 95 | 4760 | 6.48 | | Pass |
| 173 | Less than 2.0% of mass 174 | 0 | 0.00 | (0.00) [a] | Pass |
| 174 | 50.0 - 120.0% of mass 95 | 71944 | 97.9 | | Pass |
| 175 | 5.0 - 9.0% of mass 174 | 5384 | 7.33 | (7.48) [a] | Pass |
| 176 | 95.0 - 101.0% of mass 174 | 69795 | 95.0 | (97.0) [a] | Pass |
| 177 | 5.0 - 9.0% of mass 176 | 4540 | 6.18 | (6.50) [b] | Pass |

(a) Value is % of mass 174
(b) Value is % of mass 176

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| VO5810-CC5808 | O131779.D | 12/08/12 | 11:26 | 01:05 | Continuing cal 20 |
| VO5810-MB1 | O131780.D | 12/08/12 | 13:41 | 03:20 | Method Blank |
| VO5810-BS | O131781.D | 12/08/12 | 14:24 | 04:03 | Blank Spike |
| JB23049-4MS | O131782.D | 12/08/12 | 15:05 | 04:44 | Matrix Spike |
| JB23049-4MSD | O131783.D | 12/08/12 | 15:34 | 05:13 | Matrix Spike Duplicate |
| JB23049-4 | O131785.D | 12/08/12 | 16:34 | 06:13 | (used for QC only; not part of job JB22549) |
| ZZZZZZ | O131786.D | 12/08/12 | 17:04 | 06:43 | (unrelated sample) |
| ZZZZZZ | O131787.D | 12/08/12 | 17:34 | 07:13 | (unrelated sample) |
| JB22549-3 | O131788.D | 12/08/12 | 18:04 | 07:43 | BH-12-55_1.5' |
| JB22549-5 | O131789.D | 12/08/12 | 18:34 | 08:13 | BH-12-48_3' |
| ZZZZZZ | O131790.D | 12/08/12 | 19:04 | 08:43 | (unrelated sample) |
| ZZZZZZ | O131796.D | 12/08/12 | 19:34 | 09:13 | (unrelated sample) |
| ZZZZZZ | O131797.D | 12/08/12 | 20:04 | 09:43 | (unrelated sample) |
| ZZZZZZ | O131798.D | 12/08/12 | 20:34 | 10:13 | (unrelated sample) |

# Volatile Internal Standard Area Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | |
|---|---|---|---|
| **Check Std:** | VA7126-CC7086 | **Injection Date:** | 12/10/12 |
| **Lab File ID:** | A189657.D | **Injection Time:** | 22:43 |
| **Instrument ID:** | GCMSA | **Method:** | SW846 8260B |

| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|
| Check Std | 82912 | 7.24 | 229202 | 9.55 | 326379 | 10.50 | 307458 | 13.94 | 172345 | 16.57 |
| Upper Limit [a] | 165824 | 7.74 | 458404 | 10.05 | 652758 | 11.00 | 614916 | 14.44 | 344690 | 17.07 |
| Lower Limit [b] | 41456 | 6.74 | 114601 | 9.05 | 163190 | 10.00 | 153729 | 13.44 | 86173 | 16.07 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|
| VA7126-MB | 103929 | 7.24 | 212773 | 9.55 | 305315 | 10.50 | 276732 | 13.94 | 132937 | 16.57 |
| VA7126-BS | 89711 | 7.24 | 214452 | 9.55 | 306048 | 10.50 | 284736 | 13.93 | 165484 | 16.56 |
| JB22507-18MS | 72644 | 7.24 | 238294 | 9.55 | 336575 | 10.50 | 320912 | 13.93 | 175645 | 16.57 |
| JB22507-18MSD | 99485 | 7.23 | 287581 | 9.55 | 417851 | 10.50 | 384127 | 13.93 | 199366 | 16.56 |
| JB22507-18 | 126838 | 7.23 | 298437 | 9.54 | 430914 | 10.50 | 395152 | 13.93 | 207044 | 16.56 |
| ZZZZZZ | 86454 | 7.23 | 278016 | 9.54 | 406636 | 10.49 | 373169 | 13.93 | 169706 | 16.56 |
| ZZZZZZ | 104908 | 7.23 | 276227 | 9.55 | 402903 | 10.49 | 371443 | 13.93 | 176654 | 16.56 |
| ZZZZZZ | 99582 | 7.22 | 275636 | 9.55 | 399410 | 10.49 | 368397 | 13.92 | 173841 | 16.56 |
| ZZZZZZ | 101697 | 7.23 | 266936 | 9.54 | 385561 | 10.49 | 360361 | 13.93 | 170762 | 16.56 |
| ZZZZZZ | 103508 | 7.23 | 259866 | 9.54 | 376124 | 10.49 | 347416 | 13.93 | 164094 | 16.56 |
| ZZZZZZ | 103592 | 7.22 | 252442 | 9.54 | 366428 | 10.48 | 337033 | 13.92 | 161763 | 16.56 |
| ZZZZZZ | 104473 | 7.21 | 252473 | 9.54 | 361236 | 10.49 | 337571 | 13.92 | 176143 | 16.55 |
| JB22549-6 | 93098 | 7.23 | 208247 | 9.54 | 301762 | 10.49 | 268226 | 13.93 | 123557 | 16.56 |
| JB22549-2 | 89342 | 7.22 | 234170 | 9.54 | 344693 | 10.48 | 307517 | 13.92 | 145412 | 16.55 |

**IS 1** = Tert Butyl Alcohol-D9
**IS 2** = Pentafluorobenzene
**IS 3** = 1,4-Difluorobenzene
**IS 4** = Chlorobenzene-D5
**IS 5** = 1,4-Dichlorobenzene-d4

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Volatile Internal Standard Area Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | |
|---|---|---|---|
| **Check Std:** | VE8685-CC8647 | **Injection Date:** | 12/08/12 |
| **Lab File ID:** | E197674.D | **Injection Time:** | 22:37 |
| **Instrument ID:** | GCMSE | **Method:** | SW846 8260B |

| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|
| Check Std | 71223 | 7.69 | 90837 | 9.92 | 143289 | 10.84 | 136730 | 14.16 | 68781 | 16.74 |
| Upper Limit [a] | 142446 | 8.19 | 181674 | 10.42 | 286578 | 11.34 | 273460 | 14.66 | 137562 | 17.24 |
| Lower Limit [b] | 35612 | 7.19 | 45419 | 9.42 | 71645 | 10.34 | 68365 | 13.66 | 34391 | 16.24 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|
| VE8685-MB | 78704 | 7.72 | 98475 | 9.92 | 148840 | 10.84 | 138035 | 14.16 | 69992 | 16.73 |
| VE8685-BS | 68106 | 7.70 | 87202 | 9.92 | 137439 | 10.84 | 130508 | 14.16 | 66237 | 16.74 |
| JB22611-2MS | 60643 | 7.71 | 85563 | 9.92 | 133759 | 10.84 | 125529 | 14.16 | 64775 | 16.73 |
| JB22611-2MSD | 64762 | 7.72 | 87722 | 9.91 | 137489 | 10.84 | 130477 | 14.16 | 66233 | 16.73 |
| JB22611-2 | 74020 | 7.71 | 102216 | 9.92 | 152068 | 10.83 | 138439 | 14.16 | 72530 | 16.73 |
| ZZZZZZ | 74415 | 7.71 | 90328 | 9.92 | 132051 | 10.83 | 110554 | 14.16 | 62428 | 16.73 |
| ZZZZZZ | 68277 | 7.71 | 90339 | 9.92 | 133337 | 10.84 | 113053 | 14.16 | 63837 | 16.73 |
| ZZZZZZ | 78343 | 7.72 | 103456 | 9.91 | 156354 | 10.84 | 145927 | 14.16 | 78668 | 16.73 |
| JB22549-1 | 78308 | 7.71 | 98584 | 9.92 | 141068 | 10.84 | 116060 | 14.16 | 63837 | 16.74 |
| JB22549-4 [c] | 85971 | 7.70 | 103080 | 9.91 | 156967 | 10.83 | 139503 | 14.16 | 74321 | 16.73 |
| ZZZZZZ | 80377 | 7.71 | 97517 | 9.92 | 146245 | 10.84 | 135647 | 14.16 | 72914 | 16.73 |
| ZZZZZZ | 77649 | 7.70 | 100285 | 9.92 | 141728 | 10.84 | 115787 | 14.16 | 68043 | 16.73 |
| ZZZZZZ | 78179 | 7.71 | 102041 | 9.92 | 152844 | 10.84 | 132762 | 14.16 | 69845 | 16.74 |

**IS 1** = Tert Butyl Alcohol-D9
**IS 2** = Pentafluorobenzene
**IS 3** = 1,4-Difluorobenzene
**IS 4** = Chlorobenzene-D5
**IS 5** = 1,4-Dichlorobenzene-d4

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.
(c) Dilution required due to matrix interference.

# Volatile Internal Standard Area Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | |
|---|---|---|---|
| **Check Std:** | VE8686-CC8647 | **Injection Date:** | 12/10/12 |
| **Lab File ID:** | E197699.D | **Injection Time:** | 11:34 |
| **Instrument ID:** | GCMSE | **Method:** | SW846 8260B |

| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|
| Check Std | 52529 | 7.70 | 72659 | 9.92 | 108900 | 10.84 | 102539 | 14.16 | 53523 | 16.73 |
| Upper Limit [a] | 105058 | 8.20 | 145318 | 10.42 | 217800 | 11.34 | 205078 | 14.66 | 107046 | 17.23 |
| Lower Limit [b] | 26265 | 7.20 | 36330 | 9.42 | 54450 | 10.34 | 51270 | 13.66 | 26762 | 16.23 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|
| VE8686-MB | 48105 | 7.72 | 76005 | 9.92 | 110709 | 10.84 | 104451 | 14.17 | 57163 | 16.73 |
| VE8686-BS | 48998 | 7.70 | 70114 | 9.92 | 104409 | 10.84 | 99997 | 14.16 | 52486 | 16.74 |
| ZZZZZZ | 54190 | 7.70 | 71226 | 9.92 | 99166 | 10.84 | 92627 | 14.16 | 51493 | 16.73 |
| ZZZZZZ | 51992 | 7.71 | 79047 | 9.92 | 114214 | 10.84 | 108340 | 14.16 | 59688 | 16.74 |
| JB22549-1 | 58564 | 7.71 | 80055 | 9.93 | 111102 | 10.84 | 101561 | 14.17 | 54542 | 16.74 |
| ZZZZZZ | 56371 | 7.72 | 83185 | 9.92 | 121400 | 10.84 | 114673 | 14.17 | 62895 | 16.73 |
| JB22502-3 | 55392 | 7.72 | 79331 | 9.92 | 111625 | 10.84 | 100479 | 14.17 | 55502 | 16.74 |
| ZZZZZZ | 56741 | 7.72 | 84773 | 9.92 | 125700 | 10.84 | 119105 | 14.16 | 64811 | 16.74 |
| ZZZZZZ | 63715 | 7.72 | 88034 | 9.92 | 129744 | 10.84 | 121739 | 14.17 | 62334 | 16.73 |
| JB22502-3MS | 50527 | 7.72 | 75883 | 9.92 | 113418 | 10.84 | 104475 | 14.16 | 55803 | 16.74 |
| JB22502-3MSD | 51764 | 7.71 | 76226 | 9.92 | 116530 | 10.84 | 107543 | 14.17 | 55410 | 16.73 |
| ZZZZZZ | 61784 | 7.71 | 88073 | 9.93 | 127977 | 10.84 | 118771 | 14.17 | 61843 | 16.73 |
| ZZZZZZ | 61392 | 7.71 | 86596 | 9.93 | 126043 | 10.84 | 118371 | 14.17 | 61511 | 16.74 |
| ZZZZZZ | 63918 | 7.72 | 88684 | 9.93 | 129657 | 10.84 | 119365 | 14.17 | 61429 | 16.74 |
| ZZZZZZ | 64103 | 7.71 | 87791 | 9.92 | 127534 | 10.84 | 115795 | 14.17 | 59269 | 16.73 |
| ZZZZZZ | 63444 | 7.71 | 86034 | 9.93 | 126215 | 10.84 | 116841 | 14.17 | 60259 | 16.73 |
| ZZZZZZ | 57892 | 7.70 | 86655 | 9.92 | 127238 | 10.84 | 114506 | 14.17 | 59065 | 16.73 |
| ZZZZZZ | 62811 | 7.71 | 86950 | 9.92 | 128898 | 10.84 | 113256 | 14.16 | 56488 | 16.74 |

**IS 1** = Tert Butyl Alcohol-D9
**IS 2** = Pentafluorobenzene
**IS 3** = 1,4-Difluorobenzene
**IS 4** = Chlorobenzene-D5
**IS 5** = 1,4-Dichlorobenzene-d4

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Volatile Internal Standard Area Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | |
|---|---|---|---|
| **Check Std:** | VO5810-CC5808 | **Injection Date:** | 12/08/12 |
| **Lab File ID:** | O131779.D | **Injection Time:** | 11:26 |
| **Instrument ID:** | GCMSO | **Method:** | SW846 8260B |

| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|
| Check Std | 109898 | 8.26 | 214422 | 10.69 | 320445 | 11.65 | 295897 | 14.97 | 172990 | 17.44 |
| Upper Limit [a] | 219796 | 8.76 | 428844 | 11.19 | 640890 | 12.15 | 591794 | 15.47 | 345980 | 17.94 |
| Lower Limit [b] | 54949 | 7.76 | 107211 | 10.19 | 160223 | 11.15 | 147949 | 14.47 | 86495 | 16.94 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|
| VO5810-MB1 | 98692 | 8.25 | 199361 | 10.69 | 297454 | 11.65 | 276283 | 14.97 | 157724 | 17.44 |
| VO5810-BS | 101210 | 8.26 | 195907 | 10.69 | 294125 | 11.65 | 273704 | 14.97 | 161069 | 17.44 |
| JB23049-4MS | 89104 | 8.26 | 206467 | 10.69 | 311483 | 11.65 | 289473 | 14.97 | 167720 | 17.44 |
| JB23049-4MSD | 93493 | 8.27 | 213140 | 10.70 | 322962 | 11.65 | 297855 | 14.97 | 173439 | 17.44 |
| JB23049-4 | 100280 | 8.26 | 210910 | 10.70 | 314156 | 11.65 | 287728 | 14.97 | 165418 | 17.44 |
| ZZZZZZ | 100394 | 8.26 | 210636 | 10.69 | 315387 | 11.65 | 289224 | 14.97 | 166746 | 17.44 |
| ZZZZZZ | 100679 | 8.26 | 212381 | 10.70 | 317232 | 11.65 | 291495 | 14.97 | 167552 | 17.44 |
| JB22549-3 | 96358 | 8.25 | 195274 | 10.70 | 291482 | 11.65 | 265915 | 14.97 | 149384 | 17.44 |
| JB22549-5 | 88102 | 8.26 | 169245 | 10.70 | 255905 | 11.65 | 224859 | 14.97 | 117477 | 17.44 |
| ZZZZZZ | 108680 | 8.26 | 190692 | 10.69 | 286788 | 11.65 | 266710 | 14.97 | 155355 | 17.44 |
| ZZZZZZ | 93736 | 8.30 | 186882 | 10.69 | 281189 | 11.65 | 267054 | 14.97 | 158658 | 17.44 |
| ZZZZZZ | 87646 | 8.30 | 191483 | 10.69 | 284309 | 11.65 | 267766 | 14.97 | 154854 | 17.44 |
| ZZZZZZ | 99756 | 8.26 | 204410 | 10.69 | 307239 | 11.65 | 281421 | 14.97 | 162748 | 17.44 |

**IS 1** = Tert Butyl Alcohol-D9
**IS 2** = Pentafluorobenzene
**IS 3** = 1,4-Difluorobenzene
**IS 4** = Chlorobenzene-D5
**IS 5** = 1,4-Dichlorobenzene-d4

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Volatile Surrogate Recovery Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Method:** SW846 8260B **Matrix:** SO

**Samples and QC shown here apply to the above method**

| Lab Sample ID | Lab File ID | S1 | S2 | S3 | S4 |
|---|---|---|---|---|---|
| JB22549-1 | E197705.D | 88.0 | 86.0 | 96.0 | 91.0 |
| JB22549-1 | E197687.D | 91.0 | 85.0 | 159.0* [a] | 125.0 |
| JB22549-2 | A189674.D | 98.0 | 89.0 | 101.0 | 98.0 |
| JB22549-3 | O131788.D | 91.0 | 93.0 | 87.0 | 87.0 |
| JB22549-4 | E197689.D | 92.0 | 91.0 | 93.0 | 92.0 |
| JB22549-5 | O131789.D | 94.0 | 98.0 | 86.0 | 92.0 |
| JB22549-6 | A189673.D | 94.0 | 87.0 | 100.0 | 100.0 |
| JB22502-3MS | E197710.D | 92.0 | 88.0 | 92.0 | 89.0 |
| JB22502-3MSD | E197711.D | 92.0 | 88.0 | 91.0 | 90.0 |
| JB22507-18MS | A189661.D | 91.0 | 92.0 | 105.0 | 87.0 |
| JB22507-18MSD | A189662.D | 93.0 | 91.0 | 103.0 | 89.0 |
| JB22611-2MS | E197678.D | 95.0 | 91.0 | 93.0 | 93.0 |
| JB22611-2MSD | E197679.D | 96.0 | 91.0 | 93.0 | 94.0 |
| JB23049-4MS | O131782.D | 92.0 | 92.0 | 88.0 | 86.0 |
| JB23049-4MSD | O131783.D | 93.0 | 90.0 | 88.0 | 84.0 |
| VA7126-BS | A189660.D | 94.0 | 96.0 | 104.0 | 87.0 |
| VA7126-MB | A189659.D | 95.0 | 94.0 | 99.0 | 98.0 |
| VE8685-BS | E197677.D | 96.0 | 92.0 | 92.0 | 93.0 |
| VE8685-MB | E197676.D | 94.0 | 94.0 | 93.0 | 97.0 |
| VE8686-BS | E197702.D | 91.0 | 87.0 | 92.0 | 88.0 |
| VE8686-MB | E197701.D | 88.0 | 90.0 | 92.0 | 87.0 |
| VO5810-BS | O131781.D | 93.0 | 94.0 | 88.0 | 85.0 |
| VO5810-MB1 | O131780.D | 90.0 | 92.0 | 87.0 | 85.0 |

| Surrogate Compounds | Recovery Limits |
|---|---|
| **S1** = Dibromofluoromethane | 70-130% |
| **S2** = 1,2-Dichloroethane-D4 | 70-122% |
| **S3** = Toluene-D8 | 81-127% |
| **S4** = 4-Bromofluorobenzene | 66-132% |

(a) Outside control limits due to matrix interference.

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VA7086-ICC7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A188634.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Response Factor Report MSA

```
Method       : C:\HPCHEM\1\METHODS\MA7086.M (RTE Integrator)
Title        : SW 846  8260bB ZB624 60m x 0.25mm x 1.4um
Last Update  : Thu Nov 08 15:21:37 2012
Response via : Initial Calibration

Calibration Files
5   =A188631.D   2   =A188630.D   20  =A188633.D   50  =A188634.D
100 =A188639.D   1   =A188629.D   200 =A188636.D   0.5 =A188628.D
10  =A188632.D       =
```

| Compound | 5 | 2 | 20 | 50 | 100 | 1 | 200 | 0.5 | 10 | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) I Tert Butyl Alcohol-d9 ----------ISTD---------- | | | | | | | | | | | |
| 2) 1,4-dioxane | 0.081 | 0.103 | 0.109 | 0.094 | | 0.106 | | 0.093 | | 0.098 | 10.73 |
| 3) ethanol | | | | | | | | | | 0.000# | -1.00 |
| 4) tertiary butyl alcohol | 0.977 | 0.772 | 1.118 | 1.070 | 0.974 | 1.026 | | 1.018 | | 0.994 | 11.07 |
| 5) I pentafluorobenzene ----------ISTD---------- | | | | | | | | | | | |
| 6) chlorotrifluoroethene | | | | | | | | | | 0.000# | -1.00 |
| 7) chlorodifluoromethane | 0.238 | 0.315 | 0.262 | 0.292 | | 0.266 | | 0.275 | | 0.275 | 9.63 |
| 8) dichlorodifluoromethane | 0.285 | 0.288 | 0.416 | 0.354 | 0.370 | 0.340 | 0.319 | 0.398 | | 0.346 | 13.88 |
| 9) chloromethane | 0.447 | 0.402 | 0.485 | 0.422 | 0.439 | 0.480 | 0.408 | 0.452 | | 0.442 | 6.96 |
| 10) vinyl chloride | 0.471 | 0.391 | 0.491 | 0.420 | 0.453 | 0.475 | 0.403 | 0.477 | 0.459 | 0.449 | 7.93 |
| 11) bromomethane | 0.324 | 0.314 | 0.347 | 0.284 | 0.278 | 0.350 | 0.230 | 0.316 | | 0.305 | 13.09 |
| 12) chloroethane | 0.231 | 0.176 | 0.247 | 0.207 | 0.223 | 0.205 | 0.186 | 0.226 | | 0.212 | 11.12 |
| 13) vinyl bromide | | | | | | | | | | 0.000# | -1.00 |
| 14) trichlorofluoromethane | 0.550 | 0.411 | 0.559 | 0.458 | 0.490 | 0.540 | 0.423 | 0.535 | | 0.496 | 11.92 |
| 15) pentane | | | | | | | | | | 0.000# | -1.00 |
| 16) ethyl ether | 0.191 | 0.193 | 0.212 | 0.193 | 0.198 | 0.252 | 0.202 | 0.268 | 0.213 | 0.214 | 13.05 |
| 17) Freon 123a | | | | | | | | | | 0.000# | -1.00 |
| 18) acrolein | 0.059 | 0.072 | 0.067 | 0.062 | | 0.069 | | | 0.054 | 0.064 | 10.98 |
| 19) 1,1-dichloroethene | 0.277 | 0.247 | 0.341 | 0.297 | 0.315 | 0.276 | 0.297 | | 0.318 | 0.296 | 9.94 |
| 20) acetone | 0.080 | | 0.097 | 0.087 | 0.092 | | 0.085 | | 0.080 | 0.087 | 7.62 |
| 21) allyl chloride | 0.204 | 0.146 | 0.244 | 0.223 | 0.223 | | 0.219 | | 0.225 | 0.212 | 14.86 |
| 22) acetonitrile | 0.012 | 0.013 | 0.021 | 0.023 | 0.025 | | 0.025 | | 0.017 | 0.020 | 27.74 |

----- Linear regression ----- Coefficient = 0.9994

```
                Response Ratio = -0.01179 + 0.02510 *A

23)  iodomethane
           0.621 0.519 0.758 0.662 0.670 0.566 0.662 0.637 0.698   0.644   10.93
24)  iso-butyl alcohol
           0.010       0.011 0.011 0.013       0.012       0.010   0.011   10.89
25)  carbon disulfide
           1.044 0.935 1.262 1.104 1.166 0.987 1.107       1.170   1.097    9.65
26)  methylene chloride
           0.567       0.539 0.429 0.405       0.405       0.565   0.485   16.45
            ----- Linear regression -----  Coefficient =  0.9994
                Response Ratio = 0.03296 + 0.39599 *A

27)  methyl acetate
           0.217       0.276 0.259 0.271       0.260       0.249   0.255    8.35
28)  methyl tert butyl ether
           1.014 0.903 1.197 1.062 1.077 1.033 1.051 1.247 1.099   1.076    9.35
29)  trans-1,2-dichloroethene
           0.340 0.266 0.417 0.360 0.373 0.309 0.359 0.301 0.381   0.345   13.43
30)  di-isopropyl ether
           1.151 0.919 1.391 1.236 1.268 1.030 1.252 1.040 1.226   1.168   12.57
31)  t-butyl formate
           0.264       0.349 0.330 0.335       0.328       0.311   0.320    9.30
32)  3,3-dimethyl-1-butanol
           0.031 0.030 0.039 0.039 0.044 0.036 0.039       0.033   0.036   13.25
33)  ethyl tert-butyl ether
           1.143 0.941 1.383 1.234 1.228 1.020 1.228 0.918 1.208   1.145   13.50
34)  2-butanone
                       0.029 0.036 0.040       0.038       0.020   0.033   24.78
            ----- Linear regression -----  Coefficient =  0.9987
                Response Ratio = -0.00326 + 0.03950 *A

35)  1,1-dichloroethane
           0.640 0.534 0.789 0.669 0.698 0.633 0.673 0.685 0.719   0.671   10.30
36)  chloroprene
           0.501       0.605 0.534 0.555       0.513       0.542   0.542    6.77
37)  acrylonitrile
           0.085       0.110 0.109 0.121       0.114       0.092   0.105   12.98
38)  vinyl acetate
                       0.043 0.046 0.054       0.051       0.024   0.044   27.19
            ----- Linear regression -----  Coefficient =  0.9976
                Response Ratio = -0.00383 + 0.05238 *A

39)  ethyl acetate
           0.018       0.045 0.046 0.054       0.047       0.026   0.039   35.94
            ----- Linear regression -----  Coefficient =  0.9922
                Response Ratio = -0.00105 + 0.04853 *A

40)  ethyl acrylate
           0.260       0.403 0.413 0.446       0.424       0.345   0.382   17.97
            ----- Linear regression -----  Coefficient =  0.9990
                Response Ratio = -0.01022 + 0.43084 *A

41)  2,2-dichloropropane
           0.507 0.443 0.594 0.509 0.481 0.486 0.486 0.398 0.546   0.494   11.37
42)  cis-1,2-dichloroethene
           0.392 0.316 0.473 0.417 0.422 0.356 0.421 0.398 0.435   0.403   11.39
43)  propionitrile
           0.033       0.044 0.042 0.048       0.045       0.037   0.041   13.16
44)  bromochloromethane
```

```
            0.185 0.154 0.238 0.215 0.209 0.183 0.214       0.221   0.202   13.24
45)  tetrahydrofuran
            0.102       0.123 0.116 0.125       0.112       0.115   0.116    7.02
46)  chloroform
            0.662 0.579 0.814 0.704 0.686 0.670 0.672 0.780 0.747   0.702   10.01
47)  dibromofluoromethane (s)
            0.387 0.410 0.448 0.382 0.390 0.466 0.380       0.427   0.411    7.95
48)  1,2-dichloroethane-d4 (s)
            0.458 0.440 0.532 0.453 0.434 0.432 0.421       0.490   0.457    8.02
49)  freon 113
            0.245 0.170 0.279 0.245 0.265       0.237       0.256   0.242   14.35
50)  methacrylonitrile
            0.128       0.182 0.183 0.199       0.194       0.159   0.174   15.14
             ----- Linear regression -----  Coefficient =  0.9996
               Response Ratio = -0.00678 + 0.19678 *A

51)  cyclohexane
            0.462 0.382 0.529 0.459 0.506 0.370 0.468       0.511   0.461   12.63
52)  1,1,1-trichloroethane
            0.519 0.443 0.631 0.546 0.547 0.466 0.515 0.548 0.590   0.534   10.77
53)  tert-amyl methyl ether
            1.116 0.956 1.357 1.201 1.201 1.038 1.164 1.085 1.188   1.145   10.01

54) I   1,4-difluorobenzene   ----------------ISTD--------------------
55)  Di-isobutylene
                                                                    0.000#  -1.00
56)  epichlorohydrin
            0.019       0.024 0.023 0.024       0.023       0.021   0.022    9.95
57)  n-butyl alcohol
            0.004 0.004 0.007 0.007 0.008       0.008       0.005   0.006#  30.80
             ----- Linear regression -----  Coefficient =  0.9968
               Response Ratio = -0.01367 + 0.00786 *A

58)  carbon tetrachloride
            0.325 0.272 0.394 0.345 0.339 0.288 0.318 0.351 0.370   0.334   11.43
59)  1,1-dichloropropene
            0.321 0.253 0.382 0.344 0.344 0.286 0.332 0.316 0.359   0.326   11.86
60)  hexane
            0.298 0.363 0.346 0.299 0.311       0.294       0.327   0.320    8.35
61)  benzene
            0.962 0.843 1.160 1.042 1.028 0.950 1.009 1.174 1.070   1.026   10.08
62)  Iso-octane
            0.879 0.604 1.026 0.929 0.947 0.820 0.881       0.941   0.878   14.37
63)  heptane
            0.185       0.215 0.197 0.198       0.193       0.200   0.198    4.96
64)  tert amyl alcohol
            0.009       0.011 0.010 0.012       0.010       0.009   0.010    9.59
65)  isopropyl acetate
            0.471 0.377 0.485 0.467 0.476       0.460       0.398   0.448    9.49
66)  1,2-dichloroethane
            0.317 0.295 0.417 0.369 0.334 0.332 0.338 0.338 0.370   0.346   10.27
67)  trichloroethene
            0.244 0.212 0.292 0.260 0.263 0.222 0.258 0.289 0.275   0.257   10.67
68)  2-nitropropane
                        0.005 0.005 0.005       0.005               0.005#   3.17
69)  tert-amyl ethyl ether
            0.325 0.311 0.387 0.355 0.344 0.334 0.343 0.401 0.340   0.349    8.20
70)  methylcyclohexane
            0.376       0.450 0.402 0.426       0.387       0.416   0.410    6.57
71)  2-chloroethyl vinyl ether
```

```
            0.127       0.167 0.161 0.162       0.156       0.143   0.153    9.88
72)  methyl methacrylate
            0.128       0.176 0.168 0.179       0.174       0.157   0.164   11.60
73)  1,2-dichloropropane
            0.273 0.234 0.324 0.294 0.290 0.249 0.292 0.293 0.301   0.283    9.76
74)  dibromomethane
            0.153 0.138 0.190 0.176 0.168 0.159 0.169 0.136 0.175   0.163   11.00
75)  bromodichloromethane
            0.360 0.293 0.448 0.398 0.369 0.346 0.378 0.398 0.397   0.376   11.35
76)  cis-1,3-dichloropropene
            0.416 0.375 0.521 0.483 0.463 0.406 0.473 0.505 0.470   0.457   10.53
77)  toluene-d8 (s)
            0.903 0.918 1.057 0.923 0.963 1.039 0.920       0.984   0.963    6.10
78)  4-methyl-2-pentanone
            0.077       0.104 0.102 0.106       0.100       0.092   0.097   11.09
79)  toluene
            0.599 0.517 0.734 0.673 0.660 0.615 0.649 0.786 0.683   0.658   11.83
80)  3-methyl-1-butanol
            0.009 0.009 0.012 0.012 0.014 0.008 0.012       0.010   0.011   20.42
             ----- Linear regression -----  Coefficient =  0.9963
               Response Ratio = -0.00129 + 0.01278 *A

81)  trans-1,3-dichloropropene
            0.373 0.311 0.483 0.445 0.415 0.352 0.424 0.346 0.426   0.397   13.89
82)  ethyl methacrylate
            0.272       0.364 0.348 0.351       0.342       0.310   0.331   10.38
83)  1,1,2-trichloroethane
            0.191 0.166 0.235 0.215 0.208 0.203 0.209 0.241 0.210   0.209   10.61
84)  2-hexanone
            0.072       0.088 0.089 0.097       0.092       0.074   0.085   11.70

85) I   chlorobenzene-d5      ----------------ISTD---------------------
86)  tetrachloroethene
            0.238 0.195 0.279 0.249 0.255 0.225 0.249 0.262 0.271   0.247   10.23
87)  1,3-dichloropropane
            0.424 0.352 0.499 0.457 0.448 0.422 0.451 0.519 0.450   0.447   10.66
88)  butyl acetate
            0.143       0.187 0.185 0.193       0.189       0.155   0.175   11.81
89)  dibromochloromethane
            0.312 0.285 0.384 0.356 0.335 0.336 0.348 0.366 0.343   0.341    8.52
90)  1,2-dibromoethane
            0.265 0.219 0.304 0.289 0.278 0.272 0.283 0.247 0.283   0.271    9.26
91)  n-butyl ether
                                                                    0.000#  -1.00
92)  chlorobenzene
            0.848 0.720 0.953 0.883 0.849 0.828 0.874 1.135 0.897   0.888   12.63
93)  1,1,1,2-tetrachloroethane
            0.320 0.280 0.371 0.344 0.321 0.317 0.331 0.349 0.342   0.330    7.73
94)  ethylbenzene
            1.310 1.095 1.548 1.443 1.396 1.241 1.378 1.572 1.445   1.381   10.83
95)  m,p-xylene
            0.516 0.436 0.599 0.551 0.544 0.494 0.532 0.604 0.549   0.536    9.63
96)  o-xylene
            0.511 0.426 0.622 0.565 0.545 0.476 0.548 0.521 0.562   0.531   10.62
97)  styrene
            0.840 0.649 1.052 0.980 0.944 0.833 0.959 0.949 0.929   0.904   12.92
98)  bromoform
            0.228 0.201 0.268 0.255 0.244 0.213 0.245 0.271 0.246   0.241    9.79

99) I   1,4-dichlorobenzene-d ----------------ISTD---------------------
```

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VA7086-ICC7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A188634.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
100)  isopropylbenzene
            2.545 2.146 2.838 2.553 2.541 2.560 2.579 3.238 2.721   2.636   11.09
101)  cyclohexanone
            0.078 0.089 0.079 0.058 0.051 0.100 0.057       0.077   0.074   22.97
             ----- Linear regression -----  Coefficient =  0.9955
               Response Ratio = 0.02581 + 0.05509 *A

102)  4-bromofluorobenzene (s)
            0.840 0.958 0.859 0.754 0.759       0.788       0.837   0.828    8.53
103)  bromobenzene
            0.723 0.650 0.826 0.748 0.716 0.738 0.765 0.897 0.776   0.760    9.22
104)  1,1,2,2-tetrachloroethane
            0.694 0.655 0.787 0.730 0.724 0.763 0.728 0.948 0.749   0.753   10.94
105)  trans-1,4-dichloro-2-butene
            0.161 0.122 0.170 0.169 0.171       0.176       0.162   0.162   11.13
106)  1,2,3-trichloropropane
            0.170 0.149 0.188 0.176 0.170 0.170 0.171       0.175   0.171    6.28
107)  n-propylbenzene
            2.979 2.542 3.367 3.000 2.995 2.925 3.014 3.707 3.230   3.084   10.50
108)  2-chlorotoluene
            0.657 0.559 0.742 0.668 0.651 0.639 0.668 0.932 0.716   0.693   14.91
109)  4-chlorotoluene
            1.965 1.681 2.171 1.942 1.881 1.978 1.966 2.721 2.034   2.038   14.09
110)  p-ethyltoluene
            2.604 2.482 2.891 2.642 2.680 2.979 2.641 3.271 2.644   2.759    8.84
111)  1,3,5-trimethylbenzene
            2.291 1.880 2.471 2.203 2.126 2.278 2.155       2.339   2.218    7.89
112)  tert-butylbenzene
            1.836 1.558 2.082 1.920 1.825 1.876 1.865 2.263 1.996   1.914   10.14
113)  pentachloroethane
            0.485 0.428 0.554 0.492 0.456 0.465 0.480 0.601 0.522   0.498   10.71
114)  1,2,4-trimethylbenzene
            2.187 1.899 2.522 2.274 2.178 2.177 2.255 2.892 2.356   2.305   11.97
115)  sec-butylbenzene
            2.782 2.382 3.199 2.868 2.771 2.712 2.772 3.406 3.021   2.879   10.32
116)  1,3-dichlorobenzene
            1.300 1.134 1.500 1.347 1.310 1.362 1.341 1.788 1.408   1.388   12.89
117)  p-isopropyltoluene
            2.304 2.009 2.659 2.383 2.289 2.211 2.330 2.697 2.478   2.373    9.06
118)  1,2,3-trimethylbenzene
                                                                    0.000#  -1.00
119)  1,4-dichlorobenzene
            1.352 1.258 1.527 1.381 1.321 1.456 1.368       1.426   1.386    6.00
120)  p-diethylbenzene
            1.298 1.183 1.516 1.363 1.361 1.399 1.314 1.584 1.377   1.377    8.54
121)  1,2-dichlorobenzene
            1.276 1.144 1.489 1.340 1.219 1.292 1.251 1.695 1.369   1.342   12.25
122)  n-butylbenzene
            1.211 0.948 1.396 1.273 1.236 1.069 1.231 1.247 1.303   1.213   10.84
123)  1,2,4,5-tetramethylbenzene
            2.173 1.955 2.502 2.237 1.910 2.198 1.831 2.503 2.222   2.170   11.02
124)  1,2-dibromo-3-chloropropane
            0.098 0.089 0.123 0.115 0.077 0.119             0.111   0.105   16.30
        ----- Quadratic regression -----                Coefficient =  0.9984
               Response Ratio = -0.00385 + 0.15295 *A + -0.03690 *A^2

125)  1,3,5-trichlorobenzene
            0.987 0.891 1.184 1.045 0.844 0.944 0.810       1.076   0.973   12.95
126)  1,2,4-trichlorobenzene
            0.721 0.589 0.945 0.834 0.637 0.689 0.589 1.003 0.803   0.757   19.86
```

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VA7086-ICC7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A188634.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
          ----- Quadratic regression -----                Coefficient =  0.9955
               Response Ratio = 0.01664 + 0.76723 *A + -0.04668 *A^2

127)  hexachlorobutadiene
            0.566 0.501 0.641 0.546 0.408       0.377       0.603   0.520   18.80
          ----- Quadratic regression -----                Coefficient =  0.9938
               Response Ratio = 0.03066 + 0.47774 *A + -0.02763 *A^2

128)  naphthalene
            1.375 1.225 1.833 1.669 1.207       1.064       1.565   1.420   19.63
          ----- Quadratic regression -----                Coefficient =  0.9926
               Response Ratio = 0.05305 + 1.50646 *A + -0.11598 *A^2

129)  1,2,3-trichlorobenzene
            0.661 0.559 0.873 0.729 0.494 0.643             0.752   0.673   18.71
          ----- Quadratic regression -----                Coefficient =  0.9991
               Response Ratio = -0.02042 + 0.99299 *A + -0.24409 *A^2

130)  hexachloroethane
            0.443 0.382 0.515 0.471 0.422 0.317 0.417       0.484   0.431   14.45
131)  Ethylenimine
                                                                    0.000#  -1.00
132)  Bis(chloromethyl)ether
                                                                    0.000#  -1.00
133)  2-methylnaphthalene
                                                                    0.000#  -1.00
 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

           MA7086.M          Thu Nov 08 15:22:35 2012   MSA
```

6.7.1

6

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VA7086-ICV7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A188642.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\A188642.D Vial: 100
Acq On : 7 Nov 2012 7:21 pm Operator: Oksanat
Sample : icv7086-50 Inst : MSA
Misc : MS38288,VA7086,5,,,,1 Multiplr: 1.00
MS Integration Params: LSCINT.P

Method : C:\HPCHEM\1\METHODS\MA7086.M (RTE Integrator)
Title : SW 846 8260bB ZB624 60m x 0.25mm x 1.4um
Last Update : Thu Nov 08 15:21:37 2012
Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | Tert Butyl Alcohol-d9 | 1.000 | 1.000 | 0.0 | 113 | 0.00 | 7.24 |
| 2 | M | 1,4-dioxane | 0.098 | 0.097 | 1.0 | 101 | 0.00 | 11.26 |
| 3 | M | ethanol | | ----------NA---------- | | | | |
| 4 | M | tertiary butyl alcohol | 0.994 | 1.047 | -5.3 | 111 | 0.00 | 7.36 |
| 5 | I | pentafluorobenzene | 1.000 | 1.000 | 0.0 | 108 | 0.00 | 9.54 |
| 6 | | chlorotrifluoroethene | | ----------NA---------- | | | | |
| 7 | M | chlorodifluoromethane | 0.275 | 0.269 | 2.2 | 111 | 0.00 | 3.88 |
| 8 | M | dichlorodifluoromethane | 0.346 | 0.332 | 4.0 | 101 | 0.00 | 3.86 |
| 9 | M | chloromethane | 0.442 | 0.491 | -11.1 | 125 | 0.01 | 4.16 |
| 10 | M | vinyl chloride | 0.449 | 0.412 | 8.2 | 105 | 0.00 | 4.41 |
| 11 | M | bromomethane | 0.305 | 0.300 | 1.6 | 113 | 0.00 | 5.03 |
| 12 | M | chloroethane | 0.212 | 0.227 | -7.1 | 118 | 0.00 | 5.20 |
| 13 | | vinyl bromide | | ----------NA---------- | | | | |
| 14 | M | trichlorofluoromethane | 0.496 | 0.464 | 6.5 | 109 | 0.00 | 5.69 |
| 15 | m | pentane | | ----------NA---------- | | | | |
| 16 | M | ethyl ether | 0.214 | 0.202 | 5.6 | 113 | 0.00 | 6.08 |
| 17 | | Freon 123a | | ----------NA---------- | | | | |
| 18 | M | acrolein | 0.064 | 0.071 | -10.9 | 124 | 0.00 | 6.33 |
| 19 | M | 1,1-dichloroethene | 0.296 | 0.301 | -1.7 | 109 | 0.00 | 6.50 |
| 20 | M | acetone | 0.087 | 0.089 | -2.3 | 110 | 0.00 | 6.59 |
| 21 | M | allyl chloride | 0.212 | 0.221 | -4.2 | 106 | 0.00 | 7.04 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 22 | M | acetonitrile | 500.000 | 498.517 | 0.3 | 112 | 0.00 | 7.03 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 23 | M | iodomethane | 0.644 | 0.661 | -2.6 | 107 | 0.00 | 6.78 |
| 24 | M | iso-butyl alcohol | 0.011 | 0.012 | -9.1 | 113 | 0.00 | 9.87 |
| 25 | M | carbon disulfide | 1.097 | 1.094 | 0.3 | 107 | 0.00 | 6.90 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 26 | M | methylene chloride | 50.000 | 51.038 | -2.1 | 110 | 0.00 | 7.24 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 27 | M | methyl acetate | 0.255 | 0.228 | 10.6 | 95 | 0.00 | 7.05 |
| 28 | M | methyl tert butyl ether | 1.076 | 1.069 | 0.7 | 108 | 0.00 | 7.58 |
| 29 | M | trans-1,2-dichloroethene | 0.345 | 0.367 | -6.4 | 110 | 0.00 | 7.63 |
| 30 | M | di-isopropyl ether | 1.168 | 1.310 | -12.2 | 114 | 0.00 | 8.21 |
| 31 | m | t-butyl formate | 0.320 | 0.327 | -2.2 | 107 | 0.00 | 9.41 |
| 32 | m | 3,3-dimethyl-1-butanol | 0.036 | 0.036 | 0.0 | 99 | 0.00 | 13.18 |
| 33 | M | ethyl tert-butyl ether | 1.145 | 1.219 | -6.5 | 106 | 0.00 | 8.70 |

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VA7086-ICV7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A188642.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 34 | M | 2-butanone | 50.000 | 47.380 | 5.2 | 103 | 0.00 | 8.98 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 35 | M | 1,1-dichloroethane | 0.671 | 0.705 | -5.1 | 113 | 0.00 | 8.21 |
| 36 | M | chloroprene | 0.542 | 0.484 | 10.7 | 98 | 0.00 | 8.33 |
| 37 | M | acrylonitrile | 0.105 | 0.113 | -7.6 | 111 | 0.00 | 7.59 |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 38 | M | vinyl acetate | 50.000 | 51.954 | -3.9 | 117 | 0.00 | 8.23 |
| 39 | M | ethyl acetate | 50.000 | 54.570 | -9.1 | 120 | 0.01 | 9.00 |
| 40 | | ethyl acrylate | 50.000 | 48.436 | 3.1 | 106 | 0.00 | 10.87 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 41 | M | 2,2-dichloropropane | 0.494 | 0.478 | 3.2 | 101 | 0.00 | 8.98 |
| 42 | M | cis-1,2-dichloroethene | 0.403 | 0.432 | -7.2 | 111 | 0.00 | 8.99 |
| 43 | M | propionitrile | 0.041 | 0.045 | -9.8 | 115 | 0.00 | 9.06 |
| 44 | M | bromochloromethane | 0.202 | 0.213 | -5.4 | 107 | 0.00 | 9.31 |
| 45 | M | tetrahydrofuran | 0.116 | 0.117 | -0.9 | 108 | 0.00 | 9.37 |
| 46 | M | chloroform | 0.702 | 0.701 | 0.1 | 107 | 0.00 | 9.38 |
| 47 | S | dibromofluoromethane (s) | 0.411 | 0.397 | 3.4 | 112 | 0.00 | 9.58 |
| 48 | S | 1,2-dichloroethane-d4 (s) | 0.457 | 0.443 | 3.1 | 105 | 0.00 | 10.02 |
| 49 | M | freon 113 | 0.242 | 0.231 | 4.5 | 102 | 0.00 | 6.49 |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 50 | M | methacrylonitrile | 50.000 | 47.958 | 4.1 | 107 | 0.00 | 9.26 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 51 | | cyclohexane | 0.461 | 0.476 | -3.3 | 111 | 0.00 | 9.70 |
| 52 | M | 1,1,1-trichloroethane | 0.534 | 0.521 | 2.4 | 103 | 0.00 | 9.63 |
| 53 | M | tert-amyl methyl ether | 1.145 | 1.170 | -2.2 | 105 | 0.00 | 10.14 |
| 54 | I | 1,4-difluorobenzene | 1.000 | 1.000 | 0.0 | 111 | 0.00 | 10.49 |
| 55 | M | Di-isobutylene | 0.000 | 0.000# | 0.0 | 0# | 0.10 | 9.92 |
| 56 | M | epichlorohydrin | 0.022 | 0.022 | 0.0 | 104 | 0.00 | 11.83 |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 57 | M | n-butyl alcohol | 2500.000 | 2469.119 | 1.2 | 115 | 0.00 | 10.65 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 58 | M | carbon tetrachloride | 0.334 | 0.320 | 4.2 | 103 | 0.00 | 9.85 |
| 59 | M | 1,1-dichloropropene | 0.326 | 0.326 | 0.0 | 106 | 0.00 | 9.83 |
| 60 | M | hexane | 0.320 | 0.284 | 11.3 | 105 | 0.00 | 7.94 |
| 61 | M | benzene | 1.026 | 1.043 | -1.7 | 111 | 0.00 | 10.09 |
| 62 | M | Iso-octane | 0.878 | 0.792 | 9.8 | 95 | 0.00 | 10.10 |
| 63 | M | heptane | 0.198 | 0.186 | 6.0 | 104 | 0.00 | 10.28 |
| 64 | m | tert amyl alcohol | 0.010 | 0.010 | 5.0 | 103 | 0.00 | 9.99 |
| 65 | M | isopropyl acetate | 0.448 | 0.487 | -8.7 | 116 | 0.00 | 10.03 |
| 66 | M | 1,2-dichloroethane | 0.346 | 0.347 | -0.3 | 104 | 0.00 | 10.11 |
| 67 | M | trichloroethene | 0.257 | 0.257 | 0.0 | 110 | 0.00 | 10.85 |
| 68 | M | 2-nitropropane | 0.005 | 0.004# | 20.0 | 99 | 0.00 | 11.69 |
| 69 | m | tert-amyl ethyl ether | 0.349 | 0.373 | 6.9 | 117 | 0.00 | 11.02 |
| 70 | m | methylcyclohexane | 0.410 | 0.376 | 8.3 | 104 | 0.00 | 11.07 |
| 71 | M | 2-chloroethyl vinyl ether | 0.153 | 0.161 | -5.2 | 111 | 0.00 | 11.70 |
| 72 | M | methyl methacrylate | 0.164 | 0.172 | -4.9 | 113 | 0.00 | 11.14 |
| 73 | M | 1,2-dichloropropane | 0.283 | 0.302 | -6.7 | 114 | 0.00 | 11.12 |
| 74 | M | dibromomethane | 0.163 | 0.176 | -8.0 | 111 | 0.00 | 11.29 |
| 75 | M | bromodichloromethane | 0.376 | 0.390 | -3.7 | 109 | 0.00 | 11.43 |
| 76 | M | cis-1,3-dichloropropene | 0.457 | 0.455 | 0.4 | 105 | 0.00 | 11.93 |

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VA7086-ICV7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A188642.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 77 | S | toluene-d8 (s) | 0.963 | 0.941 | 2.3 | 113 | 0.00 | 12.24 |
| 78 | M | 4-methyl-2-pentanone | 0.097 | 0.098 | -1.0 | 107 | 0.00 | 12.04 |
| 79 | M | toluene | 0.658 | 0.644 | 2.1 | 106 | 0.00 | 12.32 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 80 | M | 3-methyl-1-butanol | 1000.000 | 912.319 | 8.8 | 103 | 0.00 | 12.07 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 81 | M | trans-1,3-dichloropropene | 0.397 | 0.416 | -4.8 | 104 | 0.00 | 12.54 |
| 82 | M | ethyl methacrylate | 0.331 | 0.325 | 1.8 | 104 | 0.00 | 12.55 |
| 83 | M | 1,1,2-trichloroethane | 0.209 | 0.212 | -1.4 | 110 | 0.00 | 12.78 |
| 84 | M | 2-hexanone | 0.085 | 0.086 | -1.2 | 108 | 0.00 | 12.98 |
| 85 | I | chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 110 | 0.00 | 13.93 |
| 86 | M | tetrachloroethene | 0.247 | 0.241 | 2.4 | 107 | 0.00 | 12.97 |
| 87 | M | 1,3-dichloropropane | 0.447 | 0.455 | -1.8 | 110 | 0.00 | 12.98 |
| 88 | M | butyl acetate | 0.175 | 0.180 | -2.9 | 107 | 0.00 | 13.07 |
| 89 | M | dibromochloromethane | 0.341 | 0.339 | 0.6 | 105 | 0.00 | 13.28 |
| 90 | M | 1,2-dibromoethane | 0.271 | 0.274 | -1.1 | 104 | 0.00 | 13.44 |
| 91 | M | n-butyl ether | | ----------NA---------- | | | | |
| 92 | M | chlorobenzene | 0.888 | 0.868 | 2.3 | 108 | 0.00 | 13.96 |
| 93 | M | 1,1,1,2-tetrachloroethane | 0.330 | 0.332 | -0.6 | 106 | 0.00 | 14.03 |
| 94 | M | ethylbenzene | 1.381 | 1.391 | -0.7 | 106 | 0.00 | 14.02 |
| 95 | M | m,p-xylene | 0.536 | 0.538 | -0.4 | 108 | 0.00 | 14.15 |
| 96 | M | o-xylene | 0.531 | 0.551 | -3.8 | 107 | 0.00 | 14.62 |
| 97 | M | styrene | 0.904 | 0.950 | -5.1 | 107 | 0.00 | 14.63 |
| 98 | M | bromoform | 0.241 | 0.240 | 0.4 | 103 | 0.00 | 14.92 |
| 99 | I | 1,4-dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 109 | 0.00 | 16.56 |
| 100 | M | isopropylbenzene | 2.636 | 2.451 | 7.0 | 105 | 0.00 | 15.00 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 101 | m | cyclohexanone | 500.000 | 191.184 | 61.8# | 44 | 0.00 | 15.19 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 102 | S | 4-bromofluorobenzene (s) | 0.828 | 0.748 | 9.7 | 108 | 0.00 | 15.24 |
| 103 | M | bromobenzene | 0.760 | 0.737 | 3.0 | 107 | 0.00 | 15.45 |
| 104 | M | 1,1,2,2-tetrachloroethane | 0.753 | 0.686 | 8.9 | 102 | 0.00 | 15.35 |
| 105 | M | trans-1,4-dichloro-2-bute | 0.162 | 0.145 | 10.5 | 94 | 0.00 | 15.41 |
| 106 | M | 1,2,3-trichloropropane | 0.171 | 0.168 | 1.8 | 104 | 0.00 | 15.44 |
| 107 | M | n-propylbenzene | 3.084 | 2.973 | 3.6 | 108 | 0.00 | 15.47 |
| 108 | M | 2-chlorotoluene | 0.693 | 0.654 | 5.6 | 107 | 0.00 | 15.64 |
| 109 | M | 4-chlorotoluene | 2.038 | 1.887 | 7.4 | 106 | 0.00 | 15.75 |
| 110 | m | p-ethyltoluene | 2.759 | 2.566 | 7.0 | 106 | 0.00 | 15.58 |
| 111 | M | 1,3,5-trimethylbenzene | 2.218 | 2.099 | 5.4 | 104 | 0.00 | 15.64 |
| 112 | M | tert-butylbenzene | 1.914 | 1.793 | 6.3 | 102 | 0.00 | 16.03 |
| 113 | M | pentachloroethane | 0.498 | 0.483 | 3.0 | 107 | 0.00 | 16.13 |
| 114 | M | 1,2,4-trimethylbenzene | 2.305 | 2.228 | 3.3 | 107 | 0.00 | 16.09 |
| 115 | M | sec-butylbenzene | 2.879 | 2.733 | 5.1 | 104 | 0.00 | 16.27 |
| 116 | M | 1,3-dichlorobenzene | 1.388 | 1.328 | 4.3 | 107 | 0.00 | 16.49 |
| 117 | M | p-isopropyltoluene | 2.373 | 2.360 | 0.5 | 108 | 0.00 | 16.42 |
| 118 | M | 1,2,3-trimethylbenzene | | ----------NA---------- | | | | |
| 119 | M | 1,4-dichlorobenzene | 1.386 | 1.346 | 2.9 | 106 | 0.00 | 16.59 |
| 120 | m | p-diethylbenzene | 1.377 | 1.306 | 5.2 | 104 | 0.00 | 16.84 |
| 121 | M | 1,2-dichlorobenzene | 1.342 | 1.297 | 3.4 | 105 | 0.00 | 17.03 |
| 122 | M | n-butylbenzene | 1.213 | 1.212 | 0.1 | 104 | 0.00 | 16.88 |
| 123 | m | 1,2,4,5-tetramethylbenzen | 2.170 | 2.150 | 0.9 | 105 | 0.00 | 17.73 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 124 | M | 1,2-dibromo-3-chloropropa | 50.000 | 47.324 | 5.4 | 102 | 0.00 | 17.89 |

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VA7086-ICV7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A188642.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 125 | M | 1,3,5-trichlorobenzene | 0.973 | 0.995 | -2.3 | 104 | 0.00 | 18.09 |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 126 | M | 1,2,4-trichlorobenzene | 50.000 | 56.166 | -12.3 | 107 | 0.00 | 18.79 |
| 127 | M | hexachlorobutadiene | 50.000 | 53.213 | -6.4 | 101 | 0.00 | 18.92 |
| 128 | M | naphthalene | 50.000 | 55.982 | -12.0 | 104 | 0.00 | 19.11 |
| 129 | M | 1,2,3-trichlorobenzene | 50.000 | 47.171 | 5.7 | 104 | 0.00 | 19.39 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 130 | M | hexachloroethane | 0.431 | 0.444 | -3.0 | 103 | 0.00 | 17.32 |
| 131 | | Ethylenimine | | ----------NA---------- | | | | |
| 132 | | Bis(chloromethyl)ether | | ----------NA---------- | | | | |
| 133 | | 2-methylnaphthalene | | ----------NA---------- | | | | |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
A188634.D MA7086.M Thu Nov 08 15:23:28 2012 MSA

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VA7126-CC7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A189657.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\A189657.D                    Vial: 45
Acq On    : 10 Dec 2012  10:43 pm                    Operator: Oksanat
Sample    : cc7086-50                                Inst    : MSA
Misc      : MS39549,VA7126,5,,,,1                    Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MA7086.M (RTE Integrator)
Title        : SW 846  8260bB ZB624 60m x 0.25mm x 1.4um
Last Update  : Thu Nov 08 15:38:19 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.010  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | Tert Butyl Alcohol-d9 | 1.000 | 1.000 | 0.0 | 116 | 0.00 | 7.24 |
| 2 | M | 1,4-dioxane | 0.098 | 0.105 | -7.1 | 111 | 0.00 | 11.26 |
| 3 | M | ethanol | | ----------NA---------- | | | | |
| 4 | M | tertiary butyl alcohol | 0.994 | 1.094 | -10.1 | 118 | 0.00 | 7.36 |
| 5 | I | pentafluorobenzene | 1.000 | 1.000 | 0.0 | 113 | 0.01 | 9.55 |
| 6 | | chlorotrifluoroethene | | ----------NA---------- | | | | |
| 7 | M | chlorodifluoromethane | 0.275 | 0.217 | 21.1# | 94 | 0.00 | 3.88 |
| 8 | M | dichlorodifluoromethane | 0.346 | 0.368 | -6.4 | 118 | 0.00 | 3.86 |
| 9 | M | chloromethane | 0.442 | 0.460 | -4.1 | 123 | 0.01 | 4.16 |
| 10 | M | vinyl chloride | 0.449 | 0.446 | 0.7 | 120 | 0.02 | 4.42 |
| 11 | M | bromomethane | 0.305 | 0.314 | -3.0 | 125 | 0.02 | 5.05 |
| 12 | M | chloroethane | 0.212 | 0.230 | -8.5 | 126 | 0.03 | 5.23 |
| 13 | | vinyl bromide | | ----------NA---------- | | | | |
| 14 | M | trichlorofluoromethane | 0.496 | 0.509 | -2.6 | 126 | 0.01 | 5.70 |
| 15 | m | pentane | | ----------NA---------- | | | | |
| 16 | M | ethyl ether | 0.214 | 0.202 | 5.6 | 119 | 0.00 | 6.09 |
| 17 | | Freon 123a | | ----------NA---------- | | | | |
| 18 | M | acrolein | 0.064 | 0.059 | 7.8 | 109 | 0.00 | 6.34 |
| 19 | M | 1,1-dichloroethene | 0.296 | 0.284 | 4.1 | 108 | 0.01 | 6.51 |
| 20 | M | acetone | 0.087 | 0.087 | 0.0 | 113 | 0.02 | 6.61 |
| 21 | M | allyl chloride | 0.212 | 0.215 | -1.4 | 109 | 0.02 | 7.06 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 22 | M | acetonitrile | 500.000 | 456.882 | 8.6 | 107 | 0.00 | 7.04 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 23 | M | iodomethane | 0.644 | 0.658 | -2.2 | 112 | 0.02 | 6.79 |
| 24 | M | iso-butyl alcohol | 0.011 | 0.012 | -9.1 | 119 | 0.00 | 9.87 |
| 25 | M | carbon disulfide | 1.097 | 1.032 | 5.9 | 106 | 0.01 | 6.92 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 26 | M | methylene chloride | 50.000 | 44.504 | 11.0 | 102 | 0.01 | 7.25 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 27 | M | methyl acetate | 0.255 | 0.227 | 11.0 | 99 | 0.01 | 7.06 |
| 28 | M | methyl tert butyl ether | 1.076 | 1.052 | 2.2 | 112 | 0.01 | 7.60 |
| 29 | M | trans-1,2-dichloroethene | 0.345 | 0.341 | 1.2 | 107 | 0.02 | 7.64 |
| 30 | M | di-isopropyl ether | 1.168 | 1.104 | 5.5 | 101 | 0.01 | 8.22 |
| 31 | m | t-butyl formate | 0.320 | 0.312 | 2.5 | 107 | 0.01 | 9.42 |
| 32 | m | 3,3-dimethyl-1-butanol | 0.036 | 0.037 | -2.8 | 107 | 0.00 | 13.18 |
| 33 | M | ethyl tert-butyl ether | 1.145 | 1.108 | 3.2 | 102 | 0.01 | 8.71 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VA7126-CC7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A189657.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 34 | M | 2-butanone | 50.000 | 49.711 | 0.6 | 115 | 0.01 | 8.99 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 35 | M | 1,1-dichloroethane | 0.671 | 0.639 | 4.8 | 108 | 0.00 | 8.22 |
| 36 | M | chloroprene | 0.542 | 0.483 | 10.9 | 102 | 0.01 | 8.35 |
| 37 | M | acrylonitrile | 0.105 | 0.108 | -2.9 | 112 | 0.01 | 7.60 |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 38 | M | vinyl acetate | 50.000 | 42.865 | 14.3 | 100 | 0.00 | 8.24 |
| 39 | M | ethyl acetate | 50.000 | 44.090 | 11.8 | 102 | 0.02 | 9.01 |
| 40 | | ethyl acrylate | | ----------NA---------- | | | | |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 41 | M | 2,2-dichloropropane | 0.494 | 0.476 | 3.6 | 106 | 0.00 | 8.99 |
| 42 | M | cis-1,2-dichloroethene | 0.403 | 0.403 | 0.0 | 109 | 0.01 | 9.00 |
| 43 | M | propionitrile | 0.041 | 0.043 | -4.9 | 116 | 0.01 | 9.07 |
| 44 | M | bromochloromethane | 0.202 | 0.218 | -7.9 | 115 | 0.01 | 9.32 |
| 45 | M | tetrahydrofuran | 0.116 | 0.105 | 9.5 | 102 | 0.00 | 9.38 |
| 46 | M | chloroform | 0.702 | 0.690 | 1.7 | 111 | 0.01 | 9.39 |
| 47 | S | dibromofluoromethane (s) | 0.411 | 0.382 | 7.1 | 113 | 0.01 | 9.60 |
| 48 | S | 1,2-dichloroethane-d4 (s) | 0.457 | 0.421 | 7.9 | 105 | 0.02 | 10.03 |
| 49 | M | freon 113 | 0.242 | 0.222 | 8.3 | 102 | 0.03 | 6.51 |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 50 | M | methacrylonitrile | 50.000 | 46.611 | 6.8 | 110 | 0.00 | 9.27 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 51 | | cyclohexane | 0.461 | 0.430 | 6.7 | 106 | 0.01 | 9.72 |
| 52 | M | 1,1,1-trichloroethane | 0.534 | 0.535 | -0.2 | 111 | 0.02 | 9.65 |
| 53 | M | tert-amyl methyl ether | 1.145 | 1.097 | 4.2 | 103 | 0.00 | 10.14 |
| 54 | I | 1,4-difluorobenzene | 1.000 | 1.000 | 0.0 | 112 | 0.01 | 10.50 |
| 55 | M | Di-isobutylene | | ----------NA---------- | | | | |
| 56 | M | epichlorohydrin | 0.022 | 0.023 | -4.5 | 109 | 0.00 | 11.84 |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 57 | M | n-butyl alcohol | 2500.000 | 2365.345 | 5.4 | 111 | 0.00 | 10.65 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 58 | M | carbon tetrachloride | 0.334 | 0.345 | -3.3 | 112 | 0.01 | 9.86 |
| 59 | M | 1,1-dichloropropene | 0.326 | 0.329 | -0.9 | 108 | 0.00 | 9.83 |
| 60 | M | hexane | 0.320 | 0.250 | 21.9# | 94 | 0.01 | 7.95 |
| 61 | M | benzene | 1.026 | 1.004 | 2.1 | 108 | 0.01 | 10.10 |
| 62 | M | Iso-octane | 0.878 | 0.767 | 12.6 | 93 | 0.02 | 10.11 |
| 63 | M | heptane | 0.198 | 0.170 | 14.1 | 97 | 0.01 | 10.29 |
| 64 | m | tert amyl alcohol | | ----------NA---------- | | | | |
| 65 | M | isopropyl acetate | 0.448 | 0.431 | 3.8 | 104 | 0.01 | 10.04 |
| 66 | M | 1,2-dichloroethane | 0.346 | 0.375 | -8.4 | 114 | 0.00 | 10.12 |
| 67 | M | trichloroethene | 0.257 | 0.254 | 1.2 | 109 | 0.01 | 10.86 |
| 68 | M | 2-nitropropane | 0.005 | 0.003# | 40.0# | 74 | 0.00 | 11.70 |
| 69 | m | tert-amyl ethyl ether | | ----------NA---------- | | | | |
| 70 | m | methylcyclohexane | 0.410 | 0.357 | 12.9 | 100 | 0.00 | 11.08 |
| 71 | M | 2-chloroethyl vinyl ether | 0.153 | 0.157 | -2.6 | 110 | 0.00 | 11.70 |
| 72 | M | methyl methacrylate | 0.164 | 0.168 | -2.4 | 112 | 0.00 | 11.15 |
| 73 | M | 1,2-dichloropropane | 0.283 | 0.280 | 1.1 | 107 | 0.01 | 11.13 |
| 74 | M | dibromomethane | 0.163 | 0.176 | -8.0 | 112 | 0.00 | 11.30 |
| 75 | M | bromodichloromethane | 0.376 | 0.395 | -5.1 | 112 | 0.01 | 11.44 |
| 76 | M | cis-1,3-dichloropropene | 0.457 | 0.469 | -2.6 | 109 | 0.01 | 11.94 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VA7126-CC7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A189657.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 77 | S | toluene-d8 (s) | 0.963 | 1.010 | -4.9 | 123 | 0.01 | 12.25 |
| 78 | M | 4-methyl-2-pentanone | 0.097 | 0.102 | -5.2 | 112 | 0.00 | 12.04 |
| 79 | M | toluene | 0.658 | 0.642 | 2.4 | 107 | 0.01 | 12.33 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 80 | M | 3-methyl-1-butanol | 1000.000 | 967.502 | 3.2 | 111 | 0.01 | 12.08 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 81 | M | trans-1,3-dichloropropene | 0.397 | 0.432 | -8.8 | 109 | 0.01 | 12.56 |
| 82 | M | ethyl methacrylate | 0.331 | 0.339 | -2.4 | 109 | 0.01 | 12.56 |
| 83 | M | 1,1,2-trichloroethane | 0.209 | 0.214 | -2.4 | 112 | 0.01 | 12.79 |
| 84 | M | 2-hexanone | 0.085 | 0.088 | -3.5 | 112 | 0.00 | 12.99 |
| 85 | I | chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 116 | 0.01 | 13.94 |
| 86 | M | tetrachloroethene | 0.247 | 0.243 | 1.6 | 114 | 0.01 | 12.98 |
| 87 | M | 1,3-dichloropropane | 0.447 | 0.439 | 1.8 | 111 | 0.01 | 12.99 |
| 88 | M | butyl acetate | 0.175 | 0.167 | 4.6 | 105 | 0.00 | 13.07 |
| 89 | M | dibromochloromethane | 0.341 | 0.355 | -4.1 | 116 | 0.00 | 13.28 |
| 90 | M | 1,2-dibromoethane | 0.271 | 0.281 | -3.7 | 113 | 0.01 | 13.45 |
| 91 | M | n-butyl ether | | ----------NA---------- | | | | |
| 92 | M | chlorobenzene | 0.888 | 0.834 | 6.1 | 110 | 0.00 | 13.97 |
| 93 | M | 1,1,1,2-tetrachloroethane | 0.330 | 0.335 | -1.5 | 113 | 0.01 | 14.04 |
| 94 | M | ethylbenzene | 1.381 | 1.306 | 5.4 | 105 | 0.00 | 14.03 |
| 95 | M | m,p-xylene | 0.536 | 0.508 | 5.2 | 107 | 0.00 | 14.15 |
| 96 | M | o-xylene | 0.531 | 0.517 | 2.6 | 106 | 0.01 | 14.63 |
| 97 | M | styrene | 0.904 | 0.907 | -0.3 | 107 | 0.00 | 14.64 |
| 98 | M | bromoform | 0.241 | 0.254 | -5.4 | 115 | 0.01 | 14.94 |
| 99 | I | 1,4-dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 116 | 0.01 | 16.57 |
| 100 | M | isopropylbenzene | 2.636 | 2.323 | 11.9 | 106 | 0.01 | 15.01 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 101 | m | cyclohexanone | 500.000 | 247.894 | 50.4# | 60 | 0.00 | 15.20 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 102 | S | 4-bromofluorobenzene (s) | 0.828 | 0.724 | 12.6 | 112 | 0.00 | 15.24 |
| 103 | M | bromobenzene | 0.760 | 0.698 | 8.2 | 108 | 0.01 | 15.46 |
| 104 | M | 1,1,2,2-tetrachloroethane | 0.753 | 0.684 | 9.2 | 109 | 0.01 | 15.36 |
| 105 | M | trans-1,4-dichloro-2-bute | 0.162 | 0.156 | 3.7 | 108 | 0.01 | 15.41 |
| 106 | M | 1,2,3-trichloropropane | 0.171 | 0.174 | -1.8 | 115 | 0.00 | 15.44 |
| 107 | M | n-propylbenzene | 3.084 | 2.689 | 12.8 | 104 | 0.00 | 15.47 |
| 108 | M | 2-chlorotoluene | 0.693 | 0.610 | 12.0 | 106 | 0.00 | 15.64 |
| 109 | M | 4-chlorotoluene | 2.038 | 1.746 | 14.3 | 105 | 0.01 | 15.76 |
| 110 | m | p-ethyltoluene | | ----------NA---------- | | | | |
| 111 | M | 1,3,5-trimethylbenzene | 2.218 | 2.011 | 9.3 | 106 | 0.00 | 15.65 |
| 112 | M | tert-butylbenzene | 1.914 | 1.728 | 9.7 | 105 | 0.00 | 16.04 |
| 113 | M | pentachloroethane | 0.498 | 0.482 | 3.2 | 114 | 0.00 | 16.13 |
| 114 | M | 1,2,4-trimethylbenzene | 2.305 | 2.044 | 11.3 | 104 | 0.01 | 16.10 |
| 115 | M | sec-butylbenzene | 2.879 | 2.544 | 11.6 | 103 | 0.01 | 16.28 |
| 116 | M | 1,3-dichlorobenzene | 1.388 | 1.240 | 10.7 | 107 | 0.00 | 16.50 |
| 117 | M | p-isopropyltoluene | 2.373 | 2.104 | 11.3 | 103 | 0.00 | 16.42 |
| 118 | M | 1,2,3-trimethylbenzene | | ----------NA---------- | | | | |
| 119 | M | 1,4-dichlorobenzene | 1.386 | 1.255 | 9.5 | 106 | 0.00 | 16.59 |
| 120 | m | p-diethylbenzene | | ----------NA---------- | | | | |
| 121 | M | 1,2-dichlorobenzene | 1.342 | 1.238 | 7.7 | 107 | 0.01 | 17.04 |
| 122 | M | n-butylbenzene | 1.213 | 1.027 | 15.3 | 94 | 0.00 | 16.89 |
| 123 | m | 1,2,4,5-tetramethylbenzen | | ----------NA---------- | | | | |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 124 | M | 1,2-dibromo-3-chloropropa | 50.000 | 49.179 | 1.6 | 112 | 0.00 | 17.89 |

6.7.3

6

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VA7126-CC7086
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** A189657.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 125 | M | 1,3,5-trichlorobenzene | 0.973 | 0.901 | 7.4 | 100 | 0.01 | 18.10 |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 126 | M | 1,2,4-trichlorobenzene | 50.000 | 49.772 | 0.5 | 102 | 0.00 | 18.80 |
| 127 | M | hexachlorobutadiene | 50.000 | 52.768 | -5.5 | 107 | 0.01 | 18.93 |
| 128 | M | naphthalene | 50.000 | 54.867 | -9.7 | 109 | 0.00 | 19.11 |
| 129 | M | 1,2,3-trichlorobenzene | 50.000 | 47.126 | 5.7 | 111 | 0.01 | 19.40 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 130 | M | hexachloroethane | 0.431 | 0.448 | -3.9 | 111 | 0.00 | 17.33 |
| 131 | | Ethylenimine | | ----------NA---------- | | | | |
| 132 | | Bis(chloromethyl)ether | | ----------NA---------- | | | | |
| 133 | | 2-methylnaphthalene | | ----------NA---------- | | | | |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
A188634.D MA7086.M Tue Dec 11 13:38:02 2012 MSA

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VE8647-ICC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E196788.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
                         Response Factor Report  MSE

 Method       : C:\MSDCHEM\1\METHODS\ME8647.M (RTE Integrator)
 Title        : SW846  8260B,ZB624 60m x 0.25mm x 1.4um
 Last Update  : Tue Nov 13 09:20:53 2012
 Response via : Initial Calibration

 Calibration Files
 5   =E196785.D   2   =E196784.D   20  =E196787.D   50  =E196788.D
 100 =E196789.D   1   =E196783.D   200 =E196790.D   0.5 =E196782.D
 10  =E196786.D       =

  Compound
            5     2     20    50    100   1     200   0.5   10      Avg    %RSD
 ---------------------------------------------------------------------------

 1)     Tert Butyl Alcohol-d9 ----------------ISTD--------------------
 2)  1,4-dioxane
           0.079       0.093 0.088 0.079       0.076       0.078   0.082    8.19
 3)  tertiary butyl alcohol
           1.353 1.181 1.308 1.214 1.232       1.107       1.255   1.235    6.55
 4)  ethanol
                                                                   0.000#  -1.00

 5) I   pentafluorobenzene    ----------------ISTD--------------------
 6)  freon 23
                                                                   0.000#  -1.00
 7)  freon 115
                                                                   0.000#  -1.00
 8)  freon 143a
                                                                   0.000#  -1.00
 9)  freon 152a
                                                                   0.000#  -1.00
10)  chlorotrifluoroethene
                                                                   0.000#  -1.00
11)  chlorodifluoromethane
           0.703       0.796 0.747 0.790       0.770       0.725   0.755    4.87
12)  dichlorodifluoromethane
           0.818 0.713 0.962 0.893 0.901 0.649 0.851       0.925   0.839   12.89
13)  freon 114
                                                                   0.000#  -1.00
14)  freon 142b
                                                                   0.000#  -1.00
15)  chloromethane
           0.813 0.719 0.909 0.898 0.927 0.816 0.925       0.875   0.860    8.42
16)  vinyl chloride
           0.865 0.745 0.966 0.925 0.975 0.798 0.956       0.944   0.897    9.54
17)  acetaldehyde
                                                                   0.000#  -1.00
18)  bromomethane
           0.497 0.439 0.501 0.485 0.507 0.379 0.493       0.512   0.476    9.58
19)  chloroethane
           0.407 0.289 0.425 0.429 0.457 0.204 0.443       0.427   0.385   23.28
            ----- Linear regression -----  Coefficient =  0.9996
              Response Ratio = -0.00460 + 0.44622 *A

20)  vinyl bromide
                                                                   0.000#  -1.00
21)  trichlorofluoromethane
           0.945 0.746 1.074 0.993 1.004       0.960       1.015   0.962   10.83
```

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VE8647-ICC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E196788.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
22)  pentane
           1.218 1.290 1.350 1.155 1.209       1.161       1.279   1.237    5.79
23)  ethyl ether
           0.351 0.308 0.379 0.365 0.384       0.378       0.402   0.367    8.27
24)  freon 141b
                                                                   0.000#  -1.00
25)  freon 123a
                                                                   0.000#  -1.00
26)  freon 123
                                                                   0.000#  -1.00
27)  2-chloropropane
           0.975 0.815 1.141 1.077 1.135 0.840 1.123       1.226   1.042   14.37
28)  acrolein
           0.136 0.128 0.154 0.142       0.133             0.151   0.141    7.34
29)  1,1-dichloroethene
           0.493 0.389 0.551 0.506 0.518 0.381 0.503       0.590   0.491   14.80
30)  isopropyl alcohol
                                                                   0.000#  -1.00
31)  acetone
                       0.086 0.075 0.077       0.069       0.092   0.080   11.47
32)  allyl chloride
           1.276 1.302 1.301 1.196 1.127 1.338 1.076       1.411   1.253    8.93
33)  acetonitrile
           0.045 0.040 0.051 0.045 0.047       0.044       0.048   0.046    7.46
34)  iodomethane
           0.841 0.734 0.946 0.915 0.949 0.724 0.948       1.007   0.883   11.99
35)  iso-butyl alcohol
                                                                   0.000#  -1.00
36)  carbon disulfide
           1.682 1.611 1.935 1.767 1.742 1.755 1.765 1.466 2.089   1.757   10.14
37)  methylene chloride
           0.560 0.489 0.630 0.607 0.619 0.415 0.617       0.667   0.575   14.59
38)  1-chloropropane
           1.135 1.147 1.265 1.148 1.171 1.169 1.127       1.349   1.189    6.55
39)  methyl acetate
           0.587 0.421 0.641 0.587 0.606       0.593       0.618   0.579   12.51
40)  methyl tert butyl ether
           2.004 1.853 2.186 2.032 2.000 2.011 1.915 2.063 2.344   2.045    7.09
41)  trans-1,2-dichloroethene
           0.509 0.480 0.596 0.540 0.548 0.503 0.523       0.624   0.541    8.96
42)  di-isopropyl ether
           2.239 1.832 2.255 2.079 2.064 1.864 1.948       2.266   2.068    8.48
43)  ethyl tert-butyl ether
           2.327 1.873 2.406 2.256 2.265 1.876 2.162       2.405   2.196    9.75
44)  2-butanone
                       0.093 0.089 0.090       0.088       0.089   0.090    2.17
45)  1,1-dichloroethane
           1.106 1.058 1.253 1.127 1.129 0.989 1.066       1.313   1.130    9.34
46)  chloroprene
           1.078 0.859 1.143 1.044 1.073 0.743 1.012       1.098   1.006   13.48
47)  acrylonitrile
           0.249 0.224 0.286 0.269 0.277 0.219 0.272       0.295   0.261   10.78
48)  vinyl acetate
           0.059       0.099 0.093 0.100       0.096       0.080   0.088   18.15
            ----- Linear regression -----  Coefficient =  0.9993
              Response Ratio = -0.00161 + 0.09705 *A

49)  ethyl acetate
           0.080       0.106 0.102 0.104       0.100       0.083   0.096   11.64
50)  2,2-dichloropropane
```

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VE8647-ICC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E196788.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
            0.961 0.896 1.050 0.922 0.872 0.973 0.819       1.123   0.952   10.30
51)  cis-1,2-dichloroethene
            0.583 0.583 0.664 0.601 0.595 0.510 0.575 0.501 0.714   0.592   11.27
52)  methyl acrylate
            0.585       0.679 0.618 0.619       0.605       0.629   0.622    5.09
53)  propionitrile
            0.105 0.089 0.115 0.102 0.102 0.085 0.097       0.121   0.102   12.00
54)  bromochloromethane
            0.278 0.218 0.317 0.303 0.305 0.130 0.295       0.342   0.273   24.98
             ----- Linear regression -----  Coefficient =  0.9996
               Response Ratio = 0.00347 + 0.29644 *A

55)  tetrahydrofuran
            0.253 0.199 0.282 0.260 0.257       0.251       0.293   0.256   11.63
56)  chloroform
            1.096 1.055 1.191 1.100 1.075 1.091 1.010 0.976 1.251   1.094    7.72
57)  t-butyl formate
            0.679 0.562 0.690 0.655 0.659 0.541 0.629       0.671   0.636    8.74
58)  Iso-octane
            2.242 1.918 2.448 2.130 2.143 1.820 2.087       2.341   2.141    9.68
59)  dibromofluoromethane (s)
            0.477 0.487 0.560 0.517 0.546       0.522       0.506   0.516    5.80
60)  1,2-dichloroethane-d4 (s)
            0.772 0.819 0.842 0.763 0.756 0.685 0.687 0.637 0.775   0.748    8.89
61)  freon 113
            0.364       0.409 0.375 0.382       0.377       0.406   0.385    4.69
62)  methacrylonitrile
            0.446 0.353 0.492 0.471 0.486 0.390 0.475       0.509   0.453   12.02
63)  1,1,1-trichloroethane
            0.869 0.813 1.025 0.956 0.950 0.839 0.903       1.066   0.927    9.56
64)  tert-amyl methyl ether
            2.140 1.833 2.086 1.899 1.869 1.845 1.776       2.109   1.945    7.37

65) I   1,4-difluorobenzene   ----------------ISTD---------------------
66)  Di-isobutylene
                                                                    0.000#  -1.00
67)  tert amyl alcohol
            0.021       0.022 0.020 0.018       0.017       0.022   0.020   10.39
68)  epichlorohydrin
            0.055 0.041 0.055 0.051 0.051       0.050       0.051   0.050    9.06
69)  n-butyl alcohol
            0.015 0.012 0.017 0.015 0.014       0.013       0.016   0.015   10.89
70)  tert-amyl ethyl ether
            0.655 0.730 0.690 0.631 0.615 0.612 0.592       0.672   0.650    7.14
71)  carbon tetrachloride
            0.531 0.463 0.604 0.530 0.514 0.512 0.490       0.625   0.533   10.27
72)  1,1-dichloropropene
            0.520 0.488 0.585 0.518 0.514 0.484 0.493       0.604   0.526    8.52
73)  hexane
            0.564 0.441 0.620 0.548 0.554 0.501 0.546       0.584   0.545    9.89
74)  benzene
            1.439 1.462 1.601 1.402 1.373 1.462 1.314 1.427 1.695   1.464    7.96
75)  heptane
            0.306 0.260 0.354 0.314 0.313       0.298       0.324   0.310    9.21
76)  isopropyl acetate
            1.029 0.800 0.967 0.859 0.840 0.845 0.798       1.046   0.898   11.25
77)  1,2-dichloroethane
            0.611 0.580 0.668 0.608 0.592 0.606 0.553 0.559 0.714   0.610    8.44
78)  ethyl acrylate
            0.554 0.545 0.647 0.610 0.607       0.583       0.603   0.593    5.94
```

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VE8647-ICC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E196788.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
 79)  trichloroethene
            0.356 0.346 0.414 0.371 0.366 0.333 0.340       0.425   0.369    9.16
 80)  2-nitropropane
                                                                    0.000#  -1.00
 81)  2-chloroethyl vinyl ether
            0.207 0.152 0.219 0.208 0.205 0.162 0.198       0.206   0.195   12.29
 82)  methylcyclohexane
            0.708 0.568 0.714 0.612 0.591 0.511 0.583       0.696   0.623   12.01
 83)  methyl methacrylate
            0.418 0.419 0.473 0.410 0.402 0.332 0.388       0.483   0.415   11.47
 84)  1,2-dichloropropane
            0.382 0.381 0.431 0.384 0.373 0.378 0.355       0.473   0.395    9.63
 85)  dibromomethane
            0.242 0.194 0.265 0.248 0.246 0.166 0.237       0.283   0.235   16.03
             ----- Linear regression -----  Coefficient =  0.9995
               Response Ratio = 0.00529 + 0.23734 *A

 86)  bromodichloromethane
            0.562 0.538 0.618 0.570 0.567 0.494 0.534 0.537 0.647   0.563    8.19
 87)  cis-1,3-dichloropropene
            0.695 0.661 0.785 0.718 0.700 0.649 0.670 0.558 0.816   0.695   10.90
 88)  toluene-d8 (s)
            1.372 1.451 1.527 1.326 1.314 1.234 1.203 1.352 1.384   1.351    7.41
 89)  4-methyl-2-pentanone
            0.189 0.178 0.209 0.189 0.182       0.175       0.224   0.192    9.22
 90)  toluene
            0.915 0.841 1.043 0.917 0.897 0.906 0.869 0.768 1.111   0.919   11.16
 91)  3-methyl-1-butanol
            0.031       0.029 0.025 0.023       0.021       0.027   0.026   14.15
 92)  trans-1,3-dichloropropene
            0.642 0.640 0.744 0.667 0.656 0.604 0.621 0.569 0.782   0.658   10.17
 93)  ethyl methacrylate
            0.566 0.500 0.648 0.570 0.560 0.513 0.525 0.426 0.661   0.552   13.22
 94)  1,1,2-trichloroethane
            0.300 0.289 0.328 0.307 0.304 0.256 0.290 0.232 0.346   0.295   11.65
 95)  2-hexanone
            0.164       0.209 0.189 0.192       0.183       0.207   0.190    8.70

 96) I   chlorobenzene-d5      ----------------ISTD--------------------
 97)  cyclohexanone
            0.118 0.135 0.116 0.091 0.085 0.147 0.065       0.127   0.110   25.07
          ----- Quadratic regression -----                Coefficient =  0.9991
               Response Ratio = 0.02645 + 0.10187 *A + -0.00094 *A^2

 98)  tetrachloroethene
            0.408 0.380 0.456 0.387 0.374 0.375 0.343       0.462   0.398   10.47
 99)  1,3-dichloropropane
            0.675 0.696 0.733 0.664 0.637 0.688 0.587 0.761 0.777   0.691    8.70
100)  butyl acetate
            0.365 0.241 0.345 0.309 0.302       0.279       0.338   0.311   13.61
101)  3,3-dimethyl-1-butanol
            0.064       0.059 0.052 0.049       0.044       0.059   0.054   13.51
102)  dibromochloromethane
            0.445 0.449 0.496 0.454 0.444 0.469 0.416 0.433 0.521   0.459    7.04
103)  1,2-dibromoethane
            0.372 0.371 0.435 0.404 0.399 0.345 0.382 0.335 0.454   0.389   10.03
104)  n-butyl ether
                                                                    0.000#  -1.00
105)  chlorobenzene
            1.014 0.999 1.146 1.037 1.016 0.984 0.951 1.049 1.190   1.043    7.41
```

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VE8647-ICC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E196788.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
106)  1,1,1,2-tetrachloroethane
            0.388 0.375 0.431 0.382 0.367 0.357 0.345 0.447 0.454   0.394   10.16
107)  ethylbenzene
            1.855 1.837 2.053 1.792 1.715 1.786 1.550 1.924 2.165   1.853    9.77
108)  m,p-xylene
            0.710 0.698 0.770 0.688 0.661 0.675 0.618 0.739 0.815   0.708    8.35
109)  o-xylene
            0.734 0.728 0.812 0.716 0.690 0.730 0.644 0.716 0.857   0.736    8.58
110)  butyl acrylate
                                                                    0.000#  -1.00
111)  styrene
            1.179 1.151 1.361 1.203 1.146 1.077 1.062 1.068 1.426   1.186   10.86
112)  bromoform
            0.295 0.284 0.342 0.327 0.312 0.297 0.292 0.316 0.355   0.313    7.69

113) I   1,4-dichlorobenzene-d ----------------ISTD--------------------
114)  isopropylbenzene
            3.768 3.726 4.197 3.717 3.603 3.715 3.387 3.804 4.350   3.807    7.71
115)  4-bromofluorobenzene (s)
            1.104 1.245 1.175 1.042 1.052 1.094 1.010       1.100   1.103    6.89
116)  bromobenzene
            0.828 0.864 0.940 0.854 0.857 0.878 0.814 0.907 1.029   0.886    7.45
117)  1,1,2,2-tetrachloroethane
            1.008 1.223 1.168 1.044 1.046 1.281 1.019 1.370 1.202   1.151   11.22
118)  trans-1,4-dichloro-2-butene
            0.255 0.255 0.354 0.339 0.340       0.339       0.355   0.320   13.95
119)  1,2,3-trichloropropane
            0.280 0.268 0.310 0.292 0.287 0.283 0.275 0.235 0.338   0.285    9.90
120)  n-propylbenzene
            4.299 4.344 4.687 4.060 3.957 4.335 3.732 4.255 4.952   4.291    8.55
121)  p-ethyltoluene
            3.778 3.928 3.824 3.432 3.376 3.601 3.282 2.635 3.588   3.494   11.08
122)  2-chlorotoluene
            0.783 0.790 0.859 0.768 0.763 0.726 0.748 0.736 0.936   0.790    8.50
123)  4-chlorotoluene
            2.718 2.655 2.985 2.778 2.694 2.646 2.581 3.308 3.172   2.837    9.06
124)  1,3,5-trimethylbenzene
            3.106 3.186 3.348 2.926 2.872 3.185 2.627 3.582 3.652   3.165   10.49
125)  tert-butylbenzene
            2.646 2.728 3.084 2.743 2.656 2.769 2.527 2.740 3.143   2.782    7.27
126)  pentachloroethane
            0.553 0.602 0.615 0.558 0.539 0.527 0.531 0.499 0.631   0.562    7.94
127)  1,2,4-trimethylbenzene
            3.069 3.120 3.432 3.079 2.972 2.980 2.828 3.294 3.637   3.157    8.03
128)  sec-butylbenzene
            3.794 3.723 4.416 3.949 3.894 3.686 3.660 3.572 4.506   3.911    8.52
129)  1,3-dichlorobenzene
            1.561 1.604 1.773 1.652 1.637 1.606 1.590 1.763 1.946   1.681    7.35
130)  p-isopropyltoluene
            3.052 3.012 3.641 3.282 3.176 2.819 3.034 3.127 3.751   3.210    9.47
131)  1,4-dichlorobenzene
            1.479 1.520 1.743 1.648 1.635 1.543 1.567 1.833 1.795   1.640    7.69
132)  benzyl chloride
            2.126 1.613 2.183 2.180 2.172 1.430 2.101       2.033   1.980   14.72
133)  p-diethylbenzene
            1.790 1.799 2.083 1.921 1.906 1.393 1.822       1.890   1.825   10.86
134)  1,2-dichlorobenzene
            1.509 1.470 1.750 1.653 1.626 1.561 1.550 1.737 1.824   1.631    7.37
135)  n-butylbenzene
            1.533 1.295 1.832 1.693 1.699 1.212 1.654       1.842   1.595   14.64
```

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VE8647-ICC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E196788.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
136)  1,2,4,5-tetramethylbenzene
            2.697 2.671 3.310 3.152 3.089       2.888       2.959   2.966    7.95
137)  1,2-dibromo-3-chloropropane
            0.186 0.167 0.237 0.237 0.231       0.233       0.242   0.219   13.57
138)  1,3,5-trichlorobenzene
            0.902 0.791 1.285 1.251 1.238 0.651 1.169 0.771 1.239   1.033   24.30
             ----- Linear regression -----  Coefficient =  0.9989
               Response Ratio = 0.01408 + 1.18164 *A

139)  1,2,4-trichlorobenzene
            0.571       0.935 0.995 1.032       1.013       0.851   0.900   19.32
             ----- Linear regression -----  Coefficient =  0.9998
               Response Ratio = -0.03133 + 1.02628 *A

140)  hexachlorobutadiene
            0.408 0.401 0.572 0.527 0.508       0.475       0.539   0.490   13.38
141)  naphthalene
            1.274       2.136 2.323 2.462       2.483       1.888   2.094   21.94
             ----- Linear regression -----  Coefficient =  0.9999
               Response Ratio = -0.14334 + 2.51953 *A

142)  MMT
                                                                    0.000#  -1.00
143)  1,2,3-trichlorobenzene
            0.441       0.743 0.799 0.842       0.851       0.667   0.724   21.34
             ----- Linear regression -----  Coefficient =  1.0000
               Response Ratio = -0.04629 + 0.86246 *A

144)  hexachloroethane
            0.592 0.534 0.695 0.660 0.666 0.512 0.649       0.710   0.627   11.69
145)  Cyclohexane
            1.053 1.007 1.189 1.041 1.027 0.942 1.015       1.249   1.065    9.54
146)  ethyleinimine
                                                                    0.000#  -1.00
 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

           ME8647.M          Tue Nov 13 09:56:58 2012   RPT1
```

6.7.4

6

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VE8647-ICV8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E196793.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\E196793.D Vial: 13
Acq On : 12 Nov 2012 5:07 pm Operator: OksanaT
Sample : ICV8647-50 Inst : MSE
Misc : MS38281,VE8647,5,,100,5,1 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\MSDCHEM\1\METHODS\ME8647.M (RTE Integrator)
Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
Last Update : Tue Nov 13 09:20:53 2012
Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | | Tert Butyl Alcohol-d9 | 1.000 | 1.000 | 0.0 | 113 | 0.00 | 7.71 |
| 2 | M | 1,4-dioxane | 0.082 | 0.079 | 3.7 | 102 | 0.00 | 11.56 |
| 3 | M | tertiary butyl alcohol | 1.235 | 1.211 | 1.9 | 113 | 0.00 | 7.83 |
| 4 | | ethanol | | ----------NA---------- | | | | |
| 5 | I | pentafluorobenzene | 1.000 | 1.000 | 0.0 | 108 | 0.00 | 9.93 |
| 6 | | freon 23 | | ----------NA---------- | | | | |
| 7 | | freon 115 | | ----------NA---------- | | | | |
| 8 | | freon 143a | | ----------NA---------- | | | | |
| 9 | | freon 152a | | ----------NA---------- | | | | |
| 10 | M | chlorotrifluoroethene | | ----------NA---------- | | | | |
| 11 | M | chlorodifluoromethane | 0.755 | 0.794 | -5.2 | 115 | 0.00 | 4.32 |
| 12 | M | dichlorodifluoromethane | 0.839 | 0.773 | 7.9 | 94 | 0.00 | 4.32 |
| 13 | | freon 114 | | ----------NA---------- | | | | |
| 14 | | freon 142b | | ----------NA---------- | | | | |
| 15 | M | chloromethane | 0.860 | 0.989 | -15.0 | 119 | 0.00 | 4.67 |
| 16 | M | vinyl chloride | 0.897 | 0.895 | 0.2 | 105 | 0.00 | 4.95 |
| 17 | M | acetaldehyde | | ----------NA---------- | | | | |
| 18 | M | bromomethane | 0.476 | 0.477 | -0.2 | 107 | 0.00 | 5.60 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 19 | M | chloroethane | 50.000 | 51.129 | -2.3 | 114 | 0.00 | 5.78 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 20 | M | vinyl bromide | | ----------NA---------- | | | | |
| 21 | M | trichlorofluoromethane | 0.962 | 0.985 | -2.4 | 107 | 0.00 | 6.30 |
| 22 | M | pentane | 1.237 | 1.268 | -2.5 | 119 | 0.00 | 6.37 |
| 23 | M | ethyl ether | 0.367 | 0.391 | -6.5 | 116 | 0.00 | 6.67 |
| 24 | | freon 141b | | ----------NA---------- | | | | |
| 25 | | freon 123a | | ----------NA---------- | | | | |
| 26 | | freon 123 | | ----------NA---------- | | | | |
| 27 | m | 2-chloropropane | 1.042 | 1.145 | -9.9 | 115 | 0.00 | 6.87 |
| 28 | M | acrolein | 0.141 | 0.160 | -13.5 | 123 | 0.00 | 6.88 |
| 29 | M | 1,1-dichloroethene | 0.491 | 0.512 | -4.3 | 110 | 0.00 | 7.11 |
| 30 | M | isopropyl alcohol | | ----------NA---------- | | | | |
| 31 | M | acetone | 0.080 | 0.071 | 11.3 | 102 | 0.00 | 7.10 |
| 32 | M | allyl chloride | 1.253 | 1.170 | 6.6 | 106 | 0.00 | 7.60 |
| 33 | M | acetonitrile | 0.046 | 0.050 | -8.7 | 120 | 0.02 | 7.50 |
| 34 | M | iodomethane | 0.883 | 0.902 | -2.2 | 107 | 0.00 | 7.38 |
| 35 | M | iso-butyl alcohol | | ----------NA---------- | | | | |
| 36 | M | carbon disulfide | 1.757 | 1.798 | -2.3 | 110 | 0.00 | 7.55 |
| 37 | M | methylene chloride | 0.575 | 0.614 | -6.8 | 110 | 0.00 | 7.78 |

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VE8647-ICV8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E196793.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 38 | m | 1-chloropropane | 1.189 | 1.213 | -2.0 | 114 | 0.00 | 7.83 |
| 39 | M | methyl acetate | 0.579 | 0.571 | 1.4 | 105 | -0.01 | 7.55 |
| 40 | M | methyl tert butyl ether | 2.045 | 1.893 | 7.5 | 101 | 0.00 | 8.13 |
| 41 | M | trans-1,2-dichloroethene | 0.541 | 0.522 | 3.5 | 105 | 0.00 | 8.17 |
| 42 | M | di-isopropyl ether | 2.068 | 2.165 | -4.7 | 113 | 0.00 | 8.71 |
| 43 | M | ethyl tert-butyl ether | 2.196 | 2.208 | -0.5 | 106 | 0.00 | 9.17 |
| 44 | M | 2-butanone | 0.090 | 0.083 | 7.8 | 101 | 0.00 | 9.36 |
| 45 | M | 1,1-dichloroethane | 1.130 | 1.157 | -2.4 | 111 | 0.00 | 8.70 |
| 46 | M | chloroprene | 1.006 | 0.959 | 4.7 | 100 | 0.00 | 8.83 |
| 47 | M | acrylonitrile | 0.261 | 0.286 | -9.6 | 115 | 0.00 | 8.04 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 48 | M | vinyl acetate | 50.000 | 56.831 | -13.7 | 126 | 0.00 | 8.67 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 49 | M | ethyl acetate | 0.096 | 0.108 | -12.5 | 116 | 0.00 | 9.39 |
| 50 | M | 2,2-dichloropropane | 0.952 | 0.845 | 11.2 | 99 | 0.00 | 9.45 |
| 51 | M | cis-1,2-dichloroethene | 0.592 | 0.603 | -1.9 | 109 | 0.00 | 9.42 |
| 52 | m | methyl acrylate | 0.622 | 0.645 | -3.7 | 113 | 0.00 | 9.47 |
| 53 | M | propionitrile | 0.102 | 0.111 | -8.8 | 118 | 0.00 | 9.41 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 54 | M | bromochloromethane | 50.000 | 48.658 | 2.7 | 105 | 0.00 | 9.73 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 55 | M | tetrahydrofuran | 0.256 | 0.282 | -10.2 | 117 | 0.00 | 9.78 |
| 56 | M | chloroform | 1.094 | 1.077 | 1.6 | 106 | 0.00 | 9.78 |
| 57 | m | t-butyl formate | 0.636 | 0.645 | -1.4 | 107 | 0.00 | 9.82 |
| 58 | M | Iso-octane | 2.141 | 1.912 | 10.7 | 97 | 0.00 | 10.54 |
| 59 | S | dibromofluoromethane (s) | 0.516 | 0.529 | -2.5 | 111 | 0.00 | 9.97 |
| 60 | S | 1,2-dichloroethane-d4 (s) | 0.748 | 0.740 | 1.1 | 105 | 0.00 | 10.39 |
| 61 | M | freon 113 | 0.385 | 0.359 | 6.8 | 104 | 0.00 | 7.09 |
| 62 | M | methacrylonitrile | 0.453 | 0.493 | -8.8 | 113 | 0.00 | 9.62 |
| 63 | M | 1,1,1-trichloroethane | 0.927 | 0.925 | 0.2 | 105 | 0.00 | 10.07 |
| 64 | M | tert-amyl methyl ether | 1.945 | 1.841 | 5.3 | 105 | 0.00 | 10.53 |
| 65 | I | 1,4-difluorobenzene | 1.000 | 1.000 | 0.0 | 111 | 0.00 | 10.84 |
| 66 | M | Di-isobutylene | | ----------NA---------- | | | | |
| 67 | M | tert amyl alcohol | 0.020 | 0.020 | 2.5 | 106 | 0.00 | 10.32 |
| 68 | M | epichlorohydrin | 0.050 | 0.048 | 4.0 | 105 | 0.00 | 12.08 |
| 69 | M | n-butyl alcohol | 0.015 | 0.016 | -6.7 | 118 | 0.00 | 10.92 |
| 70 | M | tert-amyl ethyl ether | 0.650 | 0.572 | 12.0 | 100 | 0.00 | 11.37 |
| 71 | M | carbon tetrachloride | 0.533 | 0.500 | 6.2 | 104 | 0.00 | 10.29 |
| 72 | M | 1,1-dichloropropene | 0.526 | 0.501 | 4.8 | 107 | 0.00 | 10.24 |
| 73 | M | hexane | 0.545 | 0.479 | 12.1 | 97 | 0.00 | 8.49 |
| 74 | M | benzene | 1.464 | 1.406 | 4.0 | 111 | 0.00 | 10.50 |
| 75 | M | heptane | 0.310 | 0.308 | 0.6 | 108 | 0.00 | 10.69 |
| 76 | M | isopropyl acetate | 0.898 | 0.884 | 1.6 | 114 | 0.00 | 10.38 |
| 77 | M | 1,2-dichloroethane | 0.610 | 0.575 | 5.7 | 105 | 0.00 | 10.47 |
| 78 | | ethyl acrylate | 0.593 | 0.610 | -2.9 | 111 | 0.00 | 11.17 |
| 79 | M | trichloroethene | 0.369 | 0.369 | 0.0 | 110 | 0.00 | 11.21 |
| 80 | M | 2-nitropropane | | ----------NA---------- | | | | |
| 81 | M | 2-chloroethyl vinyl ether | 0.195 | 0.207 | -6.2 | 110 | 0.00 | 11.97 |
| 82 | M | methylcyclohexane | 0.623 | 0.572 | 8.2 | 104 | 0.00 | 11.47 |
| 83 | M | methyl methacrylate | 0.415 | 0.406 | 2.2 | 109 | 0.00 | 11.44 |
| 84 | M | 1,2-dichloropropane | 0.395 | 0.384 | 2.8 | 111 | 0.00 | 11.45 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 85 | M | dibromomethane | 50.000 | 50.454 | -0.9 | 109 | 0.00 | 11.60 |

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VE8647-ICV8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E196793.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 86 | M | bromodichloromethane | 0.563 | 0.562 | 0.2 | 109 | 0.00 | 11.74 |
| 87 | M | cis-1,3-dichloropropene | 0.695 | 0.671 | 3.5 | 103 | 0.00 | 12.21 |
| 88 | S | toluene-d8 (s) | 1.351 | 1.345 | 0.4 | 112 | 0.00 | 12.54 |
| 89 | M | 4-methyl-2-pentanone | 0.192 | 0.191 | 0.5 | 112 | 0.00 | 12.29 |
| 90 | M | toluene | 0.919 | 0.902 | 1.8 | 109 | 0.00 | 12.62 |
| 91 | M | 3-methyl-1-butanol | 0.026 | 0.023 | 11.5 | 104 | 0.00 | 12.31 |
| 92 | M | trans-1,3-dichloropropene | 0.658 | 0.645 | 2.0 | 107 | 0.00 | 12.79 |
| 93 | M | ethyl methacrylate | 0.552 | 0.559 | -1.3 | 108 | 0.00 | 12.79 |
| 94 | M | 1,1,2-trichloroethane | 0.295 | 0.307 | -4.1 | 111 | 0.00 | 13.02 |
| 95 | M | 2-hexanone | 0.190 | 0.194 | -2.1 | 114 | 0.00 | 13.19 |
| 96 | I | chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 108 | 0.00 | 14.17 |
| | | | True | Calc. | % Drift | | | |
| 97 | M | cyclohexanone | 500.000 | 317.380 | 36.5# | 76 | 0.00 | 15.37 |
| | | | AvgRF | CCRF | % Dev | | | |
| 98 | M | tetrachloroethene | 0.398 | 0.378 | 5.0 | 106 | 0.00 | 13.26 |
| 99 | M | 1,3-dichloropropane | 0.691 | 0.659 | 4.6 | 107 | 0.00 | 13.22 |
| 100 | M | butyl acetate | 0.311 | 0.316 | -1.6 | 111 | 0.00 | 13.29 |
| 101 | m | 3,3-dimethyl-1-butanol | 0.054 | 0.051 | 5.6 | 105 | 0.00 | 13.38 |
| 102 | M | dibromochloromethane | 0.459 | 0.439 | 4.4 | 104 | 0.00 | 13.51 |
| 103 | M | 1,2-dibromoethane | 0.389 | 0.397 | -2.1 | 106 | 0.00 | 13.68 |
| 104 | M | n-butyl ether | | ----------NA---------- | | | | |
| 105 | M | chlorobenzene | 1.043 | 1.024 | 1.8 | 107 | 0.00 | 14.20 |
| 106 | M | 1,1,1,2-tetrachloroethane | 0.394 | 0.376 | 4.6 | 106 | 0.00 | 14.26 |
| 107 | M | ethylbenzene | 1.853 | 1.774 | 4.3 | 107 | 0.00 | 14.26 |
| 108 | M | m,p-xylene | 0.708 | 0.675 | 4.7 | 106 | 0.00 | 14.38 |
| 109 | M | o-xylene | 0.736 | 0.706 | 4.1 | 107 | 0.00 | 14.84 |
| 110 | M | butyl acrylate | | ----------NA---------- | | | | |
| 111 | M | styrene | 1.186 | 1.149 | 3.1 | 103 | 0.00 | 14.84 |
| 112 | M | bromoform | 0.313 | 0.305 | 2.6 | 101 | 0.00 | 15.12 |
| 113 | I | 1,4-dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 104 | 0.00 | 16.74 |
| 114 | M | isopropylbenzene | 3.807 | 3.766 | 1.1 | 105 | 0.00 | 15.22 |
| 115 | S | 4-bromofluorobenzene (s) | 1.103 | 1.107 | -0.4 | 110 | 0.00 | 15.43 |
| 116 | M | bromobenzene | 0.886 | 0.870 | 1.8 | 106 | 0.00 | 15.66 |
| 117 | M | 1,1,2,2-tetrachloroethane | 1.151 | 1.066 | 7.4 | 106 | 0.00 | 15.52 |
| 118 | M | trans-1,4-dichloro-2-bute | 0.320 | 0.327 | -2.2 | 100 | 0.00 | 15.56 |
| 119 | M | 1,2,3-trichloropropane | 0.285 | 0.292 | -2.5 | 104 | 0.00 | 15.60 |
| 120 | M | n-propylbenzene | 4.291 | 4.253 | 0.9 | 109 | 0.00 | 15.67 |
| 121 | M | p-ethyltoluene | 3.494 | 3.492 | 0.1 | 106 | 0.00 | 15.78 |
| 122 | M | 2-chlorotoluene | 0.790 | 0.775 | 1.9 | 105 | 0.00 | 15.84 |
| 123 | M | 4-chlorotoluene | 2.837 | 2.754 | 2.9 | 103 | 0.00 | 15.94 |
| 124 | M | 1,3,5-trimethylbenzene | 3.165 | 2.973 | 6.1 | 106 | 0.00 | 15.84 |
| 125 | M | tert-butylbenzene | 2.782 | 2.747 | 1.3 | 104 | 0.00 | 16.23 |
| 126 | M | pentachloroethane | 0.562 | 0.553 | 1.6 | 103 | 0.00 | 16.31 |
| 127 | M | 1,2,4-trimethylbenzene | 3.157 | 3.123 | 1.1 | 105 | 0.00 | 16.28 |
| 128 | M | sec-butylbenzene | 3.911 | 4.017 | -2.7 | 106 | 0.00 | 16.47 |
| 129 | M | 1,3-dichlorobenzene | 1.681 | 1.658 | 1.4 | 104 | 0.00 | 16.68 |
| 130 | M | p-isopropyltoluene | 3.210 | 3.394 | -5.7 | 107 | 0.00 | 16.59 |
| 131 | M | 1,4-dichlorobenzene | 1.640 | 1.604 | 2.2 | 101 | 0.00 | 16.77 |
| 132 | | benzyl chloride | 1.980 | 1.989 | -0.5 | 95 | 0.00 | 16.87 |
| 133 | M | p-diethylbenzene | 1.825 | 1.907 | -4.5 | 103 | 0.00 | 17.01 |
| 134 | M | 1,2-dichlorobenzene | 1.631 | 1.632 | -0.1 | 103 | 0.00 | 17.20 |
| 135 | M | n-butylbenzene | 1.595 | 1.722 | -8.0 | 106 | 0.00 | 17.05 |
| 136 | M | 1,2,4,5-tetramethylbenzen | 2.966 | 3.087 | -4.1 | 102 | 0.00 | 17.88 |
| 137 | M | 1,2-dibromo-3-chloropropa | 0.219 | 0.227 | -3.7 | 99 | 0.00 | 18.02 |

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VE8647-ICV8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E196793.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
            ----------------------- True    Calc.   % Drift  ------------
138 m   1,3,5-trichlorobenzene     50.000  51.602     -3.2  102   0.00   18.26
139 M   1,2,4-trichlorobenzene     50.000  51.024     -2.0  106   0.00   18.97

            ----------------------- AvgRF   CCRF     % Dev   -------------
140 M   hexachlorobutadiene         0.490   0.493     -0.6   97   0.00   19.12

            ----------------------- True    Calc.   % Drift  ------------
141 M   naphthalene                50.000  47.957      4.1  102   0.00   19.28

            ----------------------- AvgRF   CCRF     % Dev   -------------
142     MMT                                ----------NA----------

            ----------------------- True    Calc.   % Drift  ------------
143 M   1,2,3-trichlorobenzene     50.000  47.859      4.3  101   0.00   19.56

            ----------------------- AvgRF   CCRF     % Dev   -------------
144 M   hexachloroethane            0.627   0.664     -5.9  105   0.00   17.51
145 M   Cyclohexane                 1.065   1.121     -5.3  112   0.00   10.18
146     ethyleinimine                      ----------NA----------
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------

    (#) = Out of Range              SPCC's out = 0  CCC's out = 0
     E196788.D  ME8647.M         Tue Nov 13 09:59:40 2012   RPT1
```

6.7.5

6

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VE8685-CC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E197674.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E197674.D                    Vial: 77
Acq On    :  8 Dec 2012  10:37 pm                     Operator: OksanaT
Sample    : cc8647-50                                 Inst    : MSE
Misc      : MS39549,VE8685,5,,100,5,1                 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\MSDCHEM\1\METHODS\ME8647.M (RTE Integrator)
Title        : SW846  8260B,ZB624 60m x 0.25mm x 1.4um
Last Update  : Tue Nov 13 15:53:05 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.010  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | | Tert Butyl Alcohol-d9 | 1.000 | 1.000 | 0.0 | 120 | -0.02 | 7.69 |
| 2 | M | 1,4-dioxane | 0.082 | 0.089 | -8.5 | 122 | 0.00 | 11.56 |
| 3 | M | tertiary butyl alcohol | 1.235 | 1.405 | -13.8 | 139 | -0.01 | 7.81 |
| 4 | | ethanol | | ----------NA---------- | | | | |
| 5 | I | pentafluorobenzene | 1.000 | 1.000 | 0.0 | 122 | 0.00 | 9.92 |
| 6 | | freon 23 | | ----------NA---------- | | | | |
| 7 | | freon 115 | | ----------NA---------- | | | | |
| 8 | | freon 143a | | ----------NA---------- | | | | |
| 9 | | freon 152a | | ----------NA---------- | | | | |
| 10 | M | chlorotrifluoroethene | | ----------NA---------- | | | | |
| 11 | M | chlorodifluoromethane | 0.755 | 0.822 | -8.9 | 134 | 0.04 | 4.35 |
| 12 | M | dichlorodifluoromethane | 0.839 | 0.986 | -17.5 | 135 | 0.01 | 4.33 |
| 13 | | freon 114 | | ----------NA---------- | | | | |
| 14 | | freon 142b | | ----------NA---------- | | | | |
| 15 | M | chloromethane | 0.860 | 1.019 | -18.5 | 138 | 0.01 | 4.69 |
| 16 | M | vinyl chloride | 0.897 | 1.046 | -16.6 | 138 | 0.00 | 4.96 |
| 17 | M | acetaldehyde | | ----------NA---------- | | | | |
| 18 | M | bromomethane | 0.476 | 0.518 | -8.8 | 130 | 0.01 | 5.61 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 19 | M | chloroethane | 50.000 | 53.058 | -6.1 | 133 | 0.01 | 5.79 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 20 | M | vinyl bromide | | ----------NA---------- | | | | |
| 21 | M | trichlorofluoromethane | 0.962 | 1.038 | -7.9 | 127 | 0.00 | 6.30 |
| 22 | M | pentane | | ----------NA---------- | | | | |
| 23 | M | ethyl ether | 0.367 | 0.411 | -12.0 | 137 | -0.01 | 6.66 |
| 24 | | freon 141b | | ----------NA---------- | | | | |
| 25 | | freon 123a | | ----------NA---------- | | | | |
| 26 | | freon 123 | | ----------NA---------- | | | | |
| 27 | m | 2-chloropropane | 1.042 | 1.340 | -28.6# | 152 | -0.01 | 6.86 |
| 28 | M | acrolein | 0.141 | 0.154 | -9.2 | 132 | -0.01 | 6.87 |
| 29 | M | 1,1-dichloroethene | 0.491 | 0.566 | -15.3 | 136 | 0.00 | 7.11 |
| 30 | M | isopropyl alcohol | | ----------NA---------- | | | | |
| 31 | M | acetone | 0.080 | 0.074 | 7.5 | 120 | -0.03 | 7.07 |
| 32 | M | allyl chloride | 1.253 | 1.131 | 9.7 | 115 | 0.00 | 7.59 |
| 33 | M | acetonitrile | 0.046 | 0.057 | -23.9# | 154 | 0.00 | 7.49 |
| 34 | M | iodomethane | 0.883 | 1.038 | -17.6 | 138 | 0.00 | 7.37 |
| 35 | M | iso-butyl alcohol | | ----------NA---------- | | | | |
| 36 | M | carbon disulfide | 1.757 | 2.214 | -26.0# | 153 | -0.02 | 7.53 |
| 37 | M | methylene chloride | 0.575 | 0.666 | -15.8 | 134 | 0.00 | 7.77 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VE8685-CC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E197674.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 38 | m | 1-chloropropane | 1.189 | 1.281 | -7.7 | 136 | 0.00 | 7.83 |
| 39 | M | methyl acetate | 0.579 | 0.680 | -17.4 | 141 | -0.01 | 7.55 |
| 40 | M | methyl tert butyl ether | 2.045 | 2.133 | -4.3 | 128 | -0.02 | 8.11 |
| 41 | M | trans-1,2-dichloroethene | 0.541 | 0.578 | -6.8 | 131 | 0.00 | 8.16 |
| 42 | M | di-isopropyl ether | 2.068 | 2.345 | -13.4 | 138 | -0.01 | 8.70 |
| 43 | M | ethyl tert-butyl ether | 2.196 | 2.329 | -6.1 | 126 | 0.00 | 9.16 |
| 44 | M | 2-butanone | 0.090 | 0.086 | 4.4 | 117 | -0.01 | 9.35 |
| 45 | M | 1,1-dichloroethane | 1.130 | 1.230 | -8.8 | 133 | 0.00 | 8.70 |
| 46 | M | chloroprene | 1.006 | 1.082 | -7.6 | 126 | 0.00 | 8.82 |
| 47 | M | acrylonitrile | 0.261 | 0.304 | -16.5 | 138 | -0.01 | 8.03 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 48 | M | vinyl acetate | 50.000 | 49.473 | 1.1 | 123 | 0.00 | 8.67 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 49 | M | ethyl acetate | 0.096 | 0.113 | -17.7 | 136 | 0.00 | 9.39 |
| 50 | M | 2,2-dichloropropane | 0.952 | 0.786 | 17.4 | 104 | 0.00 | 9.44 |
| 51 | M | cis-1,2-dichloroethene | 0.592 | 0.640 | -8.1 | 130 | 0.00 | 9.42 |
| 52 | m | methyl acrylate | 0.622 | 0.696 | -11.9 | 138 | 0.00 | 9.47 |
| 53 | M | propionitrile | 0.102 | 0.116 | -13.7 | 139 | 0.00 | 9.41 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 54 | M | bromochloromethane | 50.000 | 52.760 | -5.5 | 128 | 0.00 | 9.72 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 55 | M | tetrahydrofuran | 0.256 | 0.295 | -15.2 | 138 | 0.00 | 9.78 |
| 56 | M | chloroform | 1.094 | 1.136 | -3.8 | 126 | 0.00 | 9.77 |
| 57 | m | t-butyl formate | 0.636 | 0.648 | -1.9 | 121 | 0.00 | 9.82 |
| 58 | M | Iso-octane | 2.141 | 1.959 | 8.5 | 112 | 0.00 | 10.53 |
| 59 | S | dibromofluoromethane (s) | 0.516 | 0.494 | 4.3 | 117 | 0.00 | 9.96 |
| 60 | S | 1,2-dichloroethane-d4 (s) | 0.748 | 0.688 | 8.0 | 110 | 0.00 | 10.38 |
| 61 | M | freon 113 | 0.385 | 0.419 | -8.8 | 137 | 0.00 | 7.09 |
| 62 | M | methacrylonitrile | 0.453 | 0.528 | -16.6 | 137 | 0.00 | 9.62 |
| 63 | M | 1,1,1-trichloroethane | 0.927 | 1.021 | -10.1 | 130 | 0.00 | 10.07 |
| 64 | M | tert-amyl methyl ether | 1.945 | 1.977 | -1.6 | 127 | 0.00 | 10.53 |
| 65 | I | 1,4-difluorobenzene | 1.000 | 1.000 | 0.0 | 124 | 0.00 | 10.84 |
| 66 | M | Di-isobutylene | | ----------NA---------- | | | | |
| 67 | M | tert amyl alcohol | | ----------NA---------- | | | | |
| 68 | M | epichlorohydrin | 0.050 | 0.048 | 4.0 | 117 | 0.00 | 12.08 |
| 69 | M | n-butyl alcohol | 0.015 | 0.016 | -6.7 | 128 | 0.00 | 10.92 |
| 70 | M | tert-amyl ethyl ether | | ----------NA---------- | | | | |
| 71 | M | carbon tetrachloride | 0.533 | 0.541 | -1.5 | 126 | 0.00 | 10.28 |
| 72 | M | 1,1-dichloropropene | 0.526 | 0.547 | -4.0 | 131 | 0.00 | 10.24 |
| 73 | M | hexane | 0.545 | 0.486 | 10.8 | 110 | 0.00 | 8.49 |
| 74 | M | benzene | 1.464 | 1.519 | -3.8 | 134 | 0.00 | 10.49 |
| 75 | M | heptane | 0.310 | 0.238 | 23.2# | 94 | 0.00 | 10.69 |
| 76 | M | isopropyl acetate | 0.898 | 0.932 | -3.8 | 134 | 0.00 | 10.38 |
| 77 | M | 1,2-dichloroethane | 0.610 | 0.612 | -0.3 | 124 | 0.00 | 10.47 |
| 78 | | ethyl acrylate | | ----------NA---------- | | | | |
| 79 | M | trichloroethene | 0.369 | 0.403 | -9.2 | 134 | 0.00 | 11.21 |
| 80 | M | 2-nitropropane | | ----------NA---------- | | | | |
| 81 | M | 2-chloroethyl vinyl ether | 0.195 | 0.218 | -11.8 | 130 | 0.00 | 11.97 |
| 82 | M | methylcyclohexane | 0.623 | 0.614 | 1.4 | 124 | 0.00 | 11.46 |
| 83 | M | methyl methacrylate | 0.415 | 0.449 | -8.2 | 135 | 0.00 | 11.44 |
| 84 | M | 1,2-dichloropropane | 0.395 | 0.444 | -12.4 | 143 | 0.00 | 11.44 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 85 | M | dibromomethane | 50.000 | 53.816 | -7.6 | 130 | 0.00 | 11.60 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VE8685-CC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E197674.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 86 | M | bromodichloromethane | 0.563 | 0.587 | -4.3 | 127 | 0.00 | 11.73 |
| 87 | M | cis-1,3-dichloropropene | 0.695 | 0.716 | -3.0 | 123 | 0.00 | 12.21 |
| 88 | S | toluene-d8 (s) | 1.351 | 1.261 | 6.7 | 118 | 0.00 | 12.54 |
| 89 | M | 4-methyl-2-pentanone | 0.192 | 0.196 | -2.1 | 128 | 0.00 | 12.29 |
| 90 | M | toluene | 0.919 | 0.947 | -3.0 | 128 | 0.00 | 12.61 |
| 91 | M | 3-methyl-1-butanol | 0.026 | 0.024 | 7.7 | 118 | 0.00 | 12.30 |
| 92 | M | trans-1,3-dichloropropene | 0.658 | 0.645 | 2.0 | 120 | 0.00 | 12.79 |
| 93 | M | ethyl methacrylate | 0.552 | 0.596 | -8.0 | 129 | 0.00 | 12.79 |
| 94 | M | 1,1,2-trichloroethane | 0.295 | 0.321 | -8.8 | 129 | 0.00 | 13.01 |
| 95 | M | 2-hexanone | 0.190 | 0.184 | 3.2 | 121 | 0.00 | 13.19 |
| 96 | I | chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 120 | 0.00 | 14.16 |
| | | | True | Calc. | % Drift | | | |
| 97 | M | cyclohexanone | 500.000 | 77.695 | 84.5# | 24 | 0.00 | 15.36 |
| | | | AvgRF | CCRF | % Dev | | | |
| 98 | M | tetrachloroethene | 0.398 | 0.415 | -4.3 | 129 | 0.00 | 13.26 |
| 99 | M | 1,3-dichloropropane | 0.691 | 0.708 | -2.5 | 128 | 0.00 | 13.22 |
| 100 | M | butyl acetate | 0.311 | 0.319 | -2.6 | 124 | 0.00 | 13.28 |
| 101 | m | 3,3-dimethyl-1-butanol | 0.054 | 0.049 | 9.3 | 113 | 0.00 | 13.38 |
| 102 | M | dibromochloromethane | 0.459 | 0.464 | -1.1 | 123 | 0.00 | 13.51 |
| 103 | M | 1,2-dibromoethane | 0.389 | 0.415 | -6.7 | 124 | 0.00 | 13.68 |
| 104 | M | n-butyl ether | | ----------NA---------- | | | | |
| 105 | M | chlorobenzene | 1.043 | 1.083 | -3.8 | 126 | 0.00 | 14.20 |
| 106 | M | 1,1,1,2-tetrachloroethane | 0.394 | 0.392 | 0.5 | 124 | 0.00 | 14.26 |
| 107 | M | ethylbenzene | 1.853 | 1.835 | 1.0 | 123 | 0.00 | 14.26 |
| 108 | M | m,p-xylene | 0.708 | 0.699 | 1.3 | 122 | 0.00 | 14.38 |
| 109 | M | o-xylene | 0.736 | 0.728 | 1.1 | 123 | 0.00 | 14.84 |
| 110 | M | butyl acrylate | | ----------NA---------- | | | | |
| 111 | M | styrene | 1.186 | 1.204 | -1.5 | 121 | 0.00 | 14.84 |
| 112 | M | bromoform | 0.313 | 0.319 | -1.9 | 118 | 0.00 | 15.12 |
| 113 | I | 1,4-dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 117 | 0.00 | 16.74 |
| 114 | M | isopropylbenzene | 3.807 | 3.781 | 0.7 | 119 | 0.00 | 15.21 |
| 115 | S | 4-bromofluorobenzene (s) | 1.103 | 1.031 | 6.5 | 116 | 0.00 | 15.43 |
| 116 | M | bromobenzene | 0.886 | 0.907 | -2.4 | 124 | 0.00 | 15.66 |
| 117 | M | 1,1,2,2-tetrachloroethane | 1.151 | 1.145 | 0.5 | 128 | 0.00 | 15.51 |
| 118 | M | trans-1,4-dichloro-2-bute | 0.320 | 0.292 | 8.8 | 101 | 0.00 | 15.56 |
| 119 | M | 1,2,3-trichloropropane | 0.285 | 0.299 | -4.9 | 120 | 0.00 | 15.60 |
| 120 | M | n-propylbenzene | 4.291 | 4.192 | 2.3 | 121 | 0.00 | 15.67 |
| 121 | M | p-ethyltoluene | | ----------NA---------- | | | | |
| 122 | M | 2-chlorotoluene | 0.790 | 0.849 | -7.5 | 129 | 0.00 | 15.84 |
| 123 | M | 4-chlorotoluene | 2.837 | 2.804 | 1.2 | 118 | 0.00 | 15.94 |
| 124 | M | 1,3,5-trimethylbenzene | 3.165 | 3.098 | 2.1 | 124 | 0.00 | 15.84 |
| 125 | M | tert-butylbenzene | 2.782 | 2.753 | 1.0 | 117 | 0.00 | 16.22 |
| 126 | M | pentachloroethane | 0.562 | 0.571 | -1.6 | 120 | 0.00 | 16.31 |
| 127 | M | 1,2,4-trimethylbenzene | 3.157 | 3.113 | 1.4 | 118 | 0.00 | 16.28 |
| 128 | M | sec-butylbenzene | 3.911 | 3.944 | -0.8 | 117 | 0.00 | 16.46 |
| 129 | M | 1,3-dichlorobenzene | 1.681 | 1.699 | -1.1 | 120 | 0.00 | 16.67 |
| 130 | M | p-isopropyltoluene | 3.210 | 3.180 | 0.9 | 113 | 0.00 | 16.59 |
| 131 | M | 1,4-dichlorobenzene | 1.640 | 1.694 | -3.3 | 120 | 0.00 | 16.76 |
| 132 | | benzyl chloride | 1.980 | 1.244 | 37.2# | 67 | 0.00 | 16.87 |
| 133 | M | p-diethylbenzene | | ----------NA---------- | | | | |
| 134 | M | 1,2-dichlorobenzene | 1.631 | 1.712 | -5.0 | 121 | 0.00 | 17.20 |
| 135 | M | n-butylbenzene | 1.595 | 1.638 | -2.7 | 113 | 0.00 | 17.05 |
| 136 | M | 1,2,4,5-tetramethylbenzen | | ----------NA---------- | | | | |
| 137 | M | 1,2-dibromo-3-chloropropa | 0.219 | 0.231 | -5.5 | 114 | 0.00 | 18.02 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VE8685-CC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E197674.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 138 | m | 1,3,5-trichlorobenzene | 50.000 | 51.045 | -2.1 | 114 | 0.00 | 18.25 |
| 139 | M | 1,2,4-trichlorobenzene | 50.000 | 48.049 | 3.9 | 112 | 0.00 | 18.97 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 140 | M | hexachlorobutadiene | 0.490 | 0.479 | 2.2 | 106 | 0.00 | 19.11 |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 141 | M | naphthalene | 50.000 | 42.803 | 14.4 | 101 | 0.00 | 19.28 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 142 | | MMT | | ----------NA---------- | | | | |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 143 | M | 1,2,3-trichlorobenzene | 50.000 | 47.408 | 5.2 | 113 | 0.00 | 19.56 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 144 | M | hexachloroethane | 0.627 | 0.662 | -5.6 | 117 | 0.00 | 17.50 |
| 145 | M | Cyclohexane | 1.065 | 1.225 | -15.0 | 138 | 0.00 | 10.17 |
| 146 | | ethyleinimine | | ----------NA---------- | | | | |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
E196788.D ME8647.M Mon Dec 10 11:58:23 2012 RPT1

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VE8686-CC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E197699.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E197699.D                    Vial: 2
Acq On    : 10 Dec 2012  11:34 am                     Operator: OksanaT
Sample    : cc8647-20                                 Inst    : MSE
Misc      : MS39553,VE8686,5,,100,5,1                 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\MSDCHEM\1\METHODS\ME8647.M (RTE Integrator)
Title        : SW846  8260B,ZB624 60m x 0.25mm x 1.4um
Last Update  : Tue Nov 13 15:53:05 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.010  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | | Tert Butyl Alcohol-d9 | 1.000 | 1.000 | 0.0 | 81 | 0.00 | 7.70 |
| 2 | M | 1,4-dioxane | 0.082 | 0.077 | 6.1 | 67 | 0.00 | 11.56 |
| 3 | M | tertiary butyl alcohol | 1.235 | 1.445 | -17.0 | 89 | 0.00 | 7.83 |
| 4 | | ethanol | | ----------NA---------- | | | | |
| 5 | I | pentafluorobenzene | 1.000 | 1.000 | 0.0 | 94 | 0.00 | 9.92 |
| 6 | | freon 23 | | ----------NA---------- | | | | |
| 7 | | freon 115 | | ----------NA---------- | | | | |
| 8 | | freon 143a | | ----------NA---------- | | | | |
| 9 | | freon 152a | | ----------NA---------- | | | | |
| 10 | M | chlorotrifluoroethene | | ----------NA---------- | | | | |
| 11 | M | chlorodifluoromethane | 0.755 | 0.713 | 5.6 | 84 | 0.04 | 4.35 |
| 12 | M | dichlorodifluoromethane | 0.839 | 0.937 | -11.7 | 91 | 0.01 | 4.34 |
| 13 | | freon 114 | | ----------NA---------- | | | | |
| 14 | | freon 142b | | ----------NA---------- | | | | |
| 15 | M | chloromethane | 0.860 | 1.023 | -19.0 | 105 | 0.00 | 4.68 |
| 16 | M | vinyl chloride | 0.897 | 1.025 | -14.3 | 99 | 0.00 | 4.95 |
| 17 | M | acetaldehyde | | ----------NA---------- | | | | |
| 18 | M | bromomethane | 0.476 | 0.532 | -11.8 | 100 | 0.00 | 5.61 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 19 | M | chloroethane | 20.000 | 21.911 | -9.6 | 105 | 0.00 | 5.79 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 20 | M | vinyl bromide | | ----------NA---------- | | | | |
| 21 | M | trichlorofluoromethane | 0.962 | 1.022 | -6.2 | 89 | 0.00 | 6.30 |
| 22 | M | pentane | | ----------NA---------- | | | | |
| 23 | M | ethyl ether | 0.367 | 0.367 | 0.0 | 91 | 0.00 | 6.66 |
| 24 | | freon 141b | | ----------NA---------- | | | | |
| 25 | | freon 123a | | ----------NA---------- | | | | |
| 26 | | freon 123 | | ----------NA---------- | | | | |
| 27 | m | 2-chloropropane | 1.042 | 1.276 | -22.5# | 105 | 0.00 | 6.86 |
| 28 | M | acrolein | 0.141 | 0.145 | -2.8 | 88 | 0.00 | 6.87 |
| 29 | M | 1,1-dichloroethene | 0.491 | 0.512 | -4.3 | 87 | 0.00 | 7.11 |
| 30 | M | isopropyl alcohol | | ----------NA---------- | | | | |
| 31 | M | acetone | 0.080 | 0.056 | 30.0# | 61 | -0.01 | 7.09 |
| 32 | M | allyl chloride | 1.253 | 1.219 | 2.7 | 88 | 0.00 | 7.60 |
| 33 | M | acetonitrile | 0.046 | 0.057 | -23.9# | 105 | 0.00 | 7.49 |
| 34 | M | iodomethane | 0.883 | 0.940 | -6.5 | 93 | 0.00 | 7.37 |
| 35 | M | iso-butyl alcohol | | ----------NA---------- | | | | |
| 36 | M | carbon disulfide | 1.757 | 1.955 | -11.3 | 95 | -0.02 | 7.52 |
| 37 | M | methylene chloride | 0.575 | 0.603 | -4.9 | 90 | 0.00 | 7.77 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VE8686-CC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E197699.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 38 | m | 1-chloropropane | 1.189 | 1.265 | -6.4 | 94 | 0.00 | 7.83 |
| 39 | M | methyl acetate | 0.579 | 0.664 | -14.7 | 97 | 0.00 | 7.56 |
| 40 | M | methyl tert butyl ether | 2.045 | 1.989 | 2.7 | 85 | 0.00 | 8.12 |
| 41 | M | trans-1,2-dichloroethene | 0.541 | 0.531 | 1.8 | 83 | -0.01 | 8.16 |
| 42 | M | di-isopropyl ether | 2.068 | 2.333 | -12.8 | 97 | 0.00 | 8.71 |
| 43 | M | ethyl tert-butyl ether | 2.196 | 2.209 | -0.6 | 86 | 0.00 | 9.17 |
| 44 | M | 2-butanone | 0.090 | 0.067 | 25.6# | 67 | 0.00 | 9.36 |
| 45 | M | 1,1-dichloroethane | 1.130 | 1.139 | -0.8 | 85 | 0.00 | 8.70 |
| 46 | M | chloroprene | 1.006 | 0.980 | 2.6 | 80 | 0.00 | 8.82 |
| 47 | M | acrylonitrile | 0.261 | 0.280 | -7.3 | 91 | 0.00 | 8.04 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 48 | M | vinyl acetate | 20.000 | 17.597 | 12.0 | 77 | 0.00 | 8.67 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 49 | M | ethyl acetate | 0.096 | 0.100 | -4.2 | 88 | 0.00 | 9.39 |
| 50 | M | 2,2-dichloropropane | 0.952 | 0.945 | 0.7 | 84 | 0.00 | 9.44 |
| 51 | M | cis-1,2-dichloroethene | 0.592 | 0.604 | -2.0 | 85 | 0.00 | 9.42 |
| 52 | m | methyl acrylate | 0.622 | 0.669 | -7.6 | 92 | 0.00 | 9.47 |
| 53 | M | propionitrile | 0.102 | 0.111 | -8.8 | 90 | 0.00 | 9.41 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 54 | M | bromochloromethane | 20.000 | 18.344 | 8.3 | 83 | 0.00 | 9.72 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 55 | M | tetrahydrofuran | 0.256 | 0.292 | -14.1 | 97 | 0.00 | 9.78 |
| 56 | M | chloroform | 1.094 | 1.044 | 4.6 | 82 | 0.00 | 9.78 |
| 57 | m | t-butyl formate | 0.636 | 0.630 | 0.9 | 85 | 0.00 | 9.81 |
| 58 | M | Iso-octane | 2.141 | 1.959 | 8.5 | 75 | 0.00 | 10.53 |
| 59 | S | dibromofluoromethane (s) | 0.516 | 0.471 | 8.7 | 79 | 0.00 | 9.97 |
| 60 | S | 1,2-dichloroethane-d4 (s) | 0.748 | 0.664 | 11.2 | 74 | 0.00 | 10.38 |
| 61 | M | freon 113 | 0.385 | 0.387 | -0.5 | 88 | 0.00 | 7.08 |
| 62 | M | methacrylonitrile | 0.453 | 0.503 | -11.0 | 96 | 0.00 | 9.62 |
| 63 | M | 1,1,1-trichloroethane | 0.927 | 0.923 | 0.4 | 84 | 0.00 | 10.07 |
| 64 | M | tert-amyl methyl ether | 1.945 | 1.895 | 2.6 | 85 | 0.00 | 10.53 |
| 65 | I | 1,4-difluorobenzene | 1.000 | 1.000 | 0.0 | 92 | 0.00 | 10.84 |
| 66 | M | Di-isobutylene | | ----------NA---------- | | | | |
| 67 | M | tert amyl alcohol | | ----------NA---------- | | | | |
| 68 | M | epichlorohydrin | 0.050 | 0.049 | 2.0 | 82 | 0.00 | 12.08 |
| 69 | M | n-butyl alcohol | 0.015 | 0.015 | 0.0 | 79 | 0.00 | 10.92 |
| 70 | M | tert-amyl ethyl ether | | ----------NA---------- | | | | |
| 71 | M | carbon tetrachloride | 0.533 | 0.516 | 3.2 | 79 | 0.00 | 10.29 |
| 72 | M | 1,1-dichloropropene | 0.526 | 0.524 | 0.4 | 82 | 0.00 | 10.24 |
| 73 | M | hexane | 0.545 | 0.502 | 7.9 | 75 | 0.00 | 8.49 |
| 74 | M | benzene | 1.464 | 1.474 | -0.7 | 85 | 0.00 | 10.49 |
| 75 | M | heptane | 0.310 | 0.258 | 16.8 | 67 | 0.00 | 10.69 |
| 76 | M | isopropyl acetate | 0.898 | 0.951 | -5.9 | 90 | 0.00 | 10.38 |
| 77 | M | 1,2-dichloroethane | 0.610 | 0.594 | 2.6 | 82 | 0.00 | 10.47 |
| 78 | | ethyl acrylate | | ----------NA---------- | | | | |
| 79 | M | trichloroethene | 0.369 | 0.380 | -3.0 | 85 | 0.00 | 11.21 |
| 80 | M | 2-nitropropane | | ----------NA---------- | | | | |
| 81 | M | 2-chloroethyl vinyl ether | 0.195 | 0.218 | -11.8 | 92 | 0.00 | 11.96 |
| 82 | M | methylcyclohexane | 0.623 | 0.596 | 4.3 | 77 | 0.00 | 11.46 |
| 83 | M | methyl methacrylate | 0.415 | 0.432 | -4.1 | 84 | 0.00 | 11.44 |
| 84 | M | 1,2-dichloropropane | 0.395 | 0.422 | -6.8 | 90 | 0.00 | 11.45 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 85 | M | dibromomethane | 20.000 | 19.581 | 2.1 | 85 | 0.00 | 11.60 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VE8686-CC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E197699.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 86 | M | bromodichloromethane | 0.563 | 0.552 | 2.0 | 82 | 0.00 | 11.73 |
| 87 | M | cis-1,3-dichloropropene | 0.695 | 0.691 | 0.6 | 81 | 0.00 | 12.21 |
| 88 | S | toluene-d8 (s) | 1.351 | 1.237 | 8.4 | 75 | 0.00 | 12.53 |
| 89 | M | 4-methyl-2-pentanone | 0.192 | 0.190 | 1.0 | 84 | 0.00 | 12.29 |
| 90 | M | toluene | 0.919 | 0.898 | 2.3 | 79 | 0.00 | 12.62 |
| 91 | M | 3-methyl-1-butanol | 0.026 | 0.022 | 15.4 | 72 | 0.00 | 12.30 |
| 92 | M | trans-1,3-dichloropropene | 0.658 | 0.632 | 4.0 | 78 | 0.00 | 12.79 |
| 93 | M | ethyl methacrylate | 0.552 | 0.556 | -0.7 | 79 | 0.00 | 12.79 |
| 94 | M | 1,1,2-trichloroethane | 0.295 | 0.307 | -4.1 | 86 | 0.00 | 13.02 |
| 95 | M | 2-hexanone | 0.190 | 0.167 | 12.1 | 74 | 0.00 | 13.20 |
| 96 | I | chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 90 | 0.00 | 14.16 |
| | | | True | Calc. | % Drift | | | |
| 97 | M | cyclohexanone | 200.000 | 50.029 | 75.0# | 25 | 0.00 | 15.36 |
| | | | AvgRF | CCRF | % Dev | | | |
| 98 | M | tetrachloroethene | 0.398 | 0.430 | -8.0 | 84 | 0.00 | 13.27 |
| 99 | M | 1,3-dichloropropane | 0.691 | 0.675 | 2.3 | 82 | 0.00 | 13.21 |
| 100 | M | butyl acetate | 0.311 | 0.305 | 1.9 | 79 | 0.00 | 13.29 |
| 101 | m | 3,3-dimethyl-1-butanol | 0.054 | 0.049 | 9.3 | 74 | 0.00 | 13.38 |
| 102 | M | dibromochloromethane | 0.459 | 0.440 | 4.1 | 80 | 0.00 | 13.51 |
| 103 | M | 1,2-dibromoethane | 0.389 | 0.397 | -2.1 | 82 | 0.00 | 13.68 |
| 104 | M | n-butyl ether | | ----------NA---------- | | | | |
| 105 | M | chlorobenzene | 1.043 | 1.042 | 0.1 | 81 | 0.00 | 14.20 |
| 106 | M | 1,1,1,2-tetrachloroethane | 0.394 | 0.403 | -2.3 | 84 | 0.00 | 14.26 |
| 107 | M | ethylbenzene | 1.853 | 1.871 | -1.0 | 82 | 0.00 | 14.26 |
| 108 | M | m,p-xylene | 0.708 | 0.685 | 3.2 | 80 | 0.00 | 14.38 |
| 109 | M | o-xylene | 0.736 | 0.697 | 5.3 | 77 | 0.00 | 14.84 |
| 110 | M | butyl acrylate | | ----------NA---------- | | | | |
| 111 | M | styrene | 1.186 | 1.175 | 0.9 | 77 | 0.00 | 14.84 |
| 112 | M | bromoform | 0.313 | 0.323 | -3.2 | 84 | 0.00 | 15.12 |
| 113 | I | 1,4-dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 89 | 0.00 | 16.73 |
| 114 | M | isopropylbenzene | 3.807 | 3.649 | 4.2 | 77 | 0.00 | 15.22 |
| 115 | S | 4-bromofluorobenzene (s) | 1.103 | 0.981 | 11.1 | 74 | 0.00 | 15.44 |
| 116 | M | bromobenzene | 0.886 | 0.910 | -2.7 | 86 | 0.00 | 15.66 |
| 117 | M | 1,1,2,2-tetrachloroethane | 1.151 | 1.067 | 7.3 | 81 | 0.00 | 15.52 |
| 118 | M | trans-1,4-dichloro-2-bute | 0.320 | 0.289 | 9.7 | 72 | 0.00 | 15.56 |
| 119 | M | 1,2,3-trichloropropane | 0.285 | 0.280 | 1.8 | 80 | 0.00 | 15.60 |
| 120 | M | n-propylbenzene | 4.291 | 4.080 | 4.9 | 77 | 0.00 | 15.67 |
| 121 | M | p-ethyltoluene | | ----------NA---------- | | | | |
| 122 | M | 2-chlorotoluene | 0.790 | 0.795 | -0.6 | 82 | 0.00 | 15.83 |
| 123 | M | 4-chlorotoluene | 2.837 | 2.663 | 6.1 | 79 | 0.00 | 15.94 |
| 124 | M | 1,3,5-trimethylbenzene | 3.165 | 2.959 | 6.5 | 79 | 0.00 | 15.83 |
| 125 | M | tert-butylbenzene | 2.782 | 2.492 | 10.4 | 72 | 0.00 | 16.23 |
| 126 | M | pentachloroethane | 0.562 | 0.585 | -4.1 | 84 | 0.00 | 16.31 |
| 127 | M | 1,2,4-trimethylbenzene | 3.157 | 2.989 | 5.3 | 77 | 0.00 | 16.27 |
| 128 | M | sec-butylbenzene | 3.911 | 3.660 | 6.4 | 74 | 0.00 | 16.47 |
| 129 | M | 1,3-dichlorobenzene | 1.681 | 1.653 | 1.7 | 83 | 0.00 | 16.67 |
| 130 | M | p-isopropyltoluene | 3.210 | 2.949 | 8.1 | 72 | 0.00 | 16.59 |
| 131 | M | 1,4-dichlorobenzene | 1.640 | 1.642 | -0.1 | 84 | 0.00 | 16.77 |
| 132 | | benzyl chloride | 1.980 | 1.687 | 14.8 | 69 | 0.00 | 16.87 |
| 133 | M | p-diethylbenzene | | ----------NA---------- | | | | |
| 134 | M | 1,2-dichlorobenzene | 1.631 | 1.636 | -0.3 | 83 | 0.00 | 17.19 |
| 135 | M | n-butylbenzene | 1.595 | 1.477 | 7.4 | 72 | 0.00 | 17.05 |
| 136 | M | 1,2,4,5-tetramethylbenzen | | ----------NA---------- | | | | |
| 137 | M | 1,2-dibromo-3-chloropropa | 0.219 | 0.194 | 11.4 | 73 | 0.00 | 18.01 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VE8686-CC8647
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** E197699.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 138 | m | 1,3,5-trichlorobenzene | 20.000 | 19.740 | 1.3 | 83 | 0.00 | 18.26 |
| 139 | M | 1,2,4-trichlorobenzene | 20.000 | 19.245 | 3.8 | 86 | 0.00 | 18.97 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 140 | M | hexachlorobutadiene | 0.490 | 0.576 | -17.6 | 90 | 0.00 | 19.11 |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 141 | M | naphthalene | 20.000 | 17.105 | 14.5 | 75 | 0.00 | 19.28 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 142 | | MMT | | ----------NA---------- | | | | |

| | | | True | Calc. | % Drift | | | |
|---|---|---|---|---|---|---|---|---|
| 143 | M | 1,2,3-trichlorobenzene | 20.000 | 20.071 | -0.4 | 90 | 0.00 | 19.56 |

| | | | AvgRF | CCRF | % Dev | | | |
|---|---|---|---|---|---|---|---|---|
| 144 | M | hexachloroethane | 0.627 | 0.574 | 8.5 | 73 | 0.00 | 17.51 |
| 145 | M | Cyclohexane | 1.065 | 1.130 | -6.1 | 84 | 0.00 | 10.17 |
| 146 | | ethyleinimine | | ----------NA---------- | | | | |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
E196787.D ME8647.M Mon Dec 10 15:08:56 2012 RPT1

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VO5808-ICC5808
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** O131727.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Response Factor Report MSO

```
Method       : C:\MSDCHEM\1\METHODS\MO5808S.M (RTE Integrator)
Title        : Method 624, ZB624 60mx0.25mmx1.4um
Last Update  : Thu Dec 06 08:30:18 2012
Response via : Initial Calibration

Calibration Files
1   =O131722.D   2   =O131723.D   100 =O131728.D   50  =O131727.D
20  =O131726.D   200 =O131729.D   5   =O131724.D   0.5 =O131731.D
10  =O131725.D       =
```

| Compound | 1 | 2 | 100 | 50 | 20 | 200 | 5 | 0.5 | 10 | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) I Tert Butyl Alcohol-d9 ----------ISTD---------- | | | | | | | | | | | |
| 2) tertiary butyl alcohol | 1.061 | 1.060 | 0.958 | 0.985 | 0.977 | 0.907 | 1.005 | | 0.927 | 0.985 | 5.71 |
| 3) ethanol | | | | | | | | | | 0.000# | -1.00 |
| 4) 1,4-dioxane | | | 0.098 | 0.087 | 0.093 | 0.093 | 0.083 | 0.089 | 0.089 | 0.090 | 5.33 |
| 5) I pentafluorobenzene ----------ISTD---------- | | | | | | | | | | | |
| 6) chlorodifluoromethane | | | | | | | | | | 0.000# | -1.00 |
| 7) dichlorodifluoromethane | 0.562 | 0.523 | 0.611 | 0.604 | 0.563 | 0.670 | 0.536 | | 0.537 | 0.576 | 8.58 |
| 8) chloromethane | 0.503 | 0.445 | 0.509 | 0.497 | 0.495 | 0.558 | 0.432 | | 0.461 | 0.487 | 8.25 |
| 9) vinyl chloride | 0.471 | 0.449 | 0.537 | 0.534 | 0.521 | 0.596 | 0.456 | | 0.473 | 0.504 | 10.11 |
| 10) bromomethane | | | 0.221 | 0.260 | 0.270 | 0.213 | 0.265 | | 0.263 | 0.249 | 9.95 |
| 11) chloroethane | 0.218 | 0.229 | 0.261 | 0.254 | 0.258 | 0.267 | 0.232 | | 0.238 | 0.245 | 7.21 |
| 12) trichlorofluoromethane | 0.524 | 0.486 | 0.571 | 0.574 | 0.543 | 0.620 | 0.492 | | 0.507 | 0.540 | 8.60 |
| 13) Pentane | | | | | | | | | | 0.000# | -1.00 |
| 14) ethyl ether | | | 0.193 | 0.179 | 0.169 | 0.173 | 0.180 | 0.165 | 0.171 | 0.176 | 5.30 |
| 15) acrolein | 0.052 | 0.042 | 0.062 | 0.058 | 0.059 | 0.064 | 0.051 | 0.051 | 0.052 | 0.054 | 12.41 |
| 16) 1,1-dichloroethene | 0.336 | 0.299 | 0.300 | 0.297 | 0.305 | 0.311 | 0.278 | 0.308 | 0.290 | 0.303 | 5.31 |
| 17) acetone | | | 0.098 | 0.095 | 0.112 | 0.103 | 0.113 | | 0.110 | 0.105 | 7.10 |
| 18) allyl chloride | 0.175 | 0.167 | 0.198 | 0.197 | 0.185 | 0.197 | 0.173 | | 0.179 | 0.184 | 6.66 |
| 19) acetonitrile | | | 0.029 | 0.028 | 0.028 | 0.030 | 0.028 | | 0.025 | 0.028 | 6.05 |
| 20) iodomethane | | | 0.397 | 0.399 | 0.360 | 0.359 | 0.273 | | 0.317 | 0.351 | 13.88 |
| 21) iso-butyl alcohol | | | | | | | | | | 0.000# | -1.00 |
| 22) carbon disulfide | 1.056 | 0.982 | 1.086 | 1.070 | 1.076 | 1.117 | 0.988 | | 1.017 | 1.049 | 4.62 |
| 23) methylene chloride | | | | | | | | | | | |

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VO5808-ICC5808
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** O131727.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
                  0.382 0.325 0.316 0.329 0.335 0.312       0.304   0.329    7.79
24)  methyl acetate
                  0.275 0.258 0.247 0.247 0.274 0.241       0.234   0.254    6.31
25)  methyl tert butyl ether
            0.723 0.761 0.895 0.851 0.825 0.916 0.755 0.738 0.806   0.808    8.60
26)  trans-1,2-dichloroethene
            0.380 0.339 0.334 0.330 0.341 0.338 0.321 0.400 0.323   0.345    7.70
27)  di-isopropyl ether
            0.803 0.937 0.964 0.948 0.946 0.996 0.884       0.890   0.921    6.55
28)  2-butanone
                  0.036 0.044 0.040 0.042 0.045 0.038       0.038   0.040    8.43
29)  1,1-dichloroethane
            0.568 0.522 0.579 0.569 0.583 0.589 0.535 0.520 0.549   0.557    4.77
30)  chloroprene
            0.439 0.501 0.518 0.522 0.528 0.532 0.490       0.476   0.501    6.35
31)  acrylonitrile
            0.097 0.101 0.117 0.111 0.112 0.122 0.101       0.106   0.108    8.04
32)  vinyl acetate
                  0.042 0.048 0.047 0.046 0.051 0.045       0.044   0.046    6.55
33)  ethyl tert-butyl ether
            0.708 0.841 0.917 0.877 0.848 0.956 0.793       0.798   0.842    9.20
34)  ethyl acetate
                        0.045 0.042 0.043 0.048 0.040       0.042   0.043    6.55
35)  2,2-dichloropropane
            0.526 0.503 0.521 0.521 0.536 0.538 0.483 0.489 0.495   0.512    4.00
36)  cis-1,2-dichloroethene
            0.400 0.360 0.356 0.351 0.356 0.366 0.353 0.394 0.342   0.364    5.44
37)  methylacrylate
                        0.055 0.050 0.050 0.057 0.044       0.049   0.051    8.70
38)  propionitrile
            0.046 0.041 0.051 0.048 0.048 0.053 0.044       0.045   0.047    8.07
39)  bromochloromethane
            0.150 0.149 0.167 0.163 0.163 0.173 0.154 0.144 0.154   0.157    6.05
40)  tetrahydrofuran
                        0.118 0.110 0.113 0.121 0.114       0.112   0.115    3.70
41)  chloroform
            0.362 0.353 0.375 0.369 0.380 0.386 0.347       0.361   0.367    3.68
42)  t-butyl formate
                        0.246 0.232 0.222 0.259 0.209       0.203   0.228    9.49
43)  dibromofluoromethane (s)
                        0.308 0.290 0.293 0.319 0.255       0.277   0.290    7.82
44)  1,2-dichloroethane-d4 (s)
                        0.341 0.322 0.319 0.348 0.299       0.324   0.326    5.38
45)  freon 113
            0.205 0.262 0.257 0.259 0.268 0.270 0.247 0.314 0.240   0.258   11.24
46)  methacrylonitrile
            0.182 0.163 0.192 0.181 0.181 0.200 0.173       0.176   0.181    6.27
47)  1,1,1-trichloroethane
            0.542 0.479 0.548 0.543 0.559 0.559 0.498 0.449 0.511   0.521    7.48
48)  Cyclohexane
            0.474 0.439 0.493 0.482 0.483 0.511 0.461       0.470   0.477    4.52

49) I   1,4-difluorobenzene   ----------------ISTD---------------------
50)  epichlorohydrin
            0.022 0.023 0.024 0.022 0.022 0.024 0.023       0.021   0.023    4.82
51)  n-butyl alcohol
                        0.008 0.008 0.008 0.009 0.008       0.007   0.008#   5.63
52)  carbon tetrachloride
            0.248 0.265 0.332 0.329 0.325 0.334 0.287       0.296   0.302   11.02
53)  1,1-dichloropropene
```

```
            0.333 0.316 0.329 0.331 0.333 0.333 0.304 0.306 0.321   0.323    3.62
54)  Tert Amyl Alcohol
                                                                    0.000#  -1.00
55)  hexane
                        0.289 0.289 0.308 0.299 0.310       0.284   0.297    3.76
56)  2,2,4-TRIMETHYLPENTANE
            0.705 0.876 0.813 0.812 0.848 0.850 0.797       0.741   0.805    7.15
57)  benzene
            0.962 0.872 0.932 0.923 0.948 0.936 0.893 0.955 0.905   0.925    3.25
58)  tert-amyl methyl ether
            0.114 0.133 0.148 0.142 0.138 0.150 0.130       0.127   0.135    8.77
59)  heptane
                  0.186 0.166 0.169 0.178 0.173 0.171       0.155   0.171    5.71
60)  isopropyl acetate
            0.483 0.550 0.529 0.510 0.511 0.547 0.485       0.481   0.512    5.45
61)  1,2-dichloroethane
            0.281 0.268 0.293 0.287 0.288 0.292 0.267 0.263 0.280   0.280    4.05
62)  Ethyl acrylate
                                                                    0.000#  -1.00
63)  trichloroethene
            0.233 0.224 0.241 0.242 0.245 0.245 0.226 0.218 0.237   0.235    4.21
64)  tert-Amyl Ethyl Ether
                                                                    0.000#  -1.00
65)  methyl methacrylate
            0.139 0.129 0.161 0.149 0.146 0.165 0.141       0.149   0.147    7.91
66)  2-nitropropane
                        0.014 0.013 0.013 0.014             0.011   0.013    8.15
67)  2-chloroethyl vinyl ether
            0.069 0.079 0.093 0.088 0.084 0.096 0.079       0.079   0.083   10.44
68)  1,2-dichloropropane
            0.216 0.207 0.227 0.220 0.221 0.227 0.204 0.198 0.217   0.215    4.70
69)  dibromomethane
            0.121 0.122 0.131 0.127 0.128 0.135 0.118 0.140 0.126   0.127    5.56
70)  methylcyclohexane
            0.336 0.383 0.385 0.384 0.399 0.398 0.365       0.347   0.375    6.22
71)  bromodichloromethane
            0.288 0.272 0.314 0.302 0.303 0.320 0.280 0.278 0.294   0.294    5.62
72)  cis-1,3-dichloropropene
            0.355 0.354 0.390 0.383 0.383 0.401 0.357 0.364 0.364   0.372    4.68
73)  toluene-d8 (s)
                  0.853 0.893 0.839 0.850 0.921 0.779       0.816   0.850    5.51
74)  4-methyl-2-pentanone
                        0.097 0.089 0.090 0.099 0.081       0.084   0.090    7.99
75)  toluene
            0.649 0.592 0.631 0.620 0.627 0.637 0.589 0.680 0.602   0.625    4.67
76)  3-methyl-1-butanol
            0.011 0.011 0.013 0.013 0.012 0.013 0.011       0.011   0.012    7.44
77)  trans-1,3-dichloropropene
            0.345 0.325 0.365 0.354 0.350 0.373 0.330 0.407 0.335   0.354    7.20
78)  ethyl methacrylate
            0.280 0.242 0.302 0.285 0.282 0.312 0.253       0.264   0.278    8.53
79)  1,1,2-trichloroethane
            0.155 0.139 0.166 0.157 0.159 0.171 0.151 0.144 0.157   0.155    6.42
80)  2-hexanone
            0.092 0.083 0.100 0.093 0.091 0.102 0.084       0.086   0.091    7.86

81) I   chlorobenzene-d5      ----------------ISTD---------------------
82)  tetrachloroethene
            0.271 0.252 0.251 0.253 0.263 0.252 0.246 0.268 0.250   0.256    3.41
83)  1,3-dichloropropane
```

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VO5808-ICC5808
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** O131727.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
            0.341 0.340 0.362 0.353 0.356 0.362 0.336       0.351   0.350    2.87
 84)  butyl acetate
            0.157 0.171 0.171 0.166 0.162 0.171 0.165       0.151   0.164    4.35
 85)  3,3-dimethyl-1-butanol
                  0.029 0.028 0.029 0.028 0.029 0.026       0.026   0.028    4.98
 86)  dibromochloromethane
            0.260 0.242 0.286 0.277 0.277 0.289 0.256 0.242 0.266   0.266    6.54
 87)  1,2-dibromoethane
            0.215 0.214 0.227 0.221 0.225 0.230 0.212 0.261 0.220   0.225    6.58
 88)  chlorobenzene
            0.781 0.730 0.781 0.773 0.783 0.789 0.747 0.835 0.760   0.776    3.78
 89)  1,1,1,2-tetrachloroethane
            0.254 0.257 0.286 0.279 0.281 0.288 0.268 0.224 0.277   0.268    7.59
 90)  ethylbenzene
            1.385 1.259 1.376 1.362 1.394 1.394 1.313 1.403 1.312   1.355    3.64
 91)  m,p-xylene
            0.567 0.510 0.530 0.529 0.540 0.529 0.501 0.562 0.515   0.531    4.15
 92)  o-xylene
            0.523 0.476 0.519 0.509 0.519 0.520 0.483 0.517 0.489   0.506    3.59
 93)  styrene
            0.837 0.804 0.894 0.877 0.871 0.902 0.817 0.990 0.823   0.868    6.64
 94)  bromoform
            0.185 0.185 0.218 0.208 0.205 0.218 0.195       0.201   0.202    6.46

 95) I   1,4-dichlorobenzene-d ----------------ISTD---------------------
 96)  isopropylbenzene
            2.427 2.292 2.437 2.415 2.468 2.624 2.234 2.372 2.376   2.405    4.59
 97)  4-bromofluorobenzene (s)
                  0.705 0.637 0.605 0.609 0.676 0.596       0.604   0.633    6.67
 98)  cyclohexanone
                                                                    0.000#  -1.00
 99)  bromobenzene
            0.631 0.564 0.600 0.591 0.598 0.628 0.578 0.721 0.572   0.609    7.85
100)  1,1,2,2-tetrachloroethane
            0.532 0.486 0.544 0.511 0.518 0.556 0.495       0.503   0.518    4.66
101)  trans-1,4-dichloro-2-butene
            0.148 0.147 0.179 0.170 0.171 0.186 0.156       0.163   0.165    8.55
102)  1,2,3-trichloropropane
            0.163 0.141 0.159 0.154 0.152 0.165 0.140 0.143 0.154   0.152    6.11
103)  n-propylbenzene
            0.619 0.627 0.648 0.643 0.654 0.685 0.608 0.702 0.631   0.646    4.74
104)  4-Ethyltoluene
                                                                    0.000#  -1.00
105)  2-chlorotoluene
            0.618 0.552 0.570 0.566 0.583 0.588 0.551 0.649 0.557   0.582    5.68
106)  4-chlorotoluene
            0.646 0.575 0.587 0.587 0.603 0.602 0.580 0.700 0.583   0.607    6.74
107)  1,3,5-trimethylbenzene
            2.015 1.935 2.080 2.053 2.081 2.169 1.915 2.171 1.994   2.046    4.45
108)  tert-butylbenzene
            1.739 1.735 1.843 1.825 1.852 1.932 1.732 1.924 1.784   1.818    4.25
109)  pentachloroethane
            0.362 0.340 0.389 0.383 0.389 0.395 0.351       0.362   0.371    5.45
110)  1,2,4-trimethylbenzene
            2.107 1.928 2.075 2.065 2.092 2.125 1.941 2.348 1.990   2.074    6.03
111)  sec-butylbenzene
            2.787 2.581 2.716 2.695 2.737 2.826 2.546 2.963 2.586   2.715    4.92
112)  1,3-dichlorobenzene
            1.229 1.176 1.155 1.159 1.183 1.164 1.122 1.575 1.122   1.209   11.64
113)  p-isopropyltoluene
```

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** VO5808-ICC5808
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** O131727.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
            2.303 2.171 2.301 2.313 2.357 2.349 2.166 2.621 2.219   2.311    5.91
114)  1,4-dichlorobenzene
            1.291 1.197 1.172 1.190 1.208 1.171 1.115       1.161   1.188    4.22
115)  1,2-dichlorobenzene
            1.158 1.032 1.089 1.074 1.100 1.091 1.045 1.370 1.060   1.113    9.25
116)  benzyl chloride
                  1.168 1.115 1.121 1.115 1.147 1.109       1.057   1.119    3.11
117)  1,4-Diethylbenzene
                                                                    0.000#  -1.00
118)  n-butylbenzene
            1.169 1.121 1.140 1.169 1.164 1.154 1.100 1.310 1.115   1.160    5.30
119)  1,2-dibromo-3-chloropropane
                  0.142 0.116 0.113 0.115 0.123 0.119       0.116   0.121    8.41
120)  1,3,5-TRICHLOROBENZENE
            1.036 0.923 0.895 0.933 0.947 0.943 0.876       0.904   0.932    5.20
121)  1,2,4-trichlorobenzene
            0.897 0.789 0.803 0.828 0.829 0.850 0.787       0.794   0.822    4.58
122)  hexachlorobutadiene
            0.562 0.507 0.520 0.520 0.534 0.560 0.495       0.507   0.526    4.70
123)  naphthalene
            1.987 1.774 1.872 1.829 1.830 1.965 1.720       1.786   1.845    5.02
124)  1,2,3-trichlorobenzene
            0.819 0.724 0.729 0.743 0.749 0.751 0.692       0.725   0.741    4.92
125)  hexachloroethane
            0.392 0.367 0.411 0.401 0.417 0.426 0.368 0.358 0.385   0.392    6.16
126)  1,2,4,5-tetramethylbenzene
                                                                    0.000#  -1.00
 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

           MO5808S.M         Mon Dec 10 10:59:02 2012   MSO
```

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VO5808-ICV5808
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** O131732.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\O131732.D Vial: 12
Acq On : 5 Dec 2012 4:23 pm Operator: DIPAP
Sample : icv5808-50 Inst : MSO
Misc : MS39413,VO5808,5.0,,,,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\MO5808S.M (RTE Integrator)
Title : Method 624, ZB624 60mx0.25mmx1.4um
Last Update : Thu Dec 06 08:30:18 2012
Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.30min
Max. RRF Dev : 20% Max. Rel. Area : 200%

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | Tert Butyl Alcohol-d9 | 1.000 | 1.000 | 0.0 | 100 | 0.00 | 8.27 |
| 2 | M | tertiary butyl alcohol | 0.985 | 1.001 | -1.6 | 102 | 0.00 | 8.40 |
| 3 | | ethanol | | ----------NA---------- | | | | |
| 4 | M | 1,4-dioxane | 0.090 | 0.087 | 3.3 | 95 | 0.00 | 12.41 |
| 5 | I | pentafluorobenzene | 1.000 | 1.000 | 0.0 | 103 | 0.00 | 10.69 |
| 6 | M | chlorodifluoromethane | | ----------NA---------- | | | | |
| 7 | M | dichlorodifluoromethane | 0.576 | 0.532 | 7.6 | 91 | 0.00 | 4.21 |
| 8 | M | chloromethane | 0.487 | 0.517 | -6.2 | 107 | 0.00 | 4.68 |
| 9 | M | vinyl chloride | 0.504 | 0.464 | 7.9 | 90 | 0.00 | 4.94 |
| 10 | M | bromomethane | 0.249 | 0.224 | 10.0 | 89 | 0.00 | 5.70 |
| 11 | M | chloroethane | 0.245 | 0.244 | 0.4 | 99 | 0.00 | 5.93 |
| 12 | M | trichlorofluoromethane | 0.540 | 0.551 | -2.0 | 99 | 0.00 | 6.44 |
| 13 | M | Pentane | | ----------NA---------- | | | | |
| 14 | M | ethyl ether | 0.176 | 0.172 | 2.3 | 105 | 0.00 | 6.96 |
| 15 | M | acrolein | 0.054 | 0.065 | -20.4# | 116 | 0.00 | 7.29 |
| 16 | M | 1,1-dichloroethene | 0.303 | 0.274 | 9.6 | 95 | -0.01 | 7.44 |
| 17 | M | acetone | 0.105 | 0.094 | 10.5 | 102 | 0.00 | 7.55 |
| 18 | M | allyl chloride | 0.184 | 0.180 | 2.2 | 94 | 0.00 | 8.08 |
| 19 | M | acetonitrile | 0.028 | 0.027 | 3.6 | 99 | 0.00 | 8.08 |
| 20 | M | iodomethane | 0.351 | 0.371 | -5.7 | 96 | 0.00 | 7.78 |
| 21 | M | iso-butyl alcohol | | ----------NA---------- | | | | |
| 22 | M | carbon disulfide | 1.049 | 0.957 | 8.8 | 92 | 0.00 | 7.90 |
| 23 | M | methylene chloride | 0.329 | 0.304 | 7.6 | 99 | 0.00 | 8.31 |
| 24 | M | methyl acetate | 0.254 | 0.225 | 11.4 | 94 | 0.00 | 8.07 |
| 25 | M | methyl tert butyl ether | 0.808 | 0.815 | -0.9 | 99 | 0.00 | 8.63 |
| 26 | M | trans-1,2-dichloroethene | 0.345 | 0.309 | 10.4 | 96 | 0.00 | 8.71 |
| 27 | M | di-isopropyl ether | 0.921 | 0.941 | -2.2 | 102 | 0.00 | 9.29 |
| 28 | M | 2-butanone | 0.040 | 0.041 | -2.5 | 105 | 0.00 | 10.13 |
| 29 | M | 1,1-dichloroethane | 0.557 | 0.554 | 0.5 | 100 | 0.00 | 9.35 |
| 30 | M | chloroprene | 0.501 | 0.452 | 9.8 | 89 | 0.00 | 9.45 |
| 31 | M | acrylonitrile | 0.108 | 0.107 | 0.9 | 100 | 0.00 | 8.70 |
| 32 | M | vinyl acetate | 0.046 | 0.053 | -15.2 | 116 | 0.00 | 9.34 |
| 33 | M | ethyl tert-butyl ether | 0.842 | 0.851 | -1.1 | 100 | 0.00 | 9.79 |
| 34 | M | ethyl acetate | 0.043 | 0.042 | 2.3 | 103 | 0.00 | 10.13 |
| 35 | M | 2,2-dichloropropane | 0.512 | 0.487 | 4.9 | 96 | 0.00 | 10.13 |
| 36 | M | cis-1,2-dichloroethene | 0.364 | 0.339 | 6.9 | 99 | 0.00 | 10.15 |
| 37 | | methylacrylate | 0.051 | 0.049 | 3.9 | 101 | 0.00 | 10.22 |
| 38 | M | propionitrile | 0.047 | 0.046 | 2.1 | 99 | 0.00 | 10.26 |
| 39 | M | bromochloromethane | 0.157 | 0.157 | 0.0 | 99 | 0.00 | 10.49 |
| 40 | M | tetrahydrofuran | 0.115 | 0.111 | 3.5 | 104 | 0.00 | 10.51 |
| 41 | M | chloroform | 0.367 | 0.369 | -0.5 | 103 | 0.00 | 10.55 |

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VO5808-ICV5808
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** O131732.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 42 | | t-butyl formate | 0.228 | 0.233 | -2.2 | 103 | 0.00 | 10.56 |
| 43 | S | dibromofluoromethane (s) | 0.290 | 0.285 | 1.7 | 101 | 0.00 | 10.77 |
| 44 | S | 1,2-dichloroethane-d4 (s) | 0.326 | 0.320 | 1.8 | 102 | 0.00 | 11.20 |
| 45 | M | freon 113 | 0.258 | 0.222 | 14.0 | 88 | 0.00 | 7.38 |
| 46 | M | methacrylonitrile | 0.181 | 0.177 | 2.2 | 101 | 0.00 | 10.44 |
| 47 | M | 1,1,1-trichloroethane | 0.521 | 0.508 | 2.5 | 96 | 0.00 | 10.79 |
| 48 | M | Cyclohexane | 0.477 | 0.460 | 3.6 | 98 | 0.00 | 10.84 |
| 49 | I | 1,4-difluorobenzene | 1.000 | 1.000 | 0.0 | 103 | 0.00 | 11.65 |
| 50 | M | epichlorohydrin | 0.023 | 0.021 | 8.7 | 98 | 0.00 | 12.98 |
| 51 | M | n-butyl alcohol | 0.008 | 0.008# | 0.0 | 102 | 0.00 | 11.80 |
| 52 | M | carbon tetrachloride | 0.302 | 0.303 | -0.3 | 95 | 0.00 | 10.99 |
| 53 | M | 1,1-dichloropropene | 0.323 | 0.310 | 4.0 | 97 | 0.00 | 10.97 |
| 54 | | Tert Amyl Alcohol | | ----------NA---------- | | | | |
| 55 | M | hexane | 0.297 | 0.248 | 16.5 | 88 | 0.00 | 9.01 |
| 56 | | 2,2,4-TRIMETHYLPENTANE | 0.805 | 0.744 | 7.6 | 94 | 0.00 | 11.21 |
| 57 | M | benzene | 0.925 | 0.886 | 4.2 | 99 | 0.00 | 11.26 |
| 58 | M | tert-amyl methyl ether | 0.135 | 0.138 | -2.2 | 100 | 0.00 | 11.27 |
| 59 | M | heptane | 0.171 | 0.155 | 9.4 | 94 | 0.00 | 11.40 |
| 60 | M | isopropyl acetate | 0.512 | 0.547 | -6.8 | 110 | 0.00 | 11.18 |
| 61 | M | 1,2-dichloroethane | 0.280 | 0.282 | -0.7 | 101 | 0.00 | 11.30 |
| 62 | m | Ethyl acrylate | | ----------NA---------- | | | | |
| 63 | M | trichloroethene | 0.235 | 0.233 | 0.9 | 99 | 0.00 | 11.99 |
| 64 | | tert-Amyl Ethyl Ether | | ----------NA---------- | | | | |
| 65 | M | methyl methacrylate | 0.147 | 0.151 | -2.7 | 104 | 0.00 | 12.27 |
| 66 | M | 2-nitropropane | 0.013 | 0.013 | 0.0 | 99 | 0.00 | 13.19 |
| 67 | M | 2-chloroethyl vinyl ether | 0.083 | 0.087 | -4.8 | 102 | 0.00 | 12.84 |
| 68 | M | 1,2-dichloropropane | 0.215 | 0.219 | -1.9 | 102 | 0.00 | 12.29 |
| 69 | M | dibromomethane | 0.127 | 0.129 | -1.6 | 104 | 0.00 | 12.46 |
| 70 | M | methylcyclohexane | 0.375 | 0.348 | 7.2 | 93 | 0.00 | 12.19 |
| 71 | M | bromodichloromethane | 0.294 | 0.293 | 0.3 | 100 | 0.00 | 12.60 |
| 72 | M | cis-1,3-dichloropropene | 0.372 | 0.353 | 5.1 | 95 | 0.00 | 13.06 |
| 73 | S | toluene-d8 (s) | 0.850 | 0.811 | 4.6 | 99 | 0.00 | 13.35 |
| 74 | M | 4-methyl-2-pentanone | 0.090 | 0.089 | 1.1 | 102 | 0.00 | 13.16 |
| 75 | M | toluene | 0.625 | 0.589 | 5.8 | 98 | 0.00 | 13.43 |
| 76 | M | 3-methyl-1-butanol | 0.012 | 0.012 | 0.0 | 99 | 0.00 | 13.19 |
| 77 | M | trans-1,3-dichloropropene | 0.354 | 0.347 | 2.0 | 101 | 0.00 | 13.66 |
| 78 | M | ethyl methacrylate | 0.278 | 0.270 | 2.9 | 97 | 0.00 | 13.63 |
| 79 | M | 1,1,2-trichloroethane | 0.155 | 0.155 | 0.0 | 102 | 0.00 | 13.89 |
| 80 | M | 2-hexanone | 0.091 | 0.089 | 2.2 | 99 | 0.00 | 14.05 |
| 81 | I | chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 103 | 0.00 | 14.97 |
| 82 | M | tetrachloroethene | 0.256 | 0.238 | 7.0 | 97 | 0.00 | 14.04 |
| 83 | M | 1,3-dichloropropane | 0.350 | 0.349 | 0.3 | 102 | 0.00 | 14.09 |
| 84 | M | butyl acetate | 0.164 | 0.168 | -2.4 | 105 | 0.00 | 14.12 |
| 85 | | 3,3-dimethyl-1-butanol | 0.028 | 0.028 | 0.0 | 102 | 0.00 | 14.24 |
| 86 | M | dibromochloromethane | 0.266 | 0.266 | 0.0 | 99 | 0.00 | 14.37 |
| 87 | M | 1,2-dibromoethane | 0.225 | 0.213 | 5.3 | 100 | 0.00 | 14.53 |
| 88 | M | chlorobenzene | 0.776 | 0.743 | 4.3 | 99 | 0.00 | 15.00 |
| 89 | M | 1,1,1,2-tetrachloroethane | 0.268 | 0.270 | -0.7 | 100 | 0.00 | 15.07 |
| 90 | M | ethylbenzene | 1.355 | 1.285 | 5.2 | 98 | 0.00 | 15.04 |
| 91 | M | m,p-xylene | 0.531 | 0.502 | 5.5 | 98 | 0.00 | 15.15 |
| 92 | M | o-xylene | 0.506 | 0.492 | 2.8 | 100 | 0.00 | 15.60 |
| 93 | M | styrene | 0.868 | 0.846 | 2.5 | 100 | 0.00 | 15.62 |
| 94 | M | bromoform | 0.202 | 0.203 | -0.5 | 101 | 0.00 | 15.94 |
| 95 | I | 1,4-dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 102 | 0.00 | 17.44 |
| 96 | M | isopropylbenzene | 2.405 | 2.274 | 5.4 | 96 | 0.00 | 15.96 |
| 97 | S | 4-bromofluorobenzene (s) | 0.633 | 0.600 | 5.2 | 102 | 0.00 | 16.20 |
| 98 | | cyclohexanone | | ----------NA---------- | | | | |

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** VO5808-ICV5808
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** O131732.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 99 | M | bromobenzene | 0.609 | 0.576 | 5.4 | 100 | 0.00 | 16.41 |
| 100 | M | 1,1,2,2-tetrachloroethane | 0.518 | 0.494 | 4.6 | 99 | 0.00 | 16.32 |
| 101 | M | trans-1,4-dichloro-2-bute | 0.165 | 0.166 | -0.6 | 100 | 0.00 | 16.36 |
| 102 | M | 1,2,3-trichloropropane | 0.152 | 0.146 | 3.9 | 97 | 0.00 | 16.40 |
| 103 | M | n-propylbenzene | 0.646 | 0.632 | 2.2 | 101 | 0.00 | 16.39 |
| 104 | | 4-Ethyltoluene | | ----------NA---------- | | | | |
| 105 | M | 2-chlorotoluene | 0.582 | 0.547 | 6.0 | 99 | 0.00 | 16.57 |
| 106 | M | 4-chlorotoluene | 0.607 | 0.560 | 7.7 | 98 | 0.00 | 16.68 |
| 107 | M | 1,3,5-trimethylbenzene | 2.046 | 1.957 | 4.3 | 98 | 0.00 | 16.55 |
| 108 | M | tert-butylbenzene | 1.818 | 1.723 | 5.2 | 97 | 0.00 | 16.92 |
| 109 | M | pentachloroethane | 0.371 | 0.375 | -1.1 | 100 | 0.00 | 17.04 |
| 110 | M | 1,2,4-trimethylbenzene | 2.074 | 2.015 | 2.8 | 100 | 0.00 | 16.97 |
| 111 | M | sec-butylbenzene | 2.715 | 2.522 | 7.1 | 96 | 0.00 | 17.15 |
| 112 | M | 1,3-dichlorobenzene | 1.209 | 1.135 | 6.1 | 100 | 0.00 | 17.38 |
| 113 | M | p-isopropyltoluene | 2.311 | 2.246 | 2.8 | 99 | 0.00 | 17.27 |
| 114 | M | 1,4-dichlorobenzene | 1.188 | 1.139 | 4.1 | 98 | 0.00 | 17.47 |
| 115 | M | 1,2-dichlorobenzene | 1.113 | 1.050 | 5.7 | 100 | 0.00 | 17.90 |
| 116 | M | benzyl chloride | 1.119 | 1.215 | -8.6 | 111 | 0.00 | 17.60 |
| 117 | | 1,4-Diethylbenzene | | ----------NA---------- | | | | |
| 118 | M | n-butylbenzene | 1.160 | 1.106 | 4.7 | 97 | 0.00 | 17.72 |
| 119 | M | 1,2-dibromo-3-chloropropa | 0.121 | 0.109 | 9.9 | 99 | 0.00 | 18.76 |
| 120 | | 1,3,5-TRICHLOROBENZENE | 0.932 | 0.907 | 2.7 | 100 | 0.00 | 18.93 |
| 121 | M | 1,2,4-trichlorobenzene | 0.822 | 0.840 | -2.2 | 104 | 0.00 | 19.63 |
| 122 | M | hexachlorobutadiene | 0.526 | 0.492 | 6.5 | 97 | 0.00 | 19.72 |
| 123 | M | naphthalene | 1.845 | 1.792 | 2.9 | 100 | 0.00 | 19.94 |
| 124 | M | 1,2,3-trichlorobenzene | 0.741 | 0.747 | -0.8 | 103 | 0.00 | 20.21 |
| 125 | M | hexachloroethane | 0.392 | 0.380 | 3.1 | 97 | 0.00 | 18.17 |
| 126 | | 1,2,4,5-tetramethylbenzen | | ----------NA---------- | | | | |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
O131727.D MO5808S.M Mon Dec 10 10:59:58 2012 MSO

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VO5810-CC5808
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** O131779.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\O131779.D Vial: 3
Acq On : 8 Dec 2012 11:26 am Operator: DIPAP
Sample : CC5808-20 Inst : MSO
Misc : MS39551,VO5810,5.0,,,,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\MO5808S.M (RTE Integrator)
Title : Method 624, ZB624 60mx0.25mmx1.4um
Last Update : Thu Dec 06 08:30:18 2012
Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.30min
Max. RRF Dev : 20% Max. Rel. Area : 200%

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | Tert Butyl Alcohol-d9 | 1.000 | 1.000 | 0.0 | 111 | -0.01 | 8.26 |
| 2 | M | tertiary butyl alcohol | 0.985 | 0.983 | 0.2 | 112 | 0.00 | 8.40 |
| 3 | | ethanol | | ----------NA---------- | | | | |
| 4 | M | 1,4-dioxane | 0.090 | 0.088 | 2.2 | 105 | 0.00 | 12.41 |
| 5 | I | pentafluorobenzene | 1.000 | 1.000 | 0.0 | 109 | 0.00 | 10.69 |
| 6 | M | chlorodifluoromethane | | ----------NA---------- | | | | |
| 7 | M | dichlorodifluoromethane | 0.576 | 0.385 | 33.2# | 74 | 0.00 | 4.21 |
| 8 | M | chloromethane | 0.487 | 0.386 | 20.7# | 85 | 0.00 | 4.68 |
| 9 | M | vinyl chloride | 0.504 | 0.412 | 18.3 | 86 | 0.00 | 4.95 |
| 10 | M | bromomethane | 0.249 | 0.223 | 10.4 | 90 | 0.01 | 5.72 |
| 11 | M | chloroethane | 0.245 | 0.213 | 13.1 | 90 | 0.01 | 5.94 |
| 12 | M | trichlorofluoromethane | 0.540 | 0.489 | 9.4 | 98 | 0.00 | 6.45 |
| 13 | M | Pentane | | ----------NA---------- | | | | |
| 14 | M | ethyl ether | 0.176 | 0.195 | -10.8 | 122 | 0.00 | 6.97 |
| 15 | M | acrolein | 0.054 | 0.049 | 9.3 | 91 | 0.00 | 7.29 |
| 16 | M | 1,1-dichloroethene | 0.303 | 0.274 | 9.6 | 97 | 0.00 | 7.45 |
| 17 | M | acetone | 0.105 | 0.109 | -3.8 | 106 | 0.00 | 7.55 |
| 18 | M | allyl chloride | 0.184 | 0.187 | -1.6 | 110 | 0.00 | 8.08 |
| 19 | M | acetonitrile | 0.028 | 0.028 | 0.0 | 108 | 0.00 | 8.08 |
| 20 | M | iodomethane | 0.351 | 0.353 | -0.6 | 106 | 0.00 | 7.78 |
| 21 | M | iso-butyl alcohol | | ----------NA---------- | | | | |
| 22 | M | carbon disulfide | 1.049 | 0.990 | 5.6 | 100 | 0.00 | 7.90 |
| 23 | M | methylene chloride | 0.329 | 0.339 | -3.0 | 112 | 0.00 | 8.31 |
| 24 | M | methyl acetate | 0.254 | 0.258 | -1.6 | 113 | 0.00 | 8.07 |
| 25 | M | methyl tert butyl ether | 0.808 | 0.960 | -18.8 | 126 | 0.00 | 8.63 |
| 26 | M | trans-1,2-dichloroethene | 0.345 | 0.323 | 6.4 | 103 | 0.00 | 8.71 |
| 27 | M | di-isopropyl ether | 0.921 | 0.939 | -2.0 | 108 | 0.00 | 9.29 |
| 28 | M | 2-butanone | 0.040 | 0.042 | -5.0 | 109 | 0.00 | 10.13 |
| 29 | M | 1,1-dichloroethane | 0.557 | 0.574 | -3.1 | 107 | 0.00 | 9.35 |
| 30 | M | chloroprene | 0.501 | 0.438 | 12.6 | 90 | 0.00 | 9.46 |
| 31 | M | acrylonitrile | 0.108 | 0.115 | -6.5 | 112 | 0.00 | 8.70 |
| 32 | M | vinyl acetate | 0.046 | 0.042 | 8.7 | 100 | 0.00 | 9.34 |
| 33 | M | ethyl tert-butyl ether | 0.842 | 0.895 | -6.3 | 115 | 0.00 | 9.80 |
| 34 | M | ethyl acetate | 0.043 | 0.046 | -7.0 | 116 | 0.00 | 10.13 |
| 35 | M | 2,2-dichloropropane | 0.512 | 0.488 | 4.7 | 99 | 0.00 | 10.13 |
| 36 | M | cis-1,2-dichloroethene | 0.364 | 0.361 | 0.8 | 110 | 0.00 | 10.15 |
| 37 | | methylacrylate | 0.051 | 0.054 | -5.9 | 118 | 0.00 | 10.22 |
| 38 | M | propionitrile | 0.047 | 0.049 | -4.3 | 112 | 0.00 | 10.26 |
| 39 | M | bromochloromethane | 0.157 | 0.179 | -14.0 | 119 | 0.00 | 10.49 |
| 40 | M | tetrahydrofuran | 0.115 | 0.119 | -3.5 | 114 | 0.00 | 10.52 |
| 41 | M | chloroform | 0.367 | 0.378 | -3.0 | 108 | 0.00 | 10.55 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VO5810-CC5808
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** O131779.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 42 | | t-butyl formate | 0.228 | 0.238 | -4.4 | 116 | 0.00 | 10.56 |
| 43 | S | dibromofluoromethane (s) | 0.290 | 0.265 | 8.6 | 98 | 0.00 | 10.77 |
| 44 | S | 1,2-dichloroethane-d4 (s) | 0.326 | 0.297 | 8.9 | 101 | 0.00 | 11.20 |
| 45 | M | freon 113 | 0.258 | 0.210 | 18.6 | 85 | 0.00 | 7.38 |
| 46 | M | methacrylonitrile | 0.181 | 0.201 | -11.0 | 120 | 0.00 | 10.44 |
| 47 | M | 1,1,1-trichloroethane | 0.521 | 0.524 | -0.6 | 102 | 0.00 | 10.79 |
| 48 | M | Cyclohexane | 0.477 | 0.467 | 2.1 | 105 | 0.00 | 10.84 |
| 49 | I | 1,4-difluorobenzene | 1.000 | 1.000 | 0.0 | 112 | 0.00 | 11.65 |
| 50 | M | epichlorohydrin | 0.023 | 0.021 | 8.7 | 108 | 0.00 | 12.98 |
| 51 | M | n-butyl alcohol | 0.008 | 0.008# | 0.0 | 112 | 0.00 | 11.80 |
| 52 | M | carbon tetrachloride | 0.302 | 0.292 | 3.3 | 101 | 0.00 | 10.99 |
| 53 | M | 1,1-dichloropropene | 0.323 | 0.306 | 5.3 | 103 | 0.00 | 10.98 |
| 54 | | Tert Amyl Alcohol | | ----------NA---------- | | | | |
| 55 | M | hexane | 0.297 | 0.235 | 20.9# | 85 | 0.00 | 9.01 |
| 56 | | 2,2,4-TRIMETHYLPENTANE | 0.805 | 0.676 | 16.0 | 89 | 0.00 | 11.21 |
| 57 | M | benzene | 0.925 | 0.897 | 3.0 | 106 | 0.00 | 11.26 |
| 58 | M | tert-amyl methyl ether | 0.135 | 0.143 | -5.9 | 116 | 0.00 | 11.26 |
| 59 | M | heptane | 0.171 | 0.136 | 20.5# | 86 | 0.00 | 11.40 |
| 60 | M | isopropyl acetate | 0.512 | 0.507 | 1.0 | 111 | 0.00 | 11.18 |
| 61 | M | 1,2-dichloroethane | 0.280 | 0.305 | -8.9 | 119 | 0.00 | 11.30 |
| 62 | m | Ethyl acrylate | | ----------NA---------- | | | | |
| 63 | M | trichloroethene | 0.235 | 0.227 | 3.4 | 104 | 0.00 | 11.99 |
| 64 | | tert-Amyl Ethyl Ether | | ----------NA---------- | | | | |
| 65 | M | methyl methacrylate | 0.147 | 0.164 | -11.6 | 126 | 0.00 | 12.28 |
| 66 | M | 2-nitropropane | 0.013 | 0.013 | 0.0 | 114 | 0.00 | 13.19 |
| 67 | M | 2-chloroethyl vinyl ether | 0.083 | 0.097 | -16.9 | 130 | 0.00 | 12.84 |
| 68 | M | 1,2-dichloropropane | 0.215 | 0.229 | -6.5 | 116 | 0.00 | 12.29 |
| 69 | M | dibromomethane | 0.127 | 0.138 | -8.7 | 121 | 0.00 | 12.47 |
| 70 | M | methylcyclohexane | 0.375 | 0.310 | 17.3 | 87 | 0.00 | 12.19 |
| 71 | M | bromodichloromethane | 0.294 | 0.310 | -5.4 | 115 | 0.00 | 12.60 |
| 72 | M | cis-1,3-dichloropropene | 0.372 | 0.398 | -7.0 | 117 | 0.00 | 13.07 |
| 73 | S | toluene-d8 (s) | 0.850 | 0.743 | 12.6 | 98 | 0.00 | 13.35 |
| 74 | M | 4-methyl-2-pentanone | 0.090 | 0.099 | -10.0 | 123 | 0.00 | 13.16 |
| 75 | M | toluene | 0.625 | 0.600 | 4.0 | 107 | 0.00 | 13.43 |
| 76 | M | 3-methyl-1-butanol | 0.012 | 0.012 | 0.0 | 112 | 0.00 | 13.19 |
| 77 | M | trans-1,3-dichloropropene | 0.354 | 0.379 | -7.1 | 122 | 0.00 | 13.66 |
| 78 | M | ethyl methacrylate | 0.278 | 0.311 | -11.9 | 124 | 0.00 | 13.63 |
| 79 | M | 1,1,2-trichloroethane | 0.155 | 0.169 | -9.0 | 119 | 0.00 | 13.89 |
| 80 | M | 2-hexanone | 0.091 | 0.098 | -7.7 | 121 | 0.00 | 14.06 |
| 81 | I | chlorobenzene-d5 | 1.000 | 1.000 | 0.0 | 114 | 0.00 | 14.97 |
| 82 | M | tetrachloroethene | 0.256 | 0.237 | 7.4 | 103 | 0.00 | 14.04 |
| 83 | M | 1,3-dichloropropane | 0.350 | 0.383 | -9.4 | 123 | 0.00 | 14.09 |
| 84 | M | butyl acetate | 0.164 | 0.173 | -5.5 | 122 | 0.00 | 14.12 |
| 85 | | 3,3-dimethyl-1-butanol | 0.028 | 0.028 | 0.0 | 111 | 0.00 | 14.24 |
| 86 | M | dibromochloromethane | 0.266 | 0.290 | -9.0 | 120 | 0.00 | 14.37 |
| 87 | M | 1,2-dibromoethane | 0.225 | 0.236 | -4.9 | 120 | 0.00 | 14.53 |
| 88 | M | chlorobenzene | 0.776 | 0.755 | 2.7 | 110 | 0.00 | 15.00 |
| 89 | M | 1,1,1,2-tetrachloroethane | 0.268 | 0.283 | -5.6 | 115 | 0.00 | 15.07 |
| 90 | M | ethylbenzene | 1.355 | 1.281 | 5.5 | 105 | 0.00 | 15.04 |
| 91 | M | m,p-xylene | 0.531 | 0.500 | 5.8 | 106 | 0.00 | 15.16 |
| 92 | M | o-xylene | 0.506 | 0.495 | 2.2 | 109 | 0.00 | 15.60 |
| 93 | M | styrene | 0.868 | 0.861 | 0.8 | 113 | 0.00 | 15.62 |
| 94 | M | bromoform | 0.202 | 0.215 | -6.4 | 120 | 0.00 | 15.93 |
| 95 | I | 1,4-dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 115 | 0.00 | 17.44 |
| 96 | M | isopropylbenzene | 2.405 | 2.240 | 6.9 | 104 | 0.00 | 15.96 |
| 97 | S | 4-bromofluorobenzene (s) | 0.633 | 0.535 | 15.5 | 101 | 0.00 | 16.20 |
| 98 | | cyclohexanone | | ----------NA---------- | | | | |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** VO5810-CC5808
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** O131779.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 99 | M | bromobenzene | 0.609 | 0.595 | 2.3 | 114 | 0.00 | 16.41 |
| 100 | M | 1,1,2,2-tetrachloroethane | 0.518 | 0.553 | -6.8 | 122 | 0.00 | 16.32 |
| 101 | M | trans-1,4-dichloro-2-bute | 0.165 | 0.178 | -7.9 | 119 | 0.00 | 16.36 |
| 102 | M | 1,2,3-trichloropropane | 0.152 | 0.158 | -3.9 | 119 | 0.00 | 16.40 |
| 103 | M | n-propylbenzene | 0.646 | 0.592 | 8.4 | 104 | 0.00 | 16.40 |
| 104 | | 4-Ethyltoluene | | ----------NA---------- | | | | |
| 105 | M | 2-chlorotoluene | 0.582 | 0.542 | 6.9 | 106 | 0.00 | 16.57 |
| 106 | M | 4-chlorotoluene | 0.607 | 0.568 | 6.4 | 108 | 0.00 | 16.68 |
| 107 | M | 1,3,5-trimethylbenzene | 2.046 | 1.926 | 5.9 | 106 | 0.00 | 16.54 |
| 108 | M | tert-butylbenzene | 1.818 | 1.675 | 7.9 | 104 | 0.00 | 16.92 |
| 109 | M | pentachloroethane | 0.371 | 0.385 | -3.8 | 113 | 0.00 | 17.04 |
| 110 | M | 1,2,4-trimethylbenzene | 2.074 | 1.993 | 3.9 | 109 | 0.00 | 16.97 |
| 111 | M | sec-butylbenzene | 2.715 | 2.474 | 8.9 | 104 | 0.00 | 17.15 |
| 112 | M | 1,3-dichlorobenzene | 1.209 | 1.162 | 3.9 | 113 | 0.00 | 17.38 |
| 113 | M | p-isopropyltoluene | 2.311 | 2.138 | 7.5 | 104 | 0.00 | 17.27 |
| 114 | M | 1,4-dichlorobenzene | 1.188 | 1.167 | 1.8 | 111 | 0.00 | 17.47 |
| 115 | M | 1,2-dichlorobenzene | 1.113 | 1.103 | 0.9 | 115 | 0.00 | 17.90 |
| 116 | M | benzyl chloride | 1.119 | 1.095 | 2.1 | 113 | 0.00 | 17.60 |
| 117 | | 1,4-Diethylbenzene | | ----------NA---------- | | | | |
| 118 | M | n-butylbenzene | 1.160 | 1.079 | 7.0 | 106 | 0.00 | 17.72 |
| 119 | M | 1,2-dibromo-3-chloropropa | 0.121 | 0.120 | 0.8 | 119 | 0.00 | 18.76 |
| 120 | | 1,3,5-TRICHLOROBENZENE | 0.932 | 0.915 | 1.8 | 111 | 0.00 | 18.92 |
| 121 | M | 1,2,4-trichlorobenzene | 0.822 | 0.835 | -1.6 | 115 | 0.00 | 19.63 |
| 122 | M | hexachlorobutadiene | 0.526 | 0.476 | 9.5 | 102 | 0.00 | 19.72 |
| 123 | M | naphthalene | 1.845 | 2.037 | -10.4 | 128 | 0.00 | 19.94 |
| 124 | M | 1,2,3-trichlorobenzene | 0.741 | 0.782 | -5.5 | 120 | 0.00 | 20.21 |
| 125 | M | hexachloroethane | 0.392 | 0.373 | 4.8 | 102 | 0.00 | 18.17 |
| 126 | | 1,2,4,5-tetramethylbenzen | | ----------NA---------- | | | | |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
O131726.D MO5808S.M Wed Dec 12 10:55:14 2012 MSO

6.7.10

6

New Jersey

ACCUTEST LABORATORIES

# GC/MS Volatiles

## Raw Data

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
Data File : E197687.D
Acq On : 9 Dec 2012 5:10 am
Operator : OksanaT
Sample : jb22549-1
Misc : MS39558,VE8685,6.0,,100,5,1
ALS Vial : 90 Sample Multiplier: 1

Quant Time: Dec 10 12:16:45 2012
Quant Method : C:\MSDCHEM\1\METHODS\ME8647.M
Quant Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
QLast Update : Tue Nov 13 15:53:05 2012
Response via : Initial Calibration

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Tert Butyl Alcohol-d9 | 7.713 | 65 | 78308 | 500.00 | ug/L | 0.00 |
| 5) pentafluorobenzene | 9.921 | 168 | 98584 | 50.00 | ug/L | 0.00 |
| 65) 1,4-difluorobenzene | 10.836 | 114 | 141068 | 50.00 | ug/L | 0.00 |
| 96) chlorobenzene-d5 | 14.162 | 117 | 116060 | 50.00 | ug/L | 0.00 |
| 113) 1,4-dichlorobenzene-d4 | 16.735 | 152 | 63837 | 50.00 | ug/L | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 59) dibromofluoromethane (s) | 9.962 | 113 | 46416 | 45.58 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 81 - 121 | | Recovery = 91.16% | | | |
| 60) 1,2-dichloroethane-d4 (s) | 10.376 | 65 | 62703 | 42.50 | ug/L | -0.01 |
| Spiked Amount 50.000 | Range 74 - 127 | | Recovery = 85.00% | | | |
| 88) toluene-d8 (s) | 12.536 | 98 | 302187 | 79.26 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 80 - 122 | | Recovery = 158.52%# | | | |
| 115) 4-bromofluorobenzene (s) | 15.433 | 95 | 87648 | 62.25 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 78 - 116 | | Recovery = 124.50%# | | | |

Target Compounds

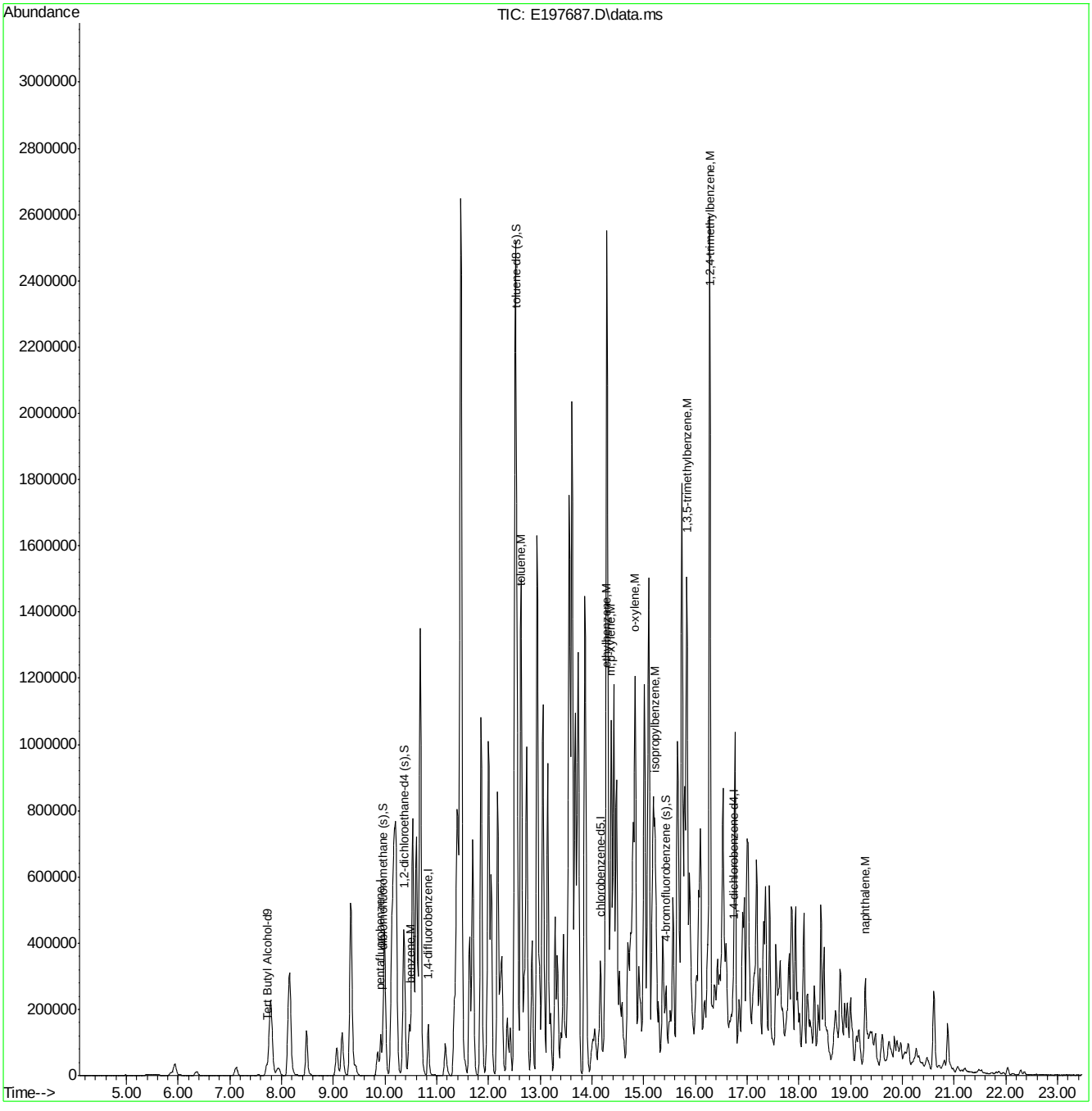
| | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 74) benzene | 10.491 | 78 | 21283 | 5.15 | ug/L | 97 |
| 90) toluene | 12.614 | 92 | 22385 | 8.64 | ug/L | 97 |
| 107) ethylbenzene | 14.262 | 91 | 390394 | 90.76 | ug/L | 99 |
| 108) m,p-xylene | 14.377 | 106 | 299956 | 182.45 | ug/L | 97 |
| 109) o-xylene | 14.837 | 106 | 134680 | 78.81 | ug/L | 99 |
| 114) isopropylbenzene | 15.219 | 105 | 165174 | 33.98 | ug/L | 99 |
| 124) 1,3,5-trimethylbenzene | 15.836 | 105 | 596044 | 147.50 | ug/L | 97 |
| 127) 1,2,4-trimethylbenzene | 16.275 | 105 | 1565966 | 388.52 | ug/L | 92 |
| 141) naphthalene | 19.277 | 128 | 214396 | 69.49 | ug/L | 99 |

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

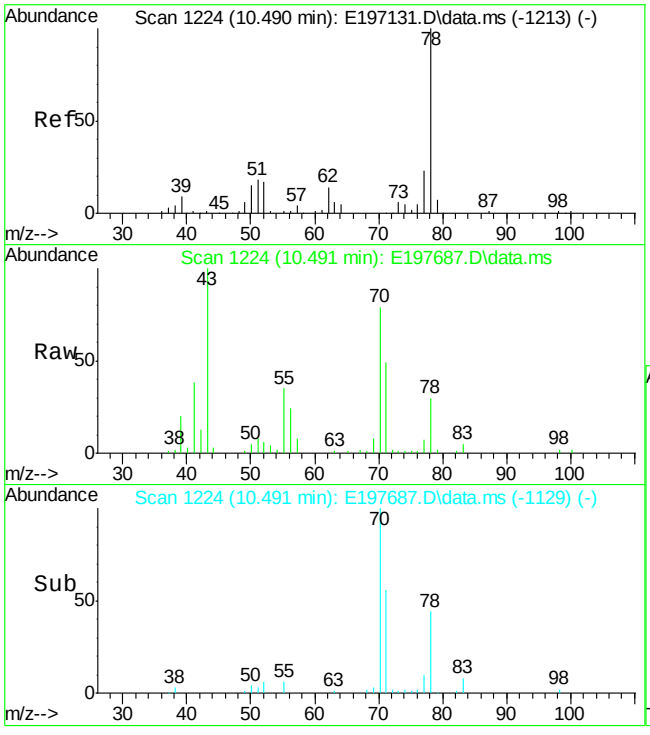
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
Data File : E197687.D
Acq On : 9 Dec 2012 5:10 am
Operator : OksanaT
Sample : jb22549-1
Misc : MS39558,VE8685,6.0,,100,5,1
ALS Vial : 90 Sample Multiplier: 1

Quant Time: Dec 10 12:16:45 2012
Quant Method : C:\MSDCHEM\1\METHODS\ME8647.M
Quant Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
QLast Update : Tue Nov 13 15:53:05 2012
Response via : Initial Calibration



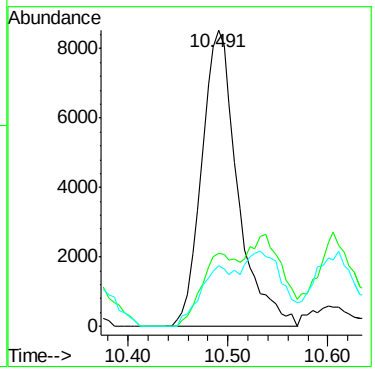

ME8647.M Mon Dec 10 12:16:57 2012 RPT1 Page: 2

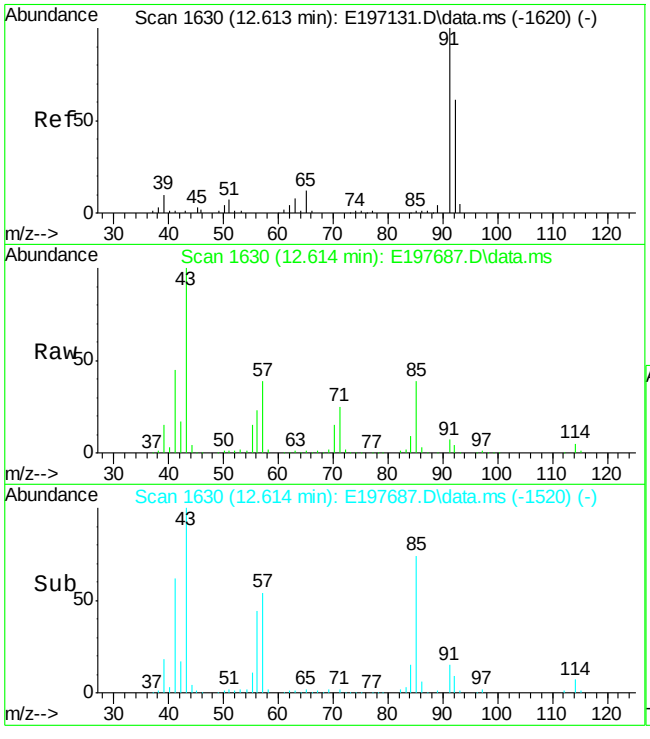



#74
benzene
Concen: 5.15 ug/L
RT: 10.491 min Scan# 1224
Delta R.T. -0.006 min
Lab File: E197687.D
Acq: 9 Dec 2012 5:10 am

Tgt Ion: 78 Resp: 21283

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 78 | 100 | | |
| 77 | 24.5 | 0.0 | 54.3 |
| 52 | 20.6 | 0.0 | 47.9 |

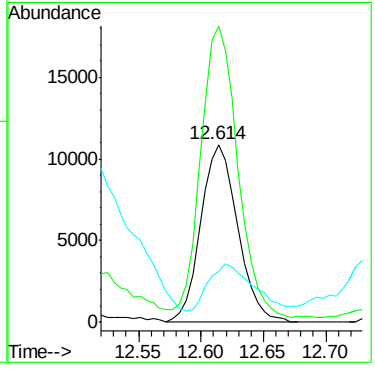


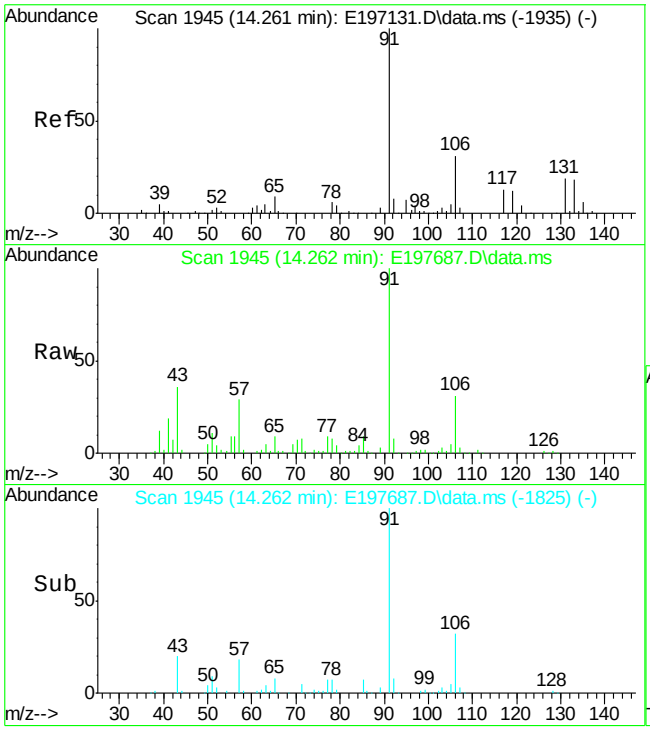




#90
toluene
Concen: 8.64 ug/L
RT: 12.614 min Scan# 1630
Delta R.T. -0.006 min
Lab File: E197687.D
Acq: 9 Dec 2012 5:10 am

Tgt Ion: 92 Resp: 22385

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 92 | 100 | | |
| 91 | 163.6 | 137.9 | 197.9 |
| 65 | 19.5 | 0.0 | 50.7 |

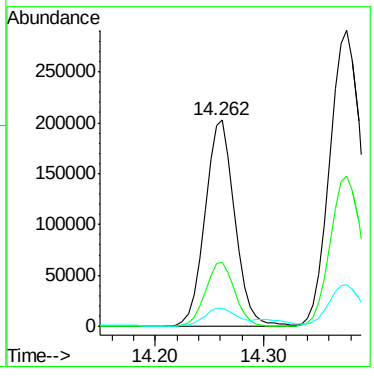


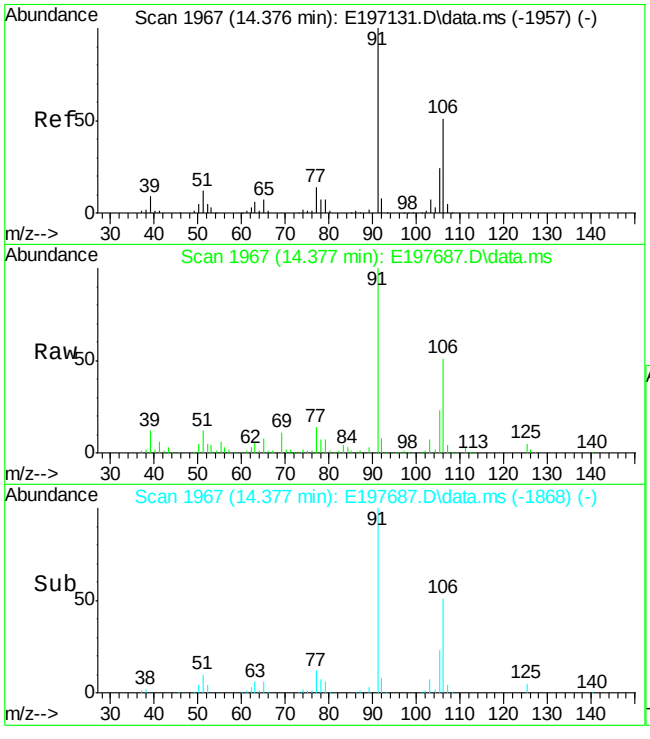



#107
ethylbenzene
Concen: 90.76 ug/L
RT: 14.262 min Scan# 1945
Delta R.T. -0.000 min
Lab File: E197687.D
Acq: 9 Dec 2012 5:10 am

Tgt Ion: 91 Resp: 390394

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 91 | 100 | | |
| 106 | 31.3 | 0.5 | 60.5 |
| 77 | 8.8 | 0.0 | 39.0 |

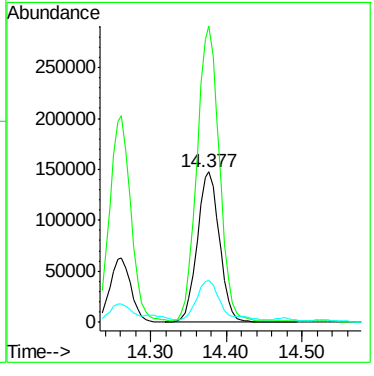


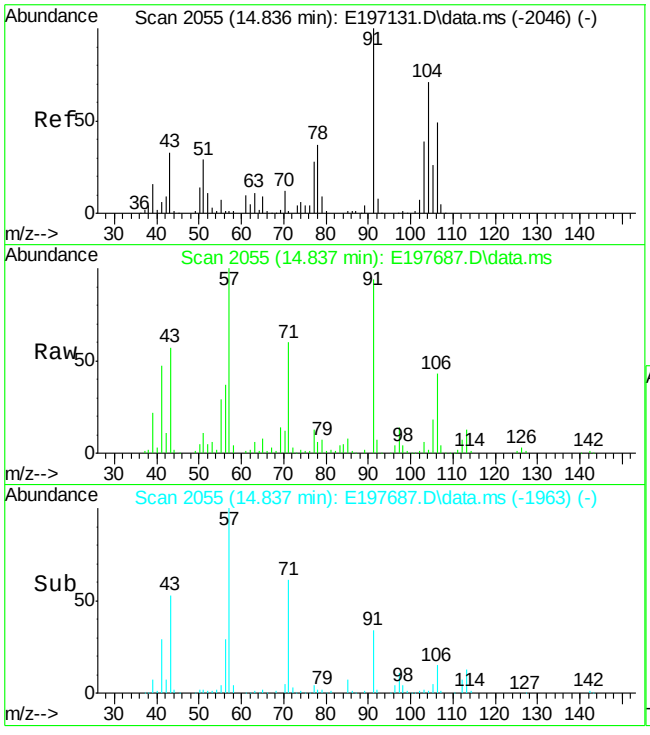




#108
m,p-xylene
Concen: 182.45 ug/L
RT: 14.377 min Scan# 1967
Delta R.T. -0.000 min
Lab File: E197687.D
Acq: 9 Dec 2012 5:10 am

Tgt Ion:106 Resp: 299956

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 106 | 100 | | |
| 91 | 196.7 | 170.7 | 230.7 |
| 77 | 26.2 | 0.0 | 57.5 |

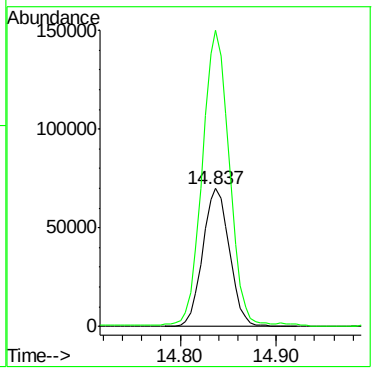


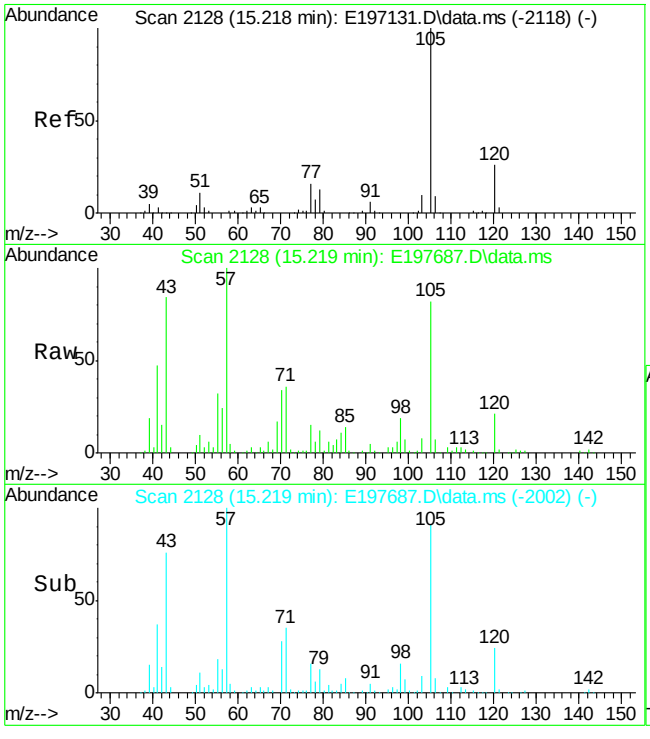



#109
o-xylene
Concen: 78.81 ug/L
RT: 14.837 min Scan# 2055
Delta R.T. -0.000 min
Lab File: E197687.D
Acq: 9 Dec 2012 5:10 am

Tgt Ion:106 Resp: 134680

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 106 | 100 | | |
| 91 | 213.8 | 185.3 | 245.3 |

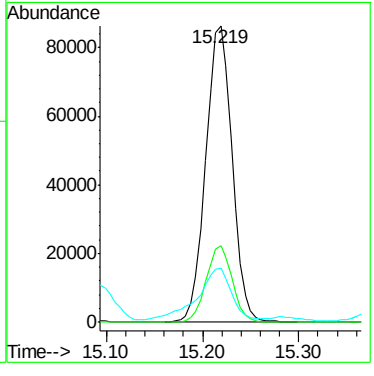


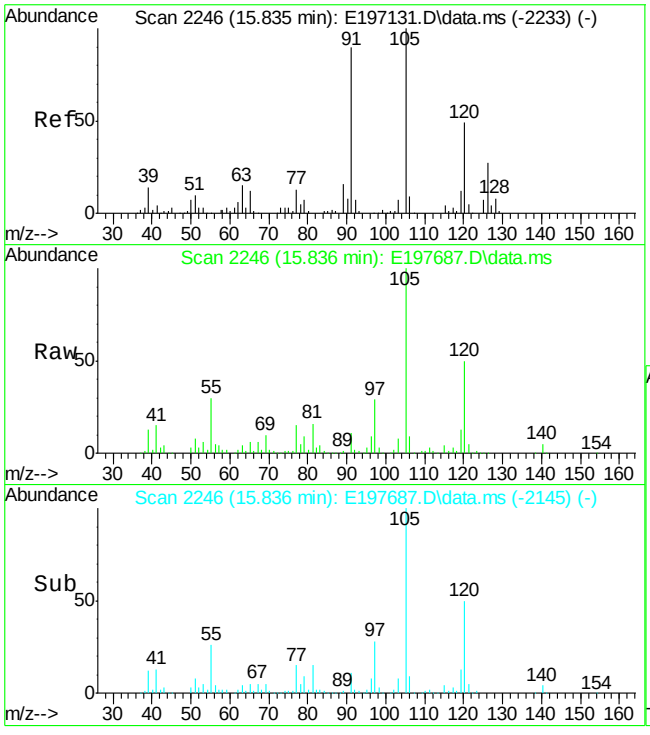




#114
isopropylbenzene
Concen: 33.98 ug/L
RT: 15.219 min Scan# 2128
Delta R.T. -0.000 min
Lab File: E197687.D
Acq: 9 Dec 2012 5:10 am

Tgt Ion:105 Resp: 165174

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 105 | 100 | | |
| 120 | 25.8 | 0.0 | 56.4 |
| 77 | 16.8 | 0.0 | 47.0 |

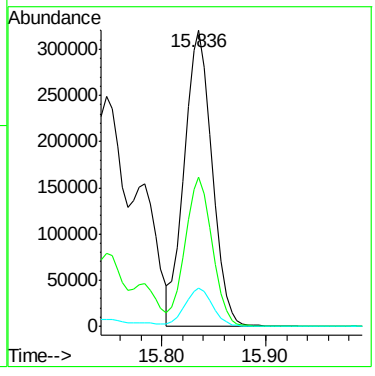


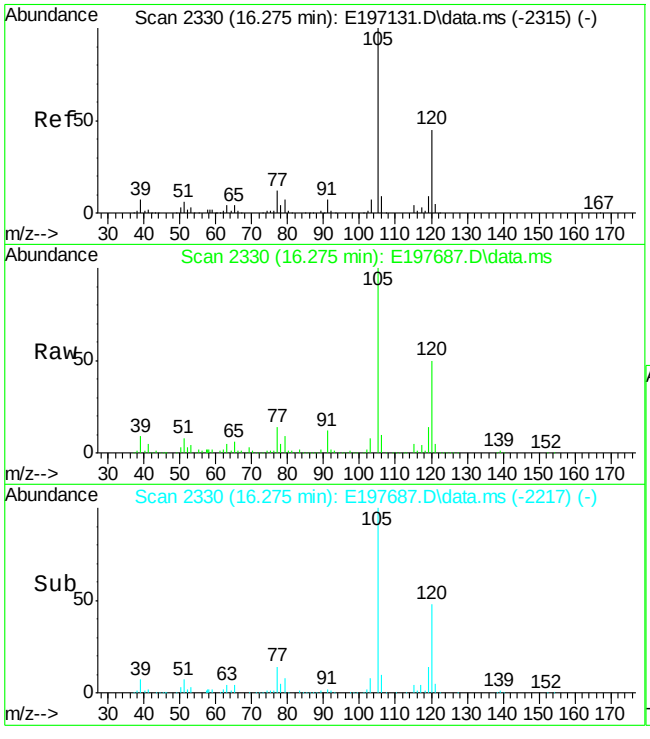



#124
1,3,5-trimethylbenzene
Concen: 147.50 ug/L
RT: 15.836 min Scan# 2246
Delta R.T. -0.000 min
Lab File: E197687.D
Acq: 9 Dec 2012 5:10 am

Tgt Ion:105 Resp: 596044

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 105 | 100 | | |
| 120 | 50.3 | 18.2 | 78.2 |
| 119 | 12.7 | 0.0 | 43.0 |

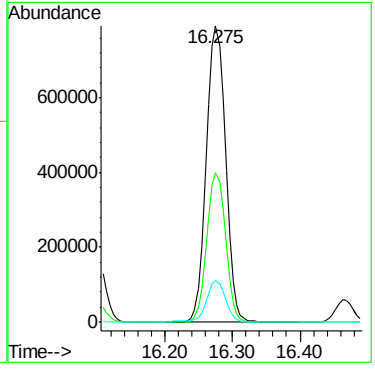


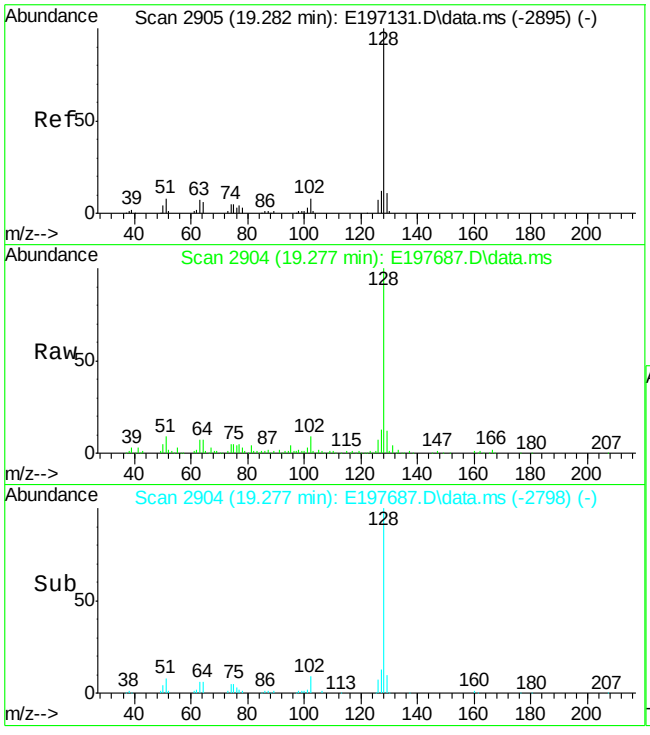




#127
1,2,4-trimethylbenzene
Concen: 388.52 ug/L
RT: 16.275 min Scan# 2330
Delta R.T. -0.000 min
Lab File: E197687.D
Acq: 9 Dec 2012 5:10 am

Tgt Ion:105 Resp: 1565966

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 105 | 100 | | |
| 120 | 50.3 | 14.3 | 74.3 |
| 119 | 13.9 | 0.0 | 42.7 |

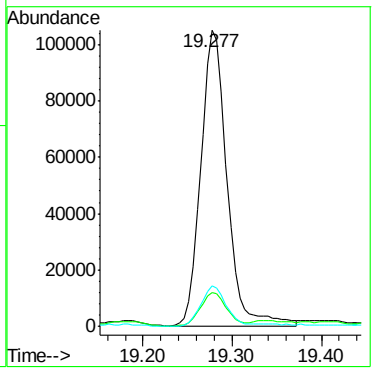





#141
naphthalene
Concen: 69.49 ug/L
RT: 19.277 min Scan# 2904
Delta R.T. -0.005 min
Lab File: E197687.D
Acq: 9 Dec 2012 5:10 am

Tgt Ion:128 Resp: 214396

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 128 | 100 | | |
| 129 | 11.4 | 0.0 | 41.1 |
| 127 | 13.5 | 0.0 | 44.0 |




7.1.1

7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
Data File : E197705.D
Acq On : 10 Dec 2012 2:57 pm
Operator : OksanaT
Sample : jb22549-1
Misc : MS39588,VE8686,6.0,,10,5,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Dec 11 12:15:56 2012
Quant Method : C:\MSDCHEM\1\METHODS\ME8647.M
Quant Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
QLast Update : Tue Nov 13 15:53:05 2012
Response via : Initial Calibration

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Tert Butyl Alcohol-d9 | 7.708 | 65 | 58564 | 500.00 | ug/L | 0.00 |
| 5) pentafluorobenzene | 9.925 | 168 | 80055 | 50.00 | ug/L | 0.00 |
| 65) 1,4-difluorobenzene | 10.841 | 114 | 111102 | 50.00 | ug/L | 0.00 |
| 96) chlorobenzene-d5 | 14.167 | 117 | 101561 | 50.00 | ug/L | 0.00 |
| 113) 1,4-dichlorobenzene-d4 | 16.735 | 152 | 54542 | 50.00 | ug/L | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 59) dibromofluoromethane (s) | 9.967 | 113 | 36416 | 44.04 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 81 - 121 | | Recovery = 88.08% | | | |
| 60) 1,2-dichloroethane-d4 (s) | 10.386 | 65 | 51683 | 43.14 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 74 - 127 | | Recovery = 86.28% | | | |
| 88) toluene-d8 (s) | 12.541 | 98 | 144489 | 48.12 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 80 - 122 | | Recovery = 96.24% | | | |
| 115) 4-bromofluorobenzene (s) | 15.433 | 95 | 54590 | 45.38 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 78 - 116 | | Recovery = 90.76% | | | |

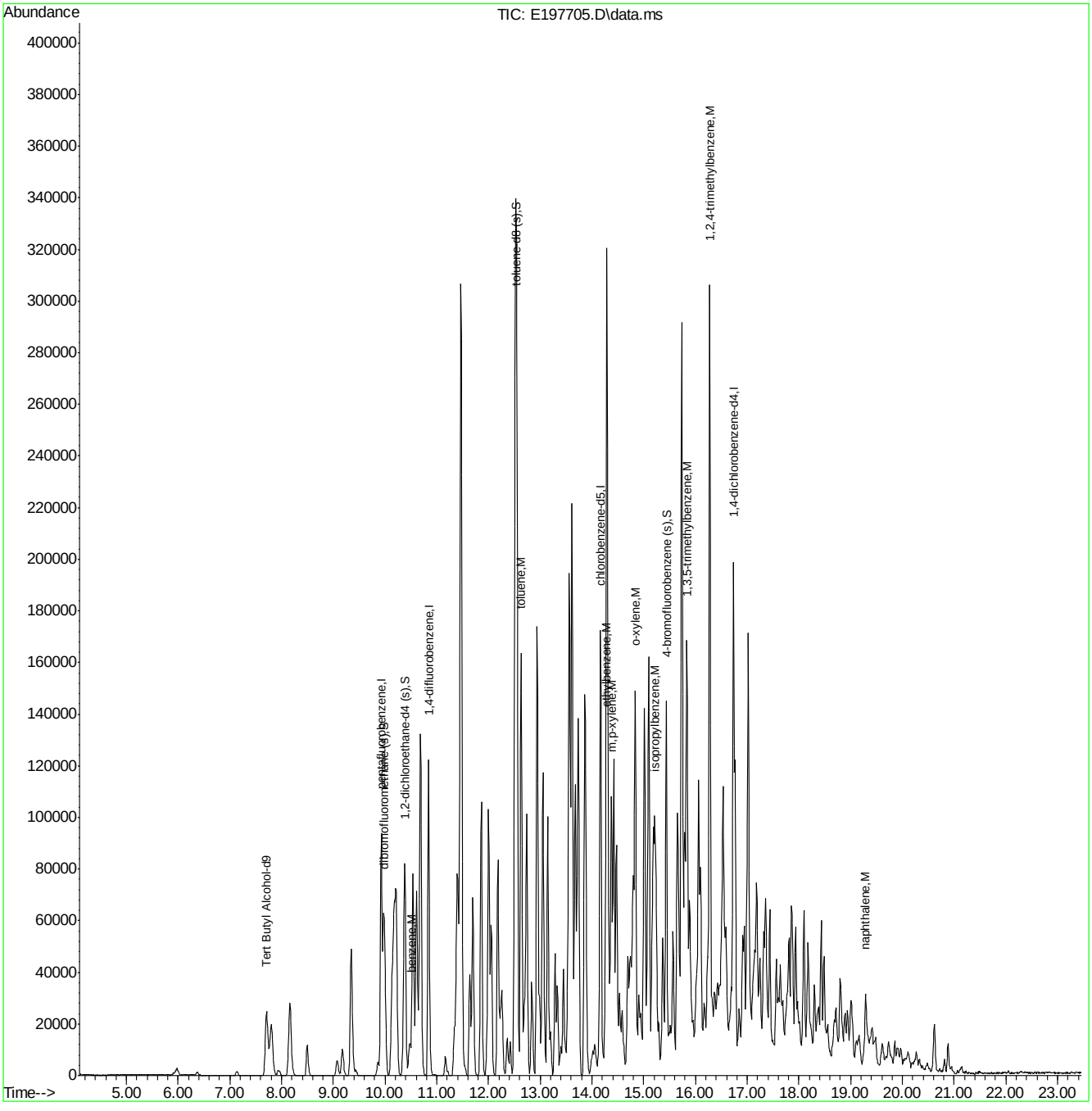
| Target Compounds | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 74) benzene | 10.506 | 78 | 2162 | 0.66 | ug/L | 91 |
| 90) toluene | 12.624 | 92 | 2588 | 1.27 | ug/L | 90 |
| 107) ethylbenzene | 14.261 | 91 | 39131 | 10.40 | ug/L | 99 |
| 108) m,p-xylene | 14.376 | 106 | 29210 | 20.30 | ug/L | 89 |
| 109) o-xylene | 14.842 | 106 | 13047 | 8.72 | ug/L | 92 |
| 114) isopropylbenzene | 15.218 | 105 | 16264 | 3.92 | ug/L | 96 |
| 124) 1,3,5-trimethylbenzene | 15.836 | 105 | 63955 | 18.52 | ug/L | 98 |
| 127) 1,2,4-trimethylbenzene | 16.275 | 105 | 182441 | 52.98 | ug/L | 98 |
| 141) naphthalene | 19.282 | 128 | 18936 | 9.73 | ug/L | 100 |

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

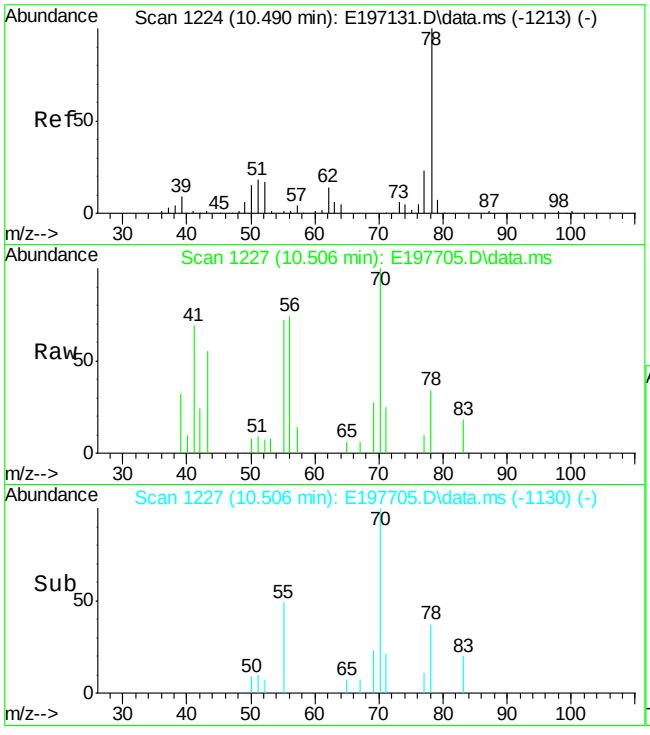
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
Data File : E197705.D
Acq On : 10 Dec 2012 2:57 pm
Operator : OksanaT
Sample : jb22549-1
Misc : MS39588,VE8686,6.0,,10,5,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Dec 11 12:15:56 2012
Quant Method : C:\MSDCHEM\1\METHODS\ME8647.M
Quant Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
QLast Update : Tue Nov 13 15:53:05 2012
Response via : Initial Calibration



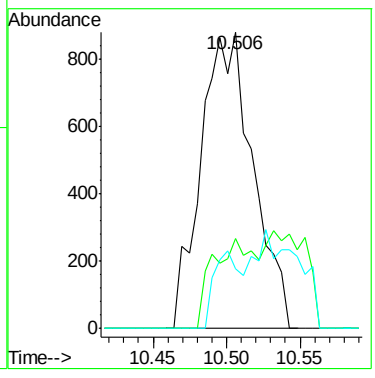

ME8647.M Tue Dec 11 12:16:19 2012 RPT1 Page: 2

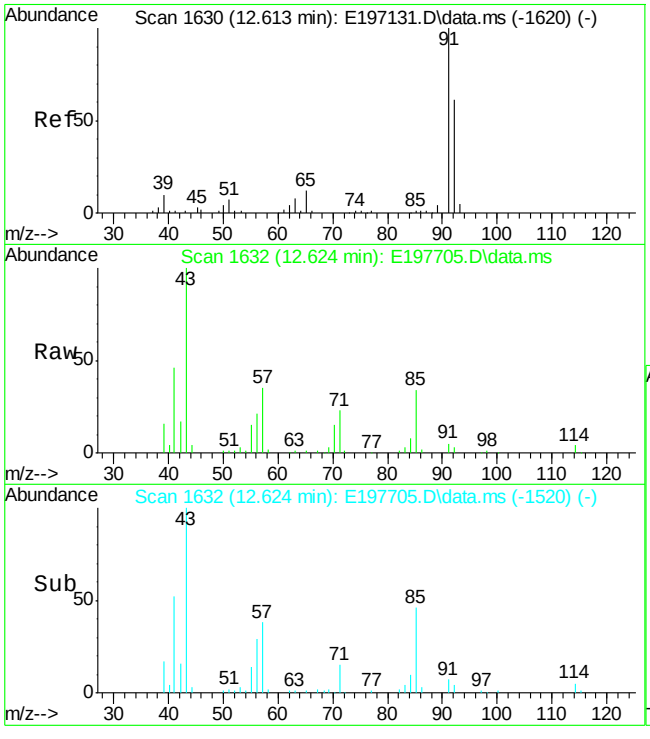



#74
benzene
Concen: 0.66 ug/L
RT: 10.506 min Scan# 1227
Delta R.T. 0.010 min
Lab File: E197705.D
Acq: 10 Dec 2012 2:57 pm

Tgt Ion: 78 Resp: 2162

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 78 | 100 | | |
| 77 | 30.4 | 0.0 | 54.3 |
| 52 | 20.1 | 0.0 | 47.9 |

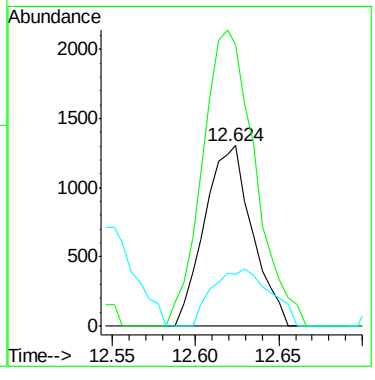



#90
toluene
Concen: 1.27 ug/L
RT: 12.624 min Scan# 1632
Delta R.T. 0.005 min
Lab File: E197705.D
Acq: 10 Dec 2012 2:57 pm

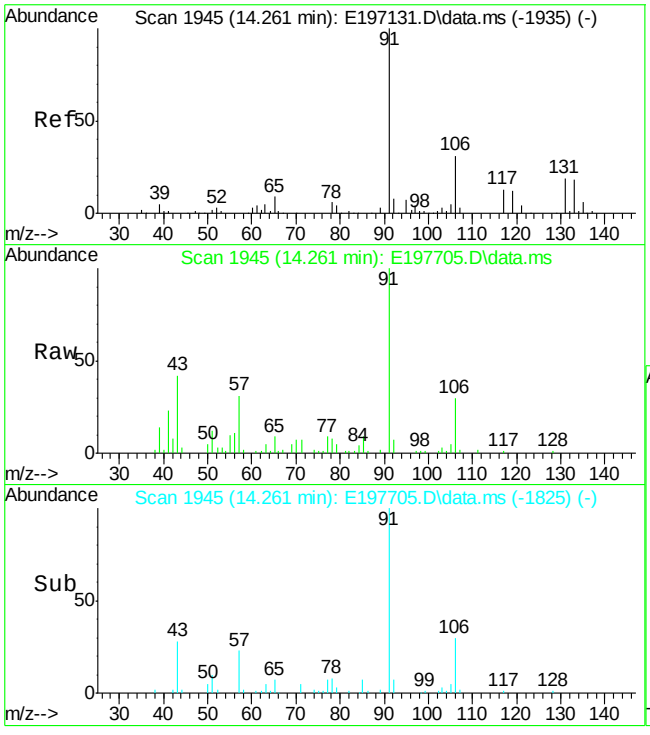
Tgt Ion: 92 Resp: 2588

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 92 | 100 | | |
| 91 | 156.3 | 137.9 | 197.9 |
| 65 | 28.9 | 0.0 | 50.7 |




7.1.2

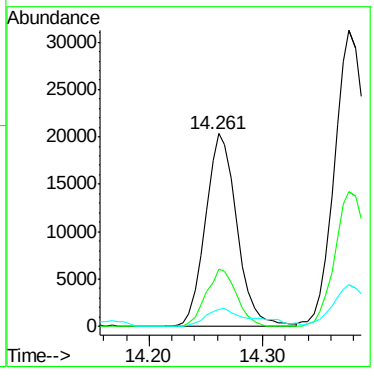
7

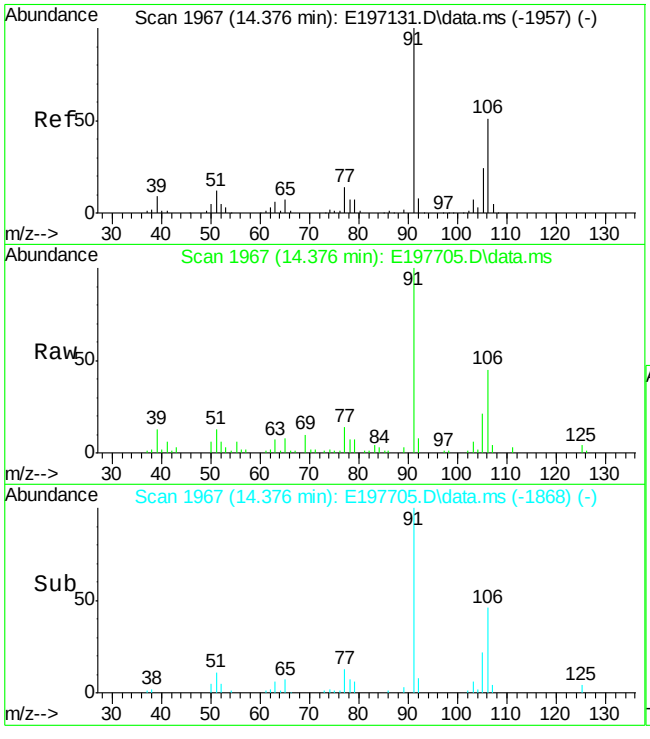



#107
ethylbenzene
Concen: 10.40 ug/L
RT: 14.261 min Scan# 1945
Delta R.T. -0.001 min
Lab File: E197705.D
Acq: 10 Dec 2012 2:57 pm

Tgt Ion: 91 Resp: 39131

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 91 | 100 | | |
| 106 | 29.6 | 0.5 | 60.5 |
| 77 | 9.0 | 0.0 | 39.0 |

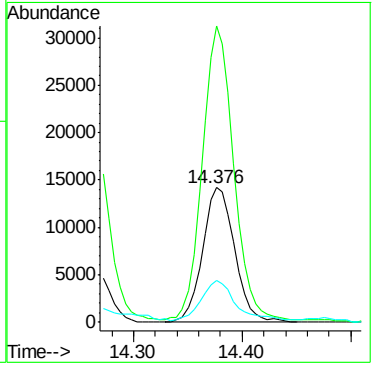



#108
m,p-xylene
Concen: 20.30 ug/L
RT: 14.376 min Scan# 1967
Delta R.T. -0.001 min
Lab File: E197705.D
Acq: 10 Dec 2012 2:57 pm

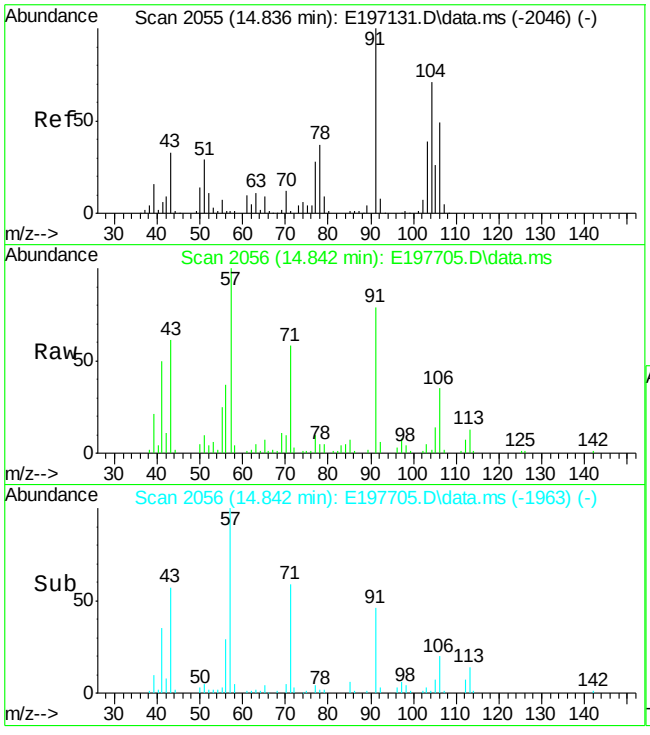
Tgt Ion:106 Resp: 29210

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 106 | 100 | | |
| 91 | 218.6 | 170.7 | 230.7 |
| 77 | 29.0 | 0.0 | 57.5 |




7.1.2

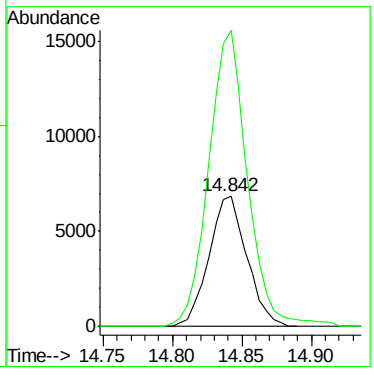
7

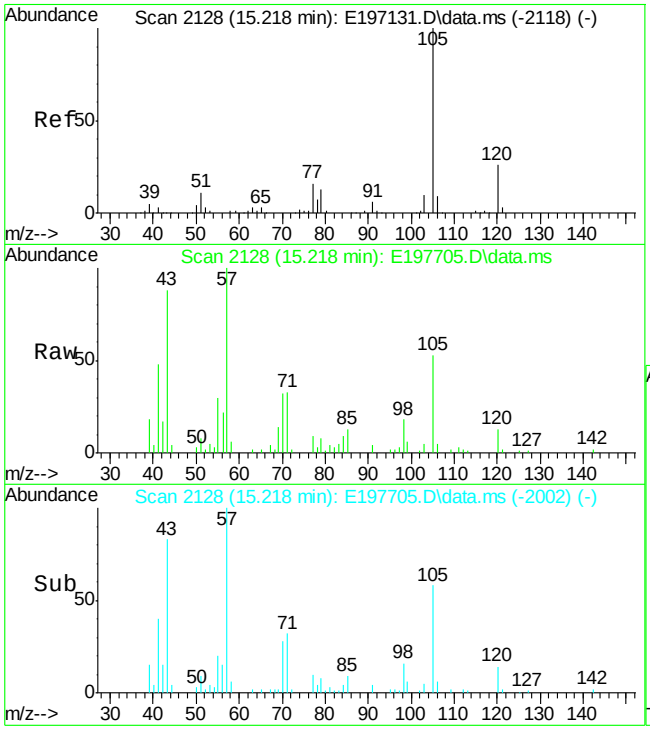



#109
o-xylene
Concen: 8.72 ug/L
RT: 14.842 min Scan# 2056
Delta R.T. 0.005 min
Lab File: E197705.D
Acq: 10 Dec 2012 2:57 pm

Tgt Ion:106 Resp: 13047

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 106 | 100 | | |
| 91 | 227.4 | 185.3 | 245.3 |

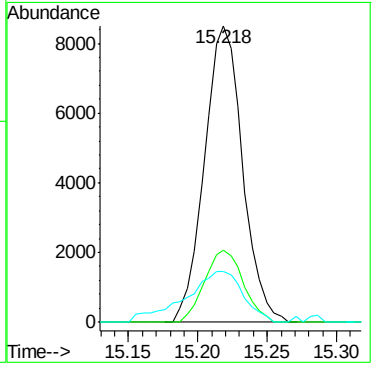


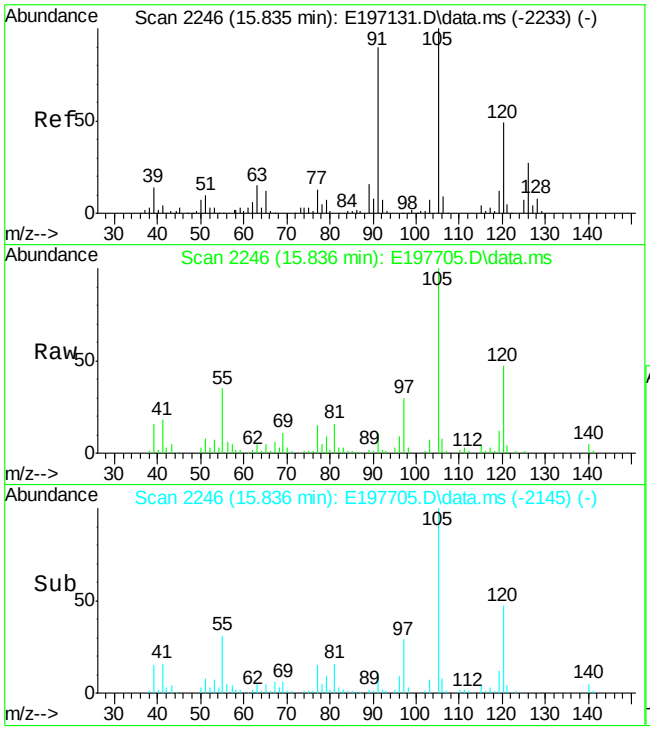




#114
isopropylbenzene
Concen: 3.92 ug/L
RT: 15.218 min Scan# 2128
Delta R.T. -0.001 min
Lab File: E197705.D
Acq: 10 Dec 2012 2:57 pm

Tgt Ion:105 Resp: 16264

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 105 | 100 | | |
| 120 | 24.3 | 0.0 | 56.4 |
| 77 | 15.2 | 0.0 | 47.0 |

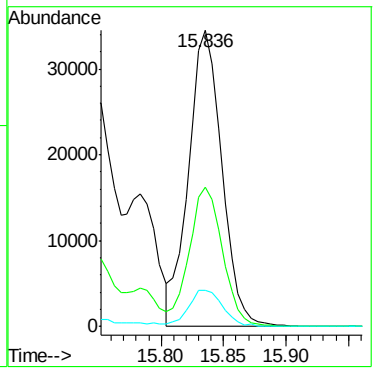


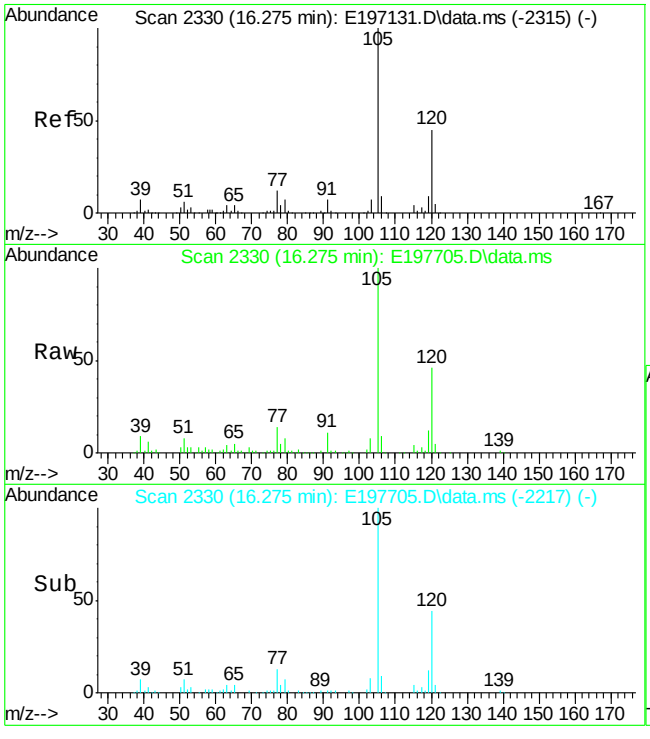



#124
1,3,5-trimethylbenzene
Concen: 18.52 ug/L
RT: 15.836 min Scan# 2246
Delta R.T. -0.001 min
Lab File: E197705.D
Acq: 10 Dec 2012 2:57 pm

Tgt Ion:105 Resp: 63955

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 105 | 100 | | |
| 120 | 47.2 | 18.2 | 78.2 |
| 119 | 12.2 | 0.0 | 43.0 |

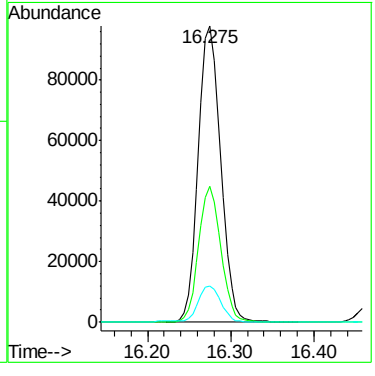



#127
1,2,4-trimethylbenzene
Concen: 52.98 ug/L
RT: 16.275 min Scan# 2330
Delta R.T. -0.001 min
Lab File: E197705.D
Acq: 10 Dec 2012 2:57 pm

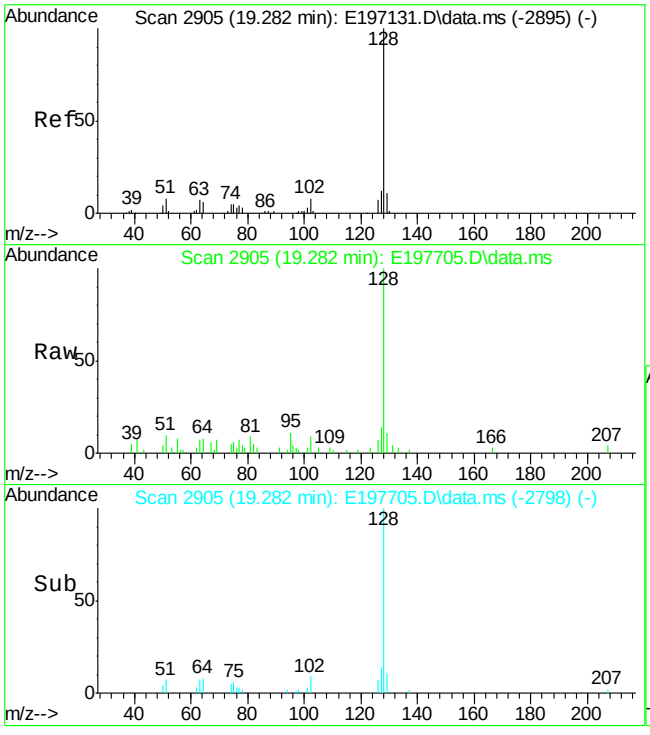
Tgt Ion:105 Resp: 182441

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 105 | 100 | | |
| 120 | 45.9 | 14.3 | 74.3 |
| 119 | 12.0 | 0.0 | 42.7 |




7.1.2

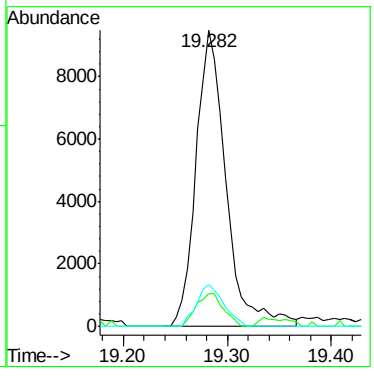
7




#141
naphthalene
Concen: 9.73 ug/L
RT: 19.282 min Scan# 2905
Delta R.T. 0.000 min
Lab File: E197705.D
Acq: 10 Dec 2012 2:57 pm

Tgt Ion:128 Resp: 18936

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 128 | 100 | | |
| 129 | 11.0 | 0.0 | 41.1 |
| 127 | 14.1 | 0.0 | 44.0 |




7.1.2

7

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\A189674.D Vial: 62
Acq On : 11 Dec 2012 7:50 am Operator: Oksanat
Sample : jb22549-2 Inst : MSA
Misc : MS39558,VA7126,5.7,,,,1 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 11 13:56 2012 Quant Results File: MA7086.RES

Quant Method : C:\HPCHEM\1\METHODS\MA7086.M (RTE Integrator)
Title : SW 846 8260bB ZB624 60m x 0.25mm x 1.4um
Last Update : Thu Nov 08 15:38:19 2012
Response via : Initial Calibration
DataAcq Meth : MA7086

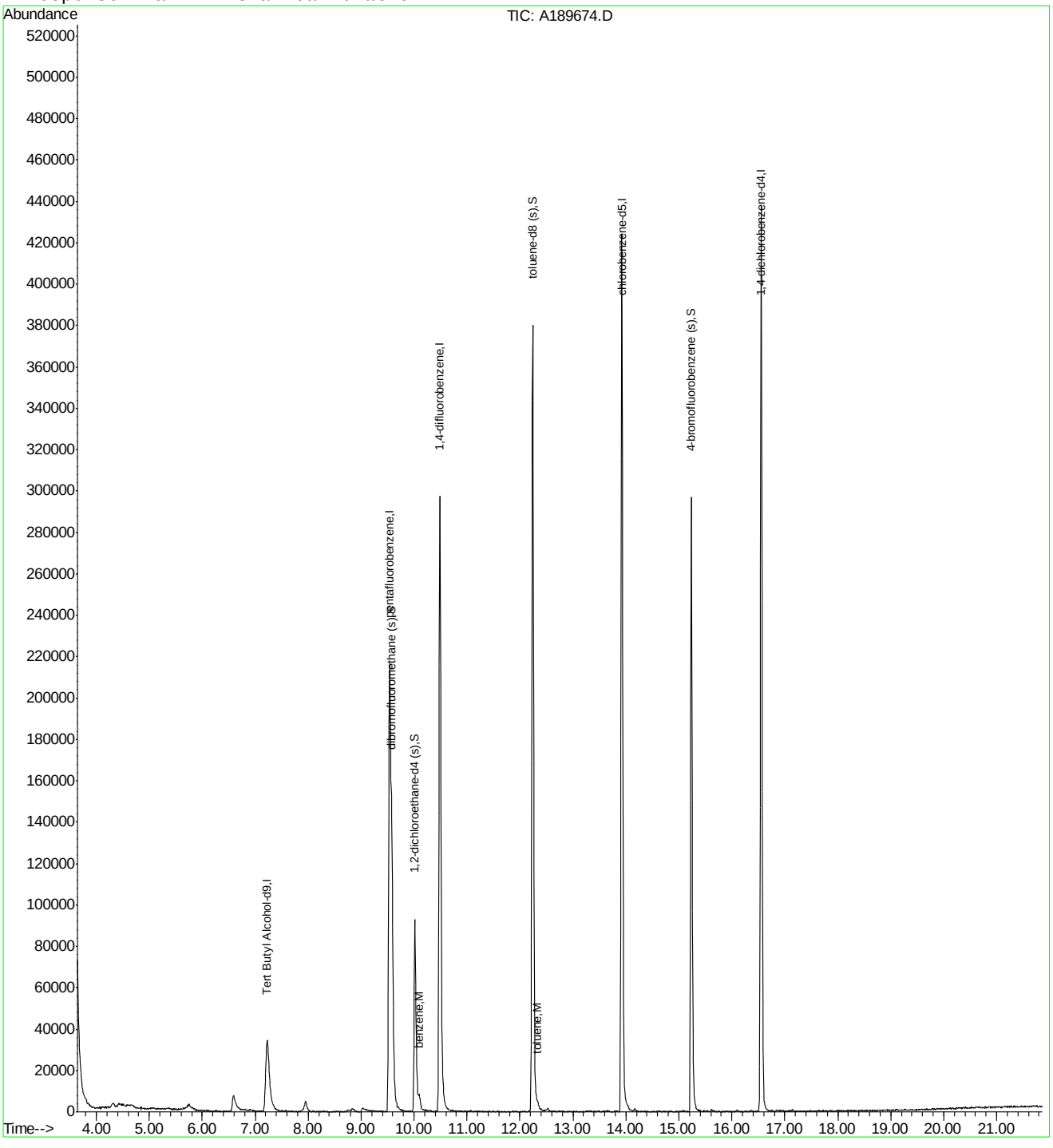
| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Tert Butyl Alcohol-d9 | 7.22 | 65 | 89342 | 500.00 | ug/L | -0.01 |
| 5) pentafluorobenzene | 9.54 | 168 | 234170 | 50.00 | ug/L | 0.00 |
| 54) 1,4-difluorobenzene | 10.48 | 114 | 344693 | 50.00 | ug/L | 0.00 |
| 85) chlorobenzene-d5 | 13.92 | 117 | 307517 | 50.00 | ug/L | 0.00 |
| 99) 1,4-dichlorobenzene-d4 | 16.55 | 152 | 145412 | 50.00 | ug/L | 0.00 |
| System Monitoring Compounds | | | | | | |
| 47) dibromofluoromethane (s) | 9.58 | 113 | 94800 | 49.22 | ug/L | 0.00 |
| Spiked Amount 50.000 Range 81 - 121 Recovery = 98.44% | | | | | | |
| 48) 1,2-dichloroethane-d4 (s) | 10.01 | 65 | 95543 | 44.60 | ug/L | 0.00 |
| Spiked Amount 50.000 Range 74 - 127 Recovery = 89.20% | | | | | | |
| 77) toluene-d8 (s) | 12.24 | 98 | 334261 | 50.33 | ug/L | 0.00 |
| Spiked Amount 50.000 Range 80 - 122 Recovery = 100.66% | | | | | | |
| 102) 4-bromofluorobenzene (s) | 15.23 | 95 | 117993 | 49.00 | ug/L | 0.00 |
| Spiked Amount 50.000 Range 78 - 116 Recovery = 98.00% | | | | | | |
| Target Compounds | | | | | | Qvalue |
| 61) benzene | 10.10 | 78 | 6950 | 0.98 | ug/L | 94 |
| 79) toluene | 12.33 | 92 | 1204 | 0.27 | ug/L | 84 |

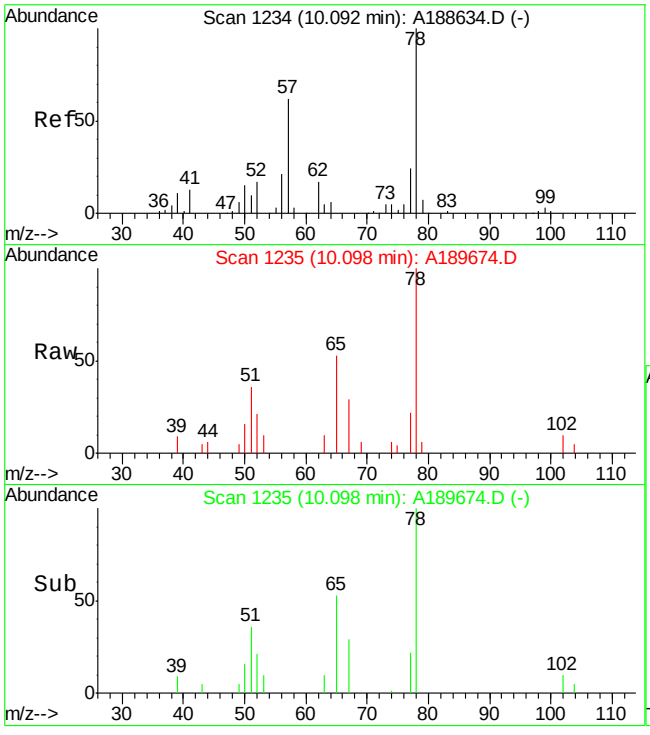
(#) = qualifier out of range (m) = manual integration

# Quantitation Report

Data File : C:\HPCHEM\1\DATA\A189674.D  Vial: 62
Acq On : 11 Dec 2012 7:50 am  Operator: Oksanat
Sample : jb22549-2  Inst : MSA
Misc : MS39558,VA7126,5.7,,,,1  Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 11 13:56 2012  Quant Results File: MA7086.RES

Method : C:\HPCHEM\1\METHODS\MA7086.M (RTE Integrator)
Title : SW 846 8260bB ZB624 60m x 0.25mm x 1.4um
Last Update : Thu Nov 08 15:38:19 2012
Response via : Initial Calibration

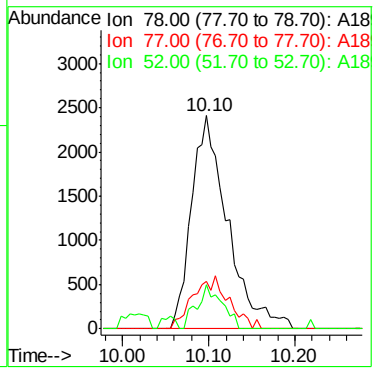


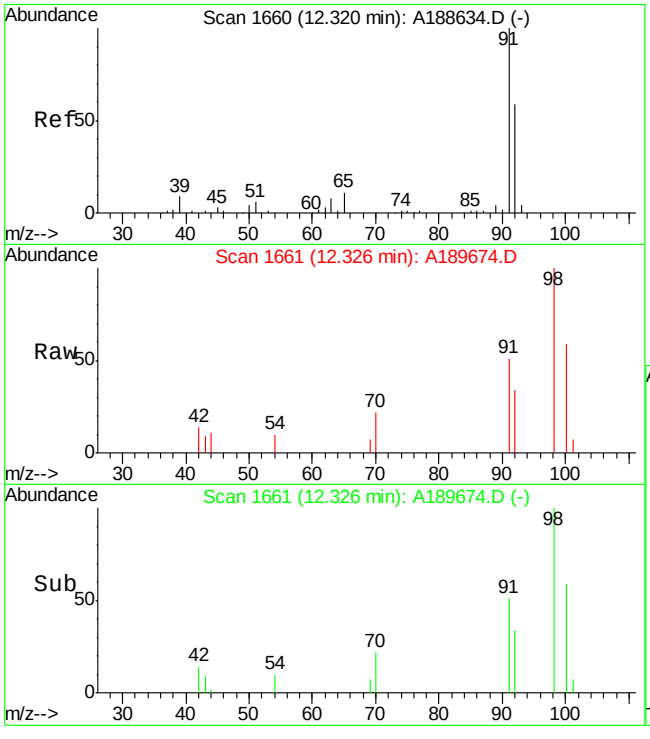



#61
benzene
Concen: 0.98 ug/L
RT: 10.10 min Scan# 1235
Delta R.T. 0.01 min
Lab File: A189674.D
Acq: 11 Dec 2012 7:50 am

Tgt Ion: 78 Resp: 6950

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 78 | 100 | | |
| 77 | 22.2 | 0.0 | 53.7 |
| 52 | 20.9 | 0.0 | 46.6 |

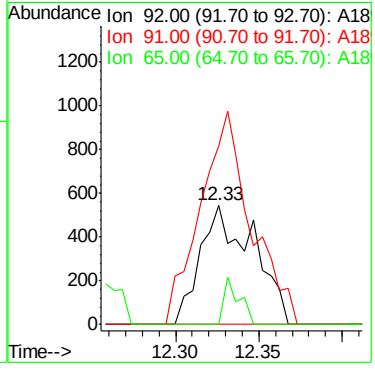



#79
toluene
Concen: 0.27 ug/L
RT: 12.33 min Scan# 1661
Delta R.T. 0.01 min
Lab File: A189674.D
Acq: 11 Dec 2012 7:50 am

Tgt Ion: 92 Resp: 1204

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 92 | 100 | | |
| 91 | 150.0 | 138.7 | 198.7 |
| 65 | 0.0 | 0.0 | 48.3 |



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : O131788.D
Acq On : 8 Dec 2012 6:04 pm
Operator : DIPAP
Sample : jb22549-3
Misc : MS39556,VO5810,6.9,,,,1
ALS Vial : 62 Sample Multiplier: 1

Quant Time: Dec 12 10:59:51 2012
Quant Method : C:\MSDCHEM\1\METHODS\MO5808S.M
Quant Title : Method 624, ZB624 60mx0.25mmx1.4um
QLast Update : Thu Dec 06 08:25:17 2012
Response via : Initial Calibration

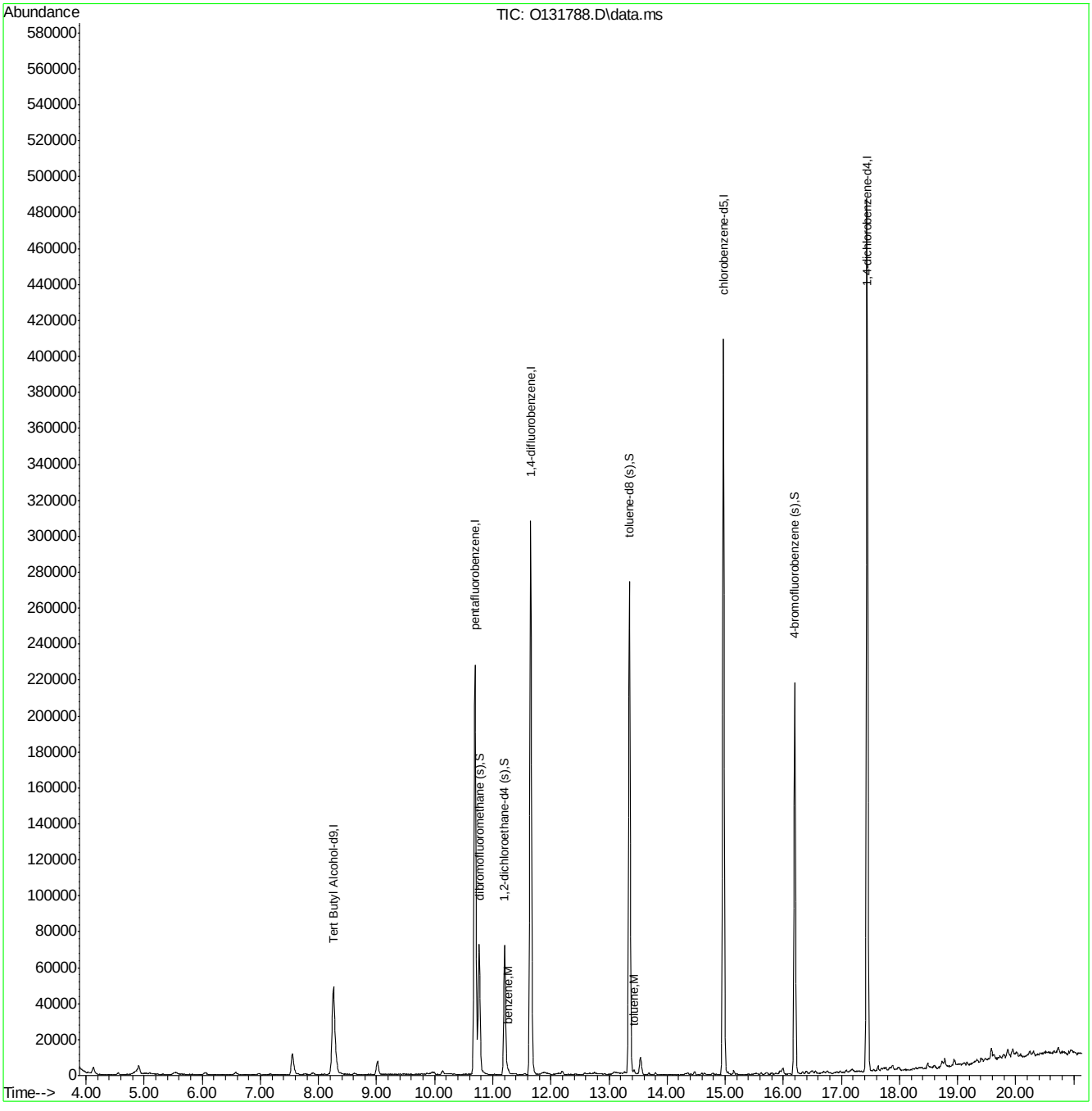
| Compound | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| Internal Standards | | | | | | |
| 1) Tert Butyl Alcohol-d9 | 8.255 | 65 | 96358 | 500.00 | ug/L | -0.02 |
| 5) pentafluorobenzene | 10.697 | 168 | 195274 | 50.00 | ug/L | 0.00 |
| 49) 1,4-difluorobenzene | 11.649 | 114 | 291482 | 50.00 | ug/L | 0.00 |
| 81) chlorobenzene-d5 | 14.970 | 117 | 265915 | 50.00 | ug/L | 0.00 |
| 95) 1,4-dichlorobenzene-d4 | 17.439 | 152 | 149384 | 50.00 | ug/L | 0.00 |
| System Monitoring Compounds | | | | | | |
| 43) dibromofluoromethane (s) | 10.765 | 113 | 51488 | 45.41 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 70 - 130 | | Recovery = 90.82% | | | |
| 44) 1,2-dichloroethane-d4 (s) | 11.204 | 65 | 59351 | 46.68 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 70 - 122 | | Recovery = 93.36% | | | |
| 73) toluene-d8 (s) | 13.354 | 98 | 214939 | 43.37 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 81 - 127 | | Recovery = 86.74% | | | |
| 97) 4-bromofluorobenzene (s) | 16.199 | 95 | 81957 | 43.32 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 66 - 132 | | Recovery = 86.64% | | | |
| Target Compounds | | | | | | Qvalue |
| 57) benzene | 11.262 | 78 | 2354 | 0.44 | ug/L | 92 |
| 75) toluene | 13.427 | 92 | 1115 | 0.31 | ug/L | 88 |

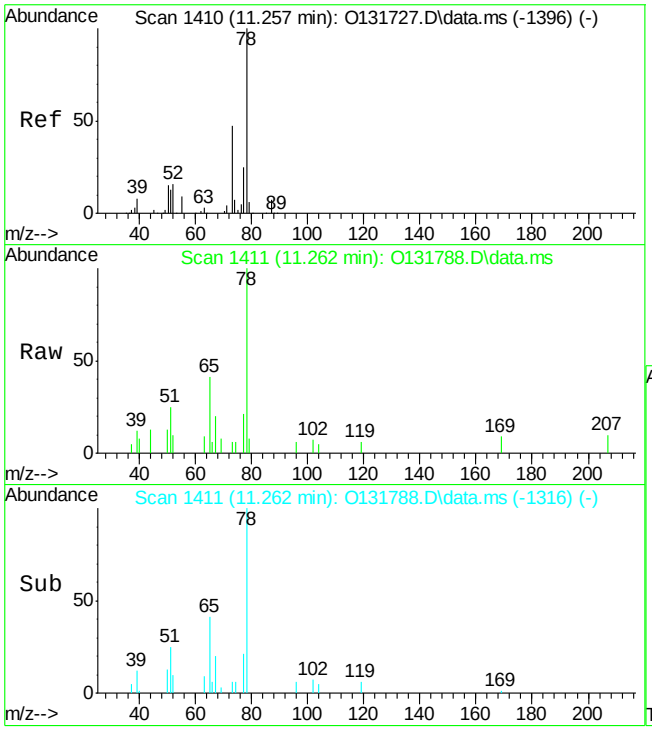
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : O131788.D
Acq On : 8 Dec 2012 6:04 pm
Operator : DIPAP
Sample : jb22549-3
Misc : MS39556,VO5810,6.9,,,,1
ALS Vial : 62 Sample Multiplier: 1

Quant Time: Dec 12 10:59:51 2012
Quant Method : C:\MSDCHEM\1\METHODS\MO5808S.M
Quant Title : Method 624, ZB624 60mx0.25mmx1.4um
QLast Update : Thu Dec 06 08:25:17 2012
Response via : Initial Calibration

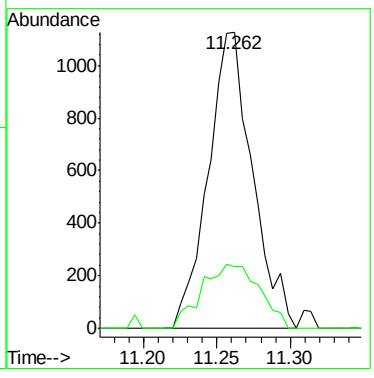


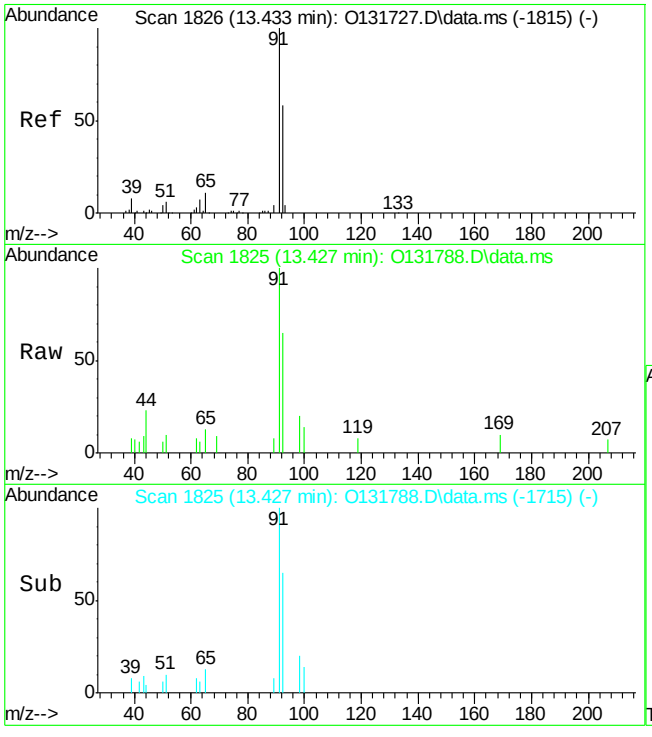



#57
benzene
Concen: 0.44 ug/L
RT: 11.262 min Scan# 1411
Delta R.T. 0.005 min
Lab File: O131788.D
Acq: 8 Dec 2012 6:04 pm

Tgt Ion: 78 Resp: 2354

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 78 | 100 | | |
| 77 | 20.9 | 0.0 | 54.6 |

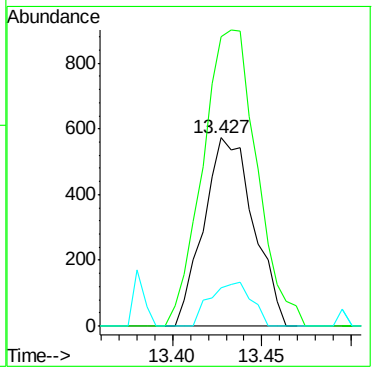



#75
toluene
Concen: 0.31 ug/L
RT: 13.427 min Scan# 1825
Delta R.T. -0.006 min
Lab File: O131788.D
Acq: 8 Dec 2012 6:04 pm

Tgt Ion: 92 Resp: 1115

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 92 | 100 | | |
| 91 | 154.2 | 142.6 | 202.6 |
| 65 | 20.6 | 0.0 | 48.6 |



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
Data File : E197689.D
Acq On : 9 Dec 2012 6:11 am
Operator : OksanaT
Sample : jb22549-4
Misc : MS39558,VE8685,5.4,,100,5,1
ALS Vial : 92 Sample Multiplier: 1

Quant Time: Dec 10 12:18:07 2012
Quant Method : C:\MSDCHEM\1\METHODS\ME8647.M
Quant Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
QLast Update : Tue Nov 13 15:53:05 2012
Response via : Initial Calibration

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Tert Butyl Alcohol-d9 | 7.702 | 65 | 85971 | 500.00 | ug/L | 0.00 |
| 5) pentafluorobenzene | 9.914 | 168 | 103080 | 50.00 | ug/L | -0.01 |
| 65) 1,4-difluorobenzene | 10.834 | 114 | 156967 | 50.00 | ug/L | 0.00 |
| 96) chlorobenzene-d5 | 14.161 | 117 | 139503 | 50.00 | ug/L | 0.00 |
| 113) 1,4-dichlorobenzene-d4 | 16.734 | 152 | 74321 | 50.00 | ug/L | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 59) dibromofluoromethane (s) | 9.961 | 113 | 48932 | 45.95 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 81 - 121 | | Recovery = 91.90% | | | |
| 60) 1,2-dichloroethane-d4 (s) | 10.379 | 65 | 70489 | 45.70 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 74 - 127 | | Recovery = 91.40% | | | |
| 88) toluene-d8 (s) | 12.534 | 98 | 196311 | 46.27 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 80 - 122 | | Recovery = 92.54% | | | |
| 115) 4-bromofluorobenzene (s) | 15.432 | 95 | 75389 | 45.99 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 78 - 116 | | Recovery = 91.98% | | | |

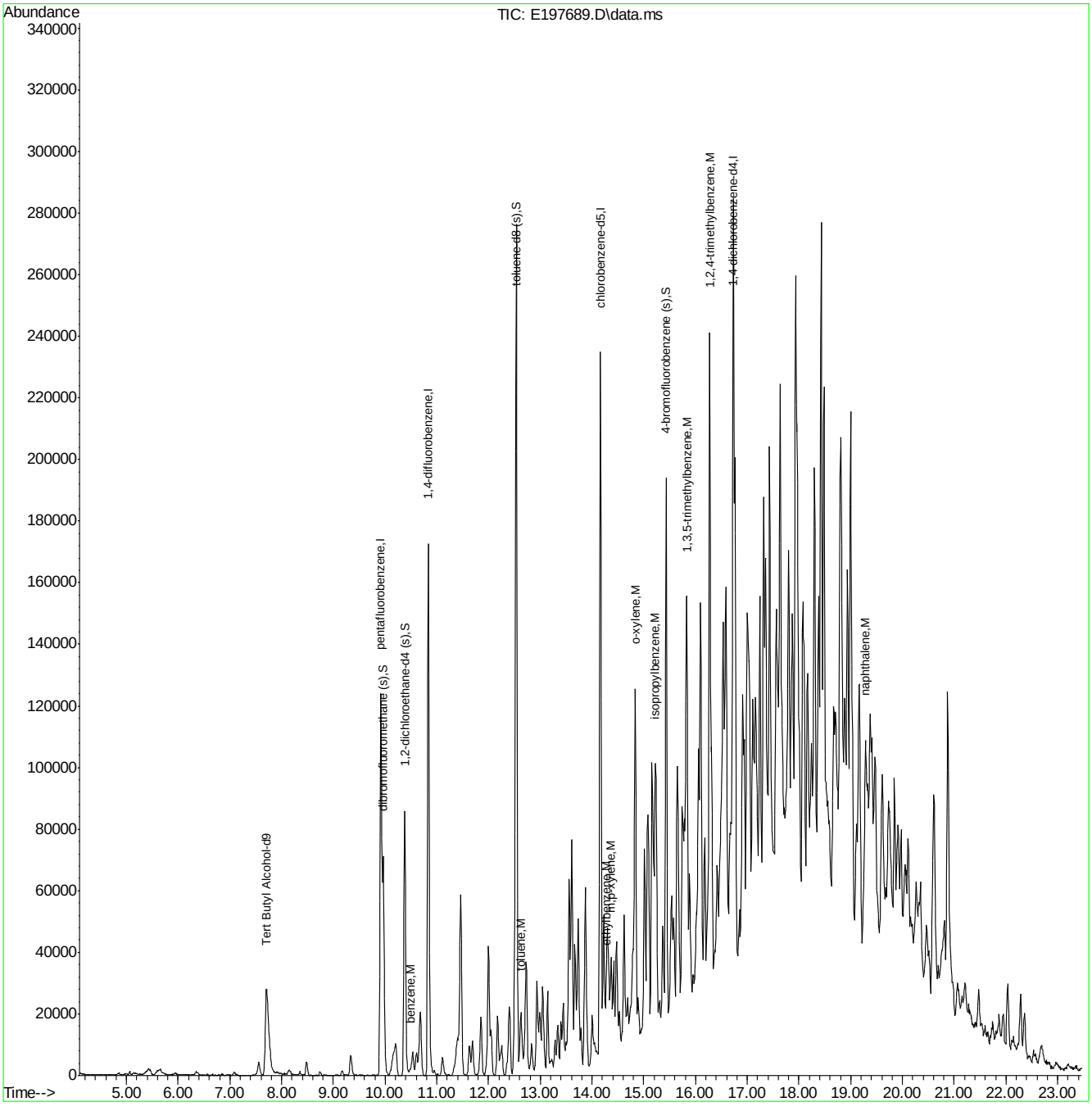
| Target Compounds | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 74) benzene | 10.494 | 78 | 2050 | 0.45 | ug/L | 94 |
| 90) toluene | 12.613 | 92 | 6462 | 2.24 | ug/L | 98 |
| 107) ethylbenzene | 14.265 | 91 | 12783 | 2.47 | ug/L | 97 |
| 108) m,p-xylene | 14.375 | 106 | 9537 | 4.83 | ug/L | 97 |
| 109) o-xylene | 14.835 | 106 | 19324 | 9.41 | ug/L | 99 |
| 114) isopropylbenzene | 15.217 | 105 | 16003 | 2.83 | ug/L | 98 |
| 124) 1,3,5-trimethylbenzene | 15.834 | 105 | 33735 | 7.17 | ug/L | 96 |
| 127) 1,2,4-trimethylbenzene | 16.274 | 105 | 131796 | 28.09 | ug/L | 98 |
| 141) naphthalene | 19.281 | 128 | 45342 | 14.95 | ug/L | 97 |

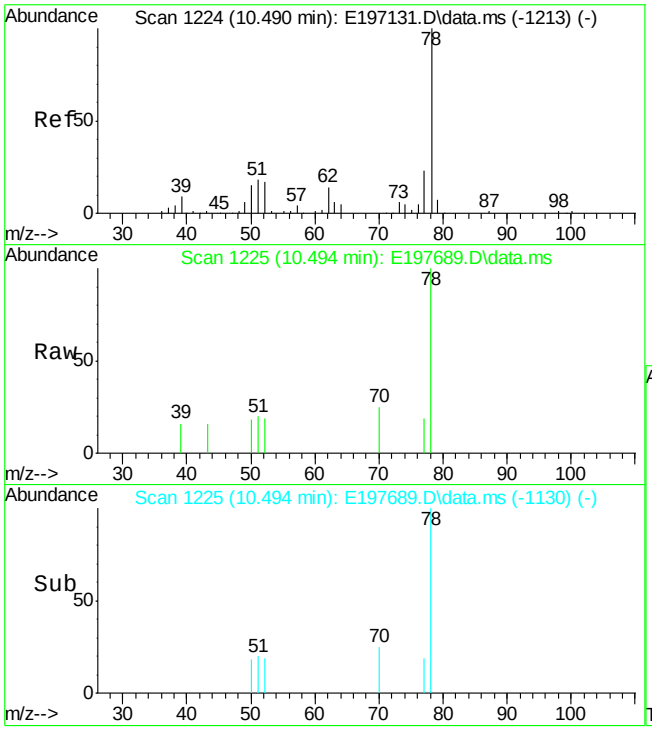
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
Data File : E197689.D
Acq On : 9 Dec 2012 6:11 am
Operator : OksanaT
Sample : jb22549-4
Misc : MS39558,VE8685,5.4,,100,5,1
ALS Vial : 92 Sample Multiplier: 1

Quant Time: Dec 10 12:18:07 2012
Quant Method : C:\MSDCHEM\1\METHODS\ME8647.M
Quant Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
QLast Update : Tue Nov 13 15:53:05 2012
Response via : Initial Calibration

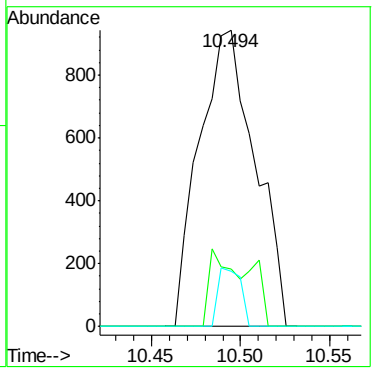


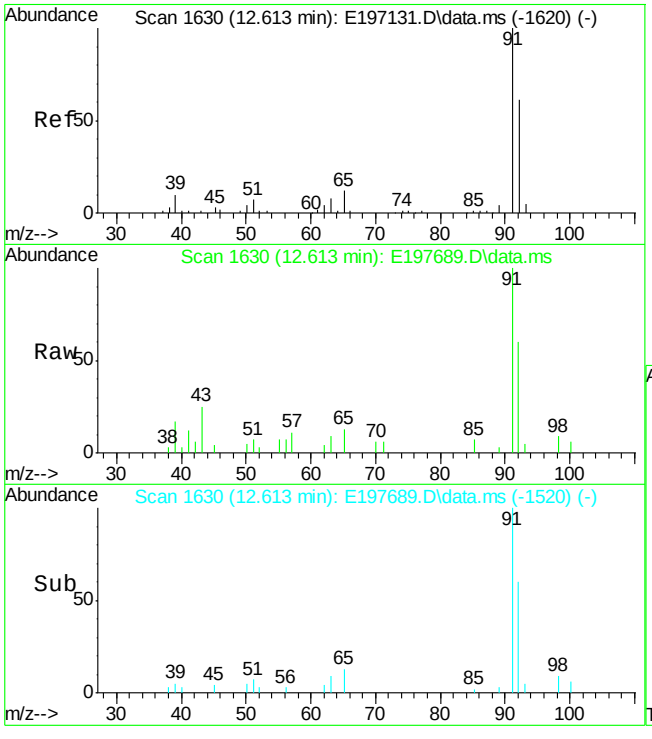



#74
benzene
Concen: 0.45 ug/L
RT: 10.494 min Scan# 1225
Delta R.T. -0.002 min
Lab File: E197689.D
Acq: 9 Dec 2012 6:11 am

Tgt Ion: 78 Resp: 2050

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 78 | 100 | | |
| 77 | 19.4 | 0.0 | 54.3 |
| 52 | 18.7 | 0.0 | 47.9 |

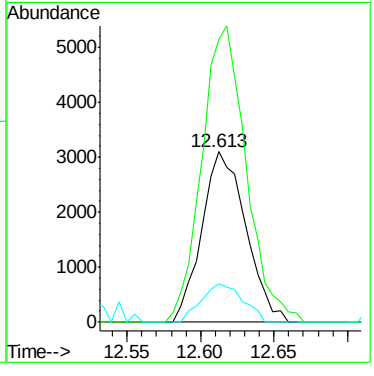


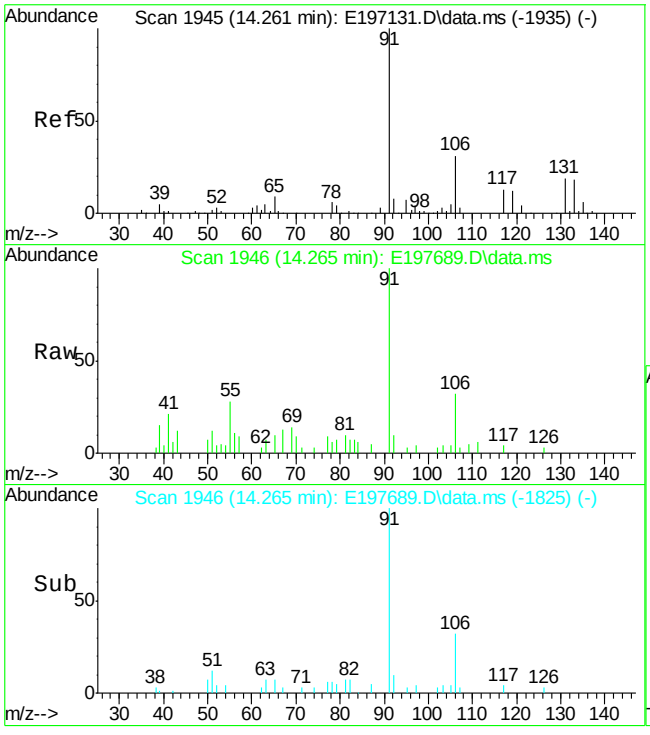




#90
toluene
Concen: 2.24 ug/L
RT: 12.613 min Scan# 1630
Delta R.T. -0.007 min
Lab File: E197689.D
Acq: 9 Dec 2012 6:11 am

Tgt Ion: 92 Resp: 6462

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 92 | 100 | | |
| 91 | 165.6 | 137.9 | 197.9 |
| 65 | 22.3 | 0.0 | 50.7 |

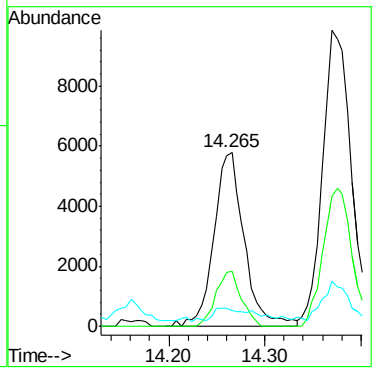


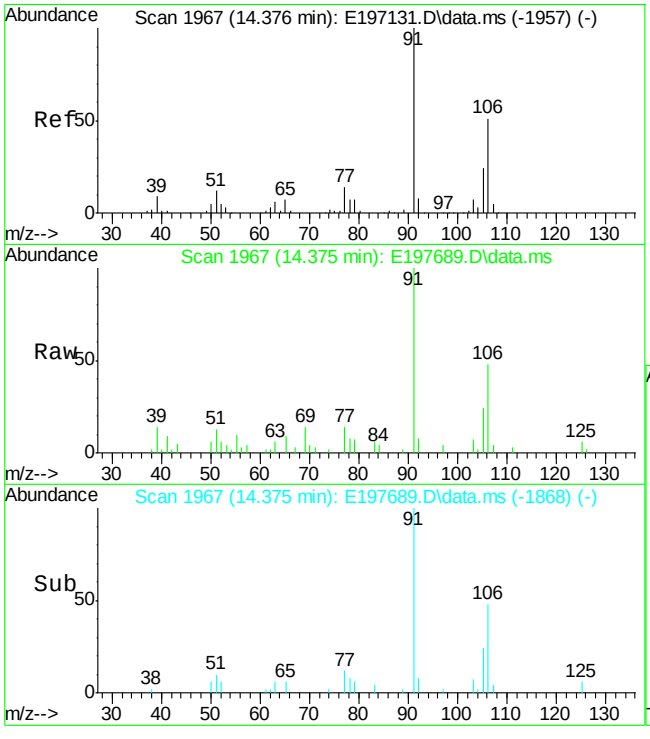



#107
ethylbenzene
Concen: 2.47 ug/L
RT: 14.265 min Scan# 1946
Delta R.T. 0.003 min
Lab File: E197689.D
Acq: 9 Dec 2012 6:11 am

Tgt Ion: 91 Resp: 12783

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 91 | 100 | | |
| 106 | 31.7 | 0.5 | 60.5 |
| 77 | 6.2 | 0.0 | 39.0 |

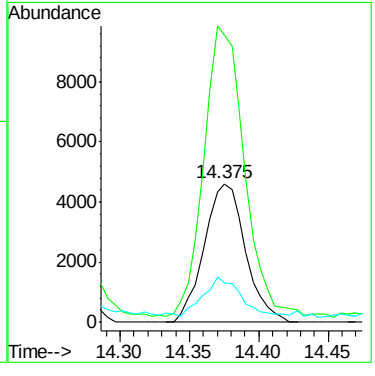


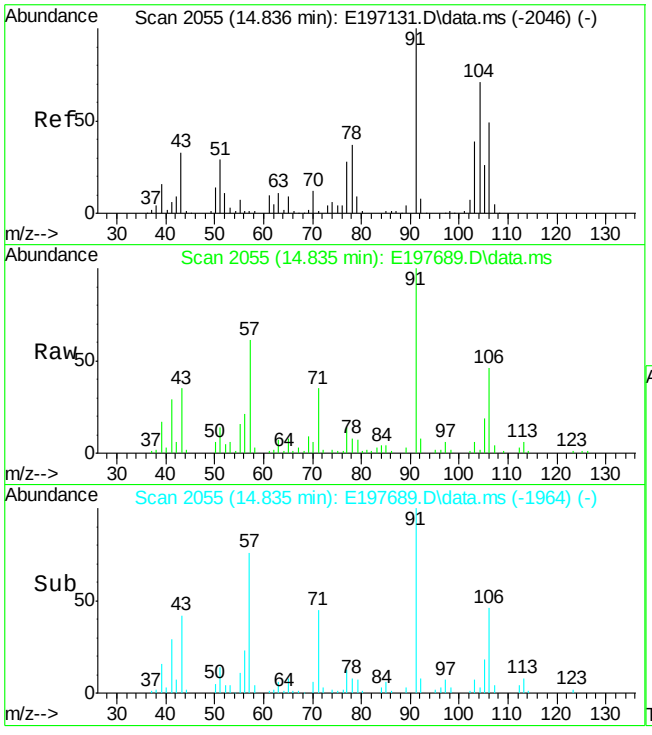




#108
m,p-xylene
Concen: 4.83 ug/L
RT: 14.375 min Scan# 1967
Delta R.T. -0.002 min
Lab File: E197689.D
Acq: 9 Dec 2012 6:11 am

Tgt Ion:106 Resp: 9537

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 106 | 100 | | |
| 91 | 204.1 | 170.7 | 230.7 |
| 77 | 22.0 | 0.0 | 57.5 |

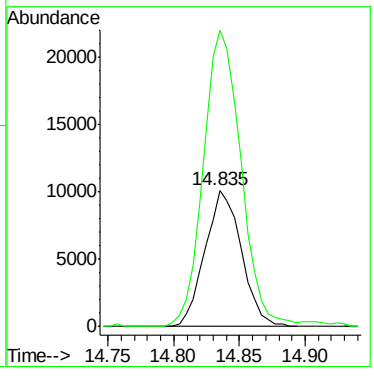


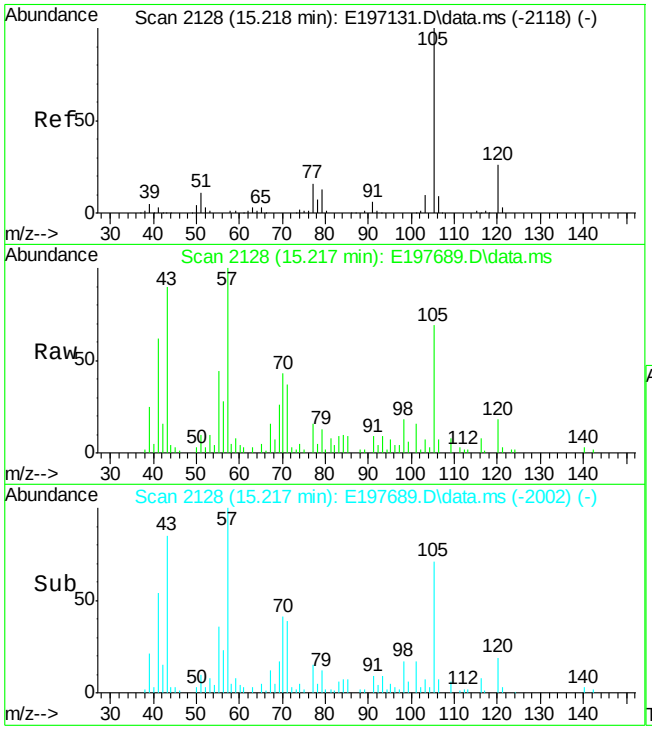



#109
o-xylene
Concen: 9.41 ug/L
RT: 14.835 min Scan# 2055
Delta R.T. -0.002 min
Lab File: E197689.D
Acq: 9 Dec 2012 6:11 am

Tgt Ion:106 Resp: 19324

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 106 | 100 | | |
| 91 | 217.4 | 185.3 | 245.3 |

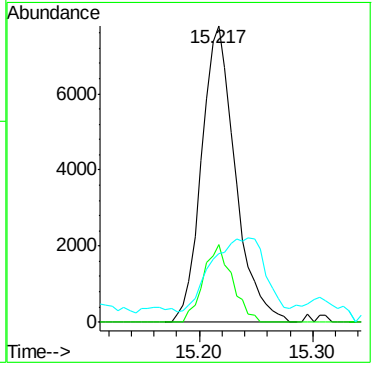


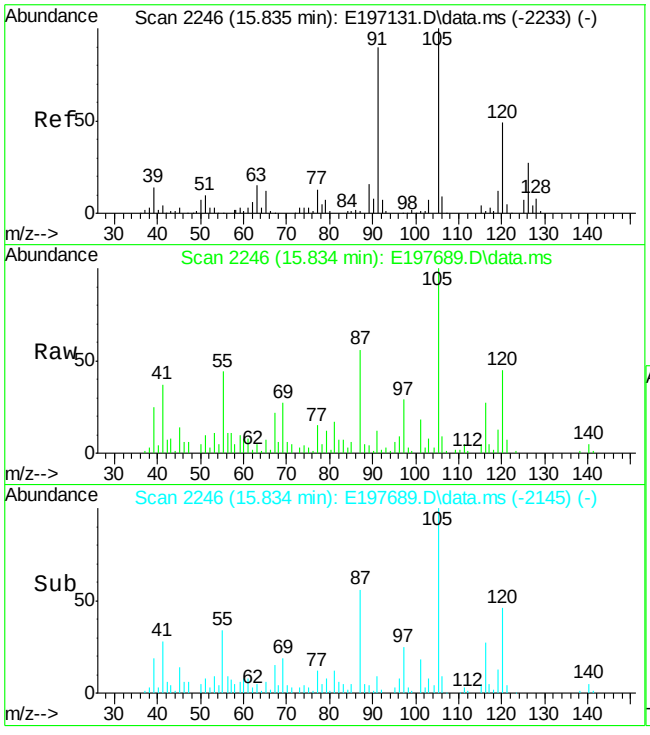




#114
isopropylbenzene
Concen: 2.83 ug/L
RT: 15.217 min Scan# 2128
Delta R.T. -0.002 min
Lab File: E197689.D
Acq: 9 Dec 2012 6:11 am

Tgt Ion:105 Resp: 16003

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 105 | 100 | | |
| 120 | 26.2 | 0.0 | 56.4 |
| 77 | 18.8 | 0.0 | 47.0 |

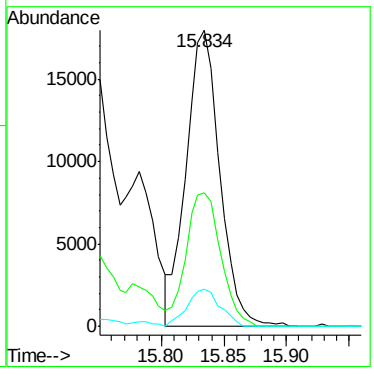


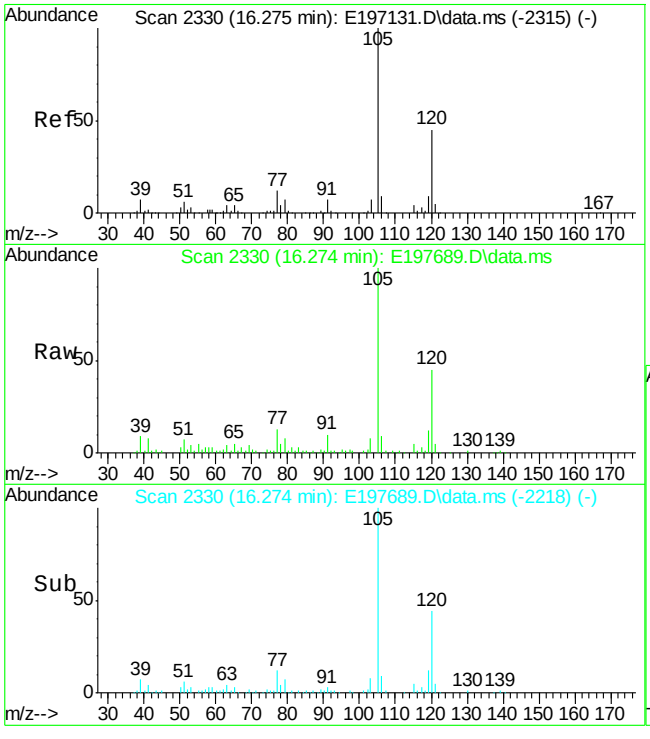



#124
1,3,5-trimethylbenzene
Concen: 7.17 ug/L
RT: 15.834 min Scan# 2246
Delta R.T. -0.002 min
Lab File: E197689.D
Acq: 9 Dec 2012 6:11 am

Tgt Ion:105 Resp: 33735

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 105 | 100 | | |
| 120 | 45.2 | 18.2 | 78.2 |
| 119 | 12.5 | 0.0 | 43.0 |

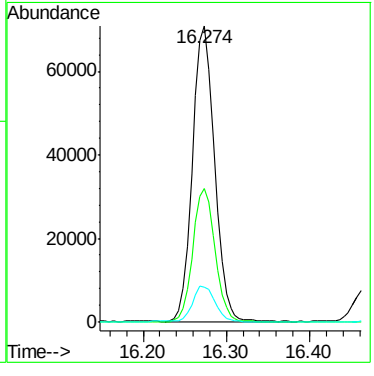


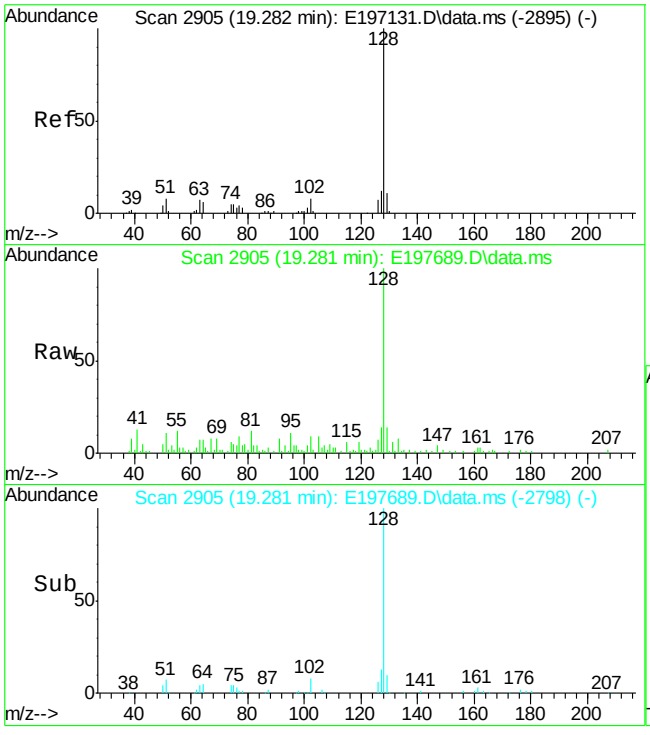




#127
1,2,4-trimethylbenzene
Concen: 28.09 ug/L
RT: 16.274 min Scan# 2330
Delta R.T. -0.002 min
Lab File: E197689.D
Acq: 9 Dec 2012 6:11 am

Tgt Ion:105 Resp: 131796

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 105 | 100 | | |
| 120 | 45.2 | 14.3 | 74.3 |
| 119 | 11.6 | 0.0 | 42.7 |

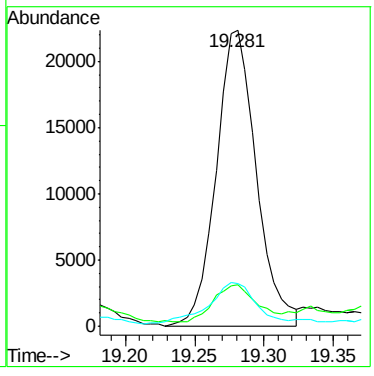





#141
naphthalene
Concen: 14.95 ug/L
RT: 19.281 min Scan# 2905
Delta R.T. -0.001 min
Lab File: E197689.D
Acq: 9 Dec 2012 6:11 am

Tgt Ion:128 Resp: 45342

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 128 | 100 | | |
| 129 | 12.4 | 0.0 | 41.1 |
| 127 | 12.8 | 0.0 | 44.0 |




7.1.5

7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : O131789.D
Acq On : 8 Dec 2012 6:34 pm
Operator : DIPAP
Sample : jb22549-5
Misc : MS39556,VO5810,5.4,,,,1
ALS Vial : 63 Sample Multiplier: 1

Quant Time: Dec 12 11:01:00 2012
Quant Method : C:\MSDCHEM\1\METHODS\MO5808S.M
Quant Title : Method 624, ZB624 60mx0.25mmx1.4um
QLast Update : Thu Dec 06 08:25:17 2012
Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| Internal Standards | | | | | | |
| 1) Tert Butyl Alcohol-d9 | 8.260 | 65 | 88102 | 500.00 | ug/L | -0.01 |
| 5) pentafluorobenzene | 10.697 | 168 | 169245 | 50.00 | ug/L | 0.00 |
| 49) 1,4-difluorobenzene | 11.649 | 114 | 255905 | 50.00 | ug/L | 0.00 |
| 81) chlorobenzene-d5 | 14.970 | 117 | 224859 | 50.00 | ug/L | 0.00 |
| 95) 1,4-dichlorobenzene-d4 | 17.439 | 152 | 117477 | 50.00 | ug/L | 0.00 |
| System Monitoring Compounds | | | | | | |
| 43) dibromofluoromethane (s) | 10.765 | 113 | 45941 | 46.75 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 70 - 130 | | Recovery = 93.50% | | | |
| 44) 1,2-dichloroethane-d4 (s) | 11.205 | 65 | 54058 | 49.06 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 70 - 122 | | Recovery = 98.12% | | | |
| 73) toluene-d8 (s) | 13.354 | 98 | 186315 | 42.82 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 81 - 127 | | Recovery = 85.64% | | | |
| 97) 4-bromofluorobenzene (s) | 16.199 | 95 | 68429 | 45.99 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 66 - 132 | | Recovery = 91.98% | | | |

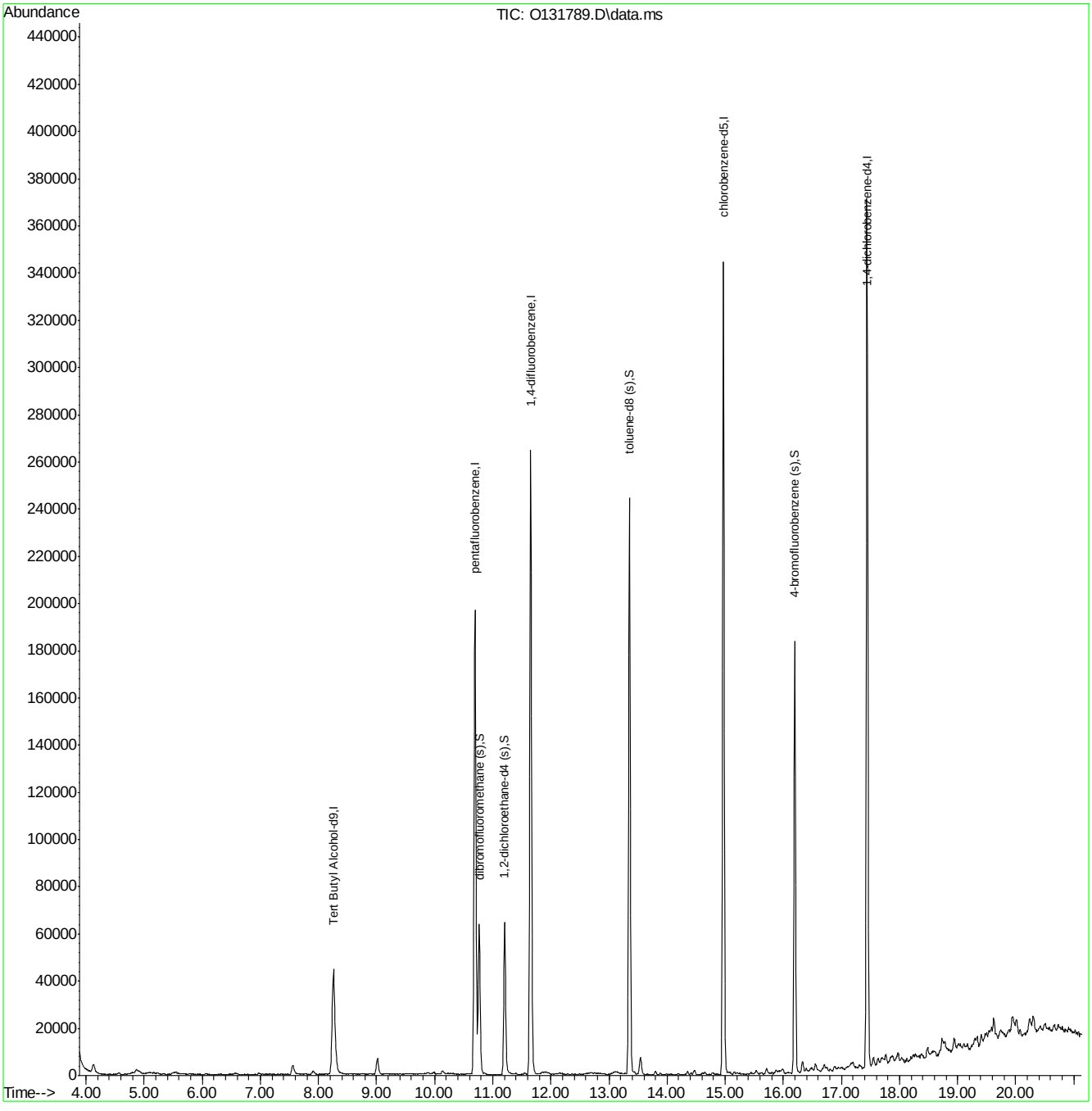
Target Compounds Qvalue

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : O131789.D
Acq On : 8 Dec 2012 6:34 pm
Operator : DIPAP
Sample : jb22549-5
Misc : MS39556,VO5810,5.4,,,,1
ALS Vial : 63 Sample Multiplier: 1

Quant Time: Dec 12 11:01:00 2012
Quant Method : C:\MSDCHEM\1\METHODS\MO5808S.M
Quant Title : Method 624, ZB624 60mx0.25mmx1.4um
QLast Update : Thu Dec 06 08:25:17 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\A189673.D Vial: 61
Acq On : 11 Dec 2012 7:06 am Operator: Oksanat
Sample : jb22549-6 Inst : MSA
Misc : MS39558,VA7126,6.7,,,,1 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 11 13:55 2012 Quant Results File: MA7086.RES

Quant Method : C:\HPCHEM\1\METHODS\MA7086.M (RTE Integrator)
Title : SW 846 8260bB ZB624 60m x 0.25mm x 1.4um
Last Update : Thu Nov 08 15:38:19 2012
Response via : Initial Calibration
DataAcq Meth : MA7086

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Tert Butyl Alcohol-d9 | 7.23 | 65 | 93098 | 500.00 | ug/L | 0.00 |
| 5) pentafluorobenzene | 9.54 | 168 | 208247 | 50.00 | ug/L | 0.00 |
| 54) 1,4-difluorobenzene | 10.49 | 114 | 301762 | 50.00 | ug/L | 0.00 |
| 85) chlorobenzene-d5 | 13.93 | 117 | 268226 | 50.00 | ug/L | 0.00 |
| 99) 1,4-dichlorobenzene-d4 | 16.56 | 152 | 123557 | 50.00 | ug/L | 0.00 |

| System Monitoring Compounds | | | | | | |
|---|---|---|---|---|---|---|
| 47) dibromofluoromethane (s) | 9.58 | 113 | 80086 | 46.75 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 81 - 121 | | Recovery = 93.50% | | | |
| 48) 1,2-dichloroethane-d4 (s) | 10.02 | 65 | 82530 | 43.32 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 74 - 127 | | Recovery = 86.64% | | | |
| 77) toluene-d8 (s) | 12.24 | 98 | 290605 | 49.98 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 80 - 122 | | Recovery = 99.96% | | | |
| 102) 4-bromofluorobenzene (s) | 15.23 | 95 | 101939 | 49.82 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 78 - 116 | | Recovery = 99.64% | | | |

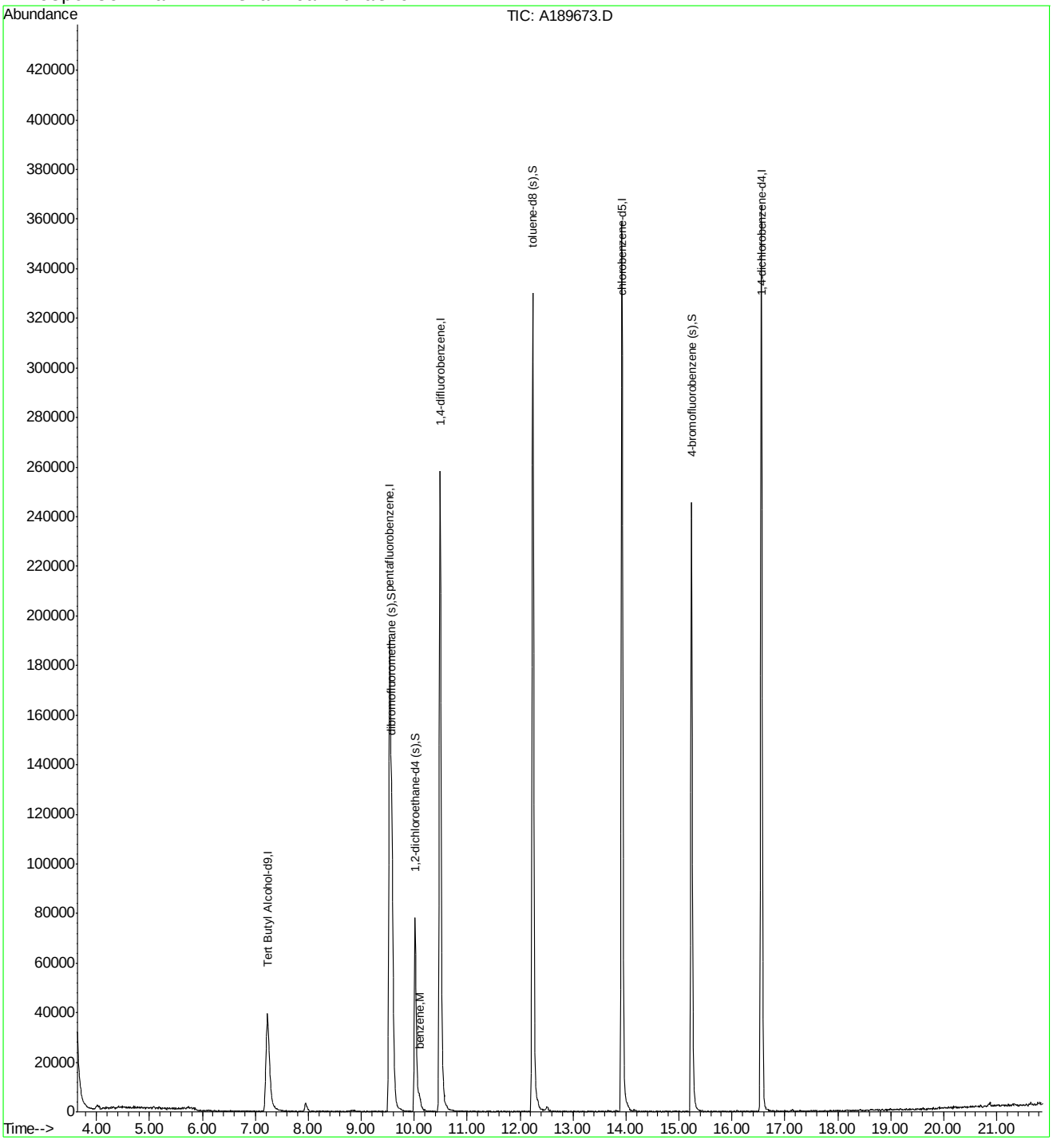
| Target Compounds | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 61) benzene | 10.11 | 78 | 5689 | 0.92 | ug/L | 99 |

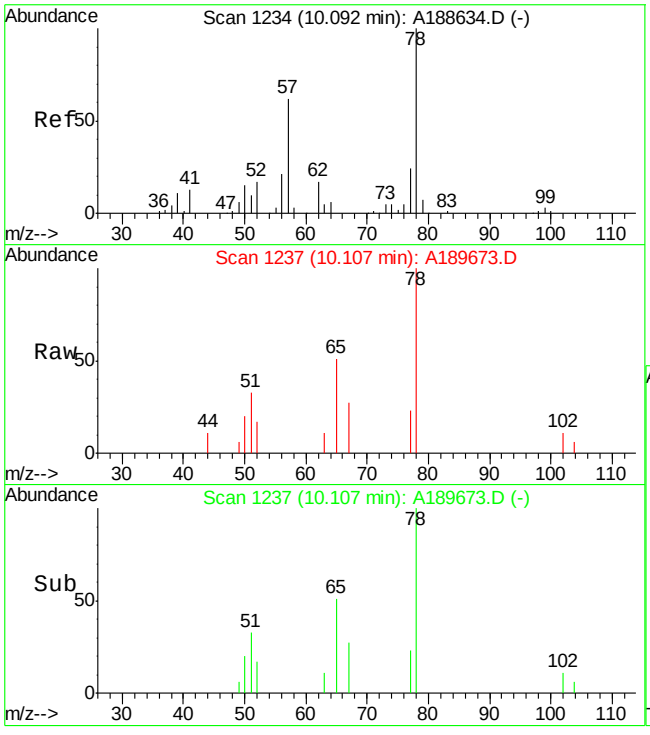
(#) = qualifier out of range (m) = manual integration
A189673.D MA7086.M Tue Dec 11 13:55:31 2012 MSA

# Quantitation Report

Data File : C:\HPCHEM\1\DATA\A189673.D  Vial: 61
Acq On : 11 Dec 2012 7:06 am  Operator: Oksanat
Sample : jb22549-6  Inst : MSA
Misc : MS39558,VA7126,6.7,,,,1  Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 11 13:55 2012  Quant Results File: MA7086.RES

Method : C:\HPCHEM\1\METHODS\MA7086.M (RTE Integrator)
Title : SW 846 8260bB ZB624 60m x 0.25mm x 1.4um
Last Update : Thu Nov 08 15:38:19 2012
Response via : Initial Calibration

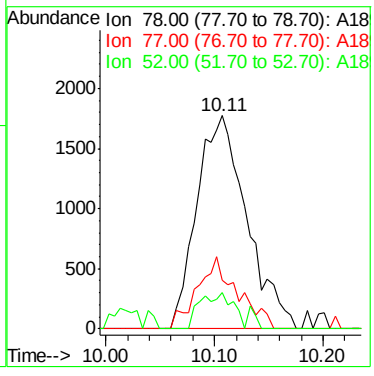





#61
benzene
Concen: 0.92 ug/L
RT: 10.11 min Scan# 1237
Delta R.T. 0.01 min
Lab File: A189673.D
Acq: 11 Dec 2012 7:06 am

Tgt Ion: 78 Resp: 5689

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 78 | 100 | | |
| 77 | 22.7 | 0.0 | 53.7 |
| 52 | 16.9 | 0.0 | 46.6 |




7.1.7

7

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\A189659.D Vial: 47
Acq On : 10 Dec 2012 11:43 pm Operator: Oksanat
Sample : mb Inst : MSA
Misc : MS39549,VA7126,5,,,,1 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 11 13:39 2012 Quant Results File: MA7086.RES

Quant Method : C:\HPCHEM\1\METHODS\MA7086.M (RTE Integrator)
Title : SW 846 8260bB ZB624 60m x 0.25mm x 1.4um
Last Update : Thu Nov 08 15:38:19 2012
Response via : Initial Calibration
DataAcq Meth : MA7086

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Tert Butyl Alcohol-d9 | 7.24 | 65 | 103929 | 500.00 | ug/L | 0.00 |
| 5) pentafluorobenzene | 9.55 | 168 | 212773 | 50.00 | ug/L | 0.00 |
| 54) 1,4-difluorobenzene | 10.50 | 114 | 305315 | 50.00 | ug/L | 0.00 |
| 85) chlorobenzene-d5 | 13.94 | 117 | 276732 | 50.00 | ug/L | 0.00 |
| 99) 1,4-dichlorobenzene-d4 | 16.57 | 152 | 132937 | 50.00 | ug/L | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 47) dibromofluoromethane (s) | 9.59 | 113 | 83248 | 47.56 | ug/L | 0.01 |
| Spiked Amount 50.000 | Range 81 - 121 | | Recovery = 95.12% | | | |
| 48) 1,2-dichloroethane-d4 (s) | 10.03 | 65 | 91020 | 46.76 | ug/L | 0.02 |
| Spiked Amount 50.000 | Range 74 - 127 | | Recovery = 93.52% | | | |
| 77) toluene-d8 (s) | 12.25 | 98 | 292239 | 49.68 | ug/L | 0.01 |
| Spiked Amount 50.000 | Range 80 - 122 | | Recovery = 99.36% | | | |
| 102) 4-bromofluorobenzene (s) | 15.25 | 95 | 107590 | 48.87 | ug/L | 0.01 |
| Spiked Amount 50.000 | Range 78 - 116 | | Recovery = 97.74% | | | |

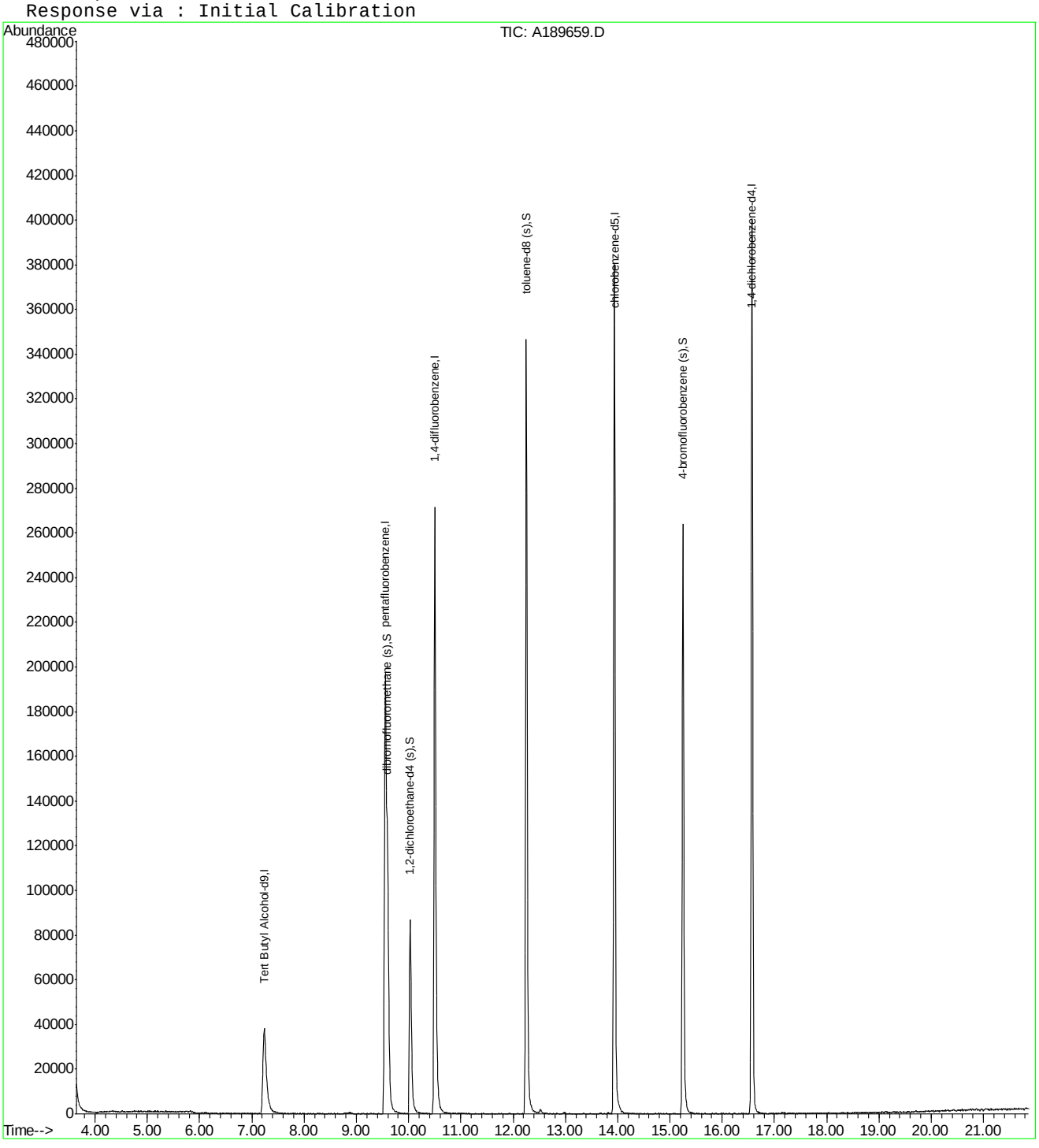
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration
A189659.D MA7086.M Tue Dec 11 13:40:06 2012 MSA

# Quantitation Report

Data File : C:\HPCHEM\1\DATA\A189659.D  Vial: 47
Acq On : 10 Dec 2012 11:43 pm  Operator: Oksanat
Sample : mb  Inst : MSA
Misc : MS39549,VA7126,5,,,,1  Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 11 13:39 2012  Quant Results File: MA7086.RES

Method : C:\HPCHEM\1\METHODS\MA7086.M (RTE Integrator)
Title : SW 846 8260bB ZB624 60m x 0.25mm x 1.4um
Last Update : Thu Nov 08 15:38:19 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
Data File : E197676.D
Acq On : 8 Dec 2012 11:38 pm
Operator : OksanaT
Sample : mb
Misc : MS39567,VE8685,5,,100,5,1
ALS Vial : 79 Sample Multiplier: 1

Quant Time: Dec 10 12:00:12 2012
Quant Method : C:\MSDCHEM\1\METHODS\ME8647.M
Quant Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
QLast Update : Tue Nov 13 15:53:05 2012
Response via : Initial Calibration

| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 1) Tert Butyl Alcohol-d9 | 7.722 | 65 | 78704 | 500.00 ug/L | 0.01 |
| 5) pentafluorobenzene | 9.919 | 168 | 98475 | 50.00 ug/L | 0.00 |
| 65) 1,4-difluorobenzene | 10.840 | 114 | 148840 | 50.00 ug/L | 0.00 |
| 96) chlorobenzene-d5 | 14.161 | 117 | 138035 | 50.00 ug/L | 0.00 |
| 113) 1,4-dichlorobenzene-d4 | 16.734 | 152 | 69992 | 50.00 ug/L | 0.00 |

System Monitoring Compounds

| | | | | | |
|---|---|---|---|---|---|
| 59) dibromofluoromethane (s) | 9.966 | 113 | 47746 | 46.94 ug/L | 0.00 |
| Spiked Amount 50.000 | Range 81 - 121 | | Recovery = 93.88% | | |
| 60) 1,2-dichloroethane-d4 (s) | 10.379 | 65 | 69366 | 47.07 ug/L | 0.00 |
| Spiked Amount 50.000 | Range 74 - 127 | | Recovery = 94.14% | | |
| 88) toluene-d8 (s) | 12.539 | 98 | 187312 | 46.56 ug/L | 0.00 |
| Spiked Amount 50.000 | Range 80 - 122 | | Recovery = 93.12% | | |
| 115) 4-bromofluorobenzene (s) | 15.432 | 95 | 74819 | 48.47 ug/L | 0.00 |
| Spiked Amount 50.000 | Range 78 - 116 | | Recovery = 96.94% | | |

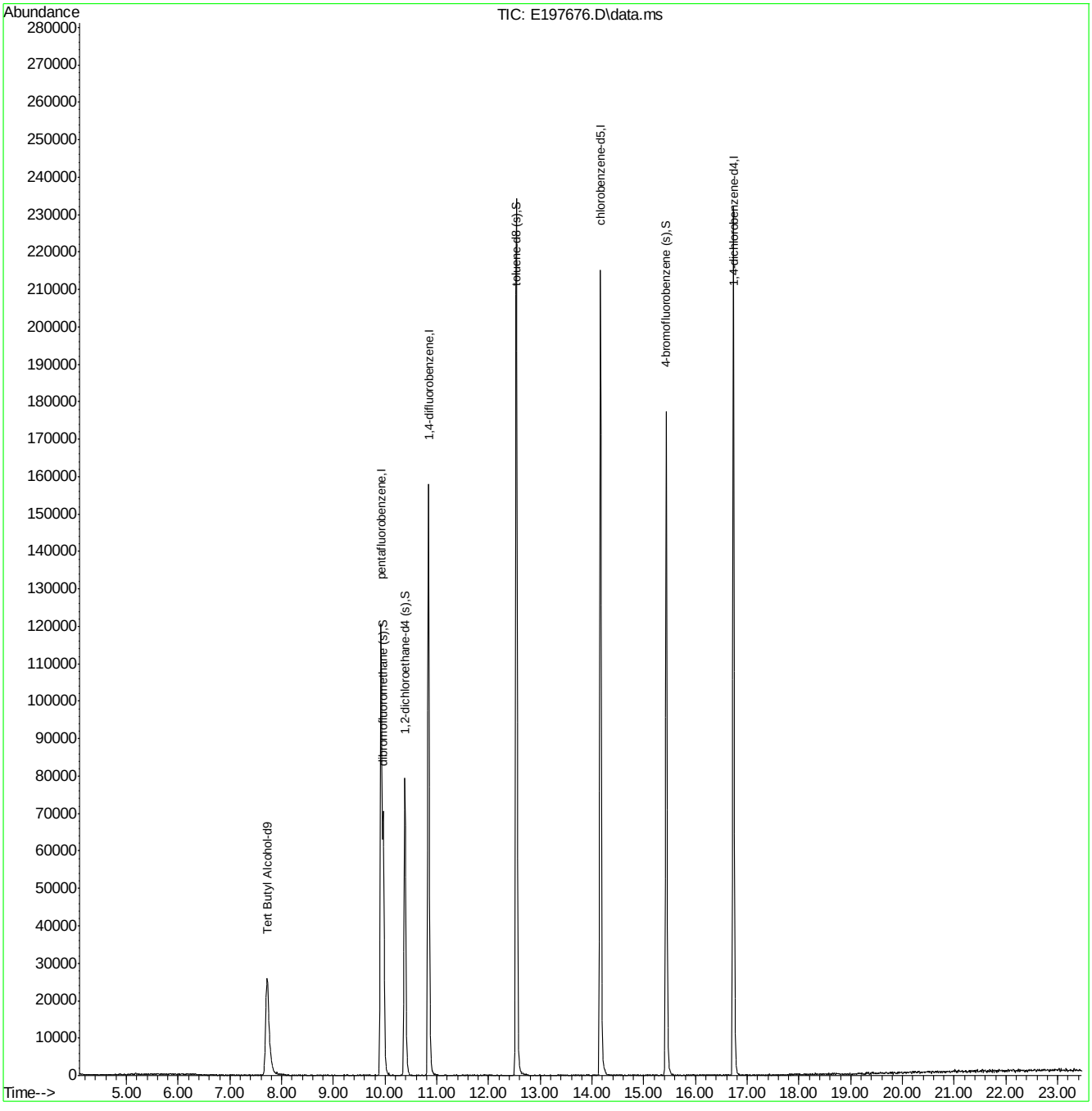
Target Compounds Qvalue

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
Data File : E197676.D
Acq On : 8 Dec 2012 11:38 pm
Operator : OksanaT
Sample : mb
Misc : MS39567,VE8685,5,,100,5,1
ALS Vial : 79 Sample Multiplier: 1

Quant Time: Dec 10 12:00:12 2012
Quant Method : C:\MSDCHEM\1\METHODS\ME8647.M
Quant Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
QLast Update : Tue Nov 13 15:53:05 2012
Response via : Initial Calibration




ME8647.M Mon Dec 10 12:00:31 2012 RPT1 Page: 2

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
Data File : E197701.D
Acq On : 10 Dec 2012 12:42 pm
Operator : OksanaT
Sample : mb
Misc : MS39553,VE8686,5,,100,5,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 10 15:09:39 2012
Quant Method : C:\MSDCHEM\1\METHODS\ME8647.M
Quant Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
QLast Update : Tue Nov 13 15:53:05 2012
Response via : Initial Calibration

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Tert Butyl Alcohol-d9 | 7.717 | 65 | 48105 | 500.00 | ug/L | 0.00 |
| 5) pentafluorobenzene | 9.924 | 168 | 76005 | 50.00 | ug/L | 0.00 |
| 65) 1,4-difluorobenzene | 10.840 | 114 | 110709 | 50.00 | ug/L | 0.00 |
| 96) chlorobenzene-d5 | 14.166 | 117 | 104451 | 50.00 | ug/L | 0.00 |
| 113) 1,4-dichlorobenzene-d4 | 16.734 | 152 | 57163 | 50.00 | ug/L | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 59) dibromofluoromethane (s) | 9.966 | 113 | 34601 | 44.07 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 81 - 121 | | Recovery = 88.14% | | | |
| 60) 1,2-dichloroethane-d4 (s) | 10.385 | 65 | 51051 | 44.88 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 74 - 127 | | Recovery = 89.76% | | | |
| 88) toluene-d8 (s) | 12.540 | 98 | 137377 | 45.91 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 80 - 122 | | Recovery = 91.82% | | | |
| 115) 4-bromofluorobenzene (s) | 15.437 | 95 | 54562 | 43.28 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 78 - 116 | | Recovery = 86.56% | | | |

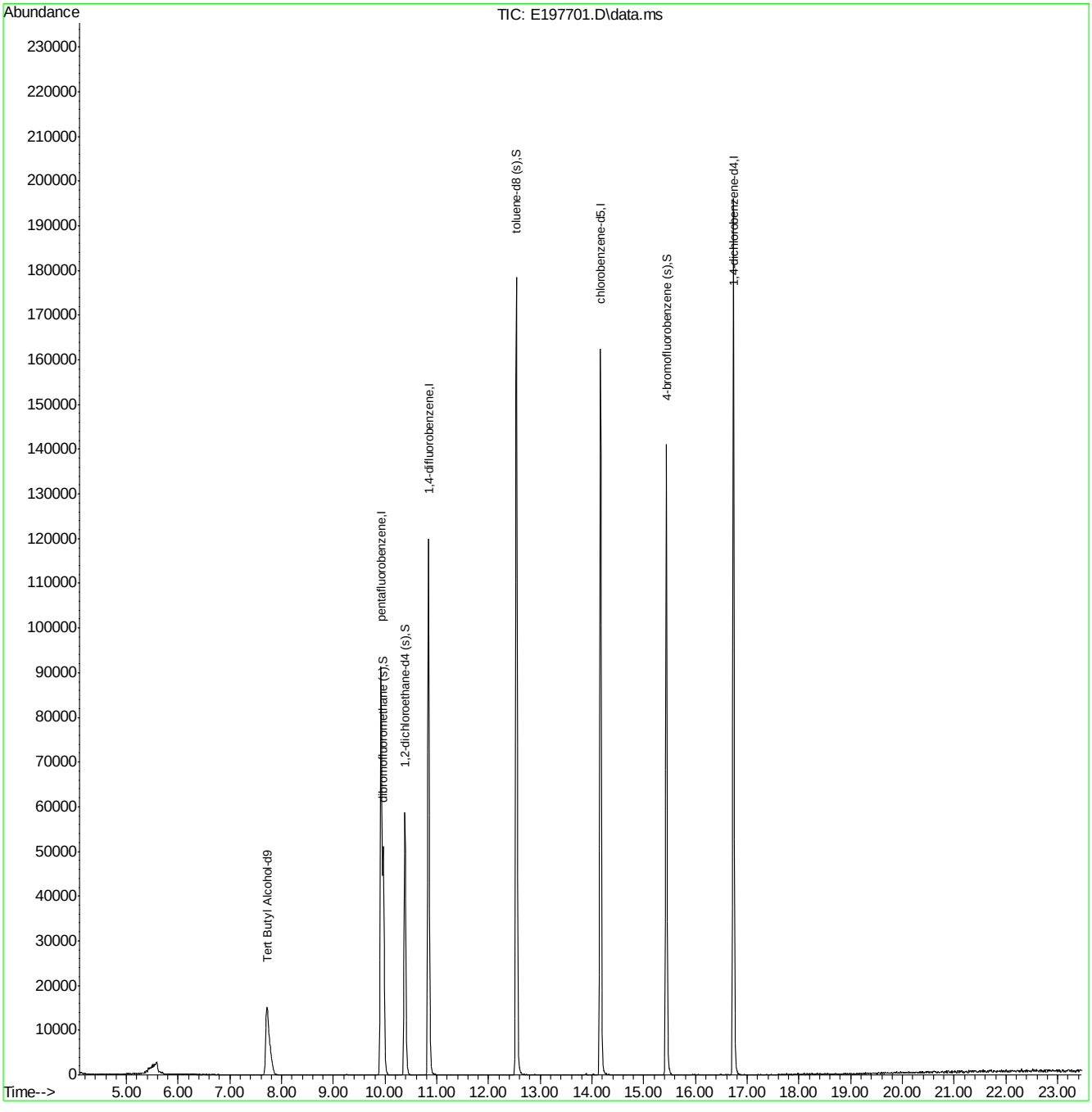
Target Compounds Qvalue

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\
Data File : E197701.D
Acq On : 10 Dec 2012 12:42 pm
Operator : OksanaT
Sample : mb
Misc : MS39553,VE8686,5,,100,5,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 10 15:09:39 2012
Quant Method : C:\MSDCHEM\1\METHODS\ME8647.M
Quant Title : SW846 8260B,ZB624 60m x 0.25mm x 1.4um
QLast Update : Tue Nov 13 15:53:05 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : O131780.D
Acq On : 8 Dec 2012 1:41 pm
Operator : DIPAP
Sample : mb1
Misc : MS39562,VO5810,5.0,,,,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 12 10:56:07 2012
Quant Method : C:\MSDCHEM\1\METHODS\MO5808S.M
Quant Title : Method 624, ZB624 60mx0.25mmx1.4um
QLast Update : Thu Dec 06 08:30:18 2012
Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| Internal Standards | | | | | | |
| 1) Tert Butyl Alcohol-d9 | 8.255 | 65 | 98692 | 500.00 | ug/L | -0.02 |
| 5) pentafluorobenzene | 10.692 | 168 | 199361 | 50.00 | ug/L | 0.00 |
| 49) 1,4-difluorobenzene | 11.649 | 114 | 297454 | 50.00 | ug/L | 0.00 |
| 81) chlorobenzene-d5 | 14.970 | 117 | 276283 | 50.00 | ug/L | 0.00 |
| 95) 1,4-dichlorobenzene-d4 | 17.439 | 152 | 157724 | 50.00 | ug/L | 0.00 |
| System Monitoring Compounds | | | | | | |
| 43) dibromofluoromethane (s) | 10.760 | 113 | 51866 | 44.81 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 70 - 130 | | Recovery = 89.62% | | | |
| 44) 1,2-dichloroethane-d4 (s) | 11.204 | 65 | 59679 | 45.98 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 70 - 122 | | Recovery = 91.96% | | | |
| 73) toluene-d8 (s) | 13.349 | 98 | 220116 | 43.53 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 81 - 127 | | Recovery = 87.06% | | | |
| 97) 4-bromofluorobenzene (s) | 16.199 | 95 | 84936 | 42.52 | ug/L | 0.00 |
| Spiked Amount 50.000 | Range 66 - 132 | | Recovery = 85.04% | | | |

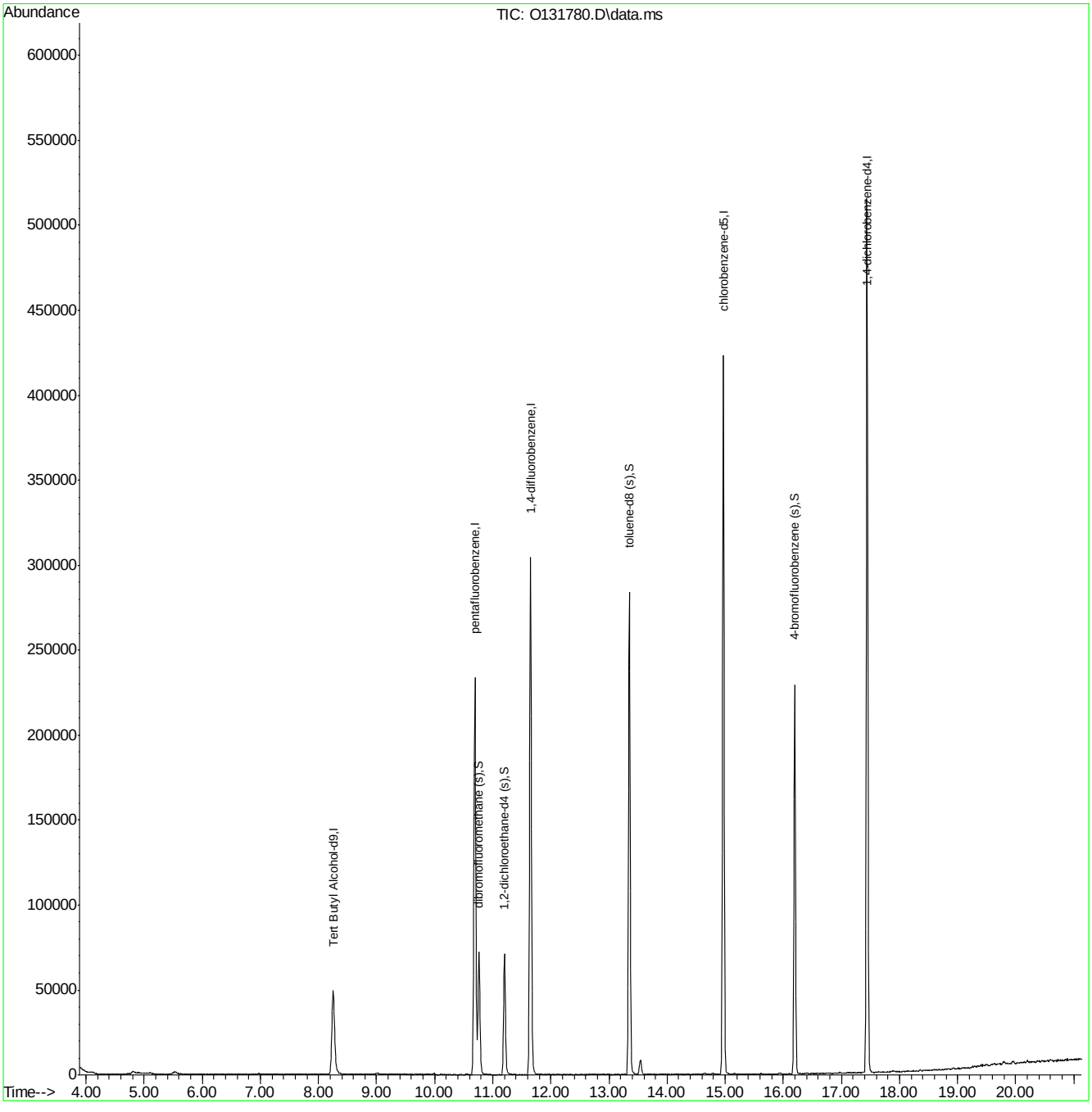
Target Compounds Qvalue

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : O131780.D
Acq On : 8 Dec 2012 1:41 pm
Operator : DIPAP
Sample : mb1
Misc : MS39562,VO5810,5.0,,,,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 12 10:56:07 2012
Quant Method : C:\MSDCHEM\1\METHODS\MO5808S.M
Quant Title : Method 624, ZB624 60mx0.25mmx1.4um
QLast Update : Thu Dec 06 08:30:18 2012
Response via : Initial Calibration




MO5808S.M Wed Dec 12 11:33:02 2012 MSO

New Jersey

ACCUTEST LABORATORIES

# GC/MS Semi-volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Instrument Performance Checks (DFTPP)
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

# Method Blank Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP61971-MB1 | M90229.D | 1 | 12/13/12 | OYA | 12/12/12 | OP61971 | EM3656 |

**The QC reported here applies to the following samples:** **Method:** SW846 8270D

JB22549-1, JB22549-2, JB22549-3, JB22549-4, JB22549-5, JB22549-6

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 120-12-7 | Anthracene | ND | 29 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 29 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 29 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 29 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 29 | ug/kg | |
| 218-01-9 | Chrysene | ND | 29 | ug/kg | |
| 86-73-7 | Fluorene | ND | 29 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 29 | ug/kg | |
| 129-00-0 | Pyrene | ND | 29 | ug/kg | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 367-12-4 | 2-Fluorophenol | 87% | 21-116% |
| 4165-62-2 | Phenol-d5 | 93% | 19-117% |
| 118-79-6 | 2,4,6-Tribromophenol | 110% | 24-136% |
| 4165-60-0 | Nitrobenzene-d5 | 87% | 21-122% |
| 321-60-8 | 2-Fluorobiphenyl | 103% | 30-117% |
| 1718-51-0 | Terphenyl-d14 | 101% | 31-129% |

| CAS No. | Tentatively Identified Compounds | R.T. | Est. Conc. | Units | Q |
|---|---|---|---|---|---|
| | system artifact | 1.35 | 590 | ug/kg | J |
| | system artifact | 1.53 | 300 | ug/kg | J |
| | system artifact | 1.58 | 220 | ug/kg | J |
| | system artifact/aldol-condensation | 1.64 | 2000 | ug/kg | J |
| | system artifact | 1.73 | 300 | ug/kg | J |
| | Total TIC, Semi-Volatile | | 0 | ug/kg | |

# Method Blank Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP61971-MB1 | 3E46353.D | 1 | 12/17/12 | OYA | 12/12/12 | OP61971 | E3E2016 |

**The QC reported here applies to the following samples:** **Method:** SW846 8270D

JB22549-1, JB22549-2, JB22549-3, JB22549-4, JB22549-5, JB22549-6

| CAS No. | Compound | Result | RL | Units | Q |
|---|---|---|---|---|---|
| 120-12-7 | Anthracene | ND | 29 | ug/kg | |
| 56-55-3 | Benzo(a)anthracene | ND | 29 | ug/kg | |
| 50-32-8 | Benzo(a)pyrene | ND | 29 | ug/kg | |
| 205-99-2 | Benzo(b)fluoranthene | ND | 29 | ug/kg | |
| 191-24-2 | Benzo(g,h,i)perylene | ND | 29 | ug/kg | |
| 218-01-9 | Chrysene | ND | 29 | ug/kg | |
| 86-73-7 | Fluorene | ND | 29 | ug/kg | |
| 85-01-8 | Phenanthrene | ND | 29 | ug/kg | |
| 129-00-0 | Pyrene | ND | 29 | ug/kg | |

| CAS No. | Surrogate Recoveries | | Limits |
|---|---|---|---|
| 367-12-4 | 2-Fluorophenol | 98% | 21-116% |
| 4165-62-2 | Phenol-d5 | 99% | 19-117% |
| 118-79-6 | 2,4,6-Tribromophenol | 105% | 24-136% |
| 4165-60-0 | Nitrobenzene-d5 | 93% | 21-122% |
| 321-60-8 | 2-Fluorobiphenyl | 87% | 30-117% |
| 1718-51-0 | Terphenyl-d14 | 107% | 31-129% |

| CAS No. | Tentatively Identified Compounds | R.T. | Est. Conc. | Units | Q |
|---|---|---|---|---|---|
| | system artifact | 1.18 | 620 | ug/kg | J |
| | system artifact | 1.24 | 150 | ug/kg | J |
| | system artifact | 1.33 | 240 | ug/kg | J |
| | system artifact | 1.38 | 250 | ug/kg | J |
| | system artifact/aldol-condensation | 1.43 | 2400 | ug/kg | J |
| | system artifact | 1.51 | 340 | ug/kg | J |
| | system artifact | 1.56 | 110 | ug/kg | J |
| | Total TIC, Semi-Volatile | | 0 | ug/kg | |

# Blank Spike Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP61971-BS1 | M90230.D | 1 | 12/13/12 | OYA | 12/12/12 | OP61971 | EM3656 |

**The QC reported here applies to the following samples:** **Method:** SW846 8270D

JB22549-1, JB22549-2, JB22549-3, JB22549-4, JB22549-5, JB22549-6

| CAS No. | Compound | Spike ug/kg | BSP ug/kg | BSP % | Limits |
|---|---|---|---|---|---|
| 120-12-7 | Anthracene | 1430 | 1450 | 102 | 59-121 |
| 56-55-3 | Benzo(a)anthracene | 1430 | 1510 | 106 | 54-119 |
| 50-32-8 | Benzo(a)pyrene | 1430 | 1510 | 106 | 59-122 |
| 205-99-2 | Benzo(b)fluoranthene | 1430 | 1380 | 97 | 45-133 |
| 191-24-2 | Benzo(g,h,i)perylene | 1430 | 1530 | 107 | 57-122 |
| 218-01-9 | Chrysene | 1430 | 1470 | 103 | 55-120 |
| 86-73-7 | Fluorene | 1430 | 1500 | 105 | 57-117 |
| 85-01-8 | Phenanthrene | 1430 | 1320 | 92 | 58-118 |
| 129-00-0 | Pyrene | 1430 | 1550 | 109 | 54-122 |

| CAS No. | Surrogate Recoveries | BSP | Limits |
|---|---|---|---|
| 367-12-4 | 2-Fluorophenol | 90% | 21-116% |
| 4165-62-2 | Phenol-d5 | 95% | 19-117% |
| 118-79-6 | 2,4,6-Tribromophenol | 115% | 24-136% |
| 4165-60-0 | Nitrobenzene-d5 | 76% | 21-122% |
| 321-60-8 | 2-Fluorobiphenyl | 85% | 30-117% |
| 1718-51-0 | Terphenyl-d14 | 114% | 31-129% |

* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|---|---|---|---|---|---|---|---|
| OP61971-MS | M90251.D | 1 | 12/13/12 | OYA | 12/12/12 | OP61971 | EM3656 |
| OP61971-MSD | M90252.D | 1 | 12/13/12 | OYA | 12/12/12 | OP61971 | EM3656 |
| JB22549-1 | M90250.D | 1 | 12/13/12 | OYA | 12/12/12 | OP61971 | EM3656 |

**The QC reported here applies to the following samples:** **Method:** SW846 8270D

JB22549-1, JB22549-2, JB22549-3, JB22549-4, JB22549-5, JB22549-6

| CAS No. | Compound | JB22549-1 ug/kg | Q | Spike ug/kg | MS ug/kg | MS % | MSD ug/kg | MSD % | RPD | Limits Rec/RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| 120-12-7 | Anthracene | 932 | | 1980 | 2370 | 73 | 2420 | 77 | 2 | 33-130/30 |
| 56-55-3 | Benzo(a)anthracene | 1350 | | 1980 | 2590 | 63 | 2580 | 64 | 0 | 29-127/33 |
| 50-32-8 | Benzo(a)pyrene | 1040 | | 1980 | 2380 | 68 | 2490 | 75 | 5 | 28-134/34 |
| 205-99-2 | Benzo(b)fluoranthene | 1320 | | 1980 | 3010 | 85 | 3070 | 91 | 2 | 19-143/38 |
| 191-24-2 | Benzo(g,h,i)perylene | 709 | | 1980 | 2260 | 78 | 2340 | 84 | 3 | 27-135/34 |
| 218-01-9 | Chrysene | 1430 | | 1980 | 2600 | 59 | 2720 | 67 | 5 | 29-129/32 |
| 86-73-7 | Fluorene | 890 | | 1980 | 2200 | 66 | 2220 | 69 | 1 | 32-125/32 |
| 85-01-8 | Phenanthrene | 2730 | | 1980 | 3630 | 45 | 3770 | 54 | 4 | 28-132/34 |
| 129-00-0 | Pyrene | 3350 | | 1980 | 4130 | 39 | 4270 | 48 | 3 | 27-132/33 |

| CAS No. | Surrogate Recoveries | MS | MSD | JB22549-1 | Limits |
|---|---|---|---|---|---|
| 367-12-4 | 2-Fluorophenol | 64% | 60% | | 21-116% |
| 4165-62-2 | Phenol-d5 | 63% | 61% | | 19-117% |
| 118-79-6 | 2,4,6-Tribromophenol | 101% | 103% | | 24-136% |
| 4165-60-0 | Nitrobenzene-d5 | 87% | 90% | 104% | 21-122% |
| 321-60-8 | 2-Fluorobiphenyl | 75% | 74% | 79% | 30-117% |
| 1718-51-0 | Terphenyl-d14 | 90% | 90% | 92% | 31-129% |

* = Outside of Control Limits.

# Instrument Performance Check (DFTPP)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** E3E1983-DFTPP
**Lab File ID:** 3E45517.D
**Instrument ID:** GCMS3E
**Injection Date:** 11/15/12
**Injection Time:** 16:51

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 51 | 30.0 - 60.0% of mass 198 | 18010 | 33.3 | | Pass |
| 68 | Less than 2.0% of mass 69 | 378 | 0.70 | (1.85) [a] | Pass |
| 69 | Mass 69 relative abundance | 20426 | 37.8 | | Pass |
| 70 | Less than 2.0% of mass 69 | 95 | 0.18 | (0.47) [a] | Pass |
| 127 | 40.0 - 60.0% of mass 198 | 26948 | 49.8 | | Pass |
| 197 | Less than 1.0% of mass 198 | 0 | 0.00 | | Pass |
| 198 | Base peak, 100% relative abundance | 54088 | 100.0 | | Pass |
| 199 | 5.0 - 9.0% of mass 198 | 3776 | 6.98 | | Pass |
| 275 | 10.0 - 30.0% of mass 198 | 13614 | 25.2 | | Pass |
| 365 | 1.0 - 100.0% of mass 198 | 1669 | 3.09 | | Pass |
| 441 | Present, but less than mass 443 | 4662 | 8.62 | (78.0) [b] | Pass |
| 442 | 40.0 - 100.0% of mass 198 | 30845 | 57.0 | | Pass |
| 443 | 17.0 - 23.0% of mass 442 | 5979 | 11.1 | (19.4) [c] | Pass |

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| E3E1983-IC1983 | 3E45518.D | 11/15/12 | 17:12 | 00:21 | Initial cal 100 |
| E3E1983-IC1983 | 3E45519.D | 11/15/12 | 17:35 | 00:44 | Initial cal 80 |
| E3E1983-ICC1983 | 3E45520.D | 11/15/12 | 17:58 | 01:07 | Initial cal 50 |
| E3E1983-IC1983 | 3E45521.D | 11/15/12 | 18:21 | 01:30 | Initial cal 25 |
| E3E1983-IC1983 | 3E45522.D | 11/15/12 | 18:44 | 01:53 | Initial cal 10 |
| E3E1983-IC1983 | 3E45523.D | 11/15/12 | 19:07 | 02:16 | Initial cal 5 |
| E3E1983-IC1983 | 3E45524.D | 11/15/12 | 19:30 | 02:39 | Initial cal 2 |
| E3E1983-IC1983 | 3E45525.D | 11/15/12 | 19:54 | 03:03 | Initial cal 1 |

# Instrument Performance Check (DFTPP)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** E3E1991-DFTPP
**Lab File ID:** 3E45692.D
**Instrument ID:** GCMS3E
**Injection Date:** 11/26/12
**Injection Time:** 10:35

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 51 | 30.0 - 60.0% of mass 198 | 3080 | 34.1 | | Pass |
| 68 | Less than 2.0% of mass 69 | 0 | 0.00 | (0.00) [a] | Pass |
| 69 | Mass 69 relative abundance | 3491 | 38.7 | | Pass |
| 70 | Less than 2.0% of mass 69 | 0 | 0.00 | (0.00) [a] | Pass |
| 127 | 40.0 - 60.0% of mass 198 | 4549 | 50.4 | | Pass |
| 197 | Less than 1.0% of mass 198 | 0 | 0.00 | | Pass |
| 198 | Base peak, 100% relative abundance | 9028 | 100.0 | | Pass |
| 199 | 5.0 - 9.0% of mass 198 | 603 | 6.68 | | Pass |
| 275 | 10.0 - 30.0% of mass 198 | 2307 | 25.6 | | Pass |
| 365 | 1.0 - 100.0% of mass 198 | 248 | 2.75 | | Pass |
| 441 | Present, but less than mass 443 | 768 | 8.51 | (82.5) [b] | Pass |
| 442 | 40.0 - 100.0% of mass 198 | 4808 | 53.3 | | Pass |
| 443 | 17.0 - 23.0% of mass 442 | 931 | 10.3 | (19.4) [c] | Pass |

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| E3E1991-ICC1991 | 3E45693.D | 11/26/12 | 10:48 | 00:13 | Initial cal 50 |
| E3E1991-IC1991 | 3E45694.D | 11/26/12 | 11:17 | 00:42 | Initial cal 25 |
| E3E1991-IC1991 | 3E45695.D | 11/26/12 | 11:40 | 01:05 | Initial cal 1 |
| E3E1991-IC1991 | 3E45696.D | 11/26/12 | 12:03 | 01:28 | Initial cal 100 |
| E3E1991-IC1991 | 3E45697.D | 11/26/12 | 12:36 | 02:01 | Initial cal 2 |
| E3E1991-IC1991 | 3E45698.D | 11/26/12 | 13:00 | 02:25 | Initial cal 5 |
| E3E1991-IC1991 | 3E45699.D | 11/26/12 | 13:23 | 02:48 | Initial cal 10 |
| E3E1991-IC1991 | 3E45700.D | 11/26/12 | 13:46 | 03:11 | Initial cal 80 |
| E3E1991-ICV1991 | 3E45701.D | 11/26/12 | 14:09 | 03:34 | Initial cal verification 50 |
| E3E1991-ICV1991 | 3E45703.D | 11/26/12 | 14:56 | 04:21 | Initial cal verification 50 |
| E3E1991-ICV1991 | 3E45704.D | 11/26/12 | 15:19 | 04:44 | Initial cal verification 50 |
| E3E1991-ICV1991 | 3E45705.D | 11/26/12 | 15:42 | 05:07 | Initial cal verification 50 |
| E3E1991-ICV1991 | 3E45706.D | 11/26/12 | 16:08 | 05:33 | Initial cal verification 50 |
| E3E1991-ICV1991 | 3E45707.D | 11/26/12 | 16:32 | 05:57 | Initial cal verification 50 |

# Instrument Performance Check (DFTPP)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** E3E2016-DFTPP
**Lab File ID:** 3E46350.D
**Instrument ID:** GCMS3E
**Injection Date:** 12/17/12
**Injection Time:** 09:07

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 51 | 30.0 - 60.0% of mass 198 | 3333 | 38.3 | | Pass |
| 68 | Less than 2.0% of mass 69 | 0 | 0.00 | (0.00) [a] | Pass |
| 69 | Mass 69 relative abundance | 3811 | 43.7 | | Pass |
| 70 | Less than 2.0% of mass 69 | 0 | 0.00 | (0.00) [a] | Pass |
| 127 | 40.0 - 60.0% of mass 198 | 4515 | 51.8 | | Pass |
| 197 | Less than 1.0% of mass 198 | 0 | 0.00 | | Pass |
| 198 | Base peak, 100% relative abundance | 8711 | 100.0 | | Pass |
| 199 | 5.0 - 9.0% of mass 198 | 571 | 6.55 | | Pass |
| 275 | 10.0 - 30.0% of mass 198 | 2452 | 28.1 | | Pass |
| 365 | 1.0 - 100.0% of mass 198 | 187 | 2.15 | | Pass |
| 441 | Present, but less than mass 443 | 753 | 8.64 | (88.2) [b] | Pass |
| 442 | 40.0 - 100.0% of mass 198 | 4407 | 50.6 | | Pass |
| 443 | 17.0 - 23.0% of mass 442 | 854 | 9.80 | (19.4) [c] | Pass |

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| E3E2016-CC1991 | 3E46351.D | 12/17/12 | 09:20 | 00:13 | Continuing cal 50 |
| E3E2016-CC1983 | 3E46352.D | 12/17/12 | 09:45 | 00:38 | Continuing cal 25 |
| OP61971-MB1 | 3E46353.D | 12/17/12 | 10:17 | 01:10 | Method Blank |
| OP62050-MB1 | 3E46354.D | 12/17/12 | 10:40 | 01:33 | Method Blank |
| OP62050-BS1 | 3E46355.D | 12/17/12 | 11:03 | 01:56 | Blank Spike |
| ZZZZZZ | 3E46356.D | 12/17/12 | 11:27 | 02:20 | (unrelated sample) |
| ZZZZZZ | 3E46357.D | 12/17/12 | 11:50 | 02:43 | (unrelated sample) |
| ZZZZZZ | 3E46358.D | 12/17/12 | 12:13 | 03:06 | (unrelated sample) |
| OP62038-MB1 | 3E46363.D | 12/17/12 | 12:36 | 03:29 | Method Blank |
| OP62038-BS1 | 3E46364.D | 12/17/12 | 12:59 | 03:52 | Blank Spike |
| ZZZZZZ | 3E46359.D | 12/17/12 | 13:23 | 04:16 | (unrelated sample) |
| ZZZZZZ | 3E46360.D | 12/17/12 | 13:46 | 04:39 | (unrelated sample) |
| ZZZZZZ | 3E46361.D | 12/17/12 | 14:09 | 05:02 | (unrelated sample) |
| ZZZZZZ | 3E46362.D | 12/17/12 | 14:32 | 05:25 | (unrelated sample) |
| ZZZZZZ | 3E46370.D | 12/17/12 | 16:52 | 07:45 | (unrelated sample) |
| ZZZZZZ | 3E46371.D | 12/17/12 | 17:15 | 08:08 | (unrelated sample) |
| ZZZZZZ | 3E46372.D | 12/17/12 | 17:38 | 08:31 | (unrelated sample) |
| OP62038-MS | 3E46373.D | 12/17/12 | 18:01 | 08:54 | Matrix Spike |
| OP62038-MSD | 3E46374.D | 12/17/12 | 18:25 | 09:18 | Matrix Spike Duplicate |

# Instrument Performance Check (DFTPP)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** E3E2016-DFTPP
**Lab File ID:** 3E46350.D
**Instrument ID:** GCMS3E
**Injection Date:** 12/17/12
**Injection Time:** 09:07

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| JB23691-1 | 3E46375.D | 12/17/12 | 18:48 | 09:41 | (used for QC only; not part of job JB22549) |
| ZZZZZZ | 3E46376.D | 12/17/12 | 19:11 | 10:04 | (unrelated sample) |
| JB23820-21 | 3E46377.D | 12/17/12 | 19:34 | 10:27 | (used for QC only; not part of job JB22549) |
| OP62050-MS | 3E46378.D | 12/17/12 | 19:57 | 10:50 | Matrix Spike |
| OP62050-MSD | 3E46379.D | 12/17/12 | 20:21 | 11:14 | Matrix Spike Duplicate |

# Instrument Performance Check (DFTPP)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** EM3617-DFTPP
**Lab File ID:** M89361.D
**Instrument ID:** GCMSM
**Injection Date:** 11/08/12
**Injection Time:** 13:13

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 51 | 30.0 - 60.0% of mass 198 | 11094 | 44.2 | | Pass |
| 68 | Less than 2.0% of mass 69 | 0 | 0.00 | (0.00) [a] | Pass |
| 69 | Mass 69 relative abundance | 12249 | 48.8 | | Pass |
| 70 | Less than 2.0% of mass 69 | 0 | 0.00 | (0.00) [a] | Pass |
| 127 | 40.0 - 60.0% of mass 198 | 12989 | 51.8 | | Pass |
| 197 | Less than 1.0% of mass 198 | 0 | 0.00 | | Pass |
| 198 | Base peak, 100% relative abundance | 25085 | 100.0 | | Pass |
| 199 | 5.0 - 9.0% of mass 198 | 1699 | 6.77 | | Pass |
| 275 | 10.0 - 30.0% of mass 198 | 6129 | 24.4 | | Pass |
| 365 | 1.0 - 100.0% of mass 198 | 719 | 2.87 | | Pass |
| 441 | Present, but less than mass 443 | 1751 | 6.98 | (78.0) [b] | Pass |
| 442 | 40.0 - 100.0% of mass 198 | 11381 | 45.4 | | Pass |
| 443 | 17.0 - 23.0% of mass 442 | 2246 | 8.95 | (19.7) [c] | Pass |

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| EM3617-IC3617 | M89363.D | 11/08/12 | 13:37 | 00:24 | Initial cal 1 |
| EM3617-IC3617 | M89362.D | 11/08/12 | 13:52 | 00:39 | Initial cal 100 |
| EM3617-ICC3617 | M89364.D | 11/08/12 | 14:22 | 01:09 | Initial cal 50 |
| EM3617-IC3617 | M89365.D | 11/08/12 | 15:03 | 01:50 | Initial cal 5 |
| EM3617-IC3617 | M89366.D | 11/08/12 | 15:29 | 02:16 | Initial cal 2 |
| EM3617-IC3617 | M89367.D | 11/08/12 | 15:59 | 02:46 | Initial cal 25 |
| EM3617-IC3617 | M89368.D | 11/08/12 | 16:23 | 03:10 | Initial cal 10 |
| EM3617-IC3617 | M89369.D | 11/08/12 | 16:53 | 03:40 | Initial cal 80 |

# Instrument Performance Check (DFTPP)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** EM3618-DFTPP
**Lab File ID:** M89370.D
**Instrument ID:** GCMSM
**Injection Date:** 11/08/12
**Injection Time:** 17:07

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 51 | 30.0 - 60.0% of mass 198 | 13783 | 41.6 | | Pass |
| 68 | Less than 2.0% of mass 69 | 0 | 0.00 | (0.00) [a] | Pass |
| 69 | Mass 69 relative abundance | 15238 | 45.9 | | Pass |
| 70 | Less than 2.0% of mass 69 | 112 | 0.34 | (0.74) [a] | Pass |
| 127 | 40.0 - 60.0% of mass 198 | 17004 | 51.3 | | Pass |
| 197 | Less than 1.0% of mass 198 | 0 | 0.00 | | Pass |
| 198 | Base peak, 100% relative abundance | 33163 | 100.0 | | Pass |
| 199 | 5.0 - 9.0% of mass 198 | 2279 | 6.87 | | Pass |
| 275 | 10.0 - 30.0% of mass 198 | 8280 | 25.0 | | Pass |
| 365 | 1.0 - 100.0% of mass 198 | 873 | 2.63 | | Pass |
| 441 | Present, but less than mass 443 | 2508 | 7.56 | (85.7) [b] | Pass |
| 442 | 40.0 - 100.0% of mass 198 | 14984 | 45.2 | | Pass |
| 443 | 17.0 - 23.0% of mass 442 | 2928 | 8.83 | (19.5) [c] | Pass |

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| EM3618-IC3618 | M89371.D | 11/08/12 | 17:27 | 00:20 | Initial cal 100 |
| EM3618-IC3618 | M89372.D | 11/08/12 | 18:01 | 00:54 | Initial cal 80 |
| EM3618-IC3618 | M89373.D | 11/08/12 | 18:16 | 01:09 | Initial cal 10 |
| EM3618-IC3618 | M89374.D | 11/08/12 | 18:46 | 01:39 | Initial cal 5 |
| EM3618-IC3618 | M89375.D | 11/08/12 | 19:15 | 02:08 | Initial cal 2 |
| EM3618-IC3618 | M89376.D | 11/08/12 | 19:45 | 02:38 | Initial cal 1 |
| EM3618-IC3618 | M89377.D | 11/08/12 | 20:14 | 03:07 | Initial cal 25 |
| EM3618-ICC3618 | M89378.D | 11/08/12 | 20:44 | 03:37 | Initial cal 50 |
| EM3618-ICV3617 | M89379.D | 11/08/12 | 21:14 | 04:07 | Initial cal verification 50 |
| EM3618-ICV3617 | M89380.D | 11/08/12 | 21:28 | 04:21 | Initial cal verification 50 |
| EM3618-ICV3618 | M89380A.D | 11/08/12 | 21:28 | 04:21 | Initial cal verification 50 |
| EM3618-ICV3618 | M89381A.D | 11/08/12 | 21:58 | 04:51 | Initial cal verification 50 |
| EM3618-ICV3617 | M89381.D | 11/08/12 | 21:58 | 04:51 | Initial cal verification 50 |
| EM3618-ICV3617 | M89382.D | 11/08/12 | 22:27 | 05:20 | Initial cal verification 50 |
| EM3618-ICV3617 | M89383.D | 11/08/12 | 22:57 | 05:50 | Initial cal verification 50 |
| EM3618-ICV3617 | M89384.D | 11/08/12 | 23:27 | 06:20 | Initial cal verification 50 |
| EM3618-ICV3618 | M89384A.D | 11/08/12 | 23:27 | 06:20 | Initial cal verification 50 |

# Instrument Performance Check (DFTPP)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** EM3656-DFTPP
**Lab File ID:** M90226.D
**Instrument ID:** GCMSM
**Injection Date:** 12/13/12
**Injection Time:** 09:06

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 51 | 30.0 - 60.0% of mass 198 | 12602 | 41.0 | | Pass |
| 68 | Less than 2.0% of mass 69 | 0 | 0.00 | (0.00) [a] | Pass |
| 69 | Mass 69 relative abundance | 13655 | 44.4 | | Pass |
| 70 | Less than 2.0% of mass 69 | 117 | 0.38 | (0.86) [a] | Pass |
| 127 | 40.0 - 60.0% of mass 198 | 14485 | 47.1 | | Pass |
| 197 | Less than 1.0% of mass 198 | 0 | 0.00 | | Pass |
| 198 | Base peak, 100% relative abundance | 30744 | 100.0 | | Pass |
| 199 | 5.0 - 9.0% of mass 198 | 2129 | 6.92 | | Pass |
| 275 | 10.0 - 30.0% of mass 198 | 7069 | 23.0 | | Pass |
| 365 | 1.0 - 100.0% of mass 198 | 641 | 2.08 | | Pass |
| 441 | Present, but less than mass 443 | 2754 | 8.96 | (88.8) [b] | Pass |
| 442 | 40.0 - 100.0% of mass 198 | 17009 | 55.3 | | Pass |
| 443 | 17.0 - 23.0% of mass 442 | 3103 | 10.1 | (18.2) [c] | Pass |

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| EM3656-CC3617 | M90227.D | 12/13/12 | 09:26 | 00:20 | Continuing cal 50 |
| EM3656-CC3618 | M90228.D | 12/13/12 | 09:58 | 00:52 | Continuing cal 25 |
| OP61971-MB1 | M90229.D | 12/13/12 | 10:27 | 01:21 | Method Blank |
| OP61971-BS1 | M90230.D | 12/13/12 | 10:56 | 01:50 | Blank Spike |
| ZZZZZZ | M90231.D | 12/13/12 | 11:11 | 02:05 | (unrelated sample) |
| ZZZZZZ | M90232.D | 12/13/12 | 11:51 | 02:45 | (unrelated sample) |
| ZZZZZZ | M90233.D | 12/13/12 | 12:21 | 03:15 | (unrelated sample) |
| ZZZZZZ | M90236.D | 12/13/12 | 13:43 | 04:37 | (unrelated sample) |
| ZZZZZZ | M90237.D | 12/13/12 | 13:58 | 04:52 | (unrelated sample) |
| ZZZZZZ | M90238.D | 12/13/12 | 14:39 | 05:33 | (unrelated sample) |
| ZZZZZZ | M90239.D | 12/13/12 | 14:59 | 05:53 | (unrelated sample) |
| ZZZZZZ | M90240.D | 12/13/12 | 15:29 | 06:23 | (unrelated sample) |
| ZZZZZZ | M90241.D | 12/13/12 | 16:00 | 06:54 | (unrelated sample) |
| ZZZZZZ | M90242.D | 12/13/12 | 16:25 | 07:19 | (unrelated sample) |
| ZZZZZZ | M90243.D | 12/13/12 | 16:52 | 07:46 | (unrelated sample) |
| ZZZZZZ | M90244.D | 12/13/12 | 17:23 | 08:17 | (unrelated sample) |
| ZZZZZZ | M90245.D | 12/13/12 | 17:53 | 08:47 | (unrelated sample) |
| OP61948-MS | M90246.D | 12/13/12 | 18:08 | 09:02 | Matrix Spike |
| OP61948-MSD | M90247.D | 12/13/12 | 18:37 | 09:31 | Matrix Spike Duplicate |

# Instrument Performance Check (DFTPP)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** EM3656-DFTPP
**Lab File ID:** M90226.D
**Instrument ID:** GCMSM
**Injection Date:** 12/13/12
**Injection Time:** 09:06

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| JB22769-6 | M90248.D | 12/13/12 | 19:07 | 10:01 | (used for QC only; not part of job JB22549) |
| ZZZZZZ | M90249.D | 12/13/12 | 19:37 | 10:31 | (unrelated sample) |
| JB22549-1 | M90250.D | 12/13/12 | 20:06 | 11:00 | BH-12-54_3' |
| OP61971-MS | M90251.D | 12/13/12 | 20:36 | 11:30 | Matrix Spike |
| OP61971-MSD | M90252.D | 12/13/12 | 21:05 | 11:59 | Matrix Spike Duplicate |

# Instrument Performance Check (DFTPP)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** EM3657-DFTPP
**Lab File ID:** M90255.D
**Instrument ID:** GCMSM
**Injection Date:** 12/14/12
**Injection Time:** 09:54

| m/e | Ion Abundance Criteria | Raw Abundance | % Relative Abundance | | Pass/Fail |
|---|---|---|---|---|---|
| 51 | 30.0 - 60.0% of mass 198 | 13852 | 39.4 | | Pass |
| 68 | Less than 2.0% of mass 69 | 0 | 0.00 | (0.00) [a] | Pass |
| 69 | Mass 69 relative abundance | 15415 | 43.8 | | Pass |
| 70 | Less than 2.0% of mass 69 | 219 | 0.62 | (1.42) [a] | Pass |
| 127 | 40.0 - 60.0% of mass 198 | 16195 | 46.0 | | Pass |
| 197 | Less than 1.0% of mass 198 | 0 | 0.00 | | Pass |
| 198 | Base peak, 100% relative abundance | 35201 | 100.0 | | Pass |
| 199 | 5.0 - 9.0% of mass 198 | 2473 | 7.03 | | Pass |
| 275 | 10.0 - 30.0% of mass 198 | 8142 | 23.1 | | Pass |
| 365 | 1.0 - 100.0% of mass 198 | 803 | 2.28 | | Pass |
| 441 | Present, but less than mass 443 | 3095 | 8.79 | (85.5) [b] | Pass |
| 442 | 40.0 - 100.0% of mass 198 | 19413 | 55.1 | | Pass |
| 443 | 17.0 - 23.0% of mass 442 | 3618 | 10.3 | (18.6) [c] | Pass |

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

**This check applies to the following Samples, MS, MSD, Blanks, and Standards:**

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| EM3657-CC3617 | M90256.D | 12/14/12 | 10:20 | 00:26 | Continuing cal 25 |
| EM3657-CC3618 | M90257.D | 12/14/12 | 10:52 | 00:58 | Continuing cal 50 |
| OP61960-MB1 | M90258.D | 12/14/12 | 11:19 | 01:25 | Method Blank |
| OP61960-BS1 | M90259.D | 12/14/12 | 11:49 | 01:55 | Blank Spike |
| ZZZZZZ | M90260.D | 12/14/12 | 12:19 | 02:25 | (unrelated sample) |
| ZZZZZZ | M90261.D | 12/14/12 | 12:35 | 02:41 | (unrelated sample) |
| JB23354-1 | M90262.D | 12/14/12 | 13:04 | 03:10 | (used for QC only; not part of job JB22549) |
| ZZZZZZ | M90263.D | 12/14/12 | 13:34 | 03:40 | (unrelated sample) |
| ZZZZZZ | M90264.D | 12/14/12 | 14:03 | 04:09 | (unrelated sample) |
| ZZZZZZ | M90265.D | 12/14/12 | 14:33 | 04:39 | (unrelated sample) |
| ZZZZZZ | M90266.D | 12/14/12 | 15:02 | 05:08 | (unrelated sample) |
| ZZZZZZ | M90267.D | 12/14/12 | 15:29 | 05:35 | (unrelated sample) |
| ZZZZZZ | M90268.D | 12/14/12 | 15:54 | 06:00 | (unrelated sample) |
| ZZZZZZ | M90269.D | 12/14/12 | 16:24 | 06:30 | (unrelated sample) |
| ZZZZZZ | M90270.D | 12/14/12 | 16:53 | 06:59 | (unrelated sample) |
| OP61960-MS | M90271.D | 12/14/12 | 17:23 | 07:29 | Matrix Spike |
| OP61960-MSD | M90272.D | 12/14/12 | 17:38 | 07:44 | Matrix Spike Duplicate |
| JB22549-3 | M90274.D | 12/14/12 | 18:37 | 08:43 | BH-12-55_1.5' |
| JB22549-6 | M90275.D | 12/14/12 | 19:06 | 09:12 | BH-12-49_2.5' |

# Instrument Performance Check (DFTPP)



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** EM3657-DFTPP
**Lab File ID:** M90255.D
**Instrument ID:** GCMSM
**Injection Date:** 12/14/12
**Injection Time:** 09:54

| Lab Sample ID | Lab File ID | Date Analyzed | Time Analyzed | Hours Lapsed | Client Sample ID |
|---|---|---|---|---|---|
| JB22549-2 | M90276.D | 12/14/12 | 19:36 | 09:42 | BH-12-55_2.5' |
| JB22549-4 | M90277.D | 12/14/12 | 20:05 | 10:11 | BH-12-53_2.5' |
| JB22549-5 | M90278.D | 12/14/12 | 20:35 | 10:41 | BH-12-48_3' |

# Semivolatile Internal Standard Area Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | |
|---|---|---|---|
| **Check Std:** | E3E2016-CC1991 | **Injection Date:** | 12/17/12 |
| **Lab File ID:** | 3E46351.D | **Injection Time:** | 09:20 |
| **Instrument ID:** | GCMS3E | **Method:** | SW846 8270D |

| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT | IS 6 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Check Std | 144478 | 2.75 | 572805 | 4.33 | 324749 | 6.94 | 506339 | 9.18 | 503621 | 12.89 | 428574 | 14.28 |
| Upper Limit [a] | 288956 | 3.25 | 1145610 | 4.83 | 649498 | 7.44 | 1012678 | 9.68 | 1007242 | 13.39 | 857148 | 14.78 |
| Lower Limit [b] | 72239 | 2.25 | 286403 | 3.83 | 162375 | 6.44 | 253170 | 8.68 | 251811 | 12.39 | 214287 | 13.78 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT | IS 6 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP61971-MB1 | 166275 | 2.75 | 671954 | 4.33 | 373579 | 6.93 | 580173 | 9.17 | 546479 | 12.89 | 496271 | 14.28 |
| OP62050-MB1 | 135896 | 2.75 | 536074 | 4.33 | 301402 | 6.93 | 473690 | 9.17 | 467721 | 12.89 | 423549 | 14.28 |
| OP62050-BS1 | 135088 | 2.75 | 540018 | 4.33 | 301727 | 6.94 | 471098 | 9.18 | 454608 | 12.89 | 395359 | 14.28 |
| ZZZZZZ | 146963 | 2.75 | 589733 | 4.33 | 331928 | 6.93 | 514489 | 9.18 | 506172 | 12.89 | 449703 | 14.27 |
| ZZZZZZ | 146979 | 2.75 | 595195 | 4.33 | 333009 | 6.93 | 514761 | 9.18 | 496244 | 12.89 | 438649 | 14.27 |
| ZZZZZZ | 137357 | 2.75 | 547699 | 4.33 | 308486 | 6.93 | 484458 | 9.18 | 480737 | 12.89 | 425050 | 14.27 |
| OP62038-MB1 | 164675 | 2.75 | 660887 | 4.33 | 369806 | 6.93 | 579158 | 9.18 | 575557 | 12.89 | 510427 | 14.27 |
| OP62038-BS1 | 149236 | 2.75 | 592239 | 4.33 | 332012 | 6.93 | 517475 | 9.17 | 504951 | 12.89 | 437349 | 14.28 |
| ZZZZZZ | 156758 | 2.75 | 625106 | 4.33 | 351315 | 6.93 | 546619 | 9.17 | 540937 | 12.89 | 473093 | 14.27 |
| ZZZZZZ | 152968 | 2.75 | 616483 | 4.33 | 346677 | 6.93 | 535986 | 9.18 | 513622 | 12.89 | 435686 | 14.27 |
| ZZZZZZ | 142603 | 2.75 | 570499 | 4.33 | 322892 | 6.93 | 497839 | 9.18 | 489151 | 12.89 | 419272 | 14.27 |
| ZZZZZZ | 155314 | 2.75 | 614892 | 4.33 | 341979 | 6.93 | 527283 | 9.18 | 508753 | 12.89 | 449999 | 14.27 |
| ZZZZZZ | 175186 | 2.75 | 699448 | 4.33 | 397639 | 6.93 | 618305 | 9.18 | 583241 | 12.89 | 502550 | 14.27 |
| ZZZZZZ | 171178 | 2.75 | 677080 | 4.33 | 381003 | 6.93 | 589462 | 9.18 | 563455 | 12.89 | 499166 | 14.27 |
| ZZZZZZ | 151123 | 2.75 | 605075 | 4.33 | 346140 | 6.93 | 548253 | 9.17 | 513914 | 12.89 | 442576 | 14.28 |
| OP62038-MS | 173640 | 2.75 | 683380 | 4.33 | 383783 | 6.94 | 594279 | 9.18 | 565309 | 12.89 | 500731 | 14.28 |
| OP62038-MSD | 168404 | 2.75 | 666549 | 4.33 | 369800 | 6.94 | 564839 | 9.18 | 547359 | 12.89 | 482291 | 14.28 |
| JB23691-1 | 186055 | 2.75 | 751179 | 4.33 | 422525 | 6.93 | 673445 | 9.18 | 640603 | 12.89 | 555460 | 14.28 |
| ZZZZZZ | 182746 | 2.75 | 720699 | 4.33 | 396141 | 6.93 | 616644 | 9.17 | 588318 | 12.89 | 526641 | 14.27 |
| JB23820-21 | 169751 | 2.75 | 683953 | 4.33 | 386344 | 6.93 | 600574 | 9.18 | 579947 | 12.89 | 524445 | 14.27 |
| OP62050-MS | 148814 | 2.75 | 616937 | 4.33 | 348829 | 6.93 | 533828 | 9.18 | 504850 | 12.89 | 507254 | 14.28 |
| OP62050-MSD | 157372 | 2.75 | 639044 | 4.33 | 363709 | 6.93 | 572727 | 9.17 | 482349 | 12.89 | 435693 | 14.28 |

**IS 1** = 1,4-Dichlorobenzene-d4
**IS 2** = Naphthalene-d8
**IS 3** = Acenaphthene-D10
**IS 4** = Phenanthrene-d10
**IS 5** = Chrysene-d12
**IS 6** = Perylene-d12

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Semivolatile Internal Standard Area Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | |
|---|---|---|---|
| **Check Std:** | EM3656-CC3617 | **Injection Date:** | 12/13/12 |
| **Lab File ID:** | M90227.D | **Injection Time:** | 09:26 |
| **Instrument ID:** | GCMSM | **Method:** | SW846 8270D |

| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT | IS 6 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Check Std | 81099 | 3.23 | 303698 | 5.19 | 214979 | 8.43 | 387990 | 11.22 | 388190 | 16.12 | 314767 | 17.94 |
| Upper Limit [a] | 162198 | 3.73 | 607396 | 5.69 | 429958 | 8.93 | 775980 | 11.72 | 776380 | 16.62 | 629534 | 18.44 |
| Lower Limit [b] | 40550 | 2.73 | 151849 | 4.69 | 107490 | 7.93 | 193995 | 10.72 | 194095 | 15.62 | 157384 | 17.44 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT | IS 6 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP61971-MB1 | 75532 | 3.23 | 299219 | 5.19 | 201008 | 8.43 | 369491 | 11.21 | 388710 | 16.12 | 314473 | 17.93 |
| OP61971-BS1 | 68408 | 3.23 | 280309 | 5.19 | 191908 | 8.43 | 359009 | 11.22 | 339293 | 16.12 | 291491 | 17.94 |
| ZZZZZZ | 82579 | 3.24 | 335253 | 5.19 | 230235 | 8.44 | 376327 | 11.22 | 1004406* | 14.90* | 258481 | 18.10 |
| ZZZZZZ | 77136 | 3.26 | 312948 | 5.20 | 194155 | 8.45 | 332172 | 11.24 | 320452 | 16.16 | 235920 | 18.01 |
| ZZZZZZ | 87886 | 3.25 | 356600 | 5.20 | 232364 | 8.44 | 386841 | 11.25 | 352387 | 16.14 | 294646 | 17.96 |
| ZZZZZZ | 97416 | 3.25 | 393898 | 5.20 | 253053 | 8.45 | 472053 | 11.24 | 391016 | 16.14 | 283711 | 17.96 |
| ZZZZZZ | 88613 | 3.25 | 382811 | 5.20 | 236672 | 8.45 | 415317 | 11.24 | 367107 | 16.14 | 295415 | 17.96 |
| ZZZZZZ | 68486 | 3.24 | 311062 | 5.20 | 213794 | 8.44 | 413974 | 11.23 | 322383 | 16.14 | 256536 | 17.96 |
| ZZZZZZ | 92126 | 3.25 | 389959 | 5.20 | 225204 | 8.44 | 377916 | 11.25 | 356889 | 16.16 | 303092 | 17.97 |
| ZZZZZZ | 87434 | 3.25 | 293623 | 5.21 | 179035 | 8.50 | 291970 | 11.32 | 279677 | 16.18 | 234823 | 18.00 |
| ZZZZZZ | 65295 | 3.25 | 248515 | 5.21 | 166639 | 8.47 | 274057 | 11.27 | 268524 | 16.17 | 253259 | 17.99 |
| ZZZZZZ | 87454 | 3.26 | 301828 | 5.22 | 208103 | 8.50 | 328095 | 11.32 | 307801 | 16.19 | 264611 | 18.01 |
| ZZZZZZ | 83663 | 3.26 | 320004 | 5.22 | 225995 | 8.46 | 389337 | 11.27 | 310952 | 16.17 | 266497 | 17.98 |
| ZZZZZZ | 78048 | 3.25 | 264027 | 5.22 | 164907 | 8.48 | 292353 | 11.29 | 300152 | 16.17 | 263054 | 17.99 |
| ZZZZZZ | 86543 | 3.25 | 312393 | 5.22 | 185753 | 8.49 | 332741 | 11.30 | 339709 | 16.18 | 294529 | 18.00 |
| OP61948-MS | 70015 | 3.34 | 254635 | 5.27 | 188879 | 8.47 | 335791 | 11.27 | 303753 | 16.17 | 254178 | 17.99 |
| OP61948-MSD | 69828 | 3.34 | 261690 | 5.27 | 195310 | 8.47 | 342781 | 11.27 | 304619 | 16.17 | 259827 | 17.98 |
| JB22769-6 | 72835 | 3.29 | 274370 | 5.23 | 200567 | 8.46 | 335221 | 11.25 | 303183 | 16.16 | 256607 | 17.98 |
| ZZZZZZ | 80098 | 3.25 | 266095 | 5.21 | 185527 | 8.46 | 329345 | 11.25 | 302288 | 16.16 | 230242 | 17.97 |
| JB22549-1 | 70952 | 3.27 | 222032 | 5.23 | 142774 | 8.49 | 254706 | 11.30 | 256792 | 16.20 | 219589 | 18.03 |
| OP61971-MS | 70214 | 3.27 | 238817 | 5.24 | 158388 | 8.50 | 278056 | 11.31 | 279084 | 16.21 | 235730 | 18.04 |
| OP61971-MSD | 74803 | 3.27 | 248460 | 5.24 | 166147 | 8.51 | 289151 | 11.32 | 291284 | 16.22 | 246790 | 18.05 |

**IS 1** = 1,4-Dichlorobenzene-d4
**IS 2** = Naphthalene-d8
**IS 3** = Acenaphthene-D10
**IS 4** = Phenanthrene-d10
**IS 5** = Chrysene-d12
**IS 6** = Perylene-d12

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

# Semivolatile Internal Standard Area Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | |
|---|---|---|---|
| **Check Std:** | EM3657-CC3617 | **Injection Date:** | 12/14/12 |
| **Lab File ID:** | M90256.D | **Injection Time:** | 10:20 |
| **Instrument ID:** | GCMSM | **Method:** | SW846 8270D |

| | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT | IS 6 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Check Std | 104089 | 3.20 | 380048 | 5.15 | 267840 | 8.39 | 491600 | 11.18 | 487738 | 16.09 | 401072 | 17.92 |
| Upper Limit [a] | 208178 | 3.70 | 760096 | 5.65 | 535680 | 8.89 | 983200 | 11.68 | 975476 | 16.59 | 802144 | 18.42 |
| Lower Limit [b] | 52045 | 2.70 | 190024 | 4.65 | 133920 | 7.89 | 245800 | 10.68 | 243869 | 15.59 | 200536 | 17.42 |

| Lab Sample ID | IS 1 AREA | RT | IS 2 AREA | RT | IS 3 AREA | RT | IS 4 AREA | RT | IS 5 AREA | RT | IS 6 AREA | RT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OP61960-MB1 | 134718 | 3.20 | 506074 | 5.15 | 348852 | 8.39 | 650019 | 11.18 | 663339 | 16.09 | 545520 | 17.92 |
| OP61960-BS1 | 91002 | 3.20 | 361013 | 5.15 | 243339 | 8.39 | 447139 | 11.18 | 444826 | 16.09 | 371046 | 17.91 |
| ZZZZZZ | 105720 | 3.20 | 406988 | 5.15 | 286311 | 8.39 | 512285 | 11.17 | 540540 | 16.09 | 448858 | 17.91 |
| ZZZZZZ | 119264 | 3.19 | 469896 | 5.15 | 310506 | 8.39 | 564254 | 11.17 | 575816 | 16.09 | 479054 | 17.91 |
| JB23354-1 | 111519 | 3.20 | 404208 | 5.15 | 258694 | 8.39 | 465997 | 11.18 | 500131 | 16.09 | 431973 | 17.91 |
| ZZZZZZ | 94942 | 3.20 | 332931 | 5.15 | 214570 | 8.39 | 379369 | 11.18 | 411524 | 16.09 | 349573 | 17.91 |
| ZZZZZZ | 131689 | 3.20 | 499023 | 5.15 | 327856 | 8.39 | 590644 | 11.17 | 596126 | 16.09 | 505831 | 17.91 |
| ZZZZZZ | 118633 | 3.20 | 439327 | 5.15 | 280847 | 8.39 | 518504 | 11.17 | 534493 | 16.09 | 438035 | 17.91 |
| ZZZZZZ | 131101 | 3.19 | 499768 | 5.15 | 309366 | 8.38 | 551868 | 11.17 | 592156 | 16.09 | 502743 | 17.91 |
| ZZZZZZ | 102132 | 3.20 | 402266 | 5.15 | 260321 | 8.39 | 470139 | 11.17 | 474334 | 16.09 | 397256 | 17.91 |
| ZZZZZZ | 125057 | 3.20 | 484816 | 5.15 | 287361 | 8.39 | 536927 | 11.18 | 576162 | 16.09 | 488009 | 17.91 |
| ZZZZZZ | 113231 | 3.20 | 413135 | 5.15 | 264453 | 8.40 | 471369 | 11.19 | 544386 | 16.09 | 473568 | 17.91 |
| ZZZZZZ | 124261 | 3.20 | 474889 | 5.15 | 303625 | 8.38 | 542766 | 11.17 | 548657 | 16.09 | 451125 | 17.91 |
| OP61960-MS | 99038 | 3.20 | 362562 | 5.15 | 247357 | 8.39 | 437449 | 11.17 | 436745 | 16.09 | 352515 | 17.91 |
| OP61960-MSD | 104593 | 3.20 | 419075 | 5.15 | 268447 | 8.39 | 495300 | 11.18 | 506369 | 16.09 | 445223 | 17.91 |
| JB22549-3 | 98206 | 3.19 | 390379 | 5.15 | 243365 | 8.38 | 408529 | 11.17 | 418155 | 16.09 | 337766 | 17.91 |
| JB22549-6 | 100224 | 3.20 | 412767 | 5.15 | 243263 | 8.39 | 409960 | 11.17 | 403636 | 16.09 | 335983 | 17.92 |
| JB22549-2 [c] | 116559 | 3.20 | 431253 | 5.15 | 271175 | 8.39 | 462585 | 11.18 | 437888 | 16.12 | 353007 | 17.95 |
| JB22549-4 [c] | 115880 | 3.20 | 406223 | 5.16 | 257758 | 8.40 | 454257 | 11.20 | 438132 | 16.14 | 400819 | 17.98 |
| JB22549-5 [c] | 120515 | 3.22 | 423074 | 5.17 | 258864 | 8.42 | 420065 | 11.24 | 454606 | 16.21 | 380524 | 18.06 |

**IS 1** = 1,4-Dichlorobenzene-d4
**IS 2** = Naphthalene-d8
**IS 3** = Acenaphthene-D10
**IS 4** = Phenanthrene-d10
**IS 5** = Chrysene-d12
**IS 6** = Perylene-d12

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.
(c) Dilution required due to viscosity of extract matrix

# Semivolatile Surrogate Recovery Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Method:** SW846 8270D **Matrix:** SO

**Samples and QC shown here apply to the above method**

| Lab Sample ID | Lab File ID | S1 | S2 | S3 |
|---|---|---|---|---|
| JB22549-1 | M90250.D | 104.0 | 79.0 | 92.0 |
| JB22549-2 | M90276.D | 61.0 | 79.0 | 92.0 |
| JB22549-3 | M90274.D | 58.0 | 73.0 | 81.0 |
| JB22549-4 | M90277.D | 63.0 | 69.0 | 76.0 |
| JB22549-5 | M90278.D | 62.0 | 63.0 | 77.0 |
| JB22549-6 | M90275.D | 58.0 | 68.0 | 92.0 |
| OP61971-BS1 | M90230.D | 76.0 | 85.0 | 114.0 |
| OP61971-MB1 | M90229.D | 87.0 | 103.0 | 101.0 |
| OP61971-MB1 | 3E46353.D | 93.0 | 87.0 | 107.0 |
| OP61971-MS | M90251.D | 87.0 | 75.0 | 90.0 |
| OP61971-MSD | M90252.D | 90.0 | 74.0 | 90.0 |

| Surrogate Compounds | Recovery Limits |
|---|---|
| **S1** = Nitrobenzene-d5 | 21-122% |
| **S2** = 2-Fluorobiphenyl | 30-117% |
| **S3** = Terphenyl-d14 | 31-129% |

# Initial Calibration Summary



**Job Number:** JB22549 **Sample:** E3E1983-ICC1983
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45520.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
                         Response Factor Report  MS3E

  Method       : C:\MSDCHEM\1\METHODS\M3E1983.M (RTE Integrator)
  Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
  Last Update  : Fri Nov 16 15:04:41 2012
  Response via : Initial Calibration

  Calibration Files
  2   =3e45524.D   5   =3e45523.D   25  =3e45521.D   80  =3e45519.D
  100 =3e45518.D   50  =3e45520.D   1   =3e45525.D   10  =3e45522.D

   Compound         2     5     25    80    100   50    1     10    Avg %RSD
  ---------------------------------------------------------------------------

102)     1,4-Dichlorobenzene-d ----------------ISTD---------------------
103) Benzaldehyde 1.125 1.318 1.150 1.122 1.110 1.126 1.100 1.142 1.149   6.10

104)     Acenaphthene-d10a     ----------------ISTD---------------------
105) 1,2,4,5-Tetr 0.506 0.562 0.485 0.489 0.493 0.478 0.484 0.472 0.496   5.74
106) 2-bromonapht 0.540 0.616 0.555 0.545 0.547 0.529 0.518 0.532 0.548   5.45

107)     Phenanthrene-d10a     ----------------ISTD---------------------
108) Atrazine     0.075 0.105 0.111 0.119 0.123 0.113       0.100 0.107  15.14
109) o-terphenyl  0.522 0.614 0.564 0.591 0.593 0.568 0.471 0.543 0.558   8.16

110) I   Chrysene-d12a         ----------------ISTD---------------------
111) benzidine    0.435 0.599 0.690 0.688 0.536 0.673       0.609 0.604  15.49
112) 1-chloroocta 0.145 0.220 0.247 0.252 0.252 0.250       0.227 0.228  16.94

113) I   naphthalene-d8a       ----------------ISTD---------------------
114) hydroquinone 0.245 0.280 0.337 0.379 0.390 0.357 0.235 0.289 0.314  19.11
 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

           M3E1982.M         Fri Nov 16 15:05:27 2012   MS3E
```

8.7.1

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** E3E1986-ICV1983
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45556A.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e1986\3e45556a.D        Vial: 5
Acq On    : 16 Nov 2012   2:22 pm                   Operator: olgaa
Sample    : icv1983-50                              Inst    : MS3E
Misc      : op61052,e3e1986,                        Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M3E1982.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Fri Nov 16 15:04:41 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|
| 104 | Acenaphthene-d10a | 1.000 | 1.000 | 0.0 | 77 | 0.00 | 7.18 |
| 105 | 1,2,4,5-Tetrachlorobenzen | 0.496 | 0.479 | 3.4 | 77 | 0.00 | 5.92 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3e45520.D M3E1982.M Fri Nov 16 15:44:41 2012 MS3E

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** E3E1986-ICV1983
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45557A.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e1986\3e45557a.D        Vial: 6
Acq On    : 16 Nov 2012   2:45 pm                   Operator: olgaa
Sample    : icv1983-50                              Inst    : MS3E
Misc      : op61052,e3e1986,                        Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M3E1982.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Fri Nov 16 15:04:41 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|
| 102 | 1,4-Dichlorobenzene-d4a | 1.000 | 1.000 | 0.0 | 78 | 0.00 | 2.94 |
| 103 | Benzaldehyde | 1.149 | 1.290 | -12.3 | 90 | 0.00 | 2.50 |
| 107 | Phenanthrene-d10a | 1.000 | 1.000 | 0.0 | 74 | 0.00 | 9.42 |
| 108 | Atrazine | 0.107 | 0.133 | -24.3 | 87 | 0.00 | 9.27 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3e45520.D M3E1982.M Fri Nov 16 15:46:13 2012 MS3E

8.7.3

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** E3E1986-ICV1983
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45560.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e1986\3e45560.D          Vial: 9
Acq On    : 16 Nov 2012   4:55 pm                    Operator: olgaa
Sample    : icv1983-50                               Inst    : MS3E
Misc      : op61052,e3e1986,                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M3E1982.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Fri Nov 16 17:33:00 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 110 | I | Chrysene-d12a | 1.000 | 1.000 | 0.0 | 157 | 0.00 | 13.08 |
| 111 | T | benzidine | 0.604 | 0.789 | -30.6# | 184 | 0.00 | 11.60 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3e45520.D M3E1982.M Fri Nov 16 17:33:43 2012 MS3E

8.7.4

8

# Initial Calibration Summary



**Job Number:** JB22549 **Sample:** E3E1991-ICC1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45693.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Response Factor Report MS3E

Method : C:\msdchem\1\METHODS\M3E1991.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update : Mon Nov 26 14:30:30 2012
Response via : Initial Calibration

Calibration Files
2 =3e45697.D 5 =3e45698.D 25 =3e45694.D 80 =3e45700.D
100 =3e45696.D 50 =3e45693.D 1 =3e45695.D 10 =3e45699.D

| Compound | 2 | 5 | 25 | 80 | 100 | 50 | 1 | 10 | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1) I 1,4-Dichlorobenzene-d | ----------ISTD---------- | | | | | | | | | |
| 2) 1,4-Dioxane | 0.627 | 0.597 | 0.525 | 0.541 | 0.529 | 0.529 | 0.602 | 0.560 | 0.564 | 7.05 |
| 3) Pyridine | 1.738 | 1.538 | 1.398 | 1.424 | 1.398 | 1.375 | 1.515 | 1.474 | 1.482 | 8.02 |
| 4) N-Nitrosodim | 0.958 | 0.936 | 0.839 | 0.862 | 0.848 | 0.844 | 0.924 | 0.866 | 0.885 | 5.32 |
| 5) 2-Fluorophen | 1.476 | 1.429 | 1.344 | 1.390 | 1.367 | 1.348 | 1.442 | 1.353 | 1.394 | 3.57 |
| 6) Indene | 2.730 | 2.585 | 2.402 | 2.370 | 2.290 | 2.345 | 2.580 | 2.436 | 2.467 | 6.07 |
| 7) Cumene | 3.663 | 3.426 | 3.152 | 3.069 | 2.925 | 3.068 | 3.561 | 3.255 | 3.265 | 8.00 |
| 8) Phenol-d5 | 1.845 | 1.786 | 1.627 | 1.642 | 1.617 | 1.609 | 1.776 | 1.666 | 1.696 | 5.42 |
| 9) Phenol | 2.065 | 1.985 | 1.831 | 1.703 | 1.666 | 1.669 | 1.973 | 1.872 | 1.846 | 8.41 |
| 10) Aniline | 2.294 | 2.141 | 1.970 | 1.887 | 1.794 | 1.943 | 2.145 | 1.981 | 2.019 | 8.03 |
| 11) bis(2-Chloro | 1.458 | 1.368 | 1.225 | 1.215 | 1.187 | 1.200 | 1.371 | 1.252 | 1.284 | 7.81 |
| 12) 2-Chlorophen | 1.707 | 1.596 | 1.474 | 1.477 | 1.449 | 1.458 | 1.696 | 1.503 | 1.545 | 6.90 |
| 13) Decane | 1.149 | 1.111 | 1.001 | 0.964 | 0.938 | 0.971 | 1.276 | 1.023 | 1.054 | 10.99 |
| 14) 1,3-Dichloro | 1.926 | 1.819 | 1.640 | 1.666 | 1.620 | 1.620 | 1.904 | 1.681 | 1.734 | 7.40 |
| 15) 1,4-Dichloro | 1.952 | 1.839 | 1.667 | 1.690 | 1.627 | 1.646 | 1.923 | 1.736 | 1.760 | 7.26 |
| 16) Benzyl alcoh | 1.043 | 1.000 | 0.935 | 0.931 | 0.914 | 0.923 | 0.983 | 0.938 | 0.958 | 4.74 |
| 17) 1,2-Dichloro | 1.873 | 1.719 | 1.559 | 1.553 | 1.490 | 1.527 | 1.786 | 1.609 | 1.640 | 8.40 |
| 18) Acetophenone | 2.021 | 1.939 | 1.795 | 1.803 | 1.771 | 1.764 | 1.943 | 1.813 | 1.856 | 5.21 |
| 19) 2-Methylphen | 1.474 | 1.407 | 1.303 | 1.283 | 1.260 | 1.265 | 1.372 | 1.309 | 1.334 | 5.71 |
| 20) 2,2'-oxybis( | 0.585 | 0.543 | 0.504 | 0.500 | 0.494 | 0.487 | 0.560 | 0.514 | 0.523 | 6.73 |
| 21) 3&4-Methylph | 1.536 | 1.471 | 1.383 | 1.394 | 1.372 | 1.357 | 1.466 | 1.383 | 1.420 | 4.46 |
| 22) n-Nitroso-di | 1.050 | 0.982 | 0.892 | 0.893 | 0.887 | 0.881 | 1.029 | 0.907 | 0.940 | 7.38 |
| 23) Hexachloroet | 0.547 | 0.519 | 0.488 | 0.502 | 0.499 | 0.480 | 0.527 | 0.487 | 0.506 | 4.51 |
| 24) I Naphthalene-d8 | ----------ISTD---------- | | | | | | | | | |
| 25) Nitrobenzene | 0.356 | 0.339 | 0.329 | 0.328 | 0.325 | 0.320 | 0.355 | 0.326 | 0.335 | 4.13 |
| 26) Nitrobenzene | 0.372 | 0.353 | 0.343 | 0.337 | 0.331 | 0.332 | 0.362 | 0.339 | 0.346 | 4.28 |
| 27) Quinoline | 0.811 | 0.777 | 0.733 | 0.734 | 0.734 | 0.721 | 0.812 | 0.741 | 0.758 | 4.89 |
| 28) Isophorone | 0.657 | 0.637 | 0.605 | 0.595 | 0.586 | 0.592 | 0.659 | 0.613 | 0.618 | 4.75 |
| 29) 2-Nitropheno | 0.212 | 0.201 | 0.212 | 0.215 | 0.213 | 0.211 | 0.197 | 0.201 | 0.208 | 3.27 |
| 30) 2,4-Dimethyl | 0.327 | 0.324 | 0.328 | 0.334 | 0.331 | 0.329 | 0.332 | 0.314 | 0.327 | 1.94 |
| 31) Benzoic acid | | 0.196 | 0.264 | 0.305 | 0.312 | 0.256 | | 0.236 | 0.261 | 16.57 |
| 32) bis(2-Chloro | 0.394 | 0.371 | 0.352 | 0.349 | 0.347 | 0.342 | 0.392 | 0.356 | 0.363 | 5.66 |
| 33) 2,4-Dichloro | 0.342 | 0.321 | 0.314 | 0.312 | 0.311 | 0.306 | 0.324 | 0.313 | 0.318 | 3.56 |
| 34) 2,6-Dichloro | 0.338 | 0.321 | 0.306 | 0.309 | 0.305 | 0.303 | 0.320 | 0.306 | 0.313 | 3.89 |
| 35) 1,3,5-Trichl | 0.372 | 0.348 | 0.328 | 0.327 | 0.325 | 0.321 | 0.365 | 0.332 | 0.340 | 5.76 |
| 36) 1,2,4-Trichl | 0.367 | 0.342 | 0.322 | 0.321 | 0.319 | 0.313 | 0.349 | 0.328 | 0.333 | 5.59 |
| 37) 1,2,3-Trichl | 0.344 | 0.329 | 0.310 | 0.309 | 0.300 | 0.301 | 0.340 | 0.313 | 0.318 | 5.39 |
| 38) Naphthalene | 1.268 | 1.193 | 1.093 | 1.048 | 0.985 | 1.053 | 1.258 | 1.123 | 1.127 | 9.15 |
| 39) 4-Chloroanil | 0.513 | 0.486 | 0.461 | 0.444 | 0.430 | 0.447 | 0.475 | 0.457 | 0.464 | 5.66 |
| 40) 2,3-Dichloro | 0.416 | 0.384 | 0.371 | 0.371 | 0.363 | 0.363 | 0.392 | 0.373 | 0.379 | 4.70 |
| 41) Caprolactam | 0.132 | 0.127 | 0.121 | 0.123 | 0.126 | 0.120 | 0.113 | 0.119 | 0.123 | 4.86 |
| 42) Hexachlorobu | 0.181 | 0.168 | 0.159 | 0.158 | 0.156 | 0.155 | 0.178 | 0.161 | 0.165 | 6.10 |
| 43) 4-Chloro-3-m | 0.317 | 0.305 | 0.300 | 0.302 | 0.301 | 0.296 | 0.310 | 0.288 | 0.302 | 2.89 |
| 44) 2-Methylnaph | 0.690 | 0.657 | 0.617 | 0.630 | 0.606 | 0.626 | 0.692 | 0.625 | 0.643 | 5.14 |
| 45) 1-Methylnaph | 0.720 | 0.676 | 0.630 | 0.613 | 0.598 | 0.609 | 0.705 | 0.645 | 0.650 | 7.09 |

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** E3E1991-ICC1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45693.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
46) Dimethylnaph 0.695 0.679 0.651 0.640 0.629 0.635 0.687 0.657 0.659   3.80

47) I   Acenaphthene-d10      ----------------ISTD---------------------
48) Hexachlorocy 0.245 0.256 0.300 0.310 0.314 0.311 0.217 0.262 0.277  13.20
49) 2,4,6-Trichl 0.356 0.347 0.347 0.346 0.346 0.349 0.338 0.338 0.346   1.68
50) 2,4,5-Trichl 0.419 0.362 0.384 0.378 0.378 0.380 0.360 0.365 0.378   4.98
51) 2-Fluorobiph 1.454 1.383 1.298 1.247 1.201 1.261 1.445 1.294 1.323   7.08
52) 2-Chloronaph 1.296 1.220 1.163 1.125 1.086 1.146 1.300 1.162 1.187   6.58
53) Biphenyl     1.694 1.602 1.498 1.416 1.364 1.466 1.703 1.515 1.532   8.09
54) 2-Nitroanili 0.280 0.284 0.288 0.288 0.287 0.288 0.266 0.267 0.281   3.33
55) Dimethylphth 1.422 1.360 1.283 1.241 1.229 1.260 1.409 1.266 1.309   5.85
56) Acenaphthyle 2.004 1.981 1.904 1.848 1.763 1.883 1.982 1.869 1.904   4.29
57) 2,6-Dinitrot 0.255 0.267 0.296 0.304 0.307 0.304 0.248 0.272 0.282   8.48
58) 3-Nitroanili 0.335 0.340 0.344 0.345 0.346 0.349 0.303 0.322 0.336   4.63
59) Acenaphthene 1.323 1.260 1.182 1.136 1.099 1.157 1.322 1.180 1.207   7.01
60) 2,4-Dinitrop       0.091 0.148 0.174 0.185 0.167       0.099 0.144  27.70
         ----- Quadratic regression -----                Coefficient =  0.9996
              Response Ratio = -0.02179 + 0.15647 *A + 0.00643 *A^2

61) 4-Nitropheno 0.119 0.125 0.144 0.148 0.151 0.148 0.096 0.130 0.133  14.33
62) Dibenzofuran 1.728 1.691 1.606 1.519 1.473 1.553 1.750 1.581 1.613   6.26
63) 2,4-Dinitrot 0.350 0.386 0.412 0.415 0.422 0.417 0.327 0.371 0.388   9.18
64) 2,3,4,6-Tetr 0.285 0.282 0.289 0.292 0.295 0.292 0.281 0.279 0.287   2.07
65) Diethylphtha 1.391 1.338 1.264 1.238 1.224 1.250 1.376 1.240 1.290   5.21
66) Fluorene     1.444 1.429 1.353 1.323 1.292 1.340 1.436 1.359 1.372   4.16
67) 4-Chlorophen 0.666 0.642 0.606 0.593 0.592 0.599 0.642 0.595 0.617   4.66
68) 4-Nitroanili 0.336 0.340 0.359 0.359 0.365 0.361 0.291 0.327 0.342   7.24

69) I   Phenanthrene-d10      ----------------ISTD---------------------
70) 4,6-Dinitro-             0.142 0.161 0.165 0.158       0.109 0.147  15.69
71) n-Nitrosodip 0.688 0.671 0.635 0.635 0.611 0.635 0.685 0.626 0.648   4.47
72) 1,2-Diphenyl 0.825 0.792 0.766 0.755 0.735 0.767 0.821 0.756 0.777   4.17
73) 2,4,6-Tribro 0.088 0.083 0.084 0.087 0.087 0.087 0.079 0.080 0.085   4.34
74) 4-Bromopheny 0.215 0.212 0.203 0.207 0.206 0.204 0.216 0.200 0.208   2.82
75) Hexachlorobe 0.224 0.213 0.203 0.205 0.204 0.203 0.228 0.202 0.210   4.91
76) Pentachlorop 0.130 0.134 0.152 0.159 0.162 0.159 0.126 0.133 0.145  10.29
77) Phenanthrene 1.336 1.260 1.175 1.145 1.106 1.178 1.349 1.184 1.217   7.29
78) Anthracene   1.282 1.271 1.216 1.180 1.115 1.199 1.288 1.198 1.219   4.87
79) Carbazole    1.209 1.200 1.146 1.136 1.098 1.153 1.217 1.140 1.162   3.60
80) Di-n-butylph 1.296 1.327 1.350 1.339 1.310 1.380 1.256 1.285 1.318   2.99
81) Fluoranthene 1.227 1.234 1.206 1.192 1.164 1.212 1.199 1.171 1.201   2.06
82) Octadecane   0.367 0.377 0.373 0.372 0.366 0.374 0.376 0.364 0.371   1.30

83) I   Chrysene-d12          ----------------ISTD---------------------
84) Pyrene       1.343 1.351 1.304 1.288 1.235 1.295 1.345 1.285 1.306   3.02
85) Terphenyl-d1 0.855 0.847 0.845 0.847 0.835 0.845 0.827 0.807 0.838   1.84
86) Butylbenzylp 0.558 0.575 0.613 0.630 0.619 0.626 0.527 0.562 0.589   6.51
87) Butyl steara 0.201 0.226 0.249 0.252 0.249 0.255 0.188 0.217 0.230  11.23
88) Benzo[a]anth 1.216 1.176 1.140 1.137 1.112 1.155 1.284 1.110 1.166   5.05
89) 3,3'-Dichlor 0.414 0.406 0.415 0.422 0.431 0.424 0.393 0.392 0.412   3.43
90) Chrysene     1.212 1.152 1.072 1.052 1.010 1.065 1.163 1.075 1.100   6.18
91) bis(2-Ethylh 0.955 0.788 0.870 0.850 0.823 0.863 0.860 0.782 0.849   6.43

92) I   Perylene-d12          ----------------ISTD---------------------
93) Di-n-octylph 1.598 1.357 1.685 1.770 1.708 1.751 1.295 1.394 1.570  12.23
94) Benzo[b]fluo 1.396 1.200 1.292 1.390 1.584 1.365 1.209 1.158 1.324  10.54
95) Benzo[k]fluo 1.289 1.347 1.272 1.296 1.101 1.309 1.336 1.308 1.282   6.02
96) Benzo[a]pyre 1.169 1.098 1.181 1.205 1.191 1.211 1.096 1.084 1.154   4.58
97) Indeno[1,2,3 1.281 1.235 1.319 1.371 1.408 1.357 1.207 1.261 1.305   5.41
98) Dibenz(a,h)a 0.908 0.855 0.976 1.031 1.064 1.022 0.752 0.860 0.934  11.54
```

8.7.5

8

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** E3E1991-ICC1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45693.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
 99) Dibenz[a,h]a 1.023 1.032 1.121 1.139 1.186 1.141 1.011 1.041 1.087   6.18
100) 7,12-Dimethy 0.596 0.582 0.633 0.713 0.735 0.701 0.561 0.559 0.635  11.31
101) Benzo[g,h,i] 1.059 1.049 1.090 1.125 1.140 1.110 1.027 1.070 1.084   3.62

 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

          M3E1991.M         Tue Nov 27 09:49:43 2012   MS3E
```

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** E3E1991-ICV1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45701.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e1991\3e45701.D          Vial: 10
Acq On    : 26 Nov 2012   2:09 pm                    Operator: olgaa
Sample    : icv1991-50                               Inst    : MS3E
Misc      : op61340,e3e1991,                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\msdchem\1\METHODS\M3E1991.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Mon Nov 26 14:30:30 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 97 | 0.00 | 2.88 |
| 9 | t | Phenol | 1.846 | 1.616 | 12.5 | 94 | 0.00 | 2.62 |
| 12 | t | 2-Chlorophenol | 1.545 | 1.427 | 7.6 | 95 | 0.00 | 2.69 |
| 19 | t | 2-Methylphenol | 1.334 | 1.221 | 8.5 | 93 | 0.00 | 3.29 |
| 21 | t | 3&4-Methylphenol | 1.420 | 1.283 | 9.6 | 91 | 0.00 | 3.48 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 95 | 0.00 | 4.48 |
| 29 | t | 2-Nitrophenol | 0.208 | 0.206 | 1.0 | 92 | 0.00 | 4.01 |
| 30 | t | 2,4-Dimethylphenol | 0.327 | 0.339 | -3.7 | 97 | 0.00 | 4.17 |
| 31 | t | Benzoic acid | 0.261 | 0.253 | 3.1 | 94 | 0.00 | 4.43 |
| 33 | t | 2,4-Dichlorophenol | 0.318 | 0.309 | 2.8 | 96 | 0.00 | 4.35 |
| 34 | t | 2,6-Dichlorophenol | 0.313 | 0.305 | 2.6 | 95 | 0.00 | 4.67 |
| 43 | t | 4-Chloro-3-methylphenol | 0.302 | 0.291 | 3.6 | 93 | -0.02 | 5.47 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 94 | 0.00 | 7.10 |
| 49 | t | 2,4,6-Trichlorophenol | 0.346 | 0.349 | -0.9 | 94 | -0.01 | 6.03 |
| 50 | t | 2,4,5-Trichlorophenol | 0.378 | 0.384 | -1.6 | 95 | -0.02 | 6.08 |
| | | ---------- | True | Calc. | % Drift | | ---------- | |
| 60 | t | 2,4-Dinitrophenol | 100.000 | 87.206 | 12.8 | 70 | -0.01 | 7.30 |
| | | ---------- | AvgRF | CCRF | % Dev | | ---------- | |
| 61 | t | 4-Nitrophenol | 0.133 | 0.136 | -2.3 | 86 | 0.00 | 7.53 |
| 64 | | 2,3,4,6-Tetrachlorophenol | 0.287 | 0.281 | 2.1 | 90 | 0.00 | 7.70 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 92 | 0.00 | 9.34 |
| 70 | t | 4,6-Dinitro-2-methylpheno | 0.147 | 0.139 | 5.4 | 81 | -0.02 | 8.15 |
| 76 | t | Pentachlorophenol | 0.145 | 0.150 | -3.4 | 86 | -0.01 | 9.21 |

```
(#) = Out of Range                SPCC's out = 0  CCC's out = 0
 3e45693.D  M3E1991.M        Mon Nov 26 14:32:18 2012   MS3E
```

8.7.6

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** E3E1991-ICV1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45703.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e1991\3e45703.D          Vial: 12
Acq On    : 26 Nov 2012   2:56 pm                    Operator: olgaa
Sample    : icv1991-50                               Inst    : MS3E
Misc      : op61340,e3e1991,                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\msdchem\1\METHODS\M3E1991.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Mon Nov 26 14:30:30 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 96 | 0.00 | 2.88 |
| 5 | S | 2-Fluorophenol | 1.394 | 1.322 | 5.2 | 94 | 0.00 | 1.76 |
| 8 | S | Phenol-d5 | 1.696 | 1.525 | 10.1 | 91 | 0.00 | 2.60 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 93 | 0.00 | 4.48 |
| 25 | S | Nitrobenzene-d5 | 0.335 | 0.336 | -0.3 | 97 | 0.00 | 3.57 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 91 | 0.00 | 7.10 |
| 51 | S | 2-Fluorobiphenyl | 1.323 | 1.369 | -3.5 | 99 | 0.00 | 6.15 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 90 | 0.00 | 9.34 |
| 73 | S | 2,4,6-Tribromophenol | 0.085 | 0.088 | -3.5 | 91 | -0.01 | 8.33 |
| 83 | I | Chrysene-d12 | 1.000 | 1.000 | 0.0 | 79 | -0.01 | 13.01 |
| 85 | S | Terphenyl-d14 | 0.838 | 0.953 | -13.7 | 89 | 0.00 | 11.86 |

```
(#) = Out of Range              SPCC's out = 0  CCC's out = 0
 3e45693.D  M3E1991.M        Mon Nov 26 15:16:14 2012   MS3E
```

8.7.7

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** E3E1991-ICV1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45704.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e1991\3e45704.D          Vial: 13
Acq On    : 26 Nov 2012   3:19 pm                    Operator: olgaa
Sample    : icv1991-50                               Inst    : MS3E
Misc      : op61340,e3e1991,                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\msdchem\1\METHODS\M3E1991.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Mon Nov 26 15:47:45 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 103 | 0.00 | 2.88 |
| 2 | t | 1,4-Dioxane | 0.564 | 0.527 | 6.6 | 102 | 0.00 | 0.88 |
| 6 | t | Indene | 2.467 | 2.558 | -3.7 | 112 | 0.00 | 3.20 |
| 7 | t | Cumene | 3.265 | 3.235 | 0.9 | 108 | 0.00 | 2.14 |
| 13 | t | Decane | 1.054 | 0.995 | 5.6 | 105 | 0.00 | 2.78 |
| 18 | t | Acetophenone | 1.856 | 1.920 | -3.4 | 112 | 0.00 | 3.40 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 103 | 0.00 | 4.48 |
| 27 | t | Quinoline | 0.758 | 0.755 | 0.4 | 108 | 0.00 | 4.99 |
| 40 | t | 2,3-Dichloroaniline | 0.379 | 0.363 | 4.2 | 103 | 0.00 | 6.02 |
| 41 | t | Caprolactam | 0.123 | 0.116 | 5.7 | 99 | 0.00 | 5.12 |
| 45 | t | 1-Methylnaphthalene | 0.650 | 0.655 | -0.8 | 110 | 0.00 | 5.67 |
| 46 | t | Dimethylnaphthalene | 0.659 | 0.695 | -5.5 | 112 | 0.00 | 6.48 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 105 | 0.00 | 7.10 |
| 53 | t | Biphenyl | 1.532 | 1.570 | -2.5 | 113 | 0.00 | 6.27 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 104 | 0.00 | 9.34 |
| 82 | t | Octadecane | 0.371 | 0.398 | -7.3 | 111 | 0.00 | 9.50 |
| 92 | I | Perylene-d12 | 1.000 | 1.000 | 0.0 | 96 | 0.00 | 14.39 |
| 100 | t | 7,12-Dimethylbenz(a)anthr | 0.635 | 0.619 | 2.5 | 85 | 0.00 | 14.10 |

```
(#) = Out of Range              SPCC's out = 0  CCC's out = 0
 3e45704.D  M3E1991.M        Mon Nov 26 15:48:36 2012   MS3E
```

8.7.8

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** E3E1991-ICV1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45705.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e1991\3e45705.D          Vial: 14
Acq On    : 26 Nov 2012   3:42 pm                    Operator: olgaa
Sample    : icv1991-50                               Inst    : MS3E
Misc      : op61340,e3e1991,                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\msdchem\1\METHODS\M3E1991.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Mon Nov 26 15:47:45 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 110 | 0.00 | 2.88 |
| 3 | t | Pyridine | 1.482 | 1.150 | 22.4 | 92 | 0.00 | 1.01 |
| 4 | t | N-Nitrosodimethylamine | 0.885 | 0.706 | 20.2 | 92 | 0.00 | 1.01 |
| 11 | t | bis(2-Chloroethyl)ether | 1.284 | 1.143 | 11.0 | 104 | 0.00 | 2.67 |
| 14 | t | 1,3-Dichlorobenzene | 1.734 | 1.535 | 11.5 | 104 | 0.00 | 2.84 |
| 15 | t | 1,4-Dichlorobenzene | 1.760 | 1.533 | 12.9 | 102 | 0.00 | 2.90 |
| 16 | t | Benzyl alcohol | 0.958 | 0.847 | 11.6 | 101 | 0.00 | 3.10 |
| 17 | t | 1,2-Dichlorobenzene | 1.640 | 1.434 | 12.6 | 103 | 0.00 | 3.10 |
| 20 | t | 2,2'-oxybis(1-Chloropropa | 0.523 | 0.463 | 11.5 | 104 | 0.00 | 3.29 |
| 22 | t | n-Nitroso-di-n-propylamin | 0.940 | 0.772 | 17.9 | 96 | 0.00 | 3.46 |
| 23 | t | Hexachloroethane | 0.506 | 0.477 | 5.7 | 109 | 0.00 | 3.46 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 108 | 0.00 | 4.48 |
| 26 | t | Nitrobenzene | 0.346 | 0.306 | 11.6 | 100 | 0.00 | 3.60 |
| 28 | t | Isophorone | 0.618 | 0.543 | 12.1 | 99 | 0.00 | 3.91 |
| 32 | t | bis(2-Chloroethoxy)methan | 0.363 | 0.342 | 5.8 | 108 | 0.00 | 4.29 |
| 36 | t | 1,2,4-Trichlorobenzene | 0.333 | 0.316 | 5.1 | 109 | 0.00 | 4.45 |
| 38 | t | Naphthalene | 1.127 | 0.985 | 12.6 | 101 | 0.00 | 4.51 |
| 42 | t | Hexachlorobutadiene | 0.165 | 0.161 | 2.4 | 112 | 0.00 | 4.83 |
| 44 | t | 2-Methylnaphthalene | 0.643 | 0.585 | 9.0 | 101 | 0.00 | 5.52 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 110 | 0.00 | 7.10 |
| 48 | t | Hexachlorocyclopentadiene | 0.277 | 0.256 | 7.6 | 90 | 0.00 | 5.89 |
| 52 | t | 2-Chloronaphthalene | 1.187 | 1.069 | 9.9 | 102 | 0.00 | 6.23 |
| 54 | t | 2-Nitroaniline | 0.281 | 0.249 | 11.4 | 95 | 0.00 | 6.50 |
| 55 | t | Dimethylphthalate | 1.309 | 1.159 | 11.5 | 101 | 0.00 | 6.91 |
| 56 | t | Acenaphthylene | 1.904 | 1.563 | 17.9 | 91 | 0.00 | 6.85 |
| 57 | t | 2,6-Dinitrotoluene | 0.282 | 0.272 | 3.5 | 98 | 0.00 | 6.97 |
| 58 | t | 3-Nitroaniline | 0.336 | 0.275 | 18.2 | 86 | 0.00 | 7.15 |
| 59 | t | Acenaphthene | 1.207 | 1.072 | 11.2 | 102 | 0.00 | 7.15 |
| 62 | t | Dibenzofuran | 1.613 | 1.501 | 6.9 | 106 | 0.00 | 7.40 |
| 63 | t | 2,4-Dinitrotoluene | 0.388 | 0.344 | 11.3 | 90 | 0.00 | 7.55 |
| 65 | t | Diethylphthalate | 1.290 | 1.133 | 12.2 | 99 | -0.01 | 8.03 |
| 66 | t | Fluorene | 1.372 | 1.242 | 9.5 | 102 | 0.00 | 7.93 |
| 67 | t | 4-Chlorophenyl-phenylethe | 0.617 | 0.571 | 7.5 | 105 | 0.00 | 8.01 |
| 68 | t | 4-Nitroaniline | 0.342 | 0.313 | 8.5 | 95 | -0.01 | 8.10 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 109 | 0.00 | 9.34 |
| 71 | t | n-Nitrosodiphenylamine | 0.648 | 0.551 | 15.0 | 95 | 0.00 | 8.22 |
| 72 | t | 1,2-Diphenylhydrazine | 0.777 | 0.690 | 11.2 | 98 | 0.00 | 8.24 |
| 74 | t | 4-Bromophenyl-phenylether | 0.208 | 0.194 | 6.7 | 104 | 0.00 | 8.74 |

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** E3E1991-ICV1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45705.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 75 | t | Hexachlorobenzene | 0.210 | 0.192 | 8.6 | 103 | 0.00 | 8.90 |
| 77 | t | Phenanthrene | 1.217 | 1.090 | 10.4 | 101 | 0.00 | 9.38 |
| 78 | t | Anthracene | 1.219 | 1.103 | 9.5 | 101 | 0.00 | 9.44 |
| 79 | t | Carbazole | 1.162 | 1.037 | 10.8 | 98 | 0.00 | 9.77 |
| 80 | t | Di-n-butylphthalate | 1.318 | 1.194 | 9.4 | 95 | 0.00 | 10.59 |
| 81 | t | Fluoranthene | 1.201 | 1.084 | 9.7 | 98 | 0.00 | 11.21 |
| 83 | I | Chrysene-d12 | 1.000 | 1.000 | 0.0 | 104 | 0.01 | 13.02 |
| 84 | t | Pyrene | 1.306 | 1.193 | 8.7 | 96 | 0.00 | 11.51 |
| 86 | t | Butylbenzylphthalate | 0.589 | 0.550 | 6.6 | 91 | 0.00 | 12.58 |
| 88 | t | Benzo[a]anthracene | 1.166 | 1.039 | 10.9 | 94 | 0.00 | 13.00 |
| 90 | t | Chrysene | 1.100 | 1.014 | 7.8 | 99 | 0.00 | 13.05 |
| 91 | t | bis(2-Ethylhexyl)phthalat | 0.849 | 0.751 | 11.5 | 91 | 0.00 | 13.30 |
| 92 | I | Perylene-d12 | 1.000 | 1.000 | 0.0 | 109 | 0.00 | 14.40 |
| 93 | t | Di-n-octylphthalate | 1.570 | 1.448 | 7.8 | 90 | 0.00 | 13.90 |
| 94 | t | Benzo[b]fluoranthene | 1.324 | 1.207 | 8.8 | 97 | 0.00 | 14.07 |
| 95 | t | Benzo[k]fluoranthene | 1.282 | 1.072 | 16.4 | 89 | 0.00 | 14.10 |
| 96 | t | Benzo[a]pyrene | 1.154 | 1.072 | 7.1 | 97 | 0.00 | 14.34 |
| 97 | t | Indeno[1,2,3-cd]pyrene | 1.305 | 1.230 | 5.7 | 99 | 0.00 | 15.22 |
| 99 | t | Dibenz[a,h]anthracene | 1.087 | 1.030 | 5.2 | 99 | 0.00 | 15.25 |
| 101 | t | Benzo[g,h,i]perylene | 1.084 | 1.045 | 3.6 | 103 | 0.00 | 15.40 |

---
---

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3e45704.D M3E1991.M Mon Nov 26 16:06:11 2012 MS3E

8.7.9

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** E3E1991-ICV1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45706.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e1991\3e45706.D          Vial: 15
Acq On    : 26 Nov 2012   4:08 pm                    Operator: olgaa
Sample    : icv1991-50                               Inst    : MS3E
Misc      : op61340,e3e1991,                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\msdchem\1\METHODS\M3E1991.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Mon Nov 26 15:47:45 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 172 | 0.00 | 2.88 |
| 10 | | Aniline | 2.019 | 1.764 | 12.6 | 157 | 0.00 | 2.59 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 171 | 0.00 | 4.48 |
| 39 | t | 4-Chloroaniline | 0.464 | 0.418 | 9.9 | 160 | 0.00 | 4.68 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3e45704.D M3E1991.M Mon Nov 26 16:27:37 2012 MS3E

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** E3E1991-ICV1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E45707.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e1991\3e45707.D          Vial: 16
Acq On    : 26 Nov 2012   4:32 pm                    Operator: olgaa
Sample    : icv1991-50                               Inst    : MS3E
Misc      : op61340,e3e1991,                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\msdchem\1\METHODS\M3E1991.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Mon Nov 26 15:47:45 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 83 | I | Chrysene-d12 | 1.000 | 1.000 | 0.0 | 191 | 0.00 | 13.02 |
| 89 | t | 3,3'-Dichlorobenzidine | 0.412 | 0.430 | -4.4 | 193 | 0.00 | 13.06 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3e45704.D M3E1991.M Mon Nov 26 16:51:50 2012 MS3E

# Continuing Calibration Summary



**Job Number:** JB22549 **Sample:** E3E2016-CC1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E46351.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e2016\3e46351.D          Vial: 2
Acq On    : 17 Dec 2012   9:20 am                    Operator: olgaa
Sample    : cc1991-50                                Inst    : MS3E
Misc      : op62010,e3e2016,                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M3E1991.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Thu Dec 06 10:24:01 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 79 | -0.05 | 2.75 |
| 2 | t | 1,4-Dioxane | 0.564 | 0.576 | -2.1 | 87 | -0.02 | 0.82 |
| 3 | t | Pyridine | 1.482 | 1.522 | -2.7 | 88 | -0.03 | 0.94 |
| 4 | t | N-Nitrosodimethylamine | 0.885 | 0.912 | -3.1 | 86 | -0.03 | 0.94 |
| 5 | S | 2-Fluorophenol | 1.394 | 1.465 | -5.1 | 86 | -0.06 | 1.68 |
| 6 | t | Indene | 2.467 | 2.591 | -5.0 | 88 | -0.05 | 3.06 |
| 7 | t | Cumene | 3.265 | 3.325 | -1.8 | 86 | -0.05 | 2.02 |
| 8 | S | Phenol-d5 | 1.696 | 1.797 | -6.0 | 89 | -0.08 | 2.54 |
| 9 | t | Phenol | 1.846 | 1.915 | -3.7 | 91 | -0.08 | 2.55 |
| 10 | | Aniline | 2.019 | 1.747 | 13.5 | 71 | -0.06 | 2.47 |
| 11 | t | bis(2-Chloroethyl)ether | 1.284 | 1.408 | -9.7 | 93 | -0.05 | 2.54 |
| 12 | t | 2-Chlorophenol | 1.545 | 1.528 | 1.1 | 83 | -0.06 | 2.59 |
| 13 | t | Decane | 1.054 | 1.290 | -22.4# | 106 | -0.05 | 2.65 |
| 14 | t | 1,3-Dichlorobenzene | 1.734 | 1.633 | 5.8 | 80 | -0.05 | 2.70 |
| 15 | t | 1,4-Dichlorobenzene | 1.760 | 1.658 | 5.8 | 80 | -0.05 | 2.76 |
| 16 | t | Benzyl alcohol | 0.958 | 1.024 | -6.9 | 88 | -0.06 | 2.98 |
| 17 | t | 1,2-Dichlorobenzene | 1.640 | 1.545 | 5.8 | 80 | -0.05 | 2.97 |
| 18 | t | Acetophenone | 1.856 | 1.880 | -1.3 | 85 | -0.05 | 3.27 |
| 19 | t | 2-Methylphenol | 1.334 | 1.394 | -4.5 | 88 | -0.07 | 3.20 |
| 20 | t | 2,2'-oxybis(1-Chloropropa | 0.523 | 0.513 | 1.9 | 84 | -0.05 | 3.16 |
| 21 | t | 3&4-Methylphenol | 1.420 | 1.533 | -8.0 | 90 | -0.08 | 3.39 |
| 22 | t | n-Nitroso-di-n-propylamin | 0.940 | 0.939 | 0.1 | 85 | -0.05 | 3.33 |
| 23 | t | Hexachloroethane | 0.506 | 0.492 | 2.8 | 81 | -0.06 | 3.32 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 81 | -0.06 | 4.33 |
| 25 | S | Nitrobenzene-d5 | 0.335 | 0.332 | 0.9 | 84 | -0.05 | 3.44 |
| 26 | t | Nitrobenzene | 0.346 | 0.349 | -0.9 | 86 | -0.05 | 3.46 |
| 27 | t | Quinoline | 0.758 | 0.744 | 1.8 | 84 | -0.05 | 4.86 |
| 28 | t | Isophorone | 0.618 | 0.606 | 1.9 | 83 | -0.05 | 3.78 |
| 29 | t | 2-Nitrophenol | 0.208 | 0.219 | -5.3 | 84 | -0.06 | 3.88 |
| 30 | t | 2,4-Dimethylphenol | 0.327 | 0.318 | 2.8 | 79 | -0.07 | 4.06 |
| 31 | t | Benzoic acid | 0.261 | 0.272 | -4.2 | 86 | -0.03 | 4.39 |
| 32 | t | bis(2-Chloroethoxy)methan | 0.363 | 0.373 | -2.8 | 89 | -0.05 | 4.15 |
| 33 | t | 2,4-Dichlorophenol | 0.318 | 0.296 | 6.9 | 78 | -0.07 | 4.24 |
| 34 | t | 2,6-Dichlorophenol | 0.313 | 0.285 | 8.9 | 76 | -0.06 | 4.55 |
| 35 | | 1,3,5-Trichlorobenzene | 0.340 | 0.310 | 8.8 | 78 | -0.05 | 3.88 |
| 36 | t | 1,2,4-Trichlorobenzene | 0.333 | 0.305 | 8.4 | 79 | -0.05 | 4.30 |
| 37 | | 1,2,3-Trichlorobenzene | 0.318 | 0.291 | 8.5 | 79 | -0.06 | 4.63 |
| 38 | t | Naphthalene | 1.127 | 1.100 | 2.4 | 85 | -0.06 | 4.36 |
| 39 | t | 4-Chloroaniline | 0.464 | 0.439 | 5.4 | 80 | -0.06 | 4.55 |
| 40 | t | 2,3-Dichloroaniline | 0.379 | 0.339 | 10.6 | 76 | -0.07 | 5.87 |
| 41 | t | Caprolactam | 0.123 | 0.135 | -9.8 | 91 | -0.02 | 5.05 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** E3E2016-CC1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E46351.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 42 | t | Hexachlorobutadiene | 0.165 | 0.148 | 10.3 | 77 | -0.06 | 4.67 |
| 43 | t | 4-Chloro-3-methylphenol | 0.302 | 0.302 | 0.0 | 83 | -0.08 | 5.40 |
| 44 | t | 2-Methylnaphthalene | 0.643 | 0.602 | 6.4 | 78 | -0.06 | 5.37 |
| 45 | t | 1-Methylnaphthalene | 0.650 | 0.611 | 6.0 | 82 | -0.06 | 5.52 |
| 46 | t | Dimethylnaphthalene | 0.659 | 0.614 | 6.8 | 79 | -0.06 | 6.32 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 79 | -0.06 | 6.94 |
| 48 | t | Hexachlorocyclopentadiene | 0.277 | 0.266 | 4.0 | 68 | -0.06 | 5.73 |
| 49 | t | 2,4,6-Trichlorophenol | 0.346 | 0.356 | -2.9 | 81 | -0.07 | 5.91 |
| 50 | t | 2,4,5-Trichlorophenol | 0.378 | 0.383 | -1.3 | 80 | -0.07 | 5.99 |
| 51 | S | 2-Fluorobiphenyl | 1.323 | 1.236 | 6.6 | 78 | -0.06 | 6.00 |
| 52 | t | 2-Chloronaphthalene | 1.187 | 1.122 | 5.5 | 78 | -0.06 | 6.08 |
| 53 | t | Biphenyl | 1.532 | 1.451 | 5.3 | 79 | -0.06 | 6.11 |
| 54 | t | 2-Nitroaniline | 0.281 | 0.299 | -6.4 | 83 | -0.06 | 6.37 |
| 55 | t | Dimethylphthalate | 1.309 | 1.241 | 5.2 | 78 | -0.05 | 6.76 |
| 56 | t | Acenaphthylene | 1.904 | 1.896 | 0.4 | 80 | -0.06 | 6.69 |
| 57 | t | 2,6-Dinitrotoluene | 0.282 | 0.317 | -12.4 | 83 | -0.05 | 6.83 |
| 58 | t | 3-Nitroaniline | 0.336 | 0.368 | -9.5 | 84 | -0.07 | 7.02 |
| 59 | t | Acenaphthene | 1.207 | 1.174 | 2.7 | 81 | -0.06 | 6.99 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 60 | t | 2,4-Dinitrophenol | 100.000 | 115.486 | -15.5 | 92 | -0.05 | 7.19 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 61 | t | 4-Nitrophenol | 0.133 | 0.110 | 17.3 | 59 | -0.10 | 7.50 |
| 62 | t | Dibenzofuran | 1.613 | 1.530 | 5.1 | 78 | -0.06 | 7.24 |
| 63 | t | 2,4-Dinitrotoluene | 0.388 | 0.423 | -9.0 | 80 | -0.05 | 7.42 |
| 64 | | 2,3,4,6-Tetrachlorophenol | 0.287 | 0.286 | 0.3 | 78 | -0.07 | 7.57 |
| 65 | t | Diethylphthalate | 1.290 | 1.199 | 7.1 | 76 | -0.06 | 7.87 |
| 66 | t | Fluorene | 1.372 | 1.321 | 3.7 | 78 | -0.06 | 7.77 |
| 67 | t | 4-Chlorophenyl-phenylethe | 0.617 | 0.607 | 1.6 | 81 | -0.06 | 7.85 |
| 68 | t | 4-Nitroaniline | 0.342 | 0.375 | -9.6 | 83 | -0.06 | 7.98 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 80 | -0.06 | 9.18 |
| 70 | t | 4,6-Dinitro-2-methylpheno | 0.147 | 0.177 | -20.4# | 90 | -0.04 | 8.04 |
| 71 | t | n-Nitrosodiphenylamine | 0.648 | 0.622 | 4.0 | 79 | -0.06 | 8.07 |
| 72 | t | 1,2-Diphenylhydrazine | 0.777 | 0.833 | -7.2 | 87 | -0.06 | 8.08 |
| 73 | S | 2,4,6-Tribromophenol | 0.085 | 0.096 | -12.9 | 89 | -0.06 | 8.19 |
| 74 | t | 4-Bromophenyl-phenylether | 0.208 | 0.209 | -0.5 | 82 | -0.06 | 8.58 |
| 75 | t | Hexachlorobenzene | 0.210 | 0.218 | -3.8 | 86 | -0.06 | 8.74 |
| 76 | t | Pentachlorophenol | 0.145 | 0.146 | -0.7 | 74 | -0.06 | 9.08 |
| 77 | t | Phenanthrene | 1.217 | 1.139 | 6.4 | 78 | -0.06 | 9.21 |
| 78 | t | Anthracene | 1.219 | 1.173 | 3.8 | 79 | -0.06 | 9.28 |
| 79 | t | Carbazole | 1.162 | 1.140 | 1.9 | 79 | -0.07 | 9.62 |
| 80 | t | Di-n-butylphthalate | 1.318 | 1.320 | -0.2 | 77 | -0.06 | 10.43 |
| 81 | t | Fluoranthene | 1.201 | 1.236 | -2.9 | 82 | -0.06 | 11.06 |
| 82 | t | Octadecane | 0.371 | 0.435 | -17.3 | 93 | -0.06 | 9.34 |
| 83 | I | Chrysene-d12 | 1.000 | 1.000 | 0.0 | 82 | -0.05 | 12.89 |
| 84 | t | Pyrene | 1.306 | 1.278 | 2.1 | 81 | -0.06 | 11.36 |
| 85 | S | Terphenyl-d14 | 0.838 | 0.876 | -4.5 | 85 | -0.05 | 11.72 |
| 86 | t | Butylbenzylphthalate | 0.589 | 0.598 | -1.5 | 78 | -0.05 | 12.45 |
| 87 | | Butyl stearate | 0.230 | 0.297 | -29.1# | 95 | -0.05 | 12.58 |
| 88 | t | Benzo[a]anthracene | 1.166 | 1.174 | -0.7 | 83 | -0.04 | 12.88 |
| 89 | t | 3,3'-Dichlorobenzidine | 0.412 | 0.451 | -9.5 | 87 | -0.05 | 12.94 |
| 90 | t | Chrysene | 1.100 | 1.082 | 1.6 | 83 | -0.04 | 12.92 |
| 91 | t | bis(2-Ethylhexyl)phthalat | 0.849 | 0.847 | 0.2 | 80 | -0.05 | 13.17 |
| 92 | I | Perylene-d12 | 1.000 | 1.000 | 0.0 | 85 | -0.04 | 14.28 |
| 93 | t | Di-n-octylphthalate | 1.570 | 1.691 | -7.7 | 82 | -0.04 | 13.77 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** E3E2016-CC1991
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E46351.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 94 | t | Benzo[b]fluoranthene | 1.324 | 1.407 | -6.3 | 87 | -0.04 | 13.96 |
| 95 | t | Benzo[k]fluoranthene | 1.282 | 1.271 | 0.9 | 82 | -0.04 | 13.98 |
| 96 | t | Benzo[a]pyrene | 1.154 | 1.225 | -6.2 | 86 | -0.04 | 14.22 |
| 97 | t | Indeno[1,2,3-cd]pyrene | 1.305 | 1.388 | -6.4 | 87 | -0.03 | 15.11 |
| 98 | t | Dibenz(a,h)acridine | 0.934 | 1.065 | -14.0 | 88 | -0.04 | 14.96 |
| 99 | t | Dibenz[a,h]anthracene | 1.087 | 1.172 | -7.8 | 87 | -0.04 | 15.13 |
| 100 | t | 7,12-Dimethylbenz(a)anthr | 0.635 | 0.628 | 1.1 | 76 | -0.04 | 13.98 |
| 101 | t | Benzo[g,h,i]perylene | 1.084 | 1.161 | -7.1 | 88 | -0.04 | 15.28 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3e46091.D M3E1991.M Tue Dec 18 11:57:57 2012 MS3E

8.7.12

8

# Continuing Calibration Summary



**Job Number:** JB22549 **Sample:** E3E2016-CC1983
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3E46352.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3e2016\3e46352.D          Vial: 3
Acq On    : 17 Dec 2012   9:45 am                    Operator: olgaa
Sample    : cc1983-25                                Inst    : MS3E
Misc      : op62010,e3e2016,                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M3E1991.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Thu Dec 06 10:24:01 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.050  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|
| 102 | 1,4-Dichlorobenzene-d4a | 1.000 | 1.000 | 0.0 | 71 | -0.05 | 2.75 |
| 103 | Benzaldehyde | 1.149 | 1.160 | -1.0 | 72 | -0.06 | 2.32 |
| 104 | Acenaphthene-d10a | 1.000 | 1.000 | 0.0 | 71 | -0.06 | 6.94 |
| 105 | 1,2,4,5-Tetrachlorobenzen | 0.496 | 0.479 | 3.4 | 70 | -0.08 | 5.68 |
| 106 | Phenanthrene-d10a | 1.000 | 1.000 | 0.0 | 70 | -0.07 | 9.17 |
| 107 | Atrazine | 0.107 | 0.119 | -11.2 | 75 | -0.10 | 9.04 |
| 108 I | Chrysene-d12a | 1.000 | 1.000 | 0.0 | 75 | -0.05 | 12.89 |
| 109 T | benzidine | 0.604 | 0.562 | 7.0 | 61 | -0.06 | 11.37 |

```
(#) = Out of Range              SPCC's out = 0  CCC's out = 0
 3e45521.D  M3E1991.M        Tue Dec 18 11:59:21 2012   MS3E
```

8.7.13

8

# Initial Calibration Summary



**Job Number:** JB22549 **Sample:** EM3617-ICC3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89364.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Response Factor Report MSM

Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Thu Nov 08 17:32:00 2012
Response via : Initial Calibration

Calibration Files
2 =M89366.D 5 =M89365.D 100 =M89362.D 50 =M89364.D
1 =M89363.D 10 =M89368.D 80 =M89369.D 25 =M89367.D

| Compound | 2 | 5 | 100 | 50 | 1 | 10 | 80 | 25 | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|
| 1) I 1,4-Dichlorobenzene-d | | | | | ISTD | | | | | |
| 2) 1,4-Dioxane | 0.519 | 0.567 | 0.530 | 0.496 | 0.561 | 0.605 | 0.533 | 0.496 | 0.539 | 6.94 |
| 3) Pyridine | 1.306 | 1.245 | 1.399 | 1.258 | 1.263 | 1.368 | 1.365 | 1.237 | 1.305 | 4.89 |
| 4) N-Nitrosodim | 1.177 | 0.956 | 0.962 | 0.917 | 1.224 | 0.886 | 0.952 | 0.885 | 0.995 | 13.15 |
| 5) 2-Fluorophen | 1.306 | 1.244 | 1.384 | 1.299 | 1.334 | 1.228 | 1.393 | 1.173 | 1.295 | 5.90 |
| 6) Indene | 2.354 | 2.312 | 2.192 | 2.087 | 2.195 | 2.253 | 2.202 | 2.003 | 2.200 | 5.18 |
| 7) Cumene | 3.611 | 3.390 | 3.142 | 3.144 | 3.514 | 3.331 | 3.214 | 3.057 | 3.301 | 5.92 |
| 8) Phenol-d5 | 1.637 | 1.682 | 1.708 | 1.636 | 1.535 | 1.627 | 1.722 | 1.554 | 1.638 | 4.10 |
| 9) Phenol | 1.938 | 1.891 | 1.874 | 1.817 | 2.009 | 1.910 | 1.886 | 1.738 | 1.883 | 4.26 |
| 10) Aniline | 2.158 | 2.237 | 2.054 | 2.005 | 2.173 | 2.088 | 2.033 | 1.917 | 2.083 | 4.95 |
| 11) bis(2-Chloro | 1.427 | 1.415 | 1.270 | 1.207 | 1.482 | 1.299 | 1.291 | 1.193 | 1.323 | 8.04 |
| 12) 2-Chlorophen | 1.557 | 1.455 | 1.471 | 1.364 | 1.605 | 1.428 | 1.480 | 1.305 | 1.458 | 6.60 |
| 13) Decane | 1.548 | 1.413 | 1.202 | 1.177 | 1.703 | 1.280 | 1.197 | 1.096 | 1.327 | 15.83 |
| 14) 1,3-Dichloro | 1.763 | 1.682 | 1.576 | 1.505 | 1.714 | 1.584 | 1.613 | 1.422 | 1.607 | 6.96 |
| 15) 1,4-Dichloro | 1.787 | 1.744 | 1.608 | 1.532 | 1.796 | 1.625 | 1.628 | 1.457 | 1.647 | 7.36 |
| 16) Benzyl alcoh | 0.875 | 0.924 | 0.983 | 0.929 | 0.833 | 0.938 | 0.979 | 0.859 | 0.915 | 5.98 |
| 17) 1,2-Dichloro | 1.690 | 1.622 | 1.548 | 1.462 | 1.612 | 1.516 | 1.563 | 1.418 | 1.554 | 5.71 |
| 18) Acetophenone | 2.191 | 2.093 | 1.977 | 1.911 | 2.110 | 2.011 | 1.988 | 1.849 | 2.016 | 5.51 |
| 19) 2-Methylphen | 1.159 | 1.273 | 1.301 | 1.226 | 1.323 | 1.226 | 1.322 | 1.171 | 1.250 | 5.18 |
| 20) 2,2'-oxybis( | 0.553 | 0.497 | 0.490 | 0.454 | 0.450 | 0.464 | 0.482 | 0.433 | 0.478 | 7.78 |
| 21) 3&4-Methylph | 1.363 | 1.421 | 1.407 | 1.336 | 1.306 | 1.339 | 1.408 | 1.283 | 1.358 | 3.73 |
| 22) n-Nitroso-di | 1.216 | 1.221 | 1.100 | 1.069 | 1.301 | 1.151 | 1.092 | 1.040 | 1.149 | 7.83 |
| 23) Hexachloroet | 0.701 | 0.674 | 0.633 | 0.612 | 0.700 | 0.632 | 0.650 | 0.563 | 0.646 | 7.19 |
| 24) I Naphthalene-d8 | | | | | ISTD | | | | | |
| 25) Nitrobenzene | 0.428 | 0.408 | 0.421 | 0.396 | 0.390 | 0.394 | 0.423 | 0.366 | 0.403 | 5.16 |
| 26) Nitrobenzene | 0.487 | 0.463 | 0.441 | 0.429 | 0.445 | 0.426 | 0.442 | 0.406 | 0.442 | 5.53 |
| 27) Quinoline | 0.823 | 0.786 | 0.780 | 0.749 | 0.771 | 0.790 | 0.793 | 0.726 | 0.777 | 3.81 |
| 28) Isophorone | 0.788 | 0.796 | 0.777 | 0.754 | 0.794 | 0.774 | 0.783 | 0.725 | 0.774 | 3.06 |
| 29) 2-Nitropheno | 0.168 | 0.181 | 0.217 | 0.202 | 0.148 | 0.179 | 0.215 | 0.186 | 0.187 | 12.53 |
| 30) 2,4-Dimethyl | 0.418 | 0.432 | 0.423 | 0.401 | 0.375 | 0.410 | 0.429 | 0.382 | 0.409 | 5.17 |
| 31) Benzoic acid | | 0.236 | 0.337 | 0.314 | | 0.261 | 0.350 | 0.275 | 0.296 | 15.24 |
| 32) bis(2-Chloro | 0.434 | 0.418 | 0.414 | 0.392 | 0.411 | 0.410 | 0.411 | 0.384 | 0.409 | 3.76 |
| 33) 2,4-Dichloro | 0.338 | 0.349 | 0.374 | 0.354 | 0.284 | 0.362 | 0.375 | 0.340 | 0.347 | 8.35 |
| 34) 2,6-Dichloro | 0.345 | 0.338 | 0.384 | 0.350 | 0.308 | 0.342 | 0.378 | 0.329 | 0.347 | 7.14 |
| 35) 1,3,5-Trichl | 0.438 | 0.426 | 0.416 | 0.392 | 0.412 | 0.398 | 0.418 | 0.367 | 0.408 | 5.47 |
| 36) 1,2,4-Trichl | 0.450 | 0.413 | 0.405 | 0.380 | 0.414 | 0.397 | 0.409 | 0.372 | 0.405 | 5.83 |
| 37) 1,2,3-Trichl | 0.390 | 0.394 | 0.393 | 0.367 | 0.435 | 0.375 | 0.396 | 0.352 | 0.388 | 6.36 |
| 38) Naphthalene | 1.219 | 1.134 | 1.046 | 1.037 | 1.207 | 1.077 | 1.064 | 0.994 | 1.097 | 7.45 |
| 39) 4-Chloroanil | 0.470 | 0.486 | 0.501 | 0.477 | 0.423 | 0.479 | 0.496 | 0.448 | 0.472 | 5.49 |
| 40) 2,3-Dichloro | 0.451 | 0.457 | 0.447 | 0.425 | 0.403 | 0.444 | 0.452 | 0.413 | 0.436 | 4.60 |
| 41) Caprolactam | 0.152 | 0.173 | 0.173 | 0.174 | 0.187 | 0.178 | 0.177 | 0.161 | 0.172 | 6.29 |
| 42) Hexachlorobu | 0.284 | 0.265 | 0.262 | 0.248 | 0.293 | 0.262 | 0.268 | 0.238 | 0.265 | 6.69 |
| 43) 4-Chloro-3-m | 0.353 | 0.372 | 0.395 | 0.382 | 0.315 | 0.375 | 0.398 | 0.365 | 0.369 | 7.15 |
| 44) 2-Methylnaph | 0.719 | 0.686 | 0.685 | 0.673 | 0.682 | 0.657 | 0.691 | 0.611 | 0.675 | 4.65 |
| 45) 1-Methylnaph | 0.818 | 0.793 | 0.747 | 0.725 | 0.803 | 0.754 | 0.743 | 0.683 | 0.758 | 5.91 |

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** EM3617-ICC3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89364.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
46) Dimethylnaph 0.771 0.742 0.737 0.701 0.685 0.702 0.743 0.674 0.719   4.69

47) I   Acenaphthene-d10      ----------------ISTD---------------------
48) Hexachlorocy 0.345 0.369 0.438 0.399 0.319 0.360 0.432 0.369 0.379  10.95
49) 2,4,6-Trichl 0.392 0.432 0.434 0.407 0.373 0.420 0.430 0.387 0.409   5.71
50) 2,4,5-Trichl 0.406 0.448 0.468 0.433 0.383 0.419 0.469 0.418 0.430   6.99
51) 2-Fluorobiph 1.385 1.336 1.241 1.178 1.354 1.265 1.242 1.157 1.270   6.49
52) 2-Chloronaph 1.179 1.139 1.085 1.003 1.146 1.084 1.072 0.988 1.087   6.21
53) Biphenyl     1.473 1.407 1.313 1.256 1.464 1.340 1.307 1.220 1.347   6.89
54) 2-Nitroanili 0.277 0.329 0.345 0.334 0.253 0.322 0.347 0.308 0.315  10.62
55) Dimethylphth 1.433 1.386 1.262 1.236 1.340 1.321 1.273 1.215 1.308   5.78
56) Acenaphthyle 1.681 1.822 1.764 1.712 1.753 1.771 1.768 1.658 1.741   3.08
57) 2,6-Dinitrot 0.216 0.254 0.286 0.267 0.189 0.249 0.290 0.243 0.249  13.73
58) 3-Nitroanili 0.216 0.263 0.316 0.287 0.173 0.260 0.310 0.263 0.261  18.20
59) Acenaphthene 1.185 1.121 1.132 1.060 1.202 1.101 1.103 1.037 1.118   5.04
60) 2,4-Dinitrop             0.173 0.150       0.085 0.172 0.111 0.138  28.20
            ----- Linear regression -----  Coefficient =  0.9969
              Response Ratio = -0.07539 + 0.18739 *A

61) 4-Nitropheno 0.157 0.191 0.238 0.230 0.138 0.203 0.249 0.206 0.201  19.27
62) Dibenzofuran 1.632 1.619 1.506 1.458 1.677 1.513 1.518 1.443 1.546   5.57
63) 2,4-Dinitrot 0.242 0.315 0.405 0.384       0.350 0.409 0.355 0.352  16.64
64) 2,3,4,6-Tetr 0.330 0.368 0.416 0.385 0.340 0.383 0.415 0.357 0.374   8.47
65) Diethylphtha 1.449 1.474 1.323 1.285 1.464 1.373 1.324 1.263 1.369   6.10
66) Fluorene     1.297 1.310 1.288 1.235 1.283 1.273 1.298 1.196 1.272   3.00
67) 4-Chlorophen 0.761 0.758 0.725 0.689 0.709 0.740 0.737 0.670 0.724   4.49
68) 4-Nitroanili 0.245 0.298 0.311 0.295 0.220 0.285 0.313 0.272 0.280  11.70

69) I   Phenanthrene-d10      ----------------ISTD---------------------
70) 4,6-Dinitro-             0.134 0.119       0.076 0.137 0.096 0.112  23.35
            ----- Linear regression -----  Coefficient =  0.9966
              Response Ratio = -0.02475 + 0.14518 *A

71) n-Nitrosodip 0.558 0.552 0.534 0.502 0.541 0.519 0.534 0.489 0.529   4.50
72) 1,2-Diphenyl 0.827 0.775 0.686 0.674 0.755 0.750 0.694 0.676 0.730   7.63
73) 2,4,6-Tribro 0.066 0.070 0.084 0.075 0.050 0.071 0.083 0.069 0.071  14.88
74) 4-Bromopheny 0.210 0.207 0.218 0.202 0.214 0.210 0.221 0.193 0.209   4.25
75) Hexachlorobe 0.224 0.219 0.212 0.201 0.236 0.211 0.213 0.191 0.213   6.47
76) Pentachlorop 0.119 0.143 0.164 0.155 0.112 0.144 0.167 0.142 0.143  13.78
77) Phenanthrene 1.111 1.019 0.966 0.948 1.149 1.003 0.979 0.931 1.013   7.70
78) Anthracene   1.014 1.013 0.978 0.957 0.935 1.007 0.990 0.930 0.978   3.48
79) Carbazole    0.962 0.972 0.937 0.919 0.867 0.957 0.948 0.904 0.933   3.75
80) Di-n-butylph 1.077 1.160 1.178 1.189 0.971 1.199 1.221 1.165 1.145   7.17
81) Fluoranthene 1.295 1.338 1.235 1.246 1.209 1.301 1.281 1.232 1.267   3.42
82) Octadecane   0.295 0.305 0.341 0.327 0.302 0.316 0.338 0.312 0.317   5.34

83) I   Chrysene-d12          ----------------ISTD---------------------
84) Pyrene       1.229 1.281 1.178 1.177 1.200 1.195 1.220 1.156 1.205   3.23
85) Butyl steara 0.172 0.194 0.223 0.215 0.143 0.196 0.222 0.203 0.196  13.83
86) Terphenyl-d1 0.825 0.845 0.837 0.806 0.771 0.814 0.859 0.784 0.818   3.68
87) Butylbenzylp 0.425 0.486 0.542 0.522       0.483 0.560 0.495 0.502   8.90
88) Benzo[a]anth 1.235 1.234 1.100 1.115 1.303 1.133 1.147 1.092 1.170   6.62
89) 3,3'-Dichlor 0.311 0.379 0.412 0.385 0.310 0.355 0.423 0.352 0.366  11.53
90) Chrysene     1.142 1.095 1.011 1.013 1.140 1.043 1.023 0.994 1.058   5.64
91) bis(2-Ethylh 0.484 0.573 0.678 0.669       0.573 0.702 0.611 0.613  12.46

92) I   Perylene-d12          ----------------ISTD---------------------
93) Di-n-octylph 0.857 1.127 1.421 1.350       1.189 1.463 1.280 1.241  16.71
94) Benzo[b]fluo 1.296 1.319 1.299 1.289 1.214 1.238 1.465 1.410 1.316   6.35
95) Benzo[k]fluo 1.334 1.271 1.289 1.184 1.318 1.334 1.166 1.035 1.241   8.50
```

# Initial Calibration Summary

**Job Number:** JB22549 **Sample:** EM3617-ICC3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89364.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
 96) Benzo[a]pyre 1.130 1.188 1.199 1.171 0.962 1.136 1.245 1.115 1.143   7.41
 97) Indeno[1,2,3 1.204 1.261 1.313 1.297 1.113 1.229 1.345 1.232 1.249   5.82
 98) Dibenz(a,h)a 0.775 0.879 0.983 0.980 0.715 0.867 1.033 0.903 0.892  12.14
 99) Dibenz[a,h]a 0.920 1.042 1.093 1.075 0.890 1.041 1.117 1.013 1.024   7.86
100) 7,12-Dimethy 0.619 0.629 0.743 0.660 0.577 0.620 0.746 0.599 0.649   9.79
101) Benzo[g,h,i] 1.040 1.005 1.065 1.040 0.984 1.012 1.067 0.998 1.026   3.03

 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

          MM3617.M          Fri Nov 09 09:27:39 2012   GCMSM
```

8.7.14

8

# Initial Calibration Summary



**Job Number:** JB22549 **Sample:** EM3618-ICC3618
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89378.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

```
                         Response Factor Report  MSM

  Method       : C:\HPCHEM\1\METHODS\MM3618.M (RTE Integrator)
  Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
  Last Update  : Fri Nov 09 15:05:00 2012
  Response via : Initial Calibration

  Calibration Files
  2   =M89375.D    5   =M89374.D    100 =M89371.D    50  =M89378.D
  1   =M89376.D    10  =M89373.D    80  =M89372.D    25  =M89377.D

   Compound         2     5     100   50    1     10    80    25    Avg %RSD
  ---------------------------------------------------------------------------

102) I   1,4-Dichlorobenzene-d ----------------ISTD---------------------
103) Benzaldehyde 0.967 1.135 1.153 1.081 0.887 0.993 1.133 1.047 1.050   9.00

104) I   Acenaphthene-d10a     ----------------ISTD---------------------
105) 1,2,4,5-Tetr 0.578 0.648 0.638 0.598 0.544 0.559 0.619 0.603 0.598   6.12
106) 2-bromonapht 0.548 0.688 0.646 0.603 0.518 0.560 0.624 0.611 0.600   9.25

107) I   Phenanthrene-d10a     ----------------ISTD---------------------
108) Atrazine     0.108 0.134 0.146 0.130 0.087 0.116 0.143 0.124 0.123  15.83
109) o-terphenyl  0.570 0.695 0.697 0.650 0.518 0.610 0.683 0.638 0.633  10.12

110) I   Chrysene-d12a         ----------------ISTD---------------------
111) Benzidine    0.420 0.597 0.601 0.612 0.385 0.554 0.631 0.591 0.549  16.99
112) 1-chloroocta 0.169 0.223 0.238 0.213 0.160 0.206 0.235 0.212 0.207  13.77

113) I   Naphthalene-d8a       ----------------ISTD---------------------
114) hydroquinone       0.358 0.442 0.402       0.322 0.424 0.358 0.384  11.91
 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

           MM3617.M          Fri Nov 09 15:05:31 2012   GCMSM
```

8.7.15

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** EM3618-ICV3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89379.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3618\M89379.D            Vial: 10
Acq On    :  8 Nov 2012   9:14 pm                   Operator: olgaa
Sample    : icv3617-50                              Inst    : MSM
Misc      : op60918,em3618,                         Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Thu Nov 08 17:32:00 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 92 | -0.01 | 3.56 |
| 9 | t | Phenol | 1.883 | 1.825 | 3.1 | 93 | -0.01 | 3.23 |
| 12 | t | 2-Chlorophenol | 1.458 | 1.502 | -3.0 | 101 | 0.00 | 3.34 |
| 19 | t | 2-Methylphenol | 1.250 | 1.291 | -3.3 | 97 | -0.01 | 4.07 |
| 21 | t | 3&4-Methylphenol | 1.358 | 1.330 | 2.1 | 92 | -0.01 | 4.31 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 86 | -0.01 | 5.57 |
| 29 | t | 2-Nitrophenol | 0.187 | 0.199 | -6.4 | 85 | -0.01 | 4.99 |
| 30 | t | 2,4-Dimethylphenol | 0.409 | 0.476 | -16.4 | 103 | 0.00 | 5.18 |
| 31 | t | Benzoic acid | 0.296 | 0.294 | 0.7 | 81 | -0.07 | 5.47 |
| 33 | t | 2,4-Dichlorophenol | 0.347 | 0.394 | -13.5 | 96 | -0.01 | 5.41 |
| 34 | t | 2,6-Dichlorophenol | 0.347 | 0.381 | -9.8 | 94 | -0.01 | 5.81 |
| 43 | t | 4-Chloro-3-methylphenol | 0.369 | 0.420 | -13.8 | 95 | -0.03 | 6.80 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 93 | 0.00 | 8.84 |
| 49 | t | 2,4,6-Trichlorophenol | 0.409 | 0.433 | -5.9 | 99 | -0.01 | 7.51 |
| 50 | t | 2,4,5-Trichlorophenol | 0.430 | 0.447 | -4.0 | 96 | -0.02 | 7.56 |
| | | ---------- | True | Calc. | % Drift | | ---------- | |
| 60 | t | 2,4-Dinitrophenol | 100.000 | 82.844 | 17.2 | 58 | -0.02 | 9.09 |
| | | ---------- | AvgRF | CCRF | % Dev | | ---------- | |
| 61 | t | 4-Nitrophenol | 0.201 | 0.227 | -12.9 | 92 | -0.02 | 9.37 |
| 64 | | 2,3,4,6-Tetrachlorophenol | 0.374 | 0.376 | -0.5 | 91 | -0.01 | 9.60 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 91 | 0.00 | 11.65 |
| | | ---------- | True | Calc. | % Drift | | ---------- | |
| 70 | t | 4,6-Dinitro-2-methylpheno | 50.000 | 41.857 | 16.3 | 77 | -0.03 | 10.16 |
| | | ---------- | AvgRF | CCRF | % Dev | | ---------- | |
| 76 | t | Pentachlorophenol | 0.143 | 0.154 | -7.7 | 90 | -0.02 | 11.48 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
M89364.D MM3617.M Fri Nov 09 09:35:25 2012 GCMSM

8.7.16

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** EM3618-ICV3618
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89380A.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3618\M89380A.D            Vial: 11
Acq On    :  8 Nov 2012   9:28 pm                    Operator: olgaa
Sample    : icv3618-50                               Inst    : MSM
Misc      : op60918,em3618,                          Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Fri Nov 09 15:05:00 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 104 | I | Acenaphthene-d10a | 1.000 | 1.000 | 0.0 | 96 | 0.00 | 8.85 |
| 105 | t | 1,2,4,5-Tetrachlorobenzen | 0.598 | 0.568 | 5.0 | 91 | 0.00 | 7.26 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
M89378.D MM3617.M Fri Nov 09 15:07:16 2012 GCMSM

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** EM3618-ICV3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89380.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3618\M89380.D            Vial: 11
Acq On    :  8 Nov 2012   9:28 pm                   Operator: olgaa
Sample    : icv3617-50                              Inst    : MSM
Misc      : op60918,em3618,                         Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Thu Nov 08 17:32:00 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 101 | 0.00 | 3.57 |
| 3 | t | Pyridine | 1.305 | 1.095 | 16.1 | 88 | -0.02 | 1.24 |
| 4 | t | N-Nitrosodimethylamine | 0.995 | 0.856 | 14.0 | 94 | -0.02 | 1.23 |
| 11 | t | bis(2-Chloroethyl)ether | 1.323 | 1.283 | 3.0 | 107 | 0.00 | 3.31 |
| 14 | t | 1,3-Dichlorobenzene | 1.607 | 1.560 | 2.9 | 104 | 0.00 | 3.51 |
| 15 | t | 1,4-Dichlorobenzene | 1.647 | 1.505 | 8.6 | 99 | 0.00 | 3.59 |
| 16 | t | Benzyl alcohol | 0.915 | 0.868 | 5.1 | 94 | 0.00 | 3.84 |
| 17 | t | 1,2-Dichlorobenzene | 1.554 | 1.431 | 7.9 | 99 | 0.00 | 3.85 |
| 20 | t | 2,2'-oxybis(1-Chloropropa | 0.478 | 0.438 | 8.4 | 97 | 0.00 | 4.09 |
| 22 | t | n-Nitroso-di-n-propylamin | 1.149 | 0.990 | 13.8 | 93 | 0.00 | 4.30 |
| 23 | t | Hexachloroethane | 0.646 | 0.583 | 9.8 | 96 | 0.00 | 4.30 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 96 | 0.00 | 5.57 |
| 26 | t | Nitrobenzene | 0.442 | 0.401 | 9.3 | 90 | 0.00 | 4.47 |
| 28 | t | Isophorone | 0.774 | 0.717 | 7.4 | 91 | -0.02 | 4.86 |
| 32 | t | bis(2-Chloroethoxy)methan | 0.409 | 0.431 | -5.4 | 106 | -0.02 | 5.33 |
| 36 | t | 1,2,4-Trichlorobenzene | 0.405 | 0.395 | 2.5 | 100 | 0.00 | 5.53 |
| 38 | t | Naphthalene | 1.097 | 1.017 | 7.3 | 94 | 0.00 | 5.61 |
| 42 | t | Hexachlorobutadiene | 0.265 | 0.258 | 2.6 | 100 | 0.00 | 6.00 |
| 44 | t | 2-Methylnaphthalene | 0.675 | 0.685 | -1.5 | 98 | 0.00 | 6.87 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 95 | 0.00 | 8.85 |
| 48 | t | Hexachlorocyclopentadiene | 0.379 | 0.320 | 15.6 | 76 | 0.00 | 7.33 |
| 52 | t | 2-Chloronaphthalene | 1.087 | 1.058 | 2.7 | 100 | 0.00 | 7.76 |
| 54 | t | 2-Nitroaniline | 0.315 | 0.331 | -5.1 | 94 | 0.00 | 8.09 |
| 55 | t | Dimethylphthalate | 1.308 | 1.255 | 4.1 | 96 | 0.00 | 8.61 |
| 56 | t | Acenaphthylene | 1.741 | 1.562 | 10.3 | 86 | 0.00 | 8.53 |
| 57 | t | 2,6-Dinitrotoluene | 0.249 | 0.251 | -0.8 | 89 | 0.00 | 8.69 |
| 58 | t | 3-Nitroaniline | 0.261 | 0.254 | 2.7 | 84 | 0.00 | 8.91 |
| 59 | t | Acenaphthene | 1.118 | 1.057 | 5.5 | 95 | 0.00 | 8.90 |
| 62 | t | Dibenzofuran | 1.546 | 1.548 | -0.1 | 101 | 0.00 | 9.22 |
| 63 | t | 2,4-Dinitrotoluene | 0.352 | 0.320 | 9.1 | 79 | 0.00 | 9.41 |
| 65 | t | Diethylphthalate | 1.369 | 1.286 | 6.1 | 95 | -0.02 | 10.01 |
| 66 | t | Fluorene | 1.272 | 1.263 | 0.7 | 97 | -0.02 | 9.87 |
| 67 | t | 4-Chlorophenyl-phenylethe | 0.724 | 0.708 | 2.2 | 97 | 0.00 | 9.98 |
| 68 | t | 4-Nitroaniline | 0.280 | 0.278 | 0.7 | 89 | -0.03 | 10.09 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 98 | 0.00 | 11.64 |
| 71 | t | n-Nitrosodiphenylamine | 0.529 | 0.465 | 12.1 | 91 | -0.02 | 10.24 |
| 72 | t | 1,2-Diphenylhydrazine | 0.730 | 0.659 | 9.7 | 96 | -0.02 | 10.26 |
| 74 | t | 4-Bromophenyl-phenylether | 0.209 | 0.199 | 4.8 | 97 | 0.00 | 10.90 |
| 75 | t | Hexachlorobenzene | 0.213 | 0.199 | 6.6 | 97 | 0.00 | 11.09 |

# Initial Calibration Verification

**Job Number:** JB22549 **Sample:** EM3618-ICV3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89380.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 77 | t | Phenanthrene | 1.013 | 0.943 | 6.9 | 98 | -0.02 | 11.68 |
| 78 | t | Anthracene | 0.978 | 0.934 | 4.5 | 96 | 0.00 | 11.77 |
| 79 | t | Carbazole | 0.933 | 0.911 | 2.4 | 97 | 0.00 | 12.18 |
| 80 | t | Di-n-butylphthalate | 1.145 | 1.147 | -0.2 | 95 | 0.00 | 13.21 |
| 81 | t | Fluoranthene | 1.267 | 1.200 | 5.3 | 95 | 0.00 | 13.99 |
| 83 | I | Chrysene-d12 | 1.000 | 1.000 | 0.0 | 95 | 0.00 | 16.46 |
| 84 | t | Pyrene | 1.205 | 1.161 | 3.7 | 94 | 0.00 | 14.38 |
| 87 | t | Butylbenzylphthalate | 0.502 | 0.516 | -2.8 | 94 | 0.00 | 15.90 |
| 88 | t | Benzo[a]anthracene | 1.170 | 1.123 | 4.0 | 96 | 0.00 | 16.44 |
| 90 | t | Chrysene | 1.058 | 1.031 | 2.6 | 97 | 0.00 | 16.50 |
| 91 | t | bis(2-Ethylhexyl)phthalat | 0.613 | 0.639 | -4.2 | 91 | 0.00 | 16.87 |
| 92 | I | Perylene-d12 | 1.000 | 1.000 | 0.0 | 91 | 0.00 | 18.25 |
| 93 | t | Di-n-octylphthalate | 1.241 | 1.348 | -8.6 | 91 | 0.00 | 17.64 |
| 94 | t | Benzo[b]fluoranthene | 1.316 | 1.465 | -11.3 | 104 | 0.00 | 17.84 |
| 95 | t | Benzo[k]fluoranthene | 1.241 | 1.000 | 19.4 | 77 | -0.02 | 17.87 |
| 96 | t | Benzo[a]pyrene | 1.143 | 1.186 | -3.8 | 92 | 0.00 | 18.19 |
| 97 | t | Indeno[1,2,3-cd]pyrene | 1.249 | 1.356 | -8.6 | 95 | -0.02 | 19.30 |
| 99 | t | Dibenz[a,h]anthracene | 1.024 | 1.087 | -6.2 | 92 | 0.00 | 19.33 |
| 101 | t | Benzo[g,h,i]perylene | 1.026 | 1.096 | -6.8 | 96 | 0.00 | 19.53 |

---
---

(#) = Out of Range SPCC's out = 0 CCC's out = 0
M89364.D MM3617.M Fri Nov 09 09:31:37 2012 GCMSM

8.7.18

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** EM3618-ICV3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89381.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3618\M89381.D            Vial: 12
Acq On    :  8 Nov 2012   9:58 pm                   Operator: olgaa
Sample    : icv3617-50                              Inst    : MSM
Misc      : op60918,em3618,                         Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Thu Nov 08 17:32:00 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 93 | 0.00 | 3.57 |
| 2 | t | 1,4-Dioxane | 0.539 | 0.530 | 1.7 | 100 | -0.02 | 1.07 |
| 6 | t | Indene | 2.200 | 2.382 | -8.3 | 106 | 0.00 | 3.96 |
| 7 | t | Cumene | 3.301 | 3.474 | -5.2 | 103 | 0.00 | 2.65 |
| 13 | t | Decane | 1.327 | 1.265 | 4.7 | 100 | 0.00 | 3.44 |
| 18 | t | Acetophenone | 2.016 | 2.066 | -2.5 | 101 | 0.00 | 4.22 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 96 | 0.00 | 5.57 |
| 27 | t | Quinoline | 0.777 | 0.788 | -1.4 | 101 | -0.04 | 6.21 |
| 40 | t | 2,3-Dichloroaniline | 0.436 | 0.418 | 4.1 | 94 | 0.00 | 7.49 |
| 41 | t | Caprolactam | 0.172 | 0.161 | 6.4 | 88 | -0.10 | 6.36 |
| 45 | t | 1-Methylnaphthalene | 0.758 | 0.776 | -2.4 | 102 | 0.00 | 7.05 |
| 46 | t | Dimethylnaphthalene | 0.719 | 0.735 | -2.2 | 100 | 0.00 | 8.07 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 93 | 0.00 | 8.84 |
| 53 | t | Biphenyl | 1.347 | 1.428 | -6.0 | 105 | 0.00 | 7.80 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 93 | 0.00 | 11.64 |
| 82 | t | Octadecane | 0.317 | 0.361 | -13.9 | 103 | 0.00 | 11.85 |
| 92 | I | Perylene-d12 | 1.000 | 1.000 | 0.0 | 88 | 0.00 | 18.25 |
| 100 | t | 7,12-Dimethylbenz(a)anthr | 0.649 | 0.731 | -12.6 | 98 | -0.02 | 17.88 |

```
(#) = Out of Range              SPCC's out = 0  CCC's out = 0
 M89364.D   MM3617.M         Fri Nov 09 09:37:08 2012   GCMSM
```

8.7.19

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** EM3618-ICV3618
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89381A.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3618\M89381A.D            Vial: 12
Acq On    :  8 Nov 2012   9:58 pm                     Operator: olgaa
Sample    : icv3618-50                                Inst    : MSM
Misc      : op60918,em3618,                           Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Fri Nov 09 15:05:00 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 102 | I | 1,4-Dichlorobenzene-d4a | 1.000 | 1.000 | 0.0 | 94 | 0.00 | 3.57 |
| 103 | t | Benzaldehyde | 1.050 | 1.192 | -13.5 | 104 | 0.00 | 3.02 |
| 107 | I | Phenanthrene-d10a | 1.000 | 1.000 | 0.0 | 90 | 0.00 | 11.64 |
| 108 | t | Atrazine | 0.123 | 0.146 | -18.7 | 102 | 0.00 | 11.46 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
M89378.D MM3617.M Fri Nov 09 15:08:34 2012 GCMSM

8.7.20

8

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** EM3618-ICV3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89382.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3618\M89382.D            Vial: 13
Acq On    :  8 Nov 2012  10:27 pm                    Operator: olgaa
Sample    : icv3617-50                               Inst    : MSM
Misc      : op60918,em3618,                          Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Thu Nov 08 17:32:00 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 93 | -0.01 | 3.56 |
| 5 | S | 2-Fluorophenol | 1.295 | 1.369 | -5.7 | 98 | 0.00 | 2.17 |
| 8 | S | Phenol-d5 | 1.638 | 1.628 | 0.6 | 92 | -0.01 | 3.21 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 92 | -0.01 | 5.57 |
| 25 | S | Nitrobenzene-d5 | 0.403 | 0.422 | -4.7 | 98 | -0.01 | 4.43 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 91 | 0.00 | 8.84 |
| 51 | S | 2-Fluorobiphenyl | 1.270 | 1.325 | -4.3 | 102 | -0.01 | 7.66 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 92 | -0.01 | 11.64 |
| 73 | S | 2,4,6-Tribromophenol | 0.071 | 0.079 | -11.3 | 96 | -0.01 | 10.38 |
| 83 | I | Chrysene-d12 | 1.000 | 1.000 | 0.0 | 89 | -0.01 | 16.46 |
| 86 | S | Terphenyl-d14 | 0.818 | 0.902 | -10.3 | 100 | -0.01 | 14.90 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
M89364.D MM3617.M Fri Nov 09 09:38:00 2012 GCMSM

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** EM3618-ICV3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89383.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3618\M89383.D            Vial: 14
Acq On    :  8 Nov 2012  10:57 pm                   Operator: olgaa
Sample    : icv3617-50                              Inst    : MSM
Misc      : op60918,em3618,                         Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Thu Nov 08 17:32:00 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 182 | 0.00 | 3.57 |
| 10 | t | Aniline | 2.083 | 1.815 | 12.9 | 165 | 0.00 | 3.20 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 189 | 0.00 | 5.57 |
| 39 | t | 4-Chloroaniline | 0.472 | 0.416 | 11.9 | 165 | 0.00 | 5.82 |

```
(#) = Out of Range              SPCC's out = 0  CCC's out = 0
 M89364.D   MM3617.M         Fri Nov 09 09:40:07 2012   GCMSM
```

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** EM3618-ICV3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89384.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3618\M89384.D            Vial: 15
Acq On    :  8 Nov 2012  11:27 pm                   Operator: olgaa
Sample    : icv3617-50                              Inst    : MSM
Misc      : op60918,em3618,                         Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Thu Nov 08 17:32:00 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 83 | I | Chrysene-d12 | 1.000 | 1.000 | 0.0 | 265 | 0.00 | 16.47 |
| 89 | t | 3,3'-Dichlorobenzidine | 0.366 | 0.401 | -9.6 | 276 | 0.00 | 16.53 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
M89364.D MM3617.M Fri Nov 09 09:58:33 2012 GCMSM

# Initial Calibration Verification



**Job Number:** JB22549 **Sample:** EM3618-ICV3618
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M89384A.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3618\M89384A.D            Vial: 15
Acq On    :  8 Nov 2012  11:27 pm                    Operator: olgaa
Sample    : icv3618-50                               Inst    : MSM
Misc      : op60918,em3618,                          Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Fri Nov 09 15:05:00 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  30%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 110 | I | Chrysene-d12a | 1.000 | 1.000 | 0.0 | 238 | 0.01 | 16.47 |
| 111 | t | Benzidine | 0.549 | 0.774 | -41.0# | 301 | 0.01 | 14.42 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
M89378.D MM3617.M Fri Nov 09 15:09:28 2012 GCMSM

# Continuing Calibration Summary



**Job Number:** JB22549 **Sample:** EM3656-CC3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M90227.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\EM3656\M90227.D Vial: 2
Acq On : 13 Dec 2012 9:26 am Operator: olgaa
Sample : cc3617-50 Inst : MSM
Misc : op61911,em3656, Multiplr: 1.00
MS Integration Params: LSCINT.P

Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Multiple Level Calibration

Min. RRF : 0.049 Min. Rel. Area : 49% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 90 | -0.03 | 3.23 |
| 2 | t | 1,4-Dioxane | 0.539 | 0.524 | 2.8 | 95 | 0.00 | 0.93 |
| 3 | t | Pyridine | 1.305 | 1.251 | 4.1 | 89 | 0.00 | 1.08 |
| 4 | t | N-Nitrosodimethylamine | 0.995 | 0.615 | 38.2# | 60 | 0.00 | 1.07 |
| 5 | S | 2-Fluorophenol | 1.295 | 1.230 | 5.0 | 85 | 0.00 | 1.96 |
| 6 | t | Indene | 2.200 | 2.065 | 6.1 | 89 | -0.03 | 3.62 |
| 7 | t | Cumene | 3.301 | 2.835 | 14.1 | 81 | -0.02 | 2.35 |
| 8 | S | Phenol-d5 | 1.638 | 1.674 | -2.2 | 92 | 0.04 | 3.02 |
| 9 | t | Phenol | 1.883 | 1.735 | 7.9 | 86 | 0.03 | 3.03 |
| 10 | t | Aniline | 2.083 | 1.589 | 23.7# | 71 | -0.02 | 2.90 |
| 11 | t | bis(2-Chloroethyl)ether | 1.323 | 1.233 | 6.8 | 92 | -0.02 | 3.00 |
| 12 | t | 2-Chlorophenol | 1.458 | 1.317 | 9.7 | 87 | 0.00 | 3.05 |
| 13 | t | Decane | 1.327 | 1.258 | 5.2 | 96 | -0.03 | 3.12 |
| 14 | t | 1,3-Dichlorobenzene | 1.607 | 1.420 | 11.6 | 85 | -0.03 | 3.18 |
| 15 | t | 1,4-Dichlorobenzene | 1.647 | 1.450 | 12.0 | 85 | -0.03 | 3.25 |
| 16 | t | Benzyl alcohol | 0.915 | 0.894 | 2.3 | 86 | 0.00 | 3.53 |
| 17 | t | 1,2-Dichlorobenzene | 1.554 | 1.424 | 8.4 | 88 | -0.03 | 3.50 |
| 18 | t | Acetophenone | 2.016 | 1.777 | 11.9 | 84 | -0.03 | 3.88 |
| 19 | t | 2-Methylphenol | 1.250 | 1.253 | -0.2 | 92 | 0.02 | 3.82 |
| 20 | t | 2,2'-oxybis(1-Chloropropa | 0.478 | 0.452 | 5.4 | 89 | -0.03 | 3.75 |
| 21 | t | 3&4-Methylphenol | 1.358 | 1.371 | -1.0 | 92 | 0.02 | 4.06 |
| 22 | t | n-Nitroso-di-n-propylamin | 1.149 | 1.032 | 10.2 | 87 | -0.03 | 3.96 |
| 23 | t | Hexachloroethane | 0.646 | 0.539 | 16.6 | 79 | -0.03 | 3.94 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 91 | -0.03 | 5.19 |
| 25 | S | Nitrobenzene-d5 | 0.403 | 0.374 | 7.2 | 86 | -0.02 | 4.09 |
| 26 | t | Nitrobenzene | 0.442 | 0.370 | 16.3 | 79 | -0.03 | 4.11 |
| 27 | t | Quinoline | 0.777 | 0.755 | 2.8 | 92 | -0.03 | 5.84 |
| 28 | t | Isophorone | 0.774 | 0.702 | 9.3 | 85 | -0.03 | 4.51 |
| 29 | t | 2-Nitrophenol | 0.187 | 0.213 | -13.9 | 96 | -0.03 | 4.63 |
| 30 | t | 2,4-Dimethylphenol | 0.409 | 0.356 | 13.0 | 81 | 0.00 | 4.88 |
| 31 | t | Benzoic acid | 0.296 | 0.345 | -16.6 | 100 | 0.07 | 5.29 |
| 32 | t | bis(2-Chloroethoxy)methan | 0.409 | 0.423 | -3.4 | 99 | -0.03 | 4.97 |
| 33 | t | 2,4-Dichlorophenol | 0.347 | 0.343 | 1.2 | 88 | 0.01 | 5.11 |
| 34 | t | 2,6-Dichlorophenol | 0.347 | 0.337 | 2.9 | 88 | 0.00 | 5.47 |
| 35 | t | 1,3,5-Trichlorobenzene | 0.408 | 0.382 | 6.4 | 89 | -0.03 | 4.63 |
| 36 | t | 1,2,4-Trichlorobenzene | 0.405 | 0.375 | 7.4 | 90 | -0.03 | 5.15 |
| 37 | t | 1,2,3-Trichlorobenzene | 0.388 | 0.353 | 9.0 | 88 | -0.03 | 5.56 |
| 38 | t | Naphthalene | 1.097 | 0.982 | 10.5 | 86 | -0.03 | 5.22 |
| 39 | t | 4-Chloroaniline | 0.472 | 0.436 | 7.6 | 83 | 0.00 | 5.47 |
| 40 | t | 2,3-Dichloroaniline | 0.436 | 0.400 | 8.3 | 86 | -0.02 | 7.12 |
| 41 | t | Caprolactam | 0.172 | 0.185 | -7.6 | 97 | 0.00 | 6.09 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** EM3656-CC3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M90227.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 42 | t | Hexachlorobutadiene | 0.265 | 0.212 | 20.0 | 78 | -0.04 | 5.60 |
| 43 | t | 4-Chloro-3-methylphenol | 0.369 | 0.360 | 2.4 | 86 | 0.04 | 6.57 |
| 44 | t | 2-Methylnaphthalene | 0.675 | 0.628 | 7.0 | 85 | -0.03 | 6.47 |
| 45 | t | 1-Methylnaphthalene | 0.758 | 0.698 | 7.9 | 88 | -0.03 | 6.66 |
| 46 | t | Dimethylnaphthalene | 0.719 | 0.674 | 6.3 | 88 | -0.03 | 7.66 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 89 | -0.03 | 8.43 |
| 48 | t | Hexachlorocyclopentadiene | 0.379 | 0.314 | 17.2 | 70 | -0.03 | 6.93 |
| 49 | t | 2,4,6-Trichlorophenol | 0.409 | 0.389 | 4.9 | 85 | 0.00 | 7.17 |
| 50 | t | 2,4,5-Trichlorophenol | 0.430 | 0.424 | 1.4 | 87 | 0.02 | 7.28 |
| 51 | S | 2-Fluorobiphenyl | 1.270 | 1.145 | 9.8 | 87 | -0.03 | 7.27 |
| 52 | t | 2-Chloronaphthalene | 1.087 | 0.991 | 8.8 | 88 | -0.03 | 7.35 |
| 53 | t | Biphenyl | 1.347 | 1.247 | 7.4 | 88 | -0.03 | 7.41 |
| 54 | t | 2-Nitroaniline | 0.315 | 0.324 | -2.9 | 86 | 0.00 | 7.74 |
| 55 | t | Dimethylphthalate | 1.308 | 1.163 | 11.1 | 84 | -0.03 | 8.21 |
| 56 | t | Acenaphthylene | 1.741 | 1.652 | 5.1 | 86 | -0.02 | 8.13 |
| 57 | t | 2,6-Dinitrotoluene | 0.249 | 0.302 | -21.3# | 101 | -0.02 | 8.31 |
| 58 | t | 3-Nitroaniline | 0.261 | 0.300 | -14.9 | 93 | 0.00 | 8.55 |
| 59 | t | Acenaphthene | 1.118 | 1.041 | 6.9 | 87 | -0.03 | 8.48 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 60 | t | 2,4-Dinitrophenol | 100.000 | 119.172 | -19.2 | 115 | 0.00 | 8.76 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 61 | t | 4-Nitrophenol | 0.201 | 0.174 | 13.4 | 67 | 0.09 | 9.21 |
| 62 | t | Dibenzofuran | 1.546 | 1.465 | 5.2 | 90 | -0.02 | 8.81 |
| 63 | t | 2,4-Dinitrotoluene | 0.352 | 0.419 | -19.0 | 97 | -0.02 | 9.04 |
| 64 | | 2,3,4,6-Tetrachlorophenol | 0.374 | 0.336 | 10.2 | 78 | 0.00 | 9.24 |
| 65 | t | Diethylphthalate | 1.369 | 1.133 | 17.2 | 79 | -0.03 | 9.61 |
| 66 | t | Fluorene | 1.272 | 1.207 | 5.1 | 87 | -0.02 | 9.46 |
| 67 | t | 4-Chlorophenyl-phenylethe | 0.724 | 0.655 | 9.5 | 85 | -0.03 | 9.57 |
| 68 | t | 4-Nitroaniline | 0.280 | 0.305 | -8.9 | 92 | 0.01 | 9.75 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 83 | -0.03 | 11.22 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 70 | t | 4,6-Dinitro-2-methylpheno | 50.000 | 61.352 | -22.7# | 111 | -0.02 | 9.82 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 71 | t | n-Nitrosodiphenylamine | 0.529 | 0.515 | 2.6 | 85 | -0.02 | 9.86 |
| 72 | t | 1,2-Diphenylhydrazine | 0.730 | 0.681 | 6.7 | 84 | -0.03 | 9.86 |
| 73 | S | 2,4,6-Tribromophenol | 0.071 | 0.083 | -16.9 | 92 | 0.00 | 10.00 |
| 74 | t | 4-Bromophenyl-phenylether | 0.209 | 0.208 | 0.5 | 86 | -0.03 | 10.48 |
| 75 | t | Hexachlorobenzene | 0.213 | 0.228 | -7.0 | 94 | -0.03 | 10.68 |
| 76 | t | Pentachlorophenol | 0.143 | 0.133 | 7.0 | 72 | 0.00 | 11.12 |
| 77 | t | Phenanthrene | 1.013 | 0.956 | 5.6 | 84 | -0.03 | 11.27 |
| 78 | t | Anthracene | 0.978 | 0.952 | 2.7 | 83 | -0.03 | 11.35 |
| 79 | t | Carbazole | 0.933 | 0.943 | -1.1 | 85 | 0.00 | 11.79 |
| 80 | t | Di-n-butylphthalate | 1.145 | 1.143 | 0.2 | 80 | -0.03 | 12.80 |
| 81 | t | Fluoranthene | 1.267 | 1.192 | 5.9 | 80 | -0.03 | 13.55 |
| 82 | t | Octadecane | 0.317 | 0.374 | -18.0 | 95 | -0.03 | 11.44 |
| 83 | I | Chrysene-d12 | 1.000 | 1.000 | 0.0 | 76 | -0.03 | 16.12 |
| 84 | t | Pyrene | 1.205 | 1.225 | -1.7 | 79 | -0.03 | 13.95 |
| 85 | | Butyl stearate | 0.196 | 0.262 | -33.7# | 93 | -0.02 | 15.75 |
| 86 | S | Terphenyl-d14 | 0.818 | 0.842 | -2.9 | 79 | -0.02 | 14.48 |
| 87 | t | Butylbenzylphthalate | 0.502 | 0.527 | -5.0 | 77 | -0.02 | 15.55 |
| 88 | t | Benzo[a]anthracene | 1.170 | 1.167 | 0.3 | 80 | -0.02 | 16.10 |
| 89 | t | 3,3'-Dichlorobenzidine | 0.366 | 0.394 | -7.7 | 78 | 0.00 | 16.20 |
| 90 | t | Chrysene | 1.058 | 0.984 | 7.0 | 74 | -0.02 | 16.16 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** EM3656-CC3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M90227.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 91 | t | bis(2-Ethylhexyl)phthalat | 0.613 | 0.707 | -15.3 | 80 | -0.03 | 16.53 |
| 92 | I | Perylene-d12 | 1.000 | 1.000 | 0.0 | 74 | -0.02 | 17.94 |
| 93 | t | Di-n-octylphthalate | 1.241 | 1.500 | -20.9# | 83 | -0.02 | 17.33 |
| 94 | t | Benzo[b]fluoranthene | 1.316 | 1.284 | 2.4 | 74 | -0.02 | 17.53 |
| 95 | t | Benzo[k]fluoranthene | 1.241 | 1.261 | -1.6 | 79 | -0.02 | 17.56 |
| 96 | t | Benzo[a]pyrene | 1.143 | 1.219 | -6.6 | 77 | -0.02 | 17.87 |
| 97 | t | Indeno[1,2,3-cd]pyrene | 1.249 | 1.372 | -9.8 | 79 | 0.00 | 19.00 |
| 98 | t | Dibenz(a,h)acridine | 0.892 | 1.020 | -14.3 | 77 | -0.02 | 18.81 |
| 99 | t | Dibenz[a,h]anthracene | 1.024 | 1.114 | -8.8 | 77 | 0.00 | 19.03 |
| 100 | t | 7,12-Dimethylbenz(a)anthr | 0.649 | 0.610 | 6.0 | 69 | -0.02 | 17.56 |
| 101 | t | Benzo[g,h,i]perylene | 1.026 | 1.117 | -8.9 | 80 | 0.00 | 19.21 |

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(#) = Out of Range SPCC's out = 0 CCC's out = 0
M90150.D MM3617.M Fri Dec 14 09:06:41 2012 GCMSM

8.7.25

8

# Continuing Calibration Summary



**Job Number:** JB22549 **Sample:** EM3656-CC3618
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M90228.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3656\M90228.D            Vial: 3
Acq On    : 13 Dec 2012   9:58 am                   Operator: olgaa
Sample    : cc3618-25                               Inst    : MSM
Misc      : op61911,em3656,                         Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Tue Dec 11 16:20:49 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 102 | I | 1,4-Dichlorobenzene-d4a | 1.000 | 1.000 | 0.0 | 108 | -0.03 | 3.23 |
| 103 | t | Benzaldehyde | 1.050 | 1.063 | -1.2 | 110 | -0.04 | 2.71 |
| 104 | I | Acenaphthene-d10a | 1.000 | 1.000 | 0.0 | 106 | -0.03 | 8.43 |
| 105 | t | 1,2,4,5-Tetrachlorobenzen | 0.598 | 0.565 | 5.5 | 100 | -0.05 | 6.86 |
| 106 | I | Phenanthrene-d10a | 1.000 | 1.000 | 0.0 | 98 | -0.04 | 11.21 |
| 107 | t | Atrazine | 0.123 | 0.132 | -7.3 | 105 | -0.05 | 11.07 |
| 108 | I | Chrysene-d12a | 1.000 | 1.000 | 0.0 | 94 | -0.03 | 16.12 |
| 109 | t | Benzidine | 0.549 | 0.586 | -6.7 | 93 | -0.05 | 14.00 |

```
(#) = Out of Range              SPCC's out = 0  CCC's out = 0
 M89377.D   MM3617.M         Fri Dec 14 15:05:04 2012   GCMSM
```

8.7.26

8

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** EM3657-CC3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M90256.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\EM3657\M90256.D Vial: 2
Acq On : 14 Dec 2012 10:20 am Operator: olgaa
Sample : cc3617-25 Inst : MSM
Misc : op61971,em3657, Multiplr: 1.00
MS Integration Params: LSCINT.P

Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Multiple Level Calibration

Min. RRF : 0.049 Min. Rel. Area : 49% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 1 | I | 1,4-Dichlorobenzene-d4 | 1.000 | 1.000 | 0.0 | 106 | -0.06 | 3.20 |
| 2 | t | 1,4-Dioxane | 0.539 | 0.516 | 4.3 | 110 | -0.03 | 0.91 |
| 3 | t | Pyridine | 1.305 | 1.105 | 15.3 | 95 | -0.03 | 1.06 |
| 4 | t | N-Nitrosodimethylamine | 0.995 | 0.586 | 41.1# | 70 | -0.03 | 1.05 |
| 5 | S | 2-Fluorophenol | 1.295 | 1.224 | 5.5 | 111 | -0.03 | 1.93 |
| 6 | t | Indene | 2.200 | 2.121 | 3.6 | 112 | -0.07 | 3.58 |
| 7 | t | Cumene | 3.301 | 2.966 | 10.1 | 103 | -0.06 | 2.31 |
| 8 | S | Phenol-d5 | 1.638 | 1.696 | -3.5 | 116 | 0.00 | 2.98 |
| 9 | t | Phenol | 1.883 | 1.728 | 8.2 | 106 | 0.00 | 2.99 |
| 10 | t | Aniline | 2.083 | 1.667 | 20.0 | 92 | -0.05 | 2.87 |
| 11 | t | bis(2-Chloroethyl)ether | 1.323 | 1.302 | 1.6 | 116 | -0.06 | 2.96 |
| 12 | t | 2-Chlorophenol | 1.458 | 1.345 | 7.8 | 109 | -0.05 | 3.01 |
| 13 | t | Decane | 1.327 | 1.221 | 8.0 | 118 | -0.07 | 3.08 |
| 14 | t | 1,3-Dichlorobenzene | 1.607 | 1.434 | 10.8 | 107 | -0.06 | 3.15 |
| 15 | t | 1,4-Dichlorobenzene | 1.647 | 1.415 | 14.1 | 103 | -0.06 | 3.22 |
| 16 | t | Benzyl alcohol | 0.915 | 0.875 | 4.4 | 108 | -0.05 | 3.49 |
| 17 | t | 1,2-Dichlorobenzene | 1.554 | 1.415 | 8.9 | 106 | -0.06 | 3.47 |
| 18 | t | Acetophenone | 2.016 | 1.800 | 10.7 | 103 | -0.06 | 3.85 |
| 19 | t | 2-Methylphenol | 1.250 | 1.206 | 3.5 | 109 | -0.02 | 3.78 |
| 20 | t | 2,2'-oxybis(1-Chloropropa | 0.478 | 0.433 | 9.4 | 106 | -0.07 | 3.71 |
| 21 | t | 3&4-Methylphenol | 1.358 | 1.345 | 1.0 | 111 | -0.02 | 4.02 |
| 22 | t | n-Nitroso-di-n-propylamin | 1.149 | 1.037 | 9.7 | 106 | -0.07 | 3.92 |
| 23 | t | Hexachloroethane | 0.646 | 0.558 | 13.6 | 105 | -0.07 | 3.90 |
| 24 | I | Naphthalene-d8 | 1.000 | 1.000 | 0.0 | 105 | -0.07 | 5.15 |
| 25 | S | Nitrobenzene-d5 | 0.403 | 0.375 | 6.9 | 107 | -0.06 | 4.05 |
| 26 | t | Nitrobenzene | 0.442 | 0.391 | 11.5 | 101 | -0.07 | 4.07 |
| 27 | t | Quinoline | 0.777 | 0.762 | 1.9 | 110 | -0.07 | 5.80 |
| 28 | t | Isophorone | 0.774 | 0.703 | 9.2 | 101 | -0.07 | 4.47 |
| 29 | t | 2-Nitrophenol | 0.187 | 0.217 | -16.0 | 122 | -0.06 | 4.60 |
| 30 | t | 2,4-Dimethylphenol | 0.409 | 0.330 | 19.3 | 90 | -0.03 | 4.85 |
| 31 | t | Benzoic acid | 0.296 | 0.264 | 10.8 | 100 | -0.03 | 5.19 |
| 32 | t | bis(2-Chloroethoxy)methan | 0.409 | 0.404 | 1.2 | 110 | -0.07 | 4.93 |
| 33 | t | 2,4-Dichlorophenol | 0.347 | 0.330 | 4.9 | 101 | -0.03 | 5.07 |
| 34 | t | 2,6-Dichlorophenol | 0.347 | 0.338 | 2.6 | 108 | -0.05 | 5.43 |
| 35 | t | 1,3,5-Trichlorobenzene | 0.408 | 0.377 | 7.6 | 107 | -0.07 | 4.59 |
| 36 | t | 1,2,4-Trichlorobenzene | 0.405 | 0.366 | 9.6 | 103 | -0.07 | 5.11 |
| 37 | t | 1,2,3-Trichlorobenzene | 0.388 | 0.367 | 5.4 | 109 | -0.07 | 5.52 |
| 38 | t | Naphthalene | 1.097 | 1.001 | 8.8 | 105 | -0.07 | 5.18 |
| 39 | t | 4-Chloroaniline | 0.472 | 0.459 | 2.8 | 107 | -0.05 | 5.43 |
| 40 | t | 2,3-Dichloroaniline | 0.436 | 0.402 | 7.8 | 102 | -0.06 | 7.07 |
| 41 | t | Caprolactam | 0.172 | 0.175 | -1.7 | 113 | -0.09 | 6.00 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** EM3657-CC3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M90256.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 42 | t | Hexachlorobutadiene | 0.265 | 0.217 | 18.1 | 95 | -0.08 | 5.56 |
| 43 | t | 4-Chloro-3-methylphenol | 0.369 | 0.351 | 4.9 | 100 | 0.00 | 6.52 |
| 44 | t | 2-Methylnaphthalene | 0.675 | 0.630 | 6.7 | 108 | -0.07 | 6.43 |
| 45 | t | 1-Methylnaphthalene | 0.758 | 0.709 | 6.5 | 109 | -0.07 | 6.62 |
| 46 | t | Dimethylnaphthalene | 0.719 | 0.686 | 4.6 | 106 | -0.07 | 7.62 |
| 47 | I | Acenaphthene-d10 | 1.000 | 1.000 | 0.0 | 101 | -0.07 | 8.39 |
| 48 | t | Hexachlorocyclopentadiene | 0.379 | 0.284 | 25.1# | 78 | -0.08 | 6.88 |
| 49 | t | 2,4,6-Trichlorophenol | 0.409 | 0.389 | 4.9 | 102 | -0.05 | 7.13 |
| 50 | t | 2,4,5-Trichlorophenol | 0.430 | 0.402 | 6.5 | 97 | -0.02 | 7.24 |
| 51 | S | 2-Fluorobiphenyl | 1.270 | 1.182 | 6.9 | 103 | -0.07 | 7.23 |
| 52 | t | 2-Chloronaphthalene | 1.087 | 1.014 | 6.7 | 104 | -0.07 | 7.31 |
| 53 | t | Biphenyl | 1.347 | 1.254 | 6.9 | 104 | -0.07 | 7.36 |
| 54 | t | 2-Nitroaniline | 0.315 | 0.331 | -5.1 | 109 | -0.05 | 7.70 |
| 55 | t | Dimethylphthalate | 1.308 | 1.167 | 10.8 | 97 | -0.07 | 8.17 |
| 56 | t | Acenaphthylene | 1.741 | 1.671 | 4.0 | 102 | -0.06 | 8.09 |
| 57 | t | 2,6-Dinitrotoluene | 0.249 | 0.286 | -14.9 | 119 | -0.06 | 8.26 |
| 58 | t | 3-Nitroaniline | 0.261 | 0.284 | -8.8 | 109 | -0.04 | 8.51 |
| 59 | t | Acenaphthene | 1.118 | 0.998 | 10.7 | 97 | -0.07 | 8.44 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 60 | t | 2,4-Dinitrophenol | 50.000 | 57.480 | -15.0 | 142 | -0.04 | 8.73 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 61 | t | 4-Nitrophenol | 0.201 | 0.140 | 30.3# | 69 | 0.04 | 9.17 |
| 62 | t | Dibenzofuran | 1.546 | 1.459 | 5.6 | 102 | -0.06 | 8.77 |
| 63 | t | 2,4-Dinitrotoluene | 0.352 | 0.401 | -13.9 | 114 | -0.05 | 9.01 |
| 64 | | 2,3,4,6-Tetrachlorophenol | 0.374 | 0.274 | 26.7# | 78 | -0.05 | 9.20 |
| 65 | t | Diethylphthalate | 1.369 | 1.156 | 15.6 | 93 | -0.08 | 9.56 |
| 66 | t | Fluorene | 1.272 | 1.207 | 5.1 | 102 | -0.06 | 9.42 |
| 67 | t | 4-Chlorophenyl-phenylethe | 0.724 | 0.667 | 7.9 | 101 | -0.07 | 9.53 |
| 68 | t | 4-Nitroaniline | 0.280 | 0.305 | -8.9 | 113 | -0.05 | 9.69 |
| 69 | I | Phenanthrene-d10 | 1.000 | 1.000 | 0.0 | 96 | -0.07 | 11.18 |
| | | ---------- | True | Calc. | % Drift | ---------- | | |
| 70 | t | 4,6-Dinitro-2-methylpheno | 25.000 | 30.473 | -21.9# | 138 | -0.05 | 9.79 |
| | | ---------- | AvgRF | CCRF | % Dev | ---------- | | |
| 71 | t | n-Nitrosodiphenylamine | 0.529 | 0.499 | 5.7 | 98 | -0.07 | 9.81 |
| 72 | t | 1,2-Diphenylhydrazine | 0.730 | 0.658 | 9.9 | 93 | -0.07 | 9.82 |
| 73 | S | 2,4,6-Tribromophenol | 0.071 | 0.075 | -5.6 | 104 | -0.06 | 9.95 |
| 74 | t | 4-Bromophenyl-phenylether | 0.209 | 0.203 | 2.9 | 101 | -0.07 | 10.44 |
| 75 | t | Hexachlorobenzene | 0.213 | 0.200 | 6.1 | 101 | -0.07 | 10.63 |
| 76 | t | Pentachlorophenol | 0.143 | 0.095 | 33.6# | 64 | -0.04 | 11.08 |
| 77 | t | Phenanthrene | 1.013 | 0.942 | 7.0 | 97 | -0.07 | 11.22 |
| 78 | t | Anthracene | 0.978 | 0.937 | 4.2 | 97 | -0.07 | 11.31 |
| 79 | t | Carbazole | 0.933 | 0.946 | -1.4 | 100 | -0.05 | 11.75 |
| 80 | t | Di-n-butylphthalate | 1.145 | 1.173 | -2.4 | 97 | -0.07 | 12.76 |
| 81 | t | Fluoranthene | 1.267 | 1.259 | 0.6 | 98 | -0.07 | 13.51 |
| 82 | t | Octadecane | 0.317 | 0.342 | -7.9 | 105 | -0.07 | 11.40 |
| 83 | I | Chrysene-d12 | 1.000 | 1.000 | 0.0 | 88 | -0.06 | 16.09 |
| 84 | t | Pyrene | 1.205 | 1.289 | -7.0 | 98 | -0.06 | 13.92 |
| 85 | | Butyl stearate | 0.196 | 0.260 | -32.7# | 112 | -0.05 | 15.72 |
| 86 | S | Terphenyl-d14 | 0.818 | 0.870 | -6.4 | 97 | -0.06 | 14.44 |
| 87 | t | Butylbenzylphthalate | 0.502 | 0.549 | -9.4 | 97 | -0.06 | 15.51 |
| 88 | t | Benzo[a]anthracene | 1.170 | 1.203 | -2.8 | 97 | -0.05 | 16.07 |
| 89 | t | 3,3'-Dichlorobenzidine | 0.366 | 0.396 | -8.2 | 99 | -0.04 | 16.17 |
| 90 | t | Chrysene | 1.058 | 1.015 | 4.1 | 90 | -0.05 | 16.13 |

# Continuing Calibration Summary

**Job Number:** JB22549 **Sample:** EM3657-CC3617
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M90256.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 91 | t | bis(2-Ethylhexyl)phthalat | 0.613 | 0.715 | -16.6 | 103 | -0.05 | 16.51 |
| 92 | I | Perylene-d12 | 1.000 | 1.000 | 0.0 | 88 | -0.04 | 17.92 |
| 93 | t | Di-n-octylphthalate | 1.241 | 1.486 | -19.7 | 103 | -0.05 | 17.30 |
| 94 | t | Benzo[b]fluoranthene | 1.316 | 1.586 | -20.5# | 99 | -0.05 | 17.50 |
| 95 | t | Benzo[k]fluoranthene | 1.241 | 0.966 | 22.2# | 83 | -0.05 | 17.53 |
| 96 | t | Benzo[a]pyrene | 1.143 | 1.220 | -6.7 | 97 | -0.04 | 17.85 |
| 97 | t | Indeno[1,2,3-cd]pyrene | 1.249 | 1.315 | -5.3 | 94 | -0.03 | 18.98 |
| 98 | t | Dibenz(a,h)acridine | 0.892 | 1.019 | -14.2 | 100 | -0.04 | 18.79 |
| 99 | t | Dibenz[a,h]anthracene | 1.024 | 1.080 | -5.5 | 94 | -0.04 | 19.00 |
| 100 | t | 7,12-Dimethylbenz(a)anthr | 0.649 | 0.528 | 18.6 | 78 | -0.05 | 17.53 |
| 101 | t | Benzo[g,h,i]perylene | 1.026 | 1.075 | -4.8 | 95 | -0.03 | 19.19 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
M89377.D MM3617.M Mon Dec 17 15:13:06 2012 GCMSM

8.7.27

8

# Continuing Calibration Summary



**Job Number:** JB22549 **Sample:** EM3657-CC3618
**Account:** AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** M90257.D
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\EM3657\M90257.D            Vial: 3
Acq On    : 14 Dec 2012  10:52 am                   Operator: olgaa
Sample    : cc3618-50                               Inst    : MSM
Misc      : op61971,em3657,                         Multiplr: 1.00
MS Integration Params: LSCINT.P

Method       : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title        : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update  : Tue Dec 11 16:20:49 2012
Response via : Multiple Level Calibration

Min. RRF     :   0.049  Min. Rel. Area :  49%  Max. R.T. Dev  0.50min
Max. RRF Dev :  20%     Max. Rel. Area : 200%
```

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) | R.T. |
|---|---|---|---|---|---|---|---|---|
| 102 | I | 1,4-Dichlorobenzene-d4a | 1.000 | 1.000 | 0.0 | 124 | -0.06 | 3.20 |
| 103 | t | Benzaldehyde | 1.050 | 0.848 | 19.2 | 97 | -0.07 | 2.68 |
| 104 | I | Acenaphthene-d10a | 1.000 | 1.000 | 0.0 | 110 | -0.07 | 8.39 |
| 105 | t | 1,2,4,5-Tetrachlorobenzen | 0.598 | 0.589 | 1.5 | 109 | -0.08 | 6.83 |
| 106 | I | Phenanthrene-d10a | 1.000 | 1.000 | 0.0 | 104 | -0.07 | 11.18 |
| 107 | t | Atrazine | 0.123 | 0.137 | -11.4 | 109 | -0.08 | 11.04 |
| 108 | I | Chrysene-d12a | 1.000 | 1.000 | 0.0 | 96 | -0.06 | 16.09 |
| 109 | t | Benzidine | 0.549 | 0.480 | 12.6 | 76 | -0.09 | 13.96 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
M90150.D MM3617.M Mon Dec 17 15:14:23 2012 GCMSM

8.7.28

8

New Jersey

ACCUTEST LABORATORIES

GC/MS Semi-volatiles

Raw Data

Manual Integrations APPROVED (compounds with "m" flag)
Kristi Schollenberger 12/17/12 11:27

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\EM3656\M90250.D Vial: 25
Acq On : 13 Dec 2012 8:06 pm Operator: olgaa
Sample : jb22549-1 Inst : MSM
Misc : op61971,em3656,33.2 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 17 13:17 2012 Quant Results File: MM3617.RES

Quant Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration
DataAcq Meth : MM3617

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) 1,4-Dichlorobenzene-d4 | 3.27 | 152 | 70952 | 40.00 | ppb | 0.00 |
| 24) Naphthalene-d8 | 5.23 | 136 | 222032 | 40.00 | ppb | 0.01 |
| 47) Acenaphthene-d10 | 8.49 | 164 | 142774 | 40.00 | ppb | 0.03 |
| 69) Phenanthrene-d10 | 11.30 | 188 | 254706 | 40.00 | ppb | 0.04 |
| 83) Chrysene-d12 | 16.20 | 240 | 256792 | 40.00 | ppb | 0.05 |
| 92) Perylene-d12 | 18.03 | 264 | 219589 | 40.00 | ppb | 0.07 |
| 102) 1,4-Dichlorobenzene-d4a | 3.27 | 152 | 70952 | 40.00 | ppb | 0.00 |
| 104) Acenaphthene-d10a | 8.49 | 164 | 142774 | 40.00 | ppb | 0.03 |
| 106) Phenanthrene-d10a | 11.30 | 188 | 254706 | 40.00 | ppb | 0.04 |
| 108) Chrysene-d12a | 16.20 | 240 | 256792 | 40.00 | ppb | 0.05 |
| **System Monitoring Compounds** | | | | | | |
| 5) 2-Fluorophenol | 1.98 | 112 | 66131 | 28.79 | ppb | 0.02 |
| Spiked Amount 50.000 | | | Recovery = 57.58% | | | |
| 8) Phenol-d5 | 3.04 | 99 | 79971 | 27.53 | ppb | 0.06 |
| Spiked Amount 50.000 | | | Recovery = 55.06% | | | |
| 25) Nitrobenzene-d5 | 4.11 | 82 | 116368 | 51.96 | ppb | 0.00 |
| Spiked Amount 50.000 | | | Recovery = 103.92% | | | |
| 51) 2-Fluorobiphenyl | 7.31 | 172 | 178531 | 39.39 | ppb | 0.01 |
| Spiked Amount 50.000 | | | Recovery = 78.78% | | | |
| 73) 2,4,6-Tribromophenol | 10.07 | 330 | 23489 | 51.91 | ppb | 0.05 |
| Spiked Amount 50.000 | | | Recovery = 103.82% | | | |
| 86) Terphenyl-d14 | 14.57 | 244 | 241304 | 45.97 | ppb | 0.06 |
| Spiked Amount 50.000 | | | Recovery = 91.94% | | | |

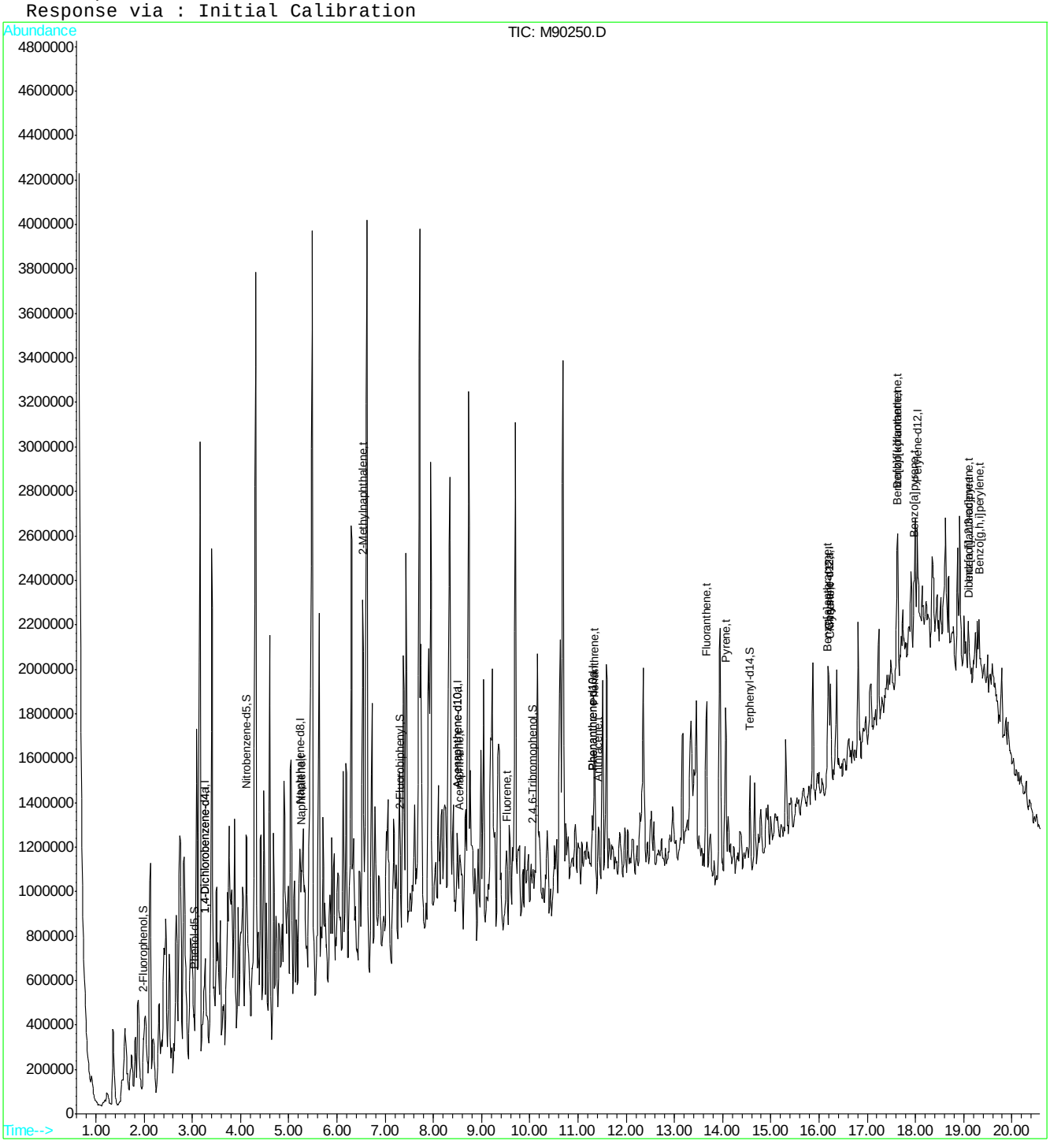
| Target Compounds | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 38) Naphthalene | 5.26 | 128 | 342928 | 56.30 | ppb | | 98 |
| 44) 2-Methylnaphthalene | 6.54 | 141 | 608432 | 162.29 | ppb | # | 75 |
| 59) Acenaphthene | 8.54 | 153 | 102569 | 25.71 | ppb | | 99 |
| 66) Fluorene | 9.53 | 166 | 106116 | 23.36 | ppb | | 96 |
| 77) Phenanthrene | 11.34 | 178 | 462638 | 71.70 | ppb | | 98 |
| 78) Anthracene | 11.42 | 178 | 152418 | 24.48 | ppb | | 98 |
| 81) Fluoranthene | 13.67 | 202 | 717772 | 88.96 | ppb | | 99 |
| 84) Pyrene | 14.06 | 202 | 680863 | 88.05 | ppb | | 98 |
| 88) Benzo[a]anthracene | 16.18 | 228 | 266489 | 35.48 | ppb | | 97 |
| 90) Chrysene | 16.23 | 228 | 254361 | 37.46 | ppb | | 93 |
| 94) Benzo[b]fluoranthene | 17.62 | 252 | 251075m | 34.75 | ppb | | |
| 95) Benzo[k]fluoranthene | 17.63 | 252 | 67215m | 9.86 | ppb | | |
| 96) Benzo[a]pyrene | 17.96 | 252 | 172137 | 27.43 | ppb | | 96 |
| 97) Indeno[1,2,3-cd]pyrene | 19.10 | 276 | 99171 | 14.46 | ppb | | 94 |
| 99) Dibenz[a,h]anthracene | 19.11 | 278 | 33438m | 5.95 | ppb | | |
| 101) Benzo[g,h,i]perylene | 19.32 | 276 | 104872 | 18.61 | ppb | | 91 |

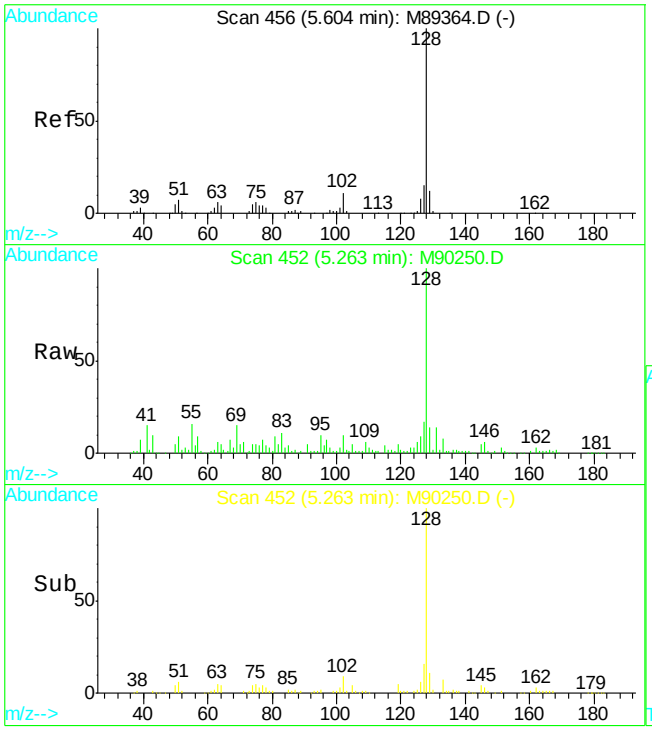
(#) = qualifier out of range (m) = manual integration
M90250.D MM3617.M Mon Dec 17 13:17:50 2012 GCMSM Page 1

# Quantitation Report

Data File : C:\HPCHEM\1\DATA\EM3656\M90250.D  Vial: 25
Acq On : 13 Dec 2012 8:06 pm  Operator: olgaa
Sample : jb22549-1  Inst : MSM
Misc : op61971,em3656,33.2  Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 17 13:17 2012  Quant Results File: MM3617.RES

Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration

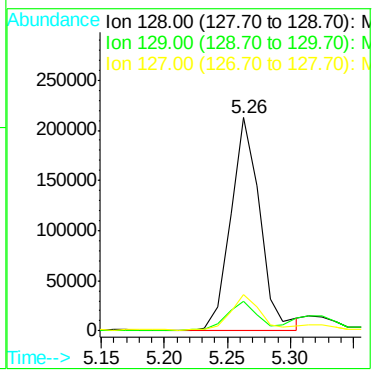


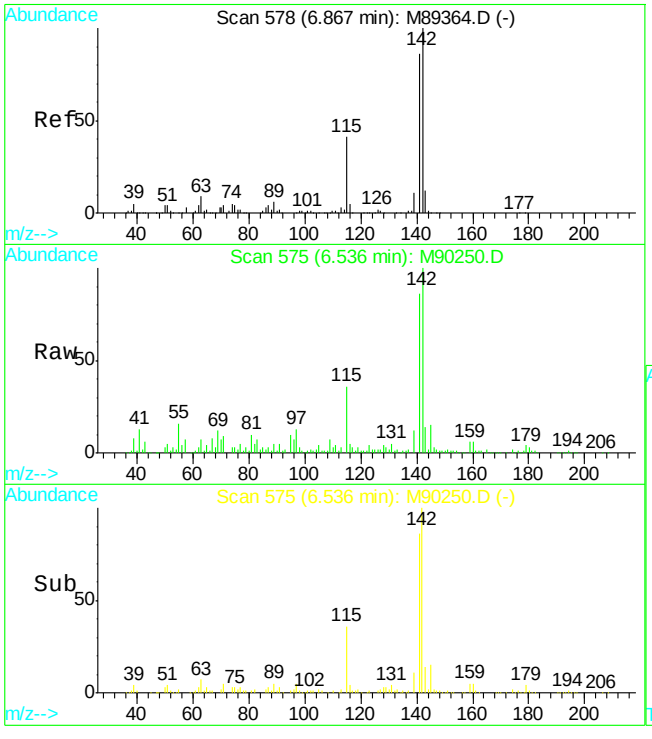



#38
Naphthalene
Concen: 56.30 ppb
RT: 5.26 min Scan# 452
Delta R.T. 0.01 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:128 Resp: 342928

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 128 | 100 | | |
| 129 | 11.3 | 0.0 | 42.1 |
| 127 | 16.3 | 0.0 | 45.2 |

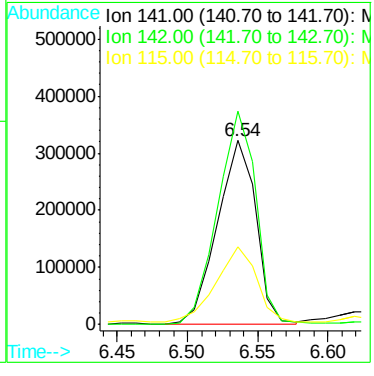


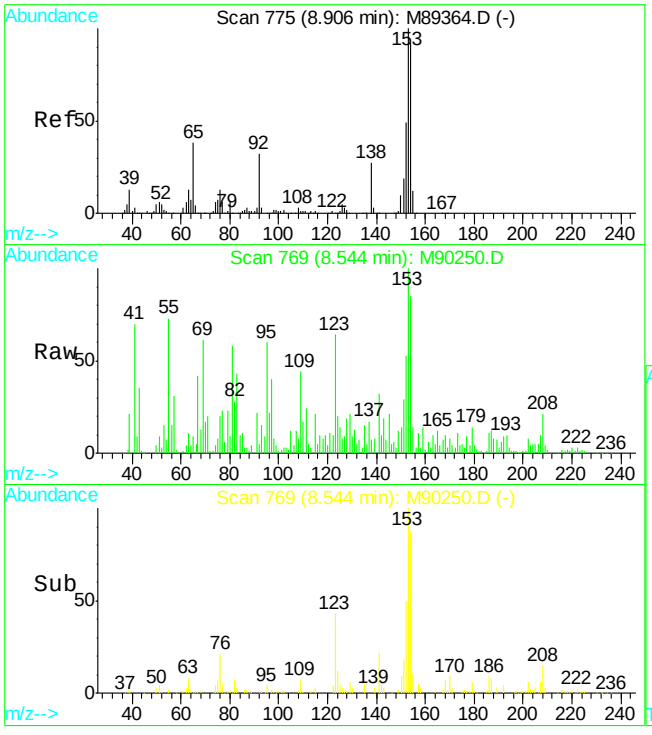




#44
2-Methylnaphthalene
Concen: 162.29 ppb
RT: 6.54 min Scan# 575
Delta R.T. 0.03 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:141 Resp: 608432

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 141 | 100 | | |
| 142 | 116.5 | 126.0 | 186.0# |
| 115 | 41.2 | 13.5 | 73.5 |

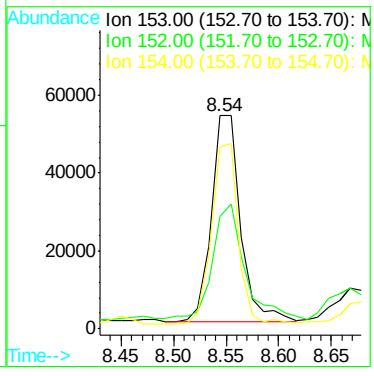


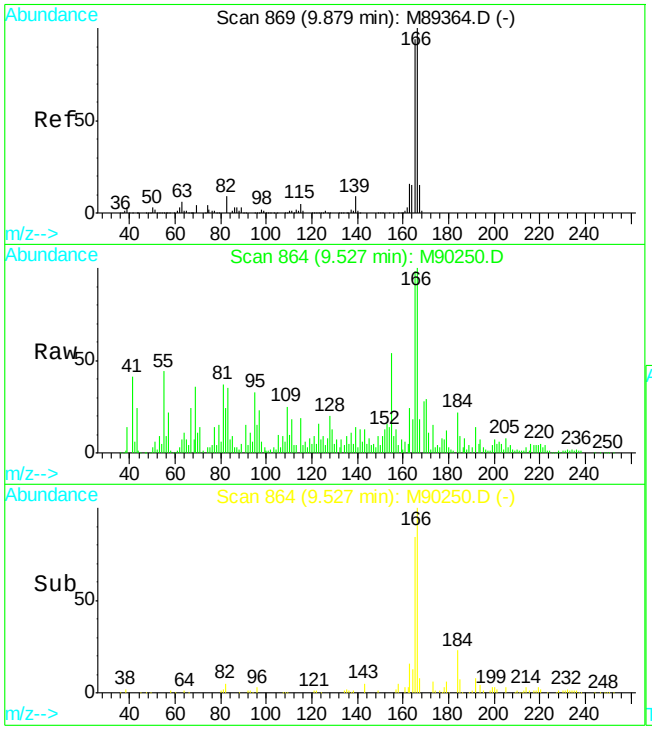



#59
Acenaphthene
Concen: 25.71 ppb
RT: 8.54 min Scan# 769
Delta R.T. 0.03 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:153 Resp: 102569

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 153 | 100 | | |
| 152 | 48.9 | 17.5 | 77.5 |
| 154 | 85.7 | 56.4 | 116.4 |

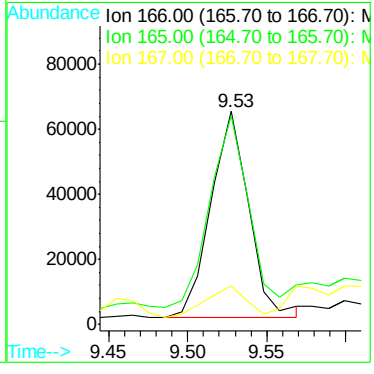


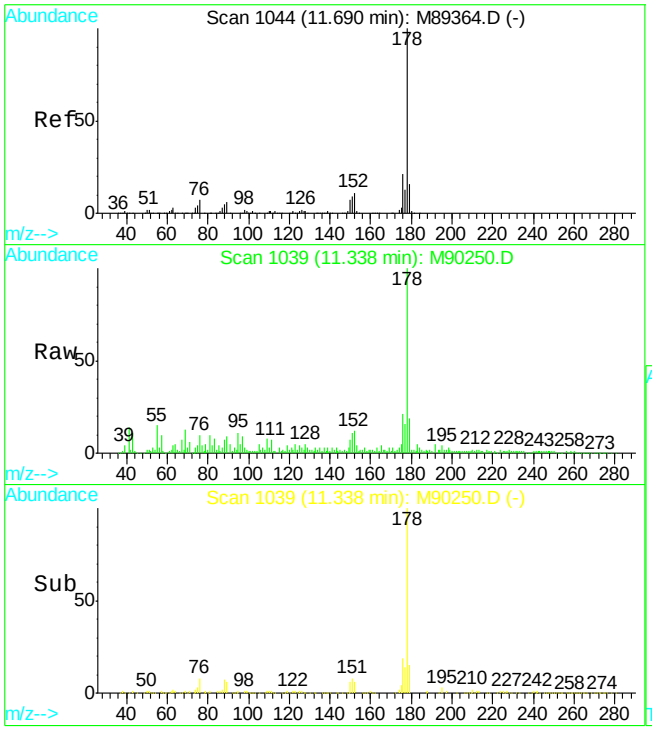




#66
Fluorene
Concen: 23.36 ppb
RT: 9.53 min Scan# 864
Delta R.T. 0.04 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:166 Resp: 106116

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 166 | 100 | | |
| 165 | 89.8 | 61.7 | 121.7 |
| 167 | 8.0 | 0.0 | 45.5 |

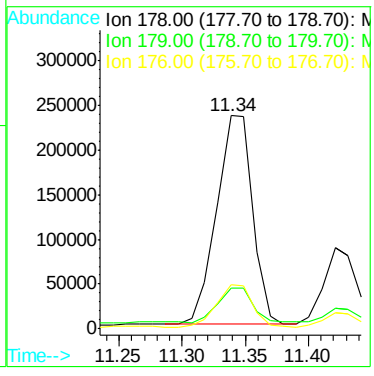


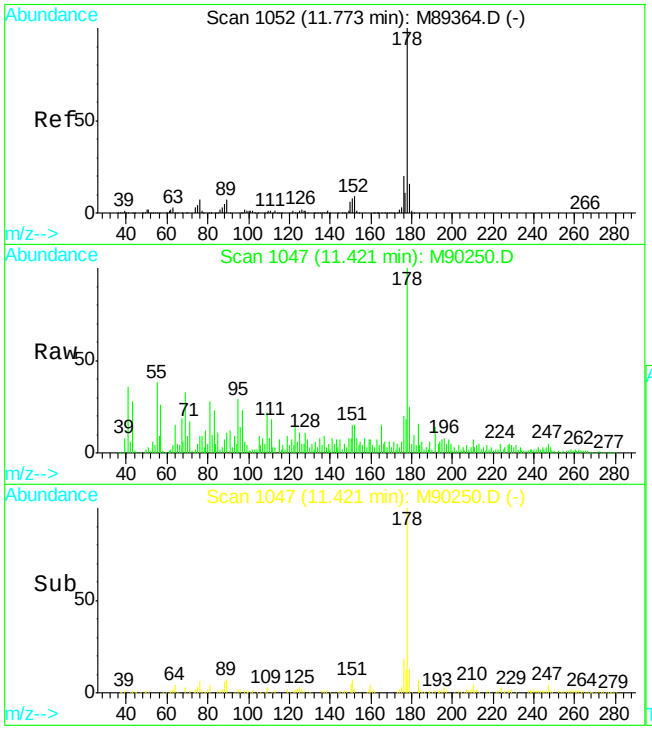



#77
Phenanthrene
Concen: 71.70 ppb
RT: 11.34 min Scan# 1039
Delta R.T. 0.04 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:178 Resp: 462638

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 16.1 | 0.0 | 47.4 |
| 176 | 20.1 | 0.0 | 50.3 |

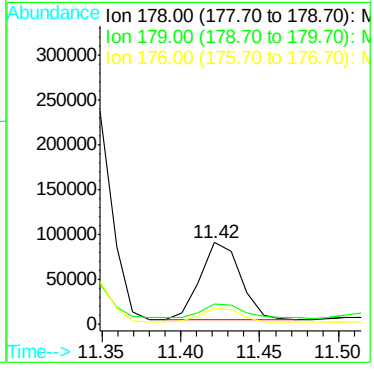



#78
Anthracene
Concen: 24.48 ppb
RT: 11.42 min Scan# 1047
Delta R.T. 0.04 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

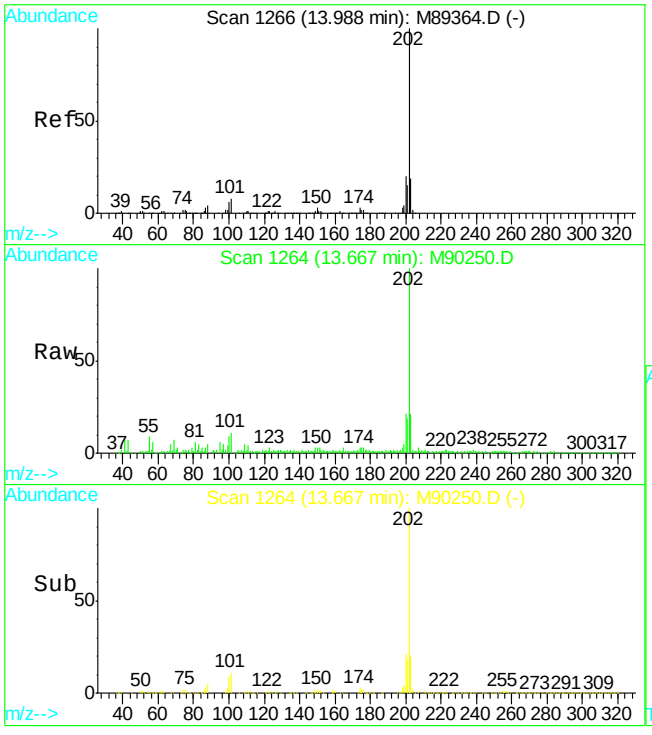
Tgt Ion:178 Resp: 152418

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 17.3 | 0.0 | 47.3 |
| 176 | 18.2 | 0.0 | 50.3 |




9.1.1

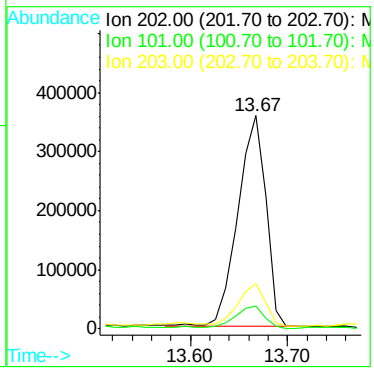
9

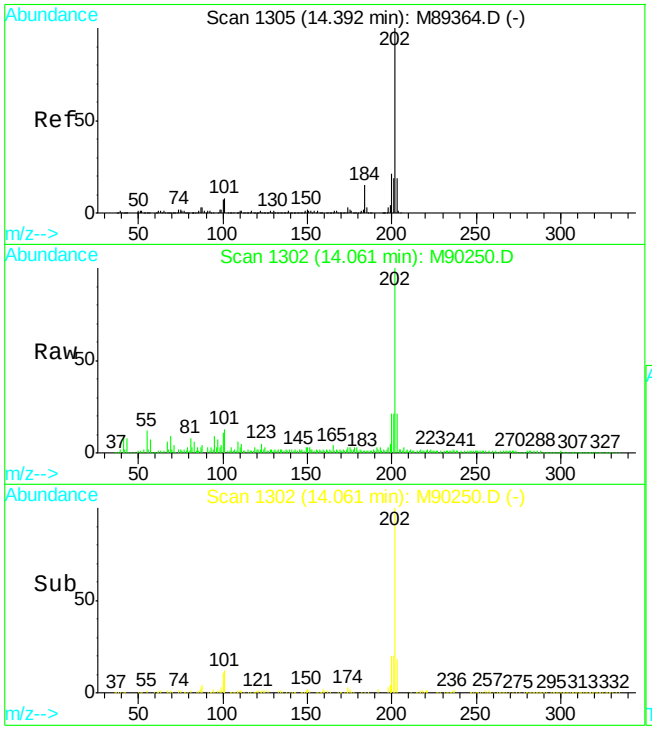



#81
Fluoranthene
Concen: 88.96 ppb
RT: 13.67 min Scan# 1264
Delta R.T. 0.09 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:202 Resp: 717772

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 101 | 10.4 | 0.0 | 40.6 |
| 203 | 19.5 | 0.0 | 50.3 |

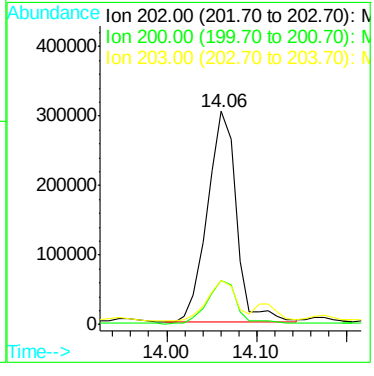


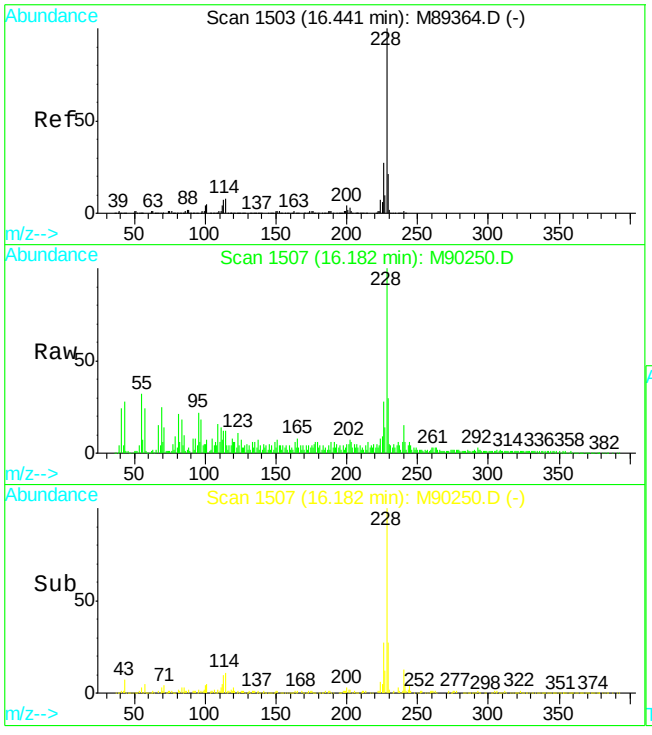




#84
Pyrene
Concen: 88.05 ppb
RT: 14.06 min Scan# 1302
Delta R.T. 0.09 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:202 Resp: 680863

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 200 | 20.5 | 0.0 | 51.0 |
| 203 | 19.0 | 0.0 | 50.0 |

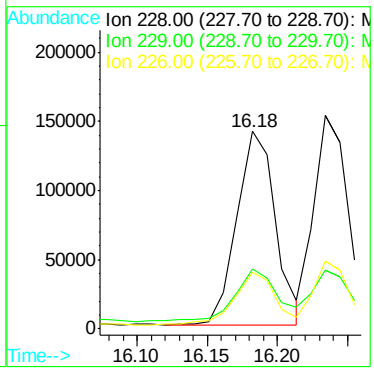


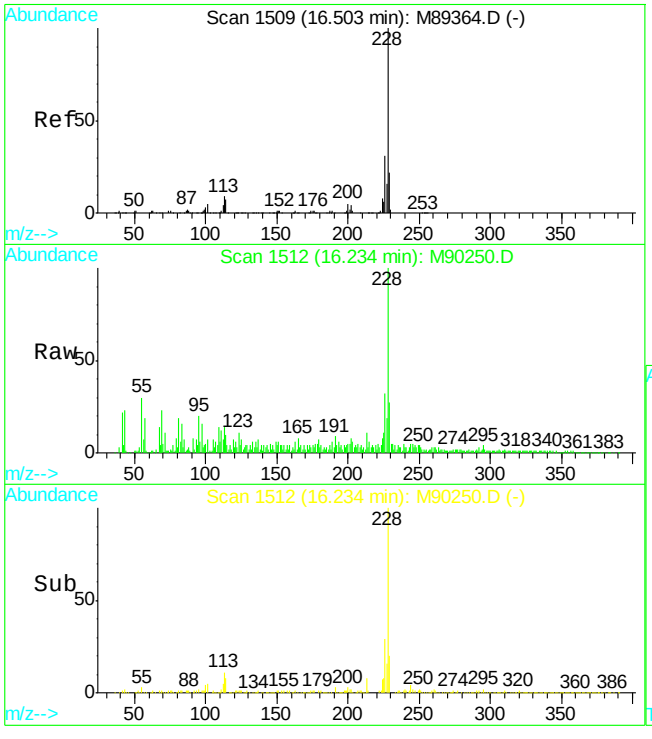



#88
Benzo[a]anthracene
Concen: 35.48 ppb
RT: 16.18 min Scan# 1507
Delta R.T. 0.06 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:228 Resp: 266489

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 229 | 24.6 | 0.0 | 53.2 |
| 226 | 26.5 | 0.0 | 58.3 |

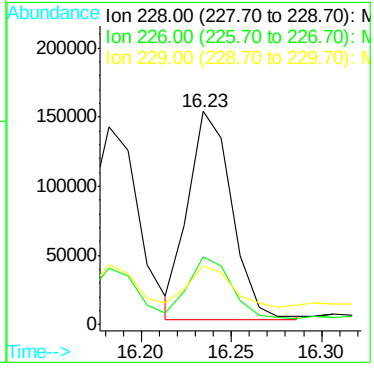


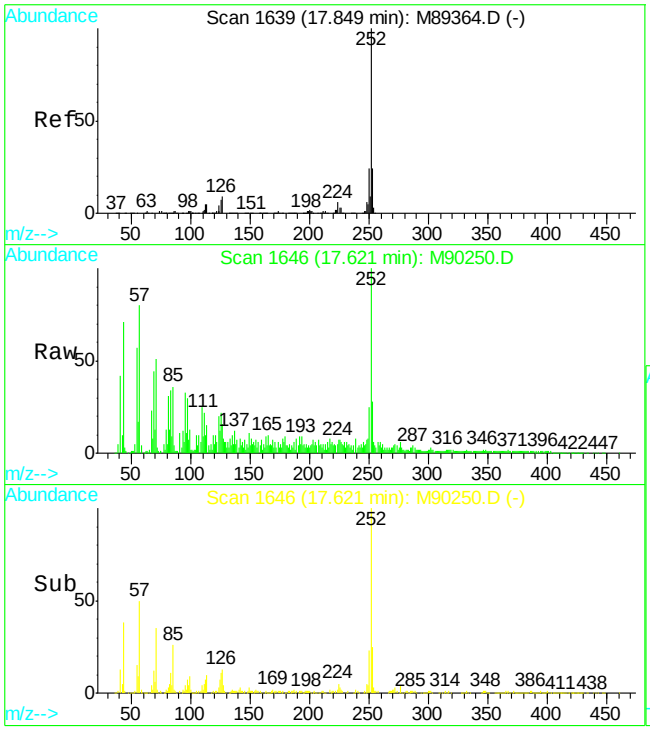




#90
Chrysene
Concen: 37.46 ppb
RT: 16.23 min Scan# 1512
Delta R.T. 0.05 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:228 Resp: 254361

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 226 | 30.0 | 2.3 | 62.3 |
| 229 | 19.3 | 0.0 | 54.2 |

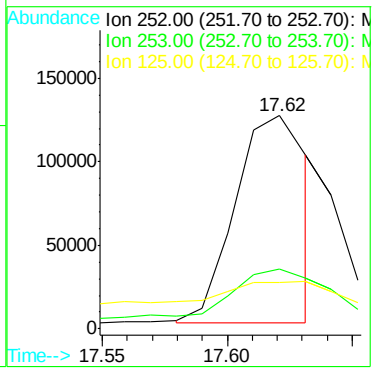


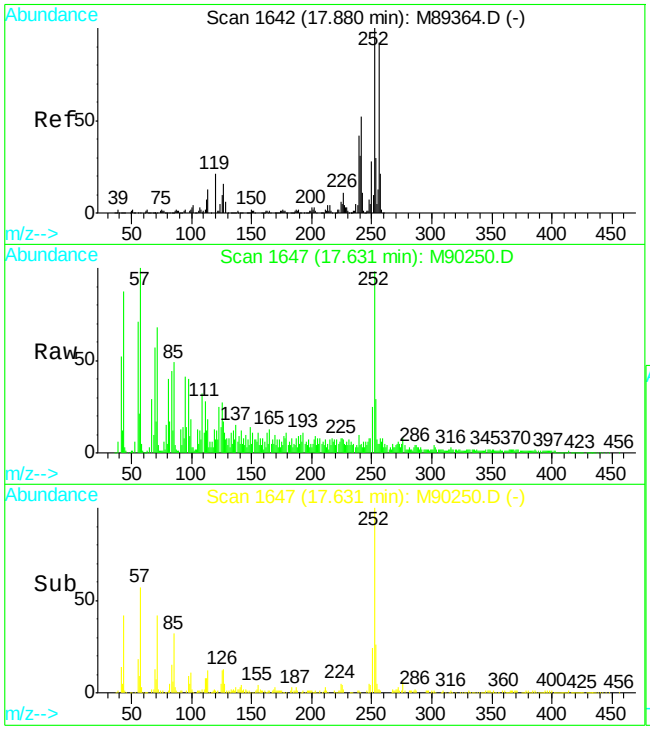



#94
Benzo[b]fluoranthene
Concen: 34.75 ppb m
RT: 17.62 min Scan# 1646
Delta R.T. 0.07 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:252 Resp: 251075

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 27.9 | 0.0 | 55.6 |
| 125 | 21.8 | 0.0 | 40.3 |

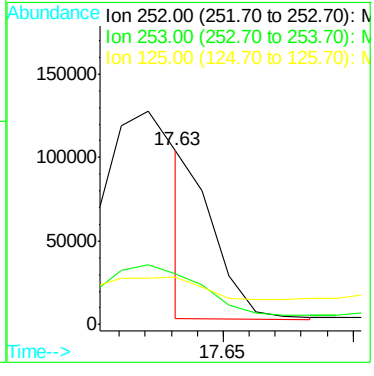


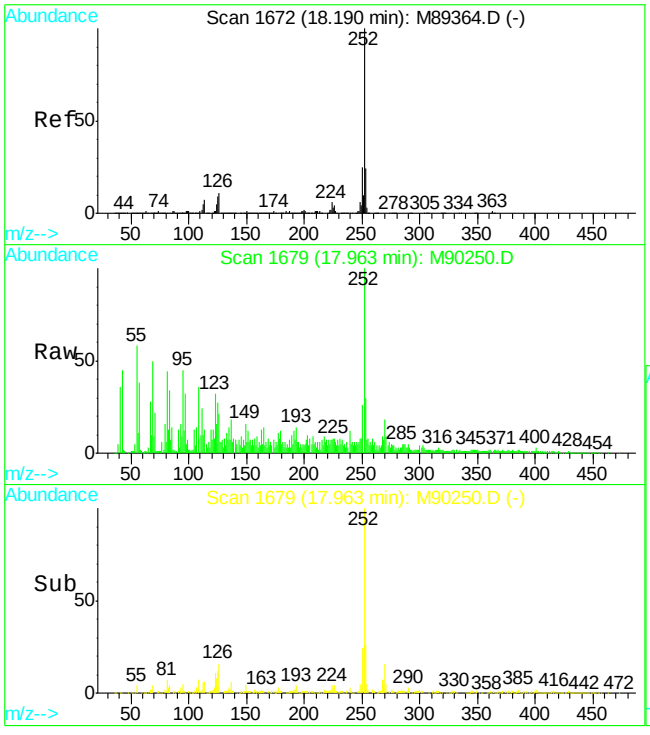




#95
Benzo[k]fluoranthene
Concen: 9.86 ppb m
RT: 17.63 min Scan# 1647
Delta R.T. 0.05 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:252 Resp: 67215

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 29.5 | 0.0 | 58.9 |
| 125 | 27.0 | 0.0 | 43.1 |

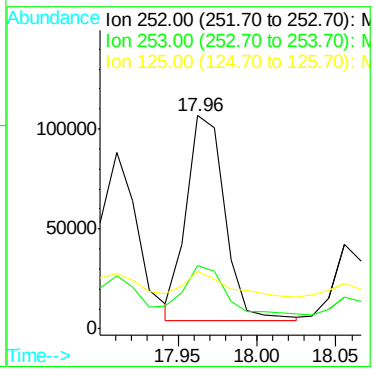


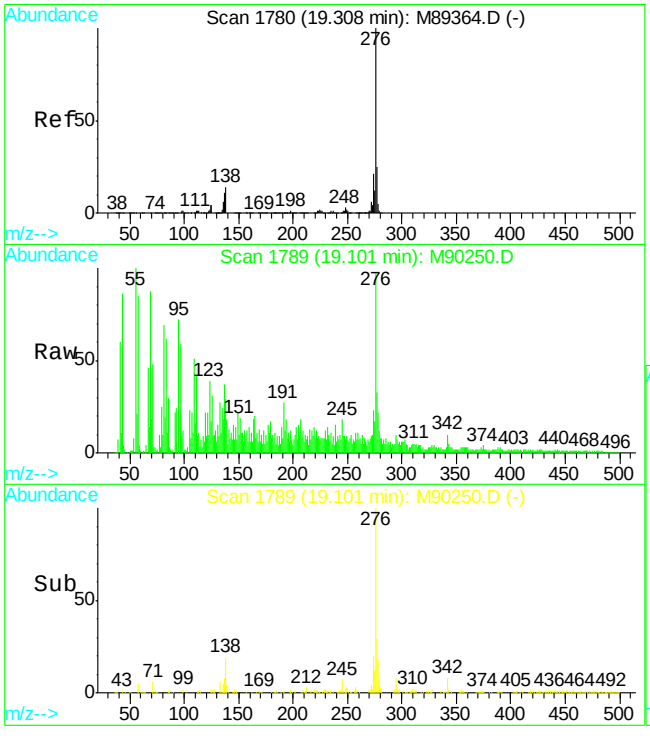



#96
Benzo[a]pyrene
Concen: 27.43 ppb
RT: 17.96 min Scan# 1679
Delta R.T. 0.07 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:252 Resp: 172137

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 23.0 | 0.0 | 55.8 |
| 125 | 12.4 | 0.0 | 42.8 |

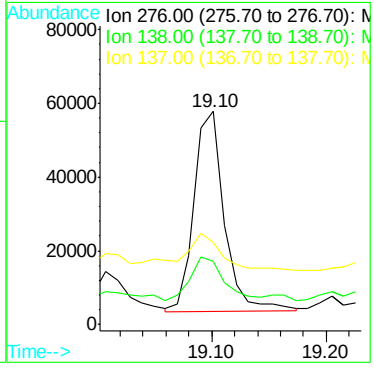


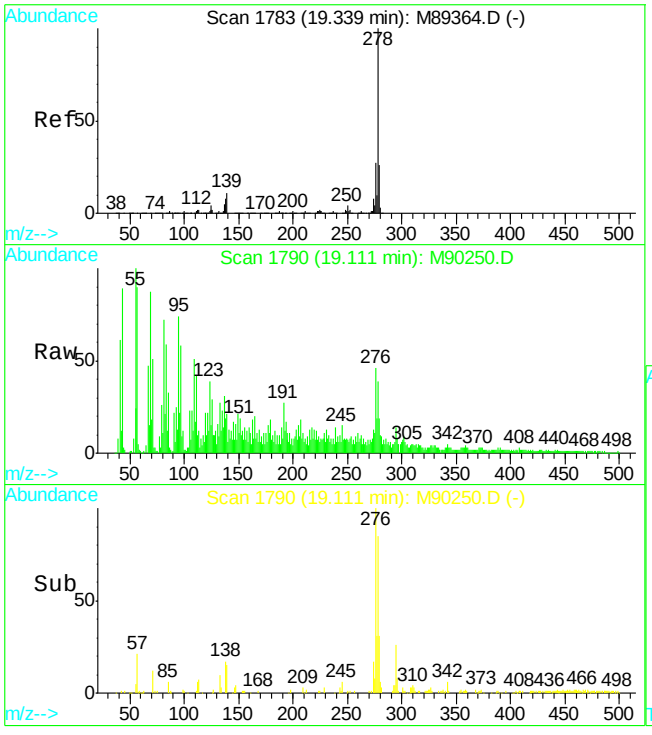




#97
Indeno[1,2,3-cd]pyrene
Concen: 14.46 ppb
RT: 19.10 min Scan# 1789
Delta R.T. 0.10 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:276 Resp: 99171

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 19.6 | 0.0 | 51.4 |
| 137 | 11.6 | 0.0 | 45.7 |

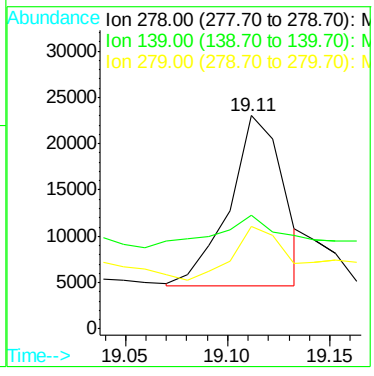


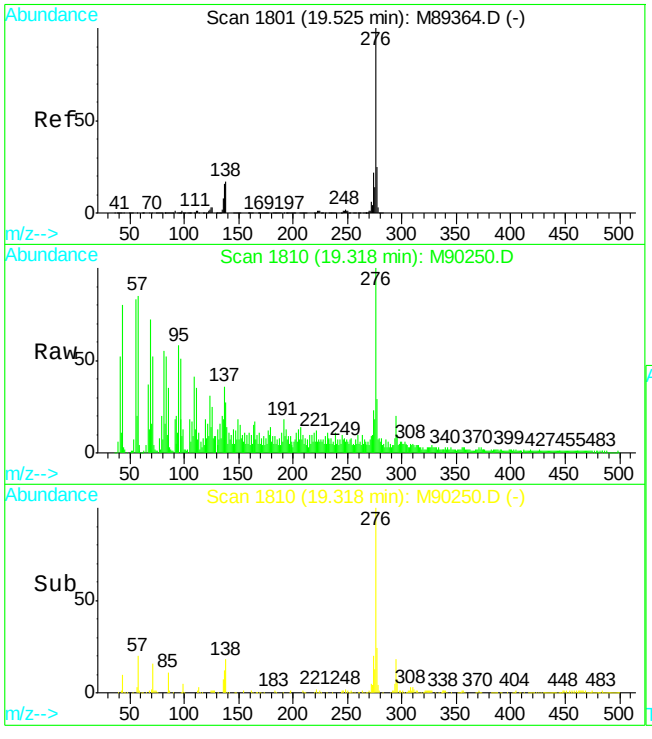



#99
Dibenz[a,h]anthracene
Concen: 5.95 ppb m
RT: 19.11 min Scan# 1790
Delta R.T. 0.07 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:278 Resp: 33438

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 278 | 100 | | |
| 139 | 53.2 | 0.0 | 45.4# |
| 279 | 47.9 | 0.0 | 58.2 |

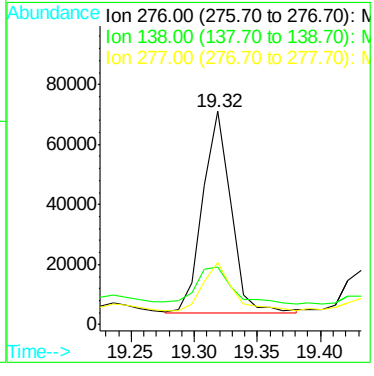



#101
Benzo[g,h,i]perylene
Concen: 18.61 ppb
RT: 19.32 min Scan# 1810
Delta R.T. 0.10 min
Lab File: M90250.D
Acq: 13 Dec 2012 8:06 pm

Tgt Ion:276 Resp: 104872

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 18.0 | 0.0 | 53.9 |
| 277 | 24.0 | 0.0 | 57.2 |



Manual Integrations APPROVED (compounds with "m" flag)
Kristi Schollenberger 12/17/12 11:27

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\EM3657\M90276.D Vial: 22
Acq On : 14 Dec 2012 7:36 pm Operator: olgaa
Sample : jb22549-2 Inst : MSM
Misc : op61971,em3657,33.2,,,1,2 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 16 14:42 2012 Quant Results File: MM3617.RES

Quant Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration
DataAcq Meth : MM3617

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) 1,4-Dichlorobenzene-d4 | 3.20 | 152 | 116559 | 40.00 | ppb | -0.06 |
| 24) Naphthalene-d8 | 5.15 | 136 | 431253 | 40.00 | ppb | -0.07 |
| 47) Acenaphthene-d10 | 8.39 | 164 | 271175 | 40.00 | ppb | -0.07 |
| 69) Phenanthrene-d10 | 11.18 | 188 | 462585 | 40.00 | ppb | -0.07 |
| 83) Chrysene-d12 | 16.12 | 240 | 437888 | 40.00 | ppb | -0.03 |
| 92) Perylene-d12 | 17.95 | 264 | 353007 | 40.00 | ppb | 0.00 |
| 102) 1,4-Dichlorobenzene-d4a | 3.20 | 152 | 116559 | 40.00 | ppb | -0.06 |
| 104) Acenaphthene-d10a | 8.39 | 164 | 271175 | 40.00 | ppb | -0.07 |
| 106) Phenanthrene-d10a | 11.18 | 188 | 462585 | 40.00 | ppb | -0.07 |
| 108) Chrysene-d12a | 16.12 | 240 | 437888 | 40.00 | ppb | -0.03 |
| **System Monitoring Compounds** | | | | | | |
| 5) 2-Fluorophenol | 1.94 | 112 | 58393 | 15.47 | ppb | -0.02 |
| Spiked Amount 50.000 | | | Recovery = 30.94% | | | |
| 8) Phenol-d5 | 2.98 | 99 | 87329 | 18.30 | ppb | 0.00 |
| Spiked Amount 50.000 | | | Recovery = 36.60% | | | |
| 25) Nitrobenzene-d5 | 4.05 | 82 | 66081 | 15.19 | ppb | -0.06 |
| Spiked Amount 50.000 | | | Recovery = 30.38% | | | |
| 51) 2-Fluorobiphenyl | 7.22 | 172 | 169347 | 19.67 | ppb | -0.08 |
| Spiked Amount 50.000 | | | Recovery = 39.34% | | | |
| 73) 2,4,6-Tribromophenol | 9.95 | 330 | 22552 | 27.44 | ppb | -0.06 |
| Spiked Amount 50.000 | | | Recovery = 54.88% | | | |
| 86) Terphenyl-d14 | 14.45 | 244 | 206309 | 23.05 | ppb | -0.05 |
| Spiked Amount 50.000 | | | Recovery = 46.10% | | | |

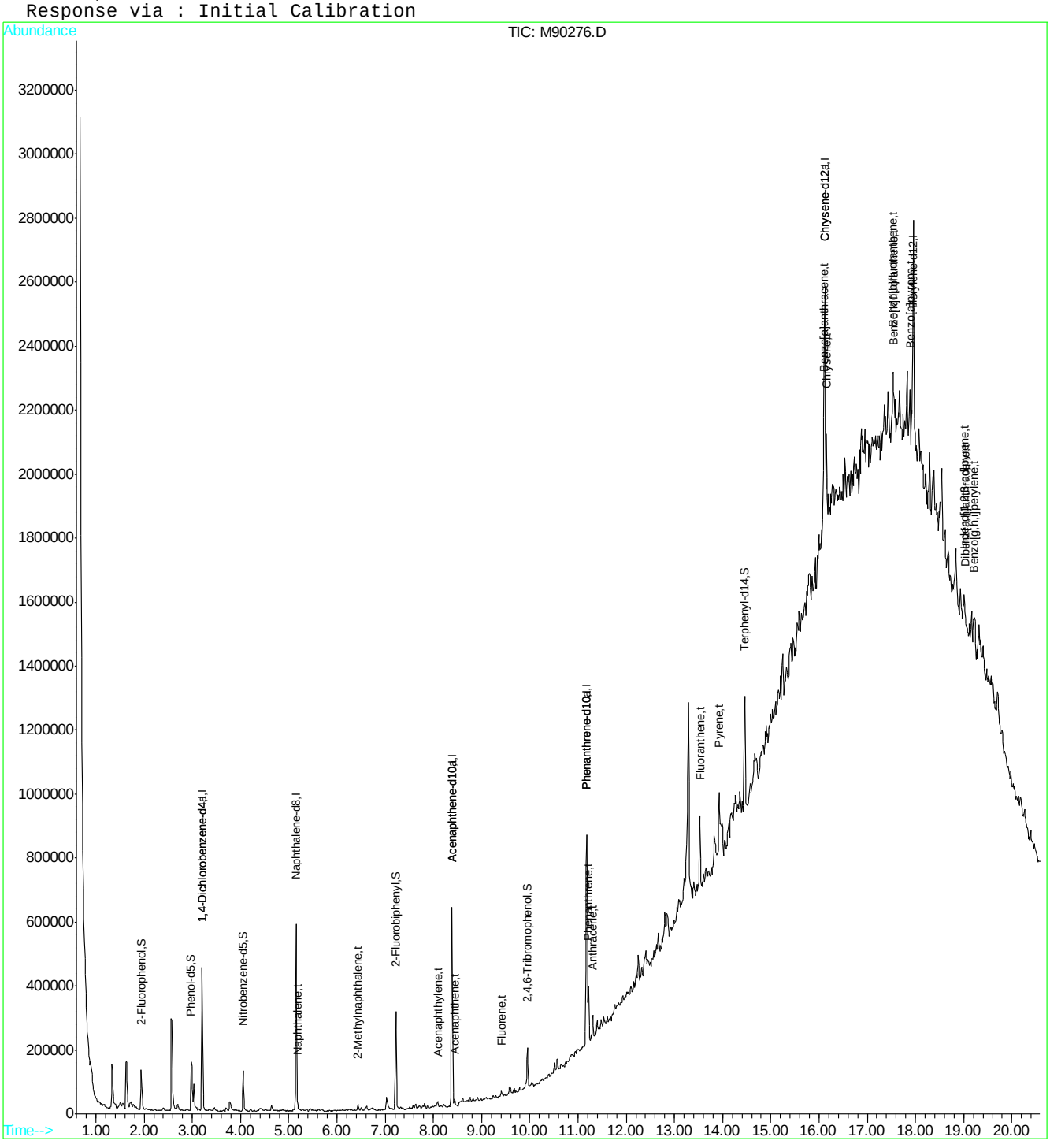
| Target Compounds | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 38) Naphthalene | 5.18 | 128 | 13503 | 1.14 | ppb | 97 |
| 44) 2-Methylnaphthalene | 6.43 | 141 | 7783m | 1.07 | ppb | |
| 56) Acenaphthylene | 8.09 | 152 | 15681 | 1.33 | ppb | 95 |
| 59) Acenaphthene | 8.44 | 153 | 9993 | 1.32 | ppb | 97 |
| 66) Fluorene | 9.41 | 166 | 11926 | 1.38 | ppb | 92 |
| 77) Phenanthrene | 11.21 | 178 | 127744 | 10.90 | ppb | 99 |
| 78) Anthracene | 11.31 | 178 | 41173 | 3.64 | ppb | 95 |
| 81) Fluoranthene | 13.53 | 202 | 192616 | 13.14 | ppb | 92 |
| 84) Pyrene | 13.93 | 202 | 168334 | 12.77 | ppb | 96 |
| 88) Benzo[a]anthracene | 16.10 | 228 | 107814 | 8.42 | ppb | 94 |
| 90) Chrysene | 16.15 | 228 | 114449 | 9.88 | ppb | 93 |
| 94) Benzo[b]fluoranthene | 17.54 | 252 | 112108m | 9.65 | ppb | |
| 95) Benzo[k]fluoranthene | 17.55 | 252 | 46881m | 4.28 | ppb | |
| 96) Benzo[a]pyrene | 17.89 | 252 | 83167 | 8.24 | ppb | 93 |
| 97) Indeno[1,2,3-cd]pyrene | 19.01 | 276 | 60407 | 5.48 | ppb | 97 |
| 99) Dibenz[a,h]anthracene | 19.03 | 278 | 28061 | 3.11 | ppb | 94 |
| 101) Benzo[g,h,i]perylene | 19.23 | 276 | 69471 | 7.67 | ppb | 94 |

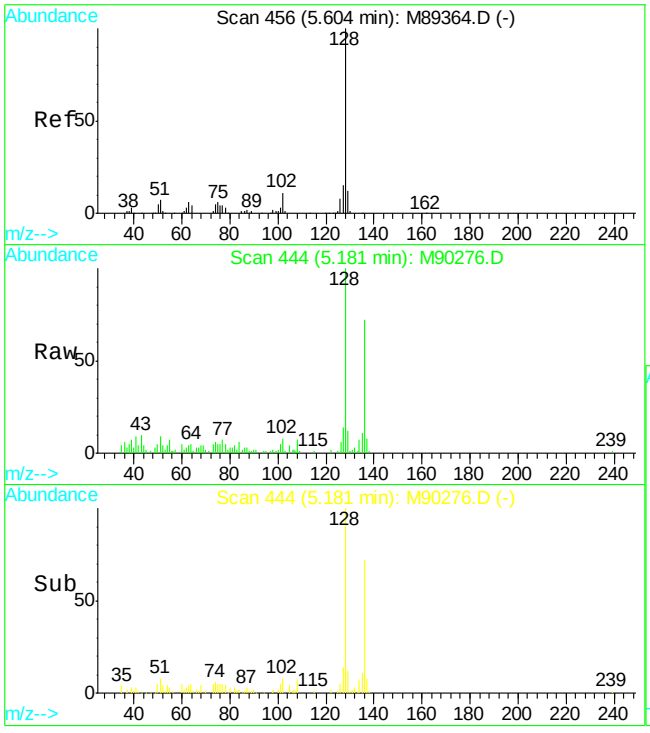
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\EM3657\M90276.D Vial: 22
Acq On : 14 Dec 2012 7:36 pm Operator: olgaa
Sample : jb22549-2 Inst : MSM
Misc : op61971,em3657,33.2,,,1,2 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 16 14:42 2012 Quant Results File: MM3617.RES

Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration

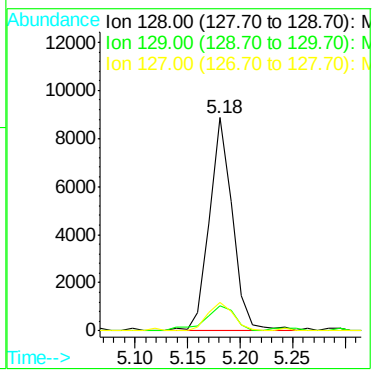


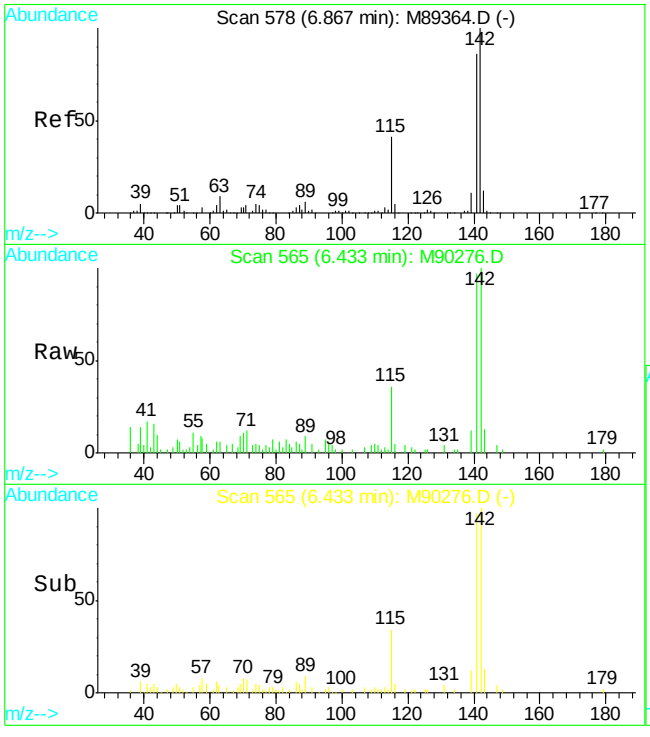



#38
Naphthalene
Concen: 1.14 ppb
RT: 5.18 min Scan# 444
Delta R.T. -0.07 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:128 Resp: 13503

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 128 | 100 | | |
| 129 | 11.3 | 0.0 | 42.1 |
| 127 | 13.5 | 0.0 | 45.2 |

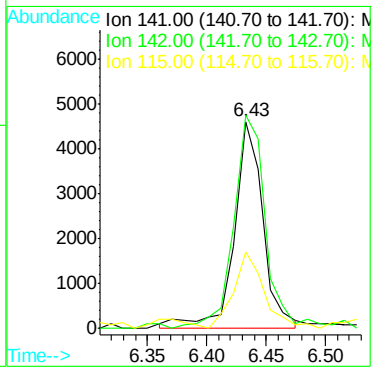



#44
2-Methylnaphthalene
Concen: 1.07 ppb m
RT: 6.43 min Scan# 565
Delta R.T. -0.07 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

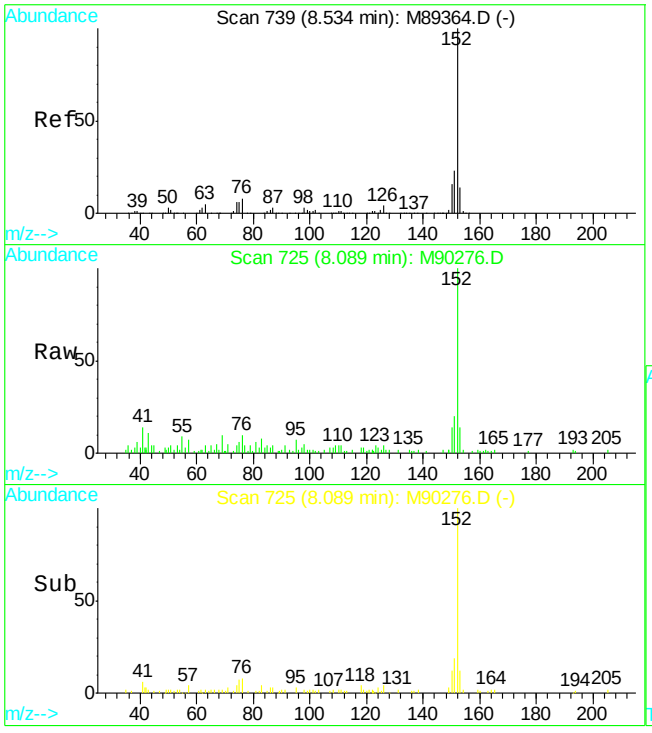
Tgt Ion:141 Resp: 7783

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 141 | 100 | | |
| 142 | 103.0 | 126.0 | 186.0# |
| 115 | 36.9 | 13.5 | 73.5 |




9.1.2

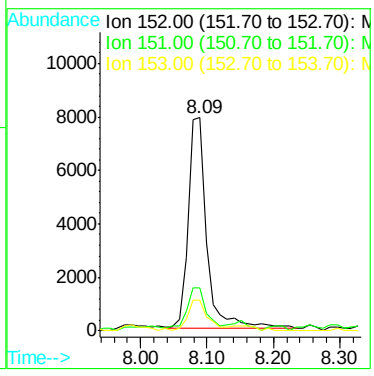
9

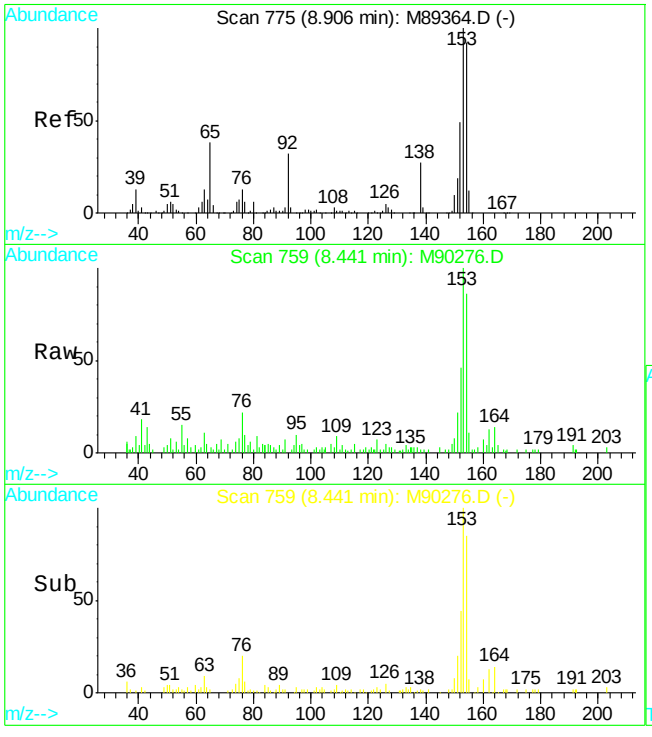



#56
Acenaphthylene
Concen: 1.33 ppb
RT: 8.09 min Scan# 725
Delta R.T. -0.06 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:152 Resp: 15681

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 152 | 100 | | |
| 151 | 19.2 | 0.0 | 52.4 |
| 153 | 14.0 | 0.0 | 44.5 |

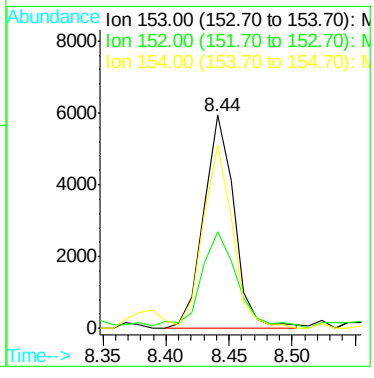



#59
Acenaphthene
Concen: 1.32 ppb
RT: 8.44 min Scan# 759
Delta R.T. -0.07 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

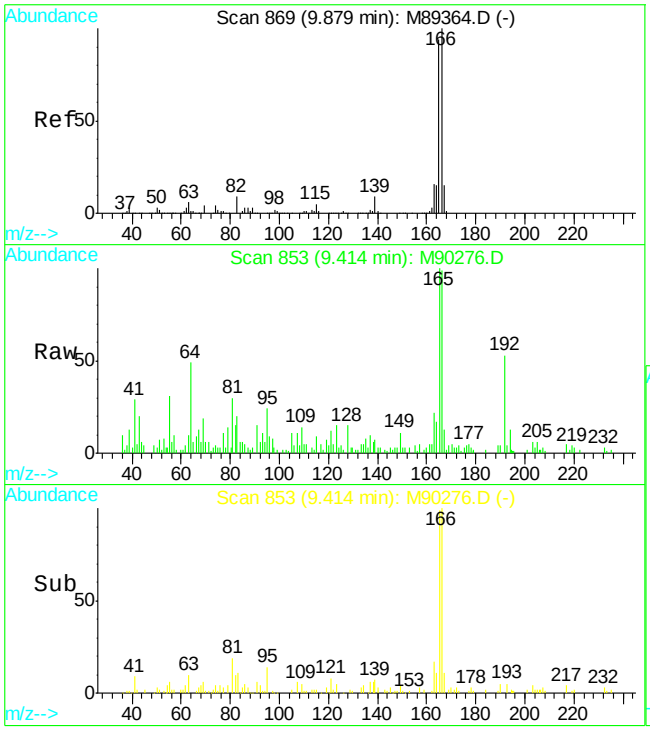
Tgt Ion:153 Resp: 9993

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 153 | 100 | | |
| 152 | 43.4 | 17.5 | 77.5 |
| 154 | 84.8 | 56.4 | 116.4 |




9.1.2

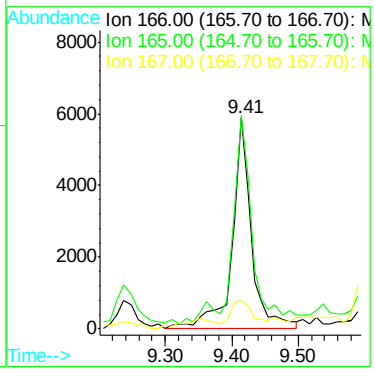
9

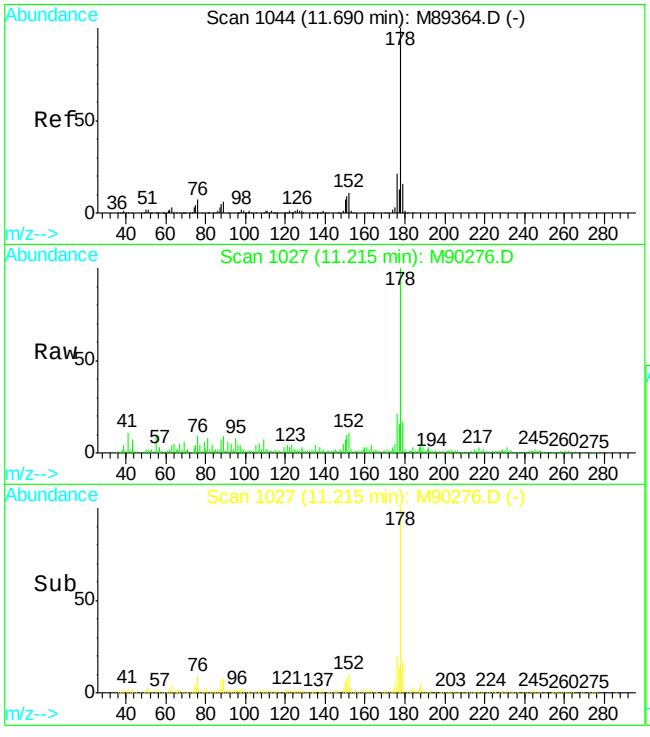



#66
Fluorene
Concen: 1.38 ppb
RT: 9.41 min Scan# 853
Delta R.T. -0.07 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:166 Resp: 11926

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 166 | 100 | | |
| 165 | 98.1 | 61.7 | 121.7 |
| 167 | 10.1 | 0.0 | 45.5 |

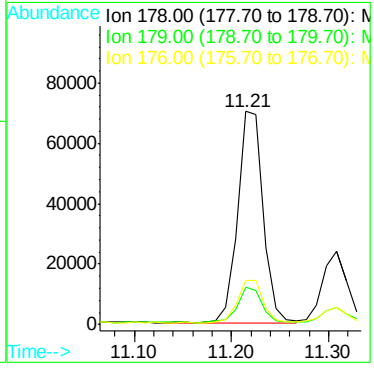


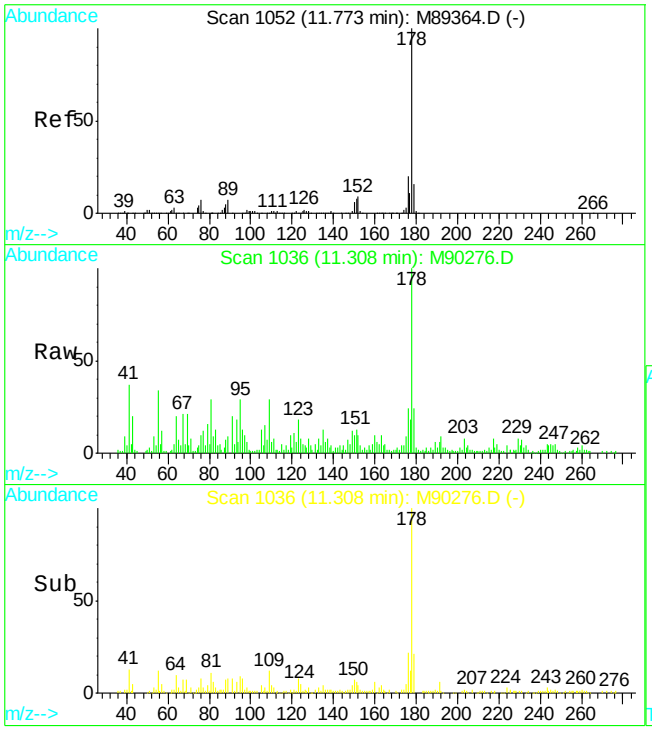




#77
Phenanthrene
Concen: 10.90 ppb
RT: 11.21 min Scan# 1027
Delta R.T. -0.08 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:178 Resp: 127744

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 16.3 | 0.0 | 47.4 |
| 176 | 20.1 | 0.0 | 50.3 |

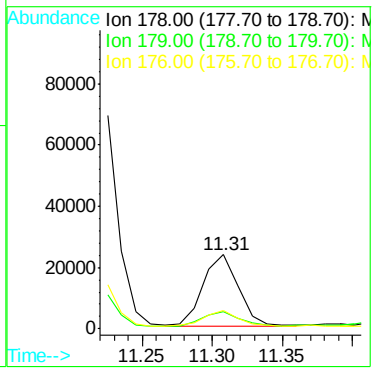


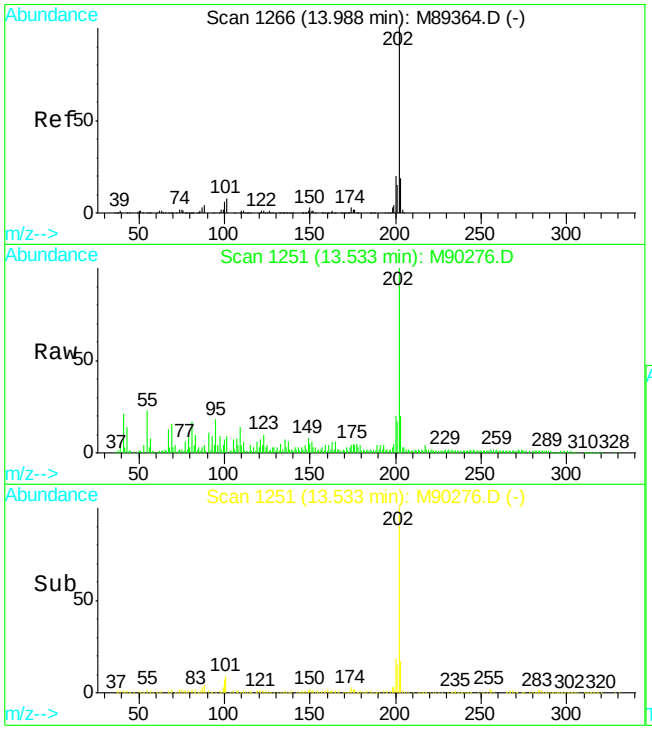



#78
Anthracene
Concen: 3.64 ppb
RT: 11.31 min Scan# 1036
Delta R.T. -0.07 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:178 Resp: 41173

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 20.7 | 0.0 | 47.3 |
| 176 | 21.6 | 0.0 | 50.3 |

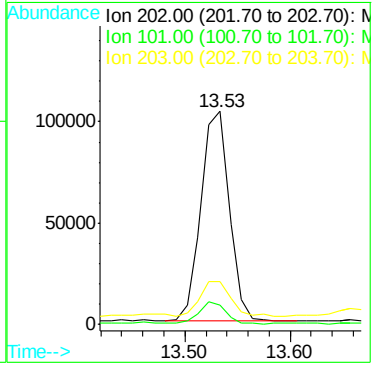


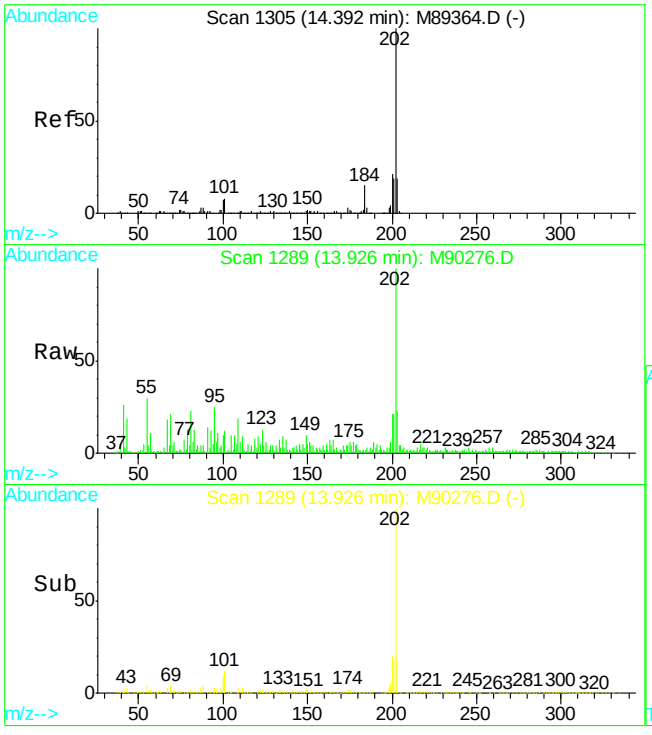




#81
Fluoranthene
Concen: 13.14 ppb
RT: 13.53 min Scan# 1251
Delta R.T. -0.05 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:202 Resp: 192616

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 101 | 8.7 | 0.0 | 40.6 |
| 203 | 15.9 | 0.0 | 50.3 |

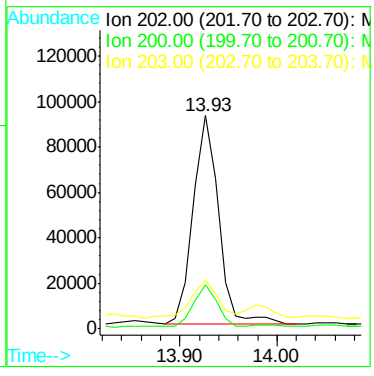


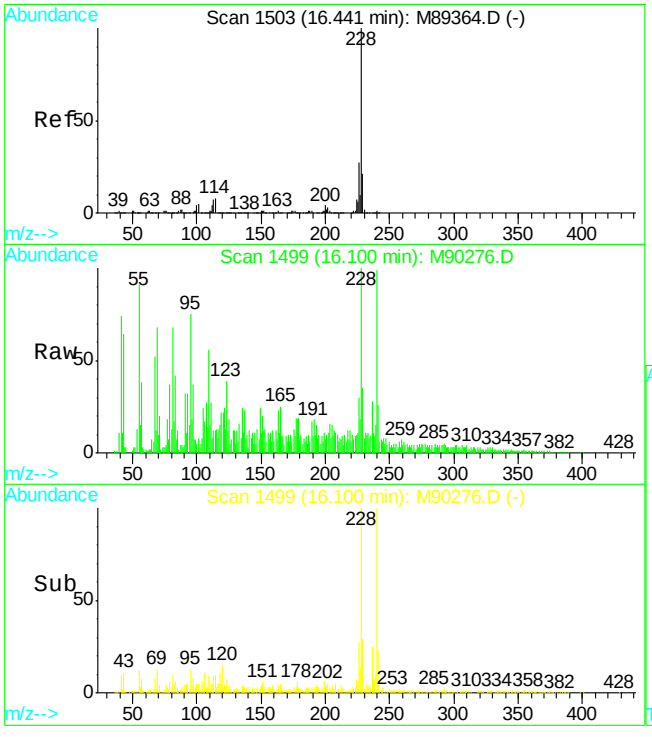



#84
Pyrene
Concen: 12.77 ppb
RT: 13.93 min Scan# 1289
Delta R.T. -0.05 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:202 Resp: 168334

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 200 | 19.7 | 0.0 | 51.0 |
| 203 | 17.7 | 0.0 | 50.0 |

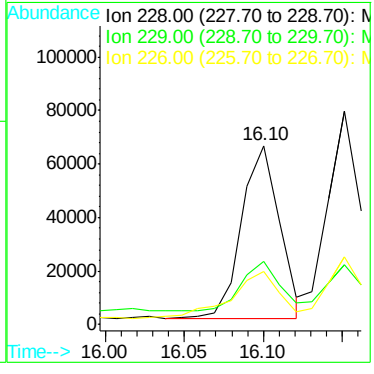



#88
Benzo[a]anthracene
Concen: 8.42 ppb
RT: 16.10 min Scan# 1499
Delta R.T. -0.02 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

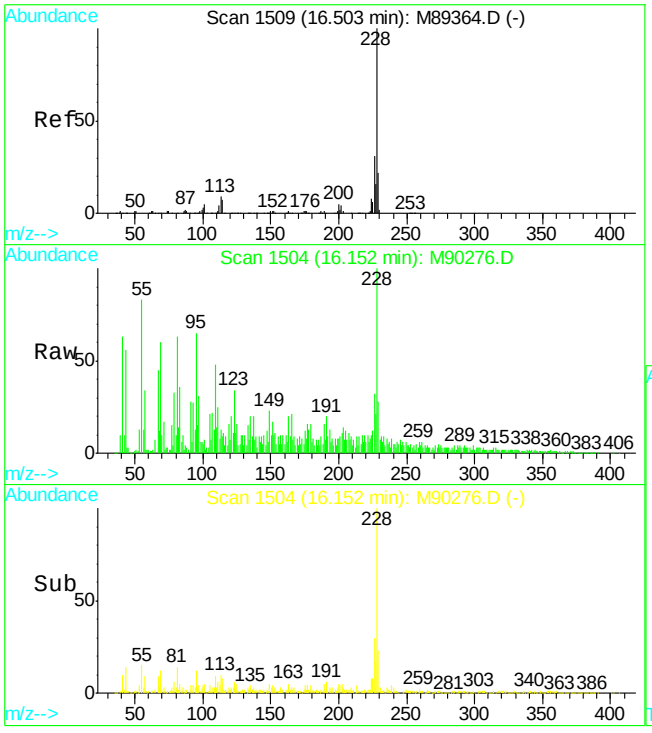
Tgt Ion:228 Resp: 107814

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 229 | 27.6 | 0.0 | 53.2 |
| 226 | 26.4 | 0.0 | 58.3 |




9.1.2

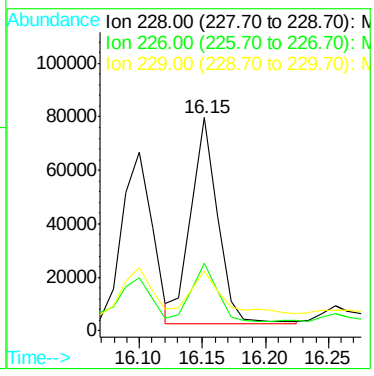
9

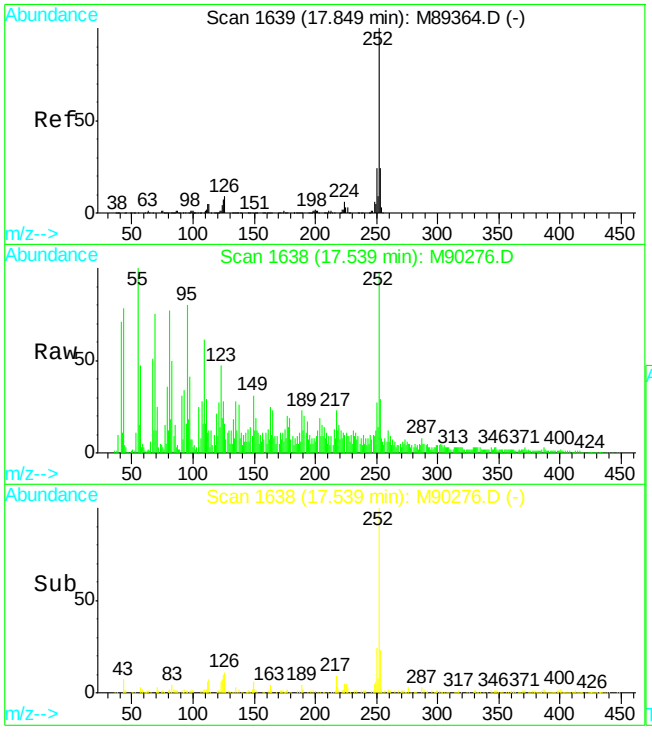



#90
Chrysene
Concen: 9.88 ppb
RT: 16.15 min Scan# 1504
Delta R.T. -0.03 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:228 Resp: 114449

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 226 | 28.8 | 2.3 | 62.3 |
| 229 | 20.7 | 0.0 | 54.2 |

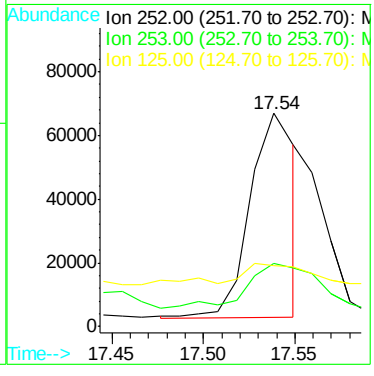



#94
Benzo[b]fluoranthene
Concen: 9.65 ppb m
RT: 17.54 min Scan# 1638
Delta R.T. -0.01 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

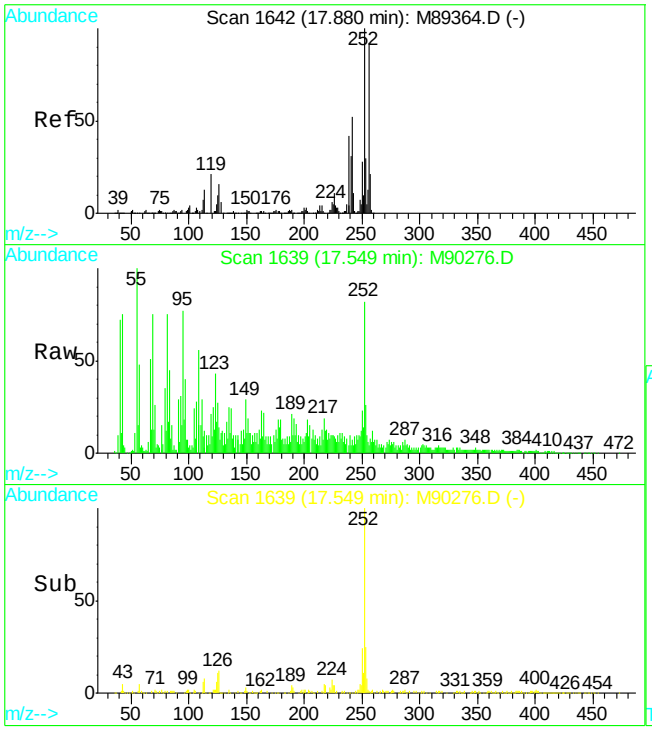
Tgt Ion:252 Resp: 112108

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 29.6 | 0.0 | 55.6 |
| 125 | 28.6 | 0.0 | 40.3 |




9.1.2

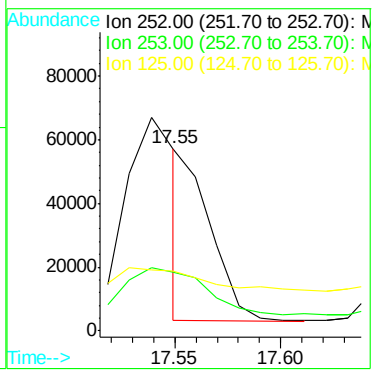
9

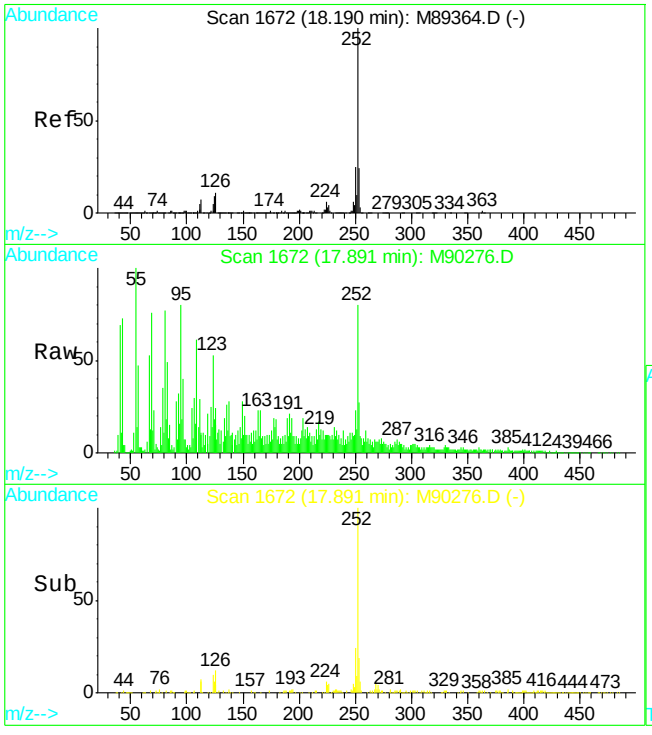



#95
Benzo[k]fluoranthene
Concen: 4.28 ppb m
RT: 17.55 min Scan# 1639
Delta R.T. -0.03 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:252 Resp: 46881

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 31.9 | 0.0 | 58.9 |
| 125 | 32.9 | 0.0 | 43.1 |

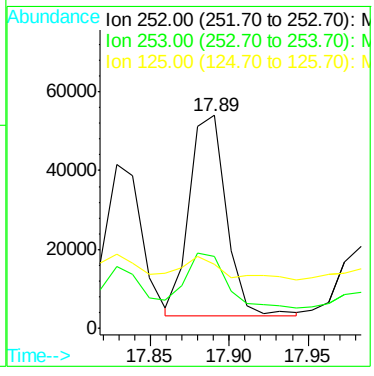



#96
Benzo[a]pyrene
Concen: 8.24 ppb
RT: 17.89 min Scan# 1672
Delta R.T. 0.00 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

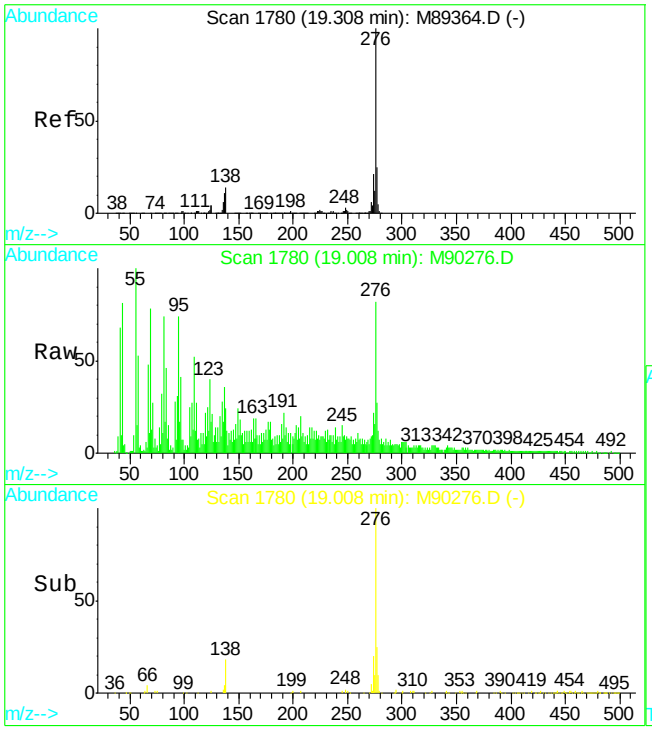
Tgt Ion:252 Resp: 83167

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 24.5 | 0.0 | 55.8 |
| 125 | 6.5 | 0.0 | 42.8 |




9.1.2

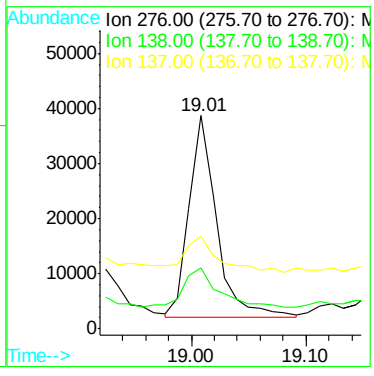
9

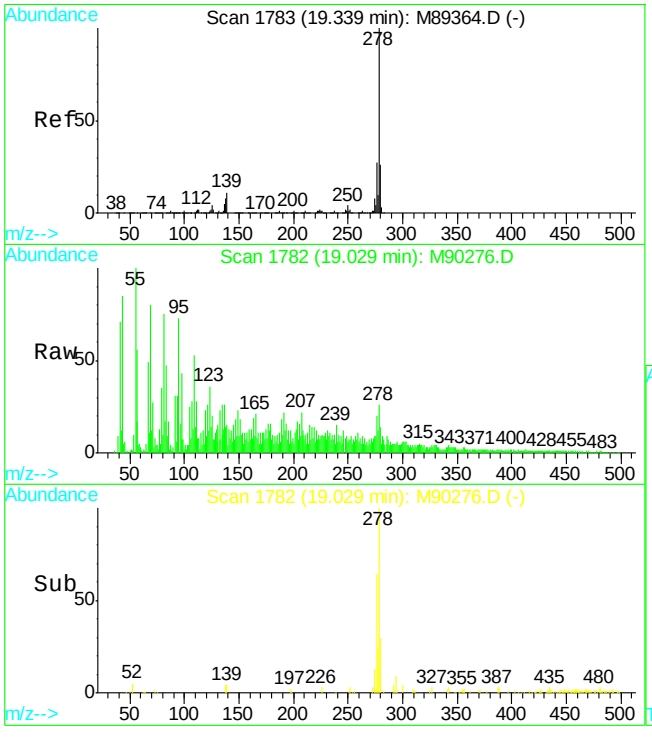



#97
Indeno[1,2,3-cd]pyrene
Concen: 5.48 ppb
RT: 19.01 min Scan# 1780
Delta R.T. 0.00 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:276 Resp: 60407

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 19.5 | 0.0 | 51.4 |
| 137 | 15.1 | 0.0 | 45.7 |

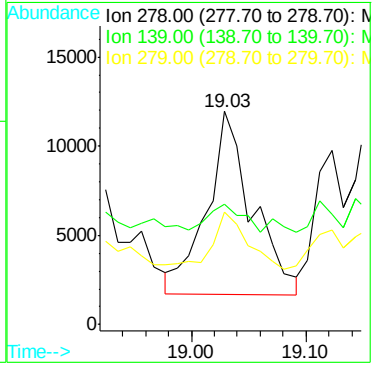


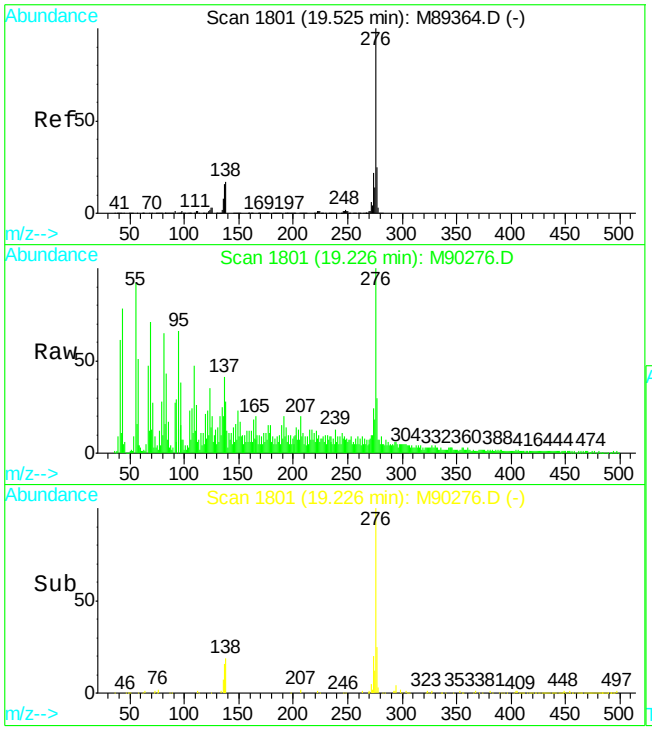




#99
Dibenz[a,h]anthracene
Concen: 3.11 ppb
RT: 19.03 min Scan# 1782
Delta R.T. -0.01 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:278 Resp: 28061

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 278 | 100 | | |
| 139 | 15.1 | 0.0 | 45.4 |
| 279 | 32.9 | 0.0 | 58.2 |

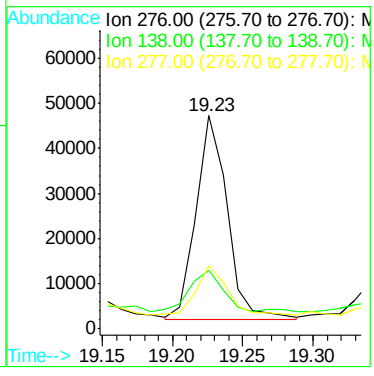





#101
Benzo[g,h,i]perylene
Concen: 7.67 ppb
RT: 19.23 min Scan# 1801
Delta R.T. 0.00 min
Lab File: M90276.D
Acq: 14 Dec 2012 7:36 pm

Tgt Ion:276 Resp: 69471

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 20.3 | 0.0 | 53.9 |
| 277 | 24.6 | 0.0 | 57.2 |




9.1.2

9

Manual Integrations APPROVED (compounds with "m" flag)
Kristi Schollenberger 12/17/12 11:27

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\EM3657\M90274.D Vial: 20
Acq On : 14 Dec 2012 6:37 pm Operator: olgaa
Sample : jb22549-3 Inst : MSM
Misc : op61971,em3657,31.8 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 16 14:39 2012 Quant Results File: MM3617.RES

Quant Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration
DataAcq Meth : MM3617

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) 1,4-Dichlorobenzene-d4 | 3.19 | 152 | 98206 | 40.00 | ppb | -0.07 |
| 24) Naphthalene-d8 | 5.15 | 136 | 390379 | 40.00 | ppb | -0.07 |
| 47) Acenaphthene-d10 | 8.38 | 164 | 243365 | 40.00 | ppb | -0.08 |
| 69) Phenanthrene-d10 | 11.17 | 188 | 408529 | 40.00 | ppb | -0.08 |
| 83) Chrysene-d12 | 16.09 | 240 | 418155 | 40.00 | ppb | -0.06 |
| 92) Perylene-d12 | 17.91 | 264 | 337766 | 40.00 | ppb | -0.05 |
| 102) 1,4-Dichlorobenzene-d4a | 3.19 | 152 | 98206 | 40.00 | ppb | -0.07 |
| 104) Acenaphthene-d10a | 8.38 | 164 | 243365 | 40.00 | ppb | -0.08 |
| 106) Phenanthrene-d10a | 11.17 | 188 | 408529 | 40.00 | ppb | -0.08 |
| 108) Chrysene-d12a | 16.09 | 240 | 418155 | 40.00 | ppb | -0.06 |
| **System Monitoring Compounds** | | | | | | |
| 5) 2-Fluorophenol | 1.93 | 112 | 95110 | 29.91 | ppb | -0.03 |
| Spiked Amount 50.000 | | | Recovery = 59.82% | | | |
| 8) Phenol-d5 | 2.98 | 99 | 142280 | 35.39 | ppb | 0.00 |
| Spiked Amount 50.000 | | | Recovery = 70.78% | | | |
| 25) Nitrobenzene-d5 | 4.05 | 82 | 113408 | 28.80 | ppb | -0.06 |
| Spiked Amount 50.000 | | | Recovery = 57.60% | | | |
| 51) 2-Fluorobiphenyl | 7.22 | 172 | 280757 | 36.34 | ppb | -0.08 |
| Spiked Amount 50.000 | | | Recovery = 72.68% | | | |
| 73) 2,4,6-Tribromophenol | 9.95 | 330 | 29761 | 41.01 | ppb | -0.06 |
| Spiked Amount 50.000 | | | Recovery = 82.02% | | | |
| 86) Terphenyl-d14 | 14.43 | 244 | 346713 | 40.57 | ppb | -0.07 |
| Spiked Amount 50.000 | | | Recovery = 81.14% | | | |

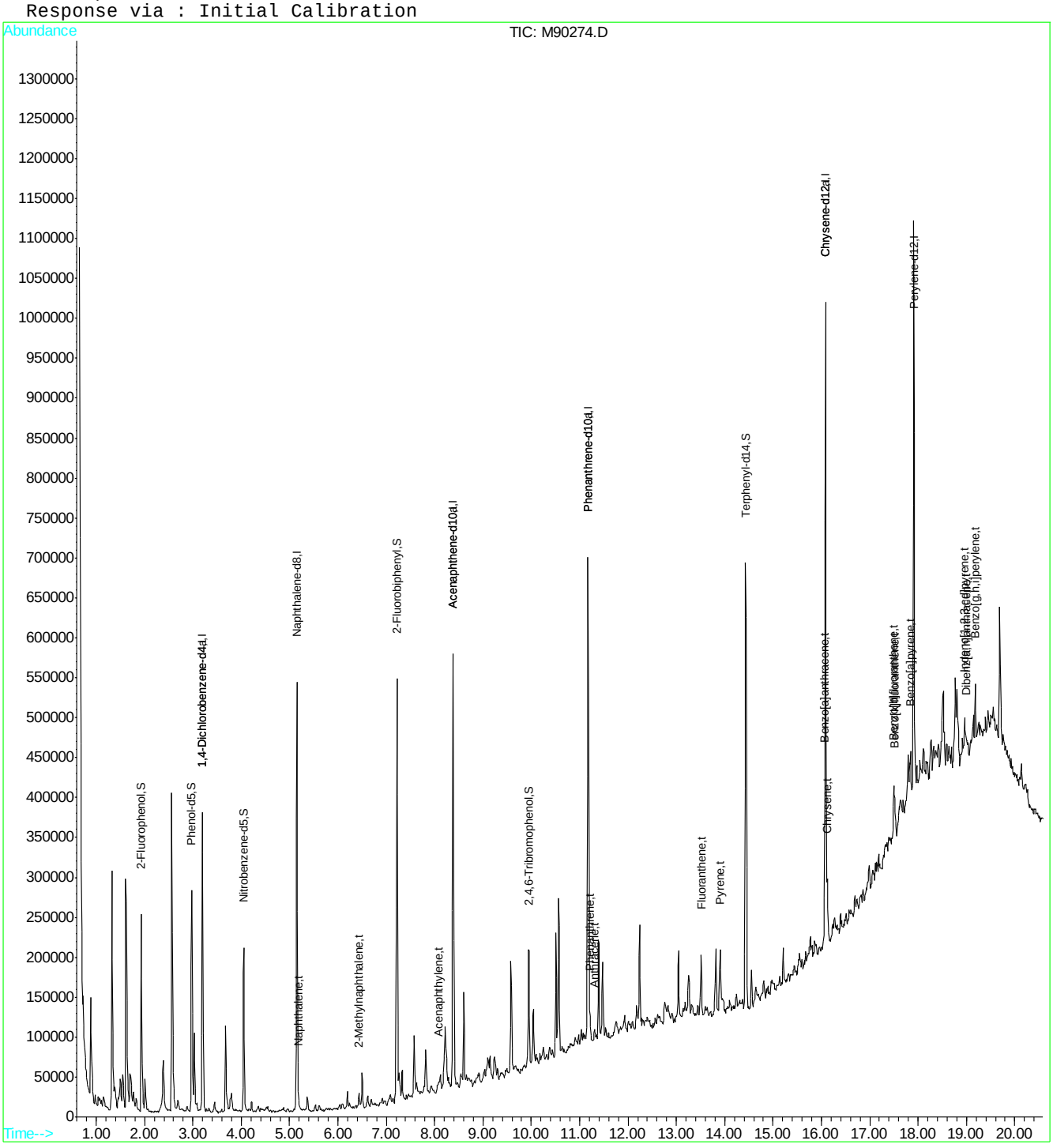
| Target Compounds | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 38) Naphthalene | 5.18 | 128 | 10410 | 0.97 | ppb | | 97 |
| 44) 2-Methylnaphthalene | 6.43 | 141 | 7430 | 1.13 | ppb | # | 75 |
| 56) Acenaphthylene | 8.08 | 152 | 5773 | 0.55 | ppb | | 86 |
| 77) Phenanthrene | 11.21 | 178 | 24109 | 2.33 | ppb | | 97 |
| 78) Anthracene | 11.30 | 178 | 10082 | 1.01 | ppb | | 97 |
| 81) Fluoranthene | 13.51 | 202 | 62055 | 4.80 | ppb | | 93 |
| 84) Pyrene | 13.91 | 202 | 63481 | 5.04 | ppb | | 95 |
| 88) Benzo[a]anthracene | 16.07 | 228 | 39165 | 3.20 | ppb | | 95 |
| 90) Chrysene | 16.12 | 228 | 37307 | 3.37 | ppb | | 94 |
| 94) Benzo[b]fluoranthene | 17.50 | 252 | 37764m | 3.40 | ppb | | |
| 95) Benzo[k]fluoranthene | 17.51 | 252 | 19433m | 1.85 | ppb | | |
| 96) Benzo[a]pyrene | 17.85 | 252 | 31570 | 3.27 | ppb | | 87 |
| 97) Indeno[1,2,3-cd]pyrene | 18.97 | 276 | 23676 | 2.24 | ppb | | 97 |
| 99) Dibenz[a,h]anthracene | 19.00 | 278 | 8927 | 1.03 | ppb | | 91 |
| 101) Benzo[g,h,i]perylene | 19.18 | 276 | 27331 | 3.15 | ppb | | 94 |

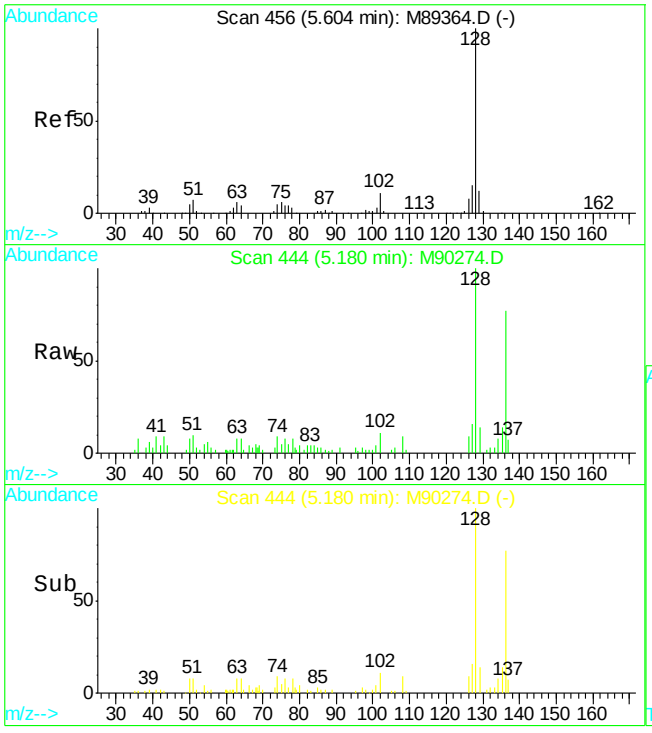
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\EM3657\M90274.D  Vial: 20
Acq On : 14 Dec 2012 6:37 pm  Operator: olgaa
Sample : jb22549-3  Inst : MSM
Misc : op61971,em3657,31.8  Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 16 14:39 2012  Quant Results File: MM3617.RES

Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration

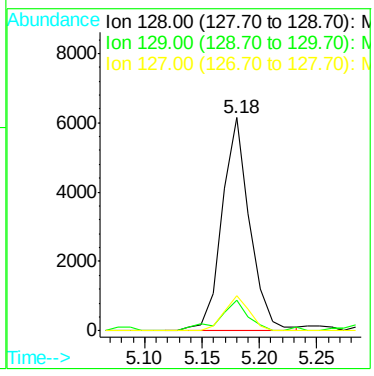


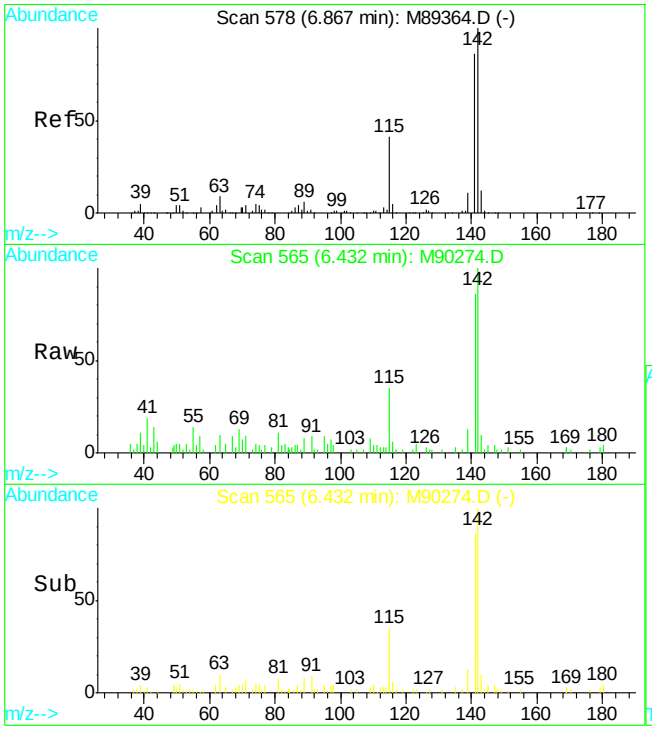



#38
Naphthalene
Concen: 0.97 ppb
RT: 5.18 min Scan# 444
Delta R.T. -0.07 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:128 Resp: 10410

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 128 | 100 | | |
| 129 | 13.6 | 0.0 | 42.1 |
| 127 | 16.4 | 0.0 | 45.2 |

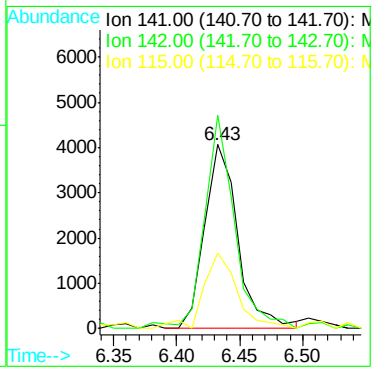


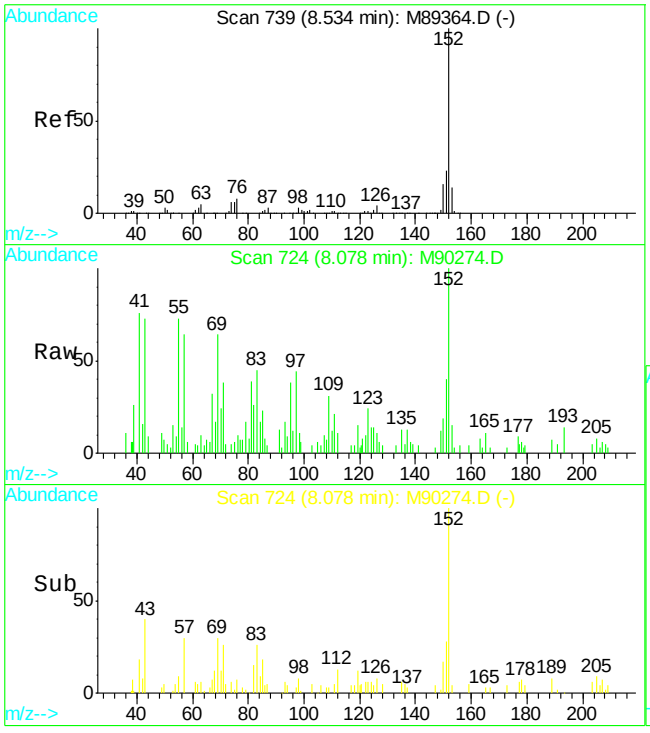




#44
2-Methylnaphthalene
Concen: 1.13 ppb
RT: 6.43 min Scan# 565
Delta R.T. -0.07 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:141 Resp: 7430

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 141 | 100 | | |
| 142 | 116.6 | 126.0 | 186.0# |
| 115 | 40.5 | 13.5 | 73.5 |

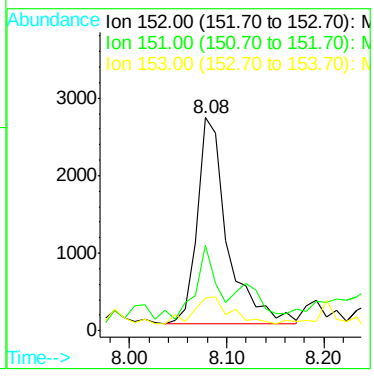


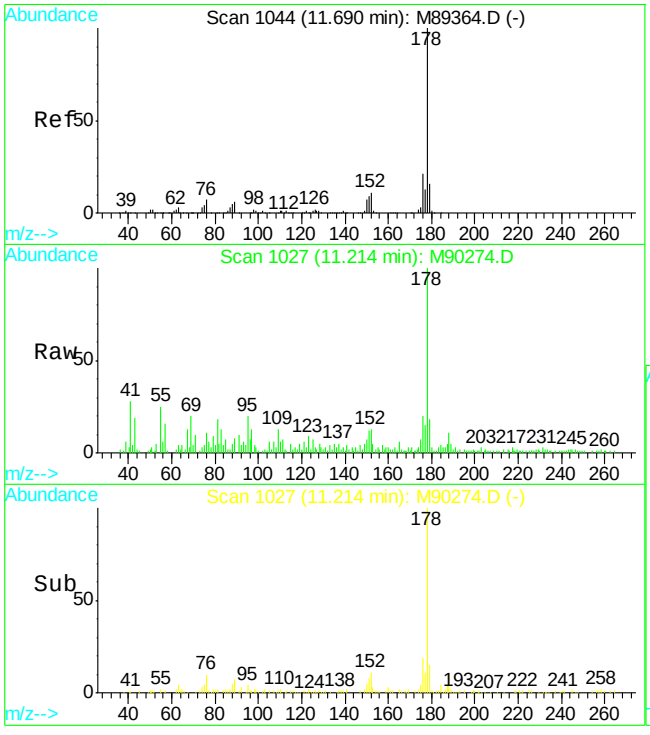



#56
Acenaphthylene
Concen: 0.55 ppb
RT: 8.08 min Scan# 724
Delta R.T. -0.07 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:152 Resp: 5773

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 152 | 100 | | |
| 151 | 31.5 | 0.0 | 52.4 |
| 153 | 12.0 | 0.0 | 44.5 |

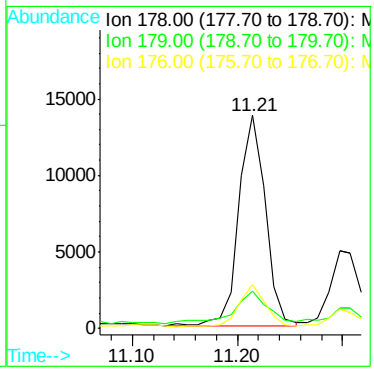


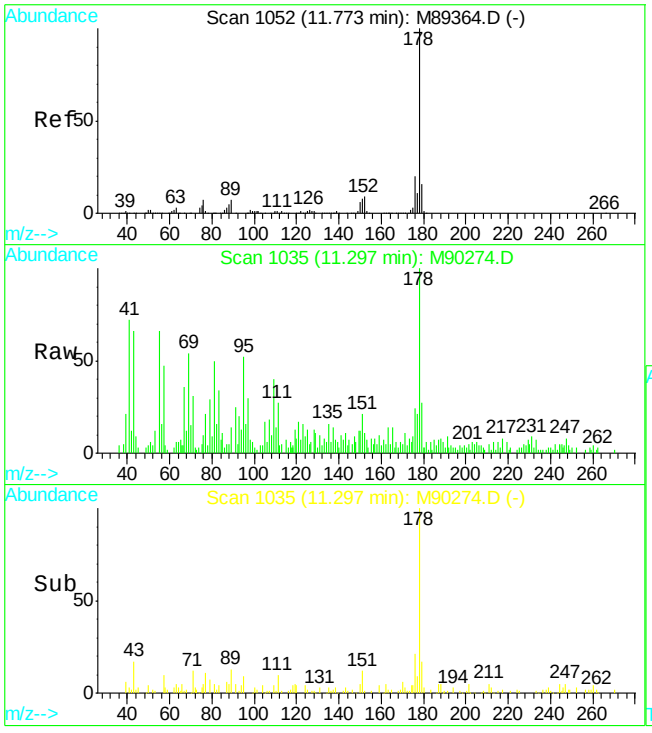




#77
Phenanthrene
Concen: 2.33 ppb
RT: 11.21 min Scan# 1027
Delta R.T. -0.08 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:178 Resp: 24109

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 15.4 | 0.0 | 47.4 |
| 176 | 19.7 | 0.0 | 50.3 |

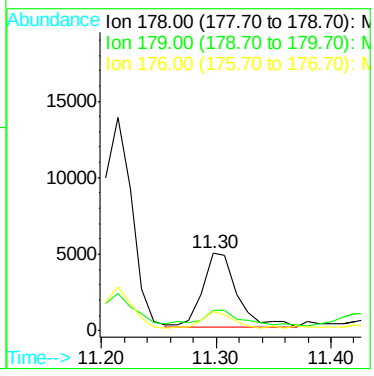


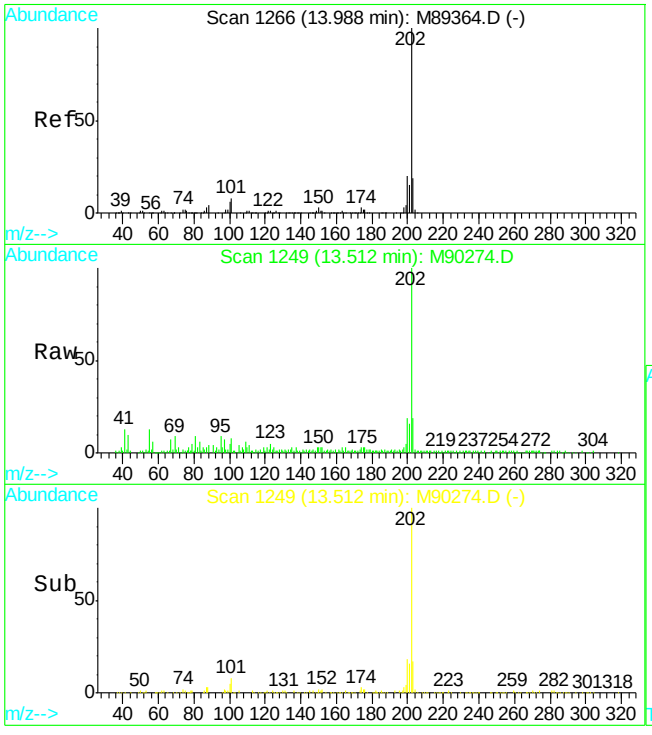



#78
Anthracene
Concen: 1.01 ppb
RT: 11.30 min Scan# 1035
Delta R.T. -0.08 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:178 Resp: 10082

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 19.8 | 0.0 | 47.3 |
| 176 | 20.9 | 0.0 | 50.3 |

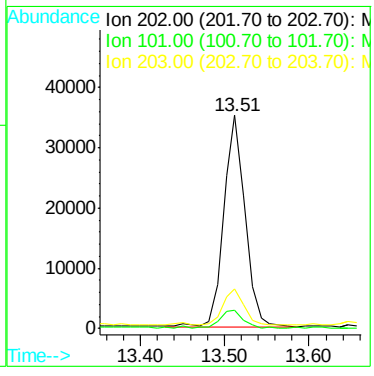


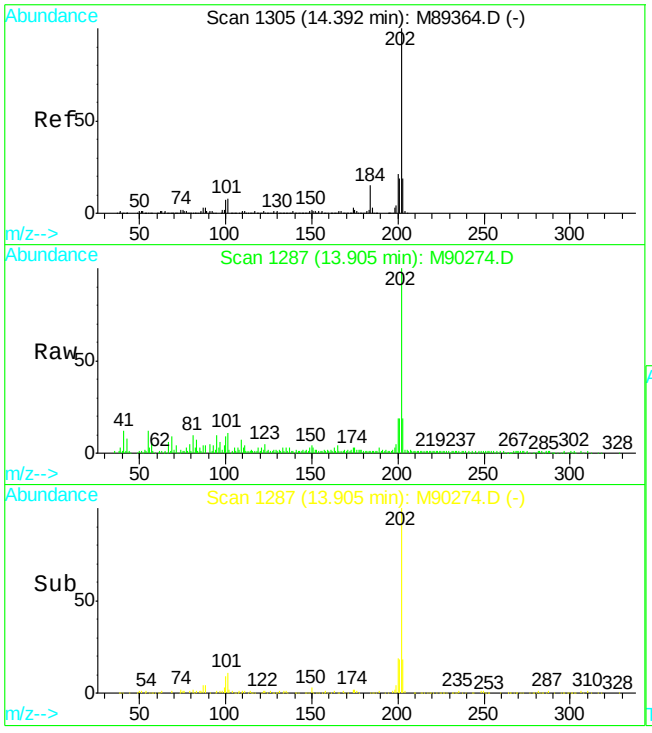




#81
Fluoranthene
Concen: 4.80 ppb
RT: 13.51 min Scan# 1249
Delta R.T. -0.07 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:202 Resp: 62055

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 101 | 7.9 | 0.0 | 40.6 |
| 203 | 16.8 | 0.0 | 50.3 |

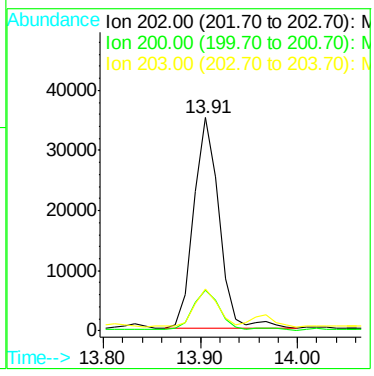


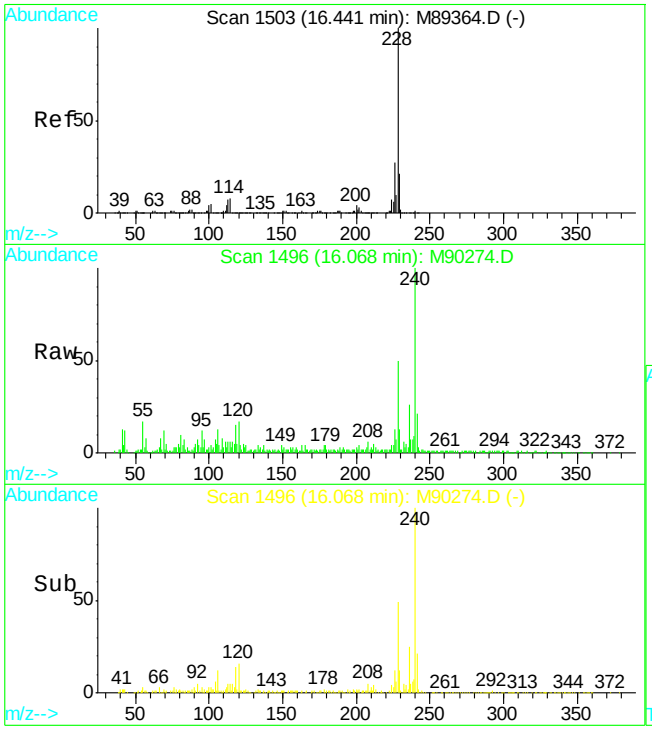



#84
Pyrene
Concen: 5.04 ppb
RT: 13.91 min Scan# 1287
Delta R.T. -0.07 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:202 Resp: 63481

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 200 | 19.0 | 0.0 | 51.0 |
| 203 | 17.6 | 0.0 | 50.0 |

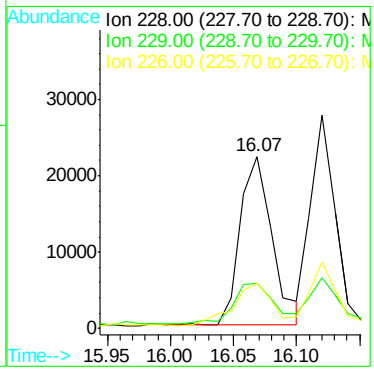


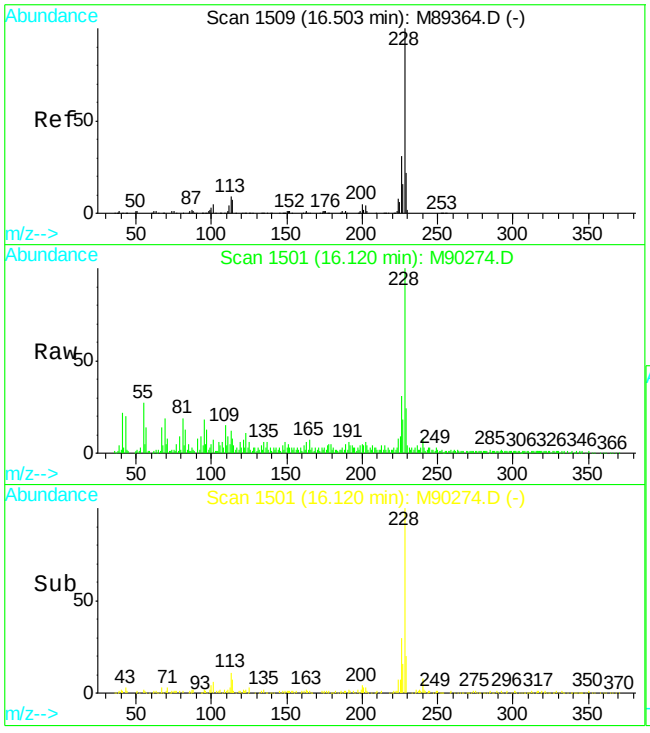




#88
Benzo[a]anthracene
Concen: 3.20 ppb
RT: 16.07 min Scan# 1496
Delta R.T. -0.05 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:228 Resp: 39165

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 229 | 22.3 | 0.0 | 53.2 |
| 226 | 24.1 | 0.0 | 58.3 |

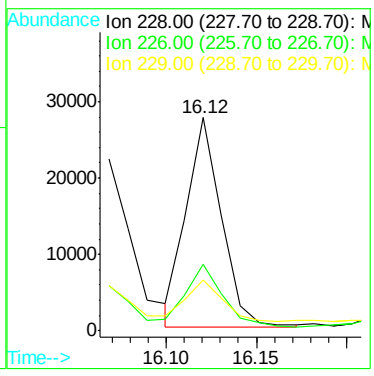


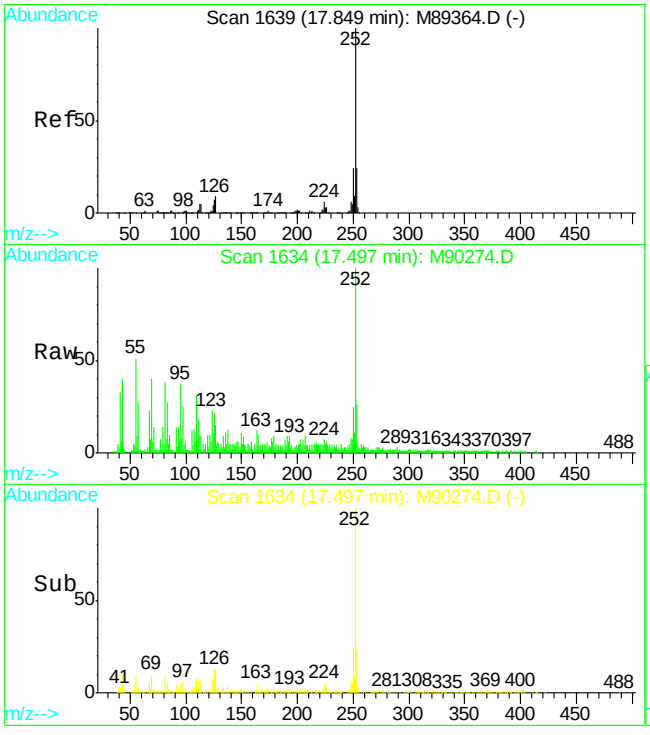



#90
Chrysene
Concen: 3.37 ppb
RT: 16.12 min Scan# 1501
Delta R.T. -0.06 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:228 Resp: 37307

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 226 | 29.9 | 2.3 | 62.3 |
| 229 | 19.6 | 0.0 | 54.2 |

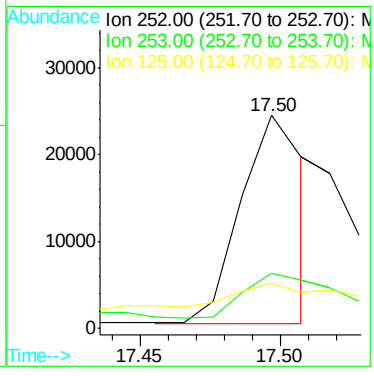


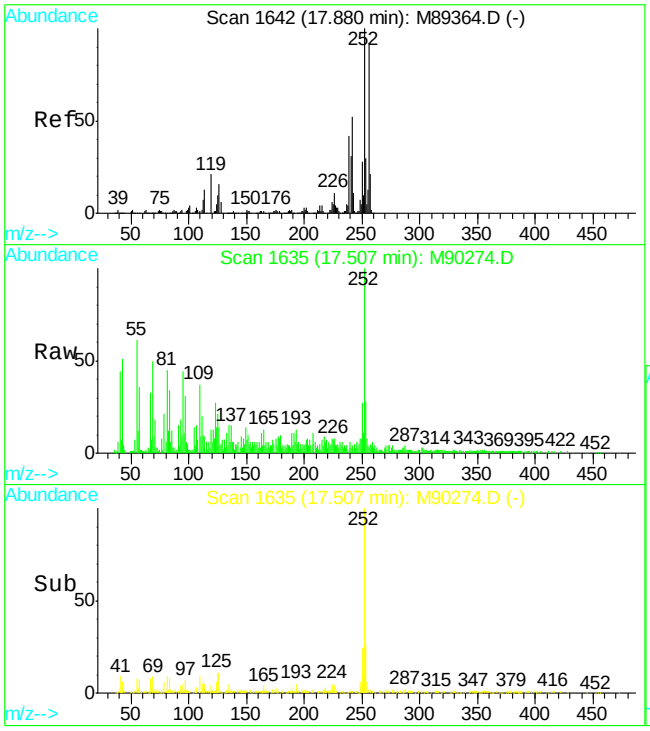




#94
Benzo[b]fluoranthene
Concen: 3.40 ppb m
RT: 17.50 min Scan# 1634
Delta R.T. -0.05 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:252 Resp: 37764

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 25.9 | 0.0 | 55.6 |
| 125 | 21.1 | 0.0 | 40.3 |

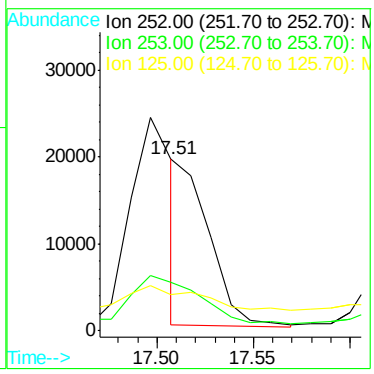


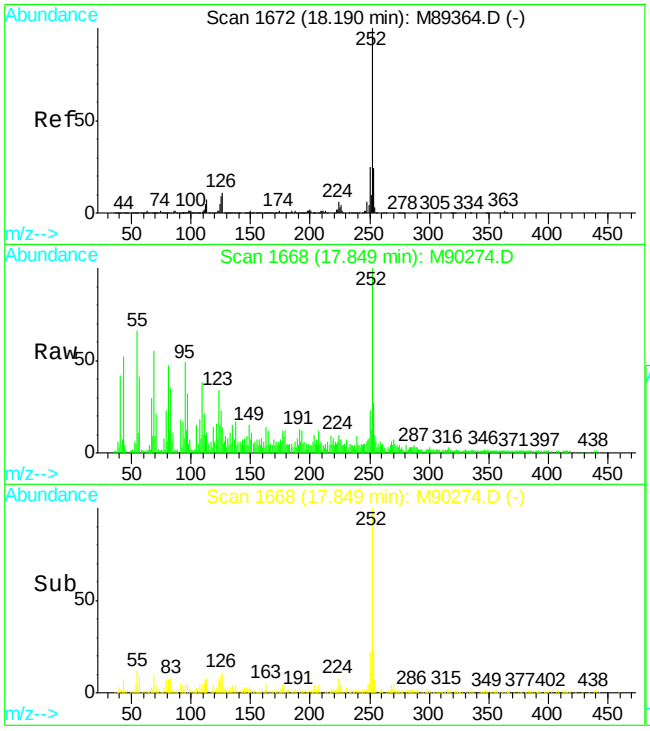



#95
Benzo[k]fluoranthene
Concen: 1.85 ppb m
RT: 17.51 min Scan# 1635
Delta R.T. -0.07 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:252 Resp: 19433

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 28.1 | 0.0 | 58.9 |
| 125 | 21.3 | 0.0 | 43.1 |

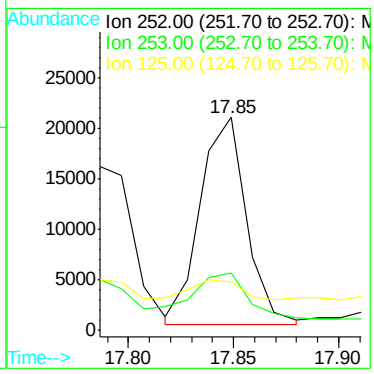



#96
Benzo[a]pyrene
Concen: 3.27 ppb
RT: 17.85 min Scan# 1668
Delta R.T. -0.04 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

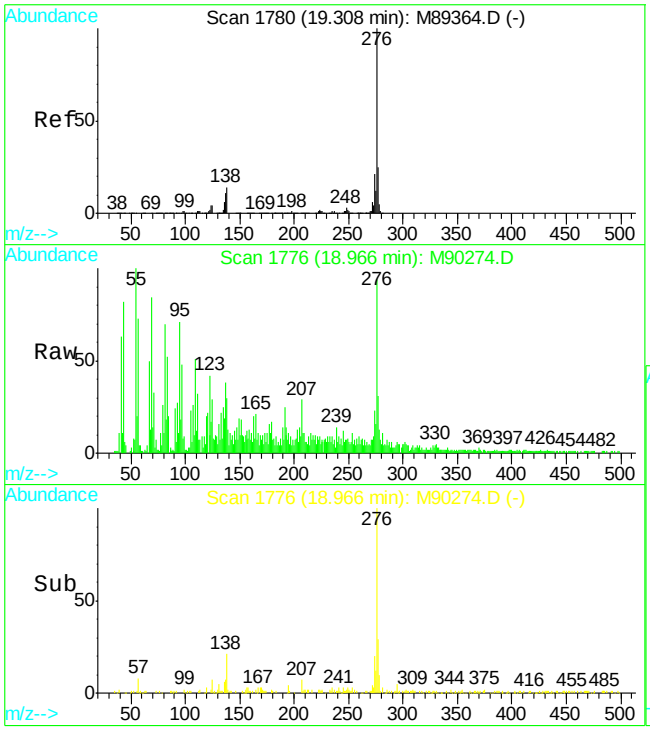
Tgt Ion:252 Resp: 31570

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 19.5 | 0.0 | 55.8 |
| 125 | 7.6 | 0.0 | 42.8 |




9.1.3

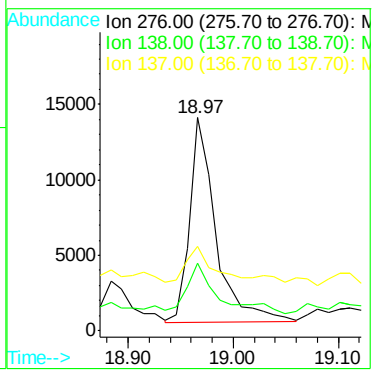
9

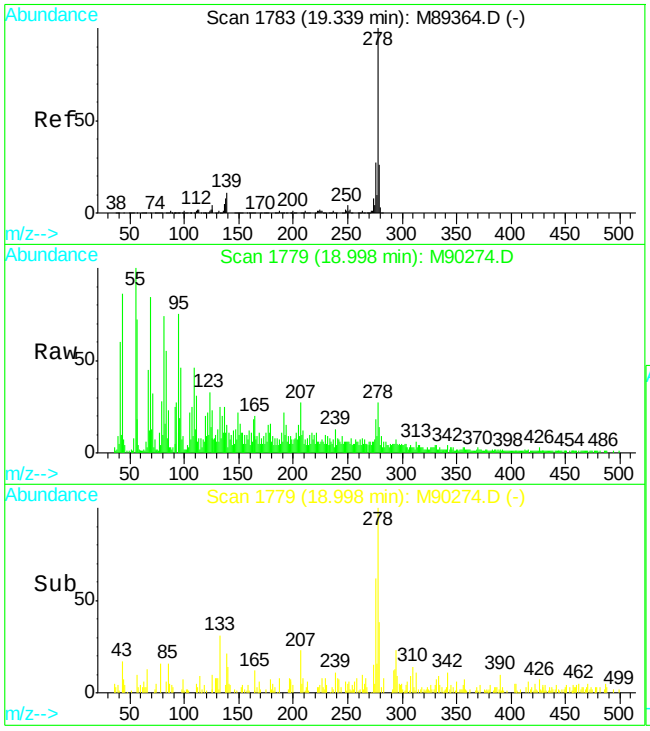



#97
Indeno[1,2,3-cd]pyrene
Concen: 2.24 ppb
RT: 18.97 min Scan# 1776
Delta R.T. -0.04 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:276 Resp: 23676

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 23.3 | 0.0 | 51.4 |
| 137 | 16.6 | 0.0 | 45.7 |

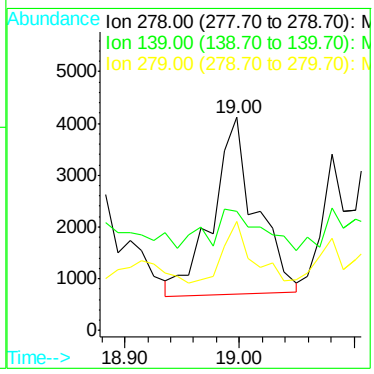


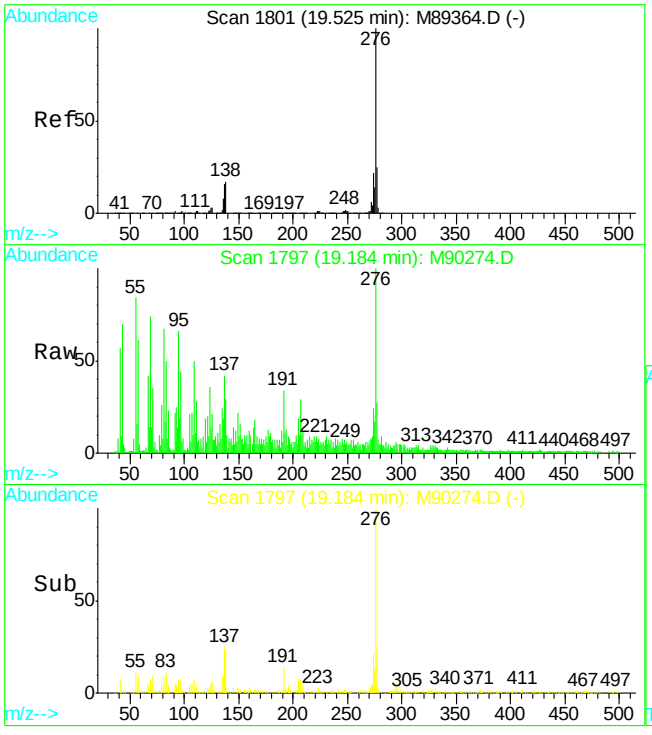




#99
Dibenz[a,h]anthracene
Concen: 1.03 ppb
RT: 19.00 min Scan# 1779
Delta R.T. -0.04 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:278 Resp: 8927

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 278 | 100 | | |
| 139 | 18.5 | 0.0 | 45.4 |
| 279 | 33.0 | 0.0 | 58.2 |

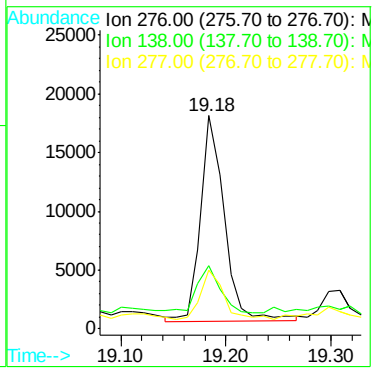





#101
Benzo[g,h,i]perylene
Concen: 3.15 ppb
RT: 19.18 min Scan# 1797
Delta R.T. -0.04 min
Lab File: M90274.D
Acq: 14 Dec 2012 6:37 pm

Tgt Ion:276 Resp: 27331

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 22.0 | 0.0 | 53.9 |
| 277 | 23.0 | 0.0 | 57.2 |




9.1.3

9

Manual Integrations APPROVED (compounds with "m" flag)
Kristi Schollenberger 12/17/12 11:27

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\EM3657\M90277.D Vial: 23
Acq On : 14 Dec 2012 8:05 pm Operator: olgaa
Sample : jb22549-4 Inst : MSM
Misc : op61971,em3657,30.3,,,1,2 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 16 14:44 2012 Quant Results File: MM3617.RES

Quant Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration
DataAcq Meth : MM3617

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) 1,4-Dichlorobenzene-d4 | 3.20 | 152 | 115880 | 40.00 | ppb | -0.06 |
| 24) Naphthalene-d8 | 5.16 | 136 | 406223 | 40.00 | ppb | -0.06 |
| 47) Acenaphthene-d10 | 8.40 | 164 | 257758 | 40.00 | ppb | -0.06 |
| 69) Phenanthrene-d10 | 11.20 | 188 | 454257 | 40.00 | ppb | -0.05 |
| 83) Chrysene-d12 | 16.14 | 240 | 438132 | 40.00 | ppb | 0.00 |
| 92) Perylene-d12 | 17.98 | 264 | 400819 | 40.00 | ppb | 0.02 |
| 102) 1,4-Dichlorobenzene-d4a | 3.20 | 152 | 115880 | 40.00 | ppb | -0.06 |
| 104) Acenaphthene-d10a | 8.40 | 164 | 257758 | 40.00 | ppb | -0.06 |
| 106) Phenanthrene-d10a | 11.20 | 188 | 454257 | 40.00 | ppb | -0.05 |
| 108) Chrysene-d12a | 16.14 | 240 | 438132 | 40.00 | ppb | 0.00 |

| System Monitoring Compounds | | | | | | |
|---|---|---|---|---|---|---|
| 5) 2-Fluorophenol | 1.95 | 112 | 56433 | 15.04 | ppb | 0.00 |
| Spiked Amount 50.000 | | | Recovery = 30.08% | | | |
| 8) Phenol-d5 | 2.98 | 99 | 73809 | 15.56 | ppb | 0.01 |
| Spiked Amount 50.000 | | | Recovery = 31.12% | | | |
| 25) Nitrobenzene-d5 | 4.06 | 82 | 65004 | 15.86 | ppb | -0.05 |
| Spiked Amount 50.000 | | | Recovery = 31.72% | | | |
| 51) 2-Fluorobiphenyl | 7.23 | 172 | 140118 | 17.13 | ppb | -0.07 |
| Spiked Amount 50.000 | | | Recovery = 34.26% | | | |
| 73) 2,4,6-Tribromophenol | 9.97 | 330 | 16403 | 20.33 | ppb | -0.04 |
| Spiked Amount 50.000 | | | Recovery = 40.66% | | | |
| 86) Terphenyl-d14 | 14.48 | 244 | 170307 | 19.02 | ppb | -0.02 |
| Spiked Amount 50.000 | | | Recovery = 38.04% | | | |

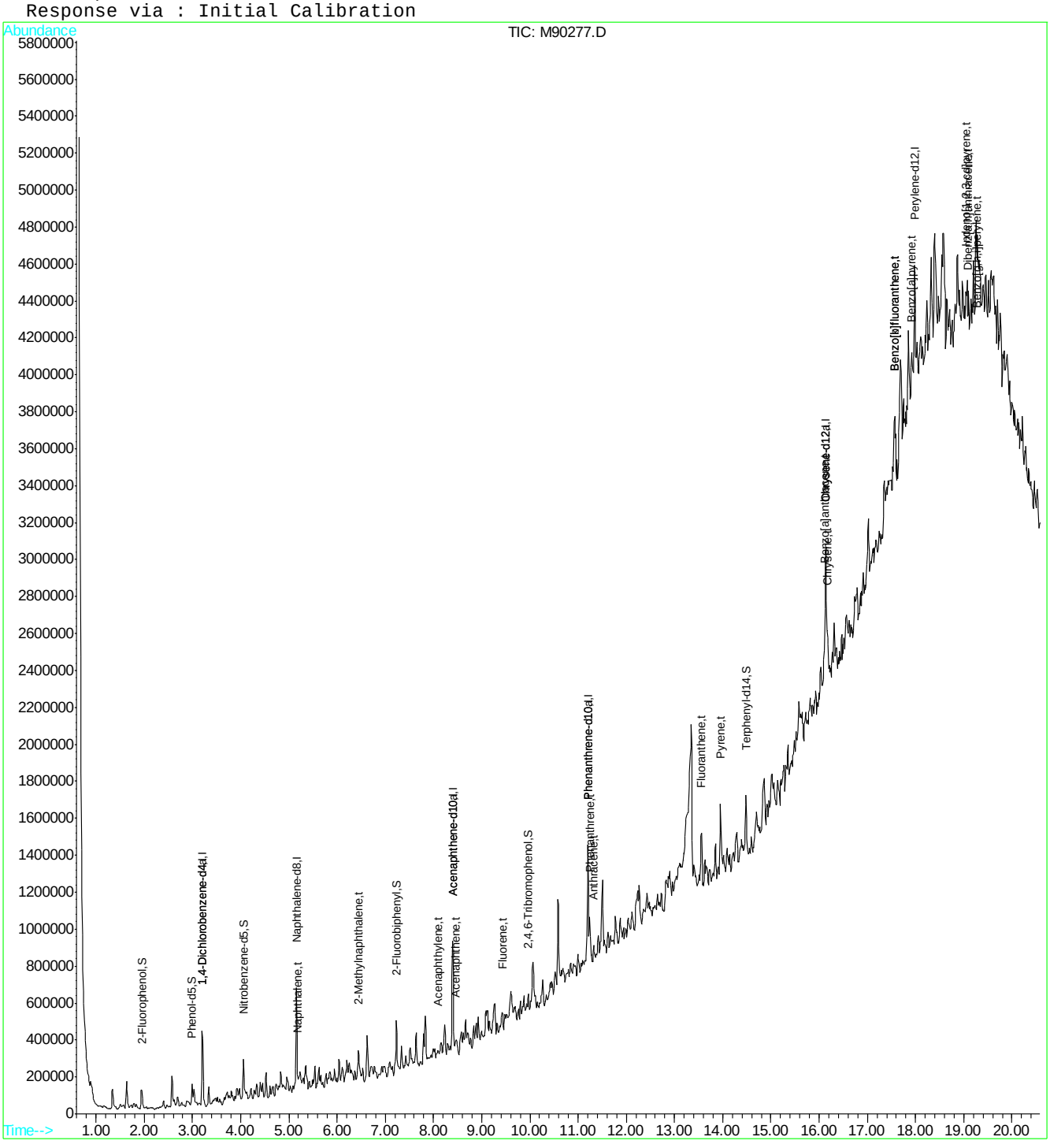
| Target Compounds | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 38) Naphthalene | 5.19 | 128 | 36255 | 3.25 | ppb | | 95 |
| 44) 2-Methylnaphthalene | 6.44 | 141 | 46284 | 6.75 | ppb | # | 72 |
| 56) Acenaphthylene | 8.10 | 152 | 19471 | 1.74 | ppb | | 89 |
| 59) Acenaphthene | 8.46 | 153 | 18360 | 2.55 | ppb | | 95 |
| 66) Fluorene | 9.43 | 166 | 30536 | 3.72 | ppb | | 95 |
| 77) Phenanthrene | 11.24 | 178 | 179962 | 15.64 | ppb | | 96 |
| 78) Anthracene | 11.33 | 178 | 57051 | 5.14 | ppb | | 97 |
| 81) Fluoranthene | 13.56 | 202 | 257132 | 17.87 | ppb | | 93 |
| 84) Pyrene | 13.96 | 202 | 299660 | 22.71 | ppb | | 96 |
| 88) Benzo[a]anthracene | 16.12 | 228 | 147026 | 11.47 | ppb | | 94 |
| 90) Chrysene | 16.17 | 228 | 190222 | 16.42 | ppb | | 94 |
| 94) Benzo[b]fluoranthene | 17.57 | 252 | 148272m | 11.24 | ppb | | |
| 95) Benzo[k]fluoranthene | 17.57 | 252 | 88005m | 7.07 | ppb | | |
| 96) Benzo[a]pyrene | 17.91 | 252 | 132545 | 11.57 | ppb | | 96 |
| 97) Indeno[1,2,3-cd]pyrene | 19.05 | 276 | 95992 | 7.67 | ppb | | 97 |
| 99) Dibenz[a,h]anthracene | 19.08 | 278 | 27984m | 2.73 | ppb | | |
| 101) Benzo[g,h,i]perylene | 19.28 | 276 | 108438 | 10.54 | ppb | | 91 |

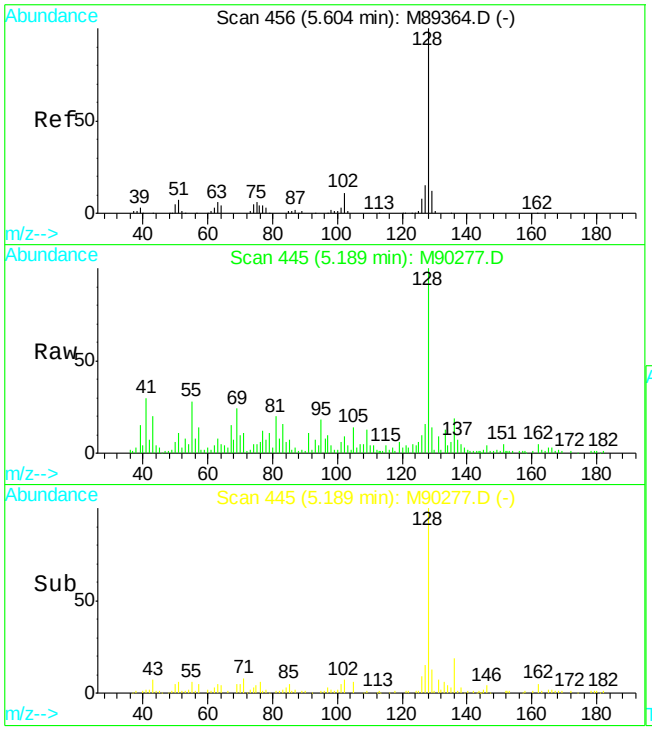
(#) = qualifier out of range (m) = manual integration

# Quantitation Report

Data File : C:\HPCHEM\1\DATA\EM3657\M90277.D  Vial: 23
Acq On : 14 Dec 2012 8:05 pm  Operator: olgaa
Sample : jb22549-4  Inst : MSM
Misc : op61971,em3657,30.3,,,1,2  Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 16 14:44 2012  Quant Results File: MM3617.RES

Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration

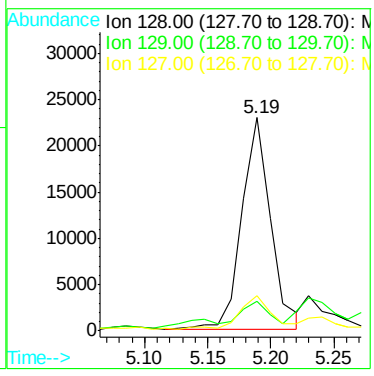


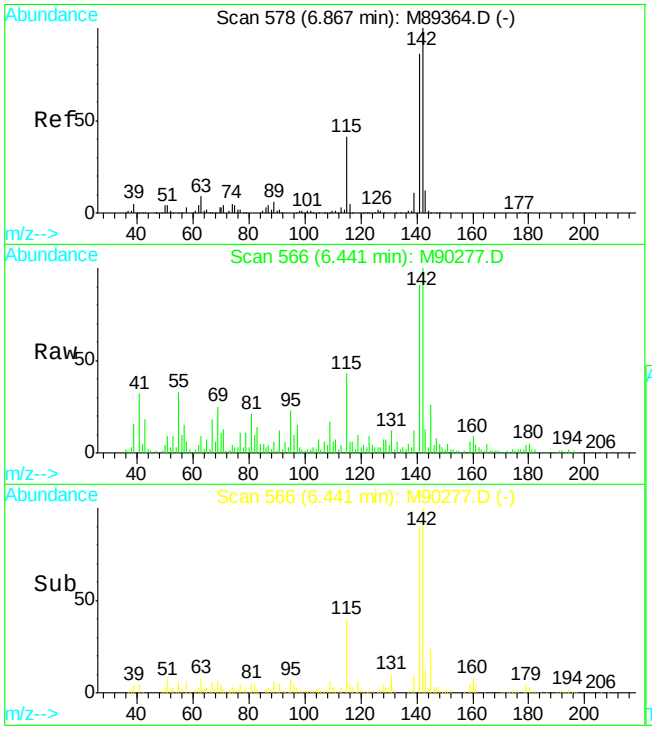



#38
Naphthalene
Concen: 3.25 ppb
RT: 5.19 min Scan# 445
Delta R.T. -0.06 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:128 Resp: 36255

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 128 | 100 | | |
| 129 | 8.5 | 0.0 | 42.1 |
| 127 | 14.7 | 0.0 | 45.2 |

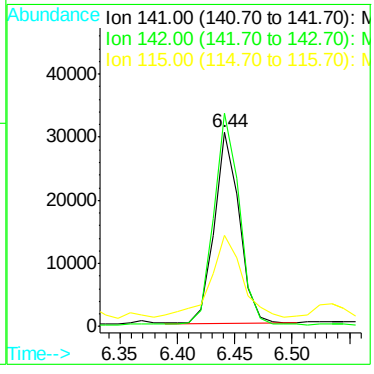


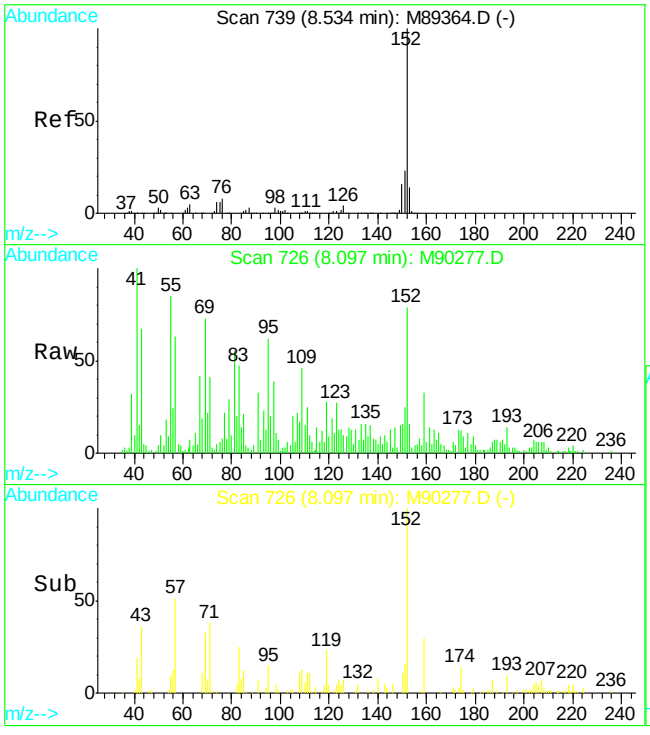




#44
2-Methylnaphthalene
Concen: 6.75 ppb
RT: 6.44 min Scan# 566
Delta R.T. -0.06 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:141 Resp: 46284

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 141 | 100 | | |
| 142 | 110.2 | 126.0 | 186.0# |
| 115 | 42.2 | 13.5 | 73.5 |

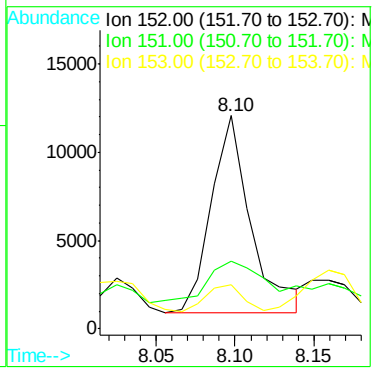


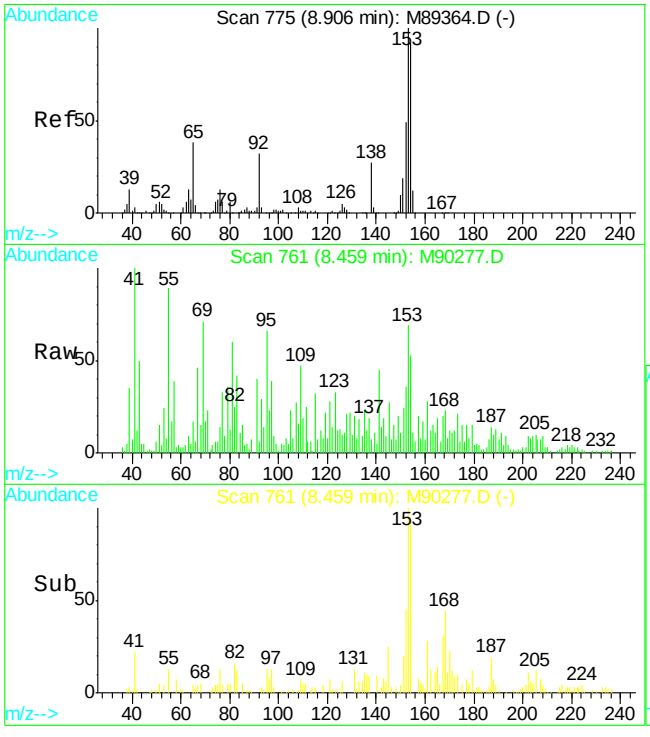



#56
Acenaphthylene
Concen: 1.74 ppb
RT: 8.10 min Scan# 726
Delta R.T. -0.05 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:152 Resp: 19471

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 152 | 100 | | |
| 151 | 17.1 | 0.0 | 52.4 |
| 153 | 9.5 | 0.0 | 44.5 |

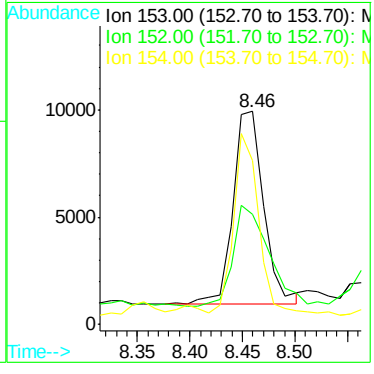



#59
Acenaphthene
Concen: 2.55 ppb
RT: 8.46 min Scan# 761
Delta R.T. -0.05 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

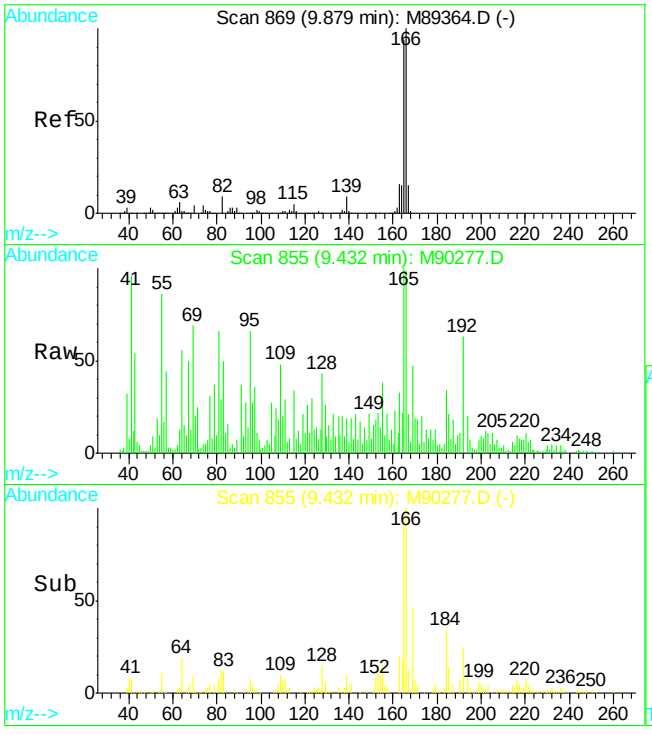
Tgt Ion:153 Resp: 18360

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 153 | 100 | | |
| 152 | 44.9 | 17.5 | 77.5 |
| 154 | 80.6 | 56.4 | 116.4 |




9.1.4

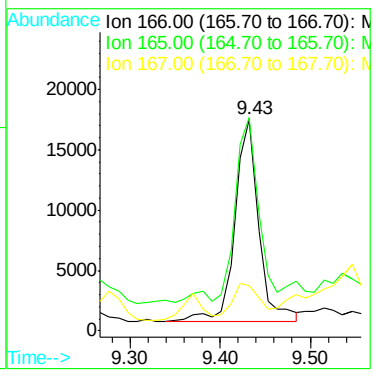
9

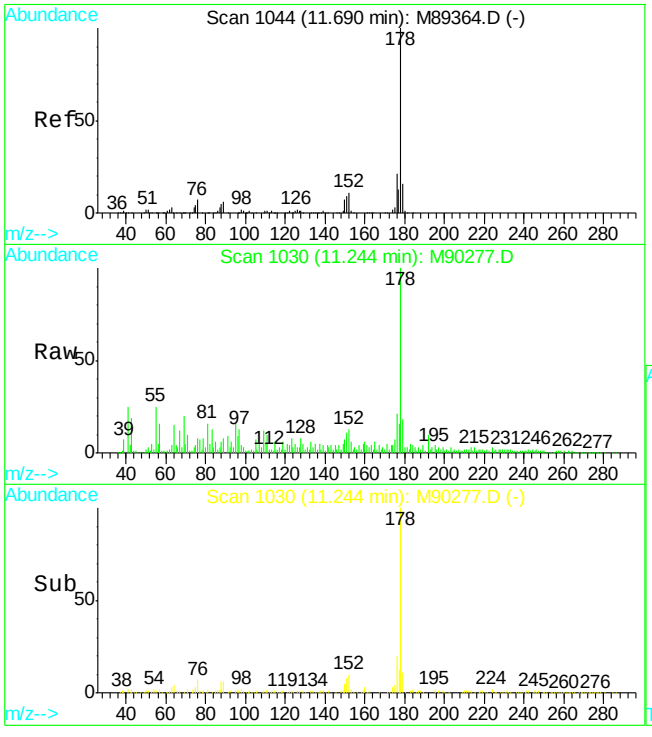



#66
Fluorene
Concen: 3.72 ppb
RT: 9.43 min Scan# 855
Delta R.T. -0.05 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:166 Resp: 30536

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 166 | 100 | | |
| 165 | 87.7 | 61.7 | 121.7 |
| 167 | 10.6 | 0.0 | 45.5 |

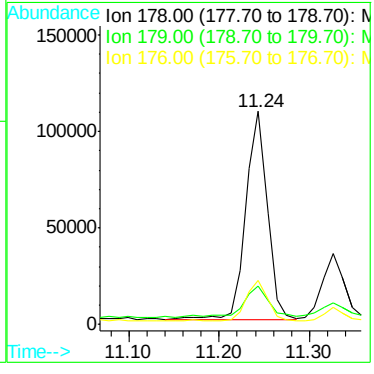



#77
Phenanthrene
Concen: 15.64 ppb
RT: 11.24 min Scan# 1030
Delta R.T. -0.05 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

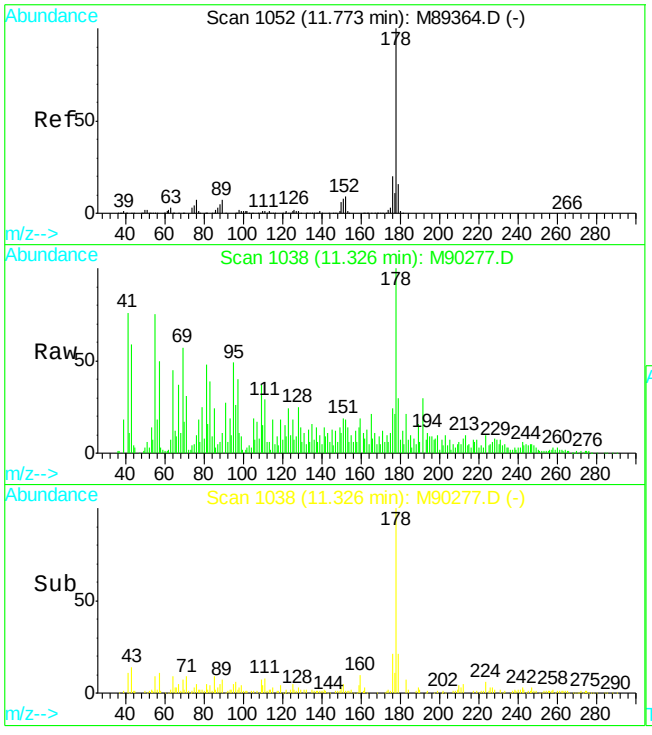
Tgt Ion:178 Resp: 179962

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 14.6 | 0.0 | 47.4 |
| 176 | 19.4 | 0.0 | 50.3 |




9.1.4

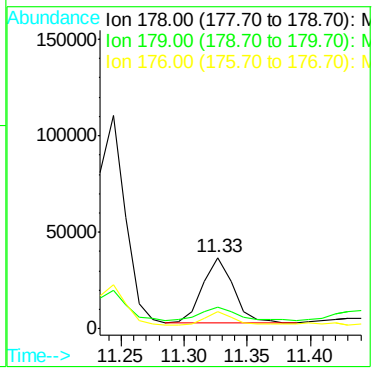
9

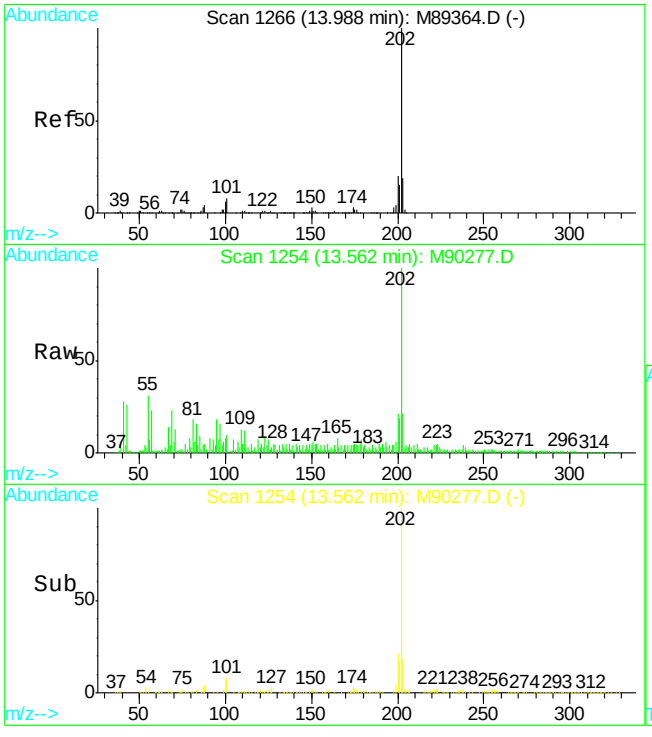



#78
Anthracene
Concen: 5.14 ppb
RT: 11.33 min Scan# 1038
Delta R.T. -0.05 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:178 Resp: 57051

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 20.0 | 0.0 | 47.3 |
| 176 | 19.9 | 0.0 | 50.3 |

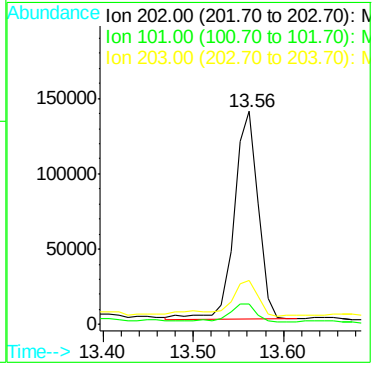


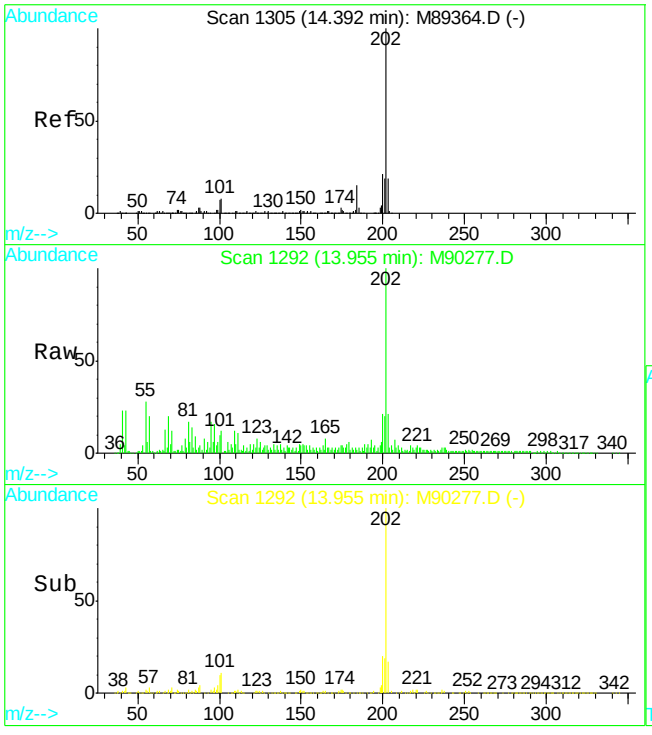




#81
Fluoranthene
Concen: 17.87 ppb
RT: 13.56 min Scan# 1254
Delta R.T. -0.02 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:202 Resp: 257132

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 101 | 8.6 | 0.0 | 40.6 |
| 203 | 16.8 | 0.0 | 50.3 |

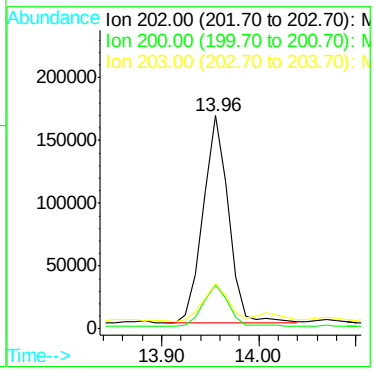


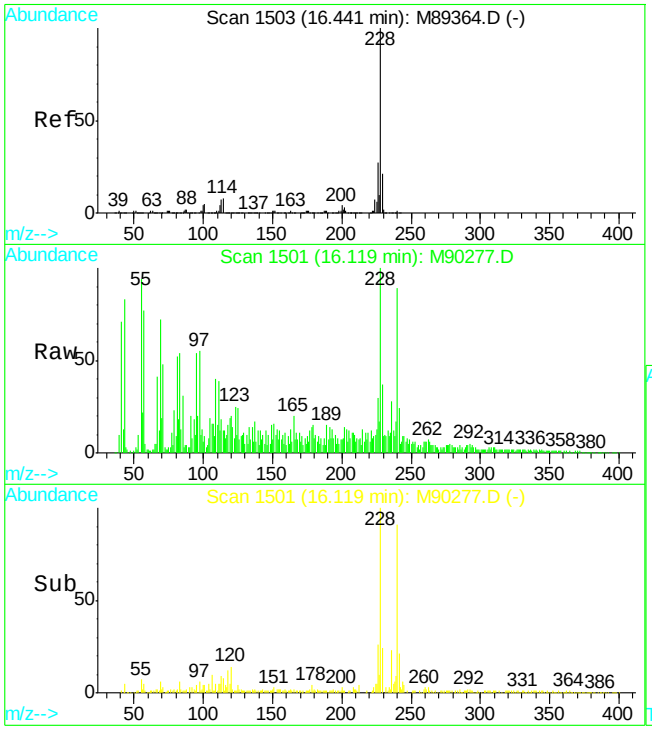



#84
Pyrene
Concen: 22.71 ppb
RT: 13.96 min Scan# 1292
Delta R.T. -0.02 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:202 Resp: 299660

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 200 | 20.0 | 0.0 | 51.0 |
| 203 | 17.6 | 0.0 | 50.0 |

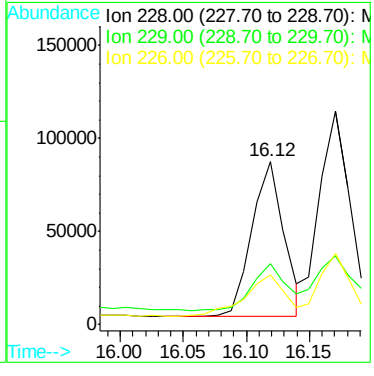


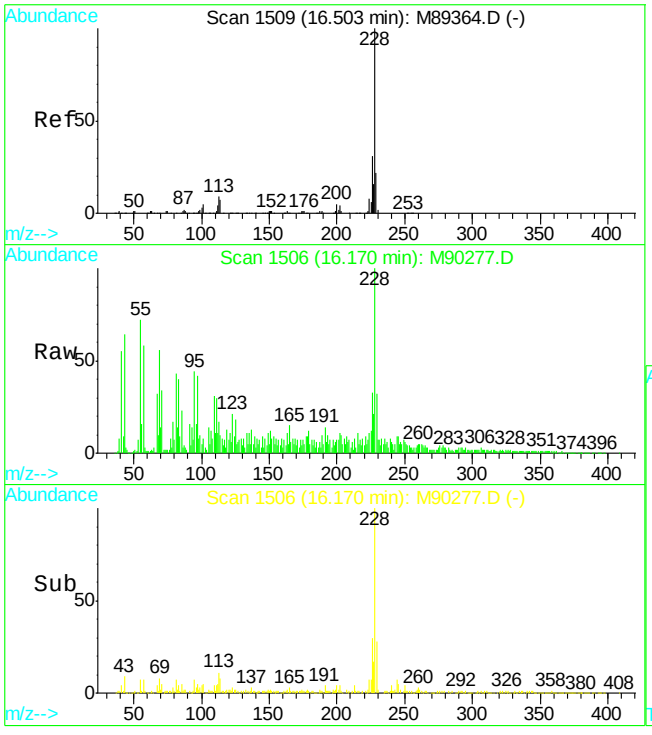




#88
Benzo[a]anthracene
Concen: 11.47 ppb
RT: 16.12 min Scan# 1501
Delta R.T. 0.00 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:228 Resp: 147026

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 229 | 27.2 | 0.0 | 53.2 |
| 226 | 26.6 | 0.0 | 58.3 |

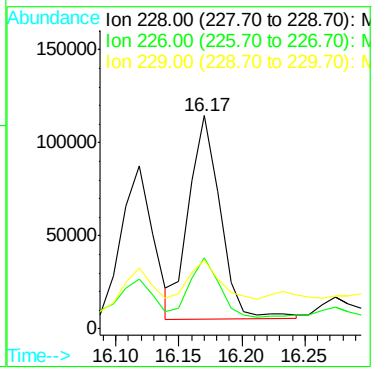


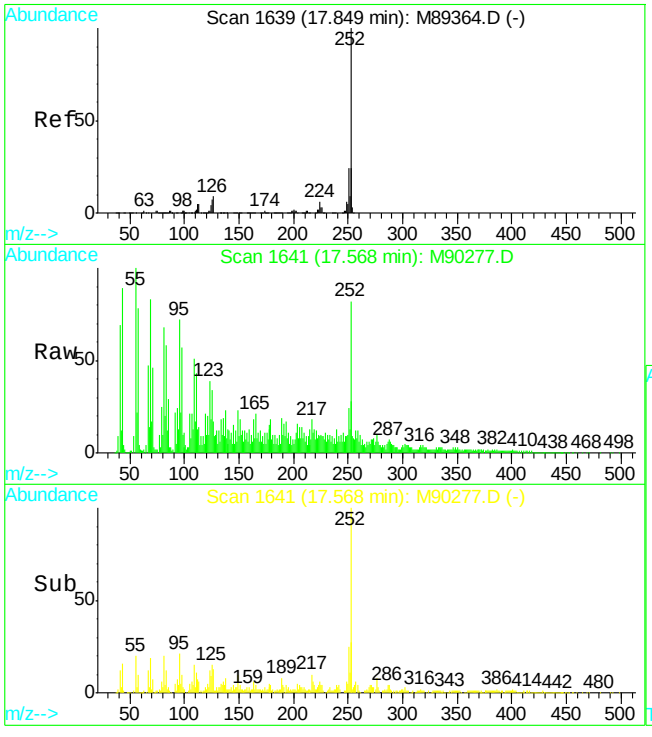



#90
Chrysene
Concen: 16.42 ppb
RT: 16.17 min Scan# 1506
Delta R.T. -0.01 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:228 Resp: 190222

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 226 | 29.9 | 2.3 | 62.3 |
| 229 | 20.0 | 0.0 | 54.2 |

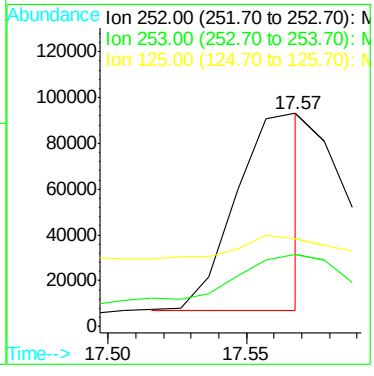



#94
Benzo[b]fluoranthene
Concen: 11.24 ppb m
RT: 17.57 min Scan# 1641
Delta R.T. 0.02 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:252 Resp: 148272

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 33.9 | 0.0 | 55.6 |
| 125 | 41.4 | 0.0 | 40.3# |




9.1.4

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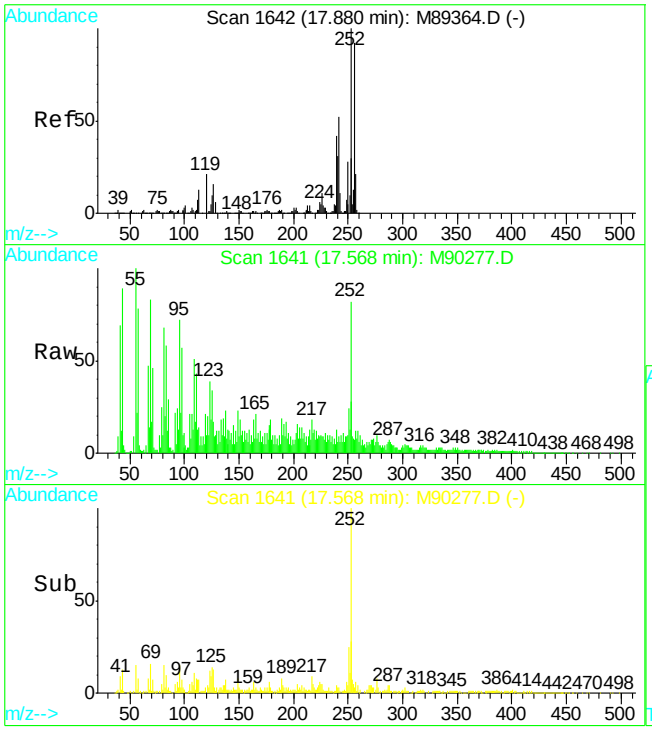
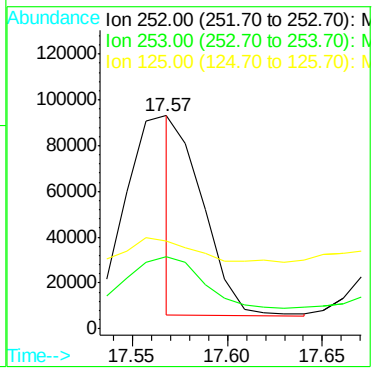
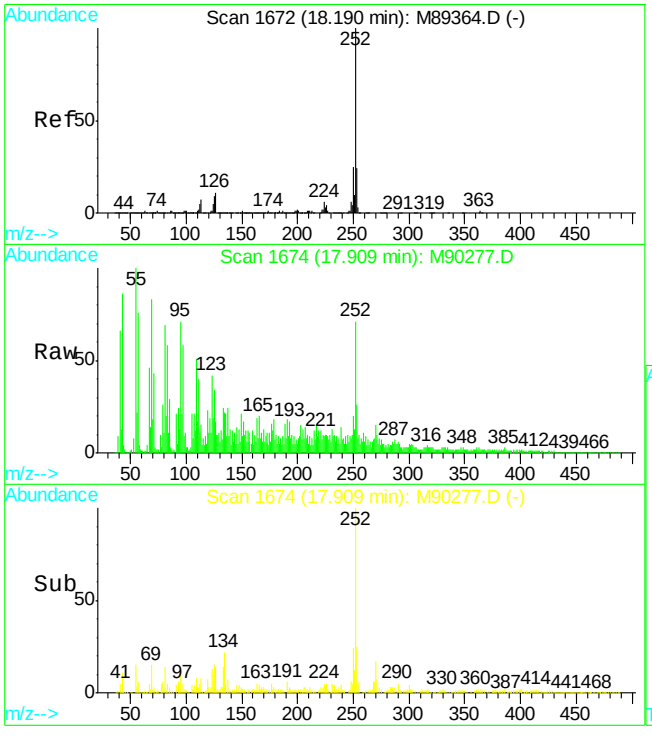



#95
Benzo[k]fluoranthene
Concen: 7.07 ppb m
RT: 17.57 min Scan# 1641
Delta R.T. -0.01 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:252 Resp: 88005

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 33.9 | 0.0 | 58.9 |
| 125 | 41.4 | 0.0 | 43.1 |

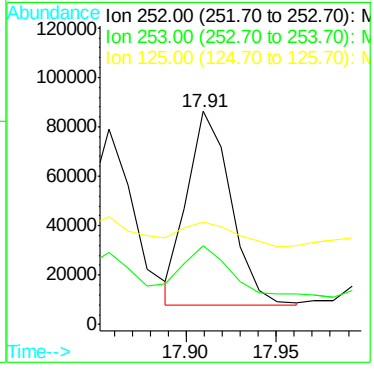



#96
Benzo[a]pyrene
Concen: 11.57 ppb
RT: 17.91 min Scan# 1674
Delta R.T. 0.02 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:252 Resp: 132545

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 24.0 | 0.0 | 55.8 |
| 125 | 10.6 | 0.0 | 42.8 |




9.1.4

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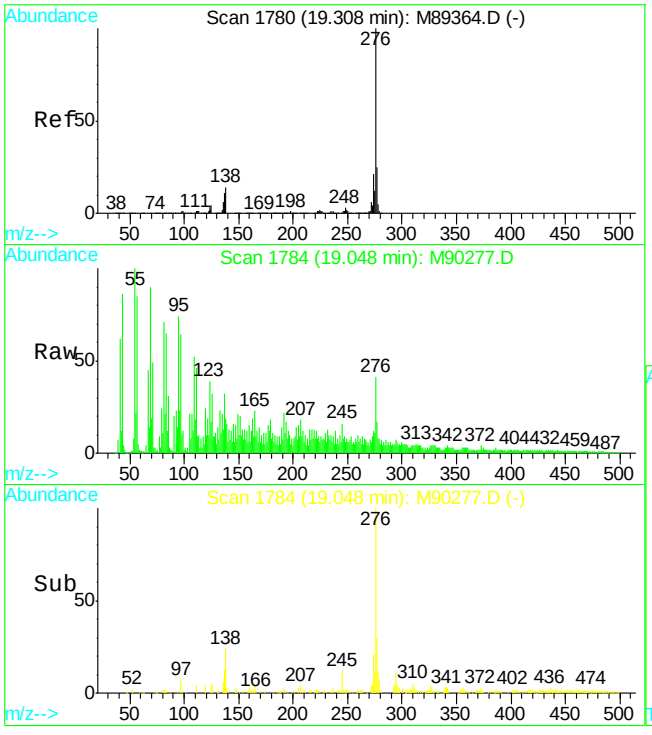
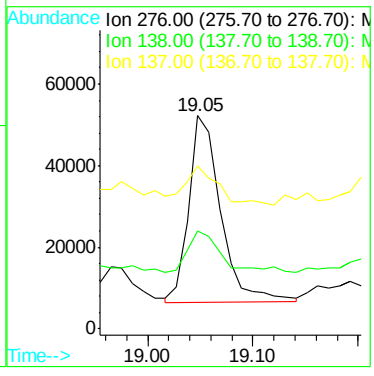
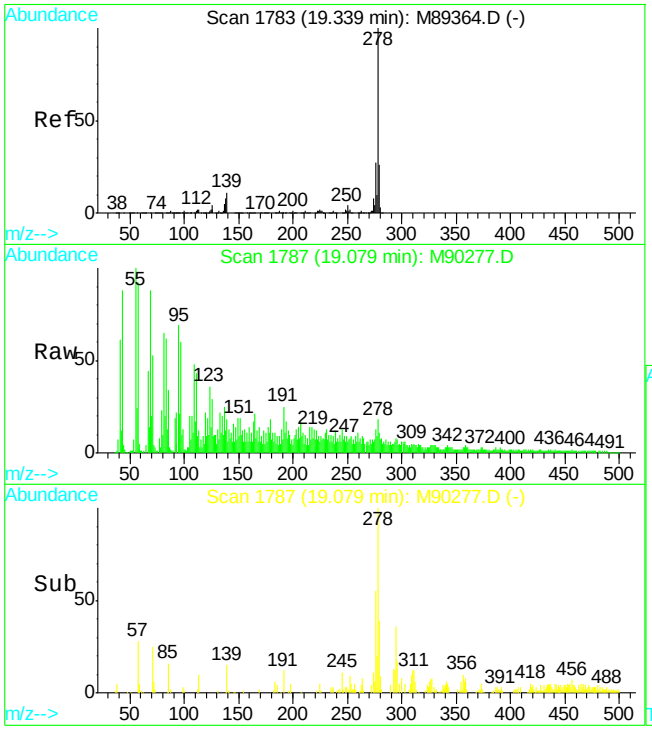



#97
Indeno[1,2,3-cd]pyrene
Concen: 7.67 ppb
RT: 19.05 min Scan# 1784
Delta R.T. 0.04 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:276 Resp: 95992

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 22.4 | 0.0 | 51.4 |
| 137 | 17.8 | 0.0 | 45.7 |

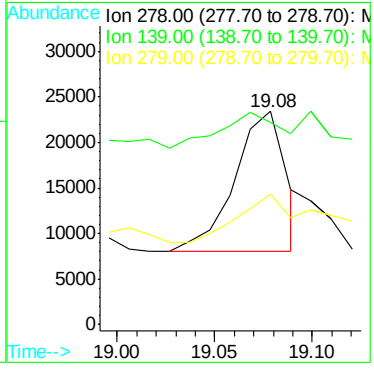



#99
Dibenz[a,h]anthracene
Concen: 2.73 ppb m
RT: 19.08 min Scan# 1787
Delta R.T. 0.04 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:278 Resp: 27984

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 278 | 100 | | |
| 139 | 94.7 | 0.0 | 45.4# |
| 279 | 61.1 | 0.0 | 58.2# |




9.1.4

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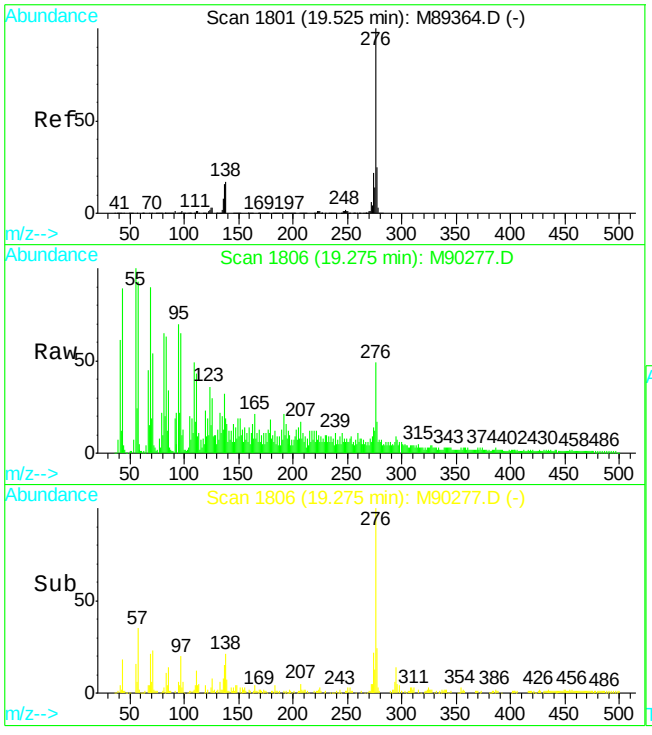
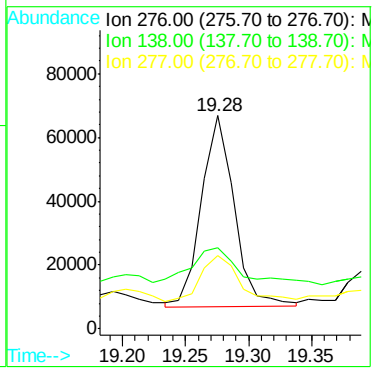



#101
Benzo[g,h,i]perylene
Concen: 10.54 ppb
RT: 19.28 min Scan# 1806
Delta R.T. 0.05 min
Lab File: M90277.D
Acq: 14 Dec 2012 8:05 pm

Tgt Ion:276 Resp: 108438

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 17.3 | 0.0 | 53.9 |
| 277 | 24.1 | 0.0 | 57.2 |




9.1.4

9

Manual Integrations APPROVED (compounds with "m" flag)
Kristi Schollenberger 12/17/12 11:27

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\EM3657\M90278.D Vial: 24
Acq On : 14 Dec 2012 8:35 pm Operator: olgaa
Sample : jb22549-5 Inst : MSM
Misc : op61971,em3657,32.0,,,1,2 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 16 14:47 2012 Quant Results File: MM3617.RES

Quant Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration
DataAcq Meth : MM3617

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) 1,4-Dichlorobenzene-d4 | 3.22 | 152 | 120515 | 40.00 | ppb | -0.04 |
| 24) Naphthalene-d8 | 5.17 | 136 | 423074 | 40.00 | ppb | -0.05 |
| 47) Acenaphthene-d10 | 8.42 | 164 | 258864 | 40.00 | ppb | -0.04 |
| 69) Phenanthrene-d10 | 11.24 | 188 | 420065 | 40.00 | ppb | -0.02 |
| 83) Chrysene-d12 | 16.21 | 240 | 454606 | 40.00 | ppb | 0.06 |
| 92) Perylene-d12 | 18.06 | 264 | 380524 | 40.00 | ppb | 0.10 |
| 102) 1,4-Dichlorobenzene-d4a | 3.22 | 152 | 120515 | 40.00 | ppb | -0.04 |
| 104) Acenaphthene-d10a | 8.42 | 164 | 258864 | 40.00 | ppb | -0.04 |
| 106) Phenanthrene-d10a | 11.24 | 188 | 420065 | 40.00 | ppb | -0.02 |
| 108) Chrysene-d12a | 16.21 | 240 | 454606 | 40.00 | ppb | 0.06 |
| **System Monitoring Compounds** | | | | | | |
| 5) 2-Fluorophenol | 1.95 | 112 | 57862 | 14.83 | ppb | 0.00 |
| Spiked Amount 50.000 | | | Recovery = 29.66% | | | |
| 8) Phenol-d5 | 3.01 | 99 | 72744 | 14.74 | ppb | 0.03 |
| Spiked Amount 50.000 | | | Recovery = 29.48% | | | |
| 25) Nitrobenzene-d5 | 4.07 | 82 | 65823 | 15.42 | ppb | -0.04 |
| Spiked Amount 50.000 | | | Recovery = 30.84% | | | |
| 51) 2-Fluorobiphenyl | 7.25 | 172 | 130175 | 15.84 | ppb | -0.05 |
| Spiked Amount 50.000 | | | Recovery = 31.68% | | | |
| 73) 2,4,6-Tribromophenol | 10.00 | 330 | 16337 | 21.89 | ppb | 0.00 |
| Spiked Amount 50.000 | | | Recovery = 43.78% | | | |
| 86) Terphenyl-d14 | 14.55 | 244 | 178950 | 19.26 | ppb | 0.04 |
| Spiked Amount 50.000 | | | Recovery = 38.52% | | | |

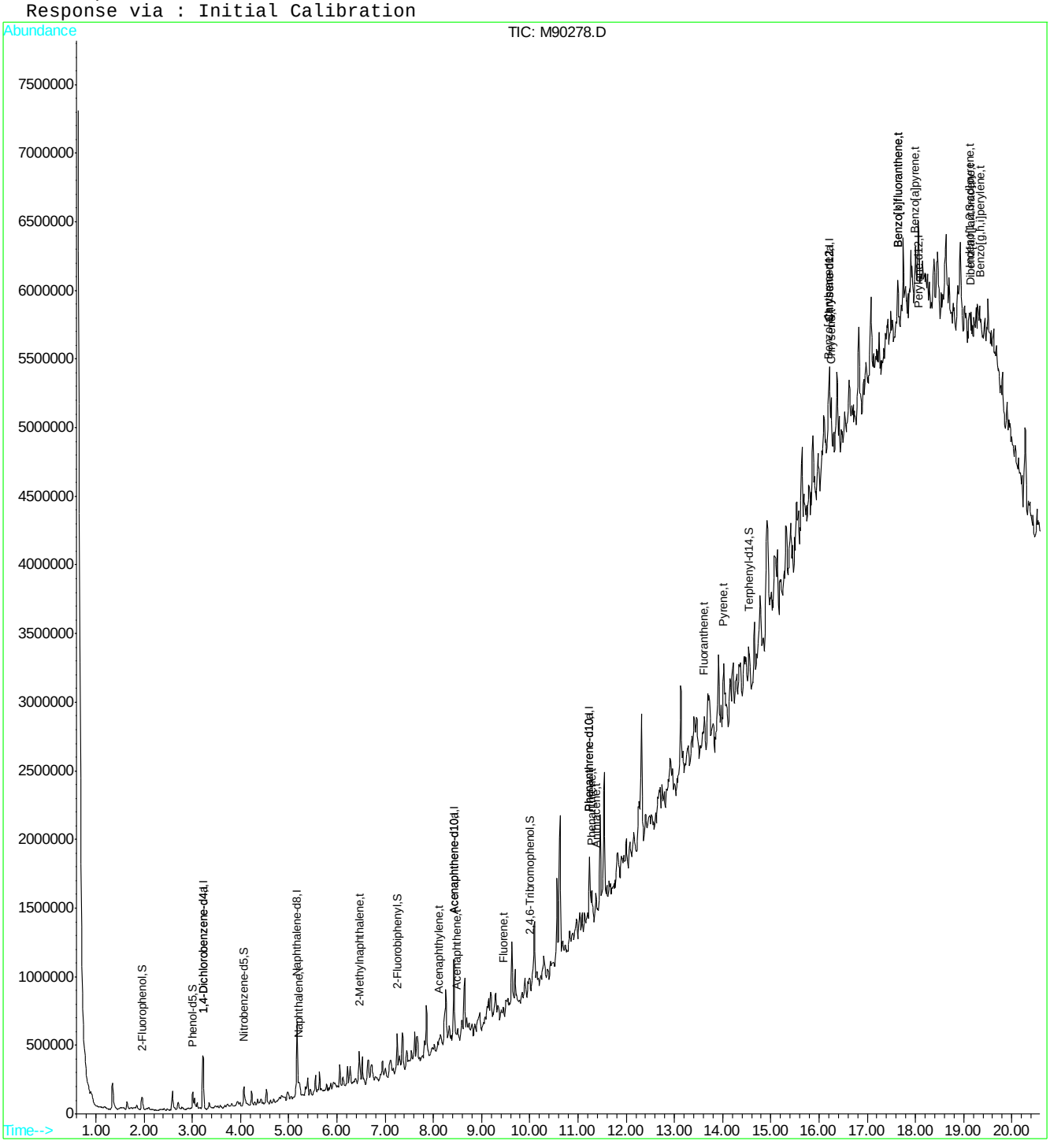
| Target Compounds | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 38) Naphthalene | 5.20 | 128 | 67332 | 5.80 | ppb | 100 |
| 44) 2-Methylnaphthalene | 6.46 | 141 | 84422 | 11.82 | ppb # | 73 |
| 56) Acenaphthylene | 8.12 | 152 | 35772 | 3.17 | ppb | 96 |
| 59) Acenaphthene | 8.48 | 153 | 14808 | 2.05 | ppb | 83 |
| 66) Fluorene | 9.46 | 166 | 21208 | 2.58 | ppb | 99 |
| 77) Phenanthrene | 11.28 | 178 | 157884 | 14.84 | ppb | 97 |
| 78) Anthracene | 11.37 | 178 | 99853 | 9.72 | ppb | 94 |
| 81) Fluoranthene | 13.62 | 202 | 172556 | 12.97 | ppb | 93 |
| 84) Pyrene | 14.02 | 202 | 341394 | 24.94 | ppb | 98 |
| 88) Benzo[a]anthracene | 16.19 | 228 | 126146 | 9.49 | ppb | 90 |
| 90) Chrysene | 16.24 | 228 | 228204 | 18.98 | ppb | 88 |
| 94) Benzo[b]fluoranthene | 17.64 | 252 | 106415m | 8.50 | ppb | |
| 95) Benzo[k]fluoranthene | 17.64 | 252 | 80923m | 6.85 | ppb | |
| 96) Benzo[a]pyrene | 17.98 | 252 | 131137 | 12.06 | ppb | 95 |
| 97) Indeno[1,2,3-cd]pyrene | 19.12 | 276 | 93670 | 7.88 | ppb | 90 |
| 99) Dibenz[a,h]anthracene | 19.14 | 278 | 40920 | 4.20 | ppb | 97 |
| 101) Benzo[g,h,i]perylene | 19.35 | 276 | 132109 | 13.53 | ppb | 90 |

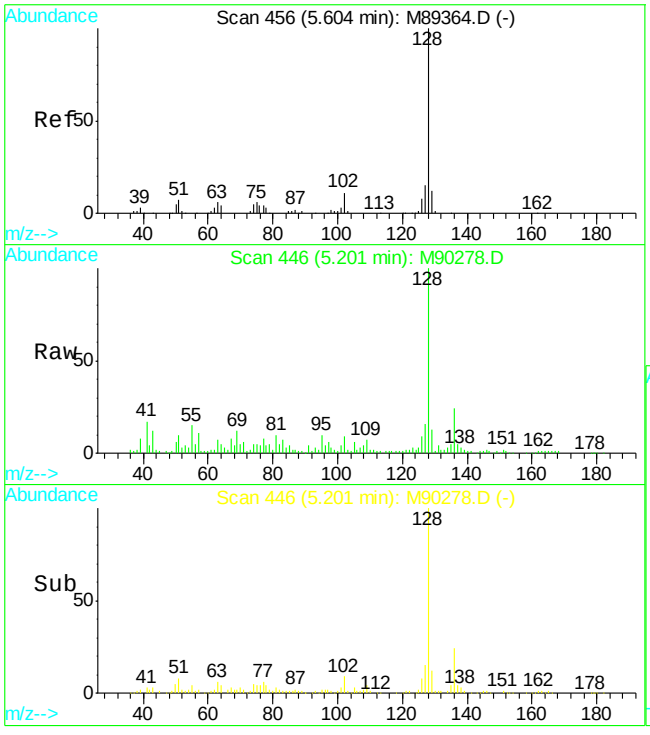
(#) = qualifier out of range (m) = manual integration
M90278.D MM3617.M Sun Dec 16 14:47:20 2012 GCMSM

Quantitation Report

Data File : C:\HPCHEM\1\DATA\EM3657\M90278.D Vial: 24
Acq On : 14 Dec 2012 8:35 pm Operator: olgaa
Sample : jb22549-5 Inst : MSM
Misc : op61971,em3657,32.0,,,1,2 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 16 14:47 2012 Quant Results File: MM3617.RES

Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration

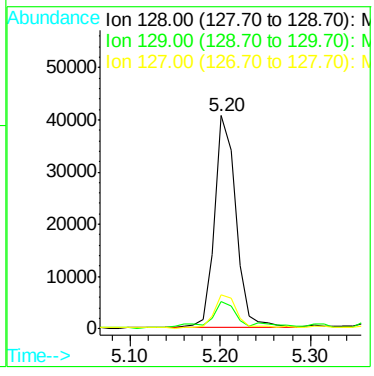


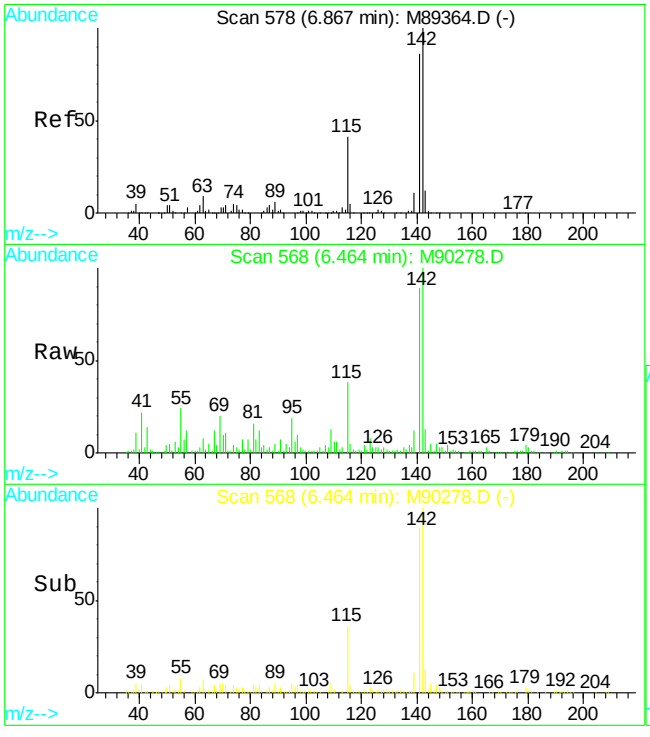



#38
Naphthalene
Concen: 5.80 ppb
RT: 5.20 min Scan# 446
Delta R.T. -0.05 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:128 Resp: 67332

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 128 | 100 | | |
| 129 | 12.0 | 0.0 | 42.1 |
| 127 | 15.2 | 0.0 | 45.2 |

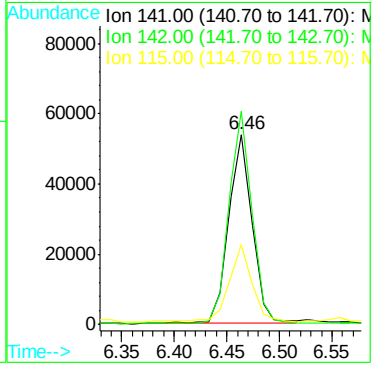


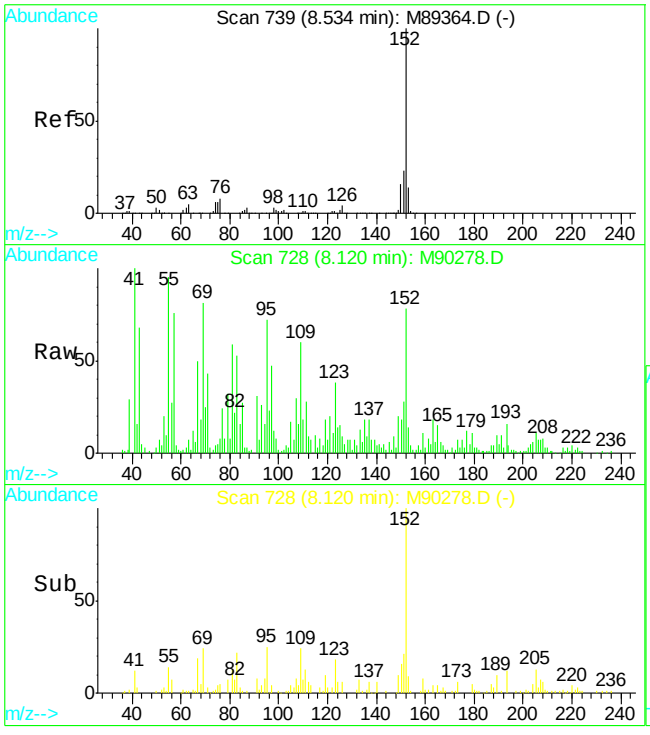




#44
2-Methylnaphthalene
Concen: 11.82 ppb
RT: 6.46 min Scan# 568
Delta R.T. -0.04 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:141 Resp: 84422

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 141 | 100 | | |
| 142 | 113.0 | 126.0 | 186.0# |
| 115 | 41.0 | 13.5 | 73.5 |

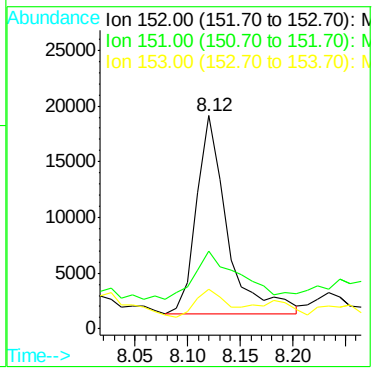


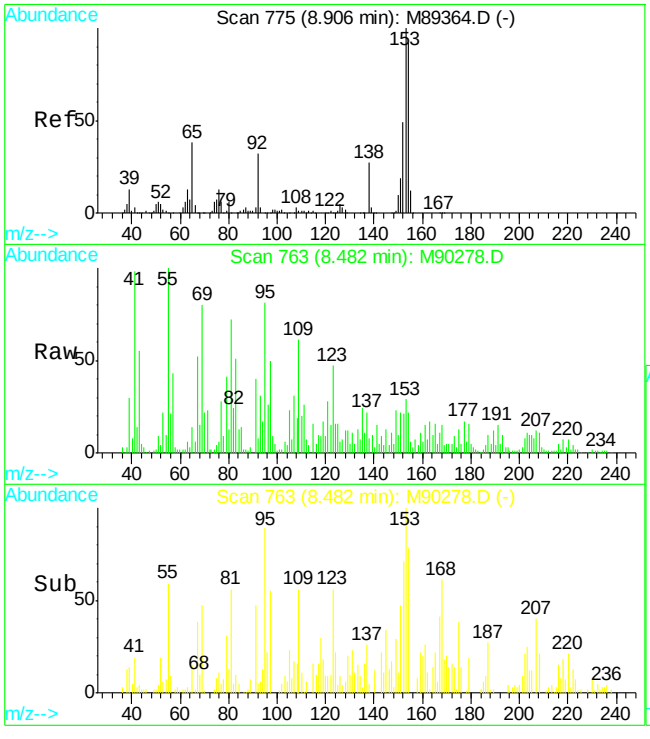



#56
Acenaphthylene
Concen: 3.17 ppb
RT: 8.12 min Scan# 728
Delta R.T. -0.03 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:152 Resp: 35772

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 152 | 100 | | |
| 151 | 23.5 | 0.0 | 52.4 |
| 153 | 11.8 | 0.0 | 44.5 |

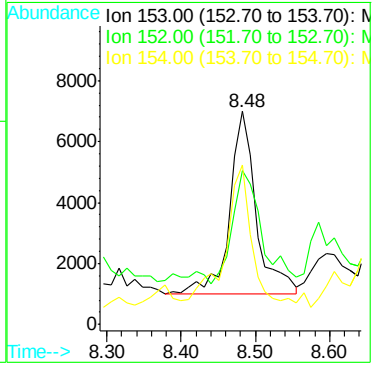



#59
Acenaphthene
Concen: 2.05 ppb
RT: 8.48 min Scan# 763
Delta R.T. -0.03 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:153 Resp: 14808

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 153 | 100 | | |
| 152 | 60.4 | 17.5 | 77.5 |
| 154 | 71.9 | 56.4 | 116.4 |




9.1.5

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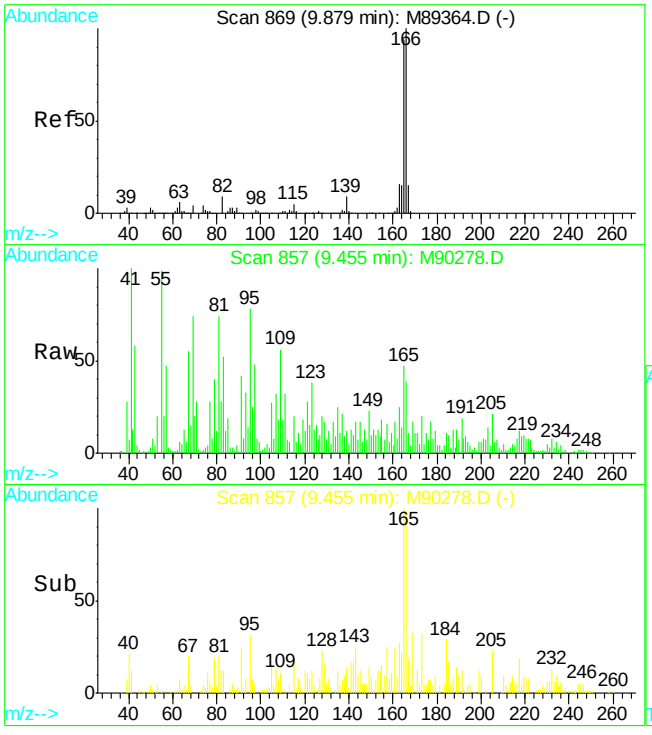
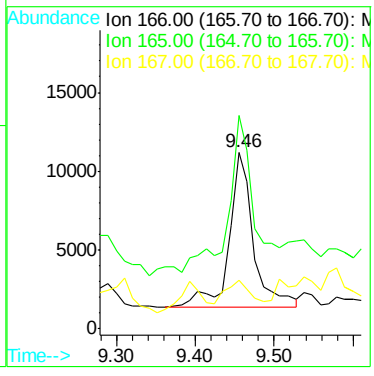
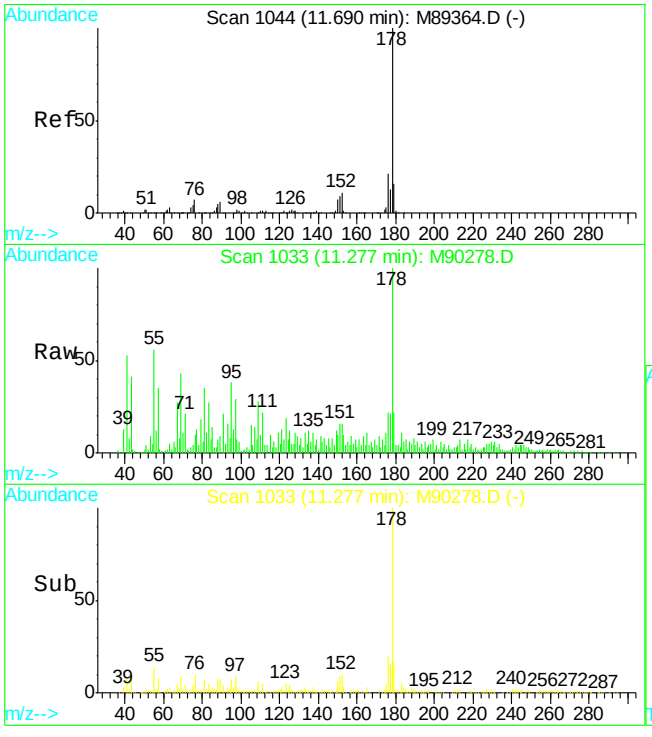



#66
Fluorene
Concen: 2.58 ppb
RT: 9.46 min Scan# 857
Delta R.T. -0.03 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:166 Resp: 21208

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 166 | 100 | | |
| 165 | 91.6 | 61.7 | 121.7 |
| 167 | 11.6 | 0.0 | 45.5 |

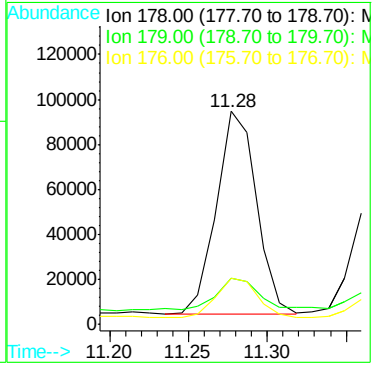


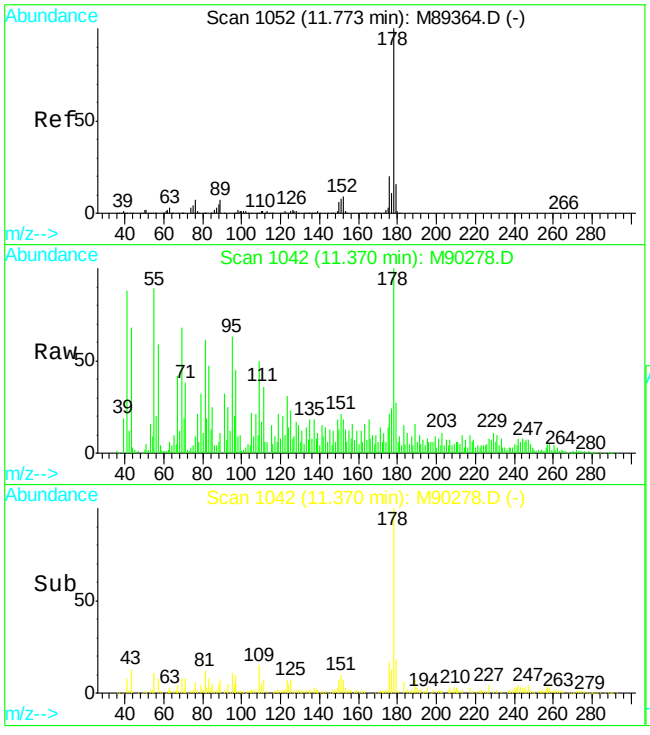




#77
Phenanthrene
Concen: 14.84 ppb
RT: 11.28 min Scan# 1033
Delta R.T. -0.02 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:178 Resp: 157884

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 14.7 | 0.0 | 47.4 |
| 176 | 19.7 | 0.0 | 50.3 |

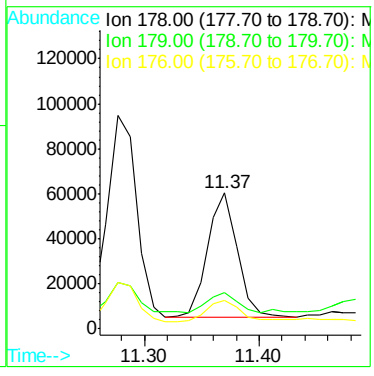


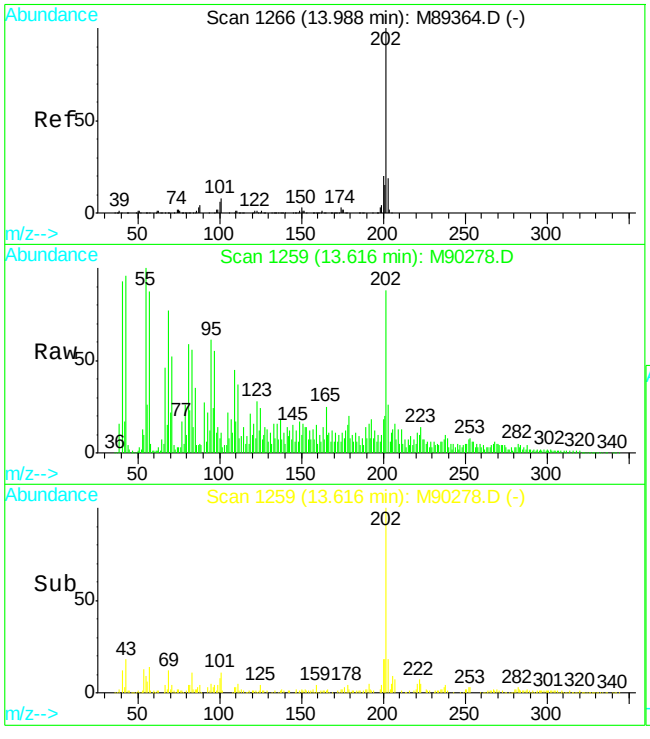



#78
Anthracene
Concen: 9.72 ppb
RT: 11.37 min Scan# 1042
Delta R.T. -0.01 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:178 Resp: 99853

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 15.4 | 0.0 | 47.3 |
| 176 | 16.5 | 0.0 | 50.3 |

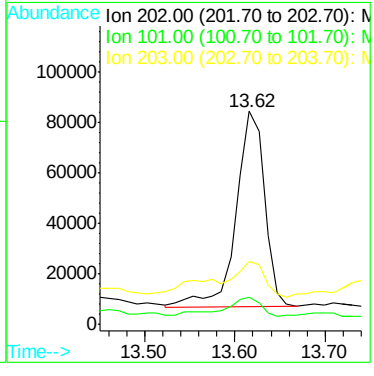



#81
Fluoranthene
Concen: 12.97 ppb
RT: 13.62 min Scan# 1259
Delta R.T. 0.03 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

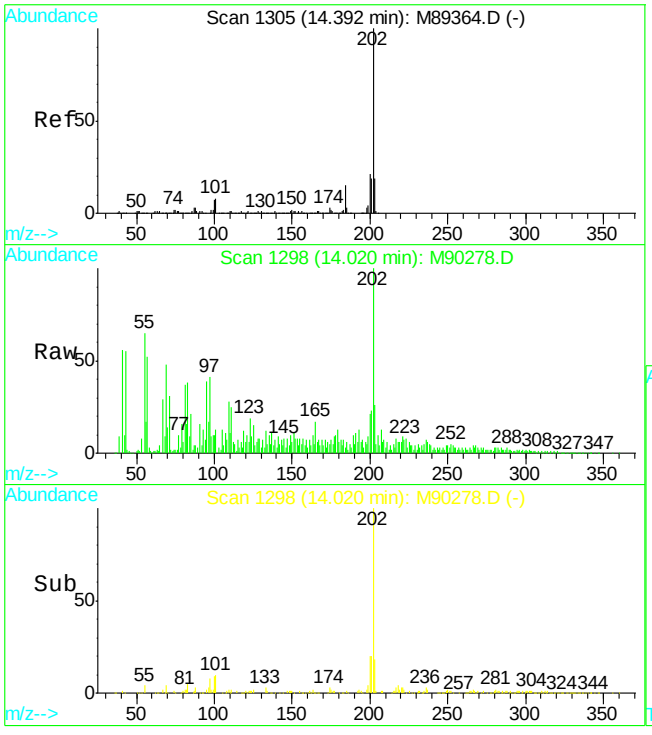
Tgt Ion:202 Resp: 172556

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 101 | 9.4 | 0.0 | 40.6 |
| 203 | 16.4 | 0.0 | 50.3 |




9.1.5

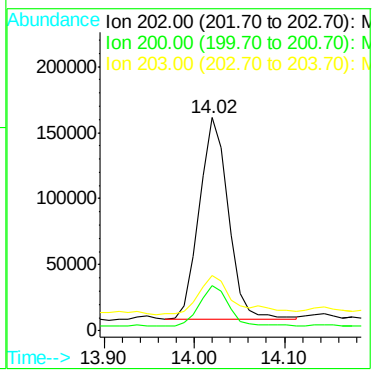
9

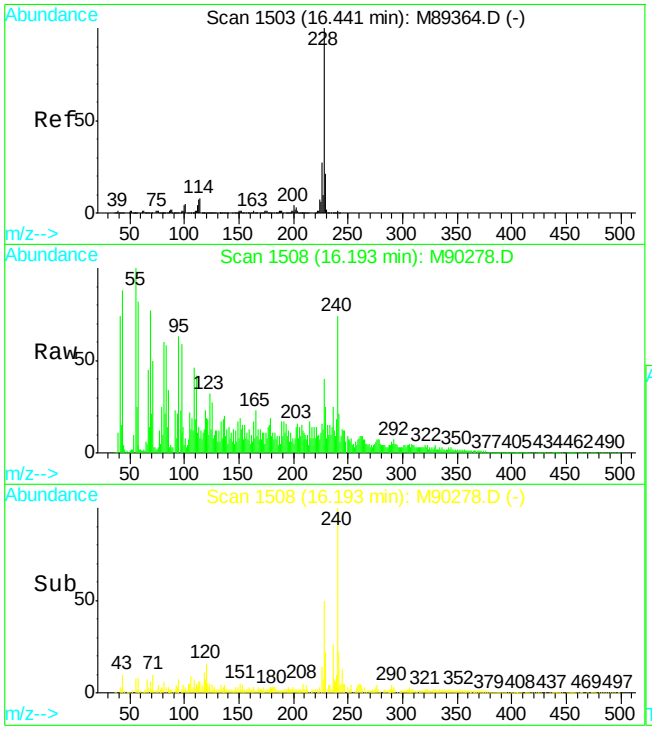



#84
Pyrene
Concen: 24.94 ppb
RT: 14.02 min Scan# 1298
Delta R.T. 0.04 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:202 Resp: 341394

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 200 | 20.4 | 0.0 | 51.0 |
| 203 | 18.5 | 0.0 | 50.0 |

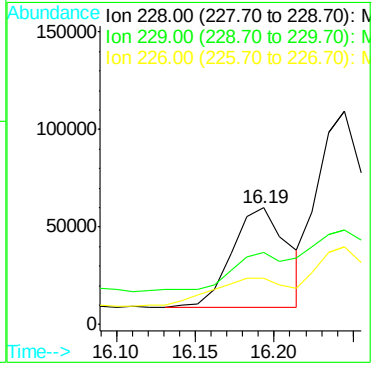


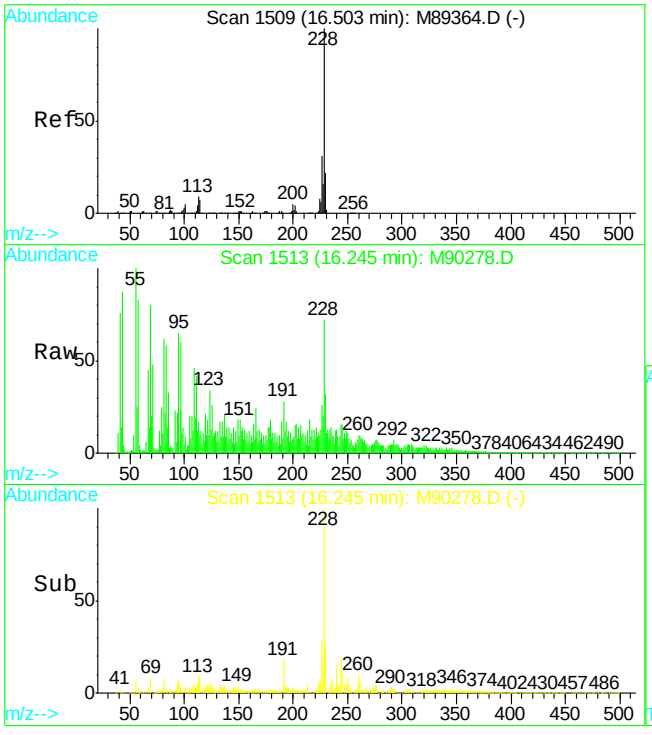




#88
Benzo[a]anthracene
Concen: 9.49 ppb
RT: 16.19 min Scan# 1508
Delta R.T. 0.08 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:228 Resp: 126146

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 229 | 30.9 | 0.0 | 53.2 |
| 226 | 25.7 | 0.0 | 58.3 |

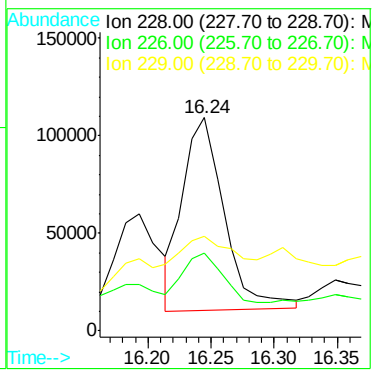


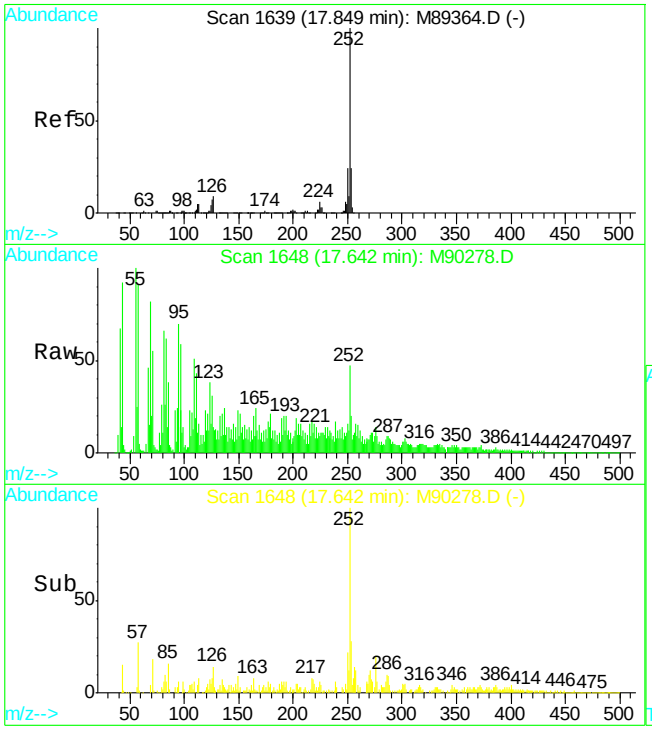



#90
Chrysene
Concen: 18.98 ppb
RT: 16.24 min Scan# 1513
Delta R.T. 0.06 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:228 Resp: 228204

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 226 | 27.8 | 2.3 | 62.3 |
| 229 | 15.8 | 0.0 | 54.2 |

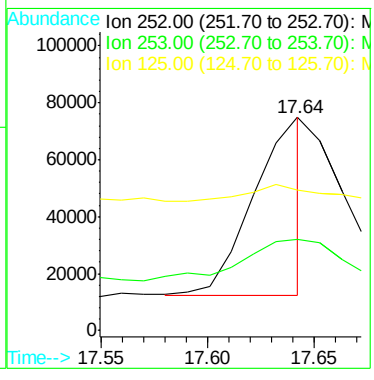


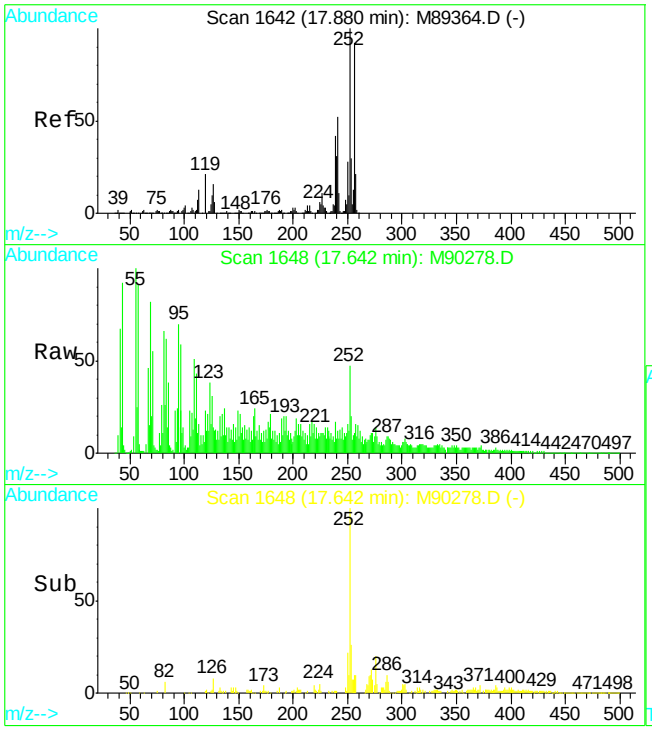




#94
Benzo[b]fluoranthene
Concen: 8.50 ppb m
RT: 17.64 min Scan# 1648
Delta R.T. 0.10 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:252 Resp: 106415

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 42.7 | 0.0 | 55.6 |
| 125 | 65.9 | 0.0 | 40.3# |

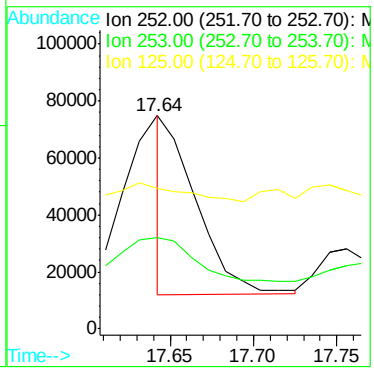


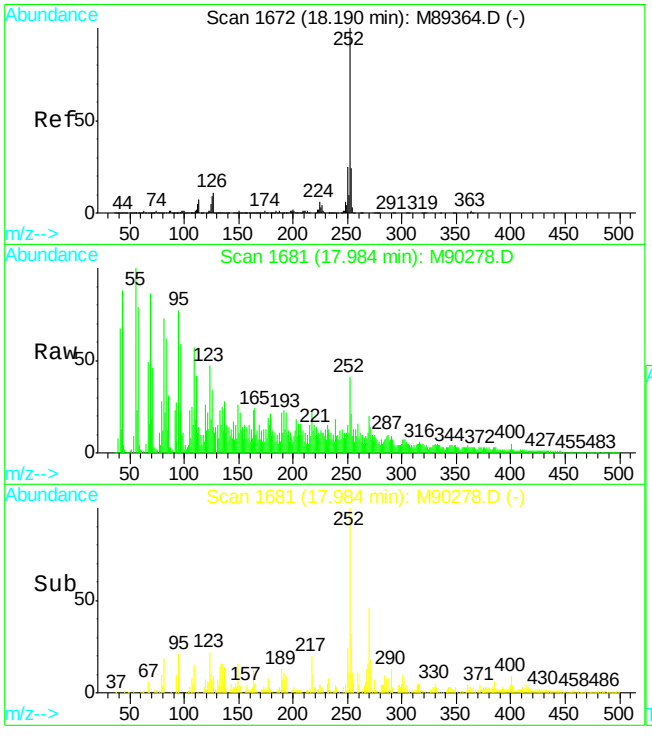



#95
Benzo[k]fluoranthene
Concen: 6.85 ppb m
RT: 17.64 min Scan# 1648
Delta R.T. 0.06 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:252 Resp: 80923

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 42.7 | 0.0 | 58.9 |
| 125 | 65.9 | 0.0 | 43.1# |

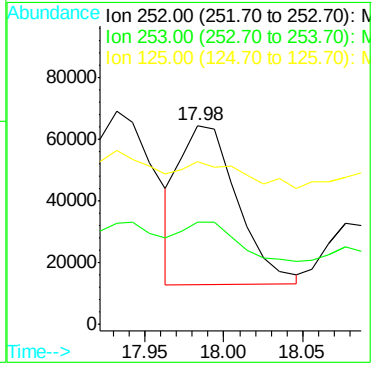



#96
Benzo[a]pyrene
Concen: 12.06 ppb
RT: 17.98 min Scan# 1681
Delta R.T. 0.10 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

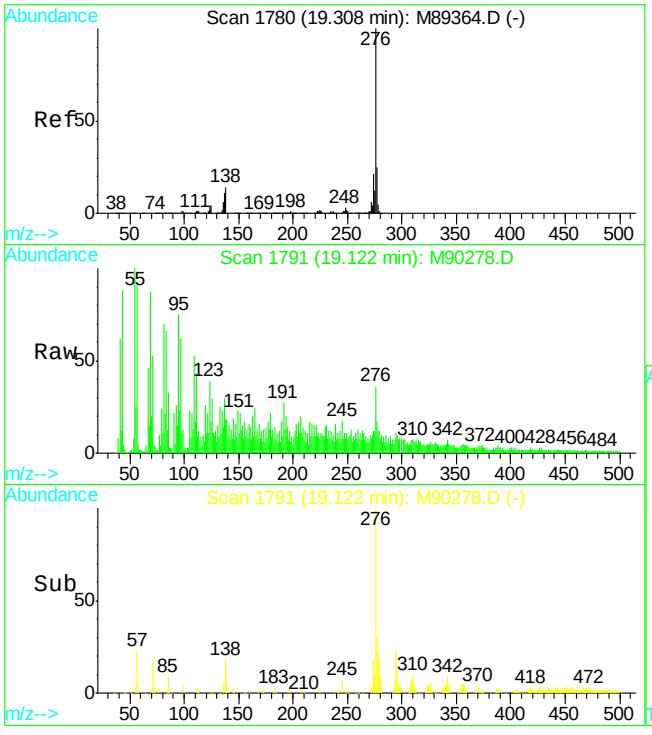
Tgt Ion:252 Resp: 131137

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 25.6 | 0.0 | 55.8 |
| 125 | 18.3 | 0.0 | 42.8 |




9.1.5

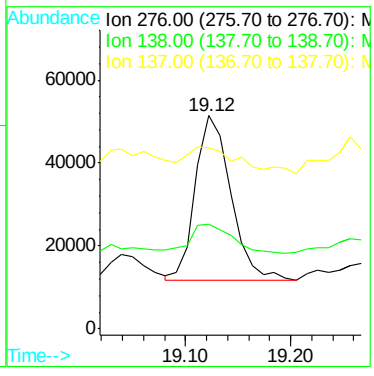
9

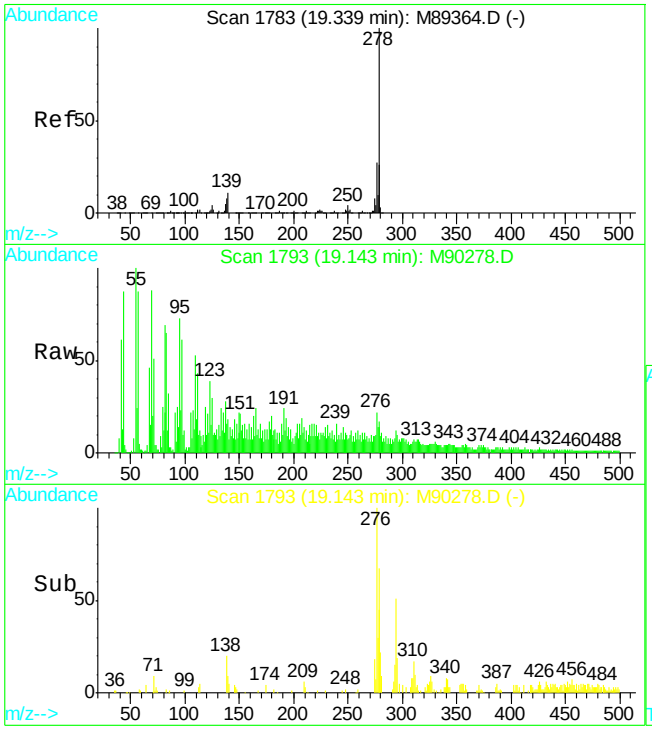



#97
Indeno[1,2,3-cd]pyrene
Concen: 7.88 ppb
RT: 19.12 min Scan# 1791
Delta R.T. 0.12 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:276 Resp: 93670

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 16.5 | 0.0 | 51.4 |
| 137 | 11.7 | 0.0 | 45.7 |

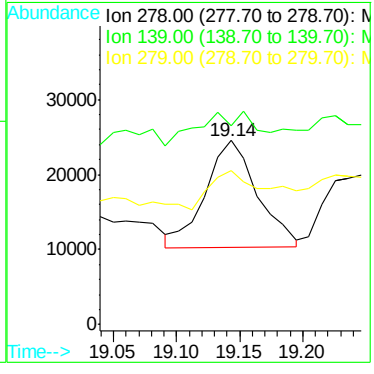


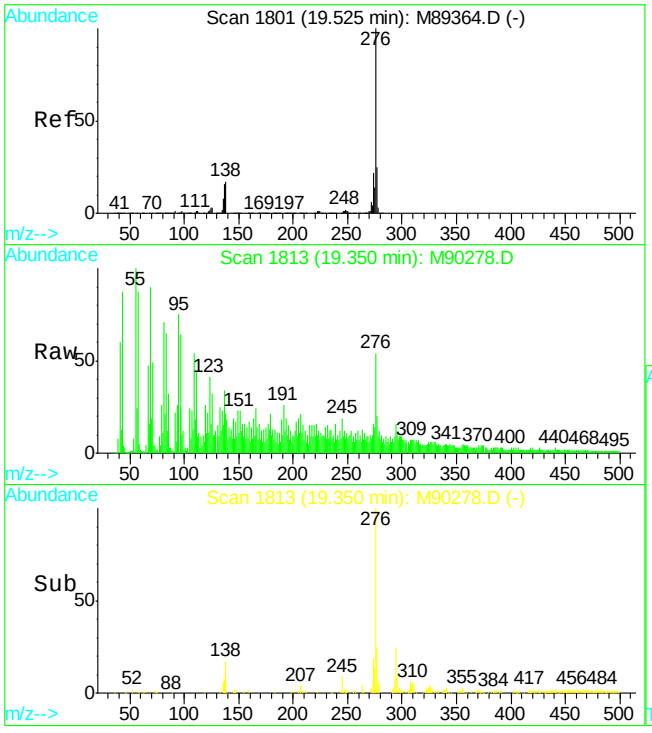




#99
Dibenz[a,h]anthracene
Concen: 4.20 ppb
RT: 19.14 min Scan# 1793
Delta R.T. 0.11 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:278 Resp: 40920

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 278 | 100 | | |
| 139 | 12.8 | 0.0 | 45.4 |
| 279 | 27.6 | 0.0 | 58.2 |

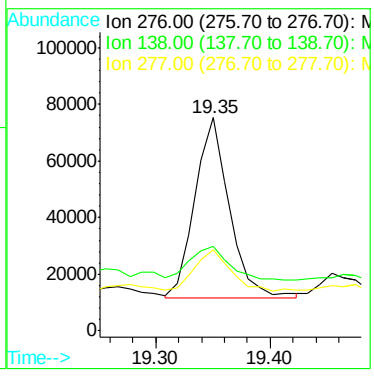





#101
Benzo[g,h,i]perylene
Concen: 13.53 ppb
RT: 19.35 min Scan# 1813
Delta R.T. 0.13 min
Lab File: M90278.D
Acq: 14 Dec 2012 8:35 pm

Tgt Ion:276 Resp: 132109

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 18.4 | 0.0 | 53.9 |
| 277 | 22.5 | 0.0 | 57.2 |




9.1.5

9

Manual Integrations APPROVED (compounds with "m" flag)
Kristi Schollenberger 12/17/12 11:27

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\EM3657\M90275.D Vial: 21
Acq On : 14 Dec 2012 7:06 pm Operator: olgaa
Sample : jb22549-6 Inst : MSM
Misc : op61971,em3657,30.6 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 16 14:41 2012 Quant Results File: MM3617.RES

Quant Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration
DataAcq Meth : MM3617

| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 1) 1,4-Dichlorobenzene-d4 | 3.20 | 152 | 100224 | 40.00 ppb | -0.06 |
| 24) Naphthalene-d8 | 5.15 | 136 | 412767 | 40.00 ppb | -0.07 |
| 47) Acenaphthene-d10 | 8.39 | 164 | 243263 | 40.00 ppb | -0.07 |
| 69) Phenanthrene-d10 | 11.17 | 188 | 409960 | 40.00 ppb | -0.08 |
| 83) Chrysene-d12 | 16.09 | 240 | 403636 | 40.00 ppb | -0.06 |
| 92) Perylene-d12 | 17.92 | 264 | 335983 | 40.00 ppb | -0.04 |
| 102) 1,4-Dichlorobenzene-d4a | 3.20 | 152 | 100224 | 40.00 ppb | -0.06 |
| 104) Acenaphthene-d10a | 8.39 | 164 | 243263 | 40.00 ppb | -0.07 |
| 106) Phenanthrene-d10a | 11.17 | 188 | 409960 | 40.00 ppb | -0.08 |
| 108) Chrysene-d12a | 16.09 | 240 | 403636 | 40.00 ppb | -0.06 |
| **System Monitoring Compounds** | | | | | |
| 5) 2-Fluorophenol | 1.94 | 112 | 107407 | 33.10 ppb | -0.02 |
| Spiked Amount 50.000 | | | Recovery = 66.20% | | |
| 8) Phenol-d5 | 2.97 | 99 | 146568 | 35.72 ppb | 0.00 |
| Spiked Amount 50.000 | | | Recovery = 71.44% | | |
| 25) Nitrobenzene-d5 | 4.05 | 82 | 121273 | 29.13 ppb | -0.06 |
| Spiked Amount 50.000 | | | Recovery = 58.26% | | |
| 51) 2-Fluorobiphenyl | 7.22 | 172 | 261878 | 33.91 ppb | -0.08 |
| Spiked Amount 50.000 | | | Recovery = 67.82% | | |
| 73) 2,4,6-Tribromophenol | 9.95 | 330 | 35914 | 49.31 ppb | -0.06 |
| Spiked Amount 50.000 | | | Recovery = 98.62% | | |
| 86) Terphenyl-d14 | 14.44 | 244 | 378077 | 45.83 ppb | -0.06 |
| Spiked Amount 50.000 | | | Recovery = 91.66% | | |

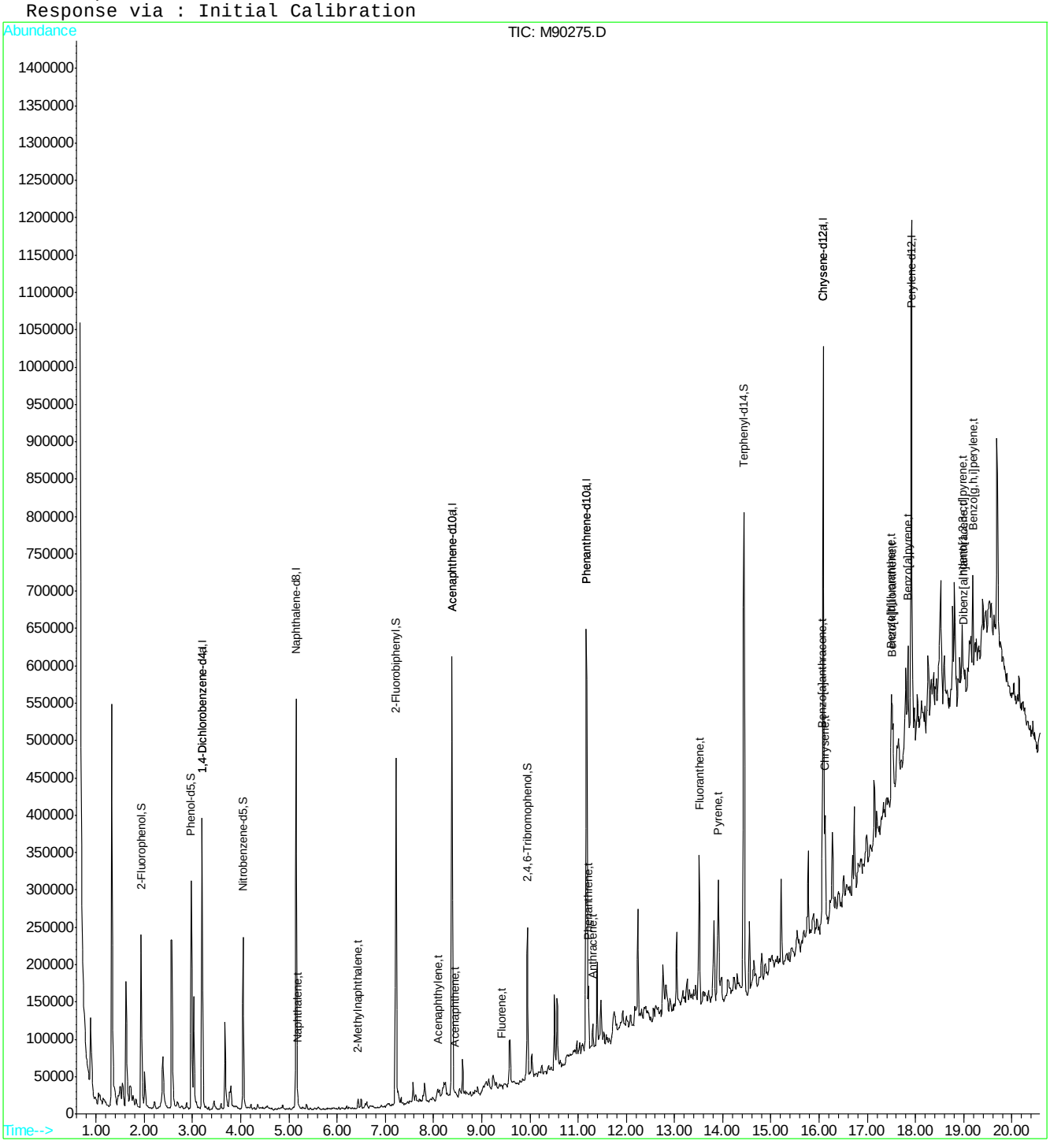
| Target Compounds | | | | | Qvalue |
|---|---|---|---|---|---|
| 38) Naphthalene | 5.18 | 128 | 9636 | 0.85 ppb | 97 |
| 44) 2-Methylnaphthalene | 6.43 | 141 | 5231 | 0.75 ppb | 83 |
| 56) Acenaphthylene | 8.09 | 152 | 12714 | 1.20 ppb | 87 |
| 59) Acenaphthene | 8.44 | 153 | 2889 | 0.42 ppb | 88 |
| 66) Fluorene | 9.41 | 166 | 3896m | 0.50 ppb | |
| 77) Phenanthrene | 11.21 | 178 | 57561 | 5.54 ppb | 97 |
| 78) Anthracene | 11.31 | 178 | 19245 | 1.92 ppb | 89 |
| 81) Fluoranthene | 13.51 | 202 | 155703 | 11.99 ppb | 95 |
| 84) Pyrene | 13.90 | 202 | 137204 | 11.29 ppb | 96 |
| 88) Benzo[a]anthracene | 16.07 | 228 | 84460 | 7.15 ppb | 96 |
| 90) Chrysene | 16.12 | 228 | 89657 | 8.40 ppb | 93 |
| 94) Benzo[b]fluoranthene | 17.50 | 252 | 80000m | 7.24 ppb | |
| 95) Benzo[k]fluoranthene | 17.51 | 252 | 59115m | 5.67 ppb | |
| 96) Benzo[a]pyrene | 17.85 | 252 | 73351 | 7.64 ppb | 91 |
| 97) Indeno[1,2,3-cd]pyrene | 18.98 | 276 | 53370 | 5.09 ppb | 91 |
| 99) Dibenz[a,h]anthracene | 19.00 | 278 | 15639m | 1.82 ppb | |
| 101) Benzo[g,h,i]perylene | 19.19 | 276 | 53711 | 6.23 ppb | 92 |

(#) = qualifier out of range (m) = manual integration
M90275.D MM3617.M Sun Dec 16 14:41:23 2012 GCMSM Page 1

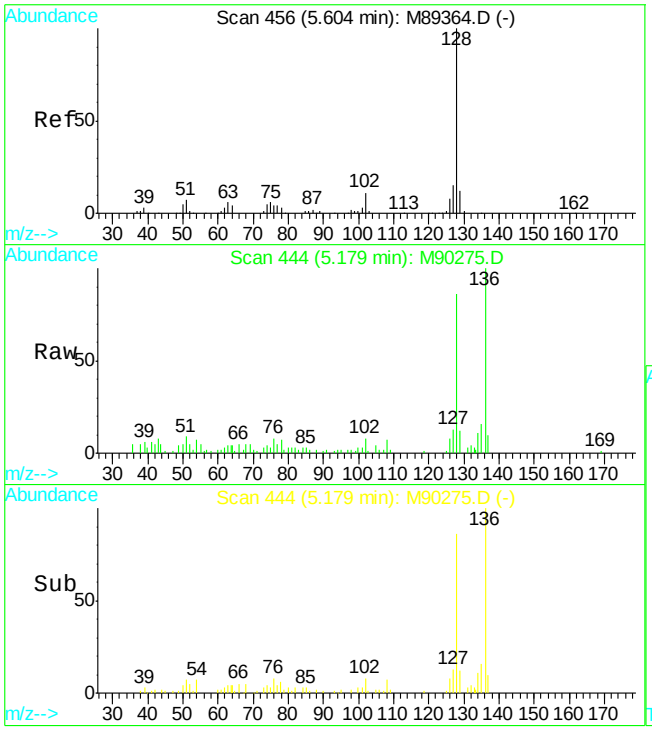
Quantitation Report

Data File : C:\HPCHEM\1\DATA\EM3657\M90275.D  Vial: 21
Acq On : 14 Dec 2012 7:06 pm  Operator: olgaa
Sample : jb22549-6  Inst : MSM
Misc : op61971,em3657,30.6  Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 16 14:41 2012  Quant Results File: MM3617.RES

Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration



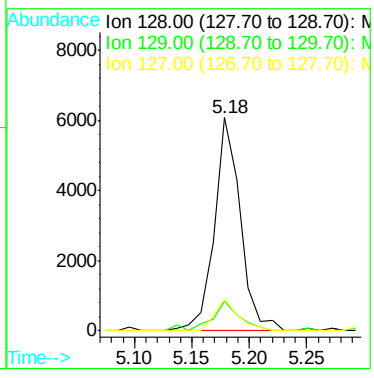

M90275.D MM3617.M Sun Dec 16 14:41:23 2012 GCMSM Page 2

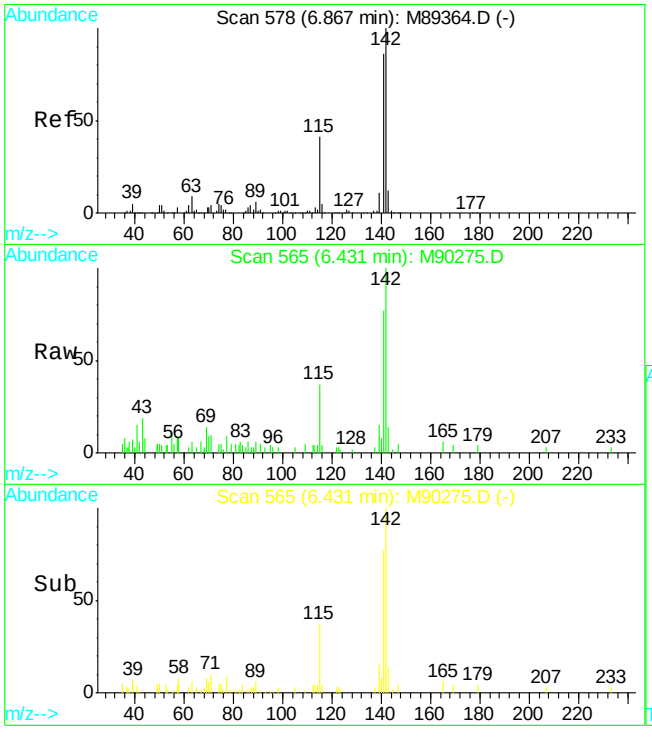



#38
Naphthalene
Concen: 0.85 ppb
RT: 5.18 min Scan# 444
Delta R.T. -0.07 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:128 Resp: 9636

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 128 | 100 | | |
| 129 | 14.0 | 0.0 | 42.1 |
| 127 | 14.7 | 0.0 | 45.2 |

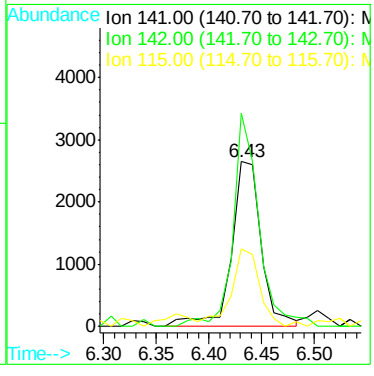


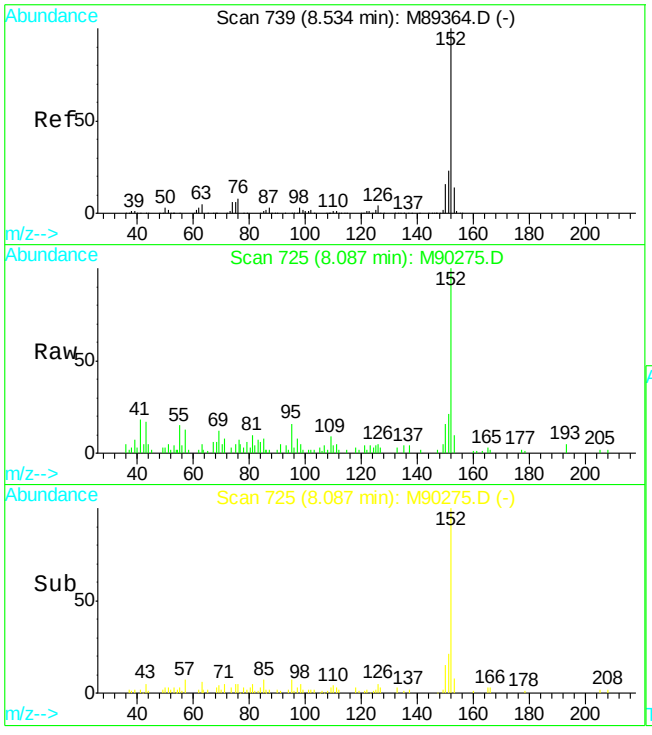




#44
2-Methylnaphthalene
Concen: 0.75 ppb
RT: 6.43 min Scan# 565
Delta R.T. -0.07 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:141 Resp: 5231

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 141 | 100 | | |
| 142 | 129.1 | 126.0 | 186.0 |
| 115 | 44.6 | 13.5 | 73.5 |

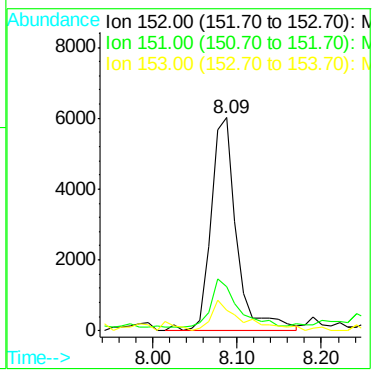


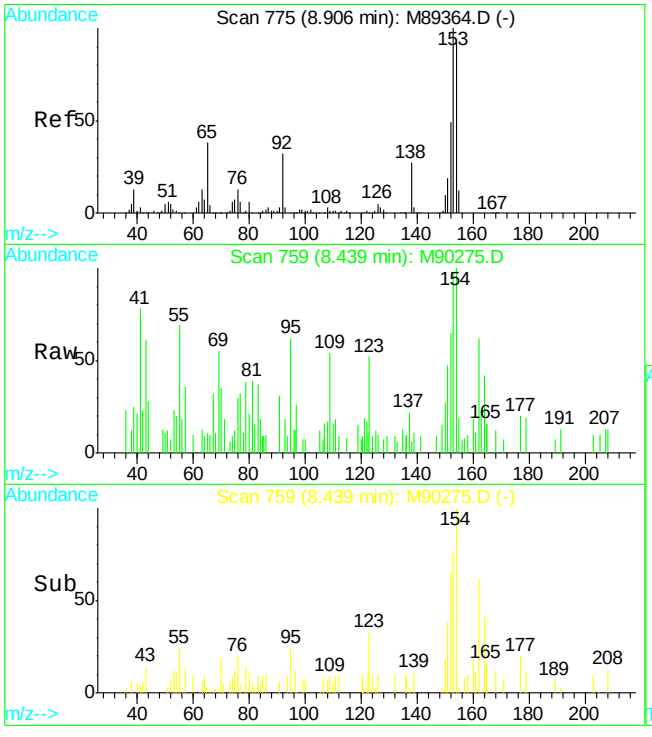



#56
Acenaphthylene
Concen: 1.20 ppb
RT: 8.09 min Scan# 725
Delta R.T. -0.06 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:152 Resp: 12714

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 152 | 100 | | |
| 151 | 18.4 | 0.0 | 52.4 |
| 153 | 6.2 | 0.0 | 44.5 |

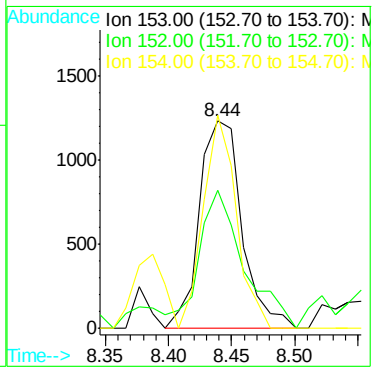



#59
Acenaphthene
Concen: 0.42 ppb
RT: 8.44 min Scan# 759
Delta R.T. -0.07 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

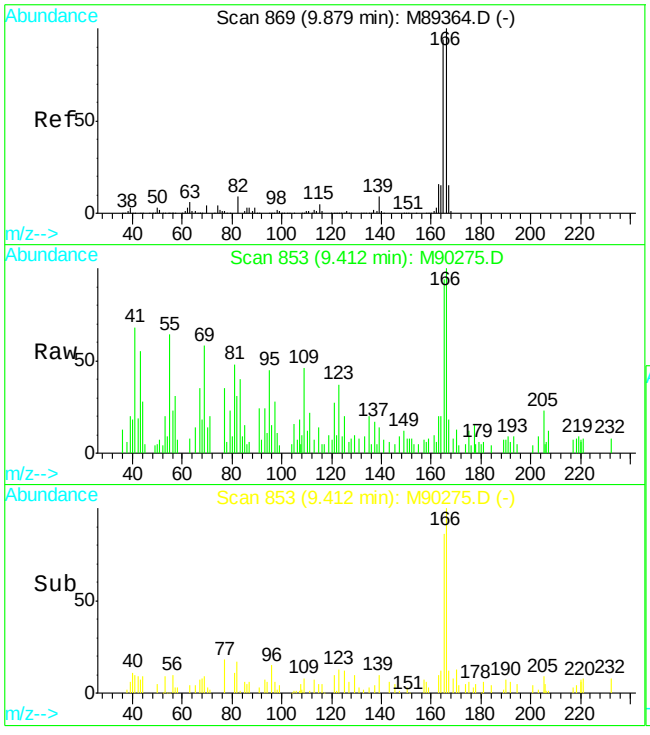
Tgt Ion:153 Resp: 2889

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 153 | 100 | | |
| 152 | 63.3 | 17.5 | 77.5 |
| 154 | 92.1 | 56.4 | 116.4 |




9.1.6

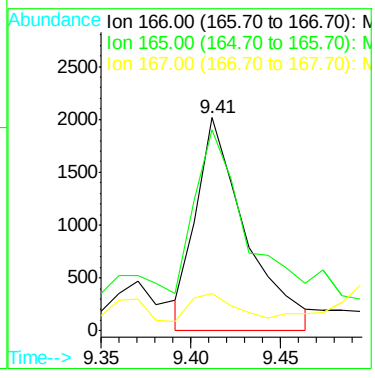
9

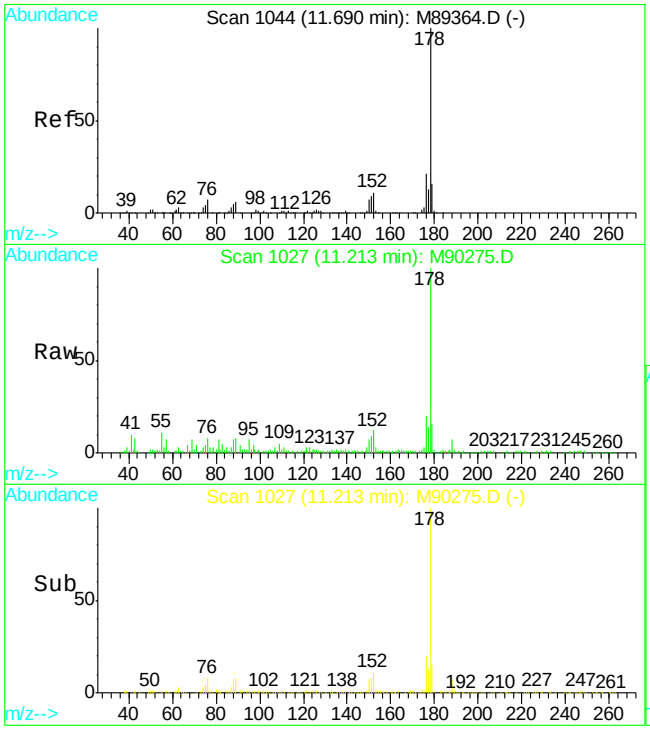



#66
Fluorene
Concen: 0.50 ppb m
RT: 9.41 min Scan# 853
Delta R.T. -0.07 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:166 Resp: 3896

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 166 | 100 | | |
| 165 | 94.1 | 61.7 | 121.7 |
| 167 | 17.6 | 0.0 | 45.5 |

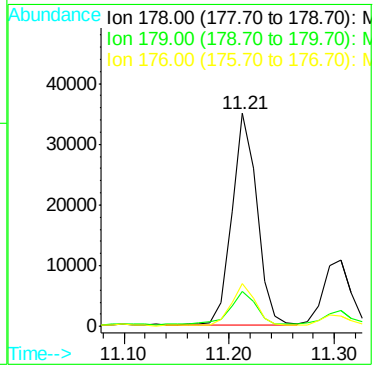



#77
Phenanthrene
Concen: 5.54 ppb
RT: 11.21 min Scan# 1027
Delta R.T. -0.08 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

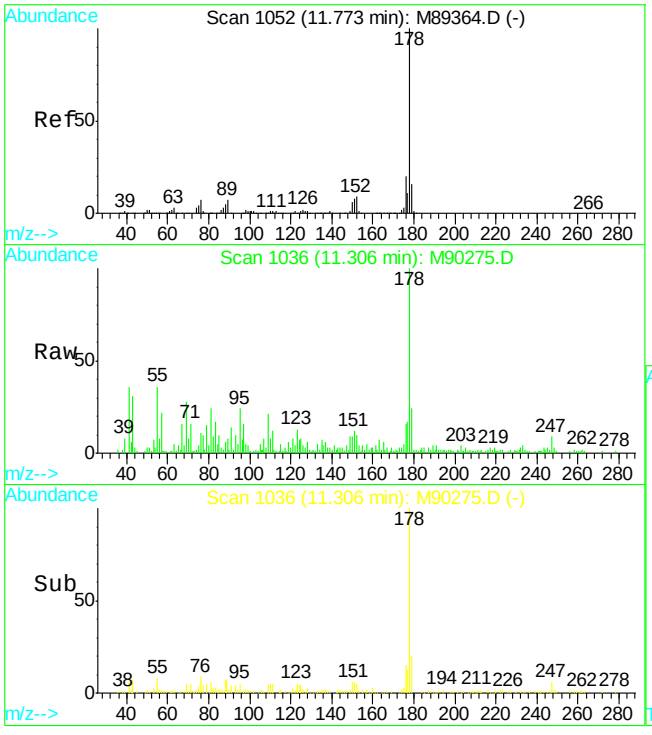
Tgt Ion:178 Resp: 57561

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 15.3 | 0.0 | 47.4 |
| 176 | 19.7 | 0.0 | 50.3 |




9.1.6

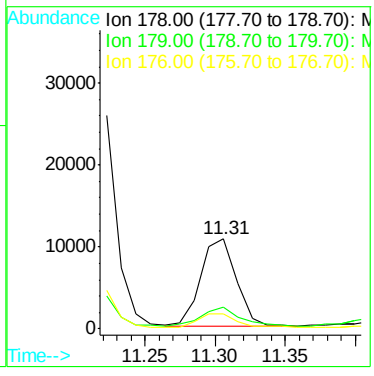
9

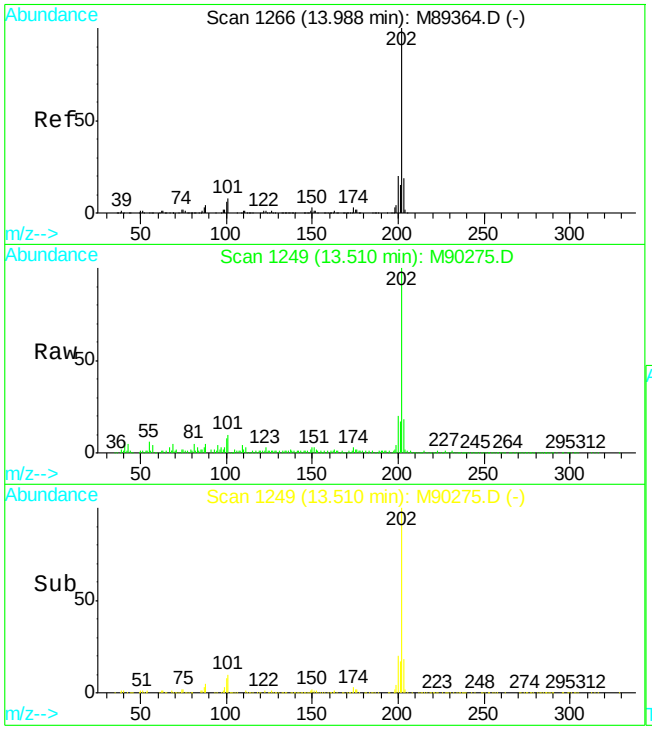



#78
Anthracene
Concen: 1.92 ppb
RT: 11.31 min Scan# 1036
Delta R.T. -0.07 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:178 Resp: 19245

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 178 | 100 | | |
| 179 | 21.6 | 0.0 | 47.3 |
| 176 | 14.9 | 0.0 | 50.3 |

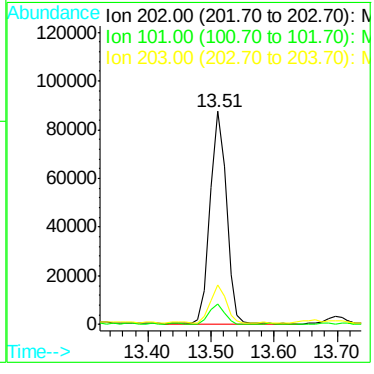


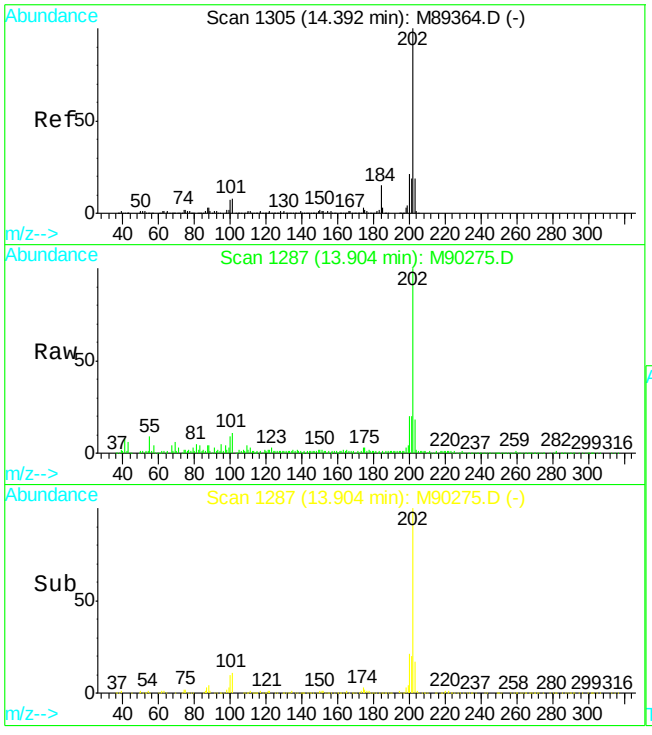




#81
Fluoranthene
Concen: 11.99 ppb
RT: 13.51 min Scan# 1249
Delta R.T. -0.07 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:202 Resp: 155703

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 101 | 9.5 | 0.0 | 40.6 |
| 203 | 17.3 | 0.0 | 50.3 |

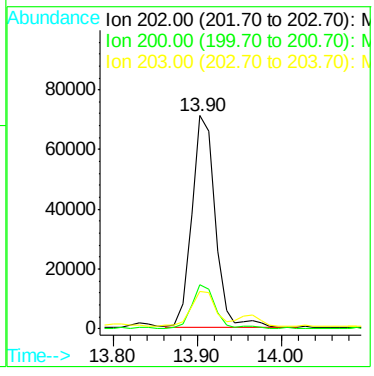


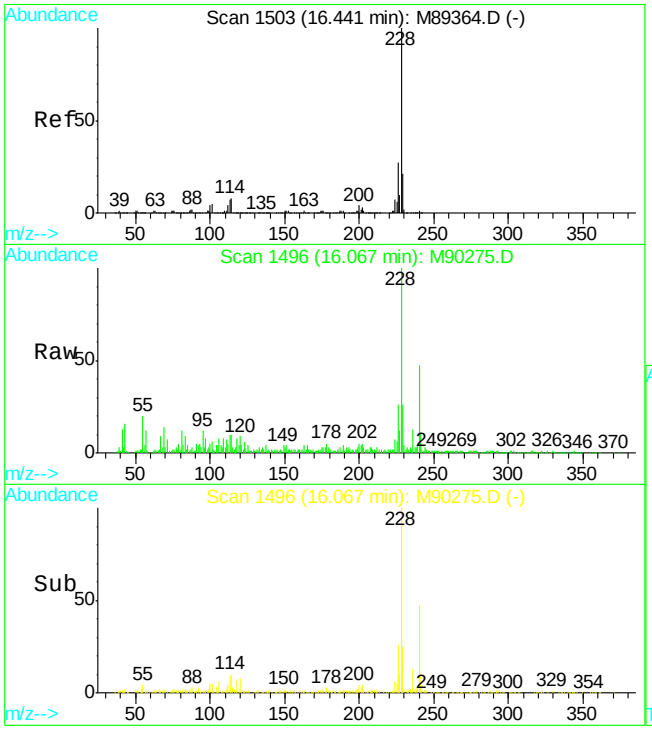



#84
Pyrene
Concen: 11.29 ppb
RT: 13.90 min Scan# 1287
Delta R.T. -0.07 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:202 Resp: 137204

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 200 | 20.3 | 0.0 | 51.0 |
| 203 | 16.5 | 0.0 | 50.0 |

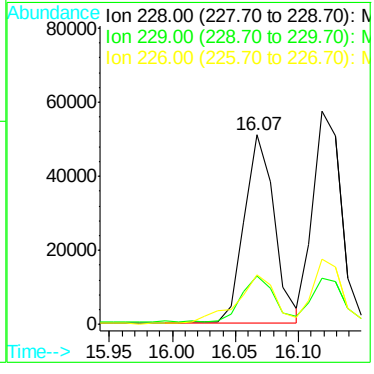


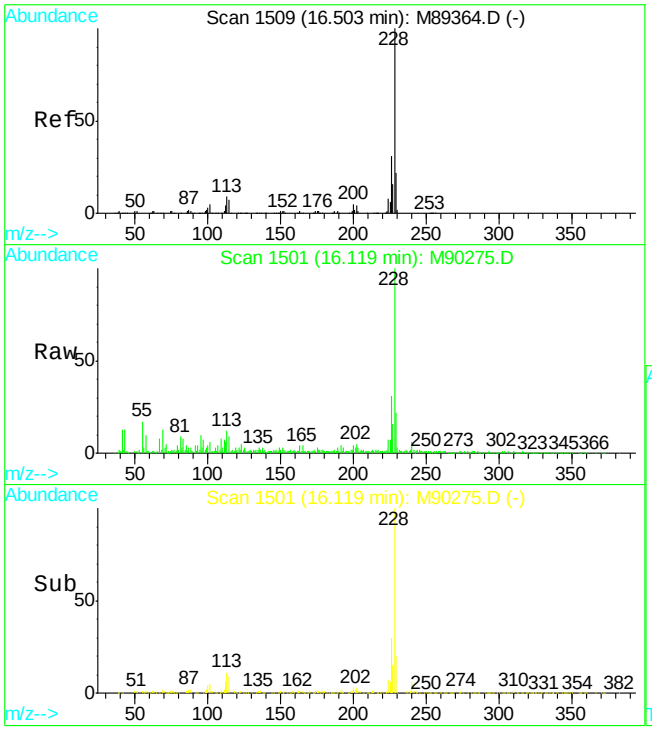




#88
Benzo[a]anthracene
Concen: 7.15 ppb
RT: 16.07 min Scan# 1496
Delta R.T. -0.05 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:228 Resp: 84460

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 229 | 24.0 | 0.0 | 53.2 |
| 226 | 25.4 | 0.0 | 58.3 |

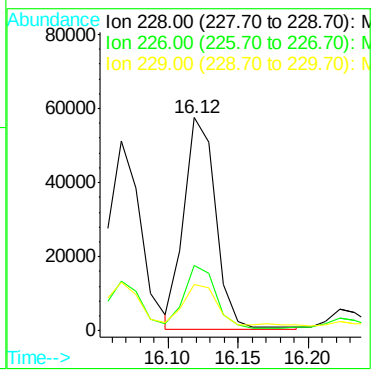


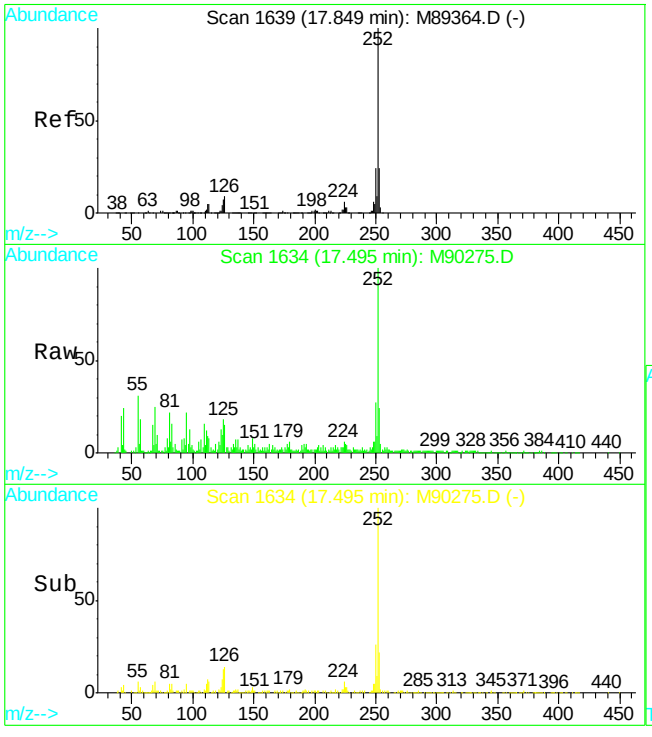



#90
Chrysene
Concen: 8.40 ppb
RT: 16.12 min Scan# 1501
Delta R.T. -0.06 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:228 Resp: 89657

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 226 | 29.9 | 2.3 | 62.3 |
| 229 | 19.4 | 0.0 | 54.2 |

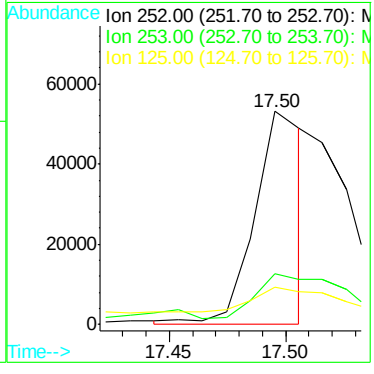


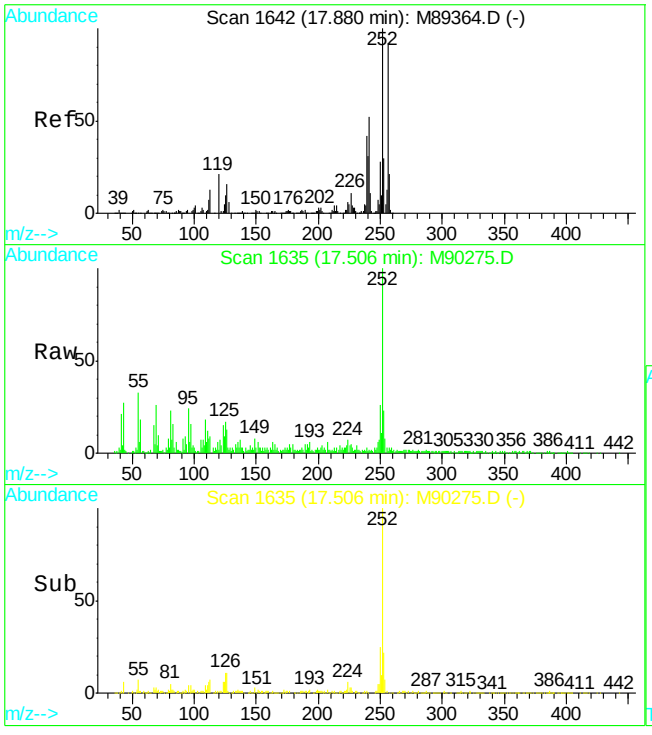




#94
Benzo[b]fluoranthene
Concen: 7.24 ppb m
RT: 17.50 min Scan# 1634
Delta R.T. -0.05 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:252 Resp: 80000

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 24.0 | 0.0 | 55.6 |
| 125 | 17.6 | 0.0 | 40.3 |

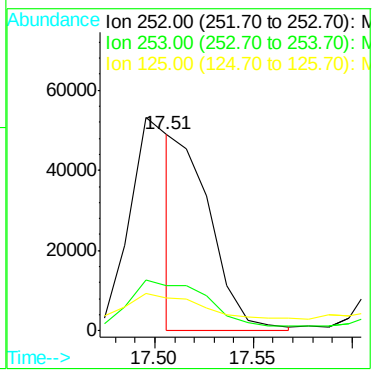


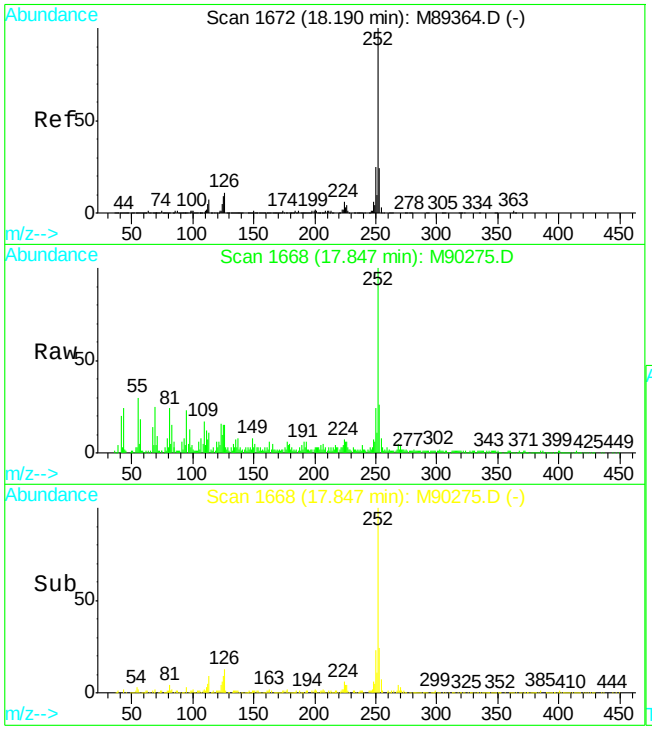



#95
Benzo[k]fluoranthene
Concen: 5.67 ppb m
RT: 17.51 min Scan# 1635
Delta R.T. -0.07 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:252 Resp: 59115

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 23.2 | 0.0 | 58.9 |
| 125 | 16.8 | 0.0 | 43.1 |

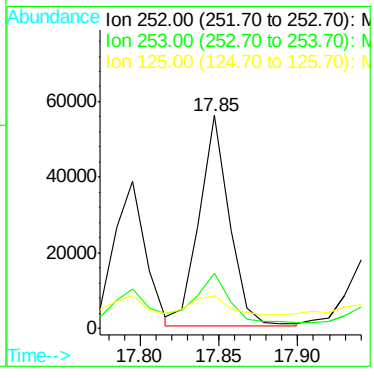



#96
Benzo[a]pyrene
Concen: 7.64 ppb
RT: 17.85 min Scan# 1668
Delta R.T. -0.04 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:252 Resp: 73351

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 253 | 22.0 | 0.0 | 55.8 |
| 125 | 8.5 | 0.0 | 42.8 |




9.1.6

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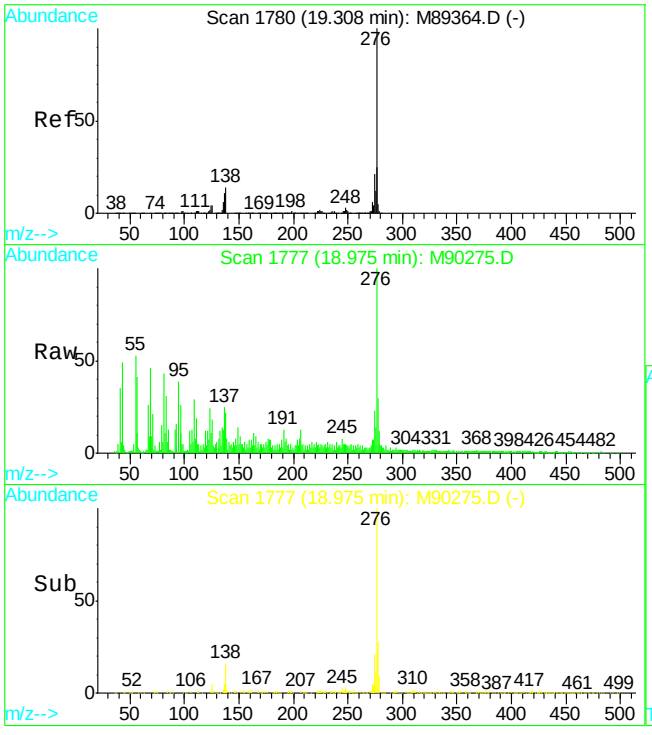
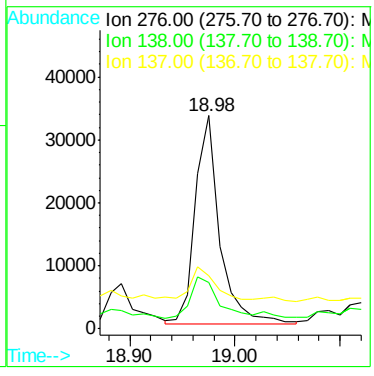
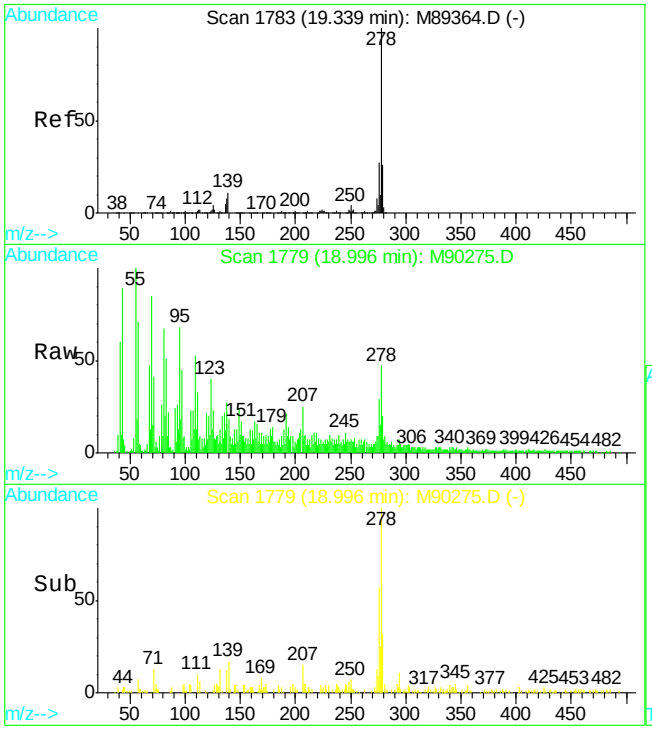



#97
Indeno[1,2,3-cd]pyrene
Concen: 5.09 ppb
RT: 18.98 min Scan# 1777
Delta R.T. -0.03 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:276 Resp: 53370

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 17.2 | 0.0 | 51.4 |
| 137 | 11.5 | 0.0 | 45.7 |

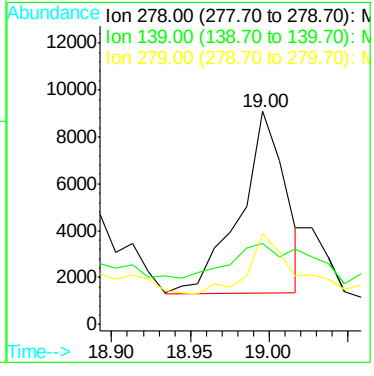



#99
Dibenz[a,h]anthracene
Concen: 1.82 ppb m
RT: 19.00 min Scan# 1779
Delta R.T. -0.04 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:278 Resp: 15639

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 278 | 100 | | |
| 139 | 37.9 | 0.0 | 45.4 |
| 279 | 42.8 | 0.0 | 58.2 |




9.1.6

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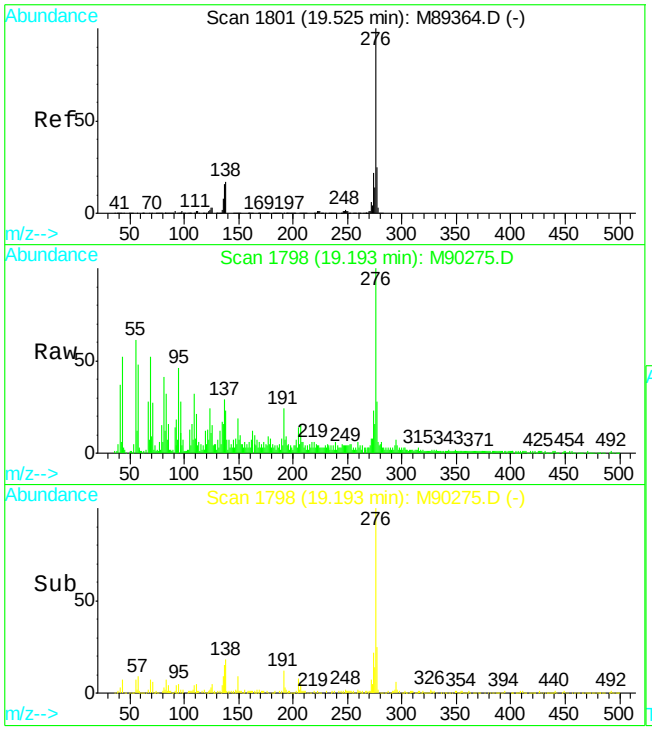
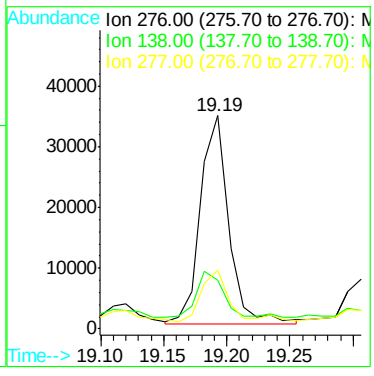



#101
Benzo[g,h,i]perylene
Concen: 6.23 ppb
RT: 19.19 min Scan# 1798
Delta R.T. -0.03 min
Lab File: M90275.D
Acq: 14 Dec 2012 7:06 pm

Tgt Ion:276 Resp: 53711

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 18.5 | 0.0 | 53.9 |
| 277 | 24.7 | 0.0 | 57.2 |




9.1.6

9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3e2016\
Data File : 3e46353.D
Acq On : 17 Dec 2012 10:17 am
Operator : olgaa
Sample : op61971-mb1
Misc : op61971,e3e2016,35.0
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 17 14:40:50 2012
Quant Method : C:\MSDCHEM\1\METHODS\M3E1991.M
Quant Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
QLast Update : Thu Dec 06 10:24:01 2012
Response via : Initial Calibration

| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 1) 1,4-Dichlorobenzene-d4 | 2.746 | 152 | 166275 | 40.00 ppb | -0.05 |
| 24) Naphthalene-d8 | 4.329 | 136 | 671954 | 40.00 ppb | -0.06 |
| 47) Acenaphthene-d10 | 6.934 | 164 | 373579 | 40.00 ppb | -0.07 |
| 69) Phenanthrene-d10 | 9.175 | 188 | 580173 | 40.00 ppb | -0.07 |
| 83) Chrysene-d12 | 12.892 | 240 | 546479 | 40.00 ppb | -0.05 |
| 92) Perylene-d12 | 14.278 | 264 | 496271 | 40.00 ppb | -0.04 |
| 102) 1,4-Dichlorobenzene-d4a | 2.746 | 152 | 166275 | 40.00 ppb | -0.05 |
| 104) Acenaphthene-d10a | 6.934 | 164 | 373579 | 40.00 ppb | -0.07 |
| 106) Phenanthrene-d10a | 9.175 | 188 | 580173 | 40.00 ppb | -0.07 |
| 108) Chrysene-d12a | 12.892 | 240 | 546479 | 40.00 ppb | -0.05 |

| System Monitoring Compounds | | | | | |
|---|---|---|---|---|---|
| 5) 2-Fluorophenol | 1.687 | 112 | 282929 | 48.84 ppb | -0.05 |
| Spiked Amount 50.000 | Range 11 - 58 | | Recovery = 97.68%# | | |
| 8) Phenol-d5 | 2.537 | 99 | 348514 | 49.44 ppb | -0.08 |
| Spiked Amount 50.000 | Range 10 - 59 | | Recovery = 98.88%# | | |
| 25) Nitrobenzene-d5 | 3.436 | 82 | 262239 | 46.64 ppb | -0.06 |
| Spiked Amount 50.000 | Range 19 - 61 | | Recovery = 93.28%# | | |
| 51) 2-Fluorobiphenyl | 5.998 | 172 | 540117 | 43.72 ppb | -0.06 |
| Spiked Amount 50.000 | Range 21 - 59 | | Recovery = 87.44%# | | |
| 73) 2,4,6-Tribromophenol | 8.185 | 330 | 64079 | 52.26 ppb | -0.06 |
| Spiked Amount 50.000 | Range 12 - 68 | | Recovery = 104.52%# | | |
| 85) Terphenyl-d14 | 11.721 | 244 | 611805 | 53.41 ppb | -0.05 |
| Spiked Amount 50.000 | Range 16 - 65 | | Recovery = 106.82%# | | |

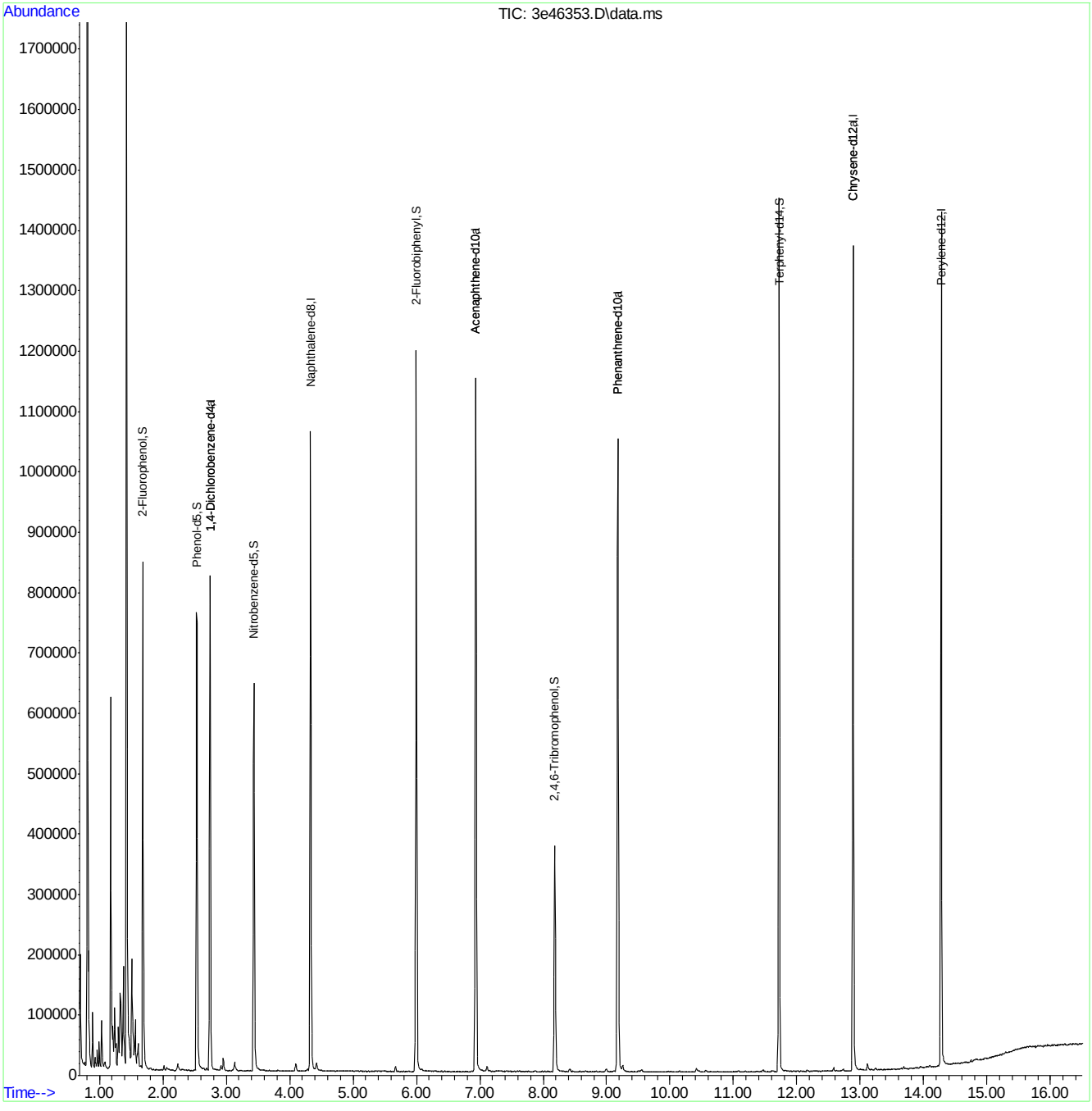
Target Compounds Qvalue

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3e2016\
Data File : 3e46353.D
Acq On : 17 Dec 2012 10:17 am
Operator : olgaa
Sample : op61971-mb1
Misc : op61971,e3e2016,35.0
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Dec 17 14:40:50 2012
Quant Method : C:\MSDCHEM\1\METHODS\M3E1991.M
Quant Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
QLast Update : Thu Dec 06 10:24:01 2012
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\EM3656\M90229.D Vial: 4
Acq On : 13 Dec 2012 10:27 am Operator: olgaa
Sample : op61971-mb1 Inst : MSM
Misc : op61971,em3656,35.0 Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 13 17:07 2012 Quant Results File: MM3617.RES

Quant Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Tue Dec 11 16:20:49 2012
Response via : Initial Calibration
DataAcq Meth : MM3617

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) 1,4-Dichlorobenzene-d4 | 3.23 | 152 | 75532 | 40.00 | ppb | -0.03 |
| 24) Naphthalene-d8 | 5.19 | 136 | 299219 | 40.00 | ppb | -0.03 |
| 47) Acenaphthene-d10 | 8.43 | 164 | 201008 | 40.00 | ppb | -0.03 |
| 69) Phenanthrene-d10 | 11.21 | 188 | 369491 | 40.00 | ppb | -0.04 |
| 83) Chrysene-d12 | 16.12 | 240 | 388710 | 40.00 | ppb | -0.03 |
| 92) Perylene-d12 | 17.93 | 264 | 314473 | 40.00 | ppb | -0.03 |
| 102) 1,4-Dichlorobenzene-d4a | 3.23 | 152 | 75532 | 40.00 | ppb | -0.03 |
| 104) Acenaphthene-d10a | 8.43 | 164 | 201008 | 40.00 | ppb | -0.03 |
| 106) Phenanthrene-d10a | 11.21 | 188 | 369491 | 40.00 | ppb | -0.04 |
| 108) Chrysene-d12a | 16.12 | 240 | 388710 | 40.00 | ppb | -0.03 |

| System Monitoring Compounds | | | | | | |
|---|---|---|---|---|---|---|
| 5) 2-Fluorophenol | 1.96 | 112 | 105848 | 43.28 | ppb | 0.00 |
| Spiked Amount 50.000 | | | Recovery = 86.56% | | | |
| 8) Phenol-d5 | 3.01 | 99 | 143560 | 46.43 | ppb | 0.03 |
| Spiked Amount 50.000 | | | Recovery = 92.86% | | | |
| 25) Nitrobenzene-d5 | 4.08 | 82 | 130836 | 43.35 | ppb | -0.03 |
| Spiked Amount 50.000 | | | Recovery = 86.70% | | | |
| 51) 2-Fluorobiphenyl | 7.26 | 172 | 328442 | 51.47 | ppb | -0.04 |
| Spiked Amount 50.000 | | | Recovery = 102.94% | | | |
| 73) 2,4,6-Tribromophenol | 9.99 | 330 | 36016 | 54.87 | ppb | -0.02 |
| Spiked Amount 50.000 | | | Recovery = 109.74% | | | |
| 86) Terphenyl-d14 | 14.47 | 244 | 403042 | 50.73 | ppb | -0.03 |
| Spiked Amount 50.000 | | | Recovery = 101.46% | | | |

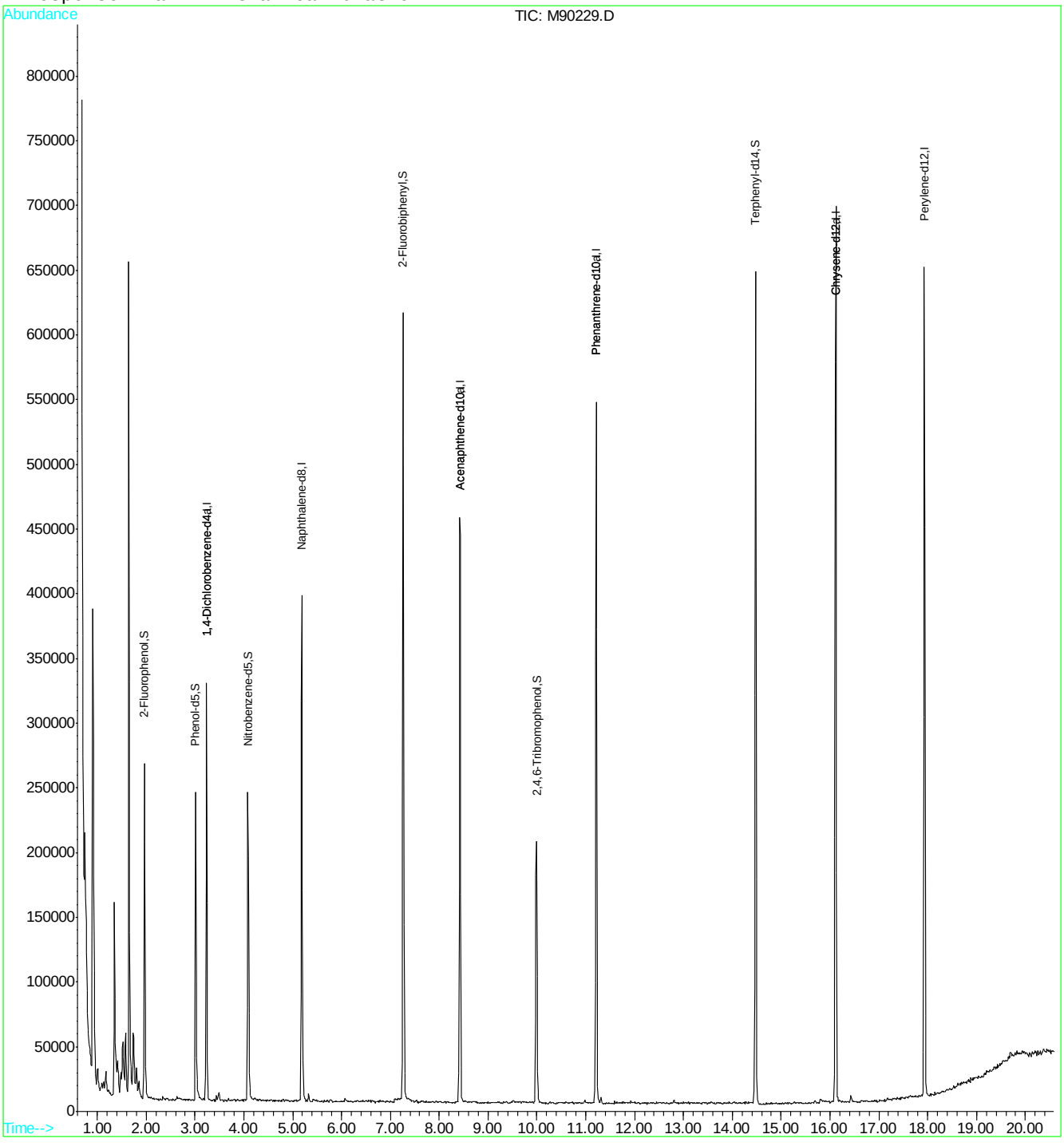
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration
M90229.D MM3617.M Thu Dec 13 17:07:23 2012 GCMSM Page 1

Quantitation Report

Data File : C:\HPCHEM\1\DATA\EM3656\M90229.D  Vial: 4
Acq On : 13 Dec 2012 10:27 am  Operator: olgaa
Sample : op61971-mb1  Inst : MSM
Misc : op61971,em3656,35.0  Multiplr: 1.00
MS Integration Params: LSCINT.P
Quant Time: Dec 13 17:07 2012  Quant Results File: MM3617.RES

Method : C:\HPCHEM\1\METHODS\MM3617.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MSI 15m x .25mm x .25um
Last Update : Thu Dec 13 11:35:23 2012
Response via : Initial Calibration



New Jersey
ACCUTEST LABORATORIES

# Metals Analysis

## QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 10:23 | MA30027-STD1 | 1 | | STDA |
| 10:29 | MA30027-STD2 | 1 | | STDB |
| 10:35 | MA30027-STD3 | 1 | | STDC |
| 10:41 | MA30027-STD4 | 1 | | STDD |
| 10:48 | MA30027-CCV1 | 1 | | |
| 10:54 | MA30027-CCB1 | 1 | | |
| 11:00 | MA30027-CRI1 | 1 | | |
| 11:06 | MA30027-CRID1 | 1 | | |
| 11:13 | MA30027-CRIA1 | 1 | | |
| 11:21 | MA30027-CRI2 | 1 | | |
| 11:28 | MA30027-ICV1 | 1 | | |
| 11:40 | MA30027-ICB1 | 1 | | |
| 11:50 | MA30027-ICCV1 | 1 | | |
| 12:03 | MA30027-CCB2 | 1 | | |
| 12:10 | MA30027-ICSA1 | 1 | | |
| 12:16 | ZZZZZZ | 1 | | |
| 12:23 | MA30027-ICSAB1 | 1 | | |
| 12:29 | ZZZZZZ | 1 | | |
| 12:35 | ZZZZZZ | 1 | | |
| 12:42 | MA30027-CCV2 | 1 | | |
| 12:48 | MA30027-CCB3 | 1 | | |
| 12:54 | ZZZZZZ | 1 | | |
| 13:00 | MP68388-S1 | 25 | | Not needed |
| 13:07 | MP68388-S2 | 25 | | Not needed |
| 13:13 | JB22548-4 | 25 | | (sample used for QC only; not part of login JB22549) |
| 13:20 | MP68388-SD1 | 125 | | Not needed |
| 13:26 | ZZZZZZ | 20 | | |
| 13:32 | ZZZZZZ | 5 | | |
| 13:39 | ZZZZZZ | 1 | | |
| 13:45 | MA30027-CCV3 | 1 | | |
| 13:51 | MA30027-CCB4 | 1 | | |
| 13:58 | MP68387-S1 | 1 | | |
| 14:04 | MP68387-S2 | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 14:10 | JB23006-1 | 1 | | (sample used for QC only; not part of login JB22549) |
| 14:16 | MP68387-SD1 | 1 | | wrong DF |
| 14:22 | MP68387-S1 | 2 | | |
| 14:29 | MP68387-S2 | 2 | | |
| 14:35 | JB23006-1 | 2 | | (sample used for QC only; not part of login JB22549) |
| 14:41 | MP68387-SD1 | 10 | | |
| 14:47 | MP68414-MB1 | 1 | | |
| 14:54 | MA30027-CCV4 | 1 | | |
| 15:00 | MA30027-CCB5 | 1 | | |
| 15:06 | MP68414-B1 | 1 | | |
| 15:12 | MP68414-LC1 | 1 | | |
| 15:18 | MP68414-S1 | 1 | | |
| 15:24 | MP68414-S2 | 1 | | |
| 15:31 | JB23287-22 | 1 | | (sample used for QC only; not part of login JB22549) |
| 15:37 | MP68414-SD1 | 5 | | possible bad dilution |
| 15:43 | ZZZZZZ | 1 | | |
| 15:49 | ZZZZZZ | 1 | | |
| 15:55 | ZZZZZZ | 1 | | |
| 16:02 | MA30027-CCV5 | 1 | | |
| 16:08 | MA30027-CCB6 | 1 | | |
| 16:14 | MA30027-CRI3 | 1 | | |
| 16:20 | MA30027-CRID2 | 1 | | |
| 16:27 | MA30027-CRIA2 | 1 | | |
| 16:33 | MA30027-ICSA2 | 1 | | |
| 16:39 | MA30027-ICSAB2 | 1 | | |
| 16:46 | MA30027-CCV6 | 1 | | |
| 16:52 | MA30027-CCB7 | 1 | | |
| 16:58 | ZZZZZZ | 1 | | |
| 17:04 | ZZZZZZ | 1 | | |
| 17:10 | ZZZZZZ | 1 | | |
| 17:17 | ZZZZZZ | 1 | | |
| 17:23 | ZZZZZZ | 1 | | |
| 17:29 | ZZZZZZ | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 17:35 | ZZZZZZ | 1 | | |
| 17:41 | ZZZZZZ | 1 | | |
| 17:48 | ZZZZZZ | 1 | | |
| 17:54 | MA30027-CCV7 | 1 | | |
| 18:00 | MA30027-CCB8 | 1 | | |
| 18:06 | ZZZZZZ | 1 | | |
| 18:12 | ZZZZZZ | 1 | | |
| 18:19 | ZZZZZZ | 1 | | |
| 18:25 | ZZZZZZ | 1 | | |
| 18:31 | ZZZZZZ | 1 | | |
| 18:37 | ZZZZZZ | 1 | | |
| 18:44 | ZZZZZZ | 1 | | |
| 18:50 | ZZZZZZ | 1 | | |
| 18:56 | ZZZZZZ | 1 | | |
| 19:03 | ZZZZZZ | 1 | | |
| 19:09 | MA30027-CCV8 | 1 | | |
| 19:15 | MA30027-CCB9 | 1 | | |
| 19:22 | ZZZZZZ | 1 | | |
| 19:28 | ZZZZZZ | 1 | | |
| 19:34 | ZZZZZZ | 1 | | |
| 19:41 | ZZZZZZ | 1 | | |
| 19:47 | ZZZZZZ | 1 | | |
| 19:53 | ZZZZZZ | 1 | | |
| 20:00 | ZZZZZZ | 1 | | |
| 20:06 | ZZZZZZ | 1 | | |
| 20:12 | ZZZZZZ | 3 | | |
| 20:18 | MA30027-CCV9 | 1 | | |
| 20:25 | MA30027-CCB10 | 1 | | |
| 20:31 | ZZZZZZ | 1 | | |
| 20:37 | ZZZZZZ | 10 | | |
| 20:43 | ZZZZZZ | 1 | | |
| 20:50 | ZZZZZZ | 5 | | |
| 20:56 | ZZZZZZ | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 21:02 | ZZZZZZ | 1 | | |
| 21:08 | ZZZZZZ | 1 | | |
| 21:14 | ZZZZZZ | 2 | | |
| 21:21 | MA30027-CCV10 | 1 | | |
| 21:27 | MA30027-CCB11 | 1 | | |
| 21:33 | ZZZZZZ | 5 | | |
| 21:40 | ZZZZZZ | 5 | | |
| 21:46 | MP68388-S1 | 10 | | CRID out |
| 21:53 | MP68388-S2 | 10 | | CRID out |
| 21:59 | JB22548-4 | 10 | | (sample used for QC only; not part of login JB22549) |
| 22:06 | MP68388-SD1 | 50 | | CRID out |
| 22:12 | MP68389-MB1 | 1 | | |
| 22:18 | MP68389-B1 | 1 | | |
| 22:25 | MA30027-CCV11 | 1 | | |
| 22:31 | MA30027-CCB12 | 1 | | |
| 22:37 | MA30027-CRI4 | 1 | | |
| 22:43 | MA30027-CRID3 | 1 | | |
| 22:50 | MA30027-CRIA3 | 1 | | |
| 22:56 | MA30027-ICSA3 | 1 | | |
| 23:02 | MA30027-ICSAB3 | 1 | | |
| 23:09 | MA30027-CCV12 | 1 | | |
| 23:15 | MA30027-CCB13 | 1 | | |
| 23:21 | ZZZZZZ | 1 | | |
| 23:27 | ZZZZZZ | 1 | | |
| 23:34 | ZZZZZZ | 1 | | |
| 23:40 | ZZZZZZ | 1 | | |
| 23:46 | ZZZZZZ | 1 | | |
| 23:52 | MP68389-S1 | 1 | | %sol Rerun for Zn |
| 23:59 | MP68389-S2 | 1 | | %sol Rerun for Zn |
| 00:05 | JB22562-1 | 1 | | (sample used for QC only; not part of login JB22549) |
| 00:11 | MP68389-SD1 | 5 | | %sol |
| 00:17 | MA30027-CCV13 | 1 | | |
| 00:23 | MA30027-CCB14 | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 00:30 | JB22549-1 | 1 | | %sol V=77ppm. |
| 00:36 | JB22549-2 | 1 | | %sol |
| 00:42 | JB22549-3 | 1 | | %sol |
| 00:49 | JB22549-4 | 1 | | %sol |
| 00:55 | JB22549-5 | 1 | | %sol |
| 01:01 | JB22549-6 | 1 | | Fe=450ppm. |
| 01:08 | ZZZZZZ | 1 | | |
| 01:14 | ZZZZZZ | 1 | | |
| 01:20 | ZZZZZZ | 1 | | |
| 01:26 | ZZZZZZ | 1 | | |
| 01:33 | MA30027-CCV14 | 1 | | |
| 01:39 | MA30027-CCB15 | 1 | | |
| 01:45 | ZZZZZZ | 1 | | |
| 01:51 | ZZZZZZ | 1 | | |
| 01:57 | ZZZZZZ | 1 | | |
| 02:04 | ZZZZZZ | 1 | | |
| 02:10 | ZZZZZZ | 1 | | |
| 02:16 | ZZZZZZ | 1 | | |
| 02:22 | ZZZZZZ | 1 | | |
| 02:28 | ZZZZZZ | 1 | | |
| 02:35 | MP68436-MB1 | 1 | | |
| 02:41 | MP68436-B1 | 1 | | |
| 02:47 | MA30027-CCV15 | 1 | | |
| 02:53 | MA30027-CCB16 | 1 | | |
| 03:00 | MP68436-S1 | 1 | | %sol |
| 03:06 | MP68436-S2 | 1 | | %sol |
| 03:12 | JB22621-1 | 1 | | (sample used for QC only; not part of login JB22549) |
| 03:18 | MP68436-SD1 | 5 | | %sol |
| 03:25 | ZZZZZZ | 1 | | |
| 03:31 | ZZZZZZ | 1 | | |
| 03:37 | ZZZZZZ | 1 | | |
| 03:43 | ZZZZZZ | 1 | | |
| 03:50 | ZZZZZZ | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 03:56 | ZZZZZZ | 1 | | |
| 04:02 | MA30027-CCV16 | 1 | | |
| 04:08 | MA30027-CCB17 | 1 | | |
| 04:15 | ZZZZZZ | 1 | | |
| 04:21 | ZZZZZZ | 1 | | |
| 04:27 | ZZZZZZ | 1 | | |
| 04:33 | ZZZZZZ | 1 | | |
| 04:39 | ZZZZZZ | 1 | | |
| 04:45 | ZZZZZZ | 1 | | |
| 04:52 | ZZZZZZ | 1 | | |
| 04:58 | ZZZZZZ | 1 | | |
| 05:04 | ZZZZZZ | 1 | | |
| 05:10 | ZZZZZZ | 1 | | |
| 05:16 | MA30027-CCV17 | 1 | | |
| 05:23 | MA30027-CCB18 | 1 | | |
| 05:29 | ZZZZZZ | 1 | | |
| 05:35 | ZZZZZZ | 1 | | |
| 05:41 | MP68437-MB1 | 1 | | |
| 05:48 | MP68437-B1 | 1 | | HIgh RSD |
| 05:54 | MP68437-S1 | 1 | | Ca high |
| 06:00 | MP68437-S2 | 1 | | Ca high |
| 06:06 | JB22769-1 | 1 | | (sample used for QC only; not part of login JB22549) |
| 06:12 | MP68437-SD1 | 5 | | Ca high |
| 06:19 | ZZZZZZ | 1 | | |
| 06:25 | ZZZZZZ | 1 | | |
| 06:31 | MA30027-CCV18 | 1 | | |
| 06:37 | MA30027-CCB19 | 1 | | |
| 06:44 | MA30027-CRI5 | 1 | | |
| 06:50 | MA30027-CRID4 | 1 | | |
| 06:56 | MA30027-CRIA4 | 1 | | |
| 07:02 | MA30027-ICSA4 | 1 | | |
| 07:09 | MA30027-ICSAB4 | 1 | | |

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 10:23 | MA30027-STD1 | 2023 R | 143860 R | 33033 R | 6861 R |
| 10:29 | MA30027-STD2 | 1976 | 139840 | 32324 | 6388 |
| 10:35 | MA30027-STD3 | 1931 | 140480 | 32590 | 6168 |
| 10:41 | MA30027-STD4 | 1876 | 136190 | 31962 | 5930 |
| 10:48 | MA30027-CCV1 | No results reported for the elements associated with this internal standard. | | | |
| 10:54 | MA30027-CCB1 | No results reported for the elements associated with this internal standard. | | | |
| 11:00 | MA30027-CRI1 | No results reported for the elements associated with this internal standard. | | | |
| 11:06 | MA30027-CRID1 | 2003 | 148370 | 33801 | 6898 |
| 11:13 | MA30027-CRIA1 | 2024 | 149890 | 33671 | 6945 |
| 11:21 | MA30027-CRI2 | 2039 | 148230 | 32856 | 6841 |
| 11:28 | MA30027-ICV1 | 1946 | 143840 | 33101 | 6225 |
| 11:40 | MA30027-ICB1 | 2065 | 151700 | 32818 | 7056 |
| 11:50 | MA30027-ICCV1 | 1947 | 144110 | 33176 | 6245 |
| 12:03 | MA30027-CCB2 | 2032 | 147630 | 33750 | 6987 |
| 12:10 | MA30027-ICSA1 | 1761 | 128780 | 31729 | 5468 |
| 12:16 | ZZZZZZ | 1768 | 128680 | 31757 | 5474 |
| 12:23 | MA30027-ICSAB1 | 1766 | 128700 | 31781 | 5491 |
| 12:29 | ZZZZZZ | 1990 | 147440 | 33717 | 6954 |
| 12:35 | ZZZZZZ | 2039 | 141770 | 33757 | 6177 |
| 12:42 | MA30027-CCV2 | 1915 | 144670 | 33784 | 6171 |
| 12:48 | MA30027-CCB3 | 2049 | 151680 | 33860 | 7032 |
| 12:54 | ZZZZZZ | 1899 | 140550 | 33061 | 6316 |
| 13:00 | MP68388-S1 | No results reported for the elements associated with this internal standard. | | | |
| 13:07 | MP68388-S2 | No results reported for the elements associated with this internal standard. | | | |
| 13:13 | JB22548-4 | No results reported for the elements associated with this internal standard. | | | |
| 13:20 | MP68388-SD1 | No results reported for the elements associated with this internal standard. | | | |
| 13:26 | ZZZZZZ | 1900 | 139980 | 33087 | 6170 |
| 13:32 | ZZZZZZ | 1933 | 142150 | 33502 | 6298 |
| 13:39 | ZZZZZZ | 1855 | 137100 | 32941 | 5968 |
| 13:45 | MA30027-CCV3 | 1927 | 143580 | 33350 | 6210 |
| 13:51 | MA30027-CCB4 | 2014 | 153200 | 34322 | 6946 |
| 13:58 | MP68387-S1 | 1823 | 999999 ! | 31720 | 5807 |
| 14:04 | MP68387-S2 | 1804 | 133470 | 32357 | 5723 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 14:10 | JB23006-1 | 1844 | 139430 | 32193 | 5930 |
| 14:16 | MP68387-SD1 | No results reported for the elements associated with this internal standard. | | | |
| 14:22 | MP68387-S1 | 1870 | 140460 | 33281 | 6044 |
| 14:29 | MP68387-S2 | 1843 | 138030 | 33093 | 5956 |
| 14:35 | JB23006-1 | 1864 | 146450 | 31734 | 6128 |
| 14:41 | MP68387-SD1 | 1973 | 148730 | 34340 | 6706 |
| 14:47 | MP68414-MB1 | 2036 | 153620 | 34813 | 7054 |
| 14:54 | MA30027-CCV4 | 1924 | 142260 | 33539 | 6216 |
| 15:00 | MA30027-CCB5 | 2049 | 152400 | 34302 | 7043 |
| 15:06 | MP68414-B1 | 1965 | 145160 | 33598 | 6518 |
| 15:12 | MP68414-LC1 | 2018 | 150180 | 35224 | 6530 |
| 15:18 | MP68414-S1 | 2090 | 154470 | 35920 | 6482 |
| 15:24 | MP68414-S2 | 2056 | 151970 | 35615 | 6455 |
| 15:31 | JB23287-22 | 2091 | 155810 | 36392 | 6685 |
| 15:37 | MP68414-SD1 | No results reported for the elements associated with this internal standard. | | | |
| 15:43 | ZZZZZZ | 2021 | 149860 | 999999 ! | 6717 |
| 15:49 | ZZZZZZ | 2180 | 162420 | 37899 | 6624 |
| 15:55 | ZZZZZZ | 2009 | 149040 | 35297 | 6437 |
| 16:02 | MA30027-CCV5 | 1938 | 142590 | 33266 | 6243 |
| 16:08 | MA30027-CCB6 | 2072 | 155660 | 34415 | 7088 |
| 16:14 | MA30027-CRI3 | 2014 | 150500 | 33917 | 6839 |
| 16:20 | MA30027-CRID2 | 2036 | 151600 | 34184 | 6982 |
| 16:27 | MA30027-CRIA2 | 2059 | 152210 | 33990 | 7051 |
| 16:33 | MA30027-ICSA2 | 1786 | 130550 | 31969 | 5531 |
| 16:39 | MA30027-ICSAB2 | 1775 | 129560 | 31913 | 5528 |
| 16:46 | MA30027-CCV6 | 1951 | 143350 | 33295 | 6266 |
| 16:52 | MA30027-CCB7 | 2067 | 153130 | 34241 | 7083 |
| 16:58 | ZZZZZZ | 2065 | 150810 | 35060 | 6573 |
| 17:04 | ZZZZZZ | 2056 | 152130 | 34597 | 6809 |
| 17:10 | ZZZZZZ | 2049 | 151430 | 34891 | 6711 |
| 17:17 | ZZZZZZ | 1931 | 143890 | 34093 | 6015 |
| 17:23 | ZZZZZZ | 2069 | 152320 | 34650 | 6770 |
| 17:29 | ZZZZZZ | 2128 | 157310 | 36666 | 6601 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 17:35 | ZZZZZZ | 2066 | 151450 | 34908 | 6679 |
| 17:41 | ZZZZZZ | 2077 | 153440 | 35463 | 6695 |
| 17:48 | ZZZZZZ | 2058 | 152160 | 35198 | 6621 |
| 17:54 | MA30027-CCV7 | 1962 | 144340 | 33727 | 6315 |
| 18:00 | MA30027-CCB8 | 2056 | 154810 | 34257 | 7061 |
| 18:06 | ZZZZZZ | 2042 | 151420 | 35629 | 6521 |
| 18:12 | ZZZZZZ | 2050 | 150910 | 35230 | 6577 |
| 18:19 | ZZZZZZ | 2063 | 151740 | 34912 | 6850 |
| 18:25 | ZZZZZZ | 2044 | 150210 | 35476 | 6519 |
| 18:31 | ZZZZZZ | 2278 | 165370 | 39719 | 6486 |
| 18:37 | ZZZZZZ | 2473 | 180960 | 43269 ! | 6457 |
| 18:44 | ZZZZZZ | 2241 | 165900 | 39427 | 6407 |
| 18:50 | ZZZZZZ | 2192 | 159090 | 38150 | 6499 |
| 18:56 | ZZZZZZ | 2202 | 158200 | 37751 | 6534 |
| 19:03 | ZZZZZZ | 2498 | 184770 | 44660 ! | 6389 |
| 19:09 | MA30027-CCV8 | 1970 | 144590 | 33744 | 6339 |
| 19:15 | MA30027-CCB9 | 2079 | 156060 | 34586 | 7134 |
| 19:22 | ZZZZZZ | 2236 | 166890 | 39315 | 6570 |
| 19:28 | ZZZZZZ | 2156 | 160280 | 37607 | 6299 |
| 19:34 | ZZZZZZ | 2077 | 156000 | 38428 | 6043 |
| 19:41 | ZZZZZZ | 2185 | 162730 | 38380 | 6523 |
| 19:47 | ZZZZZZ | 2135 | 153470 | 36789 | 6461 |
| 19:53 | ZZZZZZ | 2401 | 171160 | 41093 | 6366 |
| 20:00 | ZZZZZZ | 2202 | 161720 | 37416 | 6229 |
| 20:06 | ZZZZZZ | 2072 | 155170 | 34738 | 7125 |
| 20:12 | ZZZZZZ | 2034 | 151910 | 34321 | 6930 |
| 20:18 | MA30027-CCV9 | 1961 | 144260 | 33222 | 6307 |
| 20:25 | MA30027-CCB10 | 2051 | 153270 | 34745 | 7035 |
| 20:31 | ZZZZZZ | 2095 | 149390 | 35583 | 6514 |
| 20:37 | ZZZZZZ | 2104 | 155970 | 34997 | 6994 |
| 20:43 | ZZZZZZ | 2140 | 154810 | 37037 | 6554 |
| 20:50 | ZZZZZZ | 2088 | 153270 | 34821 | 6819 |
| 20:56 | ZZZZZZ | 1976 | 146860 | 34462 | 6333 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 21:02 | ZZZZZZ | 1975 | 142440 | 34306 | 6351 |
| 21:08 | ZZZZZZ | 1962 | 145570 | 34058 | 6294 |
| 21:14 | ZZZZZZ | 1734 | 127820 | 31762 | 5421 |
| 21:21 | MA30027-CCV10 | 1978 | 145120 | 33598 | 6358 |
| 21:27 | MA30027-CCB11 | 2071 | 153800 | 34109 | 7094 |
| 21:33 | ZZZZZZ | 1767 | 129430 | 31367 | 5507 |
| 21:40 | ZZZZZZ | 1946 | 141260 | 33163 | 6199 |
| 21:46 | MP68388-S1 | 1698 | 127110 | 31584 | 5228 |
| 21:53 | MP68388-S2 | 1699 | 123240 | 30767 | 5215 |
| 21:59 | JB22548-4 | 1696 | 123030 | 30909 | 5196 |
| 22:06 | MP68388-SD1 | 1931 | 140450 | 32673 | 6155 |
| 22:12 | MP68389-MB1 | 2070 | 155120 | 34816 | 7142 |
| 22:18 | MP68389-B1 | 2020 | 148040 | 33687 | 6671 |
| 22:25 | MA30027-CCV11 | 1980 | 146230 | 33690 | 6358 |
| 22:31 | MA30027-CCB12 | 2089 | 155340 | 34586 | 7158 |
| 22:37 | MA30027-CRI4 | 2052 | 152460 | 34068 | 6954 |
| 22:43 | MA30027-CRID3 | 2070 | 153470 | 34001 | 7084 |
| 22:50 | MA30027-CRIA3 | 2069 | 154220 | 34788 | 7088 |
| 22:56 | MA30027-ICSA3 | 1800 | 131430 | 32170 | 5580 |
| 23:02 | MA30027-ICSAB3 | 1805 | 131930 | 32383 | 5612 |
| 23:09 | MA30027-CCV12 | 1975 | 145090 | 33426 | 6351 |
| 23:15 | MA30027-CCB13 | 2085 | 152880 | 34284 | 7136 |
| 23:21 | ZZZZZZ | 2054 | 154000 | 34463 | 7049 |
| 23:27 | ZZZZZZ | 2066 | 154010 | 34144 | 7077 |
| 23:34 | ZZZZZZ | 2059 | 152470 | 34585 | 7085 |
| 23:40 | ZZZZZZ | 1984 | 153830 | 34331 | 7066 |
| 23:46 | ZZZZZZ | 2084 | 155840 | 34652 | 7174 |
| 23:52 | MP68389-S1 | 2045 | 151290 | 35554 | 6398 |
| 23:59 | MP68389-S2 | 2065 | 152340 | 35681 | 6414 |
| 00:05 | JB22562-1 | 2123 | 156740 | 36037 | 6707 |
| 00:11 | MP68389-SD1 | 2108 | 151940 | 35215 | 7003 |
| 00:17 | MA30027-CCV13 | 2005 | 145010 | 33472 | 6416 |
| 00:23 | MA30027-CCB14 | 2118 | 155800 | 33839 | 7216 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 00:30 | JB22549-1 | No results reported for the elements associated with this internal standard. | | | |
| 00:36 | JB22549-2 | 2036 | 153680 | 34127 | 7011 |
| 00:42 | JB22549-3 | 1803 | 134460 | 32496 | 5547 |
| 00:49 | JB22549-4 | 1853 | 138230 | 33107 | 5863 |
| 00:55 | JB22549-5 | 2080 | 154950 | 35909 | 6712 |
| 01:01 | JB22549-6 | No results reported for the elements associated with this internal standard. | | | |
| 01:08 | ZZZZZZ | 2191 | 153520 | 36693 | 6737 |
| 01:14 | ZZZZZZ | 2141 | 156380 | 35444 | 6717 |
| 01:20 | ZZZZZZ | 2141 | 156850 | 35412 | 6770 |
| 01:26 | ZZZZZZ | 1947 | 149840 | 34055 | 6727 |
| 01:33 | MA30027-CCV14 | 2029 | 145440 | 33027 | 6478 |
| 01:39 | MA30027-CCB15 | 2139 | 156260 | 33749 | 7269 |
| 01:45 | ZZZZZZ | 1992 | 152200 | 34616 | 6892 |
| 01:51 | ZZZZZZ | 2003 | 151100 | 34299 | 6893 |
| 01:57 | ZZZZZZ | 2044 | 148970 | 34323 | 6530 |
| 02:04 | ZZZZZZ | 2146 | 155290 | 34576 | 7004 |
| 02:10 | ZZZZZZ | 2131 | 155810 | 34688 | 6960 |
| 02:16 | ZZZZZZ | 2214 | 164770 | 36747 | 6818 |
| 02:22 | ZZZZZZ | 2091 | 154530 | 34533 | 6814 |
| 02:28 | ZZZZZZ | 2010 | 147980 | 35195 | 6243 |
| 02:35 | MP68436-MB1 | 2098 | 158390 | 35648 | 7241 |
| 02:41 | MP68436-B1 | 2083 | 152320 | 34034 | 6861 |
| 02:47 | MA30027-CCV15 | 2047 | 147690 | 33203 | 6524 |
| 02:53 | MA30027-CCB16 | 2148 | 157810 | 33983 | 7304 |
| 03:00 | MP68436-S1 | 2116 | 152710 | 35236 | 6553 |
| 03:06 | MP68436-S2 | 2117 | 153220 | 35611 | 6516 |
| 03:12 | JB22621-1 | 2195 | 158360 | 36229 | 6848 |
| 03:18 | MP68436-SD1 | 2135 | 156740 | 34858 | 7068 |
| 03:25 | ZZZZZZ | 2187 | 160050 | 35861 | 7000 |
| 03:31 | ZZZZZZ | 2180 | 157730 | 36264 | 6785 |
| 03:37 | ZZZZZZ | 2098 | 153720 | 35148 | 6798 |
| 03:43 | ZZZZZZ | 2111 | 153060 | 36076 | 6829 |
| 03:50 | ZZZZZZ | 2165 | 155840 | 35330 | 6885 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 03:56 | ZZZZZZ | 1984 | 156870 | 34955 | 6868 |
| 04:02 | MA30027-CCV16 | 2055 | 147780 | 32901 | 6528 |
| 04:08 | MA30027-CCB17 | 2168 | 157720 | 33776 | 7357 |
| 04:15 | ZZZZZZ | 2129 | 156050 | 35373 | 6708 |
| 04:21 | ZZZZZZ | 2184 | 159130 | 35761 | 6838 |
| 04:27 | ZZZZZZ | 2181 | 158670 | 35207 | 6901 |
| 04:33 | ZZZZZZ | 2147 | 164470 | 35568 | 6778 |
| 04:39 | ZZZZZZ | 2201 | 159280 | 35616 | 6972 |
| 04:45 | ZZZZZZ | 2165 | 158970 | 35447 | 6922 |
| 04:52 | ZZZZZZ | 2212 | 161580 | 36214 | 6792 |
| 04:58 | ZZZZZZ | 1977 | 146400 | 34289 | 6331 |
| 05:04 | ZZZZZZ | 2153 | 155260 | 35274 | 6663 |
| 05:10 | ZZZZZZ | 2159 | 158000 | 34666 | 7256 |
| 05:16 | MA30027-CCV17 | 2050 | 148760 | 33561 | 6547 |
| 05:23 | MA30027-CCB18 | 2160 | 158540 | 34203 | 7370 |
| 05:29 | ZZZZZZ | 2122 | 155830 | 34884 | 6727 |
| 05:35 | ZZZZZZ | 1890 | 139190 | 33561 | 5948 |
| 05:41 | MP68437-MB1 | 2151 | 158780 | 34334 | 7371 |
| 05:48 | MP68437-B1 | 2079 | 162630 | 34199 | 6837 |
| 05:54 | MP68437-S1 | 1821 | 132590 | 31874 | 5227 |
| 06:00 | MP68437-S2 | 1842 | 134000 | 32222 | 5345 |
| 06:06 | JB22769-1 | 1775 | 130280 | 31847 | 5160 |
| 06:12 | MP68437-SD1 | 1941 | 141860 | 32566 | 6079 |
| 06:19 | ZZZZZZ | 1947 | 140050 | 33147 | 5742 |
| 06:25 | ZZZZZZ | 1855 | 134340 | 31952 | 5390 |
| 06:31 | MA30027-CCV18 | 2054 | 149320 | 33468 | 6566 |
| 06:37 | MA30027-CCB19 | 2157 | 158930 | 34134 | 7361 |
| 06:44 | MA30027-CRI5 | 2133 | 154730 | 33914 | 7190 |
| 06:50 | MA30027-CRID4 | 2147 | 157480 | 34053 | 7297 |
| 06:56 | MA30027-CRIA4 | 2154 | 162070 | 34880 | 7332 |
| 07:02 | MA30027-ICSA4 | 1862 | 133860 | 32164 | 5734 |
| 07:09 | MA30027-ICSAB4 | 1857 | 134540 | 32207 | 5751 |

R = Reference for ISTD limits.  ! = Outside limits.

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
Analyst: GT  Run ID: MA30027
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|

LEGEND:

| Istd# | Parameter | Limits |
|---|---|---|
| Istd#1 | Yttrium (2243) | 70-130 % |
| Istd#2 | Yttrium (3600) | 70-130 % |
| Istd#3 | Yttrium (3710) | 70-130 % |
| Istd#4 | Indium | 70-130 % |

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30027  Units: ug/l

| Time: | | | 11:40 | | 12:03 | | 12:48 | | 13:51 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | | | ICB1 | | CCB2 | | CCB3 | | CCB4 | |
| Metal | RL | IDL | raw | final | raw | final | raw | final | raw | final |
| Aluminum | 200 | 10 | anr | | | | | | | |
| Antimony | 6.0 | 1.2 | anr | | | | | | | |
| Arsenic | 3.0 | .9 | anr | | | | | | | |
| Barium | 200 | .3 | anr | | | | | | | |
| Beryllium | 1.0 | .1 | anr | | | | | | | |
| Bismuth | 20 | .8 | | | | | | | | |
| Boron | 100 | 2.4 | anr | | | | | | | |
| Cadmium | 3.0 | .2 | anr | | | | | | | |
| Calcium | 5000 | 36 | anr | | | | | | | |
| Chromium | 10 | .4 | anr | | | | | | | |
| Cobalt | 50 | .2 | anr | | | | | | | |
| Copper | 10 | .5 | anr | | | | | | | |
| Iron | 100 | 6.6 | anr | | | | | | | |
| Lead | 3.0 | 1.1 | 0.30 | <3.0 | 0.0 | <3.0 | 1.0 | <3.0 | 0.80 | <3.0 |
| Lithium | 20 | .7 | | | | | | | | |
| Magnesium | 5000 | 16 | anr | | | | | | | |
| Manganese | 15 | .3 | anr | | | | | | | |
| Molybdenum | 20 | .6 | | | | | | | | |
| Nickel | 10 | .5 | anr | | | | | | | |
| Palladium | 50 | 1.1 | | | | | | | | |
| Potassium | 10000 | 2.7 | anr | | | | | | | |
| Selenium | 10 | 1.8 | anr | | | | | | | |
| Silicon | 200 | 8.1 | | | | | | | | |
| Silver | 10 | .3 | anr | | | | | | | |
| Sodium | 10000 | 12 | anr | | | | | | | |
| Sulfur | 50 | 18 | | | | | | | | |
| Strontium | 10 | .2 | | | | | | | | |
| Thallium | 2.0 | 1.2 | anr | | | | | | | |
| Tin | 10 | .6 | | | | | | | | |
| Titanium | 10 | .5 | | | | | | | | |
| Tungsten | 50 | 13 | | | | | | | | |
| Vanadium | 50 | .7 | anr | | | | | | | |
| Zinc | 20 | 2.2 | anr | | | | | | | |

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30027  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | .5 |

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30027  Units: ug/l

| Time: | | | 15:00 | | 16:08 | | 16:52 | | 18:00 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | | | CCB5 | | CCB6 | | CCB7 | | CCB8 | |
| Metal | RL | IDL | raw | final | raw | final | raw | final | raw | final |
| Aluminum | 200 | 10 | anr | | | | | | | |
| Antimony | 6.0 | 1.2 | anr | | | | | | | |
| Arsenic | 3.0 | .9 | anr | | | | | | | |
| Barium | 200 | .3 | anr | | | | | | | |
| Beryllium | 1.0 | .1 | anr | | | | | | | |
| Bismuth | 20 | .8 | | | | | | | | |
| Boron | 100 | 2.4 | anr | | | | | | | |
| Cadmium | 3.0 | .2 | anr | | | | | | | |
| Calcium | 5000 | 36 | anr | | | | | | | |
| Chromium | 10 | .4 | anr | | | | | | | |
| Cobalt | 50 | .2 | anr | | | | | | | |
| Copper | 10 | .5 | anr | | | | | | | |
| Iron | 100 | 6.6 | anr | | | | | | | |
| Lead | 3.0 | 1.1 | 0.50 | <3.0 | 1.1 | <3.0 | 0.70 | <3.0 | 0.40 | <3.0 |
| Lithium | 20 | .7 | | | | | | | | |
| Magnesium | 5000 | 16 | anr | | | | | | | |
| Manganese | 15 | .3 | anr | | | | | | | |
| Molybdenum | 20 | .6 | | | | | | | | |
| Nickel | 10 | .5 | anr | | | | | | | |
| Palladium | 50 | 1.1 | | | | | | | | |
| Potassium | 10000 | 2.7 | anr | | | | | | | |
| Selenium | 10 | 1.8 | anr | | | | | | | |
| Silicon | 200 | 8.1 | | | | | | | | |
| Silver | 10 | .3 | anr | | | | | | | |
| Sodium | 10000 | 12 | anr | | | | | | | |
| Sulfur | 50 | 18 | | | | | | | | |
| Strontium | 10 | .2 | | | | | | | | |
| Thallium | 2.0 | 1.2 | anr | | | | | | | |
| Tin | 10 | .6 | | | | | | | | |
| Titanium | 10 | .5 | | | | | | | | |
| Tungsten | 50 | 13 | | | | | | | | |
| Vanadium | 50 | .7 | anr | | | | | | | |
| Zinc | 20 | 2.2 | anr | | | | | | | |

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30027  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | .5 |

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30027  Units: ug/l

| Time: | | | 19:15 | | 20:25 | | 21:27 | | 22:31 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | | | CCB9 | | CCB10 | | CCB11 | | CCB12 | |
| Metal | RL | IDL | raw | final | raw | final | raw | final | raw | final |
| Aluminum | 200 | 10 | anr | | | | | | | |
| Antimony | 6.0 | 1.2 | anr | | | | | | | |
| Arsenic | 3.0 | .9 | anr | | | | | | | |
| Barium | 200 | .3 | anr | | | | | | | |
| Beryllium | 1.0 | .1 | anr | | | | | | | |
| Bismuth | 20 | .8 | | | | | | | | |
| Boron | 100 | 2.4 | anr | | | | | | | |
| Cadmium | 3.0 | .2 | anr | | | | | | | |
| Calcium | 5000 | 36 | anr | | | | | | | |
| Chromium | 10 | .4 | anr | | | | | | | |
| Cobalt | 50 | .2 | anr | | | | | | | |
| Copper | 10 | .5 | anr | | | | | | | |
| Iron | 100 | 6.6 | anr | | | | | | | |
| Lead | 3.0 | 1.1 | 0.30 | <3.0 | 0.10 | <3.0 | 0.30 | <3.0 | 0.30 | <3.0 |
| Lithium | 20 | .7 | | | | | | | | |
| Magnesium | 5000 | 16 | anr | | | | | | | |
| Manganese | 15 | .3 | anr | | | | | | | |
| Molybdenum | 20 | .6 | | | | | | | | |
| Nickel | 10 | .5 | anr | | | | | | | |
| Palladium | 50 | 1.1 | | | | | | | | |
| Potassium | 10000 | 2.7 | anr | | | | | | | |
| Selenium | 10 | 1.8 | anr | | | | | | | |
| Silicon | 200 | 8.1 | | | | | | | | |
| Silver | 10 | .3 | anr | | | | | | | |
| Sodium | 10000 | 12 | anr | | | | | | | |
| Sulfur | 50 | 18 | | | | | | | | |
| Strontium | 10 | .2 | | | | | | | | |
| Thallium | 2.0 | 1.2 | anr | | | | | | | |
| Tin | 10 | .6 | | | | | | | | |
| Titanium | 10 | .5 | | | | | | | | |
| Tungsten | 50 | 13 | | | | | | | | |
| Vanadium | 50 | .7 | anr | | | | | | | |
| Zinc | 20 | 2.2 | anr | | | | | | | |

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30027  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | .5 |

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30027  Units: ug/l

| Time: | | | 23:15 | | 00:23 | | 01:39 | | 02:53 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | | | CCB13 | | CCB14 | | CCB15 | | CCB16 | |
| Metal | RL | IDL | raw | final | raw | final | raw | final | raw | final |
| Aluminum | 200 | 10 | anr | | | | | | | |
| Antimony | 6.0 | 1.2 | anr | | | | | | | |
| Arsenic | 3.0 | .9 | anr | | | | | | | |
| Barium | 200 | .3 | anr | | | | | | | |
| Beryllium | 1.0 | .1 | anr | | | | | | | |
| Bismuth | 20 | .8 | | | | | | | | |
| Boron | 100 | 2.4 | anr | | | | | | | |
| Cadmium | 3.0 | .2 | anr | | | | | | | |
| Calcium | 5000 | 36 | anr | | | | | | | |
| Chromium | 10 | .4 | anr | | | | | | | |
| Cobalt | 50 | .2 | anr | | | | | | | |
| Copper | 10 | .5 | anr | | | | | | | |
| Iron | 100 | 6.6 | anr | | | | | | | |
| Lead | 3.0 | 1.1 | 0.20 | <3.0 | 0.90 | <3.0 | 0.50 | <3.0 | 0.90 | <3.0 |
| Lithium | 20 | .7 | | | | | | | | |
| Magnesium | 5000 | 16 | anr | | | | | | | |
| Manganese | 15 | .3 | anr | | | | | | | |
| Molybdenum | 20 | .6 | | | | | | | | |
| Nickel | 10 | .5 | anr | | | | | | | |
| Palladium | 50 | 1.1 | | | | | | | | |
| Potassium | 10000 | 2.7 | anr | | | | | | | |
| Selenium | 10 | 1.8 | anr | | | | | | | |
| Silicon | 200 | 8.1 | | | | | | | | |
| Silver | 10 | .3 | anr | | | | | | | |
| Sodium | 10000 | 12 | anr | | | | | | | |
| Sulfur | 50 | 18 | | | | | | | | |
| Strontium | 10 | .2 | | | | | | | | |
| Thallium | 2.0 | 1.2 | anr | | | | | | | |
| Tin | 10 | .6 | | | | | | | | |
| Titanium | 10 | .5 | | | | | | | | |
| Tungsten | 50 | 13 | | | | | | | | |
| Vanadium | 50 | .7 | anr | | | | | | | |
| Zinc | 20 | 2.2 | anr | | | | | | | |

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30027  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | .5 |

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30027  Units: ug/l

| Time: | | | 04:08 | | 05:23 | | 06:37 | |
|---|---|---|---|---|---|---|---|---|
| Sample ID: | | | CCB17 | | CCB18 | | CCB19 | |
| Metal | RL | IDL | raw | final | raw | final | raw | final |
| Aluminum | 200 | 10 | anr | | | | | |
| Antimony | 6.0 | 1.2 | anr | | | | | |
| Arsenic | 3.0 | .9 | anr | | | | | |
| Barium | 200 | .3 | anr | | | | | |
| Beryllium | 1.0 | .1 | anr | | | | | |
| Bismuth | 20 | .8 | | | | | | |
| Boron | 100 | 2.4 | anr | | | | | |
| Cadmium | 3.0 | .2 | anr | | | | | |
| Calcium | 5000 | 36 | anr | | | | | |
| Chromium | 10 | .4 | anr | | | | | |
| Cobalt | 50 | .2 | anr | | | | | |
| Copper | 10 | .5 | anr | | | | | |
| Iron | 100 | 6.6 | anr | | | | | |
| Lead | 3.0 | 1.1 | 0.70 | <3.0 | 0.90 | <3.0 | 0.90 | <3.0 |
| Lithium | 20 | .7 | | | | | | |
| Magnesium | 5000 | 16 | anr | | | | | |
| Manganese | 15 | .3 | anr | | | | | |
| Molybdenum | 20 | .6 | | | | | | |
| Nickel | 10 | .5 | anr | | | | | |
| Palladium | 50 | 1.1 | | | | | | |
| Potassium | 10000 | 2.7 | anr | | | | | |
| Selenium | 10 | 1.8 | anr | | | | | |
| Silicon | 200 | 8.1 | | | | | | |
| Silver | 10 | .3 | anr | | | | | |
| Sodium | 10000 | 12 | anr | | | | | |
| Sulfur | 50 | 18 | | | | | | |
| Strontium | 10 | .2 | | | | | | |
| Thallium | 2.0 | 1.2 | anr | | | | | |
| Tin | 10 | .6 | | | | | | |
| Titanium | 10 | .5 | | | | | | |
| Tungsten | 50 | 13 | | | | | | |
| Vanadium | 50 | .7 | anr | | | | | |
| Zinc | 20 | 2.2 | anr | | | | | |

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30027  Units: ug/l

Time:
Sample ID:

| Metal | | |
|---|---|---|
| Zirconium | 10 | .5 |

(*) Outside of QC limits
(anr) Analyte not requested

10.1.2
10

CALIBRATION CHECK STANDARDS SUMMARY
Initial Continuing Calibration Check

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | 11:50 | |
|---|---|---|---|
| Sample ID: | ICCV | ICCV1 | |
| Metal | True | Results | % Rec |
| Aluminum | anr | | |
| Antimony | anr | | |
| Arsenic | anr | | |
| Barium | anr | | |
| Beryllium | anr | | |
| Bismuth | | | |
| Boron | anr | | |
| Cadmium | anr | | |
| Calcium | anr | | |
| Chromium | anr | | |
| Cobalt | anr | | |
| Copper | anr | | |
| Iron | anr | | |
| Lead | 2000 | 1990 | 99.5 |
| Lithium | | | |
| Magnesium | anr | | |
| Manganese | anr | | |
| Molybdenum | | | |
| Nickel | anr | | |
| Palladium | | | |
| Potassium | anr | | |
| Selenium | anr | | |
| Silicon | | | |
| Silver | anr | | |
| Sodium | anr | | |
| Sulfur | | | |
| Strontium | | | |
| Thallium | anr | | |
| Tin | | | |
| Titanium | | | |
| Tungsten | | | |
| Vanadium | anr | | |
| Zinc | anr | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial Continuing Calibration Check

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | 11:28 | | | 12:42 | | | 13:45 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | ICV | ICV1 | | CCV | CCV2 | | CCV | CCV3 | |
| Metal | True | Results | % Rec | True | Results | % Rec | True | Results | % Rec |
| Aluminum | anr | | | | | | | | |
| Antimony | anr | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | anr | | | | | | | | |
| Bismuth | | | | | | | | | |
| Boron | anr | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | anr | | | | | | | | |
| Chromium | anr | | | | | | | | |
| Cobalt | anr | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | anr | | | | | | | | |
| Lead | 2000 | 2000 | 100.0 | 2000 | 2020 | 101.0 | 2000 | 2010 | 100.5 |
| Lithium | | | | | | | | | |
| Magnesium | anr | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Palladium | | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silicon | | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | anr | | | | | | | | |
| Sulfur | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | anr | | | | | | | | |
| Tin | | | | | | | | | |
| Titanium | | | | | | | | | |
| Tungsten | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | 14:54 | | | 16:02 | | | 16:46 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CCV | CCV4 | | CCV | CCV5 | | CCV | CCV6 | |
| Metal | True | Results | % Rec | True | Results | % Rec | True | Results | % Rec |
| Aluminum | anr | | | | | | | | |
| Antimony | anr | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | anr | | | | | | | | |
| Bismuth | | | | | | | | | |
| Boron | anr | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | anr | | | | | | | | |
| Chromium | anr | | | | | | | | |
| Cobalt | anr | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | anr | | | | | | | | |
| Lead | 2000 | 2000 | 100.0 | 2000 | 2010 | 100.5 | 2000 | 2030 | 101.5 |
| Lithium | | | | | | | | | |
| Magnesium | anr | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Palladium | | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silicon | | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | anr | | | | | | | | |
| Sulfur | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | anr | | | | | | | | |
| Tin | | | | | | | | | |
| Titanium | | | | | | | | | |
| Tungsten | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

10.1.4
10

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | 17:54 | | | 19:09 | | | 20:18 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CCV | CCV7 | | CCV | CCV8 | | CCV | CCV9 | |
| Metal | True | Results | % Rec | True | Results | % Rec | True | Results | % Rec |
| Aluminum | anr | | | | | | | | |
| Antimony | anr | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | anr | | | | | | | | |
| Bismuth | | | | | | | | | |
| Boron | anr | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | anr | | | | | | | | |
| Chromium | anr | | | | | | | | |
| Cobalt | anr | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | anr | | | | | | | | |
| Lead | 2000 | 2000 | 100.0 | 2000 | 2010 | 100.5 | 2000 | 2020 | 101.0 |
| Lithium | | | | | | | | | |
| Magnesium | anr | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Palladium | | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silicon | | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | anr | | | | | | | | |
| Sulfur | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | anr | | | | | | | | |
| Tin | | | | | | | | | |
| Titanium | | | | | | | | | |
| Tungsten | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

10.1.4
10

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | 21:21 | | | 22:25 | | | 23:09 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CCV | CCV10 | | CCV | CCV11 | | CCV | CCV12 | |
| Metal | True | Results | % Rec | True | Results | % Rec | True | Results | % Rec |
| Aluminum | anr | | | | | | | | |
| Antimony | anr | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | anr | | | | | | | | |
| Bismuth | | | | | | | | | |
| Boron | anr | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | anr | | | | | | | | |
| Chromium | anr | | | | | | | | |
| Cobalt | anr | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | anr | | | | | | | | |
| Lead | 2000 | 2010 | 100.5 | 2000 | 2030 | 101.5 | 2000 | 2020 | 101.0 |
| Lithium | | | | | | | | | |
| Magnesium | anr | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Palladium | | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silicon | | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | anr | | | | | | | | |
| Sulfur | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | anr | | | | | | | | |
| Tin | | | | | | | | | |
| Titanium | | | | | | | | | |
| Tungsten | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

10.1.4
10

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | 00:17 | | | 01:33 | | | 02:47 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CCV | CCV13 | | CCV | CCV14 | | CCV | CCV15 | |
| Metal | True | Results | % Rec | True | Results | % Rec | True | Results | % Rec |
| Aluminum | anr | | | | | | | | |
| Antimony | anr | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | anr | | | | | | | | |
| Bismuth | | | | | | | | | |
| Boron | anr | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | anr | | | | | | | | |
| Chromium | anr | | | | | | | | |
| Cobalt | anr | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | anr | | | | | | | | |
| Lead | 2000 | 2030 | 101.5 | 2000 | 2030 | 101.5 | 2000 | 2030 | 101.5 |
| Lithium | | | | | | | | | |
| Magnesium | anr | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Palladium | | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silicon | | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | anr | | | | | | | | |
| Sulfur | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | anr | | | | | | | | |
| Tin | | | | | | | | | |
| Titanium | | | | | | | | | |
| Tungsten | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

10.1.4
10

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | 04:02 | | | 05:16 | | | 06:31 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CCV | CCV16 | | CCV | CCV17 | | CCV | CCV18 | |
| Metal | True | Results | % Rec | True | Results | % Rec | True | Results | % Rec |
| Aluminum | anr | | | | | | | | |
| Antimony | anr | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | anr | | | | | | | | |
| Bismuth | | | | | | | | | |
| Boron | anr | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | anr | | | | | | | | |
| Chromium | anr | | | | | | | | |
| Cobalt | anr | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | anr | | | | | | | | |
| Lead | 2000 | 2040 | 102.0 | 2000 | 2040 | 102.0 | 2000 | 2050 | 102.5 |
| Lithium | | | | | | | | | |
| Magnesium | anr | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Palladium | | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silicon | | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | anr | | | | | | | | |
| Sulfur | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | anr | | | | | | | | |
| Tin | | | | | | | | | |
| Titanium | | | | | | | | | |
| Tungsten | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30027  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | | | 11:06 | | 11:13 | | 11:21 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CRI | CRIA | CRID | CRID1 | | CRIA1 | | CRI2 | |
| Metal | True | True | True | Results | % Rec | Results | % Rec | Results | % Rec |
| Aluminum | 200 | 500 | 100 | anr | | | | | |
| Antimony | 6.0 | 20 | 3.0 | anr | | | | | |
| Arsenic | 8.0 | 20 | 3.0 | anr | | | | | |
| Barium | 200 | | 4.0 | anr | | | | | |
| Beryllium | 2.0 | | 1.0 | anr | | | | | |
| Bismuth | 20 | | | | | | | | |
| Boron | 100 | | 10 | | | | | | |
| Cadmium | 3.0 | | 1.0 | anr | | | | | |
| Calcium | 5000 | | 1000 | anr | | | | | |
| Chromium | 10 | | 2.0 | anr | | | | | |
| Cobalt | 50 | | 3.0 | anr | | | | | |
| Copper | 10 | | 2.0 | | | | | | |
| Iron | 100 | 500 | | | | | | | |
| Lead | 3.0 | 20 | 2.5 | | | 20.3 | 101.5 | 3.1 | 103.3 |
| Lithium | 20 | | | | | | | | |
| Magnesium | 5000 | | 100 | anr | | | | | |
| Manganese | 15 | | 3.0 | anr | | | | | |
| Molybdenum | 20 | | 4.0 | | | | | | |
| Nickel | 10 | | 4.0 | anr | | | | | |
| Palladium | 50 | | | | | | | | |
| Potassium | 5000 | | 2000 | anr | | | | | |
| Selenium | 10 | 20 | 5.0 | anr | | | | | |
| Silicon | 200 | | | | | | | | |
| Silver | 5.0 | | 1.0 | anr | | | | | |
| Sodium | 5000 | | 1000 | anr | | | | | |
| Sulfur | 50 | 50 | 50 | | | | | | |
| Strontium | 10 | | | | | | | | |
| Thallium | 10 | | 2.0 | anr | | | | | |
| Tin | 10 | | | | | | | | |
| Titanium | 10 | | | | | | | | |
| Tungsten | 50 | | | | | | | | |
| Vanadium | 50 | | 2.0 | anr | | | | | |
| Zinc | 20 | | 10 | anr | | | | | |

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30027  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | 5.0 |

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | | | 16:14 | | 16:20 | | 16:27 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CRI | CRIA | CRID | CRI3 | | CRID2 | | CRIA2 | |
| Metal | True | True | True | Results | % Rec | Results | % Rec | Results | % Rec |
| Aluminum | 200 | 500 | 100 | anr | | | | | |
| Antimony | 6.0 | 20 | 3.0 | anr | | | | | |
| Arsenic | 8.0 | 20 | 3.0 | anr | | | | | |
| Barium | 200 | | 4.0 | anr | | | | | |
| Beryllium | 2.0 | | 1.0 | anr | | | | | |
| Bismuth | 20 | | | | | | | | |
| Boron | 100 | | 10 | anr | | | | | |
| Cadmium | 3.0 | | 1.0 | anr | | | | | |
| Calcium | 5000 | | 1000 | anr | | | | | |
| Chromium | 10 | | 2.0 | anr | | | | | |
| Cobalt | 50 | | 3.0 | anr | | | | | |
| Copper | 10 | | 2.0 | anr | | | | | |
| Iron | 100 | 500 | | anr | | | | | |
| Lead | 3.0 | 20 | 2.5 | 3.2 | 106.7 | | | 19.8 | 99.0 |
| Lithium | 20 | | | | | | | | |
| Magnesium | 5000 | | 100 | anr | | | | | |
| Manganese | 15 | | 3.0 | anr | | | | | |
| Molybdenum | 20 | | 4.0 | | | | | | |
| Nickel | 10 | | 4.0 | anr | | | | | |
| Palladium | 50 | | | | | | | | |
| Potassium | 5000 | | 2000 | anr | | | | | |
| Selenium | 10 | 20 | 5.0 | anr | | | | | |
| Silicon | 200 | | | | | | | | |
| Silver | 5.0 | | 1.0 | anr | | | | | |
| Sodium | 5000 | | 1000 | anr | | | | | |
| Sulfur | 50 | 50 | 50 | | | | | | |
| Strontium | 10 | | | | | | | | |
| Thallium | 10 | | 2.0 | anr | | | | | |
| Tin | 10 | | | | | | | | |
| Titanium | 10 | | | | | | | | |
| Tungsten | 50 | | | | | | | | |
| Vanadium | 50 | | 2.0 | anr | | | | | |
| Zinc | 20 | | 10 | anr | | | | | |

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30027  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | 5.0 |

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | | | 22:37 | | 22:43 | | 22:50 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CRI | CRIA | CRID | CRI4 | | CRID3 | | CRIA3 | |
| Metal | True | True | True | Results | % Rec | Results | % Rec | Results | % Rec |
| Aluminum | 200 | 500 | 100 | anr | | | | | |
| Antimony | 6.0 | 20 | 3.0 | anr | | | | | |
| Arsenic | 8.0 | 20 | 3.0 | anr | | | | | |
| Barium | 200 | | 4.0 | anr | | | | | |
| Beryllium | 2.0 | | 1.0 | anr | | | | | |
| Bismuth | 20 | | | | | | | | |
| Boron | 100 | | 10 | anr | | | | | |
| Cadmium | 3.0 | | 1.0 | anr | | | | | |
| Calcium | 5000 | | 1000 | anr | | | | | |
| Chromium | 10 | | 2.0 | anr | | | | | |
| Cobalt | 50 | | 3.0 | anr | | | | | |
| Copper | 10 | | 2.0 | anr | | | | | |
| Iron | 100 | 500 | | anr | | | | | |
| Lead | 3.0 | 20 | 2.5 | 3.2 | 106.7 | | | 20.1 | 100.5 |
| Lithium | 20 | | | | | | | | |
| Magnesium | 5000 | | 100 | anr | | | | | |
| Manganese | 15 | | 3.0 | anr | | | | | |
| Molybdenum | 20 | | 4.0 | | | | | | |
| Nickel | 10 | | 4.0 | anr | | | | | |
| Palladium | 50 | | | | | | | | |
| Potassium | 5000 | | 2000 | anr | | | | | |
| Selenium | 10 | 20 | 5.0 | anr | | | | | |
| Silicon | 200 | | | | | | | | |
| Silver | 5.0 | | 1.0 | anr | | | | | |
| Sodium | 5000 | | 1000 | anr | | | | | |
| Sulfur | 50 | 50 | 50 | | | | | | |
| Strontium | 10 | | | | | | | | |
| Thallium | 10 | | 2.0 | anr | | | | | |
| Tin | 10 | | | | | | | | |
| Titanium | 10 | | | | | | | | |
| Tungsten | 50 | | | | | | | | |
| Vanadium | 50 | | 2.0 | anr | | | | | |
| Zinc | 20 | | 10 | anr | | | | | |

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30027  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | 5.0 |

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | | | 06:44 | | 06:50 | | 06:56 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CRI | CRIA | CRID | CRI5 | | CRID4 | | CRIA4 | |
| Metal | True | True | True | Results | % Rec | Results | % Rec | Results | % Rec |
| Aluminum | 200 | 500 | 100 | anr | | | | | |
| Antimony | 6.0 | 20 | 3.0 | anr | | | | | |
| Arsenic | 8.0 | 20 | 3.0 | anr | | | | | |
| Barium | 200 | | 4.0 | anr | | | | | |
| Beryllium | 2.0 | | 1.0 | anr | | | | | |
| Bismuth | 20 | | | | | | | | |
| Boron | 100 | | 10 | anr | | | | | |
| Cadmium | 3.0 | | 1.0 | anr | | | | | |
| Calcium | 5000 | | 1000 | anr | | | | | |
| Chromium | 10 | | 2.0 | anr | | | | | |
| Cobalt | 50 | | 3.0 | anr | | | | | |
| Copper | 10 | | 2.0 | anr | | | | | |
| Iron | 100 | 500 | | anr | | | | | |
| Lead | 3.0 | 20 | 2.5 | 3.4 | 113.3 | | | 20.8 | 104.0 |
| Lithium | 20 | | | | | | | | |
| Magnesium | 5000 | | 100 | anr | | | | | |
| Manganese | 15 | | 3.0 | anr | | | | | |
| Molybdenum | 20 | | 4.0 | | | | | | |
| Nickel | 10 | | 4.0 | anr | | | | | |
| Palladium | 50 | | | | | | | | |
| Potassium | 5000 | | 2000 | anr | | | | | |
| Selenium | 10 | 20 | 5.0 | anr | | | | | |
| Silicon | 200 | | | | | | | | |
| Silver | 5.0 | | 1.0 | anr | | | | | |
| Sodium | 5000 | | 1000 | anr | | | | | |
| Sulfur | 50 | 50 | 50 | | | | | | |
| Strontium | 10 | | | | | | | | |
| Thallium | 10 | | 2.0 | anr | | | | | |
| Tin | 10 | | | | | | | | |
| Titanium | 10 | | | | | | | | |
| Tungsten | 50 | | | | | | | | |
| Vanadium | 50 | | 2.0 | anr | | | | | |
| Zinc | 20 | | 10 | anr | | | | | |

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30027  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | 5.0 |

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 80 to 120 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | | 12:10 | | 12:23 | | 16:33 | | 16:39 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | ICSA | ICSAB | ICSA1 | | ICSAB1 | | ICSA2 | | ICSAB2 | |
| Metal | True | True | Results | % Rec | Results | % Rec | Results | % Rec | Results | % Rec |
| Aluminum | 500000 | 500000 | 481000 | 96.2 | 484000 | 96.8 | 477000 | 95.4 | 489000 | 97.8 |
| Antimony | | 1000 | 0.40 | | 974 | 97.4 | 0.40 | | 973 | 97.3 |
| Arsenic | | 1000 | 1.2 | | 1040 | 104.0 | 0.70 | | 1060 | 106.0 |
| Barium | | 500 | -0.50 | | 489 | 97.8 | -0.50 | | 494 | 98.8 |
| Beryllium | | 500 | 0.0 | | 458 | 91.6 | 0.0 | | 451 | 90.2 |
| Bismuth | | 500 | -14 | | 495 | 99.0 | -14 | | 497 | 99.4 |
| Boron | | | -2.2 | | -2.0 | | -8.2 | | -5.8 | |
| Cadmium | | 1000 | 2.4 | | 1010 | 101.0 | 2.4 | | 1020 | 102.0 |
| Calcium | 400000 | 400000 | 364000 | 91.0 | 356000 | 89.0 | 361000 | 90.3 | 353000 | 88.3 |
| Chromium | | 500 | 1.0 | | 445 | 89.0 | 0.50 | | 444 | 88.8 |
| Cobalt | | 500 | 0.60 | | 447 | 89.4 | 0.80 | | 454 | 90.8 |
| Copper | | 500 | 0.70 | | 491 | 98.2 | 0.90 | | 481 | 96.2 |
| Iron | 200000 | 200000 | 190000 | 95.0 | 200000 | 100.0 | 191000 | 95.5 | 202000 | 101.0 |
| Lead | | 1000 | 1.8 | | 894 | 89.4 | 1.7 | | 900 | 90.0 |
| Lithium | | 500 | 6.3 | | 520 | 104.0 | 6.2 | | 520 | 104.0 |
| Magnesium | 500000 | 500000 | 519000 | 103.8 | 534000 | 106.8 | 527000 | 105.4 | 544000 | 108.8 |
| Manganese | | 500 | -1.8 | | 471 | 94.2 | -0.80 | | 478 | 95.6 |
| Molybdenum | | 500 | 7.8 | | 496 | 99.2 | 7.8 | | 500 | 100.0 |
| Nickel | | 1000 | -0.50 | | 906 | 90.6 | -1.1 | | 907 | 90.7 |
| Palladium | | 500 | 7.7 | | 566 | 113.2 | 7.6 | | 577 | 115.4 |
| Potassium | | | 134 | | 168 | | 111 | | 141 | |
| Selenium | | 1000 | 0.60 | | 1010 | 101.0 | 3.6 | | 1020 | 102.0 |
| Silicon | | | -18 | | -1.2 | | -21 | | -4.4 | |
| Silver | | 1000 | 2.0 | | 1060 | 106.0 | 2.1 | | 1070 | 107.0 |
| Sodium | | | -6.2 | | 13.9 | | -11 | | 14.2 | |
| Sulfur | | 500 | 11.9 | | 500 | 100.0 | 13.0 | | 497 | 99.4 |
| Strontium | | | -6.1 | | -5.8 | | -6.1 | | -5.6 | |
| Thallium | | 1000 | 3.2 | | 908 | 90.8 | 3.7 | | 945 | 94.5 |
| Tin | | | -0.30 | | -0.50 | | -1.8 | | -1.1 | |
| Titanium | | | 3.1 | | 6.3 | | 2.9 | | 6.0 | |
| Tungsten | | 500 | 21.6 | | 483 | 96.6 | 15.0 | | 478 | 95.6 |
| Vanadium | | 500 | 2.7 | | 466 | 93.2 | 2.3 | | 473 | 94.6 |
| Zinc | | 1000 | -4.4 | | 887 | 88.7 | -3.8 | | 895 | 89.5 |

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 80 to 120 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample ID: | | | | | | | |
| Metal | | | | | | | |
| Zirconium | 500 | -6.7 | 514 | 102.8 | -6.9 | 518 | 103.6 |

(*) Outside of QC limits
(anr) Analyte not requested

10.1.6
10

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 80 to 120 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | | 22:56 | | 23:02 | | 07:02 | | 07:09 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | ICSA | ICSAB | ICSA3 | | ICSAB3 | | ICSA4 | | ICSAB4 | |
| Metal | True | True | Results | % Rec | Results | % Rec | Results | % Rec | Results | % Rec |
| Aluminum | 500000 | 500000 | 492000 | 98.4 | 498000 | 99.6 | 485000 | 97.0 | 492000 | 98.4 |
| Antimony | | 1000 | 2.2 | | 972 | 97.2 | 1.5 | | 970 | 97.0 |
| Arsenic | | 1000 | 2.3 | | 1070 | 107.0 | 2.2 | | 1090 | 109.0 |
| Barium | | 500 | -0.60 | | 497 | 99.4 | -0.70 | | 500 | 100.0 |
| Beryllium | | 500 | 0.0 | | 441 | 88.2 | 0.0 | | 439 | 87.8 |
| Bismuth | | 500 | -14 | | 498 | 99.6 | -12 | | 497 | 99.4 |
| Boron | | | -9.2 | | -6.2 | | -9.2 | | -5.5 | |
| Cadmium | | 1000 | 2.5 | | 1020 | 102.0 | 2.3 | | 1030 | 103.0 |
| Calcium | 400000 | 400000 | 354000 | 88.5 | 345000 | 86.3 | 353000 | 88.3 | 346000 | 86.5 |
| Chromium | | 500 | 0.50 | | 440 | 88.0 | 0.50 | | 447 | 89.4 |
| Cobalt | | 500 | 1.0 | | 458 | 91.6 | 1.2 | | 463 | 92.6 |
| Copper | | 500 | 0.90 | | 476 | 95.2 | 0.60 | | 471 | 94.2 |
| Iron | 200000 | 200000 | 192000 | 96.0 | 200000 | 100.0 | 190000 | 95.0 | 200000 | 100.0 |
| Lead | | 1000 | -0.70 | | 903 | 90.3 | -2.9 | | 911 | 91.1 |
| Lithium | | 500 | 6.8 | | 524 | 104.8 | 6.4 | | 525 | 105.0 |
| Magnesium | 500000 | 500000 | 522000 | 104.4 | 535000 | 107.0 | 524000 | 104.8 | 542000 | 108.4 |
| Manganese | | 500 | 0.70 | | 476 | 95.2 | 0.70 | | 486 | 97.2 |
| Molybdenum | | 500 | 7.4 | | 501 | 100.2 | 8.1 | | 503 | 100.6 |
| Nickel | | 1000 | -0.40 | | 907 | 90.7 | -0.70 | | 916 | 91.6 |
| Palladium | | 500 | 5.8 | | 586 | 117.2 | 5.4 | | 594 | 118.8 |
| Potassium | | | 111 | | 129 | | 127 | | 154 | |
| Selenium | | 1000 | 5.0 | | 1020 | 102.0 | 5.6 | | 1030 | 103.0 |
| Silicon | | | -24 | | -3.6 | | -23 | | -4.1 | |
| Silver | | 1000 | 2.7 | | 1080 | 108.0 | 3.0 | | 1090 | 109.0 |
| Sodium | | | 2.4 | | 24.4 | | -4.4 | | 16.2 | |
| Sulfur | | 500 | 11.3 | | 492 | 98.4 | 10.9 | | 487 | 97.4 |
| Strontium | | | -5.6 | | -5.3 | | -5.6 | | -5.4 | |
| Thallium | | 1000 | 1.6 | | 985 | 98.5 | -1.5 | | 1020 | 102.0 |
| Tin | | | -1.6 | | -1.7 | | -0.90 | | -0.90 | |
| Titanium | | | 3.1 | | 6.1 | | 3.1 | | 6.2 | |
| Tungsten | | 500 | 16.3 | | 483 | 96.6 | 14.8 | | 486 | 97.2 |
| Vanadium | | 500 | 2.1 | | 470 | 94.0 | 2.1 | | 479 | 95.8 |
| Zinc | | 1000 | -3.3 | | 902 | 90.2 | -3.5 | | 917 | 91.7 |

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SB121112M1.ICP  Date Analyzed: 12/11/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 80 to 120 % Recovery  Run ID: MA30027  Units: ug/l

| Time: | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample ID: | | | | | | | |
| Metal | | | | | | | |
| Zirconium | 500 | -7.4 | 516 | 103.2 | -7.4 | 525 | 105.0 |

(*) Outside of QC limits
(anr) Analyte not requested

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 11:14 | MA30049-STD1 | 1 | | STDA |
| 11:19 | MA30049-STD2 | 1 | | STDB |
| 11:25 | MA30049-STD3 | 1 | | STDC |
| 11:31 | MA30049-STD4 | 1 | | STDD |
| 11:36 | MA30049-CCV1 | 1 | | |
| 11:42 | MA30049-CCB1 | 1 | | |
| 11:48 | MA30049-CRI1 | 1 | | |
| 11:54 | MA30049-CRID1 | 1 | | |
| 12:00 | MA30049-CRIA1 | 1 | | |
| 12:09 | MA30049-ICV1 | 1 | | |
| 12:18 | MA30049-ICB1 | 1 | | |
| 12:23 | MA30049-ICCV1 | 1 | | |
| 12:34 | MA30049-CCB2 | 1 | | |
| 12:48 | MA30049-ICSA1 | 1 | | |
| 12:54 | MA30049-ICSAB1 | 1 | | |
| 13:00 | ZZZZZZ | 1 | | |
| 13:06 | ZZZZZZ | 1 | | |
| 13:12 | MA30049-CCV2 | 1 | | |
| 13:17 | MA30049-CCB3 | 1 | | |
| 13:23 | MP68388-S1 | 10 | | |
| 13:29 | MP68388-S2 | 10 | | |
| 13:35 | JB22548-4 | 10 | | (sample used for QC only; not part of login JB22549) |
| 13:41 | MP68388-SD1 | 50 | | |
| 13:47 | ZZZZZZ | 5 | | |
| 13:53 | ZZZZZZ | 2 | | |
| 13:59 | MP68432-S1 | 1 | | |
| 14:05 | MP68432-S2 | 1 | | |
| 14:11 | JB22591-20 | 1 | | (sample used for QC only; not part of login JB22549) |
| 14:17 | MP68432-SD1 | 5 | | |
| 14:22 | MA30049-CCV3 | 1 | | |
| 14:28 | MA30049-CCB4 | 1 | | |
| 14:34 | ZZZZZZ | 2 | | |
| 14:40 | ZZZZZZ | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 14:46 | ZZZZZZ | 1 | | |
| 14:52 | ZZZZZZ | 1 | | |
| 14:58 | ZZZZZZ | 1 | | |
| 15:04 | ZZZZZZ | 1 | | |
| 15:09 | ZZZZZZ | 1 | | |
| 15:15 | ZZZZZZ | 1 | | |
| 15:21 | ZZZZZZ | 3 | | |
| 15:27 | ZZZZZZ | 10 | | |
| 15:33 | MA30049-CCV4 | 1 | | |
| 15:39 | MA30049-CCB5 | 1 | | |
| 15:45 | ZZZZZZ | 1 | | |
| 15:51 | ZZZZZZ | 10 | | |
| 15:56 | ZZZZZZ | 10 | | |
| 16:02 | ZZZZZZ | 2 | | |
| 16:08 | ZZZZZZ | 1 | | |
| 16:14 | ZZZZZZ | 1 | | |
| 16:20 | MP68485-MB1 | 1 | | |
| 16:26 | ZZZZZZ | 1 | | |
| 16:32 | MP68482-MB1 | 1 | | |
| 16:37 | MP68482-LC1 | 1 | | |
| 16:43 | MA30049-CCV5 | 1 | | |
| 16:49 | MA30049-CCB6 | 1 | | |
| 16:55 | MP68482-S1 | 1 | | |
| 17:01 | MP68482-S2 | 1 | | |
| 17:06 | JB22549-1 | 2 | | |
| 17:12 | JB22549-6 | 2 | | |
| ----------> | Last reportable sample/prep for job JB22549 | | | |
| 17:18 | MP68484-MB1 | 1 | | |
| 17:24 | MP68484-LC1 | 1 | | |
| 17:30 | ZZZZZZ | 1 | | |
| 17:36 | JB23066-11 | 1 | | (sample used for QC only; not part of login JB22549) |
| 17:41 | MP68482-SD1 | 5 | | |
| 17:47 | MA30049-CCV6 | 1 | | |
| 17:53 | MA30049-CCB7 | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| | Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|---|
| | 17:59 | MA30049-CRI2 | 1 | | |
| | 18:05 | MA30049-CRID2 | 1 | | |
| | 18:11 | MA30049-CRIA2 | 1 | | |
| | 18:17 | MA30049-ICSA2 | 1 | | |
| | 18:23 | MA30049-ICSAB2 | 1 | | |
| | 18:28 | MA30049-CCV7 | 1 | | |
| | 18:34 | MA30049-CCB8 | 1 | | |
| ----------> | Last reportable CCB for job JB22549 | | | | |
| | 18:40 | ZZZZZZ | 1 | | |
| | 18:46 | ZZZZZZ | 1 | | |
| | 18:52 | ZZZZZZ | 1 | | |
| | 18:58 | ZZZZZZ | 1 | | |
| | 19:04 | ZZZZZZ | 1 | | |
| | 19:09 | ZZZZZZ | 1 | | |
| | 19:15 | ZZZZZZ | 1 | | |
| | 19:21 | ZZZZZZ | 1 | | |
| | 19:27 | MA30049-CCV8 | 1 | | |
| | 19:33 | MA30049-CCB9 | 1 | | |
| | 19:39 | ZZZZZZ | 1 | | |
| | 19:44 | ZZZZZZ | 1 | | |
| | 19:50 | ZZZZZZ | 1 | | |
| | 19:56 | ZZZZZZ | 1 | | |
| | 20:02 | MP68517-MB1 | 1 | | |
| | 20:08 | MP68517-LC1 | 1 | | |
| | 20:13 | MP68517-B1 | 1 | | |
| | 20:19 | ZZZZZZ | 1 | | |
| | 20:25 | MA30049-CCV9 | 1 | | |
| | 20:31 | MA30049-CCB10 | 1 | | |
| | 20:37 | ZZZZZZ | 1 | | |
| | 20:43 | ZZZZZZ | 1 | | |
| | 20:48 | ZZZZZZ | 1 | | |
| | 20:55 | MP68517-S1 | 1 | | |
| | 21:00 | MP68517-S2 | 1 | | |
| | 21:06 | JB22974-3 | 1 | | (sample used for QC only; not part of login JB22549) |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 21:12 | MP68517-SD1 | 5 | | |
| 21:18 | MP68517-S3 | 1 | | |
| 21:23 | MA30049-CCV10 | 1 | | |
| 21:29 | MA30049-CCB11 | 1 | | |
| 21:35 | ZZZZZZ | 1 | | |
| 21:41 | ZZZZZZ | 1 | | |
| 21:47 | JB22974-4 | 1 | | (sample used for QC only; not part of login JB22549) |
| 21:52 | ZZZZZZ | 1 | | |
| 21:58 | ZZZZZZ | 1 | | |
| 22:04 | ZZZZZZ | 1 | | |
| 22:10 | ZZZZZZ | 1 | | |
| 22:16 | ZZZZZZ | 1 | | |
| 22:22 | ZZZZZZ | 1 | | |
| 22:28 | MA30049-CCV11 | 1 | | |
| 22:33 | MA30049-CCB12 | 1 | | |
| 22:39 | MA30049-CRI3 | 1 | | |
| 22:45 | MA30049-CRID3 | 1 | | |
| 22:51 | MA30049-CRIA3 | 1 | | |
| 22:57 | MA30049-ICSA3 | 1 | | |
| 23:03 | MA30049-ICSAB3 | 1 | | |
| 23:09 | MA30049-CCV12 | 1 | | |
| 23:15 | MA30049-CCB13 | 1 | | |
| 23:21 | ZZZZZZ | 1 | | |
| 23:27 | ZZZZZZ | 1 | | |
| 23:32 | ZZZZZZ | 1 | | |
| 23:38 | ZZZZZZ | 1 | | |
| 23:44 | ZZZZZZ | 1 | | |
| 23:50 | ZZZZZZ | 1 | | |
| 23:56 | ZZZZZZ | 1 | | |
| 00:02 | ZZZZZZ | 1 | | |
| 00:08 | ZZZZZZ | 1 | | |
| 00:14 | ZZZZZZ | 1 | | |
| 00:20 | MA30049-CCV13 | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 00:25 | MA30049-CCB14 | 1 | | |
| 00:31 | MP68484-S1 | 1 | | High RSD-s |
| 00:37 | MP68484-S2 | 1 | | High RSD-s |
| 00:43 | JB22978-1 | 1 | | (sample used for QC only; not part of login JB22549) |
| 00:49 | MP68484-SD1 | 5 | | |
| 00:54 | MP68484-S3 | 5 | | wrong Df |
| 01:00 | JB22978-3 | 1 | | (sample used for QC only; not part of login JB22549) |
| 01:06 | ZZZZZZ | 1 | | |
| 01:12 | ZZZZZZ | 1 | | |
| 01:18 | ZZZZZZ | 1 | | |
| 01:24 | ZZZZZZ | 1 | | |
| 01:29 | MA30049-CCV14 | 1 | | |
| 01:35 | MA30049-CCB15 | 1 | | |
| 01:41 | ZZZZZZ | 1 | | |
| 01:47 | ZZZZZZ | 1 | | |
| 01:53 | ZZZZZZ | 1 | | |
| 01:59 | ZZZZZZ | 1 | | |
| 02:04 | ZZZZZZ | 1 | | |
| 02:10 | ZZZZZZ | 1 | | |
| 02:16 | ZZZZZZ | 1 | | |
| 02:22 | ZZZZZZ | 1 | | |
| 02:28 | ZZZZZZ | 1 | | |
| 02:34 | MP68485-LC1 | 1 | | |
| 02:40 | MA30049-CCV15 | 1 | | |
| 02:45 | MA30049-CCB16 | 1 | | |
| 02:51 | MP68485-S1 | 1 | | |
| 02:57 | MP68485-S2 | 1 | | |
| 03:03 | JB22874-5 | 1 | | (sample used for QC only; not part of login JB22549) |
| 03:08 | MP68485-SD1 | 5 | | |
| 03:14 | ZZZZZZ | 1 | | |
| 03:20 | ZZZZZZ | 1 | | |
| 03:26 | ZZZZZZ | 1 | | |
| 03:32 | ZZZZZZ | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 03:38 | ZZZZZZ | 1 | | |
| 03:44 | ZZZZZZ | 1 | | |
| 03:49 | MA30049-CCV16 | 1 | | |
| 03:55 | MA30049-CCB17 | 1 | | |
| 04:01 | ZZZZZZ | 1 | | |
| 04:07 | ZZZZZZ | 1 | | |
| 04:13 | ZZZZZZ | 1 | | |
| 04:19 | ZZZZZZ | 1 | | |
| 04:24 | ZZZZZZ | 1 | | |
| 04:30 | ZZZZZZ | 1 | | |
| 04:36 | ZZZZZZ | 1 | | |
| 04:42 | ZZZZZZ | 1 | | |
| 04:48 | ZZZZZZ | 1 | | |
| 04:54 | ZZZZZZ | 1 | | |
| 05:00 | MA30049-CCV17 | 1 | | |
| 05:05 | MA30049-CCB18 | 1 | | |
| 05:11 | ZZZZZZ | 1 | | |
| 05:17 | ZZZZZZ | 1 | | |
| 05:23 | MP68432-S1 | 2 | | |
| 05:29 | MP68432-S2 | 2 | | |
| 05:35 | JB22591-20 | 2 | | (sample used for QC only; not part of login JB22549) |
| 05:41 | MP68432-SD1 | 10 | | |
| 05:47 | MP68466-MB1 | 1 | | |
| 05:53 | MP68466-B1 | 1 | | |
| 05:58 | MP68466-S1 | 1 | | Ca and Fe high |
| 06:04 | MP68466-S2 | 1 | | Ca and Fe high |
| 06:10 | MA30049-CCV18 | 1 | | |
| 06:16 | MA30049-CCB19 | 1 | | |
| 06:22 | JB22822-1 | 1 | | (sample used for QC only; not part of login JB22549) |
| 06:28 | MP68466-SD1 | 5 | | Ca and Fe high |
| 06:33 | MP68484-MB1 | 1 | | |
| 06:39 | MA30049-CRI4 | 1 | | |
| 06:45 | MA30049-CRID4 | 1 | | |

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Dilution Factor | PS Recov | Comments |
|---|---|---|---|---|
| 06:51 | MA30049-CRIA4 | 1 | | |
| 06:57 | MA30049-ICSA4 | 1 | | |
| 07:03 | MA30049-ICSAB4 | 1 | | |
| 07:09 | MA30049-CCV19 | 1 | | |
| 07:15 | MA30049-CCB20 | 1 | | |

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 11:14 | MA30049-STD1 | 2388 R | 130840 R | 19781 R | 4173 R |
| 11:19 | MA30049-STD2 | 2320 | 126890 | 19603 | 3864 |
| 11:25 | MA30049-STD3 | 2279 | 124450 | 19499 | 3745 |
| 11:31 | MA30049-STD4 | 2211 | 120850 | 19246 | 3593 |
| 11:36 | MA30049-CCV1 | No results reported for the elements associated with this internal standard. | | | |
| 11:42 | MA30049-CCB1 | No results reported for the elements associated with this internal standard. | | | |
| 11:48 | MA30049-CRI1 | 2364 | 129610 | 19964 | 4086 |
| 11:54 | MA30049-CRID1 | 2387 | 130720 | 19770 | 4164 |
| 12:00 | MA30049-CRIA1 | 2402 | 132290 | 20074 | 4200 |
| 12:09 | MA30049-ICV1 | 2292 | 124660 | 19632 | 3765 |
| 12:18 | MA30049-ICB1 | 2398 | 131810 | 19788 | 4204 |
| 12:23 | MA30049-ICCV1 | 2284 | 125140 | 19599 | 3755 |
| 12:34 | MA30049-CCB2 | 2400 | 132010 | 19948 | 4203 |
| 12:48 | MA30049-ICSA1 | 2137 | 117510 | 19225 | 3362 |
| 12:54 | MA30049-ICSAB1 | 2134 | 117420 | 19154 | 3362 |
| 13:00 | ZZZZZZ | 2340 | 129220 | 19907 | 4132 |
| 13:06 | ZZZZZZ | 2472 | 128120 | 20528 | 3762 |
| 13:12 | MA30049-CCV2 | 2281 | 125390 | 19643 | 3756 |
| 13:17 | MA30049-CCB3 | 2377 | 131270 | 19935 | 4170 |
| 13:23 | MP68388-S1 | 1992 | 110230 | 18902 | 3179 |
| 13:29 | MP68388-S2 | 1996 | 110230 | 18918 | 3184 |
| 13:35 | JB22548-4 | 1962 | 108800 | 18740 | 3130 |
| 13:41 | MP68388-SD1 | 2187 | 120880 | 19447 | 3599 |
| 13:47 | ZZZZZZ | 2047 | 113460 | 18977 | 3314 |
| 13:53 | ZZZZZZ | 2390 | 130570 | 20214 | 4195 |
| 13:59 | MP68432-S1 | 2194 | 121290 | 20014 | 3558 |
| 14:05 | MP68432-S2 | 2189 | 120840 | 19970 | 3550 |
| 14:11 | JB22591-20 | 2228 | 122340 | 20179 | 3638 |
| 14:17 | MP68432-SD1 | 2310 | 127140 | 19982 | 3913 |
| 14:22 | MA30049-CCV3 | 2285 | 125260 | 19691 | 3763 |
| 14:28 | MA30049-CCB4 | 2379 | 131330 | 19999 | 4175 |
| 14:34 | ZZZZZZ | 2169 | 121000 | 19678 | 3580 |
| 14:40 | ZZZZZZ | 2294 | 127270 | 20248 | 3862 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 14:46 | ZZZZZZ | 2053 | 112430 | 19451 | 3250 |
| 14:52 | ZZZZZZ | 2041 | 111840 | 19497 | 3228 |
| 14:58 | ZZZZZZ | 2045 | 112060 | 19419 | 3239 |
| 15:04 | ZZZZZZ | 2048 | 112090 | 19411 | 3252 |
| 15:09 | ZZZZZZ | 2015 | 111680 | 19156 | 3174 |
| 15:15 | ZZZZZZ | 2431 | 134920 | 20659 | 4269 |
| 15:21 | ZZZZZZ | 2299 | 126590 | 19775 | 3881 |
| 15:27 | ZZZZZZ | 2304 | 127110 | 19714 | 3932 |
| 15:33 | MA30049-CCV4 | 2272 | 125260 | 19530 | 3745 |
| 15:39 | MA30049-CCB5 | 2376 | 130830 | 19825 | 4169 |
| 15:45 | ZZZZZZ | 2073 | 113210 | 19465 | 3239 |
| 15:51 | ZZZZZZ | 2276 | 125320 | 19643 | 3795 |
| 15:56 | ZZZZZZ | 2293 | 126100 | 19852 | 3825 |
| 16:02 | ZZZZZZ | 2371 | 130970 | 20158 | 4035 |
| 16:08 | ZZZZZZ | 2487 | 134740 | 20579 | 4392 |
| 16:14 | ZZZZZZ | 2397 | 133210 | 20341 | 4106 |
| 16:20 | MP68485-MB1 | 2420 | 134720 | 20435 | 4254 |
| 16:26 | ZZZZZZ | 2386 | 133340 | 20167 | 4198 |
| 16:32 | MP68482-MB1 | 2443 | 136040 | 20520 | 4289 |
| 16:37 | MP68482-LC1 | 2410 | 132970 | 20386 | 4123 |
| 16:43 | MA30049-CCV5 | 2304 | 125780 | 19433 | 3787 |
| 16:49 | MA30049-CCB6 | 2402 | 132450 | 19838 | 4210 |
| 16:55 | MP68482-S1 | 2252 | 125750 | 20097 | 3699 |
| 17:01 | MP68482-S2 | 2256 | 124140 | 19798 | 3704 |
| 17:06 | JB22549-1 | 2239 | 125140 | 19786 | 3610 |
| 17:12 | JB22549-6 | 2079 | 118240 | 19305 | 3441 |
| 17:18 | MP68484-MB1 | No results reported for the elements associated with this internal standard. | | | |
| 17:24 | MP68484-LC1 | 2343 | 130490 | 20222 | 4031 |
| 17:30 | ZZZZZZ | 2003 | 110510 | 19405 | 3132 |
| 17:36 | JB23066-11 | 2278 | 127160 | 20213 | 3803 |
| 17:41 | MP68482-SD1 | 2354 | 130580 | 19974 | 4050 |
| 17:47 | MA30049-CCV6 | 2295 | 126270 | 19486 | 3778 |
| 17:53 | MA30049-CCB7 | 2397 | 132190 | 19622 | 4195 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 17:59 | MA30049-CRI2 | 2361 | 130090 | 19499 | 4086 |
| 18:05 | MA30049-CRID2 | 2374 | 130940 | 19503 | 4146 |
| 18:11 | MA30049-CRIA2 | 2399 | 132330 | 19591 | 4200 |
| 18:17 | MA30049-ICSA2 | 2131 | 117230 | 18596 | 3354 |
| 18:23 | MA30049-ICSAB2 | 2133 | 117960 | 18776 | 3364 |
| 18:28 | MA30049-CCV7 | 2273 | 125040 | 19188 | 3737 |
| 18:34 | MA30049-CCB8 | 2411 | 134060 | 19682 | 4232 |
| 18:40 | ZZZZZZ | 2425 | 134750 | 20222 | 4251 |
| 18:46 | ZZZZZZ | 2439 | 135530 | 20186 | 4273 |
| 18:52 | ZZZZZZ | 2405 | 134130 | 19997 | 4226 |
| 18:58 | ZZZZZZ | 2446 | 135750 | 20069 | 4288 |
| 19:04 | ZZZZZZ | 2288 | 128010 | 19831 | 3851 |
| 19:09 | ZZZZZZ | 2442 | 135400 | 20230 | 4281 |
| 19:15 | ZZZZZZ | 2358 | 130540 | 20011 | 3943 |
| 19:21 | ZZZZZZ | 2301 | 128110 | 19918 | 3844 |
| 19:27 | MA30049-CCV8 | 2288 | 126040 | 19373 | 3769 |
| 19:33 | MA30049-CCB9 | 2392 | 131590 | 19551 | 4193 |
| 19:39 | ZZZZZZ | 2297 | 128140 | 19943 | 3841 |
| 19:44 | ZZZZZZ | 2300 | 128010 | 19903 | 3855 |
| 19:50 | ZZZZZZ | 2443 | 135920 | 20309 | 4283 |
| 19:56 | ZZZZZZ | 2219 | 123610 | 19471 | 3668 |
| 20:02 | MP68517-MB1 | 2425 | 135120 | 20411 | 4299 |
| 20:08 | MP68517-LC1 | 2362 | 131840 | 20060 | 4053 |
| 20:13 | MP68517-B1 | 2317 | 129120 | 20079 | 3942 |
| 20:19 | ZZZZZZ | 2285 | 127500 | 20012 | 3840 |
| 20:25 | MA30049-CCV9 | 2269 | 125180 | 19222 | 3743 |
| 20:31 | MA30049-CCB10 | 2376 | 131920 | 19583 | 4172 |
| 20:37 | ZZZZZZ | 2017 | 113000 | 17759 | 3217 |
| 20:43 | ZZZZZZ | 2016 | 112780 | 19017 | 3218 |
| 20:48 | ZZZZZZ | 2223 | 124330 | 19801 | 3666 |
| 20:55 | MP68517-S1 | 2277 | 127830 | 19882 | 3837 |
| 21:00 | MP68517-S2 | 2281 | 127730 | 19858 | 3842 |
| 21:06 | JB22974-3 | 2368 | 131610 | 20072 | 4082 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 21:12 | MP68517-SD1 | 2409 | 134140 | 20073 | 4252 |
| 21:18 | MP68517-S3 | 2295 | 128580 | 19851 | 3887 |
| 21:23 | MA30049-CCV10 | 2271 | 125900 | 19248 | 3745 |
| 21:29 | MA30049-CCB11 | 2374 | 132310 | 19452 | 4169 |
| 21:35 | ZZZZZZ | 2424 | 134820 | 20198 | 4237 |
| 21:41 | ZZZZZZ | 2405 | 134740 | 20189 | 4211 |
| 21:47 | JB22974-4 | 2392 | 133970 | 20094 | 4203 |
| 21:52 | ZZZZZZ | 2405 | 134700 | 20148 | 4268 |
| 21:58 | ZZZZZZ | 2316 | 128820 | 19863 | 3894 |
| 22:04 | ZZZZZZ | 2325 | 129100 | 19570 | 3924 |
| 22:10 | ZZZZZZ | 2292 | 127270 | 19792 | 3802 |
| 22:16 | ZZZZZZ | 2299 | 127510 | 19828 | 3829 |
| 22:22 | ZZZZZZ | 2088 | 116960 | 18970 | 3484 |
| 22:28 | MA30049-CCV11 | 2293 | 126830 | 19440 | 3785 |
| 22:33 | MA30049-CCB12 | 2397 | 132650 | 19451 | 4208 |
| 22:39 | MA30049-CRI3 | 2363 | 131160 | 19294 | 4097 |
| 22:45 | MA30049-CRID3 | 2398 | 132510 | 19514 | 4187 |
| 22:51 | MA30049-CRIA3 | 2402 | 133070 | 19451 | 4209 |
| 22:57 | MA30049-ICSA3 | 2142 | 118580 | 18603 | 3377 |
| 23:03 | MA30049-ICSAB3 | 2142 | 119110 | 18622 | 3377 |
| 23:09 | MA30049-CCV12 | 2289 | 127060 | 19244 | 3776 |
| 23:15 | MA30049-CCB13 | 2393 | 132670 | 19399 | 4203 |
| 23:21 | ZZZZZZ | 2163 | 121140 | 18581 | 3598 |
| 23:27 | ZZZZZZ | 2176 | 121090 | 18683 | 3605 |
| 23:32 | ZZZZZZ | 2384 | 132840 | 19250 | 4178 |
| 23:38 | ZZZZZZ | 2390 | 133050 | 19411 | 4188 |
| 23:44 | ZZZZZZ | 2393 | 133130 | 19391 | 4227 |
| 23:50 | ZZZZZZ | 2388 | 133140 | 19657 | 4200 |
| 23:56 | ZZZZZZ | 2326 | 132770 | 19207 | 4163 |
| 00:02 | ZZZZZZ | 2393 | 133480 | 19359 | 4192 |
| 00:08 | ZZZZZZ | 2383 | 133050 | 19421 | 4185 |
| 00:14 | ZZZZZZ | 2386 | 132910 | 19420 | 4195 |
| 00:20 | MA30049-CCV13 | 2292 | 127410 | 19088 | 3777 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 00:25 | MA30049-CCB14 | 2398 | 134210 | 19372 | 4223 |
| 00:31 | MP68484-S1 | 2294 | 119610 | 19817 | 3860 |
| 00:37 | MP68484-S2 | 2280 | 128650 | 19672 | 3834 |
| 00:43 | JB22978-1 | 2351 | 131370 | 19770 | 4011 |
| 00:49 | MP68484-SD1 | 2385 | 132080 | 19331 | 4163 |
| 00:54 | MP68484-S3 | No results reported for the elements associated with this internal standard. | | | |
| 01:00 | JB22978-3 | 2342 | 131790 | 19712 | 3994 |
| 01:06 | ZZZZZZ | 2233 | 125820 | 19374 | 3705 |
| 01:12 | ZZZZZZ | 2228 | 125730 | 19425 | 3687 |
| 01:18 | ZZZZZZ | 2347 | 132680 | 20010 | 4038 |
| 01:24 | ZZZZZZ | 2294 | 129050 | 19751 | 3845 |
| 01:29 | MA30049-CCV14 | 2272 | 127140 | 18888 | 3750 |
| 01:35 | MA30049-CCB15 | 2386 | 134070 | 19219 | 4204 |
| 01:41 | ZZZZZZ | 2316 | 129620 | 19655 | 3887 |
| 01:47 | ZZZZZZ | 2310 | 129340 | 19620 | 3875 |
| 01:53 | ZZZZZZ | 2401 | 135090 | 19963 | 4199 |
| 01:59 | ZZZZZZ | 2259 | 127390 | 19456 | 3784 |
| 02:04 | ZZZZZZ | 2181 | 122200 | 19361 | 3543 |
| 02:10 | ZZZZZZ | 2254 | 126950 | 19482 | 3751 |
| 02:16 | ZZZZZZ | 2032 | 114840 | 18950 | 3180 |
| 02:22 | ZZZZZZ | 2172 | 121970 | 19250 | 3537 |
| 02:28 | ZZZZZZ | 2416 | 136830 | 19850 | 4239 |
| 02:34 | MP68485-LC1 | 2402 | 135280 | 19818 | 4124 |
| 02:40 | MA30049-CCV15 | 2298 | 128260 | 18889 | 3793 |
| 02:45 | MA30049-CCB16 | 2391 | 134110 | 19316 | 4210 |
| 02:51 | MP68485-S1 | 2264 | 128650 | 19463 | 3780 |
| 02:57 | MP68485-S2 | 2271 | 128610 | 19390 | 3788 |
| 03:03 | JB22874-5 | 2313 | 130550 | 19458 | 3923 |
| 03:08 | MP68485-SD1 | 2385 | 134000 | 19617 | 4138 |
| 03:14 | ZZZZZZ | 2391 | 135090 | 19786 | 4123 |
| 03:20 | ZZZZZZ | 2312 | 130490 | 19627 | 3902 |
| 03:26 | ZZZZZZ | 2392 | 134770 | 19768 | 4121 |
| 03:32 | ZZZZZZ | 2233 | 126520 | 19185 | 3728 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 03:38 | ZZZZZZ | 2383 | 135080 | 20391 | 3671 |
| 03:44 | ZZZZZZ | 2444 | 138530 | 19890 | 4308 |
| 03:49 | MA30049-CCV16 | 2295 | 128220 | 18832 | 3791 |
| 03:55 | MA30049-CCB17 | 2401 | 135440 | 19413 | 4235 |
| 04:01 | ZZZZZZ | 2321 | 131530 | 19551 | 3929 |
| 04:07 | ZZZZZZ | 2319 | 131400 | 19579 | 3951 |
| 04:13 | ZZZZZZ | 2364 | 134640 | 19568 | 4079 |
| 04:19 | ZZZZZZ | 2235 | 127790 | 19086 | 3755 |
| 04:24 | ZZZZZZ | 2376 | 134970 | 19690 | 4064 |
| 04:30 | ZZZZZZ | 2436 | 137700 | 19744 | 4296 |
| 04:36 | ZZZZZZ | 2307 | 131380 | 19347 | 3941 |
| 04:42 | ZZZZZZ | 2319 | 131080 | 19313 | 3926 |
| 04:48 | ZZZZZZ | 2329 | 131820 | 19330 | 3965 |
| 04:54 | ZZZZZZ | 2214 | 124980 | 18977 | 3662 |
| 05:00 | MA30049-CCV17 | 2294 | 128230 | 18802 | 3788 |
| 05:05 | MA30049-CCB18 | 2417 | 135850 | 19357 | 4268 |
| 05:11 | ZZZZZZ | 2207 | 125420 | 18978 | 3650 |
| 05:17 | ZZZZZZ | 2334 | 132930 | 19457 | 4019 |
| 05:23 | MP68432-S1 | 2271 | 127580 | 19278 | 3753 |
| 05:29 | MP68432-S2 | 2256 | 127150 | 19130 | 3734 |
| 05:35 | JB22591-20 | 2285 | 128510 | 19171 | 3810 |
| 05:41 | MP68432-SD1 | 2403 | 134820 | 19694 | 4144 |
| 05:47 | MP68466-MB1 | 2393 | 136330 | 19584 | 4245 |
| 05:53 | MP68466-B1 | 2384 | 134630 | 19537 | 4030 |
| 05:58 | MP68466-S1 | No results reported for the elements associated with this internal standard. | | | |
| 06:04 | MP68466-S2 | No results reported for the elements associated with this internal standard. | | | |
| 06:10 | MA30049-CCV18 | 2294 | 128420 | 18681 | 3790 |
| 06:16 | MA30049-CCB19 | 2401 | 134920 | 18965 | 4238 |
| 06:22 | JB22822-1 | No results reported for the elements associated with this internal standard. | | | |
| 06:28 | MP68466-SD1 | No results reported for the elements associated with this internal standard. | | | |
| 06:33 | MP68484-MB1 | 2435 | 137720 | 19662 | 4340 |
| 06:39 | MA30049-CRI4 | 2354 | 132040 | 18818 | 4105 |
| 06:45 | MA30049-CRID4 | 2389 | 133920 | 18970 | 4200 |

INTERNAL STANDARD SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
Analyst: ND  Run ID: MA30049
Parameters: Pb

| Time | Sample Description | Istd#1 | Istd#2 | Istd#3 | Istd#4 |
|---|---|---|---|---|---|
| 06:51 | MA30049-CRIA4 | 2400 | 134900 | 18951 | 4229 |
| 06:57 | MA30049-ICSA4 | 2147 | 119860 | 18182 | 3389 |
| 07:03 | MA30049-ICSAB4 | 2142 | 120320 | 18132 | 3386 |
| 07:09 | MA30049-CCV19 | 2284 | 129540 | 18743 | 3772 |
| 07:15 | MA30049-CCB20 | 2423 | 136110 | 19034 | 4273 |

R = Reference for ISTD limits.  ! = Outside limits.

LEGEND:

| Istd# | Parameter | Limits |
|---|---|---|
| Istd#1 | Yttrium (2243) | 70-130 % |
| Istd#2 | Yttrium (3600) | 70-130 % |
| Istd#3 | Yttrium (3710) | 70-130 % |
| Istd#4 | Indium | 70-130 % |

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30049  Units: ug/l

| Time: | | | 12:18 | | 12:34 | | 13:17 | | 14:28 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | | | ICB1 | | CCB2 | | CCB3 | | CCB4 | |
| Metal | RL | IDL | raw | final | raw | final | raw | final | raw | final |
| Aluminum | 200 | 7 | anr | | | | | | | |
| Antimony | 6.0 | 1.4 | anr | | | | | | | |
| Arsenic | 3.0 | 1.4 | anr | | | | | | | |
| Barium | 200 | .3 | anr | | | | | | | |
| Beryllium | 1.0 | .1 | anr | | | | | | | |
| Bismuth | 20 | 1.7 | | | | | | | | |
| Boron | 100 | 1.2 | | | | | | | | |
| Cadmium | 3.0 | .2 | anr | | | | | | | |
| Calcium | 5000 | 44 | anr | | | | | | | |
| Chromium | 10 | .6 | anr | | | | | | | |
| Cobalt | 50 | .3 | anr | | | | | | | |
| Copper | 10 | .8 | anr | | | | | | | |
| Iron | 100 | 10 | anr | | | | | | | |
| Lead | 3.0 | 1.3 | -0.60 | <3.0 | -0.30 | <3.0 | -1.0 | <3.0 | -1.1 | <3.0 |
| Lithium | 20 | 1.5 | | | | | | | | |
| Magnesium | 5000 | 18 | anr | | | | | | | |
| Manganese | 15 | .2 | anr | | | | | | | |
| Molybdenum | 20 | .5 | anr | | | | | | | |
| Nickel | 10 | .4 | anr | | | | | | | |
| Palladium | 50 | 1.3 | | | | | | | | |
| Potassium | 10000 | 27 | anr | | | | | | | |
| Selenium | 10 | 1.8 | anr | | | | | | | |
| Silicon | 200 | 5.1 | | | | | | | | |
| Silver | 10 | .5 | anr | | | | | | | |
| Sodium | 10000 | 9 | anr | | | | | | | |
| Sulfur | 50 | 7.4 | | | | | | | | |
| Strontium | 10 | .2 | | | | | | | | |
| Thallium | 2.0 | 1.3 | anr | | | | | | | |
| Tin | 10 | .7 | anr | | | | | | | |
| Titanium | 10 | .4 | | | | | | | | |
| Tungsten | 50 | 6 | | | | | | | | |
| Vanadium | 50 | .4 | anr | | | | | | | |
| Zinc | 20 | 2.1 | anr | | | | | | | |

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30049  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | .4 |

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30049  Units: ug/l

| Time: | | | 15:39 | | 16:49 | | 17:53 | | 18:34 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | | | CCB5 | | CCB6 | | CCB7 | | CCB8 | |
| Metal | RL | IDL | raw | final | raw | final | raw | final | raw | final |
| Aluminum | 200 | 7 | anr | | | | | | | |
| Antimony | 6.0 | 1.4 | anr | | | | | | | |
| Arsenic | 3.0 | 1.4 | anr | | | | | | | |
| Barium | 200 | .3 | anr | | | | | | | |
| Beryllium | 1.0 | .1 | anr | | | | | | | |
| Bismuth | 20 | 1.7 | | | | | | | | |
| Boron | 100 | 1.2 | | | | | | | | |
| Cadmium | 3.0 | .2 | anr | | | | | | | |
| Calcium | 5000 | 44 | anr | | | | | | | |
| Chromium | 10 | .6 | anr | | | | | | | |
| Cobalt | 50 | .3 | anr | | | | | | | |
| Copper | 10 | .8 | anr | | | | | | | |
| Iron | 100 | 10 | anr | | | | | | | |
| Lead | 3.0 | 1.3 | -0.60 | <3.0 | -0.90 | <3.0 | -1.2 | <3.0 | -0.50 | <3.0 |
| Lithium | 20 | 1.5 | | | | | | | | |
| Magnesium | 5000 | 18 | anr | | | | | | | |
| Manganese | 15 | .2 | anr | | | | | | | |
| Molybdenum | 20 | .5 | anr | | | | | | | |
| Nickel | 10 | .4 | anr | | | | | | | |
| Palladium | 50 | 1.3 | | | | | | | | |
| Potassium | 10000 | 27 | anr | | | | | | | |
| Selenium | 10 | 1.8 | anr | | | | | | | |
| Silicon | 200 | 5.1 | | | | | | | | |
| Silver | 10 | .5 | anr | | | | | | | |
| Sodium | 10000 | 9 | anr | | | | | | | |
| Sulfur | 50 | 7.4 | | | | | | | | |
| Strontium | 10 | .2 | | | | | | | | |
| Thallium | 2.0 | 1.3 | anr | | | | | | | |
| Tin | 10 | .7 | anr | | | | | | | |
| Titanium | 10 | .4 | | | | | | | | |
| Tungsten | 50 | 6 | | | | | | | | |
| Vanadium | 50 | .4 | anr | | | | | | | |
| Zinc | 20 | 2.1 | anr | | | | | | | |

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL  Run ID: MA30049  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | .4 |

(*) Outside of QC limits
(anr) Analyte not requested

10.2.2
10

CALIBRATION CHECK STANDARDS SUMMARY
Initial Continuing Calibration Check

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30049  Units: ug/l

| Time: | | 12:23 | |
|---|---|---|---|
| Sample ID: | ICCV | ICCV1 | |
| Metal | True | Results | % Rec |
| Aluminum | anr | | |
| Antimony | anr | | |
| Arsenic | anr | | |
| Barium | anr | | |
| Beryllium | anr | | |
| Bismuth | | | |
| Boron | | | |
| Cadmium | anr | | |
| Calcium | anr | | |
| Chromium | anr | | |
| Cobalt | anr | | |
| Copper | anr | | |
| Iron | anr | | |
| Lead | 2000 | 2000 | 100.0 |
| Lithium | | | |
| Magnesium | anr | | |
| Manganese | anr | | |
| Molybdenum | anr | | |
| Nickel | anr | | |
| Palladium | | | |
| Potassium | anr | | |
| Selenium | anr | | |
| Silicon | | | |
| Silver | anr | | |
| Sodium | anr | | |
| Sulfur | | | |
| Strontium | | | |
| Thallium | anr | | |
| Tin | anr | | |
| Titanium | | | |
| Tungsten | | | |
| Vanadium | anr | | |
| Zinc | anr | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial Continuing Calibration Check

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30049  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30049  Units: ug/l

| Time: | | 12:09 | | | 13:12 | | | 14:22 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | ICV | ICV1 | | CCV | CCV2 | | CCV | CCV3 | |
| Metal | True | Results | % Rec | True | Results | % Rec | True | Results | % Rec |
| Aluminum | anr | | | | | | | | |
| Antimony | anr | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | anr | | | | | | | | |
| Bismuth | | | | | | | | | |
| Boron | | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | anr | | | | | | | | |
| Chromium | anr | | | | | | | | |
| Cobalt | anr | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | anr | | | | | | | | |
| Lead | 2000 | 2010 | 100.5 | 2000 | 1990 | 99.5 | 2000 | 1990 | 99.5 |
| Lithium | | | | | | | | | |
| Magnesium | anr | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | anr | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Palladium | | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silicon | | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | anr | | | | | | | | |
| Sulfur | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | anr | | | | | | | | |
| Tin | anr | | | | | | | | |
| Titanium | | | | | | | | | |
| Tungsten | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30049  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30049  Units: ug/l

| Time: | | 15:33 | | | 16:43 | | | 17:47 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CCV | CCV4 | | CCV | CCV5 | | CCV | CCV6 | |
| Metal | True | Results | % Rec | True | Results | % Rec | True | Results | % Rec |
| Aluminum | anr | | | | | | | | |
| Antimony | anr | | | | | | | | |
| Arsenic | anr | | | | | | | | |
| Barium | anr | | | | | | | | |
| Beryllium | anr | | | | | | | | |
| Bismuth | | | | | | | | | |
| Boron | | | | | | | | | |
| Cadmium | anr | | | | | | | | |
| Calcium | anr | | | | | | | | |
| Chromium | anr | | | | | | | | |
| Cobalt | anr | | | | | | | | |
| Copper | anr | | | | | | | | |
| Iron | anr | | | | | | | | |
| Lead | 2000 | 1990 | 99.5 | 2000 | 1990 | 99.5 | 2000 | 1970 | 98.5 |
| Lithium | | | | | | | | | |
| Magnesium | anr | | | | | | | | |
| Manganese | anr | | | | | | | | |
| Molybdenum | anr | | | | | | | | |
| Nickel | anr | | | | | | | | |
| Palladium | | | | | | | | | |
| Potassium | anr | | | | | | | | |
| Selenium | anr | | | | | | | | |
| Silicon | | | | | | | | | |
| Silver | anr | | | | | | | | |
| Sodium | anr | | | | | | | | |
| Sulfur | | | | | | | | | |
| Strontium | | | | | | | | | |
| Thallium | anr | | | | | | | | |
| Tin | anr | | | | | | | | |
| Titanium | | | | | | | | | |
| Tungsten | | | | | | | | | |
| Vanadium | anr | | | | | | | | |
| Zinc | anr | | | | | | | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30049  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

10.2.4
10

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30049  Units: ug/l

| Time: | | 18:28 | |
|---|---|---|---|
| Sample ID: | CCV | CCV7 | |
| Metal | True | Results | % Rec |
| Aluminum | anr | | |
| Antimony | anr | | |
| Arsenic | anr | | |
| Barium | anr | | |
| Beryllium | anr | | |
| Bismuth | | | |
| Boron | | | |
| Cadmium | anr | | |
| Calcium | anr | | |
| Chromium | anr | | |
| Cobalt | anr | | |
| Copper | anr | | |
| Iron | anr | | |
| Lead | 2000 | 2000 | 100.0 |
| Lithium | | | |
| Magnesium | anr | | |
| Manganese | anr | | |
| Molybdenum | anr | | |
| Nickel | anr | | |
| Palladium | | | |
| Potassium | anr | | |
| Selenium | anr | | |
| Silicon | | | |
| Silver | anr | | |
| Sodium | anr | | |
| Sulfur | | | |
| Strontium | | | |
| Thallium | anr | | |
| Tin | anr | | |
| Titanium | | | |
| Tungsten | | | |
| Vanadium | anr | | |
| Zinc | anr | | |

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery  Run ID: MA30049  Units: ug/l

| | |
|---|---|
| Time: | |
| Sample ID: | |
| Metal | |
| Zirconium | |

(*) Outside of QC limits
(anr) Analyte not requested

10.2.4
10

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30049  Units: ug/l

| Time: | | | | 11:48 | | 11:54 | | 12:00 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CRI | CRIA | CRID | CRI1 | | CRID1 | | CRIA1 | |
| Metal | True | True | True | Results | % Rec | Results | % Rec | Results | % Rec |
| Aluminum | 200 | 500 | 100 | anr | | | | | |
| Antimony | 6.0 | 20 | 3.0 | anr | | | | | |
| Arsenic | 8.0 | 20 | 3.0 | anr | | | | | |
| Barium | 200 | | 4.0 | anr | | | | | |
| Beryllium | 2.0 | | 1.0 | anr | | | | | |
| Bismuth | 20 | | | | | | | | |
| Boron | 100 | | 10 | | | | | | |
| Cadmium | 3.0 | | 1.0 | anr | | | | | |
| Calcium | 5000 | | 1000 | anr | | | | | |
| Chromium | 10 | | 2.0 | anr | | | | | |
| Cobalt | 50 | | 3.0 | anr | | | | | |
| Copper | 10 | | 2.0 | anr | | | | | |
| Iron | 100 | 500 | | anr | | | | | |
| Lead | 3.0 | 20 | 2.5 | 2.9 | 96.7 | | | 19.5 | 97.5 |
| Lithium | 20 | | | | | | | | |
| Magnesium | 5000 | | 100 | anr | | | | | |
| Manganese | 15 | | 3.0 | anr | | | | | |
| Molybdenum | 20 | | 4.0 | anr | | | | | |
| Nickel | 10 | | 4.0 | anr | | | | | |
| Palladium | 50 | | | | | | | | |
| Potassium | 5000 | | 2000 | anr | | | | | |
| Selenium | 10 | 20 | 5.0 | anr | | | | | |
| Silicon | 200 | | | | | | | | |
| Silver | 5.0 | | 1.0 | anr | | | | | |
| Sodium | 5000 | | 1000 | anr | | | | | |
| Sulfur | 50 | 50 | 50 | | | | | | |
| Strontium | 10 | | | | | | | | |
| Thallium | 10 | | 2.0 | anr | | | | | |
| Tin | 10 | | | anr | | | | | |
| Titanium | 10 | | | | | | | | |
| Tungsten | 50 | | | | | | | | |
| Vanadium | 50 | | 2.0 | anr | | | | | |
| Zinc | 20 | | 10 | anr | | | | | |

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30049  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | 5.0 |

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30049  Units: ug/l

| Time: | | | | 17:59 | | 18:05 | | 18:11 | |
|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | CRI | CRIA | CRID | CRI2 | | CRID2 | | CRIA2 | |
| Metal | True | True | True | Results | % Rec | Results | % Rec | Results | % Rec |
| Aluminum | 200 | 500 | 100 | anr | | | | | |
| Antimony | 6.0 | 20 | 3.0 | anr | | | | | |
| Arsenic | 8.0 | 20 | 3.0 | anr | | | | | |
| Barium | 200 | | 4.0 | anr | | | | | |
| Beryllium | 2.0 | | 1.0 | anr | | | | | |
| Bismuth | 20 | | | | | | | | |
| Boron | 100 | | 10 | | | | | | |
| Cadmium | 3.0 | | 1.0 | anr | | | | | |
| Calcium | 5000 | | 1000 | anr | | | | | |
| Chromium | 10 | | 2.0 | anr | | | | | |
| Cobalt | 50 | | 3.0 | anr | | | | | |
| Copper | 10 | | 2.0 | anr | | | | | |
| Iron | 100 | 500 | | anr | | | | | |
| Lead | 3.0 | 20 | 2.5 | 2.5 | 83.3 | | | 19.4 | 97.0 |
| Lithium | 20 | | | | | | | | |
| Magnesium | 5000 | | 100 | anr | | | | | |
| Manganese | 15 | | 3.0 | anr | | | | | |
| Molybdenum | 20 | | 4.0 | anr | | | | | |
| Nickel | 10 | | 4.0 | anr | | | | | |
| Palladium | 50 | | | | | | | | |
| Potassium | 5000 | | 2000 | anr | | | | | |
| Selenium | 10 | 20 | 5.0 | anr | | | | | |
| Silicon | 200 | | | | | | | | |
| Silver | 5.0 | | 1.0 | anr | | | | | |
| Sodium | 5000 | | 1000 | anr | | | | | |
| Sulfur | 50 | 50 | 50 | | | | | | |
| Strontium | 10 | | | | | | | | |
| Thallium | 10 | | 2.0 | anr | | | | | |
| Tin | 10 | | | anr | | | | | |
| Titanium | 10 | | | | | | | | |
| Tungsten | 50 | | | | | | | | |
| Vanadium | 50 | | 2.0 | anr | | | | | |
| Zinc | 20 | | 10 | anr | | | | | |

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery  Run ID: MA30049  Units: ug/l

| | | |
|---|---|---|
| Time: | | |
| Sample ID: | | |
| Metal | | |
| Zirconium | 10 | 5.0 |

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 80 to 120 % Recovery  Run ID: MA30049  Units: ug/l

| Time: | | | 12:48 | | 12:54 | | 18:17 | | 18:23 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID: | ICSA | ICSAB | ICSA1 | | ICSAB1 | | ICSA2 | | ICSAB2 | |
| Metal | True | True | Results | % Rec | Results | % Rec | Results | % Rec | Results | % Rec |
| Aluminum | 500000 | 500000 | 481000 | 96.2 | 470000 | 94.0 | 483000 | 96.6 | 465000 | 93.0 |
| Antimony | | 1000 | 6.8 | | 965 | 96.5 | 7.2 | | 969 | 96.9 |
| Arsenic | | 1000 | -1.7 | | 966 | 96.6 | -2.9 | | 970 | 97.0 |
| Barium | | 500 | -1.2 | | 478 | 95.6 | -1.0 | | 479 | 95.8 |
| Beryllium | | 500 | 0.60 | | 450 | 90.0 | 0.50 | | 439 | 87.8 |
| Bismuth | | 500 | -6.2 | | 466 | 93.2 | -6.1 | | 471 | 94.2 |
| Boron | | | -7.0 | | 0.40 | | -6.3 | | 0.30 | |
| Cadmium | | 1000 | -0.30 | | 950 | 95.0 | -0.50 | | 950 | 95.0 |
| Calcium | 400000 | 400000 | 366000 | 91.5 | 350000 | 87.5 | 362000 | 90.5 | 349000 | 87.3 |
| Chromium | | 500 | 0.30 | | 432 | 86.4 | 0.20 | | 433 | 86.6 |
| Cobalt | | 500 | 0.10 | | 430 | 86.0 | 0.40 | | 432 | 86.4 |
| Copper | | 500 | -1.2 | | 460 | 92.0 | -1.2 | | 459 | 91.8 |
| Iron | 200000 | 200000 | 186000 | 93.0 | 181000 | 90.5 | 183000 | 91.5 | 176000 | 88.0 |
| Lead | | 1000 | 0.70 | | 867 | 86.7 | 0.80 | | 868 | 86.8 |
| Lithium | | 500 | 9.7 | | 528 | 105.6 | 4.2 | | 528 | 105.6 |
| Magnesium | 500000 | 500000 | 477000 | 95.4 | 480000 | 96.0 | 470000 | 94.0 | 471000 | 94.2 |
| Manganese | | 500 | 3.2 | | 442 | 88.4 | 2.8 | | 443 | 88.6 |
| Molybdenum | | 500 | -0.70 | | 458 | 91.6 | -1.2 | | 459 | 91.8 |
| Nickel | | 1000 | -1.9 | | 879 | 87.9 | -2.0 | | 879 | 87.9 |
| Palladium | | 500 | -8.7 | | 490 | 98.0 | -6.4 | | 490 | 98.0 |
| Potassium | | | 195 | | 172 | | 195 | | 153 | |
| Selenium | | 1000 | 5.7 | | 953 | 95.3 | 0.70 | | 949 | 94.9 |
| Silicon | | | -20 | | -14 | | -8.6 | | -5.8 | |
| Silver | | 1000 | -1.2 | | 945 | 94.5 | -1.9 | | 943 | 94.3 |
| Sodium | | | 99.2 | | 106 | | 203 | | 184 | |
| Sulfur | | 500 | -0.40 | | 451 | 90.2 | 16.6 | | 461 | 92.2 |
| Strontium | | | -0.30 | | -0.20 | | -0.10 | | 0.0 | |
| Thallium | | 1000 | 1.1 | | 900 | 90.0 | 1.9 | | 906 | 90.6 |
| Tin | | | -3.6 | | -3.7 | | -3.4 | | -3.5 | |
| Titanium | | | 1.7 | | 1.9 | | 1.4 | | 1.8 | |
| Tungsten | | 500 | 17.1 | | 503 | 100.6 | -1.6 | | 490 | 98.0 |
| Vanadium | | 500 | 0.80 | | 438 | 87.6 | 0.50 | | 437 | 87.4 |
| Zinc | | 1000 | -4.9 | | 849 | 84.9 | -5.5 | | 858 | 85.8 |

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

File ID: SD121312M1.ICP  Date Analyzed: 12/13/12  Methods: EPA 200.7, SW846 6010C
QC Limits: 80 to 120 % Recovery  Run ID: MA30049  Units: ug/l

| Time: | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample ID: | | | | | | | |
| Metal | | | | | | | |
| Zirconium | 500 | -0.90 | 455 | 91.0 | -1.7 | 447 | 89.4 |

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

QC Batch ID: MP68389
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 12/08/12

| Metal | RL | IDL | MDL | MB raw | final |
|---|---|---|---|---|---|
| Aluminum | 50 | 1 | .74 | | |
| Antimony | 2.0 | .12 | .15 | | |
| Arsenic | 2.0 | .09 | .13 | | |
| Barium | 20 | .03 | .054 | | |
| Beryllium | 0.20 | .01 | .02 | | |
| Bismuth | 2.0 | .08 | .14 | | |
| Boron | 10 | .24 | .14 | | |
| Cadmium | 0.50 | .02 | .025 | | |
| Calcium | 500 | 3.6 | 2.3 | | |
| Chromium | 1.0 | .04 | .11 | | |
| Cobalt | 5.0 | .02 | .031 | | |
| Copper | 2.5 | .05 | .13 | | |
| Iron | 50 | .66 | .79 | | |
| Lead | 2.0 | .11 | .11 | 0.080 | <2.0 |
| Lithium | 2.0 | .07 | .25 | | |
| Magnesium | 500 | 1.6 | 3.1 | | |
| Manganese | 1.5 | .03 | .048 | | |
| Molybdenum | 2.0 | .06 | .074 | | |
| Nickel | 4.0 | .05 | .11 | | |
| Palladium | 5.0 | .11 | .17 | | |
| Potassium | 1000 | .27 | 14 | | |
| Selenium | 2.0 | .18 | .24 | | |
| Silicon | 20 | .81 | 1.9 | | |
| Silver | 0.50 | .03 | .063 | | |
| Sodium | 1000 | 1.2 | 13 | | |
| Strontium | 1.0 | .02 | .17 | | |
| Sulfur | 5.0 | 1.8 | .65 | | |
| Thallium | 1.0 | .12 | .22 | | |
| Tin | 5.0 | .06 | 1.5 | | |
| Titanium | 1.0 | .05 | .62 | | |
| Tungsten | 5.0 | 1.3 | 1.1 | | |
| Vanadium | 5.0 | .07 | .1 | | |
| Zinc | 2.0 | .22 | .19 | | |

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

QC Batch ID: MP68389 Methods: SW846 6010C
Matrix Type: SOLID Units: mg/kg

Prep Date:

| Metal | | | |
|---|---|---|---|
| Zirconium | 2.0 | .05 | .1 |

Associated samples MP68389: JB22549-1, JB22549-2, JB22549-3, JB22549-4, JB22549-5, JB22549-6

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: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

QC Batch ID: MP68389
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 12/08/12

| Metal | JB22562-1 Original | MS | Spikelot MPIRS1 | % Rec | QC Limits |
|---|---|---|---|---|---|
| Aluminum | anr | | | | |
| Antimony | anr | | | | |
| Arsenic | anr | | | | |
| Barium | anr | | | | |
| Beryllium | anr | | | | |
| Bismuth | | | | | |
| Boron | | | | | |
| Cadmium | anr | | | | |
| Calcium | anr | | | | |
| Chromium | anr | | | | |
| Cobalt | anr | | | | |
| Copper | anr | | | | |
| Iron | anr | | | | |
| Lead | 101 | 205 | 126 | 82.4 | 75-125 |
| Lithium | | | | | |
| Magnesium | anr | | | | |
| Manganese | anr | | | | |
| Molybdenum | | | | | |
| Nickel | anr | | | | |
| Palladium | | | | | |
| Potassium | anr | | | | |
| Selenium | anr | | | | |
| Silicon | | | | | |
| Silver | anr | | | | |
| Sodium | anr | | | | |
| Strontium | | | | | |
| Sulfur | | | | | |
| Thallium | anr | | | | |
| Tin | | | | | |
| Titanium | | | | | |
| Tungsten | | | | | |
| Vanadium | anr | | | | |
| Zinc | anr | | | | |

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

QC Batch ID: MP68389 | Methods: SW846 6010C
Matrix Type: SOLID | Units: mg/kg

Prep Date:

| Metal |
|---|

Zirconium

Associated samples MP68389: JB22549-1, JB22549-2, JB22549-3, JB22549-4, JB22549-5, JB22549-6

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: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

QC Batch ID: MP68389
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 12/08/12

| Metal | JB22562-1 Original | MSD | Spikelot MPIRS1 | % Rec | MSD RPD | QC Limit |
|---|---|---|---|---|---|---|
| Aluminum | anr | | | | | |
| Antimony | anr | | | | | |
| Arsenic | anr | | | | | |
| Barium | anr | | | | | |
| Beryllium | anr | | | | | |
| Bismuth | | | | | | |
| Boron | | | | | | |
| Cadmium | anr | | | | | |
| Calcium | anr | | | | | |
| Chromium | anr | | | | | |
| Cobalt | anr | | | | | |
| Copper | anr | | | | | |
| Iron | anr | | | | | |
| Lead | 101 | 167 | 127 | 51.8N(a) | 20.4 (b) | 20 |
| Lithium | | | | | | |
| Magnesium | anr | | | | | |
| Manganese | anr | | | | | |
| Molybdenum | | | | | | |
| Nickel | anr | | | | | |
| Palladium | | | | | | |
| Potassium | anr | | | | | |
| Selenium | anr | | | | | |
| Silicon | | | | | | |
| Silver | anr | | | | | |
| Sodium | anr | | | | | |
| Strontium | | | | | | |
| Sulfur | | | | | | |
| Thallium | anr | | | | | |
| Tin | | | | | | |
| Titanium | | | | | | |
| Tungsten | | | | | | |
| Vanadium | anr | | | | | |
| Zinc | anr | | | | | |

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

QC Batch ID: MP68389 Methods: SW846 6010C
Matrix Type: SOLID Units: mg/kg

Prep Date:

| Metal |
|---|

Zirconium

Associated samples MP68389: JB22549-1, JB22549-2, JB22549-3, JB22549-4, JB22549-5, JB22549-6

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
(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
(b) High rpd due to possible sample nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

QC Batch ID: MP68389
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 12/08/12

| Metal | BSP Result | Spikelot MPIRS1 | % Rec | QC Limits |
|---|---|---|---|---|
| Aluminum | anr | | | |
| Antimony | anr | | | |
| Arsenic | anr | | | |
| Barium | anr | | | |
| Beryllium | anr | | | |
| Bismuth | | | | |
| Boron | | | | |
| Cadmium | anr | | | |
| Calcium | anr | | | |
| Chromium | anr | | | |
| Cobalt | anr | | | |
| Copper | anr | | | |
| Iron | anr | | | |
| Lead | 96.5 | 100 | 96.5 | 80-120 |
| Lithium | | | | |
| Magnesium | anr | | | |
| Manganese | anr | | | |
| Molybdenum | | | | |
| Nickel | anr | | | |
| Palladium | | | | |
| Potassium | anr | | | |
| Selenium | anr | | | |
| Silicon | | | | |
| Silver | anr | | | |
| Sodium | anr | | | |
| Strontium | | | | |
| Sulfur | | | | |
| Thallium | anr | | | |
| Tin | | | | |
| Titanium | | | | |
| Tungsten | | | | |
| Vanadium | anr | | | |
| Zinc | anr | | | |

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

QC Batch ID: MP68389
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

| Metal |
|---|

Zirconium

Associated samples MP68389: JB22549-1, JB22549-2, JB22549-3, JB22549-4, JB22549-5, JB22549-6

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

QC Batch ID: MP68389
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date: 12/08/12

| Metal | JB22562-1 Original | SDL 1:5 | %DIF | QC Limits |
|---|---|---|---|---|
| Aluminum | anr | | | |
| Antimony | anr | | | |
| Arsenic | anr | | | |
| Barium | anr | | | |
| Beryllium | anr | | | |
| Bismuth | | | | |
| Boron | | | | |
| Cadmium | anr | | | |
| Calcium | anr | | | |
| Chromium | anr | | | |
| Cobalt | anr | | | |
| Copper | anr | | | |
| Iron | anr | | | |
| Lead | 735 | 717 | 2.5 | 0-10 |
| Lithium | | | | |
| Magnesium | anr | | | |
| Manganese | anr | | | |
| Molybdenum | | | | |
| Nickel | anr | | | |
| Palladium | | | | |
| Potassium | anr | | | |
| Selenium | anr | | | |
| Silicon | | | | |
| Silver | anr | | | |
| Sodium | anr | | | |
| Strontium | | | | |
| Sulfur | | | | |
| Thallium | anr | | | |
| Tin | | | | |
| Titanium | | | | |
| Tungsten | | | | |
| Vanadium | anr | | | |
| Zinc | anr | | | |

SERIAL DILUTION RESULTS SUMMARY

Login Number: JB22549
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

QC Batch ID: MP68389
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date:

| Metal |
| --- |
| Zirconium |

Associated samples MP68389: JB22549-1, JB22549-2, JB22549-3, JB22549-4, JB22549-5, JB22549-6

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

New Jersey
ACCUTEST LABORATORIES

## General Chemistry

# QC Data Summaries

Includes the following where applicable:

- Percent Solids Raw Data Summary

# Percent Solids Raw Data Summary



**Job Number:** JB22549
**Account:** AQTPAW Aquaterra Technologies, Inc.
**Project:** Sun-Philadelphia Refinery, 3144 Passyunk Avenue, Philadelphia, PA

**Sample:** JB22549-1 **Analyzed:** 13-DEC-12 by KP **Method:** ASTM 4643-00
**ClientID:** BH-12-54_3'

| | | |
|---|---|---|
| Wet Weight (Total) | 31.39 | g |
| Tare Weight | 26.02 | g |
| Dry Weight (Total) | 30.27 | g |
| Solids, Percent | 79.1 | % |

**Sample:** JB22549-2 **Analyzed:** 13-DEC-12 by KP **Method:** ASTM 4643-00
**ClientID:** BH-12-55_2.5'

| | | |
|---|---|---|
| Wet Weight (Total) | 32.93 | g |
| Tare Weight | 25.74 | g |
| Dry Weight (Total) | 31.7 | g |
| Solids, Percent | 82.9 | % |

**Sample:** JB22549-3 **Analyzed:** 13-DEC-12 by KP **Method:** ASTM 4643-00
**ClientID:** BH-12-55_1.5'

| | | |
|---|---|---|
| Wet Weight (Total) | 32.87 | g |
| Tare Weight | 26.58 | g |
| Dry Weight (Total) | 31.97 | g |
| Solids, Percent | 85.7 | % |

**Sample:** JB22549-4 **Analyzed:** 13-DEC-12 by KP **Method:** ASTM 4643-00
**ClientID:** BH-12-53_2.5'

| | | |
|---|---|---|
| Wet Weight (Total) | 31.38 | g |
| Tare Weight | 25.37 | g |
| Dry Weight (Total) | 30.35 | g |
| Solids, Percent | 82.9 | % |

**Sample:** JB22549-5 **Analyzed:** 13-DEC-12 by KP **Method:** ASTM 4643-00
**ClientID:** BH-12-48_3'

| | | |
|---|---|---|
| Wet Weight (Total) | 32.74 | g |
| Tare Weight | 26.41 | g |
| Dry Weight (Total) | 31.1 | g |
| Solids, Percent | 74.1 | % |

**Sample:** JB22549-6 **Analyzed:** 13-DEC-12 by KP **Method:** ASTM 4643-00
**ClientID:** BH-12-49_2.5'

| | | |
|---|---|---|
| Wet Weight (Total) | 32.58 | g |
| Tare Weight | 24.23 | g |
| Dry Weight (Total) | 31.74 | g |
| Solids, Percent | 89.9 | % |