New Jersey
ACCUTEST LABORATORIES

08/12/15

Technical Report for

Aquaterra Technologies, Inc.

Sun-Marcus Hook Refinery, Philadelphia, PA

AOI-4

Accutest Job Number: JC300

Sampling Date: 07/29/15

Report to:

AquaTerra Technologies
122 South Church Street P.O. Box 744
West Chester, PA 19382
td@aquaterra-tech.com

ATTN: Tiffani Doerr

Total number of pages in report: **389**

NELAP ACCREDITED TNI LABORATORY

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

Nancy Cole
Laboratory Director

Client Service contact: Marie Meidhof 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TN, TX, VA, WV, DoD ELAP (L-A-B L2248)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories. Test results relate only to samples analyzed.

Accutest Laboratories is the sole authority for authorizing edits or modifications to this document. Unauthorized modification of this report is strictly prohibited.

Table of Contents

-1-

Sections: 1 2 3 4 5 6 7 8 9 10 11 12

Section 1: Sample Summary **4**
Section 2: Case Narrative/Conformance Summary **5**
Section 3: Summary of Hits **8**
Section 4: Sample Results **11**
4.1: JC300-1: AOI5_MW-510_072915 12
4.2: JC300-1F: AOI5_MW-510_072915 15
4.3: JC300-2: AOI4_MW-504_072915 16
4.4: JC300-2F: AOI4_MW-504_072915 20
4.5: JC300-3: AOI4_MW-505_072915 21
4.6: JC300-3F: AOI4_MW-505_072915 25
4.7: JC300-4: AOI4_MW-506_072915 26
4.8: JC300-4F: AOI4_MW-506_072915 30
4.9: JC300-5: AOI4_MW-508_072915 31
4.10: JC300-5F: AOI4_MW-508_072915 34
4.11: JC300-6: AOI4_MW-507_072915 35
4.12: JC300-6F: AOI4_MW-507_072915 38
4.13: JC300-7: TRIP BLANK 39
Section 5: Misc. Forms **41**
5.1: Chain of Custody 42
5.2: Sample Tracking Chronicle 44
5.3: Internal Chain of Custody 47
Section 6: GC/MS Volatiles - QC Data Summaries **54**
6.1: Method Blank Summary 55
6.2: Blank Spike Summary 57
6.3: Matrix Spike/Matrix Spike Duplicate Summary 59
6.4: Instrument Performance Checks (BFB) 61
6.5: Internal Standard Area Summaries 64
6.6: Surrogate Recovery Summaries 66
6.7: Initial and Continuing Calibration Summaries 67
Section 7: GC/MS Volatiles - Raw Data **81**
7.1: Samples 82
7.2: Method Blanks 132
Section 8: GC/MS Semi-volatiles - QC Data Summaries **136**
8.1: Method Blank Summary 137
8.2: Blank Spike Summary 142
8.3: Blank Spike/Blank Spike Duplicate Summary 143
8.4: Matrix Spike/Matrix Spike Duplicate Summary 146
8.5: Instrument Performance Checks (DFTPP) 147
8.6: Internal Standard Area Summaries 162
8.7: Surrogate Recovery Summaries 168
8.8: Initial and Continuing Calibration Summaries 170
Section 9: GC/MS Semi-volatiles - Raw Data **228**

Table of Contents

9.1: Samples 229
9.2: Method Blanks 275
Section 10: GC Volatiles - QC Data Summaries 287
10.1: Method Blank Summary 288
10.2: Blank Spike Summary 289
10.3: Matrix Spike/Matrix Spike Duplicate Summary 290
10.4: Surrogate Recovery Summaries 291
10.5: GC Surrogate Retention Time Summaries 292
10.6: Initial and Continuing Calibration Summaries 294
Section 11: GC Volatiles - Raw Data 300
11.1: Samples 301
11.2: Method Blanks 315
Section 12: Metals Analysis - QC Data Summaries 317
12.1: Inst QC MA37260: Co,Pb,Ni,V,Zn 318
12.2: Inst QC MA37268: V 350
12.3: Prep QC MP88107: Co,Pb,Ni,V,Zn 380

Accutest Laboratories

Sample Summary

Aquaterra Technologies, Inc.

Job No: JC300

Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-4

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC300-1	07/29/15	10:35	NS	07/29/15	AQ	Ground Water	AOI5_MW-510_072915
JC300-1F	07/29/15	10:35	NS	07/29/15	AQ	Groundwater Filtered	AOI5_MW-510_072915
JC300-2	07/29/15	11:30	NS	07/29/15	AQ	Ground Water	AOI4_MW-504_072915
JC300-2F	07/29/15	11:30	NS	07/29/15	AQ	Groundwater Filtered	AOI4_MW-504_072915
JC300-3	07/29/15	12:05	NS	07/29/15	AQ	Ground Water	AOI4_MW-505_072915
JC300-3F	07/29/15	12:05	NS	07/29/15	AQ	Groundwater Filtered	AOI4_MW-505_072915
JC300-4	07/29/15	12:40	NS	07/29/15	AQ	Ground Water	AOI4_MW-506_072915
JC300-4F	07/29/15	12:40	NS	07/29/15	AQ	Groundwater Filtered	AOI4_MW-506_072915
JC300-5	07/29/15	13:20	NS	07/29/15	AQ	Ground Water	AOI4_MW-508_072915
JC300-5F	07/29/15	13:20	NS	07/29/15	AQ	Groundwater Filtered	AOI4_MW-508_072915
JC300-6	07/29/15	14:15	NS	07/29/15	AQ	Ground Water	AOI4_MW-507_072915
JC300-6F	07/29/15	14:15	NS	07/29/15	AQ	Groundwater Filtered	AOI4_MW-507_072915
JC300-7	07/29/15	14:15	NS	07/29/15	AQ	Trip Blank Water	TRIP BLANK

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Aquaterra Technologies, Inc.	**Job No**	JC300
Site:	Sun-Marcus Hook Refinery, Philadelphia, PA	**Report Date**	8/12/2015 2:57:37 PM

On 07/29/2015, 6 Sample(s), 1 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a maximum corrected temperature of 5.2 C. Samples were intact and chemically preserved, unless noted below. An Accutest Job Number of JC300 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 8260C

Matrix: AQ **Batch ID:** V4D2729

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB99871-14MS, JB99871-14MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix: AQ **Batch ID:** V4D2730

- All samples were analyzed within the recommended method holding time.
- Sample(s) JC462-9MS, JC462-9MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270D

Matrix: AQ **Batch ID:** OP85953

- All samples were extracted within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Extractables by GCMS By Method SW846 8270D BY SIM

Matrix: AQ **Batch ID:** OP85942A

- All samples were extracted within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Matrix: AQ **Batch ID:** OP85953A

- All samples were extracted within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- OP85953A-BSD12 for Phenanthrene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Pyrene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Acenaphthene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Benzo(k)fluoranthene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Naphthalene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Indeno(1,2,3-cd)pyrene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Fluorene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Fluoranthene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Dibenzo(a,h)anthracene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Chrysene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Anthracene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Benzo(g,h,i)perylene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Benzo(b)fluoranthene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Benzo(a)pyrene: Analytical precision exceeds in-house control limits.
- OP85953A-BSD12 for Benzo(a)anthracene: Analytical precision exceeds in-house control limits.

Matrix: AQ **Batch ID:** OP85975A

- All samples were extracted within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC346-2MS, JC346-2MSD were used as the QC samples indicated.
- Matrix Spike / Matrix Spike Duplicate Recovery(s) for Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Chrysene, Phenanthrene, Pyrene are outside control limits. Outside control limits due to matrix interference.
- RPD(s) for MSD for Naphthalene are outside control limits for sample OP85975A-MSD. Analytical precision exceeds in-house control limits.
- JC300-6 for Nitrobenzene-d5: Outside control limits due to dilution and matrix interference.
- JC300-6 for Nitrobenzene-d5: Outside control limits due to matrix interference. Confirmed by re-extraction.

Volatiles by GC By Method SW846-8011

Matrix: AQ **Batch ID:** OP85954

- All samples were extracted within the recommended method holding time.
- Sample(s) JC279-1MS, JC279-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method SW846 6010C

Matrix: AQ	**Batch ID:** MP88107

- All samples were digested within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC472-5MS, JC472-5MSD, JC472-5SDL were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Cobalt, Lead, Nickel, Vanadium are outside control limits for sample MP88107-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

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: JC300
Account: Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Collected: 07/29/15

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC300-1	**AOI5_MW-510_072915**					
Pyrene		0.155	0.10	0.014	ug/l	SW846 8270D BY SIM
JC300-1F	**AOI5_MW-510_072915**					
No hits reported in this sample.						
JC300-2	**AOI4_MW-504_072915**					
bis(2-Ethylhexyl)phthalate		2.5	2.0	0.55	ug/l	SW846 8270D
Fluoranthene		0.109	0.10	0.011	ug/l	SW846 8270D BY SIM
Pyrene		0.116	0.10	0.013	ug/l	SW846 8270D BY SIM
JC300-2F	**AOI4_MW-504_072915**					
Nickel		3.0 B	10	0.79	ug/l	SW846 6010C
Vanadium		1.8 B	50	0.70	ug/l	SW846 6010C
Zinc		5.8 B	20	4.9	ug/l	SW846 6010C
JC300-3	**AOI4_MW-505_072915**					
Benzene		7.4	0.50	0.24	ug/l	SW846 8260C
Toluene		0.80 J	1.0	0.16	ug/l	SW846 8260C
Ethylbenzene		0.77 J	1.0	0.27	ug/l	SW846 8260C
Xylene (total)		0.96 J	1.0	0.17	ug/l	SW846 8260C
Methyl Tert Butyl Ether		11.9	1.0	0.24	ug/l	SW846 8260C
Cyclohexane		1.2 J	5.0	0.28	ug/l	SW846 8260C
JC300-3F	**AOI4_MW-505_072915**					
Cobalt		0.70 B	50	0.54	ug/l	SW846 6010C
Nickel		1.3 B	10	0.79	ug/l	SW846 6010C
JC300-4	**AOI4_MW-506_072915**					
Benzene		241	5.0	2.4	ug/l	SW846 8260C
Toluene		3.5	1.0	0.16	ug/l	SW846 8260C
Ethylbenzene		2.3	1.0	0.27	ug/l	SW846 8260C
Xylene (total)		3.1	1.0	0.17	ug/l	SW846 8260C
Methyl Tert Butyl Ether		221	10	2.4	ug/l	SW846 8260C
Cyclohexane		3.8 J	5.0	0.28	ug/l	SW846 8260C
Isopropylbenzene		1.7	1.0	0.23	ug/l	SW846 8260C
1,2,4-Trimethylbenzene		0.39 J	2.0	0.22	ug/l	SW846 8260C
2-Methylnaphthalene		2.3	1.0	0.29	ug/l	SW846 8270D

Summary of Hits

Job Number: JC300
Account: Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Collected: 07/29/15

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Acenaphthene		0.166	0.10	0.013	ug/l	SW846 8270D BY SIM
Naphthalene		0.304	0.10	0.013	ug/l	SW846 8270D BY SIM
JC300-4F	**AOI4_MW-506_072915**					
Vanadium		1.4 B	50	0.70	ug/l	SW846 6010C
Zinc		9.0 B	20	4.9	ug/l	SW846 6010C
JC300-5	**AOI4_MW-508_072915**					
Benzene		865	50	24	ug/l	SW846 8260C
Ethylbenzene		294	100	27	ug/l	SW846 8260C
Xylene (total)		231	100	17	ug/l	SW846 8260C
Methyl Tert Butyl Ether		26300	1000	240	ug/l	SW846 8260C
Isopropylbenzene		32.9 J	100	23	ug/l	SW846 8260C
1,2,4-Trimethylbenzene		74.9 J	200	22	ug/l	SW846 8260C
Fluorene		0.414	0.10	0.027	ug/l	SW846 8270D BY SIM
Naphthalene		49.8	1.0	0.013	ug/l	SW846 8270D BY SIM
Phenanthrene		0.282	0.10	0.016	ug/l	SW846 8270D BY SIM
JC300-5F	**AOI4_MW-508_072915**					
No hits reported in this sample.						
JC300-6	**AOI4_MW-507_072915**					
Benzene		107	2.5	1.2	ug/l	SW846 8260C
Toluene		54.8	5.0	0.81	ug/l	SW846 8260C
Ethylbenzene		64.3	5.0	1.3	ug/l	SW846 8260C
Xylene (total)		149	5.0	0.83	ug/l	SW846 8260C
Methyl Tert Butyl Ether		548	5.0	1.2	ug/l	SW846 8260C
Isopropylbenzene		20.6	5.0	1.2	ug/l	SW846 8260C
1,2,4-Trimethylbenzene		58.3	10	1.1	ug/l	SW846 8260C
1,3,5-Trimethylbenzene		12.0	10	1.5	ug/l	SW846 8260C
Anthracene		7.98	4.0	0.052	ug/l	SW846 8270D BY SIM
Benzo(a)anthracene		0.482	0.051	0.019	ug/l	SW846 8270D BY SIM
Benzo(a)pyrene		0.179	0.051	0.030	ug/l	SW846 8270D BY SIM
Benzo(g,h,i)perylene		0.125	0.10	0.026	ug/l	SW846 8270D BY SIM
Chrysene		0.801	0.10	0.015	ug/l	SW846 8270D BY SIM
Fluorene		20.0	4.0	0.11	ug/l	SW846 8270D BY SIM
Naphthalene		187	4.0	0.053	ug/l	SW846 8270D BY SIM
Phenanthrene		51.9	4.0	0.064	ug/l	SW846 8270D BY SIM
Pyrene		7.69	4.0	0.054	ug/l	SW846 8270D BY SIM

Summary of Hits

Job Number: JC300
Account: Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Collected: 07/29/15

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC300-6F	**AOI4_MW-507_072915**					

No hits reported in this sample.

JC300-7	**TRIP BLANK**

No hits reported in this sample.

New Jersey

ACCUTEST LABORATORIES

Sample Results

Report of Analysis

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI5_MW-510_072915		
Lab Sample ID:	JC300-1	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4D61706.D	1	07/31/15	XC	n/a	n/a	V4D2729
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.23	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.29	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		76-120%
17060-07-0	1,2-Dichloroethane-D4	105%		73-122%
2037-26-5	Toluene-D8	101%		84-119%
460-00-4	4-Bromofluorobenzene	99%		78-117%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI5_MW-510_072915		
Lab Sample ID:	JC300-1	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3M56681.D	1	07/31/15	LK	07/30/15	OP85942A	E3M2618
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.10	0.013	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.051	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.051	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.022	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.027	ug/l	
218-01-9	Chrysene	ND	0.10	0.016	ug/l	
86-73-7	Fluorene	ND	0.10	0.027	ug/l	
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	
85-01-8	Phenanthrene	ND	0.10	0.016	ug/l	
129-00-0	Pyrene	0.155	0.10	0.014	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	47%		23-131%
321-60-8	2-Fluorobiphenyl	45%		24-120%
1718-51-0	Terphenyl-d14	21%		10-125%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI5_MW-510_072915		
Lab Sample ID:	JC300-1	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846-8011 SW846 8011	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G14263.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521
Run #2							

	Initial Volume	Final Volume
Run #1	37 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.019	0.0080	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
3017-95-6	2-Bromo-1-chloropropane	59%		38-167%
3017-95-6	2-Bromo-1-chloropropane	77%		38-167%

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

Report of Analysis

Client Sample ID:	AOI5_MW-510_072915		
Lab Sample ID:	JC300-1F	**Date Sampled:**	07/29/15
Matrix:	AQ - Groundwater Filtered	**Date Received:**	07/29/15
		Percent Solids:	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Lead	2.3 U	3.0	2.3	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA37260
(2) Prep QC Batch: MP88107

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-504_072915		
Lab Sample ID:	JC300-2	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4D61707.D	1	07/31/15	XC	n/a	n/a	V4D2729
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/l	
135-98-8	sec-Butylbenzene	ND	2.0	0.21	ug/l	
98-06-6	tert-Butylbenzene	ND	2.0	0.28	ug/l	
110-82-7	Cyclohexane	ND	5.0	0.28	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
110-54-3	Hexane	ND	5.0	0.40	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.23	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.29	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		76-120%
17060-07-0	1,2-Dichloroethane-D4	106%		73-122%
2037-26-5	Toluene-D8	103%		84-119%
460-00-4	4-Bromofluorobenzene	100%		78-117%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-504_072915		
Lab Sample ID:	JC300-2	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Z103269.D	1	07/31/15	BP	07/30/15	OP85953	EZ5150
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	5.0	1.8	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	6.5	ug/l	
95-48-7	2-Methylphenol	ND	2.0	1.3	ug/l	
	3&4-Methylphenol	ND	2.0	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	10	0.91	ug/l	
108-95-2	Phenol	ND	2.0	0.55	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.27	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.58	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.23	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	2.5	2.0	0.55	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.29	ug/l	
110-86-1	Pyridine	ND	2.0	0.29	ug/l	
91-22-5	Quinoline	ND	5.0	0.35	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	50%		12-110%
4165-62-2	Phenol-d5	32%		10-110%
118-79-6	2,4,6-Tribromophenol	77%		42-154%
4165-60-0	Nitrobenzene-d5	82%		29-139%
321-60-8	2-Fluorobiphenyl	85%		33-129%
1718-51-0	Terphenyl-d14	121%		10-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-504_072915		
Lab Sample ID:	JC300-2	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3M56674.D	1	07/31/15	LK	07/30/15	OP85953A	E3M2618
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.10	0.013	ug/l	
120-12-7	Anthracene	ND	0.10	0.013	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.050	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.050	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.021	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.026	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.10	0.019	ug/l	
218-01-9	Chrysene	ND	0.10	0.015	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.10	0.035	ug/l	
206-44-0	Fluoranthene	0.109	0.10	0.011	ug/l	
86-73-7	Fluorene	ND	0.10	0.027	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.10	0.031	ug/l	
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	
85-01-8	Phenanthrene	ND	0.10	0.016	ug/l	
129-00-0	Pyrene	0.116	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	52%		23-131%
321-60-8	2-Fluorobiphenyl	64%		24-120%
1718-51-0	Terphenyl-d14	59%		10-125%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-504_072915		
Lab Sample ID:	JC300-2	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846-8011 SW846 8011	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G14264.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521
Run #2							

	Initial Volume	Final Volume
Run #1	36 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.019	0.0082	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
3017-95-6	2-Bromo-1-chloropropane	58%		38-167%
3017-95-6	2-Bromo-1-chloropropane	58%		38-167%

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

Report of Analysis

Client Sample ID:	AOI4_MW-504_072915		
Lab Sample ID:	JC300-2F	**Date Sampled:**	07/29/15
Matrix:	AQ - Groundwater Filtered	**Date Received:**	07/29/15
		Percent Solids:	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Cobalt	0.54 U	50	0.54	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Lead	2.3 U	3.0	2.3	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Nickel	3.0 B	10	0.79	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Vanadium	1.8 B	50	0.70	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Zinc	5.8 B	20	4.9	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA37260
(2) Prep QC Batch: MP88107

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-505_072915		
Lab Sample ID:	JC300-3	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4D61708.D	1	07/31/15	XC	n/a	n/a	V4D2729
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	7.4	0.50	0.24	ug/l	
108-88-3	Toluene	0.80	1.0	0.16	ug/l	J
100-41-4	Ethylbenzene	0.77	1.0	0.27	ug/l	J
1330-20-7	Xylene (total)	0.96	1.0	0.17	ug/l	J
1634-04-4	Methyl Tert Butyl Ether	11.9	1.0	0.24	ug/l	
135-98-8	sec-Butylbenzene	ND	2.0	0.21	ug/l	
98-06-6	tert-Butylbenzene	ND	2.0	0.28	ug/l	
110-82-7	Cyclohexane	1.2	5.0	0.28	ug/l	J
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
110-54-3	Hexane	ND	5.0	0.40	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.23	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.29	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		76-120%
17060-07-0	1,2-Dichloroethane-D4	106%		73-122%
2037-26-5	Toluene-D8	101%		84-119%
460-00-4	4-Bromofluorobenzene	99%		78-117%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-505_072915		
Lab Sample ID:	JC300-3	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Z103270.D	1	07/31/15	BP	07/30/15	OP85953	EZ5150
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	5.0	1.8	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	6.5	ug/l	
95-48-7	2-Methylphenol	ND	2.0	1.3	ug/l	
	3&4-Methylphenol	ND	2.0	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	10	0.91	ug/l	
108-95-2	Phenol	ND	2.0	0.55	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.27	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.58	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.23	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	0.55	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.29	ug/l	
110-86-1	Pyridine	ND	2.0	0.29	ug/l	
91-22-5	Quinoline	ND	5.0	0.35	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	44%		12-110%
4165-62-2	Phenol-d5	27%		10-110%
118-79-6	2,4,6-Tribromophenol	96%		42-154%
4165-60-0	Nitrobenzene-d5	75%		29-139%
321-60-8	2-Fluorobiphenyl	82%		33-129%
1718-51-0	Terphenyl-d14	94%		10-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-505_072915		
Lab Sample ID:	JC300-3	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3M56675.D	1	07/31/15	LK	07/30/15	OP85953A	E3M2618
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.10	0.013	ug/l	
120-12-7	Anthracene	ND	0.10	0.013	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.050	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.050	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.021	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.026	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.10	0.019	ug/l	
218-01-9	Chrysene	ND	0.10	0.015	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.10	0.035	ug/l	
206-44-0	Fluoranthene	ND	0.10	0.011	ug/l	
86-73-7	Fluorene	ND	0.10	0.027	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.10	0.031	ug/l	
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	
85-01-8	Phenanthrene	ND	0.10	0.016	ug/l	
129-00-0	Pyrene	ND	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	48%		23-131%
321-60-8	2-Fluorobiphenyl	65%		24-120%
1718-51-0	Terphenyl-d14	59%		10-125%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-505_072915		
Lab Sample ID:	JC300-3	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846-8011 SW846 8011	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G14265.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521
Run #2							

	Initial Volume	Final Volume
Run #1	37 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.019	0.0081	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
3017-95-6	2-Bromo-1-chloropropane	58%		38-167%
3017-95-6	2-Bromo-1-chloropropane	58%		38-167%

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

Report of Analysis

Client Sample ID:	AOI4_MW-505_072915		
Lab Sample ID:	JC300-3F	**Date Sampled:**	07/29/15
Matrix:	AQ - Groundwater Filtered	**Date Received:**	07/29/15
		Percent Solids:	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Cobalt	0.70 B	50	0.54	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Lead	2.3 U	3.0	2.3	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Nickel	1.3 B	10	0.79	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Vanadium	0.70 U	50	0.70	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Zinc	4.9 U	20	4.9	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA37260
(2) Prep QC Batch: MP88107

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-506_072915		
Lab Sample ID:	JC300-4	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4D61709.D	1	07/31/15	XC	n/a	n/a	V4D2729
Run #2	4D61710.D	10	07/31/15	XC	n/a	n/a	V4D2729

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	241 [a]	5.0	2.4	ug/l	
108-88-3	Toluene	3.5	1.0	0.16	ug/l	
100-41-4	Ethylbenzene	2.3	1.0	0.27	ug/l	
1330-20-7	Xylene (total)	3.1	1.0	0.17	ug/l	
1634-04-4	Methyl Tert Butyl Ether	221 [a]	10	2.4	ug/l	
135-98-8	sec-Butylbenzene	ND	2.0	0.21	ug/l	
98-06-6	tert-Butylbenzene	ND	2.0	0.28	ug/l	
110-82-7	Cyclohexane	3.8	5.0	0.28	ug/l	J
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
110-54-3	Hexane	ND	5.0	0.40	ug/l	
98-82-8	Isopropylbenzene	1.7	1.0	0.23	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.39	2.0	0.22	ug/l	J
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.29	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%	107%	76-120%
17060-07-0	1,2-Dichloroethane-D4	105%	106%	73-122%
2037-26-5	Toluene-D8	100%	100%	84-119%
460-00-4	4-Bromofluorobenzene	99%	99%	78-117%

(a) Result is from Run# 2

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-506_072915		
Lab Sample ID:	JC300-4	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Z103271.D	1	07/31/15	BP	07/30/15	OP85953	EZ5150
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	5.0	1.8	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	6.5	ug/l	
95-48-7	2-Methylphenol	ND	2.0	1.3	ug/l	
	3&4-Methylphenol	ND	2.0	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	10	0.91	ug/l	
108-95-2	Phenol	ND	2.0	0.55	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.27	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.58	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.23	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	0.55	ug/l	
91-57-6	2-Methylnaphthalene	2.3	1.0	0.29	ug/l	
110-86-1	Pyridine	ND	2.0	0.29	ug/l	
91-22-5	Quinoline	ND	5.0	0.35	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	34%		12-110%
4165-62-2	Phenol-d5	21%		10-110%
118-79-6	2,4,6-Tribromophenol	71%		42-154%
4165-60-0	Nitrobenzene-d5	70%		29-139%
321-60-8	2-Fluorobiphenyl	67%		33-129%
1718-51-0	Terphenyl-d14	62%		10-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-506_072915		
Lab Sample ID:	JC300-4	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3M56676.D	1	07/31/15	LK	07/30/15	OP85953A	E3M2618
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	0.166	0.10	0.013	ug/l	
120-12-7	Anthracene	ND	0.10	0.013	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.050	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.050	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.021	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.026	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.10	0.019	ug/l	
218-01-9	Chrysene	ND	0.10	0.015	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.10	0.035	ug/l	
206-44-0	Fluoranthene	ND	0.10	0.011	ug/l	
86-73-7	Fluorene	ND	0.10	0.027	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.10	0.031	ug/l	
91-20-3	Naphthalene	0.304	0.10	0.013	ug/l	
85-01-8	Phenanthrene	ND	0.10	0.016	ug/l	
129-00-0	Pyrene	ND	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	46%		23-131%
321-60-8	2-Fluorobiphenyl	52%		24-120%
1718-51-0	Terphenyl-d14	36%		10-125%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-506_072915		
Lab Sample ID:	JC300-4	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846-8011 SW846 8011	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G14266.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521
Run #2							

	Initial Volume	Final Volume
Run #1	38 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.018	0.0079	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
3017-95-6	2-Bromo-1-chloropropane	48%		38-167%
3017-95-6	2-Bromo-1-chloropropane	50%		38-167%

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

Report of Analysis

Client Sample ID:	AOI4_MW-506_072915		
Lab Sample ID:	JC300-4F	**Date Sampled:**	07/29/15
Matrix:	AQ - Groundwater Filtered	**Date Received:**	07/29/15
		Percent Solids:	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Cobalt	0.54 U	50	0.54	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Lead	2.3 U	3.0	2.3	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Nickel	0.79 U	10	0.79	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Vanadium	1.4 B	50	0.70	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]
Zinc	9.0 B	20	4.9	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA37260
(2) Prep QC Batch: MP88107

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-508_072915		
Lab Sample ID:	JC300-5	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4D61711.D	100	07/31/15	XC	n/a	n/a	V4D2729
Run #2	4D61722.D	1000	08/03/15	XC	n/a	n/a	V4D2730

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	865	50	24	ug/l	
108-88-3	Toluene	ND	100	16	ug/l	
100-41-4	Ethylbenzene	294	100	27	ug/l	
1330-20-7	Xylene (total)	231	100	17	ug/l	
1634-04-4	Methyl Tert Butyl Ether	26300 [a]	1000	240	ug/l	
107-06-2	1,2-Dichloroethane	ND	100	18	ug/l	
98-82-8	Isopropylbenzene	32.9	100	23	ug/l	J
95-63-6	1,2,4-Trimethylbenzene	74.9	200	22	ug/l	J
108-67-8	1,3,5-Trimethylbenzene	ND	200	29	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%	106%	76-120%
17060-07-0	1,2-Dichloroethane-D4	104%	103%	73-122%
2037-26-5	Toluene-D8	101%	101%	84-119%
460-00-4	4-Bromofluorobenzene	99%	99%	78-117%

(a) Result is from Run# 2

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-508_072915		
Lab Sample ID:	JC300-5	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3M56682.D	1	07/31/15	LK	07/30/15	OP85942A	E3M2618
Run #2	5P20008.D	1	07/30/15	SD	07/30/15	OP85942A	E5P1033

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2	1000 ml	1.0 ml

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.10	0.013	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.050	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.050	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.021	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.026	ug/l	
218-01-9	Chrysene	ND	0.10	0.015	ug/l	
86-73-7	Fluorene	0.414	0.10	0.027	ug/l	
91-20-3	Naphthalene	49.8 [a]	1.0	0.013	ug/l	
85-01-8	Phenanthrene	0.282	0.10	0.016	ug/l	
129-00-0	Pyrene	ND	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	55%	83%	23-131%
321-60-8	2-Fluorobiphenyl	63%	83%	24-120%
1718-51-0	Terphenyl-d14	32%	46%	10-125%

(a) Result is from Run# 2

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-508_072915		
Lab Sample ID:	JC300-5	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846-8011 SW846 8011	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G14267.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521
Run #2							

	Initial Volume	Final Volume
Run #1	37 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.019	0.0080	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
3017-95-6	2-Bromo-1-chloropropane	66%		38-167%
3017-95-6	2-Bromo-1-chloropropane	64%		38-167%

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

Report of Analysis

Client Sample ID:	AOI4_MW-508_072915		
Lab Sample ID:	JC300-5F	**Date Sampled:**	07/29/15
Matrix:	AQ - Groundwater Filtered	**Date Received:**	07/29/15
		Percent Solids:	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Lead	2.3 U	3.0	2.3	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA37260
(2) Prep QC Batch: MP88107

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-507_072915		
Lab Sample ID:	JC300-6	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4D61712.D	5	07/31/15	XC	n/a	n/a	V4D2729
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	107	2.5	1.2	ug/l	
108-88-3	Toluene	54.8	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	64.3	5.0	1.3	ug/l	
1330-20-7	Xylene (total)	149	5.0	0.83	ug/l	
1634-04-4	Methyl Tert Butyl Ether	548	5.0	1.2	ug/l	
107-06-2	1,2-Dichloroethane	ND	5.0	0.90	ug/l	
98-82-8	Isopropylbenzene	20.6	5.0	1.2	ug/l	
95-63-6	1,2,4-Trimethylbenzene	58.3	10	1.1	ug/l	
108-67-8	1,3,5-Trimethylbenzene	12.0	10	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		76-120%
17060-07-0	1,2-Dichloroethane-D4	106%		73-122%
2037-26-5	Toluene-D8	102%		84-119%
460-00-4	4-Bromofluorobenzene	101%		78-117%

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

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-507_072915		
Lab Sample ID:	JC300-6	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4M59393.D	1	08/02/15	AD	07/31/15	OP85975A	E4M2592
Run #2	5P20383.D	4	08/12/15	AP	07/31/15	OP85975A	E5P1049
Run #3 [a]	3M56683.D	1	07/31/15	LK	07/30/15	OP85942A	E3M2618

	Initial Volume	Final Volume
Run #1	990 ml	1.0 ml
Run #2	990 ml	1.0 ml
Run #3	1000 ml	1.0 ml

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	7.98 [b]	4.0	0.052	ug/l	
56-55-3	Benzo(a)anthracene	0.482	0.051	0.019	ug/l	
50-32-8	Benzo(a)pyrene	0.179	0.051	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.021	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.125	0.10	0.026	ug/l	
218-01-9	Chrysene	0.801	0.10	0.015	ug/l	
86-73-7	Fluorene	20.0 [b]	4.0	0.11	ug/l	
91-20-3	Naphthalene	187 [b]	4.0	0.053	ug/l	
85-01-8	Phenanthrene	51.9 [b]	4.0	0.064	ug/l	
129-00-0	Pyrene	7.69 [b]	4.0	0.054	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
4165-60-0	Nitrobenzene-d5	15% [c]	11% [d]	1% [e]	23-131%
321-60-8	2-Fluorobiphenyl	46%	55%	9% [e]	24-120%
1718-51-0	Terphenyl-d14	25%	26%	4% [e]	10-125%

(a) Confirmation run for surrogate recoveries.
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference. Confirmed by re-extraction.
(d) Outside control limits due to dilution and matrix interference.
(e) Outside control limits due to matrix interference.

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI4_MW-507_072915		
Lab Sample ID:	JC300-6	**Date Sampled:**	07/29/15
Matrix:	AQ - Ground Water	**Date Received:**	07/29/15
Method:	SW846-8011 SW846 8011	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G14268.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521
Run #2							

	Initial Volume	Final Volume
Run #1	37 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.019	0.0082	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
3017-95-6	2-Bromo-1-chloropropane	63%		38-167%
3017-95-6	2-Bromo-1-chloropropane	68%		38-167%

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

Report of Analysis

Client Sample ID:	AOI4_MW-507_072915		
Lab Sample ID:	JC300-6F	**Date Sampled:**	07/29/15
Matrix:	AQ - Groundwater Filtered	**Date Received:**	07/29/15
		Percent Solids:	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

Dissolved Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Lead	2.3 U	3.0	2.3	ug/l	1	08/04/15	08/05/15	BS	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA37260
(2) Prep QC Batch: MP88107

RL = Reporting Limit
MDL = Method Detection Limit

U = Indicates a result < MDL
B = Indicates a result > = MDL but < RL

Accutest Laboratories

Report of Analysis

Client Sample ID:	TRIP BLANK		
Lab Sample ID:	JC300-7	**Date Sampled:**	07/29/15
Matrix:	AQ - Trip Blank Water	**Date Received:**	07/29/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4D61704.D	1	07/31/15	XC	n/a	n/a	V4D2729
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.23	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.29	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		76-120%
17060-07-0	1,2-Dichloroethane-D4	104%		73-122%
2037-26-5	Toluene-D8	100%		84-119%
460-00-4	4-Bromofluorobenzene	99%		78-117%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	TRIP BLANK		
Lab Sample ID:	JC300-7	**Date Sampled:**	07/29/15
Matrix:	AQ - Trip Blank Water	**Date Received:**	07/29/15
Method:	SW846-8011 SW846 8011	**Percent Solids:**	n/a
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G14269.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521
Run #2							

	Initial Volume	Final Volume
Run #1	39 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.018	0.0078	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
3017-95-6	2-Bromo-1-chloropropane	85%		38-167%
3017-95-6	2-Bromo-1-chloropropane	87%		38-167%

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

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

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 #: JC300

Client / Reporting Information

Company Name: Aquaterra
Street Address: 122 South Church Street
City / State / Zip: West Chester PA 19382
Project Contact / E-mail: T. Doerr TD@aquaterra-tech.com
Phone # / Fax #: 610-431-5733
Sampler(s) Name(s) / Phone #: N. Stroik

Project Information

Project Name: MH AOI-4
Street:
City / State:
Project #:
Client Purchase Order #:
Project Manager: T. Doerr

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	V8260SL	V8011EDB	B8270SL	PB	V8260SL2	V8011EDB	AB8270SL	Co,Ni,PB,V,ZN		LAB USE ONLY
1F	AOI5-MW-510-072915		7/29/15	1035	NS		8	5				3				X	X	X	X						E55
~~NO~~	~~AOI5-MW-433-072915~~		~~7/29/15~~	~~0945~~	~~NS~~		~~8~~	~~5~~				~~3~~				~~X~~	~~X~~	~~X~~	~~X~~						~~C25~~
2F	AOI4-MW-504-072915		7/29/15	1130	NS		8	5				3								X	X	X	X		V757
3F	AOI4-MW-505-072915		7/29/15	1205	NS		8	5				3								X	X	X	X		
4F	AOI4-MW-506-072915		7/29/15	1240	NS		8	5				3								X	X	X	X		
5F	AOI4-MW-508-072915		7/29/15	1320	NS		8	5				3				X	X	X	X						
6F	AOI4-MW-507-072915		7/29/15	1415	NS		8	5				3				X	X	X	X						
7	Trip Blank						8																		

Turnaround Time (Business days)

- [x] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other _____

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

INITIAL ASESSMENT KIR 2A

LABEL VERIFICATION OB

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] *NJ Data of Known Quality Protocol Reporting*
- [ ] 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

Lab to filter for Metals (dissolved metals).
• Trip Blank Rec'd x 8 ADDED TO COC @ 7/29/15

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 N. Stroik	7/29/15 1500	1	2	7/29/15 1500	2
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	Intact / Not intact	Preserved where applicable / On Ice: Y	Cooler Temp: 5.5 C

JC300: Chain of Custody
Page 1 of 2

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JC300 **Client:** **Project:**

Date / Time Received: 7/29/2015 4:30:00 PM **Delivery Method:** **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (5.5);

Cooler Temps (Corrected) °C: Cooler 1: (5.2);

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:	IR Gun	
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

JC300: Chain of Custody
Page 2 of 2

Internal Sample Tracking Chronicle

Aquaterra Technologies, Inc.

Job No: JC300

Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-4

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JC300-1	Collected: 29-JUL-15 10:35 By: NS		Received: 29-JUL-15 By: AS			
AOI5_MW-510_072915						
JC300-1	SW846 8270D BY SIM	31-JUL-15 17:33	LK	30-JUL-15	RM	B8270SIMSL
JC300-1	SW846 8260C	31-JUL-15 19:47	XC			V8260SL
JC300-1	SW846-8011	03-AUG-15 20:13	VDT	31-JUL-15	AQ	V8011EDB
JC300-2	Collected: 29-JUL-15 11:30 By: NS		Received: 29-JUL-15 By: AS			
AOI4_MW-504_072915						
JC300-2	SW846 8270D BY SIM	31-JUL-15 14:01	LK	30-JUL-15	RF	B8270SIMSL2
JC300-2	SW846 8270D	31-JUL-15 18:53	BP	30-JUL-15	RF	AB8270SL2
JC300-2	SW846 8260C	31-JUL-15 20:14	XC			V8260SL2
JC300-2	SW846-8011	03-AUG-15 20:32	VDT	31-JUL-15	AQ	V8011EDB
JC300-3	Collected: 29-JUL-15 12:05 By: NS		Received: 29-JUL-15 By: AS			
AOI4_MW-505_072915						
JC300-3	SW846 8270D BY SIM	31-JUL-15 14:32	LK	30-JUL-15	RF	B8270SIMSL2
JC300-3	SW846 8270D	31-JUL-15 19:24	BP	30-JUL-15	RF	AB8270SL2
JC300-3	SW846 8260C	31-JUL-15 20:41	XC			V8260SL2
JC300-3	SW846-8011	03-AUG-15 20:51	VDT	31-JUL-15	AQ	V8011EDB
JC300-4	Collected: 29-JUL-15 12:40 By: NS		Received: 29-JUL-15 By: AS			
AOI4_MW-506_072915						
JC300-4	SW846 8270D BY SIM	31-JUL-15 15:02	LK	30-JUL-15	RF	B8270SIMSL2
JC300-4	SW846 8270D	31-JUL-15 19:55	BP	30-JUL-15	RF	AB8270SL2
JC300-4	SW846 8260C	31-JUL-15 21:09	XC			V8260SL2
JC300-4	SW846 8260C	31-JUL-15 21:36	XC			V8260SL2
JC300-4	SW846-8011	03-AUG-15 21:09	VDT	31-JUL-15	AQ	V8011EDB
JC300-5	Collected: 29-JUL-15 13:20 By: NS		Received: 29-JUL-15 By: AS			
AOI4_MW-508_072915						
JC300-5	SW846 8270D BY SIM	30-JUL-15 22:08	SD	30-JUL-15	RM	B8270SIMSL
JC300-5	SW846 8270D BY SIM	31-JUL-15 18:04	LK	30-JUL-15	RM	B8270SIMSL
JC300-5	SW846 8260C	31-JUL-15 22:02	XC			V8260SL
JC300-5	SW846 8260C	03-AUG-15 13:26	XC			V8260SL
JC300-5	SW846-8011	03-AUG-15 21:28	VDT	31-JUL-15	AQ	V8011EDB

Internal Sample Tracking Chronicle

Aquaterra Technologies, Inc.

Job No: JC300

Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-4

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JC300-6	Collected: 29-JUL-15 14:15 By: NS		Received: 29-JUL-15 By: AS			
AOI4_MW-507_072915						
JC300-6	SW846 8270D BY SIM	31-JUL-15 18:34	LK	30-JUL-15	RP	B8270SIMSL
JC300-6	SW846 8260C	31-JUL-15 22:29	XC			V8260SL
JC300-6	SW846 8270D BY SIM	02-AUG-15 01:14	AD	31-JUL-15	RM	B8270SIMSL
JC300-6	SW846-8011	03-AUG-15 21:47	VDT	31-JUL-15	AQ	V8011EDB
JC300-6	SW846 8270D BY SIM	12-AUG-15 13:16	AP	31-JUL-15	RM	B8270SIMSL
JC300-7	Collected: 29-JUL-15 14:15 By: NS		Received: 29-JUL-15 By: AS			
TRIP BLANK						
JC300-7	SW846 8260C	31-JUL-15 18:53	XC			V8260SL
JC300-7	SW846-8011	03-AUG-15 22:05	VDT	31-JUL-15	AQ	V8011EDB
JC300-1F	Collected: 29-JUL-15 10:35 By: NS		Received: 29-JUL-15 By: AS			
AOI5_MW-510_072915						
JC300-1F	SW846 6010C	05-AUG-15 19:14	BS	04-AUG-15	FP	PB
JC300-2F	Collected: 29-JUL-15 11:30 By: NS		Received: 29-JUL-15 By: AS			
AOI4_MW-504_072915						
JC300-2F	SW846 6010C	05-AUG-15 19:17	BS	04-AUG-15	FP	CO,NI,PB,V,ZN
JC300-3F	Collected: 29-JUL-15 12:05 By: NS		Received: 29-JUL-15 By: AS			
AOI4_MW-505_072915						
JC300-3F	SW846 6010C	05-AUG-15 19:21	BS	04-AUG-15	FP	CO,NI,PB,V,ZN
JC300-4F	Collected: 29-JUL-15 12:40 By: NS		Received: 29-JUL-15 By: AS			
AOI4_MW-506_072915						
JC300-4F	SW846 6010C	05-AUG-15 19:24	BS	04-AUG-15	FP	CO,NI,PB,V,ZN
JC300-5F	Collected: 29-JUL-15 13:20 By: NS		Received: 29-JUL-15 By: AS			
AOI4_MW-508_072915						
JC300-5F	SW846 6010C	05-AUG-15 19:27	BS	04-AUG-15	FP	PB

Internal Sample Tracking Chronicle

Aquaterra Technologies, Inc.

Job No: JC300

Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-4

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JC300-6F	Collected: 29-JUL-15 14:15 By: NS		Received: 29-JUL-15 By: AS			
AOI4_MW-507_072915						
JC300-6F	SW846 6010C	05-AUG-15 19:30	BS	04-AUG-15	FP	PB

Accutest Internal Chain of Custody

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 07/29/15

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC300-1.2	Secured Storage	Cathy Abreu	07/30/15 09:34	Retrieve from Storage
JC300-1.2	Cathy Abreu	Secured Staging Area	07/30/15 09:34	Return to Storage
JC300-1.2	Secured Staging Area	Nicholas Goydish	07/30/15 10:07	Retrieve from Storage
JC300-1.2	Nicholas Goydish		07/30/15 12:51	Depleted
JC300-1.2.1	Nicholas Goydish	Organics Prep	07/30/15 10:07	Extract from JC300-1.2
JC300-1.2.1	Organics Prep	Sara Davis	07/30/15 18:11	Extract from JC300-1.2
JC300-1.2.1	Sara Davis	Extract Storage	07/30/15 18:11	Return to Storage
JC300-1.2.1	Extract Storage	Sara Davis	07/30/15 18:11	Retrieve from Storage
JC300-1.2.1	Sara Davis	GCMS5P	07/30/15 18:11	Load on Instrument
JC300-1.2.1	GCMS5P	Alicja Pawelec	08/04/15 12:22	Unload from Instrument
JC300-1.2.1	Alicja Pawelec	Extract Freezer	08/04/15 12:22	Return to Storage
JC300-1.4	Secured Storage	Adil Quyser	07/31/15 12:59	Retrieve from Storage
JC300-1.4	Adil Quyser		07/31/15 18:36	Depleted
JC300-1.4.1	Adil Quyser	Organics Prep	07/31/15 12:59	Extract from JC300-1.4
JC300-1.4.1	Organics Prep	Adil Quyser	07/31/15 18:35	Extract from JC300-1.4
JC300-1.4.1	Adil Quyser	Extract Storage	07/31/15 18:35	Return to Storage
JC300-1.4.1	Extract Storage	Vincent Drago	08/03/15 13:50	Retrieve from Storage
JC300-1.4.1	Vincent Drago	GC7G	08/03/15 13:50	Load on Instrument
JC300-1.4.1	GC7G	Vincent Drago	08/04/15 16:14	Unload from Instrument
JC300-1.4.1	Vincent Drago	Extract Freezer	08/04/15 16:14	Return to Storage
JC300-1.5	Secured Storage	Ximena Collado	07/31/15 12:43	Retrieve from Storage
JC300-1.5	Ximena Collado	GCMS4D	07/31/15 12:43	Load on Instrument
JC300-1.5	GCMS4D	Ximena Collado	08/03/15 11:34	Unload from Instrument
JC300-1.5	Ximena Collado	Secured Storage	08/03/15 11:34	Return to Storage
JC300-1F.3	Secured Storage	Edwin Gonzalez	07/29/15 18:30	Retrieve from Storage
JC300-1F.3	Edwin Gonzalez	Secured Staging Area	07/29/15 18:31	Return to Storage
JC300-1F.3	Secured Staging Area	Radhika Mistry	07/29/15 18:40	Retrieve from Storage
JC300-1F.3	Radhika Mistry	Secured Storage	07/29/15 21:33	Return to Storage
JC300-1F.3	Secured Storage	Todd Shoemaker	08/04/15 09:17	Retrieve from Storage
JC300-1F.3	Todd Shoemaker	Jessica Adametz	08/04/15 09:19	Custody Transfer
JC300-1F.3	Jessica Adametz	Secured Storage	08/04/15 09:33	Return to Storage
JC300-1F.3.1	Jessica Adametz	Metals Digestion	08/04/15 09:32	Digestate from JC300-1F.3
JC300-1F.3.1	Metals Digestion	Jessica Adametz	08/04/15 09:32	Digestate from JC300-1F.3
JC300-1F.3.1	Jessica Adametz	Metals Digestate Storage	08/04/15 09:32	Return to Storage
JC300-2.2	Secured Storage	Luis Villanueva	07/30/15 12:51	Retrieve from Storage
JC300-2.2	Luis Villanueva	Secured Staging Area	07/30/15 12:51	Return to Storage
JC300-2.2	Secured Staging Area	Joseph Baum	07/30/15 15:08	Retrieve from Storage

Accutest Internal Chain of Custody

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 07/29/15

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC300-2.2	Joseph Baum		07/30/15 23:13	Depleted
JC300-2.2.1	Joseph Baum	Organics Prep	07/30/15 15:11	Extract from JC300-2.2
JC300-2.2.1	Organics Prep	Ryan Fantasia	07/30/15 23:05	Extract from JC300-2.2
JC300-2.2.1	Ryan Fantasia	Extract Storage	07/30/15 23:05	Return to Storage
JC300-2.2.1	Extract Storage	Linsey Kirschmann	07/31/15 11:39	Retrieve from Storage
JC300-2.2.1	Linsey Kirschmann	GCMS3M	07/31/15 11:39	Load on Instrument
JC300-2.2.1	GCMS3M	Brittany Piercy	07/31/15 17:09	Unload from Instrument
JC300-2.2.1	Brittany Piercy	GCMS6P	07/31/15 17:09	Load on Instrument
JC300-2.2.1	GCMS6P	Olga Azarihn	08/03/15 09:49	Unload from Instrument
JC300-2.2.1	Olga Azarihn	Extract Freezer	08/03/15 09:49	Return to Storage
JC300-2.6	Secured Storage	Adil Quyser	07/31/15 12:59	Retrieve from Storage
JC300-2.6	Adil Quyser		07/31/15 18:36	Depleted
JC300-2.6.1	Adil Quyser	Organics Prep	07/31/15 12:59	Extract from JC300-2.6
JC300-2.6.1	Organics Prep	Adil Quyser	07/31/15 18:35	Extract from JC300-2.6
JC300-2.6.1	Adil Quyser	Extract Storage	07/31/15 18:35	Return to Storage
JC300-2.6.1	Extract Storage	Vincent Drago	08/03/15 13:50	Retrieve from Storage
JC300-2.6.1	Vincent Drago	GC7G	08/03/15 13:50	Load on Instrument
JC300-2.6.1	GC7G	Vincent Drago	08/04/15 16:14	Unload from Instrument
JC300-2.6.1	Vincent Drago	Extract Freezer	08/04/15 16:14	Return to Storage
JC300-2.7	Secured Storage	Ximena Collado	07/31/15 12:43	Retrieve from Storage
JC300-2.7	Ximena Collado	GCMS4D	07/31/15 12:43	Load on Instrument
JC300-2.7	GCMS4D	Ximena Collado	08/03/15 11:34	Unload from Instrument
JC300-2.7	Ximena Collado	Secured Storage	08/03/15 11:34	Return to Storage
JC300-2F.3	Secured Storage	Edwin Gonzalez	07/29/15 18:30	Retrieve from Storage
JC300-2F.3	Edwin Gonzalez	Secured Staging Area	07/29/15 18:31	Return to Storage
JC300-2F.3	Secured Staging Area	Radhika Mistry	07/29/15 18:40	Retrieve from Storage
JC300-2F.3	Radhika Mistry	Secured Storage	07/29/15 21:33	Return to Storage
JC300-2F.3	Secured Storage	Todd Shoemaker	08/04/15 09:17	Retrieve from Storage
JC300-2F.3	Todd Shoemaker	Jessica Adametz	08/04/15 09:19	Custody Transfer
JC300-2F.3	Jessica Adametz	Secured Storage	08/04/15 09:33	Return to Storage
JC300-2F.3.1	Jessica Adametz	Metals Digestion	08/04/15 09:32	Digestate from JC300-2F.3
JC300-2F.3.1	Metals Digestion	Jessica Adametz	08/04/15 09:32	Digestate from JC300-2F.3
JC300-2F.3.1	Jessica Adametz	Metals Digestate Storage	08/04/15 09:32	Return to Storage
JC300-3.1	Secured Storage	Luis Villanueva	07/30/15 12:51	Retrieve from Storage
JC300-3.1	Luis Villanueva	Secured Staging Area	07/30/15 12:51	Return to Storage
JC300-3.1	Secured Staging Area	Joseph Baum	07/30/15 15:08	Retrieve from Storage
JC300-3.1	Joseph Baum		07/30/15 23:13	Depleted

Accutest Internal Chain of Custody

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 07/29/15

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC300-3.1.1	Joseph Baum	Organics Prep	07/30/15 15:11	Extract from JC300-3.1
JC300-3.1.1	Organics Prep	Ryan Fantasia	07/30/15 23:05	Extract from JC300-3.1
JC300-3.1.1	Ryan Fantasia	Extract Storage	07/30/15 23:05	Return to Storage
JC300-3.1.1	Extract Storage	Linsey Kirschmann	07/31/15 11:39	Retrieve from Storage
JC300-3.1.1	Linsey Kirschmann	GCMS3M	07/31/15 11:39	Load on Instrument
JC300-3.1.1	GCMS3M	Brittany Piercy	07/31/15 17:09	Unload from Instrument
JC300-3.1.1	Brittany Piercy	GCMS6P	07/31/15 17:09	Load on Instrument
JC300-3.1.1	GCMS6P	Olga Azarihn	08/03/15 09:49	Unload from Instrument
JC300-3.1.1	Olga Azarihn	Extract Freezer	08/03/15 09:49	Return to Storage
JC300-3.5	Secured Storage	Ximena Collado	07/31/15 12:43	Retrieve from Storage
JC300-3.5	Ximena Collado	GCMS4D	07/31/15 12:43	Load on Instrument
JC300-3.5	GCMS4D	Ximena Collado	08/03/15 11:34	Unload from Instrument
JC300-3.5	Ximena Collado	Secured Storage	08/03/15 11:34	Return to Storage
JC300-3.6	Secured Storage	Adil Quyser	07/31/15 12:59	Retrieve from Storage
JC300-3.6	Adil Quyser		07/31/15 18:36	Depleted
JC300-3.6.1	Adil Quyser	Organics Prep	07/31/15 12:59	Extract from JC300-3.6
JC300-3.6.1	Organics Prep	Adil Quyser	07/31/15 18:35	Extract from JC300-3.6
JC300-3.6.1	Adil Quyser	Extract Storage	07/31/15 18:35	Return to Storage
JC300-3.6.1	Extract Storage	Vincent Drago	08/03/15 13:50	Retrieve from Storage
JC300-3.6.1	Vincent Drago	GC7G	08/03/15 13:50	Load on Instrument
JC300-3.6.1	GC7G	Vincent Drago	08/04/15 16:14	Unload from Instrument
JC300-3.6.1	Vincent Drago	Extract Freezer	08/04/15 16:14	Return to Storage
JC300-3F.3	Secured Storage	Edwin Gonzalez	07/29/15 18:30	Retrieve from Storage
JC300-3F.3	Edwin Gonzalez	Secured Staging Area	07/29/15 18:31	Return to Storage
JC300-3F.3	Secured Staging Area	Radhika Mistry	07/29/15 18:40	Retrieve from Storage
JC300-3F.3	Radhika Mistry	Secured Storage	07/29/15 21:33	Return to Storage
JC300-3F.3	Secured Storage	Todd Shoemaker	08/04/15 09:17	Retrieve from Storage
JC300-3F.3	Todd Shoemaker	Jessica Adametz	08/04/15 09:19	Custody Transfer
JC300-3F.3	Jessica Adametz	Secured Storage	08/04/15 09:33	Return to Storage
JC300-3F.3.1	Jessica Adametz	Metals Digestion	08/04/15 09:32	Digestate from JC300-3F.3
JC300-3F.3.1	Metals Digestion	Jessica Adametz	08/04/15 09:32	Digestate from JC300-3F.3
JC300-3F.3.1	Jessica Adametz	Metals Digestate Storage	08/04/15 09:32	Return to Storage
JC300-4.2	Secured Storage	Luis Villanueva	07/30/15 12:51	Retrieve from Storage
JC300-4.2	Luis Villanueva	Secured Staging Area	07/30/15 12:51	Return to Storage
JC300-4.2	Secured Staging Area	Joseph Baum	07/30/15 15:08	Retrieve from Storage
JC300-4.2	Joseph Baum		07/30/15 23:13	Depleted

Accutest Internal Chain of Custody

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 07/29/15

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC300-4.2.1	Joseph Baum	Organics Prep	07/30/15 15:11	Extract from JC300-4.2
JC300-4.2.1	Organics Prep	Ryan Fantasia	07/30/15 23:05	Extract from JC300-4.2
JC300-4.2.1	Ryan Fantasia	Extract Storage	07/30/15 23:05	Return to Storage
JC300-4.2.1	Extract Storage	Linsey Kirschmann	07/31/15 11:39	Retrieve from Storage
JC300-4.2.1	Linsey Kirschmann	GCMS3M	07/31/15 11:39	Load on Instrument
JC300-4.2.1	GCMS3M	Brittany Piercy	07/31/15 17:09	Unload from Instrument
JC300-4.2.1	Brittany Piercy	GCMS6P	07/31/15 17:09	Load on Instrument
JC300-4.2.1	GCMS6P	Olga Azarihn	08/03/15 09:49	Unload from Instrument
JC300-4.2.1	Olga Azarihn	Extract Freezer	08/03/15 09:49	Return to Storage
JC300-4.5	Secured Storage	Ximena Collado	07/31/15 12:43	Retrieve from Storage
JC300-4.5	Ximena Collado	GCMS4D	07/31/15 12:43	Load on Instrument
JC300-4.5	GCMS4D	Ximena Collado	08/03/15 11:34	Unload from Instrument
JC300-4.5	Ximena Collado	Secured Storage	08/03/15 11:34	Return to Storage
JC300-4.6	Secured Storage	Adil Quyser	07/31/15 12:59	Retrieve from Storage
JC300-4.6	Adil Quyser		07/31/15 18:36	Depleted
JC300-4.6.1	Adil Quyser	Organics Prep	07/31/15 12:59	Extract from JC300-4.6
JC300-4.6.1	Organics Prep	Adil Quyser	07/31/15 18:35	Extract from JC300-4.6
JC300-4.6.1	Adil Quyser	Extract Storage	07/31/15 18:35	Return to Storage
JC300-4.6.1	Extract Storage	Vincent Drago	08/03/15 13:50	Retrieve from Storage
JC300-4.6.1	Vincent Drago	GC7G	08/03/15 13:50	Load on Instrument
JC300-4.6.1	GC7G	Vincent Drago	08/04/15 16:14	Unload from Instrument
JC300-4.6.1	Vincent Drago	Extract Freezer	08/04/15 16:14	Return to Storage
JC300-4F.3	Secured Storage	Edwin Gonzalez	07/29/15 18:30	Retrieve from Storage
JC300-4F.3	Edwin Gonzalez	Secured Staging Area	07/29/15 18:31	Return to Storage
JC300-4F.3	Secured Staging Area	Radhika Mistry	07/29/15 18:40	Retrieve from Storage
JC300-4F.3	Radhika Mistry	Secured Storage	07/29/15 21:33	Return to Storage
JC300-4F.3	Secured Storage	Todd Shoemaker	08/04/15 09:17	Retrieve from Storage
JC300-4F.3	Todd Shoemaker	Jessica Adametz	08/04/15 09:19	Custody Transfer
JC300-4F.3	Jessica Adametz	Secured Storage	08/04/15 09:33	Return to Storage
JC300-4F.3.1	Jessica Adametz	Metals Digestion	08/04/15 09:32	Digestate from JC300-4F.3
JC300-4F.3.1	Metals Digestion	Jessica Adametz	08/04/15 09:32	Digestate from JC300-4F.3
JC300-4F.3.1	Jessica Adametz	Metals Digestate Storage	08/04/15 09:32	Return to Storage
JC300-5.1	Secured Storage	Cathy Abreu	07/30/15 09:34	Retrieve from Storage
JC300-5.1	Cathy Abreu	Secured Staging Area	07/30/15 09:34	Return to Storage
JC300-5.1	Secured Staging Area	Nicholas Goydish	07/30/15 10:07	Retrieve from Storage
JC300-5.1	Nicholas Goydish		07/30/15 12:51	Depleted
JC300-5.1.1	Nicholas Goydish	Organics Prep	07/30/15 10:07	Extract from JC300-5.1

Accutest Internal Chain of Custody

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 07/29/15

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC300-5.1.1	Organics Prep	Sara Davis	07/30/15 18:11	Extract from JC300-5.1
JC300-5.1.1	Sara Davis	Extract Storage	07/30/15 18:11	Return to Storage
JC300-5.1.1	Extract Storage	Sara Davis	07/30/15 18:11	Retrieve from Storage
JC300-5.1.1	Sara Davis	GCMS5P	07/30/15 18:11	Load on Instrument
JC300-5.1.1	GCMS5P	Alicja Pawelec	08/04/15 12:22	Unload from Instrument
JC300-5.1.1	Alicja Pawelec	Extract Freezer	08/04/15 12:22	Return to Storage
JC300-5.4	Secured Storage	Adil Quyser	07/31/15 12:59	Retrieve from Storage
JC300-5.4	Adil Quyser		07/31/15 18:36	Depleted
JC300-5.4.1	Adil Quyser	Organics Prep	07/31/15 12:59	Extract from JC300-5.4
JC300-5.4.1	Organics Prep	Adil Quyser	07/31/15 18:35	Extract from JC300-5.4
JC300-5.4.1	Adil Quyser	Extract Storage	07/31/15 18:35	Return to Storage
JC300-5.4.1	Extract Storage	Vincent Drago	08/03/15 13:50	Retrieve from Storage
JC300-5.4.1	Vincent Drago	GC7G	08/03/15 13:50	Load on Instrument
JC300-5.4.1	GC7G	Vincent Drago	08/04/15 16:14	Unload from Instrument
JC300-5.4.1	Vincent Drago	Extract Freezer	08/04/15 16:14	Return to Storage
JC300-5.5	Secured Storage	Ximena Collado	08/03/15 11:51	Retrieve from Storage
JC300-5.5	Ximena Collado	Secured Storage	08/04/15 11:23	Return to Storage
JC300-5.7	Secured Storage	Ximena Collado	07/31/15 12:44	Retrieve from Storage
JC300-5.7	Ximena Collado	Secured Storage	07/31/15 16:59	Return to Storage
JC300-5F.3	Secured Storage	Edwin Gonzalez	07/29/15 18:30	Retrieve from Storage
JC300-5F.3	Edwin Gonzalez	Secured Staging Area	07/29/15 18:31	Return to Storage
JC300-5F.3	Secured Staging Area	Radhika Mistry	07/29/15 18:40	Retrieve from Storage
JC300-5F.3	Radhika Mistry	Secured Storage	07/29/15 21:33	Return to Storage
JC300-5F.3	Secured Storage	Todd Shoemaker	08/04/15 09:17	Retrieve from Storage
JC300-5F.3	Todd Shoemaker	Jessica Adametz	08/04/15 09:19	Custody Transfer
JC300-5F.3	Jessica Adametz	Secured Storage	08/04/15 09:33	Return to Storage
JC300-5F.3.1	Jessica Adametz	Metals Digestion	08/04/15 09:32	Digestate from JC300-5F.3
JC300-5F.3.1	Metals Digestion	Jessica Adametz	08/04/15 09:32	Digestate from JC300-5F.3
JC300-5F.3.1	Jessica Adametz	Metals Digestate Storage	08/04/15 09:32	Return to Storage
JC300-6.1	Secured Storage	Cathy Abreu	07/30/15 09:34	Retrieve from Storage
JC300-6.1	Cathy Abreu	Secured Staging Area	07/30/15 09:34	Return to Storage
JC300-6.1	Secured Staging Area	Nicholas Goydish	07/30/15 10:07	Retrieve from Storage
JC300-6.1	Nicholas Goydish		07/30/15 12:51	Depleted
JC300-6.1.1	Nicholas Goydish	Organics Prep	07/30/15 10:07	Extract from JC300-6.1
JC300-6.1.1	Organics Prep	Sara Davis	07/30/15 18:11	Extract from JC300-6.1
JC300-6.1.1	Sara Davis	Extract Storage	07/30/15 18:11	Return to Storage

Accutest Internal Chain of Custody

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 07/29/15

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC300-6.1.1	Extract Storage	Sara Davis	07/30/15 18:11	Retrieve from Storage
JC300-6.1.1	Sara Davis	GCMS5P	07/30/15 18:11	Load on Instrument
JC300-6.1.1	GCMS5P	Alicja Pawelec	08/04/15 12:22	Unload from Instrument
JC300-6.1.1	Alicja Pawelec	Extract Freezer	08/04/15 12:22	Return to Storage
JC300-6.2	Secured Storage	Allan Chung-yew	07/31/15 15:34	Retrieve from Storage
JC300-6.2	Allan Chung-yew		08/01/15 11:08	Depleted
JC300-6.2.1	Allan Chung-yew	Organics Prep	07/31/15 15:44	Extract from JC300-6.2
JC300-6.2.1	Organics Prep	Joseph Baum	07/31/15 23:14	Extract from JC300-6.2
JC300-6.2.1	Joseph Baum	Extract Storage	07/31/15 23:14	Return to Storage
JC300-6.5	Secured Storage	Adil Quyser	07/31/15 12:59	Retrieve from Storage
JC300-6.5	Adil Quyser		07/31/15 18:36	Depleted
JC300-6.5.1	Adil Quyser	Organics Prep	07/31/15 12:59	Extract from JC300-6.5
JC300-6.5.1	Organics Prep	Adil Quyser	07/31/15 18:35	Extract from JC300-6.5
JC300-6.5.1	Adil Quyser	Extract Storage	07/31/15 18:35	Return to Storage
JC300-6.5.1	Extract Storage	Vincent Drago	08/03/15 13:50	Retrieve from Storage
JC300-6.5.1	Vincent Drago	GC7G	08/03/15 13:50	Load on Instrument
JC300-6.5.1	GC7G	Vincent Drago	08/04/15 16:14	Unload from Instrument
JC300-6.5.1	Vincent Drago	Extract Freezer	08/04/15 16:14	Return to Storage
JC300-6.7	Secured Storage	Ximena Collado	07/31/15 14:52	Retrieve from Storage
JC300-6.7	Ximena Collado	Secured Storage	07/31/15 16:59	Return to Storage
JC300-6F.3	Secured Storage	Edwin Gonzalez	07/29/15 18:30	Retrieve from Storage
JC300-6F.3	Edwin Gonzalez	Secured Staging Area	07/29/15 18:31	Return to Storage
JC300-6F.3	Secured Staging Area	Radhika Mistry	07/29/15 18:40	Retrieve from Storage
JC300-6F.3	Radhika Mistry	Secured Storage	07/29/15 21:33	Return to Storage
JC300-6F.3	Secured Storage	Todd Shoemaker	08/04/15 09:17	Retrieve from Storage
JC300-6F.3	Todd Shoemaker	Jessica Adametz	08/04/15 09:19	Custody Transfer
JC300-6F.3	Jessica Adametz	Secured Storage	08/04/15 09:33	Return to Storage
JC300-6F.3.1	Jessica Adametz	Metals Digestion	08/04/15 09:32	Digestate from JC300-6F.3
JC300-6F.3.1	Metals Digestion	Jessica Adametz	08/04/15 09:32	Digestate from JC300-6F.3
JC300-6F.3.1	Jessica Adametz	Metals Digestate Storage	08/04/15 09:32	Return to Storage
JC300-7.4	Secured Storage	Ximena Collado	07/31/15 12:43	Retrieve from Storage
JC300-7.4	Ximena Collado	GCMS4D	07/31/15 12:43	Load on Instrument
JC300-7.4	GCMS4D	Ximena Collado	08/03/15 11:34	Unload from Instrument
JC300-7.4	Ximena Collado	Secured Storage	08/03/15 11:34	Return to Storage
JC300-7.7	Secured Storage	Adil Quyser	07/31/15 12:59	Retrieve from Storage

Accutest Internal Chain of Custody

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 07/29/15

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JC300-7.7	Adil Quyser		07/31/15 18:36	Depleted
JC300-7.7.1	Adil Quyser	Organics Prep	07/31/15 12:59	Extract from JC300-7.7
JC300-7.7.1	Organics Prep	Adil Quyser	07/31/15 18:35	Extract from JC300-7.7
JC300-7.7.1	Adil Quyser	Extract Storage	07/31/15 18:35	Return to Storage
JC300-7.7.1	Extract Storage	Vincent Drago	08/03/15 13:50	Retrieve from Storage
JC300-7.7.1	Vincent Drago	GC7G	08/03/15 13:50	Load on Instrument
JC300-7.7.1	GC7G	Vincent Drago	08/04/15 16:14	Unload from Instrument
JC300-7.7.1	Vincent Drago	Extract Freezer	08/04/15 16:14	Return to Storage

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: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V4D2729-MB	4D61689.D	1	07/31/15	XC	n/a	n/a	V4D2729

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

JC300-1, JC300-2, JC300-3, JC300-4, JC300-5, JC300-6, JC300-7

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.24	ug/l	
135-98-8	sec-Butylbenzene	ND	2.0	0.21	ug/l	
98-06-6	tert-Butylbenzene	ND	2.0	0.28	ug/l	
110-82-7	Cyclohexane	ND	5.0	0.28	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.18	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
110-54-3	Hexane	ND	5.0	0.40	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.23	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.29	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	105%	76-120%
17060-07-0	1,2-Dichloroethane-D4	101%	73-122%
2037-26-5	Toluene-D8	100%	84-119%
460-00-4	4-Bromofluorobenzene	100%	78-117%

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

Method Blank Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V4D2730-MB	4D61718.D	1	08/03/15	XC	n/a	n/a	V4D2730

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

JC300-5

CAS No.	Compound	Result	RL	MDL	Units	Q
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	108%	76-120%
17060-07-0	1,2-Dichloroethane-D4	105%	73-122%
2037-26-5	Toluene-D8	100%	84-119%
460-00-4	4-Bromofluorobenzene	101%	78-117%

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

Blank Spike Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V4D2729-BS	4D61690.D	1	07/31/15	XC	n/a	n/a	V4D2729

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

JC300-1, JC300-2, JC300-3, JC300-4, JC300-5, JC300-6, JC300-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	54.0	108	81-119
135-98-8	sec-Butylbenzene	50	53.2	106	78-124
98-06-6	tert-Butylbenzene	50	52.1	104	77-127
110-82-7	Cyclohexane	50	56.9	114	77-125
107-06-2	1,2-Dichloroethane	50	52.1	104	78-131
100-41-4	Ethylbenzene	50	51.6	103	80-118
110-54-3	Hexane	50	42.9	86	40-144
98-82-8	Isopropylbenzene	50	51.8	104	78-125
1634-04-4	Methyl Tert Butyl Ether	100	102	102	73-122
108-88-3	Toluene	50	52.5	105	80-122
95-63-6	1,2,4-Trimethylbenzene	50	53.2	106	82-125
108-67-8	1,3,5-Trimethylbenzene	50	52.3	105	79-123
1330-20-7	Xylene (total)	150	156	104	82-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	76-120%
17060-07-0	1,2-Dichloroethane-D4	99%	73-122%
2037-26-5	Toluene-D8	101%	84-119%
460-00-4	4-Bromofluorobenzene	98%	78-117%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V4D2730-BS	4D61719.D	1	08/03/15	XC	n/a	n/a	V4D2730

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

JC300-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
1634-04-4	Methyl Tert Butyl Ether	100	96.2	96	73-122

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	108%	76-120%
17060-07-0	1,2-Dichloroethane-D4	104%	73-122%
2037-26-5	Toluene-D8	102%	84-119%
460-00-4	4-Bromofluorobenzene	98%	78-117%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB99871-14MS	4D61701.D	1	07/31/15	XC	n/a	n/a	V4D2729
JB99871-14MSD	4D61702.D	1	07/31/15	XC	n/a	n/a	V4D2729
JB99871-14 [a]	4D61692.D	1	07/31/15	XC	n/a	n/a	V4D2729

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

JC300-1, JC300-2, JC300-3, JC300-4, JC300-5, JC300-6, JC300-7

CAS No.	Compound	JB99871-14 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		50	49.9	100	50	49.4	99	1	43-138/12
135-98-8	sec-Butylbenzene	ND		50	46.4	93	50	46.3	93	0	52-138/16
98-06-6	tert-Butylbenzene	ND		50	46.8	94	50	46.2	92	1	55-137/16
110-82-7	Cyclohexane	ND		50	49.1	98	50	49.0	98	0	30-148/17
107-06-2	1,2-Dichloroethane	ND		50	52.3	105	50	51.8	104	1	72-133/12
100-41-4	Ethylbenzene	ND		50	47.8	96	50	47.8	96	0	38-139/12
110-54-3	Hexane	ND		50	47.7	95	50	47.1	94	1	20-158/19
98-82-8	Isopropylbenzene	ND		50	46.4	93	50	46.2	92	0	54-137/15
1634-04-4	Methyl Tert Butyl Ether	ND		50	51.3	103	50	53.6	107	4	64-132/13
108-88-3	Toluene	ND		50	48.8	98	50	49.3	99	1	51-136/13
95-63-6	1,2,4-Trimethylbenzene	ND		50	47.8	96	50	48.0	96	0	40-143/13
108-67-8	1,3,5-Trimethylbenzene	ND		50	47.9	96	50	47.7	95	0	54-135/14
1330-20-7	Xylene (total)	ND		150	145	97	150	145	97	0	46-137/12

CAS No.	Surrogate Recoveries	MS	MSD	JB99871-14	Limits
1868-53-7	Dibromofluoromethane	106%	107%	104%	76-120%
17060-07-0	1,2-Dichloroethane-D4	103%	103%	99%	73-122%
2037-26-5	Toluene-D8	101%	101%	100%	84-119%
460-00-4	4-Bromofluorobenzene	100%	100%	102%	78-117%

(a) (pH = 8)Sample pH did not satisfy field preservation criteria.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JC462-9MS	4D61725.D	1	08/03/15	XC	n/a	n/a	V4D2730
JC462-9MSD	4D61726.D	1	08/03/15	XC	n/a	n/a	V4D2730
JC462-9	4D61723.D	1	08/03/15	XC	n/a	n/a	V4D2730

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

JC300-5

CAS No.	Compound	JC462-9 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
1634-04-4	Methyl Tert Butyl Ether	ND		50	51.9	104	50	50.6	101	3	64-132/13

CAS No.	Surrogate Recoveries	MS	MSD	JC462-9	Limits
1868-53-7	Dibromofluoromethane	108%	108%	107%	76-120%
17060-07-0	1,2-Dichloroethane-D4	103%	103%	104%	73-122%
2037-26-5	Toluene-D8	102%	103%	101%	84-119%
460-00-4	4-Bromofluorobenzene	98%	98%	100%	78-117%

* = Outside of Control Limits.

Instrument Performance Check (BFB)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: V4D2625-BFB
Lab File ID: 4D59142.D
Instrument ID: GCMS4D
Injection Date: 04/27/15
Injection Time: 18:56

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	15990	16.3		Pass
75	30.0 - 60.0% of mass 95	42272	43.2		Pass
95	Base peak, 100% relative abundance	97931	100.0		Pass
96	5.0 - 9.0% of mass 95	6389	6.52		Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) [a]	Pass
174	50.0 - 120.0% of mass 95	85120	86.9		Pass
175	5.0 - 9.0% of mass 174	6512	6.65	(7.65) [a]	Pass
176	95.0 - 101.0% of mass 174	82229	84.0	(96.6) [a]	Pass
177	5.0 - 9.0% of mass 176	5522	5.64	(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
V4D2625-IC2625	4D59143.D	04/27/15	19:43	00:47	Initial cal 0.2
V4D2625-IC2625	4D59144.D	04/27/15	20:10	01:14	Initial cal 0.5
V4D2625-IC2625	4D59145.D	04/27/15	20:38	01:42	Initial cal 1
V4D2625-IC2625	4D59146.D	04/27/15	21:05	02:09	Initial cal 2
V4D2625-IC2625	4D59147.D	04/27/15	21:33	02:37	Initial cal 5
V4D2625-IC2625	4D59148.D	04/27/15	22:00	03:04	Initial cal 10
V4D2625-IC2625	4D59149.D	04/27/15	22:28	03:32	Initial cal 20
V4D2625-ICC2625	4D59150.D	04/27/15	22:55	03:59	Initial cal 50
V4D2625-IC2625	4D59151.D	04/27/15	23:23	04:27	Initial cal 100
V4D2625-IC2625	4D59152.D	04/27/15	23:50	04:54	Initial cal 200
V4D2625-ICV2625	4D59155.D	04/28/15	01:12	06:16	Initial cal verification 50

Instrument Performance Check (BFB)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: V4D2729-BFB
Lab File ID: 4D61686.D
Instrument ID: GCMS4D
Injection Date: 07/31/15
Injection Time: 10:31

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	12548	15.9		Pass
75	30.0 - 60.0% of mass 95	33341	42.1		Pass
95	Base peak, 100% relative abundance	79120	100.0		Pass
96	5.0 - 9.0% of mass 95	5220	6.60		Pass
173	Less than 2.0% of mass 174	295	0.37	(0.41) [a]	Pass
174	50.0 - 120.0% of mass 95	71749	90.7		Pass
175	5.0 - 9.0% of mass 174	5443	6.88	(7.59) [a]	Pass
176	95.0 - 101.0% of mass 174	69379	87.7	(96.7) [a]	Pass
177	5.0 - 9.0% of mass 176	4623	5.84	(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
V4D2729-CC2625	4D61687.D	07/31/15	11:01	00:30	Continuing cal 20
V4D2729-MB	4D61689.D	07/31/15	11:55	01:24	Method Blank
V4D2729-BS	4D61690.D	07/31/15	12:22	01:51	Blank Spike
JB99871-14	4D61692.D	07/31/15	13:16	02:45	(used for QC only; not part of job JC300)
ZZZZZZ	4D61693.D	07/31/15	13:44	03:13	(unrelated sample)
ZZZZZZ	4D61694.D	07/31/15	14:11	03:40	(unrelated sample)
ZZZZZZ	4D61695.D	07/31/15	14:38	04:07	(unrelated sample)
ZZZZZZ	4D61696.D	07/31/15	15:05	04:34	(unrelated sample)
ZZZZZZ	4D61697.D	07/31/15	15:32	05:01	(unrelated sample)
ZZZZZZ	4D61698.D	07/31/15	16:10	05:39	(unrelated sample)
ZZZZZZ	4D61699.D	07/31/15	16:37	06:06	(unrelated sample)
ZZZZZZ	4D61700.D	07/31/15	17:05	06:34	(unrelated sample)
JB99871-14MS	4D61701.D	07/31/15	17:32	07:01	Matrix Spike
JB99871-14MSD	4D61702.D	07/31/15	17:59	07:28	Matrix Spike Duplicate
JC300-7	4D61704.D	07/31/15	18:53	08:22	TRIP BLANK
ZZZZZZ	4D61705.D	07/31/15	19:20	08:49	(unrelated sample)
JC300-1	4D61706.D	07/31/15	19:47	09:16	AOI5_MW-510_072915
JC300-2	4D61707.D	07/31/15	20:14	09:43	AOI4_MW-504_072915
JC300-3	4D61708.D	07/31/15	20:41	10:10	AOI4_MW-505_072915
JC300-4	4D61709.D	07/31/15	21:09	10:38	AOI4_MW-506_072915
JC300-4	4D61710.D	07/31/15	21:36	11:05	AOI4_MW-506_072915
JC300-5	4D61711.D	07/31/15	22:02	11:31	AOI4_MW-508_072915
JC300-6	4D61712.D	07/31/15	22:29	11:58	AOI4_MW-507_072915

Instrument Performance Check (BFB)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: V4D2730-BFB
Lab File ID: 4D61714.D
Instrument ID: GCMS4D
Injection Date: 08/03/15
Injection Time: 08:42

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	13212	16.7		Pass
75	30.0 - 60.0% of mass 95	34645	43.8		Pass
95	Base peak, 100% relative abundance	79043	100.0		Pass
96	5.0 - 9.0% of mass 95	5375	6.80		Pass
173	Less than 2.0% of mass 174	246	0.31	(0.36) [a]	Pass
174	50.0 - 120.0% of mass 95	67720	85.7		Pass
175	5.0 - 9.0% of mass 174	5170	6.54	(7.63) [a]	Pass
176	95.0 - 101.0% of mass 174	65597	83.0	(96.9) [a]	Pass
177	5.0 - 9.0% of mass 176	4571	5.78	(6.97) [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
V4D2730-CC2625	4D61716.D	08/03/15	10:10	01:28	Continuing cal 20
V4D2730-MB	4D61718.D	08/03/15	11:19	02:37	Method Blank
V4D2730-BS	4D61719.D	08/03/15	11:46	03:04	Blank Spike
ZZZZZZ	4D61720.D	08/03/15	12:32	03:50	(unrelated sample)
ZZZZZZ	4D61721.D	08/03/15	12:59	04:17	(unrelated sample)
JC300-5	4D61722.D	08/03/15	13:26	04:44	AOI4_MW-508_072915
JC462-9	4D61723.D	08/03/15	13:53	05:11	(used for QC only; not part of job JC300)
ZZZZZZ	4D61724.D	08/03/15	14:20	05:38	(unrelated sample)
JC462-9MS	4D61725.D	08/03/15	15:08	06:26	Matrix Spike
JC462-9MSD	4D61726.D	08/03/15	15:35	06:53	Matrix Spike Duplicate
ZZZZZZ	4D61728.D	08/03/15	16:32	07:50	(unrelated sample)
ZZZZZZ	4D61731.D	08/03/15	17:53	09:11	(unrelated sample)
ZZZZZZ	4D61733.D	08/03/15	18:48	10:06	(unrelated sample)
ZZZZZZ	4D61737.D	08/03/15	20:36	11:54	(unrelated sample)

Volatile Internal Standard Area Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	V4D2729-CC2625	**Injection Date:**	07/31/15
Lab File ID:	4D61687.D	**Injection Time:**	11:01
Instrument ID:	GCMS4D	**Method:**	SW846 8260C

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
Check Std	87995	6.98	222776	9.56	289652	10.52	260616	13.89	140612	16.31
Upper Limit [a]	175990	7.48	445552	10.06	579304	11.02	521232	14.39	281224	16.81
Lower Limit [b]	43998	6.48	111388	9.06	144826	10.02	130308	13.39	70306	15.81

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
V4D2729-MB	82656	6.98	226833	9.56	298535	10.52	265498	13.89	142196	16.31
V4D2729-BS	89722	6.98	214707	9.56	281514	10.52	253064	13.89	137452	16.32
JB99871-14	76516	6.98	229217	9.56	300981	10.52	269789	13.89	141759	16.32
ZZZZZZ	85080	6.98	228157	9.56	300598	10.52	267743	13.89	141926	16.32
ZZZZZZ	79590	6.98	220089	9.56	290516	10.52	259565	13.89	138576	16.32
ZZZZZZ	83364	6.98	218985	9.56	293368	10.52	257298	13.89	137001	16.32
ZZZZZZ	79952	6.98	213859	9.56	283159	10.52	251121	13.89	135282	16.32
ZZZZZZ	85886	6.99	220560	9.56	292247	10.52	257446	13.89	138624	16.31
ZZZZZZ	81961	6.98	216104	9.56	285289	10.52	254014	13.89	137621	16.32
ZZZZZZ	83309	6.98	215955	9.56	286762	10.52	252095	13.89	135686	16.32
ZZZZZZ	80628	6.98	214729	9.56	286319	10.52	251844	13.89	137160	16.32
JB99871-14MS	82772	6.98	211550	9.56	276752	10.52	248244	13.89	135287	16.32
JB99871-14MSD	83503	6.98	206408	9.56	273007	10.52	245638	13.88	135844	16.31
JC300-7	84181	6.98	220786	9.56	289407	10.51	258217	13.88	139086	16.31
ZZZZZZ	80800	6.98	213439	9.56	282171	10.52	250435	13.88	134815	16.31
JC300-1	84571	6.97	214381	9.56	280887	10.51	248122	13.88	134150	16.32
JC300-2	77869	6.98	204032	9.56	269271	10.51	245681	13.89	131196	16.32
JC300-3	78030	6.99	213292	9.56	280283	10.52	247873	13.89	134067	16.32
JC300-4	76668	6.98	202415	9.56	263987	10.52	232419	13.88	126209	16.32
JC300-4	72414	6.98	196972	9.56	259746	10.52	229019	13.89	125283	16.32
JC300-5	74764	6.98	207111	9.56	272413	10.51	240936	13.89	131472	16.31
JC300-6	74690	6.98	207187	9.56	270439	10.52	244228	13.89	131135	16.31

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: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	V4D2730-CC2625	**Injection Date:**	08/03/15
Lab File ID:	4D61716.D	**Injection Time:**	10:10
Instrument ID:	GCMS4D	**Method:**	SW846 8260C

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
Check Std	83485	6.98	217741	9.56	287469	10.52	265134	13.89	144027	16.31
Upper Limit [a]	166970	7.48	435482	10.06	574938	11.02	530268	14.39	288054	16.81
Lower Limit [b]	41743	6.48	108871	9.06	143735	10.02	132567	13.39	72014	15.81

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
V4D2730-MB	73762	6.98	203175	9.56	270829	10.51	246058	13.89	130485	16.32
V4D2730-BS	83231	6.98	210708	9.56	278986	10.52	256689	13.89	141030	16.32
ZZZZZZ	88387	6.98	226182	9.56	296303	10.52	267648	13.89	144368	16.31
ZZZZZZ	72760	6.99	217457	9.56	286656	10.52	256546	13.89	136285	16.31
JC300-5	58589	6.98	224071	9.56	293595	10.52	266968	13.89	141787	16.31
JC462-9	55865	6.98	215914	9.56	283687	10.52	256892	13.89	137896	16.32
ZZZZZZ	59037	6.98	215822	9.56	285452	10.52	254449	13.89	136690	16.32
JC462-9MS	68292	6.98	215466	9.57	281833	10.52	259351	13.89	144071	16.32
JC462-9MSD	72339	6.98	219727	9.56	289118	10.52	263984	13.89	146749	16.31
ZZZZZZ	73108	6.98	215901	9.56	284559	10.52	254556	13.89	140813	16.32
ZZZZZZ	80722	6.98	228683	9.56	299218	10.51	267234	13.88	151753	16.31
ZZZZZZ	84813	6.98	230020	9.56	302560	10.52	270464	13.89	149505	16.32
ZZZZZZ	80635	6.98	235517	9.56	306102	10.52	272762	13.89	148813	16.32

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: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8260C **Matrix:** AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4
JC300-1	4D61706.D	107	105	101	99
JC300-2	4D61707.D	107	106	103	100
JC300-3	4D61708.D	107	106	101	99
JC300-4	4D61709.D	107	105	100	99
JC300-4	4D61710.D	107	106	100	99
JC300-5	4D61711.D	107	104	101	99
JC300-5	4D61722.D	106	103	101	99
JC300-6	4D61712.D	107	106	102	101
JC300-7	4D61704.D	107	104	100	99
JB99871-14MS	4D61701.D	106	103	101	100
JB99871-14MSD	4D61702.D	107	103	101	100
JC462-9MS	4D61725.D	108	103	102	98
JC462-9MSD	4D61726.D	108	103	103	98
V4D2729-BS	4D61690.D	105	99	101	98
V4D2729-MB	4D61689.D	105	101	100	100
V4D2730-BS	4D61719.D	108	104	102	98
V4D2730-MB	4D61718.D	108	105	100	101

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	76-120%
S2 = 1,2-Dichloroethane-D4	73-122%
S3 = Toluene-D8	84-119%
S4 = 4-Bromofluorobenzene	78-117%

Initial Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: V4D2625-ICC2625
Lab FileID: 4D59150.D

Response Factor Report MS4D

```
Method       : C:\MSDCHEM\1\METHODS\M4D2625.M (RTE Integrator)
Title        : SW-846 Method 8260C
Last Update  : Tue Apr 28 10:34:28 2015
Response via : Initial Calibration

Calibration Files
10  =4d59148.D   0.5 =4d59144.D   5   =4d59147.D   50  =4d59150.D
100 =4d59151.D   1   =4d59145.D   200 =4d59152.D   20  =4d59149.D
2   =4d59146.D   0.2 =4d59143.D       =                =

Compound
        10    0.5   5     50    100   1     200   20    2     0.2    Avg   %RSD
-------------------------------------------------------------------------------

1) I   Tert Butyl Alcohol-d9 ----------------ISTD---------------------
2)  1,4-dioxane
     0.136       0.128 0.128 0.130       0.117 0.137 0.143        0.131    6.36
3)  tertiary butyl alcohol
     1.403       1.387 1.346 1.330       1.191 1.382 1.456        1.357    6.15

4) I   pentafluorobenzene    ----------------ISTD---------------------
5)  chlorodifluoromethane
     0.525       0.545 0.465 0.493 0.511 0.515 0.537 0.577        0.521    6.50
6)  dichlorodifluoromethane
     0.655       0.650 0.570 0.644 0.587 0.632 0.643 0.587        0.621    5.45
7)  chloromethane
     0.715 0.713 0.731 0.651 0.692 0.730 0.691 0.712 0.724        0.707    3.59
8)  vinyl chloride
     0.654 0.468 0.649 0.573 0.640 0.633 0.631 0.643 0.637        0.614    9.73
9)  acetaldehyde
                                                                  0.000   -1.00
10)  bromomethane
     0.464 0.499 0.470 0.415 0.428 0.488 0.386 0.463 0.488 0.633  0.473   14.03
11)  chloroethane
     0.320       0.324 0.285 0.301 0.304 0.284 0.312 0.309        0.305    4.77
12)  trichlorofluoromethane
     0.782       0.781 0.678 0.747 0.719 0.732 0.776 0.740        0.745    4.80
13)  vinyl bromide
                                                                  0.000   -1.00
14)  ethyl ether
     0.257       0.268 0.286 0.272 0.220 0.276 0.275 0.254        0.264    7.67
15)  pentane
                                                                  0.000   -1.00
16)  2-chloropropane
                                                                  0.000   -1.00
17)  acrolein
     0.109       0.109 0.115 0.109 0.092 0.109 0.109 0.109        0.108    6.11
18)  1,1-dichloroethene
     0.465 0.367 0.468 0.425 0.435 0.449 0.460 0.467 0.483        0.447    7.78
19)  acetone
     0.046       0.043 0.054 0.051       0.052 0.050              0.049    8.21
20)  allyl chloride
     0.246       0.251 0.231 0.228 0.210 0.241 0.243 0.248        0.237    5.69
21)  acetonitrile
     0.030       0.028 0.035 0.036       0.035 0.033 0.029        0.032    9.20
22)  iodomethane
     0.951 0.850 0.967 0.935 0.924 0.924 0.961 0.974 1.000 0.742  0.923    8.16
23)  iso-butyl alcohol
```

Initial Calibration Summary

Job Number: JC300 **Sample:** V4D2625-ICC2625
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 4D59150.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
      0.022       0.022 0.022 0.020 0.019 0.020 0.022 0.029        0.022   13.20
24)  carbon disulfide
      1.664 1.538 1.701 1.576 1.617 1.685 1.706 1.711 1.763        1.662    4.34
25)  methylene chloride
      0.548 0.634 0.559 0.553 0.532 0.571 0.555 0.554 0.597 0.678  0.578    7.87
26)  1-chloropropane
                                                                   0.000   -1.00
27)  methyl acetate
      0.082       0.074 0.091 0.090       0.090 0.084 0.066        0.082   11.57
28)  methyl tert butyl ether
      1.451 1.367 1.503 1.502 1.405 1.428 1.424 1.478 1.550 1.462  1.457    3.70
29)  trans-1,2-dichloroethene
      0.509 0.507 0.529 0.497 0.490 0.539 0.511 0.524 0.544        0.517    3.61
30)  di-isopropyl ether
      1.675 1.769 1.744 1.643 1.632 1.577 1.639 1.691 1.838 1.675  1.688    4.53
31)  ethyl tert-butyl ether
      1.587 1.578 1.607 1.556 1.552 1.471 1.558 1.597 1.681 1.336  1.552    5.96
32)  2-butanone
      0.062       0.060 0.070 0.066       0.066 0.065 0.049        0.063   10.86
33)  1,1-dichloroethane
      0.942 0.876 0.981 0.931 0.910 0.911 0.942 0.971 0.981        0.938    3.79
34)  chloroprene
      0.706 0.535 0.728 0.639 0.662 0.617 0.685 0.707 0.737        0.668    9.58
35)  acrylonitrile
      0.198 0.143 0.204 0.217 0.203 0.173 0.206 0.206 0.205        0.195   11.63
36)  vinyl acetate
      0.072       0.069 0.089 0.086       0.086 0.079 0.052        0.076   16.92
37)  ethyl acetate
      0.080       0.098 0.083 0.079       0.079 0.081 0.097        0.085    9.89
38)  2,2-dichloropropane
      0.707 0.659 0.712 0.652 0.644 0.738 0.661 0.703 0.734        0.690    5.27
39)  cis-1,2-dichloroethene
      0.564 0.576 0.604 0.570 0.559 0.586 0.579 0.582 0.612 0.447  0.568    8.00
40)  propionitrile
      0.078       0.080 0.086 0.079 0.068 0.079 0.081 0.080        0.079    6.21
41)  methyl acrylate
      0.499       0.528 0.537 0.506       0.512 0.508 0.600        0.527    6.60
42)  bromochloromethane
      0.304 0.233 0.311 0.312 0.299 0.271 0.308 0.308 0.312        0.295    9.00
43)  tetrahydrofuran
      0.182       0.232 0.184 0.169       0.170 0.178              0.186   12.43
44)  chloroform
      0.938 0.947 0.968 0.930 0.900 0.943 0.932 0.962 1.005 1.097  0.962    5.70
45)  dibromofluoromethane (s)
      0.443 0.441 0.447 0.446 0.439 0.440 0.440 0.444 0.443 0.440  0.442    0.65
46)  1,2-dichloroethane-d4 (s)
      0.453 0.445 0.457 0.452 0.442 0.444 0.439 0.455 0.453 0.442  0.448    1.40
47)  freon 113
      0.325       0.328 0.282 0.293 0.260 0.314 0.323 0.321        0.306    8.06
48)  methacrylonitrile
      0.355       0.367 0.376 0.351 0.435 0.355 0.357 0.400        0.375    7.77
49)  1,1,1-trichloroethane
      0.756 0.617 0.787 0.708 0.718 0.713 0.751 0.769 0.767 0.625  0.721    8.18
50)  tert-amyl methyl ether
      1.503 1.515 1.543 1.462 1.445 1.423 1.440 1.496 1.616 1.273  1.472    6.12

51) I   1,4-difluorobenzene   ----------------ISTD---------------------
52)  epichlorohydrin
      0.045       0.045 0.047 0.046 0.043 0.045 0.045 0.050        0.046    4.32
53)  n-butyl alcohol
```

Initial Calibration Summary

Job Number: JC300 **Sample:** V4D2625-ICC2625
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 4D59150.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
      0.013 0.010 0.012 0.014 0.013 0.011 0.013 0.013 0.014        0.012   11.68
54)  cyclohexane
      0.519 0.302 0.528 0.455 0.475 0.504 0.499 0.526 0.522        0.481   14.84
55)  tert amyl alcohol
                                                                   0.000   -1.00
56)  carbon tetrachloride
      0.528 0.397 0.532 0.492 0.509 0.511 0.528 0.536 0.531        0.507    8.61
57)  1,1-dichloropropene
      0.541 0.461 0.554 0.503 0.516 0.522 0.538 0.549 0.557        0.527    5.81
58)  hexane
      0.421 0.290 0.422 0.363 0.379 0.405 0.400 0.414 0.449        0.394   11.71
59)  benzene
      1.566 1.421 1.572 1.512 1.509 1.517 1.542 1.575 1.654 1.494  1.536    4.02
60)  ISO-OCTANE
      1.252 0.977 1.267 1.092 1.138 1.190 1.181 1.250 1.341        1.187    9.13
61)  heptane
      0.251 0.202 0.245 0.214 0.230 0.230 0.236 0.248 0.262        0.235    7.94
62)  isopropyl acetate
      0.816 0.895 0.826 0.826 0.816 0.858 0.804 0.802 0.915        0.840    4.84
63)  1,2-dichloroethane
      0.536 0.484 0.541 0.548 0.529 0.527 0.528 0.546 0.571 0.509  0.532    4.42
64)  trichloroethene
      0.417 0.362 0.428 0.402 0.407 0.408 0.427 0.425 0.435        0.412    5.33
65)  ethyl acrylate
                                                                   0.000   -1.00
66)  2-nitropropane
      0.123       0.132 0.127 0.121       0.128 0.123 0.160        0.131   10.18
67)  2-chloroethyl vinyl ether
      0.275 0.250 0.276 0.275 0.281 0.242 0.272 0.275 0.294        0.271    5.78
68)  methyl methacrylate
      0.376 0.513 0.318 0.402 0.386 0.408 0.381 0.377 0.520        0.409   16.15
69)  1,2-dichloropropane
      0.430 0.381 0.438 0.424 0.422 0.427 0.435 0.442 0.451        0.428    4.64
70)  methylcyclohexane
      0.593       0.603 0.504 0.540 0.530 0.576 0.589 0.618        0.569    7.00
71)  tert-amyl ethyl ether
                                                                   0.000   -1.00
72)  dibromomethane
      0.295 0.258 0.300 0.303 0.294 0.293 0.299 0.300 0.306        0.294    4.85
73)  bromodichloromethane
      0.569 0.545 0.571 0.581 0.573 0.542 0.597 0.582 0.591 0.520  0.567    4.29
74)  cis-1,3-dichloropropene
      0.686 0.648 0.684 0.697 0.701 0.640 0.713 0.703 0.717 0.658  0.685    3.96
75)  toluene-d8 (s)
      1.132 1.133 1.133 1.135 1.158 1.143 1.162 1.132 1.140 1.137  1.141    0.96
76)  4-methyl-2-pentanone
      0.181       0.179 0.195 0.182 0.186 0.186 0.181 0.198        0.186    3.78
77)  toluene
      0.954 0.930 0.977 0.925 0.938 0.934 0.971 0.965 1.005 1.055  0.965    4.17
78)  3-methyl-1-butanol
      0.011       0.011 0.013 0.012 0.009 0.012 0.012 0.013        0.012    9.95
79)  trans-1,3-dichloropropene
      0.628 0.583 0.624 0.650 0.651 0.600 0.660 0.638 0.640 0.597  0.627    4.14
80)  ethyl methacrylate
      0.546 0.509 0.545 0.577 0.559 0.515 0.574 0.552 0.580 0.456  0.541    7.10
81)  1,1,2-trichloroethane
      0.343 0.324 0.345 0.358 0.350 0.342 0.357 0.349 0.366 0.311  0.345    4.75
82)  2-hexanone
      0.174       0.172 0.186 0.174 0.157 0.179 0.172 0.187        0.175    5.47
```

Initial Calibration Summary

Job Number: JC300 **Sample:** V4D2625-ICC2625
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 4D59150.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
 83) I   chlorobenzene-d5      ----------------ISTD--------------------
 84)  tetrachloroethene
       0.524 0.445 0.538 0.490 0.499 0.530 0.513 0.525 0.538 0.474  0.508    6.04
 85)  1,3-dichloropropane
       0.724 0.726 0.730 0.739 0.716 0.702 0.722 0.724 0.774 0.659  0.722    4.01
 86)  butyl acetate
       0.343 0.329 0.338 0.344 0.340 0.311 0.332 0.336 0.379 0.318  0.337    5.38
 87)  dibromochloromethane
       0.557 0.504 0.563 0.593 0.585 0.551 0.590 0.576 0.591 0.523  0.563    5.39
 88)  1,2-dibromoethane
       0.499 0.460 0.505 0.519 0.507 0.465 0.508 0.502 0.536 0.458  0.496    5.31
 89)  n-Butyl Ether
       2.006       2.051 1.986 1.956       1.971 2.044 2.154        2.024    3.32
 90)  chlorobenzene
       1.262 1.199 1.312 1.259 1.239 1.254 1.244 1.289 1.345 1.347  1.275    3.74
 91)  1,1,1,2-tetrachloroethane
       0.481 0.436 0.485 0.488 0.480 0.433 0.488 0.487 0.508 0.414  0.470    6.55
 92)  ethylbenzene
       2.152 1.947 2.203 2.058 2.065 2.099 2.108 2.170 2.262 2.286  2.135    4.77
 93)  m,p-xylene
       0.808 0.775 0.822 0.781 0.770 0.790 0.790 0.820 0.856 0.853  0.807    3.83
 94)  o-xylene
       0.817 0.736 0.822 0.799 0.789 0.759 0.805 0.831 0.881 0.793  0.803    4.96
 95)  styrene
       1.388 1.274 1.392 1.382 1.372 1.310 1.390 1.404 1.416 1.248  1.358    4.31
 96)  butyl acrylate
                                                                    0.000   -1.00
 97)  bromoform
       0.396 0.338 0.403 0.442 0.435 0.360 0.440 0.419 0.413 0.342  0.399    9.88

 98) I   1,4-dichlorobenzene-d ----------------ISTD--------------------
 99)  isopropylbenzene
       3.871 3.432 4.007 3.699 3.753 3.778 3.905 3.950 3.997 3.791  3.818    4.50
100)  4-bromofluorobenzene (s)
       0.936 0.959 0.939 0.927 0.935 0.947 0.938 0.953 0.938 0.942  0.942    0.98
101)  bromobenzene
       1.086 1.035 1.114 1.102 1.083 1.059 1.098 1.124 1.156 0.961  1.082    4.99
102)  cyclohexanone
       0.112       0.108 0.125 0.112       0.091 0.118              0.111   10.47
103)  1,1,2,2-tetrachloroethane
       1.307 1.264 1.354 1.377 1.326 1.338 1.346 1.331 1.402 1.372  1.342    2.90
104)  trans-1,4-dichloro-2-butene
       0.259 0.195 0.257 0.298 0.292 0.248 0.300 0.275 0.264        0.266   12.18
105)  1,2,3-trichloropropane
       0.302 0.257 0.313 0.312 0.296 0.282 0.302 0.311 0.312        0.298    6.22
106)  n-propylbenzene
       4.496 3.999 4.639 4.325 4.360 4.431 4.438 4.616 4.591 4.295  4.419    4.32
107)  2-chlorotoluene
       0.978 0.855 0.986 0.959 0.948 0.953 0.973 1.005 1.023 0.785  0.947    7.64
108)  4-chlorotoluene
       2.853 2.770 2.921 2.845 2.803 2.855 2.854 2.924 3.033 2.891  2.875    2.54
109)  1,3,5-trimethylbenzene
       3.242 2.970 3.375 3.188 3.151 3.071 3.243 3.312 3.318 3.017  3.189    4.25
110)  tert-butylbenzene
       2.779 2.519 2.766 2.589 2.655 2.725 2.763 2.784 2.803 2.487  2.687    4.36
111)  pentachloroethane
       0.680 0.504 0.681 0.704 0.692 0.611 0.705 0.697 0.700 0.513  0.649   12.17
112)  1,2,4-trimethylbenzene
       3.213 3.073 3.309 3.186 3.187 3.183 3.270 3.323 3.360 3.618  3.272    4.52
113)  sec-butylbenzene
```

Initial Calibration Summary

Job Number: JC300 **Sample:** V4D2625-ICC2625
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 4D59150.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
       4.310 3.809 4.377 4.105 4.185 4.146 4.288 4.394 4.447 3.916  4.198    5.00
114)  1,3-dichlorobenzene
       2.019 1.928 2.079 2.026 1.980 1.986 2.023 2.054 2.093 2.131  2.032    2.94
115)  p-isopropyltoluene
       3.544 3.126 3.561 3.394 3.392 3.399 3.486 3.589 3.593 3.412  3.450    4.07
116)  1,4-dichlorobenzene
       2.034 2.058 2.094 2.054 2.022 2.035 2.068 2.054 2.136 2.320  2.088    4.22
117)  1,2-dichlorobenzene
       2.012 1.936 2.066 2.037 1.983 1.944 1.981 2.028 2.097 2.132  2.022    3.16
118)  n-butylbenzene
       1.825 1.488 1.876 1.824 1.838 1.700 1.884 1.914 1.854 1.627  1.783    7.61
119)  1,2-dibromo-3-chloropropane
       0.226       0.219 0.245 0.231 0.236 0.231 0.223 0.235        0.231    3.56
120)  1,3,5-trichlorobenzene
       1.578 1.387 1.608 1.624 1.598 1.503 1.619 1.636 1.613 1.589  1.575    4.82
121)  1,2,4-trichlorobenzene
       1.443 1.342 1.452 1.532 1.521 1.347 1.536 1.514 1.455 1.417  1.456    4.94
122)  hexachlorobutadiene
       0.731 0.557 0.730 0.717 0.736 0.710 0.739 0.767 0.723        0.712    8.50
123)  naphthalene
       3.585 3.174 3.575 3.954 3.801 3.452 3.764 3.747 3.659 4.097  3.681    7.04
124)  1,2,3-trichlorobenzene
       1.345 1.167 1.369 1.446 1.421 1.282 1.436 1.423 1.433 1.265  1.359    6.90
125)  hexachloroethane
       0.698 0.574 0.703 0.733 0.746 0.623 0.787 0.745 0.706        0.701    9.37
126)  Benzyl chloride
       2.146 2.122 2.133 2.244 2.242 1.907 2.206 2.174 2.312 2.179  2.166    5.00
 ------------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

          M4D2625.M         Tue Apr 28 11:18:40 2015   RPT1
```

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: V4D2625-ICV2625
Lab FileID: 4D59155.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\4d59155.D Vial: 15
Acq On : 28 Apr 2015 1:12 am Operator: mihirm
Sample : icv2625-50 Inst : MS4D
Misc : MS83980,V4D2625,5,,,,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M4D2625.M (RTE Integrator)
Title : SW-846 Method 8260C
Last Update : Tue Apr 28 10:34:28 2015
Response via : Multiple Level Calibration

Min. RRF : 0.000 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	Tert Butyl Alcohol-d9	1.000	1.000	0.0	86	0.00	6.99
2		1,4-dioxane	0.131	0.127	3.1	85	0.00	11.27
3	M	tertiary butyl alcohol	1.357	1.467	-8.1	94	0.00	7.13
4	I	pentafluorobenzene	1.000	1.000	0.0	100	0.00	9.57
5		chlorodifluoromethane	0.521	0.464	10.9	99	0.00	3.36
6		dichlorodifluoromethane	0.621	0.545	12.2	95	0.00	3.34
7		chloromethane	0.707	0.713	-0.8	109	0.00	3.67
8		vinyl chloride	0.614	0.635	-3.4	110	0.00	3.93
9		acetaldehyde		----------NA----------				
10		bromomethane	0.473	0.476	-0.6	114	0.00	4.59
11		chloroethane	0.305	0.353	-15.7	123	0.00	4.79
12		trichlorofluoromethane	0.745	0.713	4.3	105	0.00	5.33
13		vinyl bromide		----------NA----------				
14		ethyl ether	0.264	0.278	-5.3	97	0.00	5.79
15		pentane		----------NA----------				
16		2-chloropropane		----------NA----------				
17		acrolein	0.108	0.126	-16.7	109	0.00	6.00
18		1,1-dichloroethene	0.447	0.446	0.2	104	0.00	6.22
19		acetone	0.049	0.048	2.0	88	0.00	6.27
20		allyl chloride	0.237	0.262	-10.5	113	0.00	6.81
21		acetonitrile	0.032	0.034	-6.3	97	0.00	6.72
22		iodomethane	0.923	0.941	-2.0	100	0.00	6.49
23		iso-butyl alcohol	0.022	0.020	9.1	92	0.00	9.85
24		carbon disulfide	1.662	1.611	3.1	102	0.00	6.63
25		methylene chloride	0.578	0.549	5.0	99	0.00	7.00
26		1-chloropropane		----------NA----------				
27		methyl acetate	0.082	0.087	-6.1	95	0.00	6.82
28		methyl tert butyl ether	1.457	1.443	1.0	96	0.00	7.45
29		trans-1,2-dichloroethene	0.517	0.502	2.9	101	0.00	7.46
30		di-isopropyl ether	1.688	1.709	-1.2	103	0.00	8.18
31		ethyl tert-butyl ether	1.552	1.583	-2.0	101	0.00	8.70
32		2-butanone	0.063	0.065	-3.2	92	0.00	8.91
33	M	1,1-dichloroethane	0.938	0.938	0.0	100	0.00	8.10
34		chloroprene	0.668	0.628	6.0	98	0.00	8.25
35		acrylonitrile	0.195	0.212	-8.7	97	0.00	7.36
36		vinyl acetate	0.076	0.089	-17.1	100	0.00	8.14
37		ethyl acetate	0.085	0.081	4.7	97	0.00	8.97
38		2,2-dichloropropane	0.690	0.639	7.4	98	0.00	8.95
39		cis-1,2-dichloroethene	0.568	0.570	-0.4	100	0.00	8.93
40		propionitrile	0.079	0.082	-3.8	95	0.00	8.97
41		methyl acrylate	0.527	0.496	5.9	92	0.00	9.04

Initial Calibration Verification

Job Number: JC300 **Sample:** V4D2625-ICV2625
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 4D59155.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

42		bromochloromethane	0.295	0.299	-1.4	95	0.00	9.25
43		tetrahydrofuran	0.186	0.170	8.6	92	0.00	9.32
44		chloroform	0.962	0.932	3.1	100	0.00	9.34
45	S	dibromofluoromethane (s)	0.442	0.442	0.0	98	0.00	9.55
46	S	1,2-dichloroethane-d4 (s)	0.448	0.439	2.0	97	0.00	10.00
47		freon 113	0.306	0.325	-6.2	115	0.00	6.24
48		methacrylonitrile	0.375	0.349	6.9	92	0.00	9.20
49		1,1,1-trichloroethane	0.721	0.746	-3.5	105	0.00	9.63
50		tert-amyl methyl ether	1.472	1.494	-1.5	102	0.00	10.20
51	I	1,4-difluorobenzene	1.000	1.000	0.0	98	0.00	10.52
52		epichlorohydrin	0.046	0.046	0.0	96	0.00	11.82
53		n-butyl alcohol	0.012	0.013	-8.3	92	0.00	10.65
54	M	cyclohexane	0.481	0.485	-0.8	104	0.00	9.73
55		tert amyl alcohol		----------NA----------				
56		carbon tetrachloride	0.507	0.526	-3.7	105	0.00	9.86
57		1,1-dichloropropene	0.527	0.526	0.2	102	0.00	9.83
58		hexane	0.394	0.369	6.3	100	0.00	7.88
59	M	benzene	1.536	1.564	-1.8	101	0.00	10.10
60		ISO-OCTANE	1.187	1.102	7.2	99	0.00	10.19
61		heptane	0.235	0.225	4.3	103	0.00	10.38
62		isopropyl acetate	0.840	0.813	3.2	96	0.00	10.09
63		1,2-dichloroethane	0.532	0.538	-1.1	96	0.00	10.09
64		trichloroethene	0.412	0.417	-1.2	101	0.00	10.87
65		ethyl acrylate		----------NA----------				
66		2-nitropropane	0.131	0.118	9.9	91	0.00	11.67
67		2-chloroethyl vinyl ether	0.271	0.298	-10.0	106	0.00	11.73
68		methyl methacrylate	0.409	0.400	2.2	98	0.00	11.19
69		1,2-dichloropropane	0.428	0.429	-0.2	99	0.00	11.13
70		methylcyclohexane	0.569	0.563	1.1	109	0.00	11.14
71	M	tert-amyl ethyl ether		----------NA----------				
72		dibromomethane	0.294	0.298	-1.4	96	0.00	11.28
73		bromodichloromethane	0.567	0.570	-0.5	96	0.00	11.43
74		cis-1,3-dichloropropene	0.685	0.668	2.5	94	0.00	11.94
75	S	toluene-d8 (s)	1.141	1.147	-0.5	99	0.00	12.27
76		4-methyl-2-pentanone	0.186	0.185	0.5	93	0.00	12.08
77		toluene	0.965	0.949	1.7	101	0.00	12.35
78		3-methyl-1-butanol	0.012	0.011	8.3	88	0.00	12.09
79		trans-1,3-dichloropropene	0.627	0.624	0.5	94	0.00	12.55
80		ethyl methacrylate	0.541	0.543	-0.4	92	0.00	12.60
81		1,1,2-trichloroethane	0.345	0.352	-2.0	96	0.00	12.77
82		2-hexanone	0.175	0.179	-2.3	94	0.00	13.00
83	I	chlorobenzene-d5	1.000	1.000	0.0	99	0.00	13.89
84		tetrachloroethene	0.508	0.519	-2.2	105	0.00	12.99
85		1,3-dichloropropane	0.722	0.717	0.7	96	0.00	12.96
86		butyl acetate	0.337	0.337	0.0	97	0.00	13.11
87		dibromochloromethane	0.563	0.574	-2.0	96	0.00	13.24
88		1,2-dibromoethane	0.496	0.502	-1.2	96	0.00	13.39
89		n-Butyl Ether	2.024	2.111	-4.3	105	0.00	13.91
90		chlorobenzene	1.275	1.269	0.5	100	0.00	13.92
91		1,1,1,2-tetrachloroethane	0.470	0.477	-1.5	97	0.00	13.99
92		ethylbenzene	2.135	2.082	2.5	100	0.00	14.01
93		m,p-xylene	0.807	0.794	1.6	101	0.00	14.13
94		o-xylene	0.803	0.793	1.2	98	0.00	14.57
95		styrene	1.358	1.392	-2.5	100	0.00	14.57
96		butyl acrylate		----------NA----------				
97		bromoform	0.399	0.419	-5.0	94	0.00	14.81
98	I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	100	0.00	16.31

Initial Calibration Verification

Job Number: JC300 **Sample:** V4D2625-ICV2625
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 4D59155.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

99		isopropylbenzene	3.818	3.785	0.9	102	0.00	14.95
100	S	4-bromofluorobenzene (s)	0.942	0.925	1.8	99	0.00	15.13
101		bromobenzene	1.082	1.094	-1.1	99	0.00	15.32
102		cyclohexanone	0.111	0.094	15.3	75	0.00	15.07
103		1,1,2,2-tetrachloroethane	1.342	1.254	6.6	91	0.00	15.22
104		trans-1,4-dichloro-2-bute	0.266	0.281	-5.6	94	0.00	15.27
105		1,2,3-trichloropropane	0.298	0.293	1.7	94	0.00	15.30
106		n-propylbenzene	4.419	4.668	-5.6	108	0.00	15.37
107		2-chlorotoluene	0.947	0.957	-1.1	100	0.00	15.50
108		4-chlorotoluene	2.875	2.830	1.6	99	0.00	15.60
109		1,3,5-trimethylbenzene	3.189	3.199	-0.3	100	0.00	15.53
110		tert-butylbenzene	2.687	2.710	-0.9	104	0.00	15.88
111		pentachloroethane	0.649	0.687	-5.9	97	0.00	15.94
112		1,2,4-trimethylbenzene	3.272	3.319	-1.4	104	0.00	15.93
113		sec-butylbenzene	4.198	4.186	0.3	102	0.00	16.11
114		1,3-dichlorobenzene	2.032	1.988	2.2	98	0.00	16.26
115		p-isopropyltoluene	3.450	3.494	-1.3	103	0.00	16.23
116		1,4-dichlorobenzene	2.088	2.031	2.7	99	0.00	16.34
117		1,2-dichlorobenzene	2.022	1.985	1.8	97	0.00	16.72
118		n-butylbenzene	1.783	1.895	-6.3	104	0.00	16.63
119		1,2-dibromo-3-chloropropa	0.231	0.224	3.0	91	0.00	17.45
120	m	1,3,5-trichlorobenzene	1.575	1.649	-4.7	101	0.00	17.65
121		1,2,4-trichlorobenzene	1.456	1.523	-4.6	99	0.00	18.22
122		hexachlorobutadiene	0.712	0.733	-2.9	102	0.00	18.35
123		naphthalene	3.681	3.733	-1.4	94	0.00	18.48
124		1,2,3-trichlorobenzene	1.359	1.410	-3.8	97	0.00	18.70
125		hexachloroethane	0.701	0.754	-7.6	103	0.00	16.99
126		Benzyl chloride	2.166	2.191	-1.2	97	0.00	16.45

(#) = Out of Range SPCC's out = 0 CCC's out = 0
4d59150.D M4D2625.M Tue Apr 28 11:19:08 2015 RPT1

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: V4D2729-CC2625
Lab FileID: 4D61687.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\4D61687.D Vial: 2
Acq On : 31 Jul 2015 11:01 am Operator: ximenac
Sample : cc2625-20 Inst : MS4D
Misc : MS88773,V4D2729,5,,,,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M4D2625.M (RTE Integrator)
Title : SW-846 Method 8260B/8260C
Last Update : Tue Apr 28 10:34:28 2015
Response via : Multiple Level Calibration

Min. RRF : 0.000 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	71	-0.02	6.98
2		1,4-dioxane	0.131	0.129	1.5	67	0.00	11.27
3	M	tertiary butyl alcohol	1.357	1.461	-7.7	75	-0.02	7.11
4	I	pentafluorobenzene	1.000	1.000	0.0	82	0.00	9.56
5		chlorodifluoromethane	0.521	0.502	3.6	77	-0.01	3.35
6		dichlorodifluoromethane	0.621	0.657	-5.8	84	0.00	3.35
7		chloromethane	0.707	0.728	-3.0	84	-0.02	3.66
8		vinyl chloride	0.614	0.689	-12.2	88	-0.02	3.91
9		acetaldehyde		----------NA----------				
10		bromomethane	0.473	0.543	-14.8	97	0.00	4.59
11		chloroethane	0.305	0.336	-10.2	89	0.00	4.79
12		trichlorofluoromethane	0.745	0.815	-9.4	87	0.00	5.32
13		vinyl bromide		----------NA----------				
14		ethyl ether	0.264	0.278	-5.3	83	-0.01	5.78
15		pentane		----------NA----------				
16		2-chloropropane		----------NA----------				
17		acrolein	0.108	0.103	4.6	78	-0.01	5.99
18		1,1-dichloroethene	0.447	0.520	-16.3	92	0.00	6.21
19		acetone	0.049	0.052	-6.1	85	0.00	6.26
20		allyl chloride	0.237	0.270	-13.9	91	0.00	6.81
21		acetonitrile	0.032	0.028	12.5	70	0.00	6.71
22		iodomethane	0.923	1.111	-20.4#	94	0.00	6.48
23		iso-butyl alcohol	0.022	0.017	22.7#	64	0.00	9.85
24		carbon disulfide	1.662	1.993	-19.9	96	-0.01	6.62
25		methylene chloride	0.578	0.621	-7.4	92	-0.01	7.00
26		1-chloropropane		----------NA----------				
27		methyl acetate	0.082	0.080	2.4	79	0.00	6.81
28		methyl tert butyl ether	1.457	1.536	-5.4	86	-0.01	7.44
29		trans-1,2-dichloroethene	0.517	0.582	-12.6	92	-0.01	7.45
30		di-isopropyl ether	1.688	1.685	0.2	82	0.00	8.17
31		ethyl tert-butyl ether	1.552	1.545	0.5	80	-0.01	8.69
32		2-butanone	0.063	0.068	-7.9	86	0.00	8.91
33	M	1,1-dichloroethane	0.938	1.007	-7.4	86	0.00	8.09
34		chloroprene	0.668	0.665	0.4	78	0.00	8.24
35		acrylonitrile	0.195	0.205	-5.1	82	0.00	7.35
36		vinyl acetate	0.076	0.072	5.3	74	0.00	8.13
37		ethyl acetate	0.085	0.073	14.1	74	0.00	8.97
38		2,2-dichloropropane	0.690	0.777	-12.6	91	0.00	8.95
39		cis-1,2-dichloroethene	0.568	0.636	-12.0	90	0.00	8.92
40		propionitrile	0.079	0.079	0.0	81	0.00	8.97
41		methyl acrylate	0.527	0.489	7.2	79	0.00	9.04

Continuing Calibration Summary

Job Number: JC300 **Sample:** V4D2729-CC2625
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 4D61687.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

42		bromochloromethane	0.295	0.331	-12.2	89	0.00	9.25
43		tetrahydrofuran	0.186	0.176	5.4	82	0.00	9.32
44		chloroform	0.962	1.013	-5.3	87	0.00	9.33
45	S	dibromofluoromethane (s)	0.442	0.459	-3.8	85	0.00	9.54
46	S	1,2-dichloroethane-d4 (s)	0.448	0.432	3.6	78	0.00	9.99
47		freon 113	0.306	0.349	-14.1	89	0.00	6.24
48		methacrylonitrile	0.375	0.323	13.9	75	0.00	9.19
49		1,1,1-trichloroethane	0.721	0.833	-15.5	89	0.00	9.63
50		tert-amyl methyl ether	1.472	1.435	2.5	79	0.00	10.20
51	I	1,4-difluorobenzene	1.000	1.000	0.0	83	0.00	10.52
52		epichlorohydrin	0.046	0.036	21.7#	68	0.00	11.83
53		n-butyl alcohol	0.012	0.011	8.3	70	0.00	10.65
54	M	cyclohexane	0.481	0.538	-11.9	85	0.00	9.73
55		tert amyl alcohol		----------NA----------				
56		carbon tetrachloride	0.507	0.585	-15.4	90	0.00	9.85
57		1,1-dichloropropene	0.527	0.565	-7.2	85	0.00	9.83
58		hexane	0.394	0.404	-2.5	81	0.00	7.88
59	M	benzene	1.536	1.682	-9.5	88	0.00	10.10
60		ISO-OCTANE	1.187	1.214	-2.3	80	0.00	10.19
61		heptane	0.235	0.237	-0.9	79	0.00	10.38
62		isopropyl acetate	0.840	0.724	13.8	75	0.00	10.08
63		1,2-dichloroethane	0.532	0.547	-2.8	83	0.00	10.09
64		trichloroethene	0.412	0.452	-9.7	88	0.00	10.87
65		ethyl acrylate		----------NA----------				
66		2-nitropropane	0.131	0.104	20.6#	70	0.00	11.66
67		2-chloroethyl vinyl ether	0.271	0.053	80.4#	16#	0.00	11.73
68		methyl methacrylate	0.409	0.413	-1.0	91	0.00	11.19
69		1,2-dichloropropane	0.428	0.453	-5.8	85	0.00	11.13
70		methylcyclohexane	0.569	0.557	2.1	78	0.00	11.13
71	M	tert-amyl ethyl ether		----------NA----------				
72		dibromomethane	0.294	0.312	-6.1	86	0.00	11.28
73		bromodichloromethane	0.567	0.611	-7.8	87	0.00	11.43
74		cis-1,3-dichloropropene	0.685	0.738	-7.7	87	0.00	11.94
75	S	toluene-d8 (s)	1.141	1.151	-0.9	84	0.00	12.27
76		4-methyl-2-pentanone	0.186	0.173	7.0	79	0.00	12.08
77		toluene	0.965	1.035	-7.3	89	0.00	12.35
78		3-methyl-1-butanol	0.012	0.010	16.7	72	0.00	12.09
79		trans-1,3-dichloropropene	0.627	0.661	-5.4	86	0.00	12.55
80		ethyl methacrylate	0.541	0.532	1.7	80	0.00	12.60
81		1,1,2-trichloroethane	0.345	0.369	-7.0	87	0.00	12.77
82		2-hexanone	0.175	0.165	5.7	79	0.00	13.00
83	I	chlorobenzene-d5	1.000	1.000	0.0	87	0.00	13.89
84		tetrachloroethene	0.508	0.543	-6.9	90	0.00	12.98
85		1,3-dichloropropane	0.722	0.737	-2.1	88	0.00	12.96
86		butyl acetate	0.337	0.294	12.8	76	0.00	13.11
87		dibromochloromethane	0.563	0.600	-6.6	90	0.00	13.24
88		1,2-dibromoethane	0.496	0.515	-3.8	89	0.00	13.39
89		n-Butyl Ether	2.024	2.029	-0.2	86	0.00	13.91
90		chlorobenzene	1.275	1.336	-4.8	90	0.00	13.92
91		1,1,1,2-tetrachloroethane	0.470	0.511	-8.7	91	0.00	13.99
92		ethylbenzene	2.135	2.240	-4.9	89	0.00	14.01
93		m,p-xylene	0.807	0.859	-6.4	91	0.00	14.12
94		o-xylene	0.803	0.851	-6.0	89	0.00	14.57
95		styrene	1.358	1.408	-3.7	87	0.00	14.57
96		butyl acrylate		----------NA----------				
97		bromoform	0.399	0.427	-7.0	88	0.00	14.81
98	I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	88	0.00	16.31

Continuing Calibration Summary

Job Number: JC300 **Sample:** V4D2729-CC2625
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 4D61687.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

99		isopropylbenzene	3.818	3.989	-4.5	89	0.00	14.94
100	S	4-bromofluorobenzene (s)	0.942	0.931	1.2	86	0.00	15.12
101		bromobenzene	1.082	1.145	-5.8	89	0.00	15.32
102		cyclohexanone	0.111	0.167	-50.5#	124	0.00	15.07
103		1,1,2,2-tetrachloroethane	1.342	1.324	1.3	87	0.00	15.22
104		trans-1,4-dichloro-2-bute	0.266	0.269	-1.1	86	0.00	15.27
105		1,2,3-trichloropropane	0.298	0.302	-1.3	85	0.00	15.29
106		n-propylbenzene	4.419	4.697	-6.3	89	0.00	15.37
107		2-chlorotoluene	0.947	1.018	-7.5	89	0.00	15.50
108		4-chlorotoluene	2.875	2.998	-4.3	90	0.00	15.60
109		1,3,5-trimethylbenzene	3.189	3.363	-5.5	89	0.00	15.53
110		tert-butylbenzene	2.687	2.811	-4.6	89	0.00	15.89
111		pentachloroethane	0.649	0.687	-5.9	86	0.00	15.93
112		1,2,4-trimethylbenzene	3.272	3.367	-2.9	89	0.00	15.93
113		sec-butylbenzene	4.198	4.492	-7.0	90	0.00	16.11
114		1,3-dichlorobenzene	2.032	2.148	-5.7	92	0.00	16.26
115		p-isopropyltoluene	3.450	3.670	-6.4	90	0.00	16.23
116		1,4-dichlorobenzene	2.088	2.173	-4.1	93	0.00	16.34
117		1,2-dichlorobenzene	2.022	2.105	-4.1	91	0.00	16.72
118		n-butylbenzene	1.783	1.968	-10.4	90	0.00	16.63
119		1,2-dibromo-3-chloropropa	0.231	0.212	8.2	84	0.00	17.45
120	m	1,3,5-trichlorobenzene	1.575	1.691	-7.4	91	0.00	17.65
121		1,2,4-trichlorobenzene	1.456	1.516	-4.1	88	0.00	18.22
122		hexachlorobutadiene	0.712	0.744	-4.5	85	0.00	18.35
123		naphthalene	3.681	3.508	4.7	82	0.00	18.47
124		1,2,3-trichlorobenzene	1.359	1.392	-2.4	86	0.00	18.70
125		hexachloroethane	0.701	0.777	-10.8	92	0.00	16.99
126		Benzyl chloride	2.166	2.196	-1.4	89	0.00	16.45

(#) = Out of Range SPCC's out = 0 CCC's out = 0
4d59149.D M4D2625.M Fri Jul 31 11:36:05 2015 RPT1

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: V4D2730-CC2625
Lab FileID: 4D61716.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\4D61716.D Vial: 4
Acq On : 3 Aug 2015 10:10 am Operator: ximenac
Sample : cc2625-20 Inst : MS4D
Misc : MS88773,V4D2730,5,,,,1 Multiplr: 1.00
MS Integration Params: rteint.p

Method : C:\MSDCHEM\1\METHODS\M4D2625.M (RTE Integrator)
Title : SW-846 Method 8260B/8260C
Last Update : Tue Apr 28 10:34:28 2015
Response via : Multiple Level Calibration

Min. RRF : 0.000 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	68	-0.02	6.98
2		1,4-dioxane	0.131	0.144	-9.9	71	0.00	11.26
3	M	tertiary butyl alcohol	1.357	1.509	-11.2	74	-0.02	7.11
4	I	pentafluorobenzene	1.000	1.000	0.0	81	0.00	9.56
5		chlorodifluoromethane	0.521	0.510	2.1	77	-0.02	3.34
6		dichlorodifluoromethane	0.621	0.627	-1.0	79	0.00	3.34
7		chloromethane	0.707	0.650	8.1	74	-0.02	3.65
8		vinyl chloride	0.614	0.621	-1.1	78	-0.03	3.90
9		acetaldehyde		----------NA----------				
10		bromomethane	0.473	0.484	-2.3	84	-0.01	4.58
11		chloroethane	0.305	0.308	-1.0	80	-0.01	4.77
12		trichlorofluoromethane	0.745	0.800	-7.4	83	0.00	5.32
13		vinyl bromide		----------NA----------				
14		ethyl ether	0.264	0.268	-1.5	79	-0.02	5.77
15		pentane		----------NA----------				
16		2-chloropropane		----------NA----------				
17		acrolein	0.108	0.093	13.9	69	-0.01	5.99
18		1,1-dichloroethene	0.447	0.491	-9.8	85	-0.01	6.21
19		acetone	0.049	0.062	-26.5#	99	-0.01	6.26
20		allyl chloride	0.237	0.240	-1.3	80	-0.02	6.80
21		acetonitrile	0.032	0.031	3.1	75	0.00	6.71
22		iodomethane	0.923	1.052	-14.0	87	-0.01	6.48
23		iso-butyl alcohol	0.022	0.016	27.3#	61	0.00	9.84
24		carbon disulfide	1.662	1.888	-13.6	89	-0.01	6.62
25		methylene chloride	0.578	0.593	-2.6	86	-0.02	6.99
26		1-chloropropane		----------NA----------				
27		methyl acetate	0.082	0.081	1.2	78	-0.01	6.81
28		methyl tert butyl ether	1.457	1.476	-1.3	80	-0.02	7.44
29		trans-1,2-dichloroethene	0.517	0.534	-3.3	82	-0.01	7.45
30		di-isopropyl ether	1.688	1.738	-3.0	83	-0.01	8.17
31		ethyl tert-butyl ether	1.552	1.602	-3.2	81	-0.01	8.69
32		2-butanone	0.063	0.072	-14.3	89	0.00	8.91
33	M	1,1-dichloroethane	0.938	0.979	-4.4	81	-0.01	8.09
34		chloroprene	0.668	0.672	-0.6	77	0.00	8.24
35		acrylonitrile	0.195	0.195	0.0	76	-0.01	7.35
36		vinyl acetate	0.076	0.074	2.6	75	0.00	8.13
37		ethyl acetate	0.085	0.072	15.3	71	0.00	8.97
38		2,2-dichloropropane	0.690	0.759	-10.0	87	0.00	8.95
39		cis-1,2-dichloroethene	0.568	0.593	-4.4	82	0.00	8.92
40		propionitrile	0.079	0.076	3.8	76	0.00	8.97
41		methyl acrylate	0.527	0.442	16.1	70	0.00	9.04

Continuing Calibration Summary

Job Number: JC300 **Sample:** V4D2730-CC2625
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 4D61716.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

42		bromochloromethane	0.295	0.323	-9.5	85	0.00	9.25
43		tetrahydrofuran	0.186	0.150	19.4	68	0.00	9.32
44		chloroform	0.962	0.983	-2.2	82	0.00	9.33
45	S	dibromofluoromethane (s)	0.442	0.478	-8.1	87	0.00	9.54
46	S	1,2-dichloroethane-d4 (s)	0.448	0.471	-5.1	83	0.00	9.99
47		freon 113	0.306	0.368	-20.3#	92	0.00	6.24
48		methacrylonitrile	0.375	0.317	15.5	71	0.00	9.19
49		1,1,1-trichloroethane	0.721	0.799	-10.8	84	0.00	9.63
50		tert-amyl methyl ether	1.472	1.477	-0.3	80	-0.01	10.19
51	I	1,4-difluorobenzene	1.000	1.000	0.0	82	0.00	10.52
52		epichlorohydrin	0.046	0.037	19.6	68	0.00	11.82
53		n-butyl alcohol	0.012	0.011	8.3	70	0.00	10.65
54	M	cyclohexane	0.481	0.546	-13.5	85	0.00	9.73
55		tert amyl alcohol		----------NA----------				
56		carbon tetrachloride	0.507	0.567	-11.8	87	0.00	9.86
57		1,1-dichloropropene	0.527	0.526	0.2	79	0.00	9.82
58		hexane	0.394	0.462	-17.3	92	0.00	7.88
59	M	benzene	1.536	1.555	-1.2	81	0.00	10.10
60		ISO-OCTANE	1.187	1.338	-12.7	88	0.00	10.19
61		heptane	0.235	0.267	-13.6	89	0.00	10.38
62		isopropyl acetate	0.840	0.729	13.2	75	0.00	10.08
63		1,2-dichloroethane	0.532	0.536	-0.8	81	0.00	10.09
64		trichloroethene	0.412	0.418	-1.5	81	0.00	10.87
65		ethyl acrylate		----------NA----------				
66		2-nitropropane	0.131	0.102	22.1#	68	0.00	11.66
67		2-chloroethyl vinyl ether	0.271	0.065	76.0#	19#	0.00	11.73
68		methyl methacrylate	0.409	0.324	20.8#	71	0.00	11.19
69		1,2-dichloropropane	0.428	0.427	0.2	79	0.00	11.13
70		methylcyclohexane	0.569	0.603	-6.0	84	0.00	11.13
71	M	tert-amyl ethyl ether		----------NA----------				
72		dibromomethane	0.294	0.295	-0.3	81	0.00	11.28
73		bromodichloromethane	0.567	0.588	-3.7	83	0.00	11.43
74		cis-1,3-dichloropropene	0.685	0.695	-1.5	81	0.00	11.94
75	S	toluene-d8 (s)	1.141	1.164	-2.0	85	0.00	12.27
76		4-methyl-2-pentanone	0.186	0.161	13.4	73	0.00	12.08
77		toluene	0.965	0.954	1.1	81	0.00	12.35
78		3-methyl-1-butanol	0.012	0.010	16.7	70	0.00	12.09
79		trans-1,3-dichloropropene	0.627	0.635	-1.3	82	0.00	12.55
80		ethyl methacrylate	0.541	0.503	7.0	75	0.00	12.60
81		1,1,2-trichloroethane	0.345	0.356	-3.2	84	0.00	12.77
82		2-hexanone	0.175	0.168	4.0	80	0.00	13.00
83	I	chlorobenzene-d5	1.000	1.000	0.0	88	0.00	13.89
84		tetrachloroethene	0.508	0.497	2.2	83	0.00	12.99
85		1,3-dichloropropane	0.722	0.680	5.8	83	0.00	12.96
86		butyl acetate	0.337	0.290	13.9	76	0.00	13.11
87		dibromochloromethane	0.563	0.565	-0.4	86	0.00	13.24
88		1,2-dibromoethane	0.496	0.479	3.4	84	0.00	13.39
89		n-Butyl Ether	2.024	1.866	7.8	80	0.00	13.91
90		chlorobenzene	1.275	1.225	3.9	84	0.00	13.92
91		1,1,1,2-tetrachloroethane	0.470	0.475	-1.1	86	0.00	13.99
92		ethylbenzene	2.135	2.038	4.5	83	0.00	14.01
93		m,p-xylene	0.807	0.777	3.7	83	0.00	14.13
94		o-xylene	0.803	0.777	3.2	82	0.00	14.57
95		styrene	1.358	1.293	4.8	81	0.00	14.57
96		butyl acrylate		----------NA----------				
97		bromoform	0.399	0.399	0.0	84	0.00	14.81
98	I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	90	0.00	16.31

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: V4D2730-CC2625
Lab FileID: 4D61716.D

99		isopropylbenzene	3.818	3.633	4.8	83	0.00	14.95
100	S	4-bromofluorobenzene (s)	0.942	0.931	1.2	88	0.00	15.12
101		bromobenzene	1.082	1.060	2.0	85	0.00	15.32
102		cyclohexanone	0.111	0.180	-62.2#	137	0.00	15.07
103		1,1,2,2-tetrachloroethane	1.342	1.244	7.3	84	0.00	15.22
104		trans-1,4-dichloro-2-bute	0.266	0.249	6.4	81	0.00	15.27
105		1,2,3-trichloropropane	0.298	0.281	5.7	81	0.00	15.30
106		n-propylbenzene	4.419	4.332	2.0	84	0.00	15.37
107		2-chlorotoluene	0.947	0.936	1.2	84	0.00	15.50
108		4-chlorotoluene	2.875	2.780	3.3	85	0.00	15.60
109		1,3,5-trimethylbenzene	3.189	3.084	3.3	84	0.00	15.53
110		tert-butylbenzene	2.687	2.512	6.5	81	0.00	15.88
111		pentachloroethane	0.649	0.651	-0.3	84	0.00	15.93
112		1,2,4-trimethylbenzene	3.272	3.072	6.1	83	0.00	15.93
113		sec-butylbenzene	4.198	4.064	3.2	83	0.00	16.11
114		1,3-dichlorobenzene	2.032	1.996	1.8	87	0.00	16.26
115		p-isopropyltoluene	3.450	3.366	2.4	84	0.00	16.23
116		1,4-dichlorobenzene	2.088	1.992	4.6	87	0.00	16.34
117		1,2-dichlorobenzene	2.022	1.971	2.5	87	0.00	16.72
118		n-butylbenzene	1.783	1.818	-2.0	85	0.00	16.63
119		1,2-dibromo-3-chloropropa	0.231	0.199	13.9	80	0.00	17.45
120	m	1,3,5-trichlorobenzene	1.575	1.529	2.9	84	0.00	17.65
121		1,2,4-trichlorobenzene	1.456	1.390	4.5	82	0.00	18.22
122		hexachlorobutadiene	0.712	0.699	1.8	82	0.00	18.35
123		naphthalene	3.681	3.189	13.4	76	0.00	18.47
124		1,2,3-trichlorobenzene	1.359	1.248	8.2	79	0.00	18.70
125		hexachloroethane	0.701	0.716	-2.1	86	0.00	16.99
126		Benzyl chloride	2.166	2.186	-0.9	90	0.00	16.45

(#) = Out of Range SPCC's out = 0 CCC's out = 0
4d59149.D M4D2625.M Mon Aug 03 10:36:41 2015 RPT1

New Jersey

ACCUTEST LABORATORIES

GC/MS Volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61706.D
Acq On : 31 Jul 2015 7:47 pm
Operator : ximenac
Sample : jc300-1
Misc : MS88773,V4D2729,5,,,,1
ALS Vial : 21 Sample Multiplier: 1

Quant Time: Aug 03 10:19:38 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.972	65	84571	500.00	ug/L	-0.03
4) pentafluorobenzene	9.557	168	214381	50.00	ug/L	-0.01
51) 1,4-difluorobenzene	10.511	114	280887	50.00	ug/L	0.00
83) chlorobenzene-d5	13.882	117	248122	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	134150	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.541	113	101026	53.28	ug/L	0.00
Spiked Amount 50.000	Range 76 - 120		Recovery = 106.56%			
46) 1,2-dichloroethane-d4 (s)	9.987	65	100602	52.35	ug/L	-0.01
Spiked Amount 50.000	Range 73 - 122		Recovery = 104.70%			
75) toluene-d8 (s)	12.273	98	322090	50.27	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 100.54%			
100) 4-bromofluorobenzene (s)	15.125	95	124934	49.46	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 98.92%			

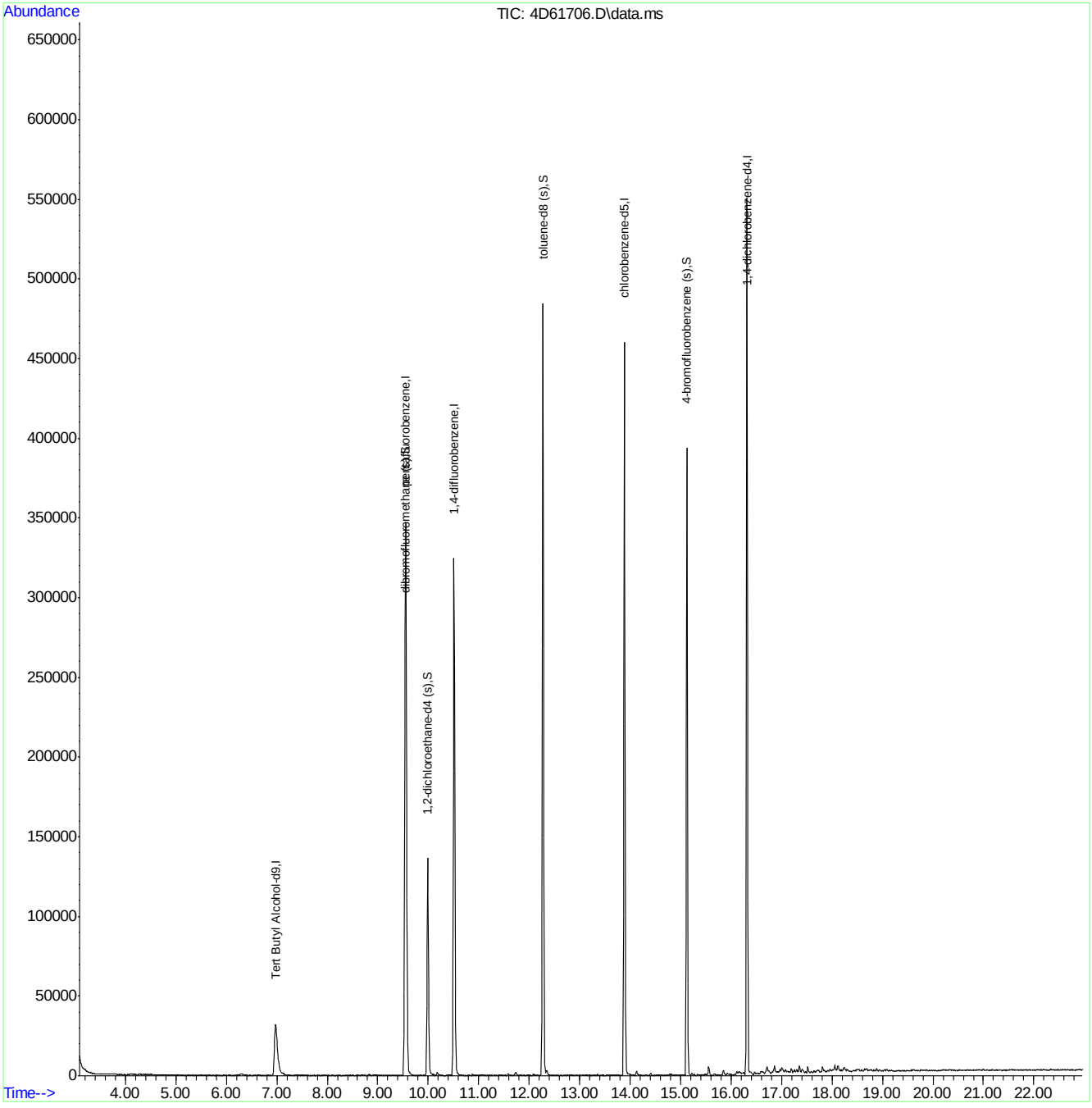
Target Compounds Qvalue

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61706.D
Acq On : 31 Jul 2015 7:47 pm
Operator : ximenac
Sample : jc300-1
Misc : MS88773,V4D2729,5,,,,1
ALS Vial : 21 Sample Multiplier: 1

Quant Time: Aug 03 10:19:38 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration



M4D2625.M Mon Aug 03 10:19:52 2015 RPT1 Page: 2

Quantitation Report (QT/LSC Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61707.D
Acq On : 31 Jul 2015 8:14 pm
Operator : ximenac
Sample : jc300-2
Misc : MS88773,V4D2729,5,,,,1
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Aug 03 10:20:42 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

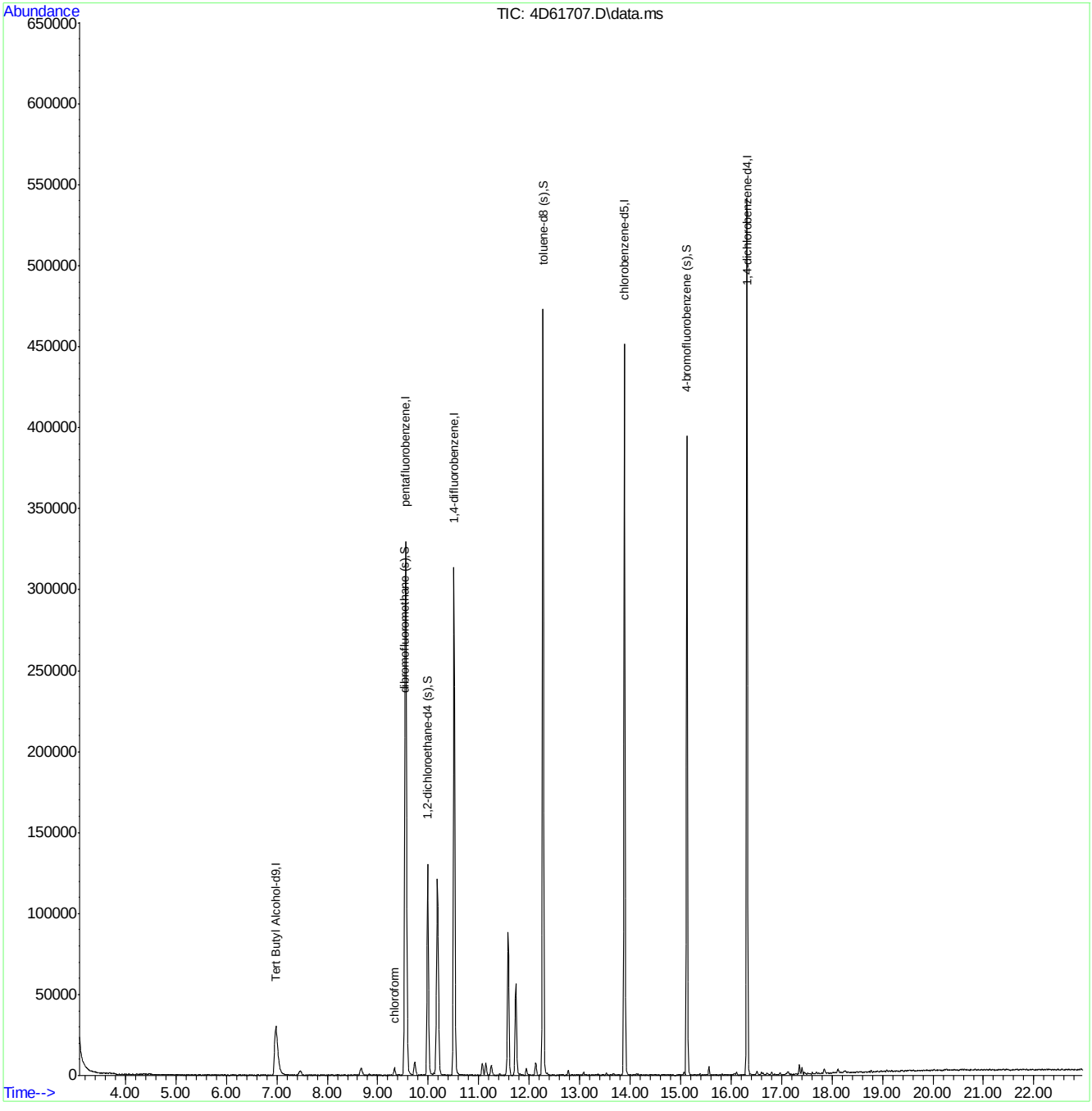
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.982	65	77869	500.00	ug/L	-0.02
4) pentafluorobenzene	9.557	168	204032	50.00	ug/L	-0.01
51) 1,4-difluorobenzene	10.511	114	269271	50.00	ug/L	-0.01
83) chlorobenzene-d5	13.888	117	245681	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	131196	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.536	113	96795	53.63	ug/L	-0.01
Spiked Amount 50.000	Range 76 - 120		Recovery = 107.26%			
46) 1,2-dichloroethane-d4 (s)	9.987	65	96684	52.87	ug/L	-0.01
Spiked Amount 50.000	Range 73 - 122		Recovery = 105.74%			
75) toluene-d8 (s)	12.273	98	315351	51.34	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 102.68%			
100) 4-bromofluorobenzene (s)	15.125	95	123927	50.16	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 100.32%			
Target Compounds						Qvalue
44) chloroform	9.331	83	4558	1.16	ug/L	99

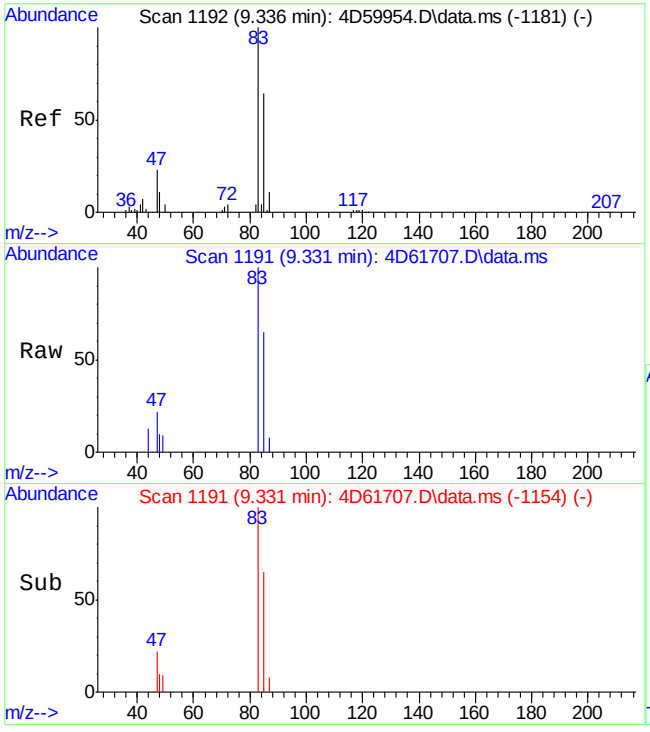
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT/LSC Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61707.D
Acq On : 31 Jul 2015 8:14 pm
Operator : ximenac
Sample : jc300-2
Misc : MS88773,V4D2729,5,,,,1
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Aug 03 10:20:42 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

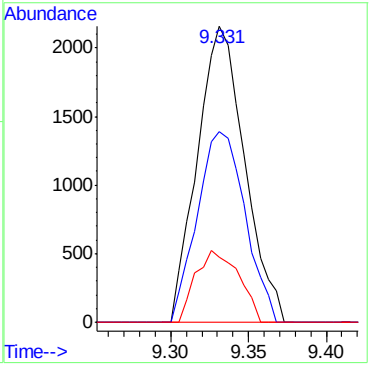




#44
chloroform
Concen: 1.16 ug/L
RT: 9.331 min Scan# 1191
Delta R.T. -0.005 min
Lab File: 4D61707.D
Acq: 31 Jul 2015 8:14 pm

Tgt Ion: 83 Resp: 4558

Ion	Ratio	Lower	Upper
83	100		
85	64.5	35.5	95.5
47	22.1	0.0	53.0



7.1.2

7

Manual Integrations APPROVED (compounds with "m" flag)
Kanya Veerawat
08/09/15 21:02

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61708.D
Acq On : 31 Jul 2015 8:41 pm
Operator : ximenac
Sample : jc300-3
Misc : MS88773,V4D2729,5,,,,1
ALS Vial : 23 Sample Multiplier: 1

Quant Time: Aug 03 10:28:00 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Tue Apr 28 10:34:28 2015
Response via : Initial Calibration

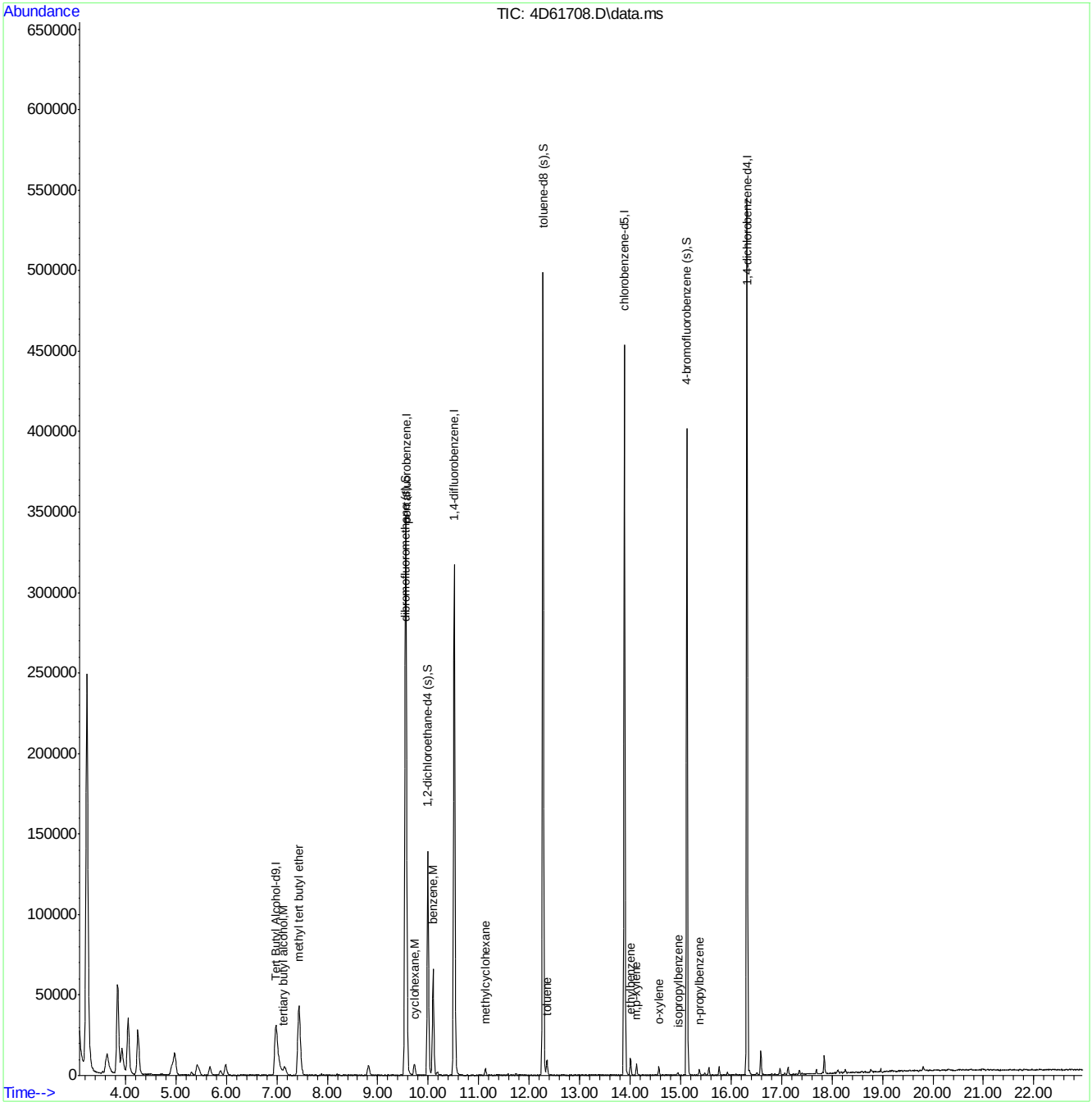
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.988	65	78030	500.00	ug/L	-0.01
4) pentafluorobenzene	9.562	168	213292	50.00	ug/L	0.00
51) 1,4-difluorobenzene	10.516	114	280283	50.00	ug/L	0.00
83) chlorobenzene-d5	13.887	117	247873	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	134067	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.541	113	101123	53.60	ug/L	0.00
Spiked Amount 50.000	Range 76 - 120		Recovery = 107.20%			
46) 1,2-dichloroethane-d4 (s)	9.992	65	101237	52.95	ug/L	0.00
Spiked Amount 50.000	Range 73 - 122		Recovery = 105.90%			
75) toluene-d8 (s)	12.273	98	323301	50.56	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 101.12%			
100) 4-bromofluorobenzene (s)	15.125	95	125547	49.73	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 99.46%			
Target Compounds						Qvalue
3) tertiary butyl alcohol	7.124	59	4483m	21.18	ug/L	
28) methyl tert butyl ether	7.439	73	73666	11.85	ug/L	97
54) cyclohexane	9.730	84	3324	1.23	ug/L #	33
59) benzene	10.097	78	63982	7.43	ug/L	98
70) methylcyclohexane	11.135	83	2073	0.65	ug/L	90
77) toluene	12.351	92	4316	0.80	ug/L	97
92) ethylbenzene	14.008	91	8192	0.77	ug/L	97
93) m,p-xylene	14.123	106	2201	0.55	ug/L	98
94) o-xylene	14.574	106	1616	0.41	ug/L	83
99) isopropylbenzene	14.947	105	1727	0.17	ug/L	96
106) n-propylbenzene	15.371	91	3649	0.31	ug/L	96

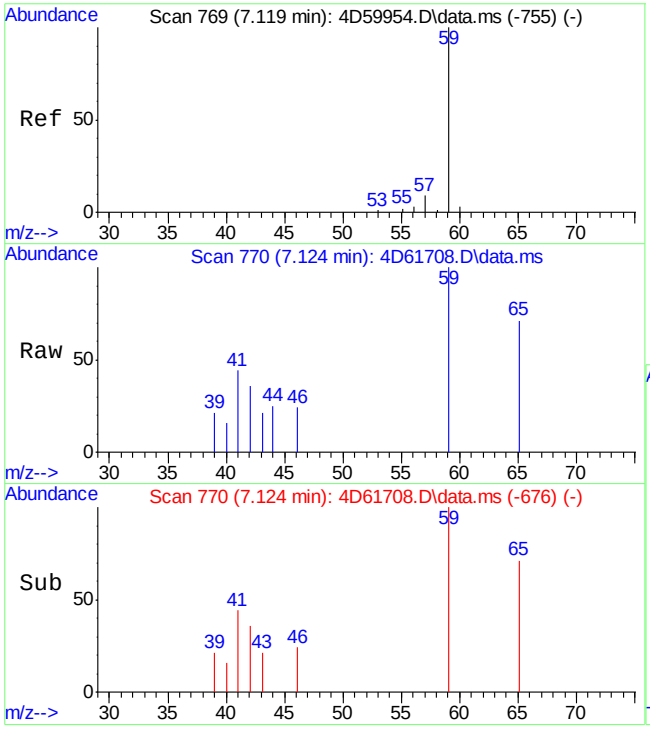
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61708.D
Acq On : 31 Jul 2015 8:41 pm
Operator : ximenac
Sample : jc300-3
Misc : MS88773,V4D2729,5,,,,1
ALS Vial : 23 Sample Multiplier: 1

Quant Time: Aug 03 10:28:00 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Tue Apr 28 10:34:28 2015
Response via : Initial Calibration

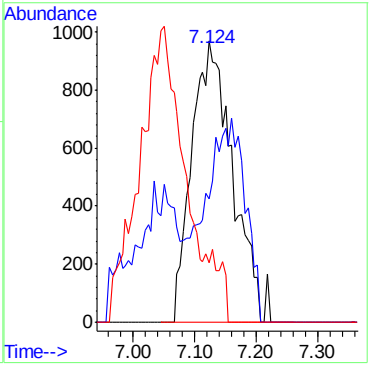


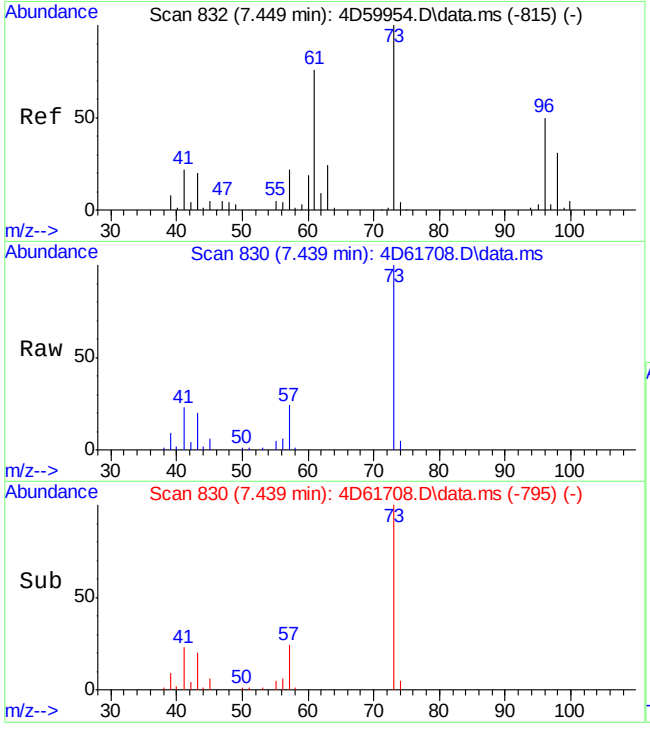


#3
tertiary butyl alcohol
Concen: 21.18 ug/L m
RT: 7.124 min Scan# 770
Delta R.T. -0.005 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

Tgt Ion: 59 Resp: 4483

Ion	Ratio	Lower	Upper
59	100		
41	44.1	0.0	54.5
43	21.2	0.0	45.4

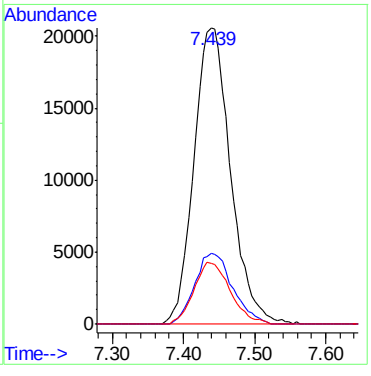


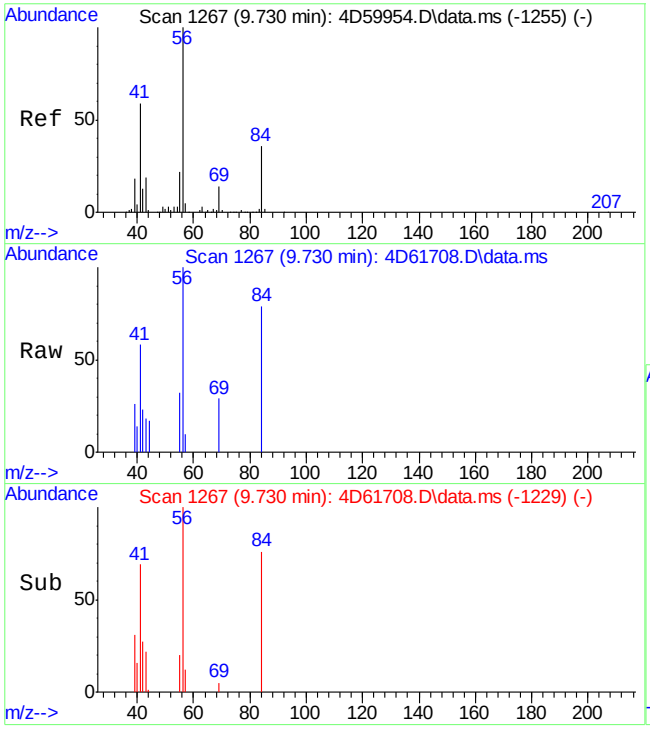


#28
methyl tert butyl ether
Concen: 11.85 ug/L
RT: 7.439 min Scan# 830
Delta R.T. -0.015 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

Tgt Ion: 73 Resp: 73666

Ion	Ratio	Lower	Upper
73	100		
57	23.7	0.0	52.0
43	20.4	0.0	49.4

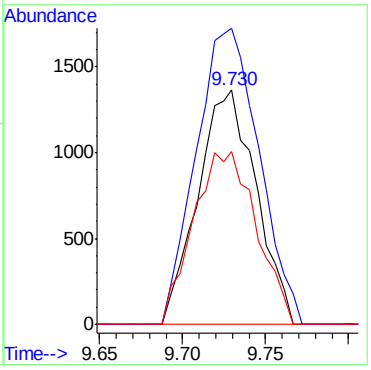


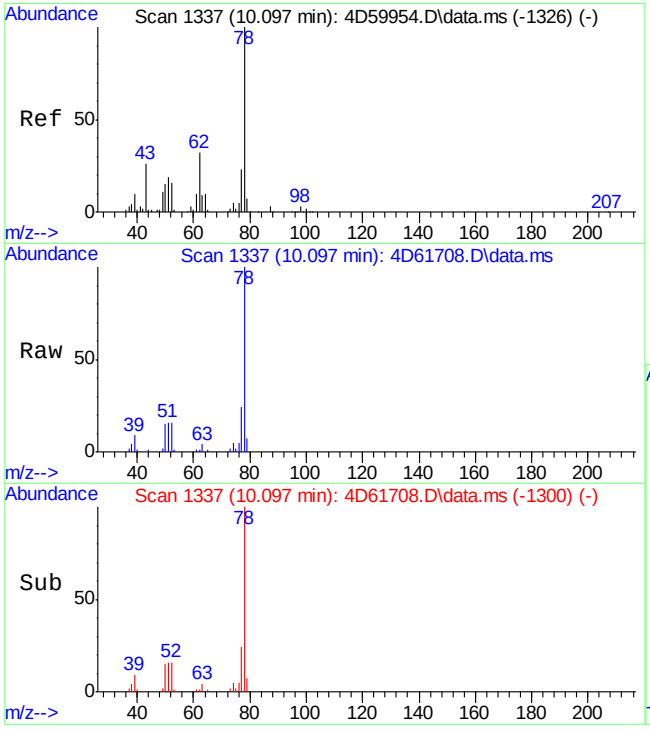


#54
cyclohexane
Concen: 1.23 ug/L
RT: 9.730 min Scan# 1267
Delta R.T. -0.000 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

Tgt Ion: 84 Resp: 3324

Ion	Ratio	Lower	Upper
84	100		
56	137.0	236.1	296.1#
41	79.7	126.6	186.6#

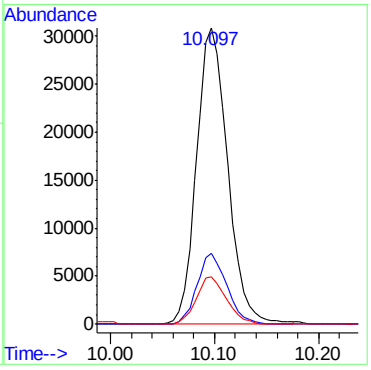


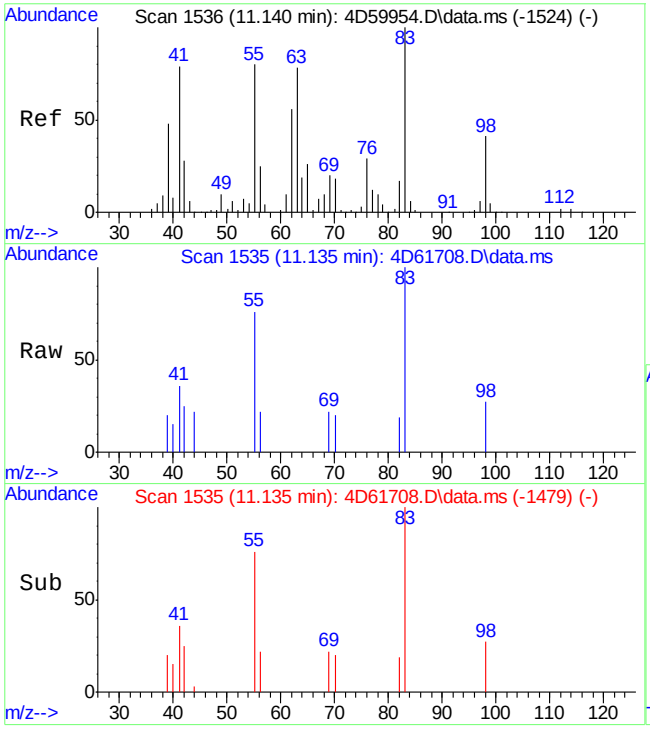


#59
benzene
Concen: 7.43 ug/L
RT: 10.097 min Scan# 1337
Delta R.T. -0.005 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

Tgt Ion: 78 Resp: 63982

Ion	Ratio	Lower	Upper
78	100		
77	23.8	0.0	53.0
52	15.9	0.0	45.4

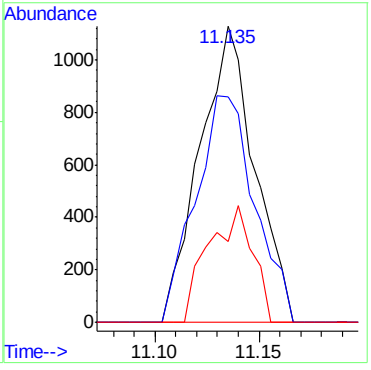


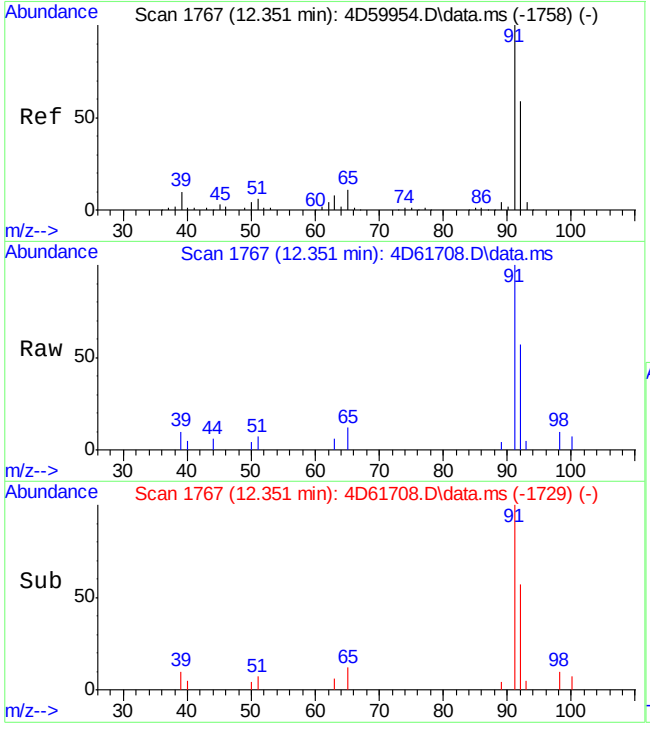


#70
methylcyclohexane
Concen: 0.65 ug/L
RT: 11.135 min Scan# 1535
Delta R.T. -0.005 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

Tgt Ion: 83 Resp: 2073

Ion	Ratio	Lower	Upper
83	100		
55	76.1	50.4	110.4
98	27.5	10.7	70.7

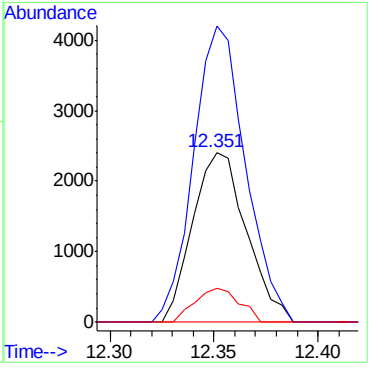




#77
toluene
Concen: 0.80 ug/L
RT: 12.351 min Scan# 1767
Delta R.T. 0.000 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

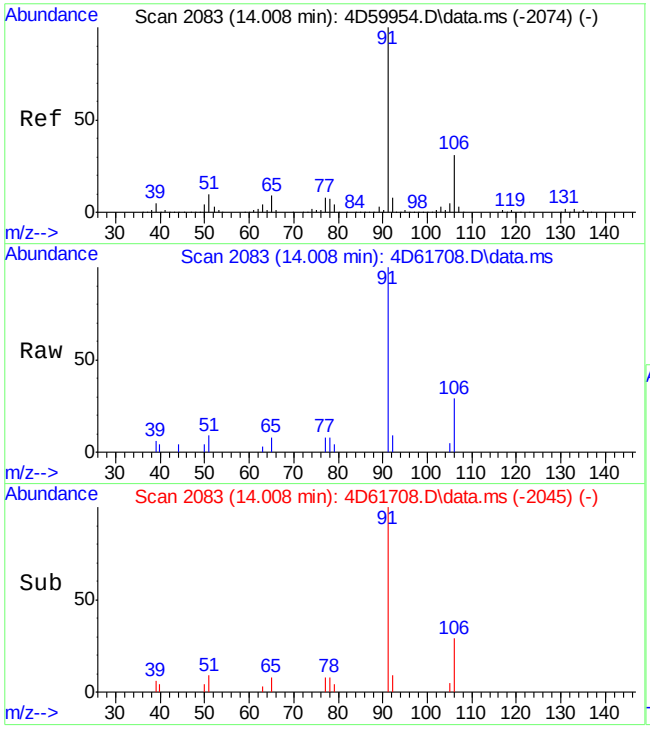
Tgt Ion: 92 Resp: 4316

Ion	Ratio	Lower	Upper
92	100		
91	174.6	140.3	200.3
65	20.2	0.0	48.9



7.1.3

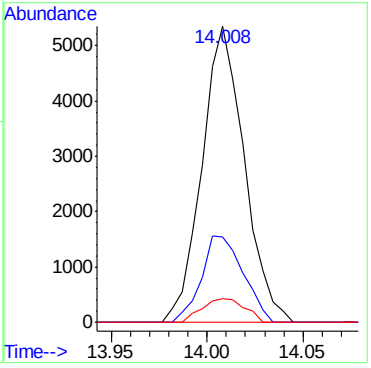
7

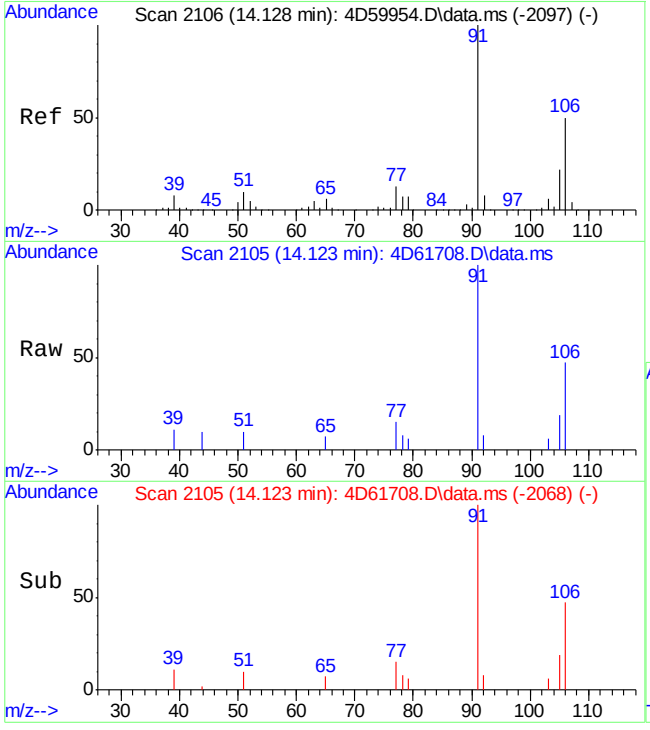


#92
ethylbenzene
Concen: 0.77 ug/L
RT: 14.008 min Scan# 2083
Delta R.T. 0.000 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

Tgt Ion: 91 Resp: 8192

Ion	Ratio	Lower	Upper
91	100		
106	29.0	0.8	60.8
77	8.1	0.0	38.3

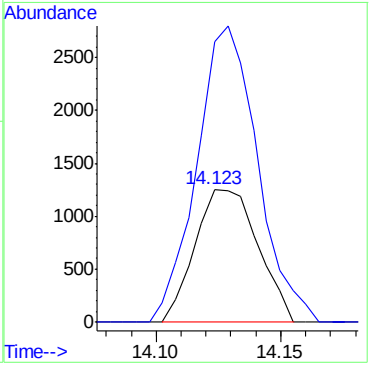


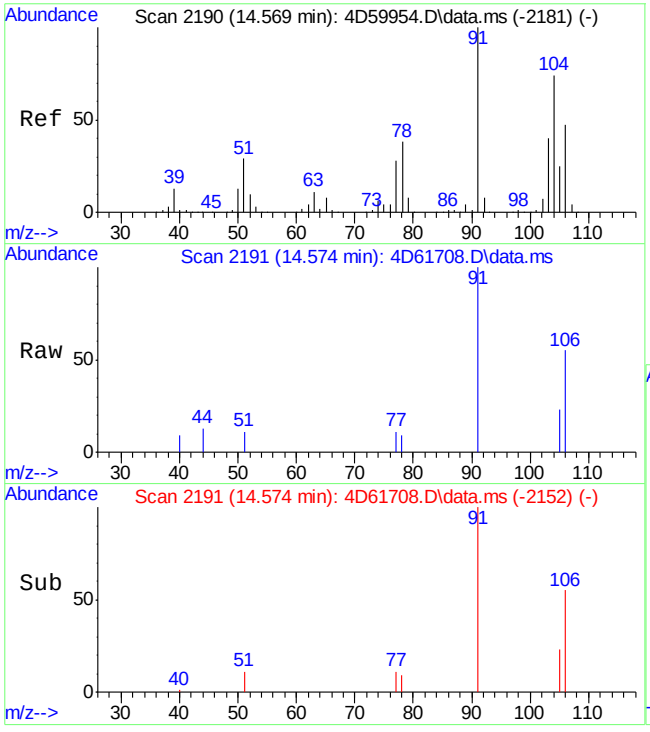


#93
m,p-xylene
Concen: 0.55 ug/L
RT: 14.123 min Scan# 2105
Delta R.T. -0.006 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

Tgt Ion:106 Resp: 2201

Ion	Ratio	Lower	Upper
106	100		
91	197.5	140.6	261.2

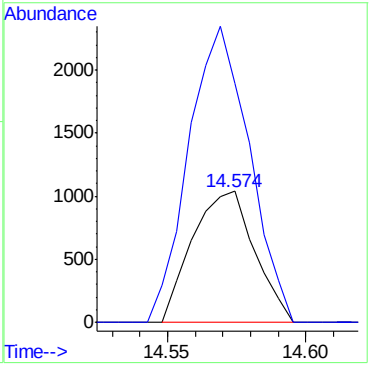


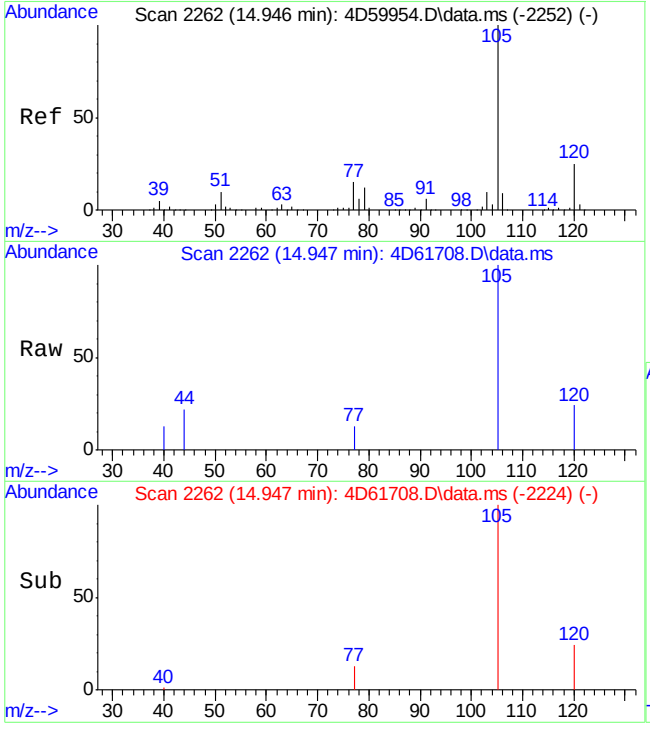


#94
o-xylene
Concen: 0.41 ug/L
RT: 14.574 min Scan# 2191
Delta R.T. 0.005 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

Tgt Ion:106 Resp: 1616

Ion	Ratio	Lower	Upper
106	100		
91	182.2	146.3	271.7

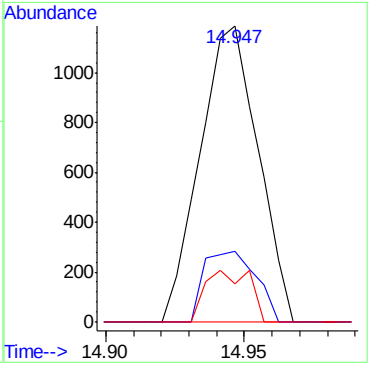


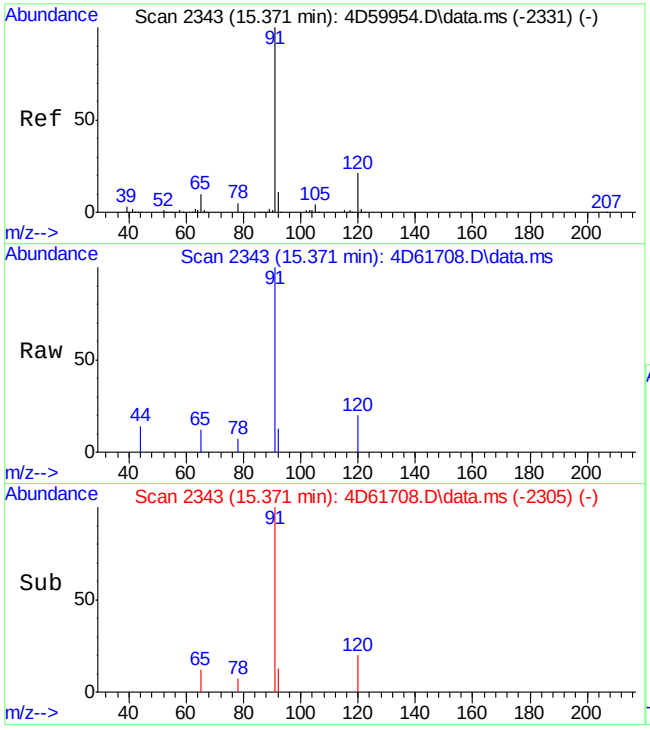


#99
isopropylbenzene
Concen: 0.17 ug/L
RT: 14.947 min Scan# 2262
Delta R.T. -0.000 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

Tgt Ion:105 Resp: 1727

Ion	Ratio	Lower	Upper
105	100		
120	23.8	0.0	55.5
77	13.0	0.0	44.8

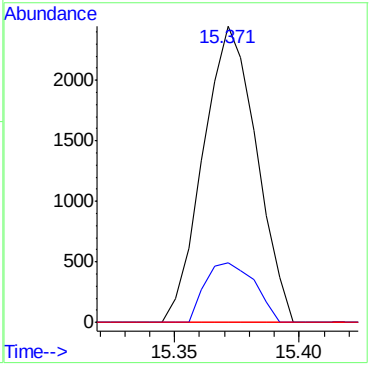




#106
n-propylbenzene
Concen: 0.31 ug/L
RT: 15.371 min Scan# 2343
Delta R.T. 0.000 min
Lab File: 4D61708.D
Acq: 31 Jul 2015 8:41 pm

Tgt Ion: 91 Resp: 3649

Ion	Ratio	Lower	Upper
91	100		
120	20.2	0.0	51.4
105	0.0	0.0	33.6



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61709.D
Acq On : 31 Jul 2015 9:09 pm
Operator : ximenac
Sample : jc300-4
Misc : MS88773,V4D2729,5,,,,1
ALS Vial : 24 Sample Multiplier: 1

Quant Time: Aug 03 10:29:27 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

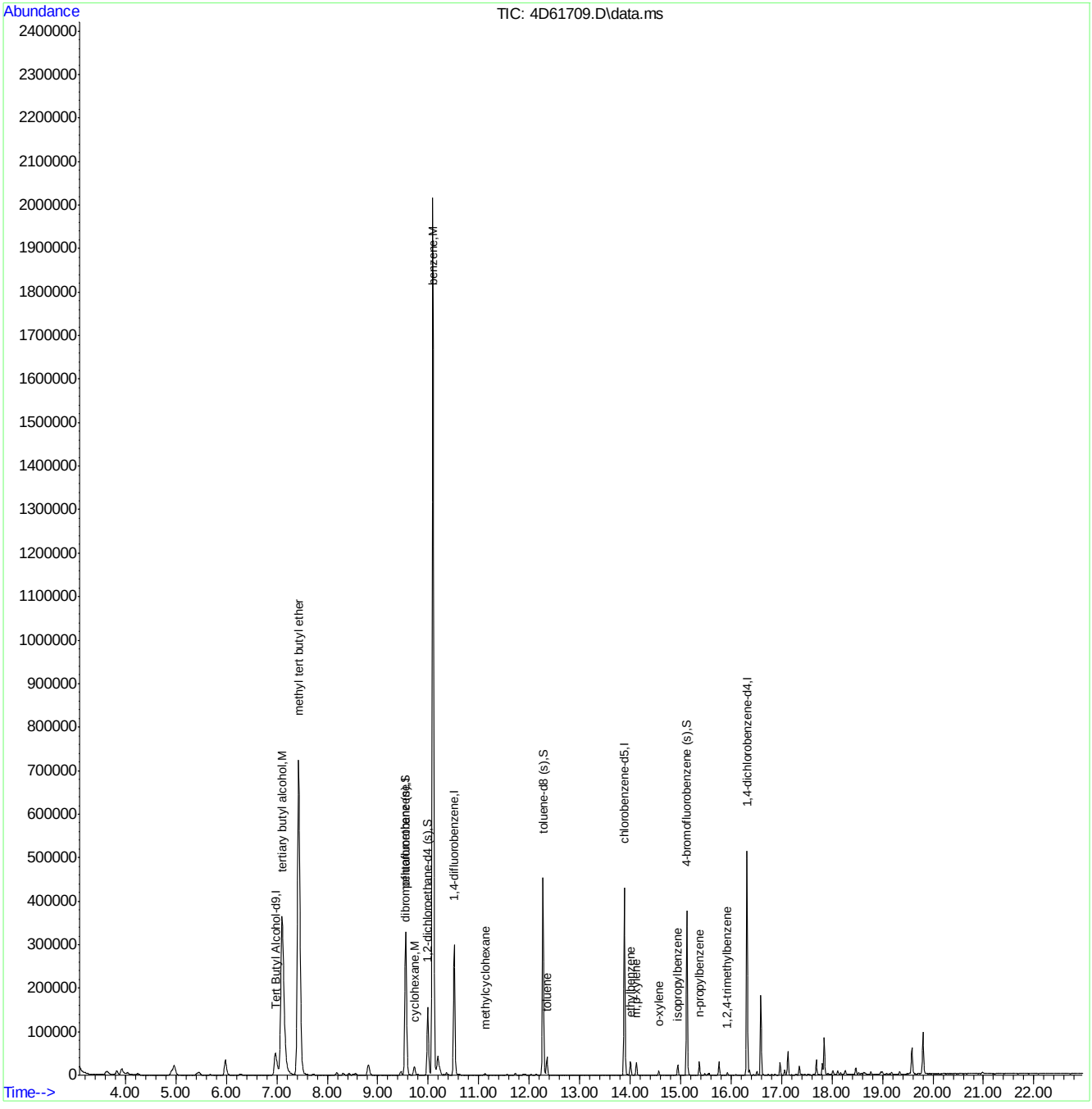
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.977	65	76668	500.00	ug/L	-0.02
4) pentafluorobenzene	9.557	168	202415	50.00	ug/L	-0.01
51) 1,4-difluorobenzene	10.516	114	263987	50.00	ug/L	0.00
83) chlorobenzene-d5	13.882	117	232419	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	126209	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.541	113	95367	53.26	ug/L	0.00
Spiked Amount 50.000	Range 76 - 120		Recovery = 106.52%			
46) 1,2-dichloroethane-d4 (s)	9.992	65	95067	52.40	ug/L	0.00
Spiked Amount 50.000	Range 73 - 122		Recovery = 104.80%			
75) toluene-d8 (s)	12.273	98	301281	50.03	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 100.06%			
100) 4-bromofluorobenzene (s)	15.125	95	118238	49.75	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 99.50%			
Target Compounds						Qvalue
3) tertiary butyl alcohol	7.103	59	905321	4352.29	ug/L	93
28) methyl tert butyl ether	7.433	73	1226626	207.95	ug/L	99
54) cyclohexane	9.725	84	9531	3.75	ug/L #	30
59) benzene	10.092	78	1967846	242.64	ug/L	99
70) methylcyclohexane	11.135	83	1522	0.51	ug/L	96
77) toluene	12.351	92	17740	3.48	ug/L	99
92) ethylbenzene	14.008	91	22993	2.32	ug/L	99
93) m,p-xylene	14.123	106	8725	2.33	ug/L	100
94) o-xylene	14.569	106	2738	0.73	ug/L	90
99) isopropylbenzene	14.941	105	16058	1.67	ug/L	98
106) n-propylbenzene	15.371	91	25018	2.24	ug/L	99
112) 1,2,4-trimethylbenzene	15.927	105	3189	0.39	ug/L	87

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

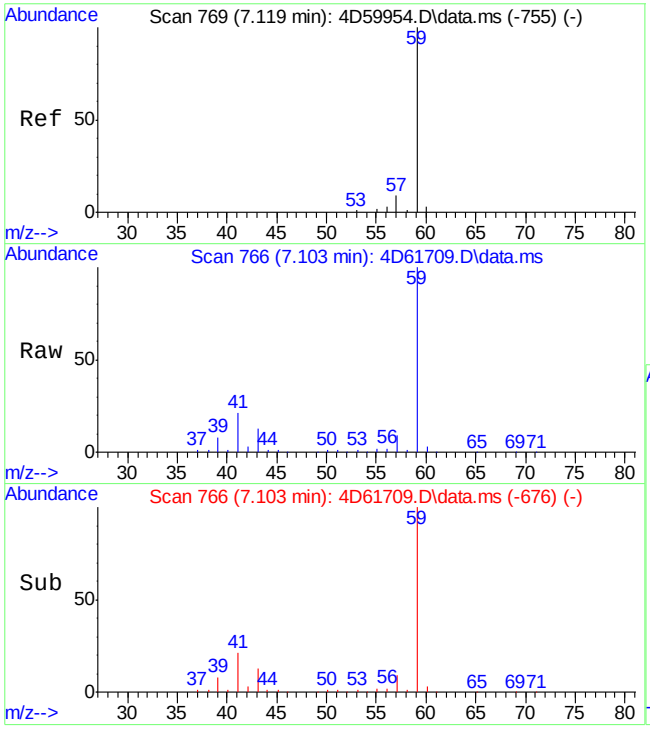
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61709.D
Acq On : 31 Jul 2015 9:09 pm
Operator : ximenac
Sample : jc300-4
Misc : MS88773,V4D2729,5,,,,1
ALS Vial : 24 Sample Multiplier: 1

Quant Time: Aug 03 10:29:27 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration



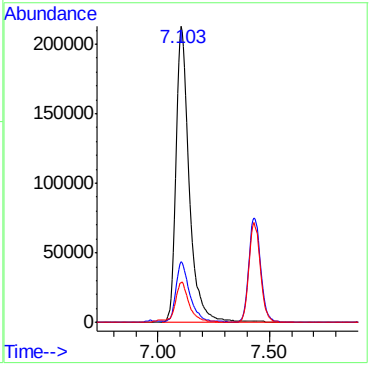
ACCUTEST LABORATORIES JC300

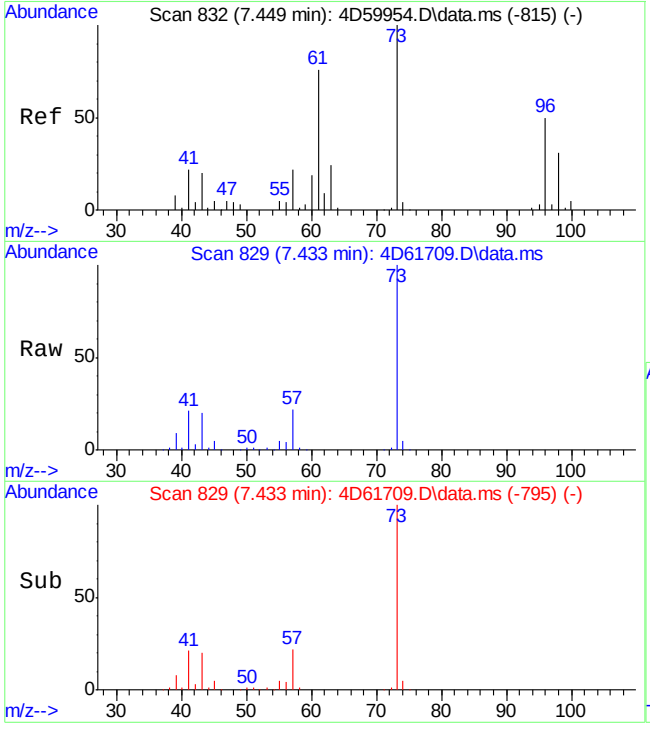


#3
tertiary butyl alcohol
Concen: 4352.29 ug/L
RT: 7.103 min Scan# 766
Delta R.T. -0.026 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion: 59 Resp: 905321

Ion	Ratio	Lower	Upper
59	100		
41	20.6	0.0	54.5
43	13.2	0.0	45.4

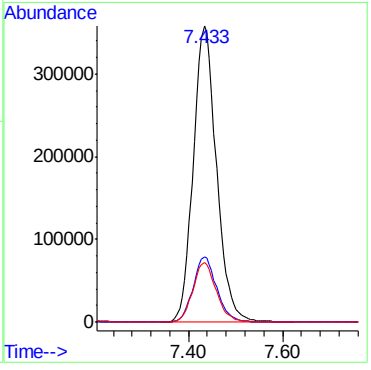


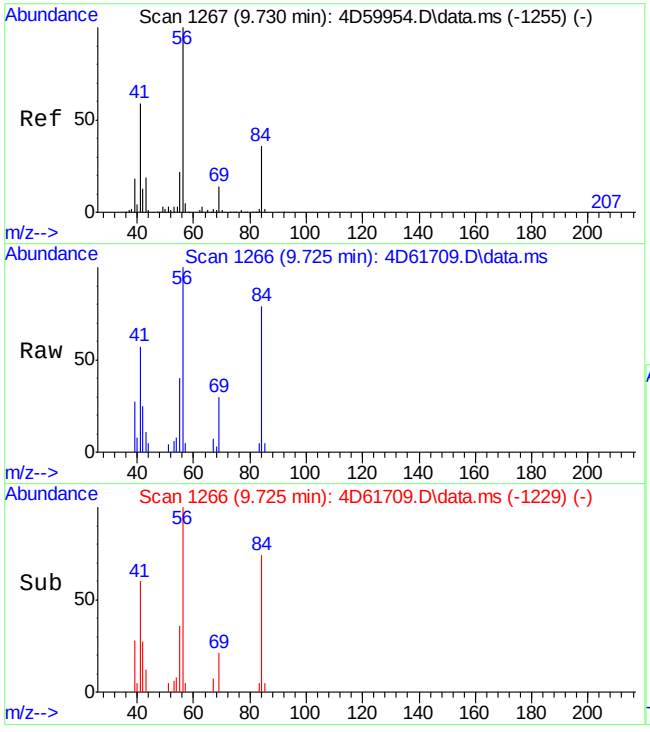


#28
methyl tert butyl ether
Concen: 207.95 ug/L
RT: 7.433 min Scan# 829
Delta R.T. -0.021 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion: 73 Resp: 1226626

Ion	Ratio	Lower	Upper
73	100		
57	22.1	0.0	52.0
43	20.1	0.0	49.4

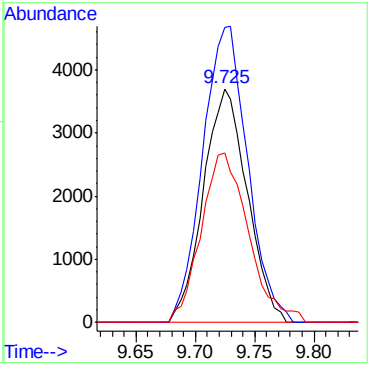


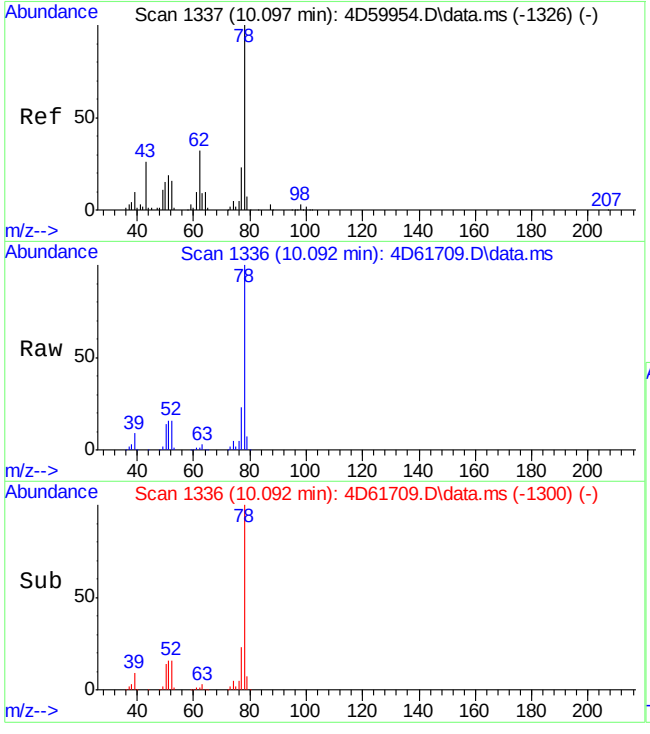


#54
cyclohexane
Concen: 3.75 ug/L
RT: 9.725 min Scan# 1266
Delta R.T. -0.005 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion: 84 Resp: 9531

Ion	Ratio	Lower	Upper
84	100		
56	129.9	236.1	296.1#
41	78.0	126.6	186.6#

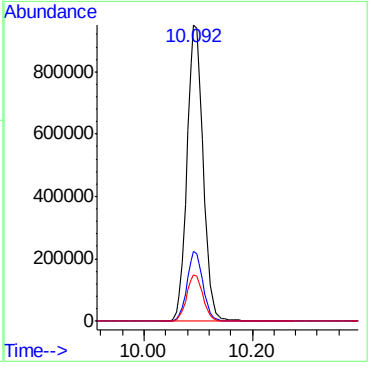


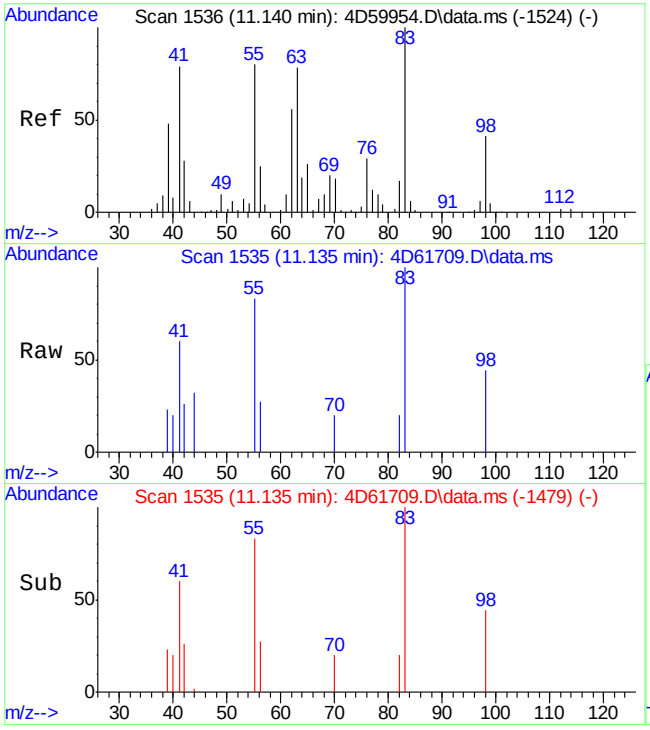


#59
benzene
Concen: 242.64 ug/L
RT: 10.092 min Scan# 1336
Delta R.T. -0.010 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion: 78 Resp: 1967846

Ion	Ratio	Lower	Upper
78	100		
77	23.4	0.0	53.0
52	15.7	0.0	45.4

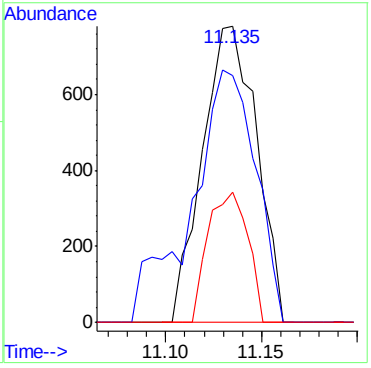


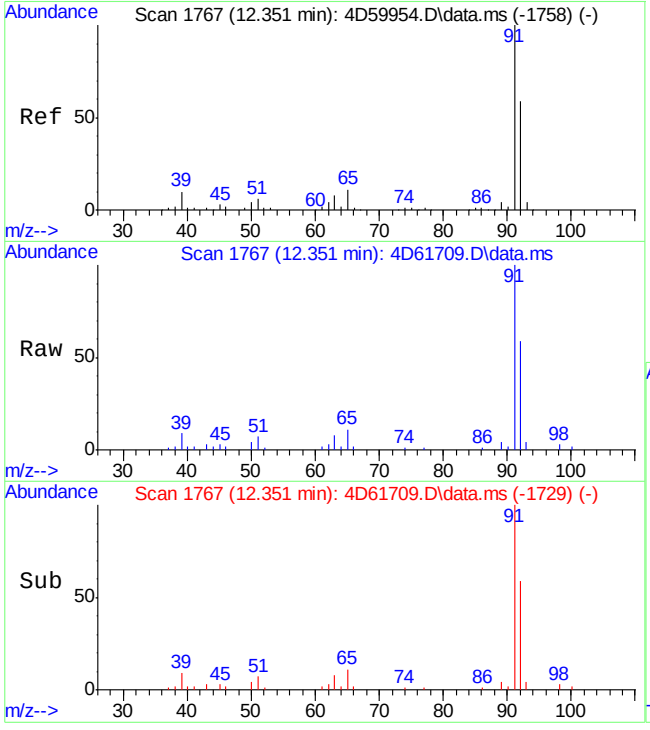


#70
methylcyclohexane
Concen: 0.51 ug/L
RT: 11.135 min Scan# 1535
Delta R.T. -0.005 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion: 83 Resp: 1522

Ion	Ratio	Lower	Upper
83	100		
55	83.3	50.4	110.4
98	44.1	10.7	70.7

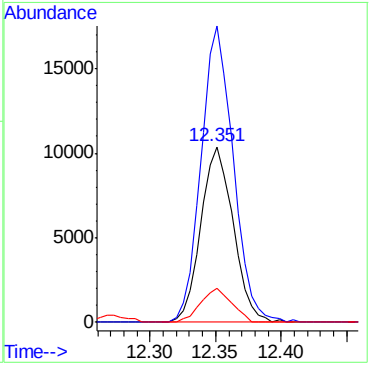




#77
toluene
Concen: 3.48 ug/L
RT: 12.351 min Scan# 1767
Delta R.T. 0.000 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

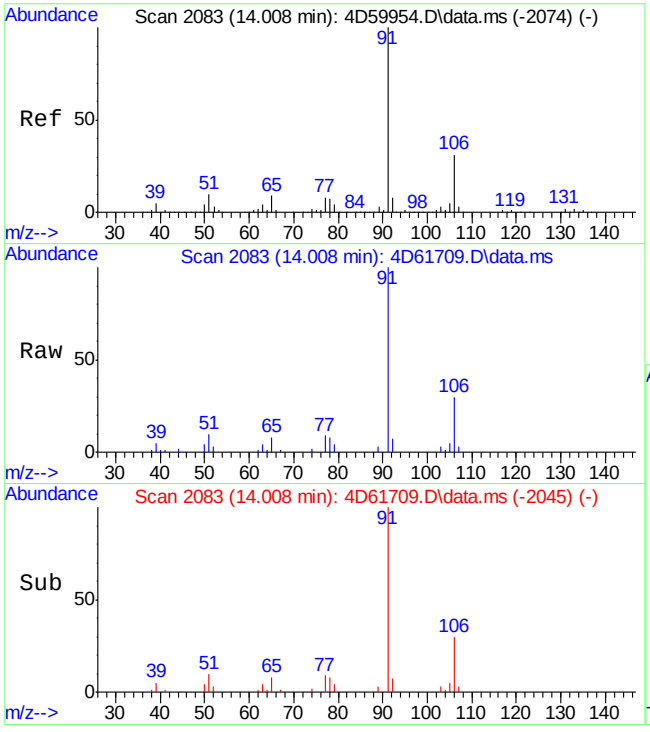
Tgt Ion: 92 Resp: 17740

Ion	Ratio	Lower	Upper
92	100		
91	169.1	140.3	200.3
65	19.1	0.0	48.9



7.1.4

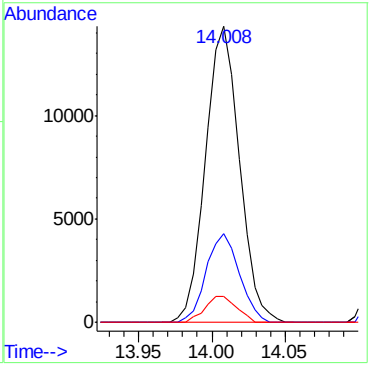
7

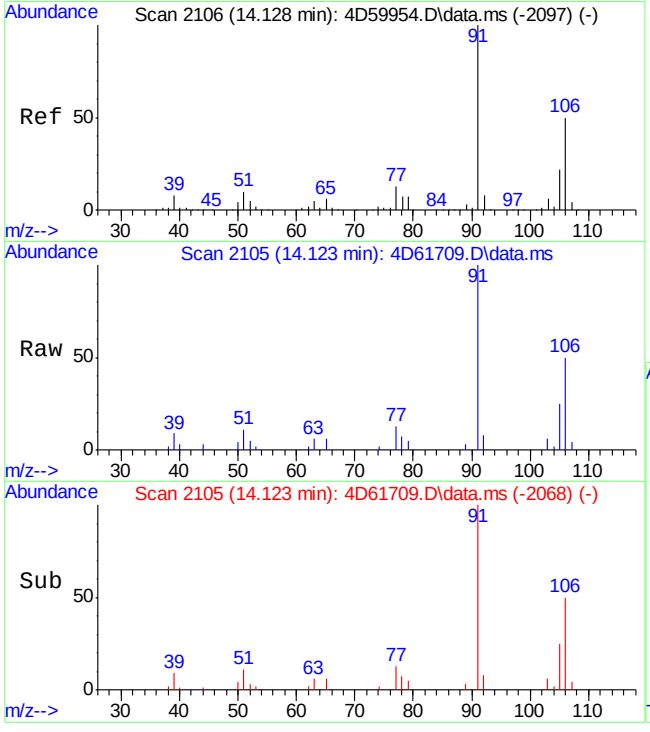


#92
ethylbenzene
Concen: 2.32 ug/L
RT: 14.008 min Scan# 2083
Delta R.T. 0.000 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion: 91 Resp: 22993

Ion	Ratio	Lower	Upper
91	100		
106	30.1	0.8	60.8
77	8.8	0.0	38.3

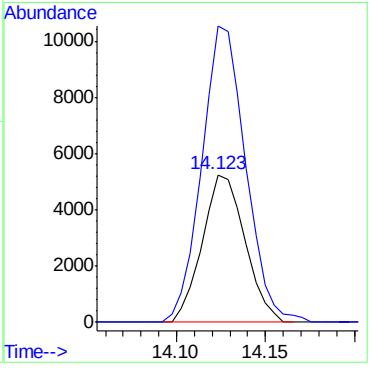


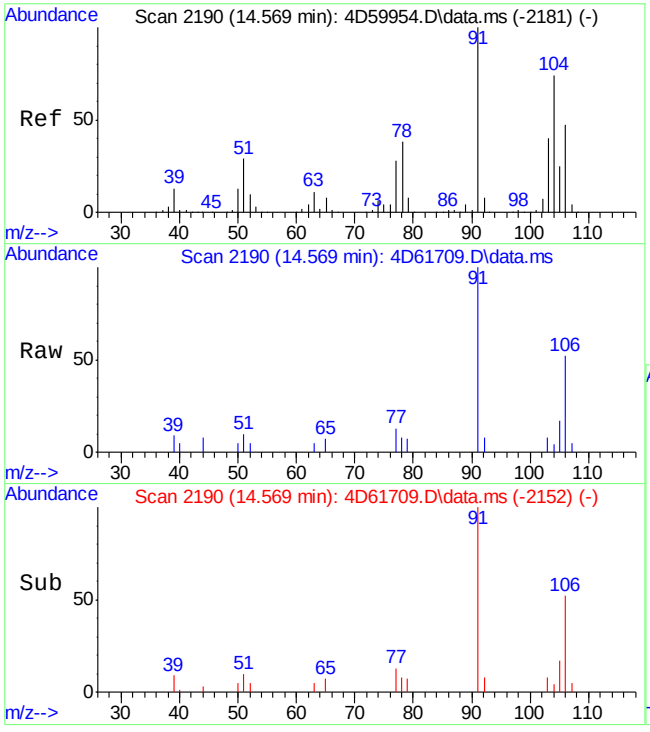


#93
m,p-xylene
Concen: 2.33 ug/L
RT: 14.123 min Scan# 2105
Delta R.T. -0.006 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion:106 Resp: 8725

Ion	Ratio	Lower	Upper
106	100		
91	201.3	140.6	261.2

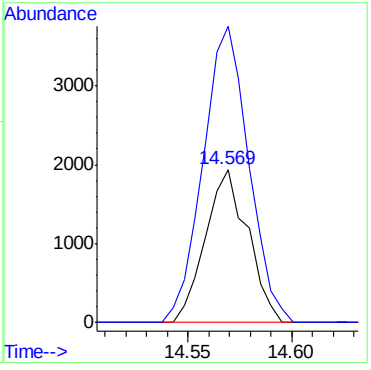


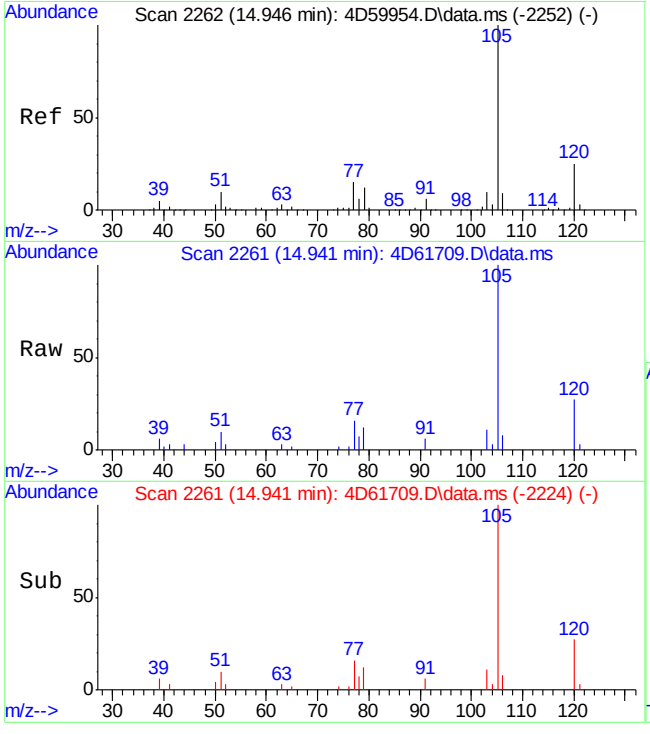


#94
o-xylene
Concen: 0.73 ug/L
RT: 14.569 min Scan# 2190
Delta R.T. 0.000 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion:106 Resp: 2738

Ion	Ratio	Lower	Upper
106	100		
91	193.7	146.3	271.7

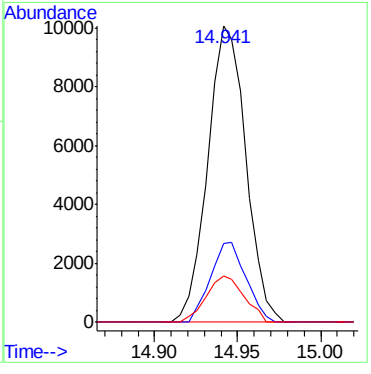


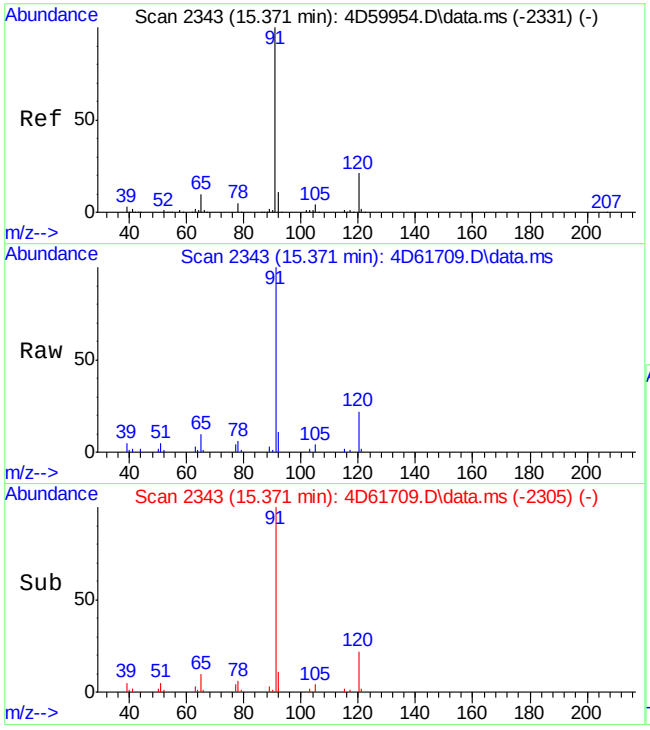


#99
isopropylbenzene
Concen: 1.67 ug/L
RT: 14.941 min Scan# 2261
Delta R.T. -0.006 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion:105 Resp: 16058

Ion	Ratio	Lower	Upper
105	100		
120	26.6	0.0	55.5
77	15.6	0.0	44.8

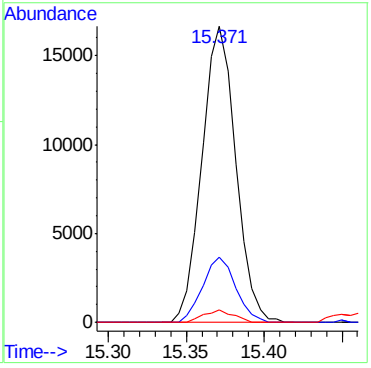


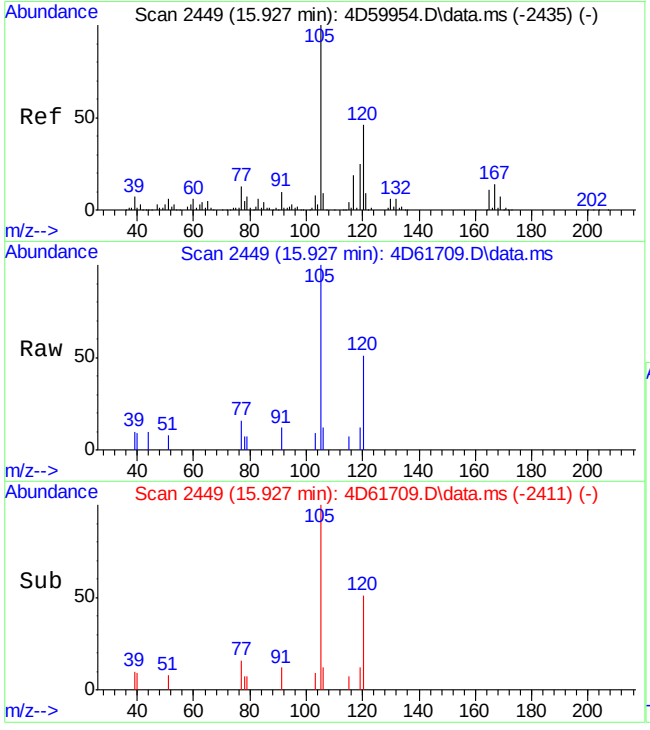


#106
n-propylbenzene
Concen: 2.24 ug/L
RT: 15.371 min Scan# 2343
Delta R.T. 0.000 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion: 91 Resp: 25018

Ion	Ratio	Lower	Upper
91	100		
120	22.0	0.0	51.4
105	4.0	0.0	33.6

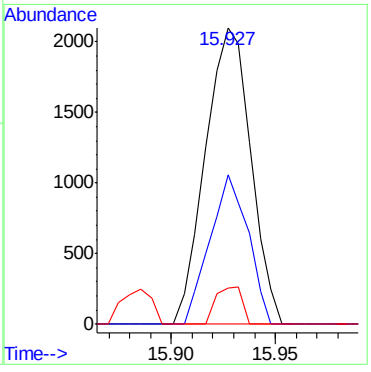




#112
1,2,4-trimethylbenzene
Concen: 0.39 ug/L
RT: 15.927 min Scan# 2449
Delta R.T. 0.000 min
Lab File: 4D61709.D
Acq: 31 Jul 2015 9:09 pm

Tgt Ion:105 Resp: 3189

Ion	Ratio	Lower	Upper
105	100		
120	50.5	16.1	76.1
119	12.3	0.0	54.6



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61710.D
Acq On : 31 Jul 2015 9:36 pm
Operator : ximenac
Sample : jc300-4
Misc : MS88773,V4D2729,5,,,,10
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Aug 03 10:30:23 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

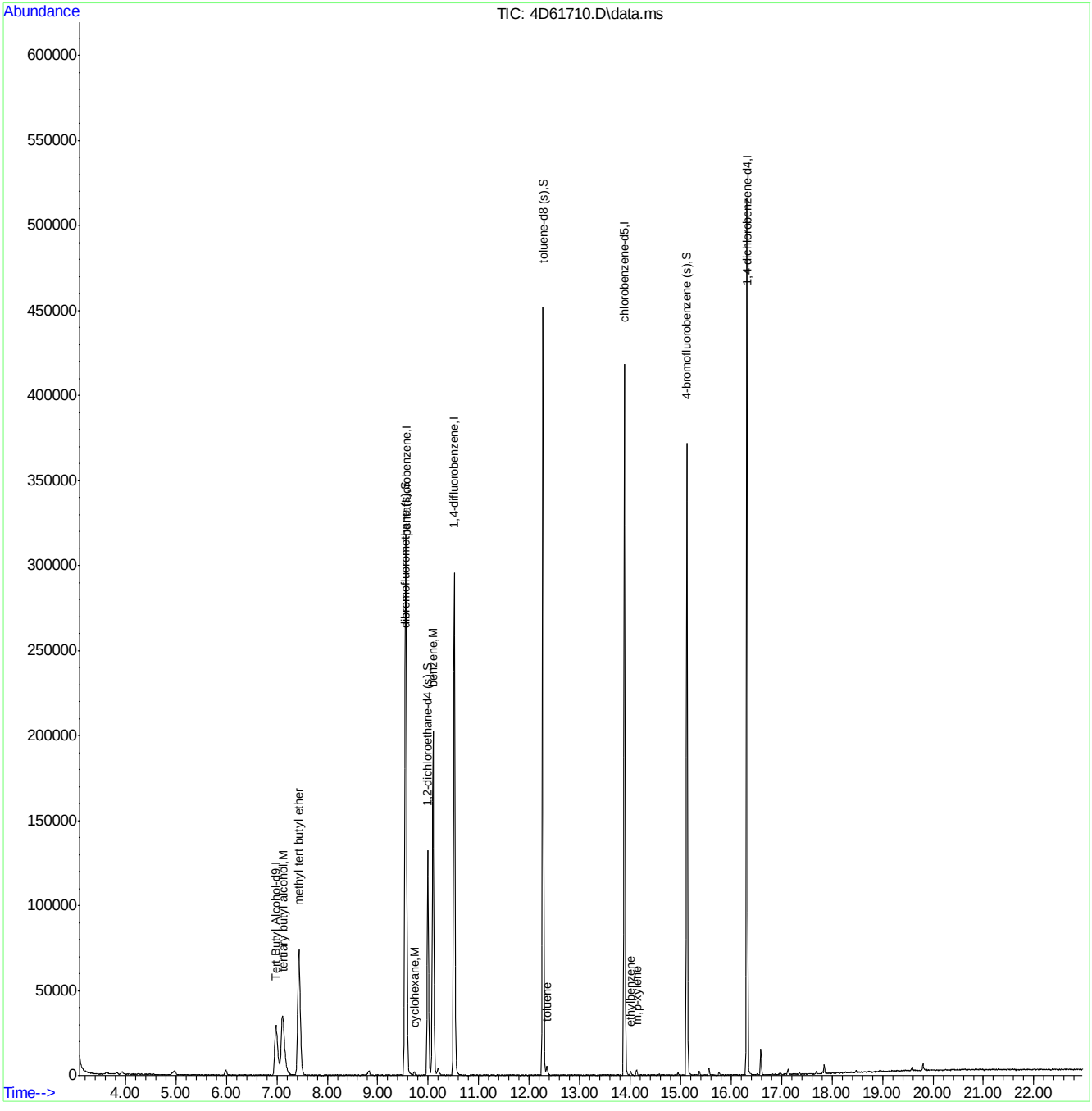
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.982	65	72414	500.00	ug/L	-0.02
4) pentafluorobenzene	9.562	168	196972	50.00	ug/L	0.00
51) 1,4-difluorobenzene	10.516	114	259746	50.00	ug/L	0.00
83) chlorobenzene-d5	13.888	117	229019	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	125283	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.541	113	93402	53.61	ug/L	0.00
Spiked Amount 50.000	Range 76 - 120		Recovery = 107.22%			
46) 1,2-dichloroethane-d4 (s)	9.992	65	93616	53.02	ug/L	0.00
Spiked Amount 50.000	Range 73 - 122		Recovery = 106.04%			
75) toluene-d8 (s)	12.273	98	297656	50.23	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 100.46%			
100) 4-bromofluorobenzene (s)	15.125	95	117176	49.67	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 99.34%			
Target Compounds						Qvalue
3) tertiary butyl alcohol	7.119	59	88546	450.69	ug/L	95
28) methyl tert butyl ether	7.439	73	126751	22.08	ug/L	99
54) cyclohexane	9.725	84	933	0.37	ug/L #	28
59) benzene	10.097	78	192350	24.10	ug/L	99
77) toluene	12.351	92	2306	0.46	ug/L	95
92) ethylbenzene	14.008	91	2467	0.25	ug/L	90
93) m,p-xylene	14.129	106	1353	0.37	ug/L	92

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

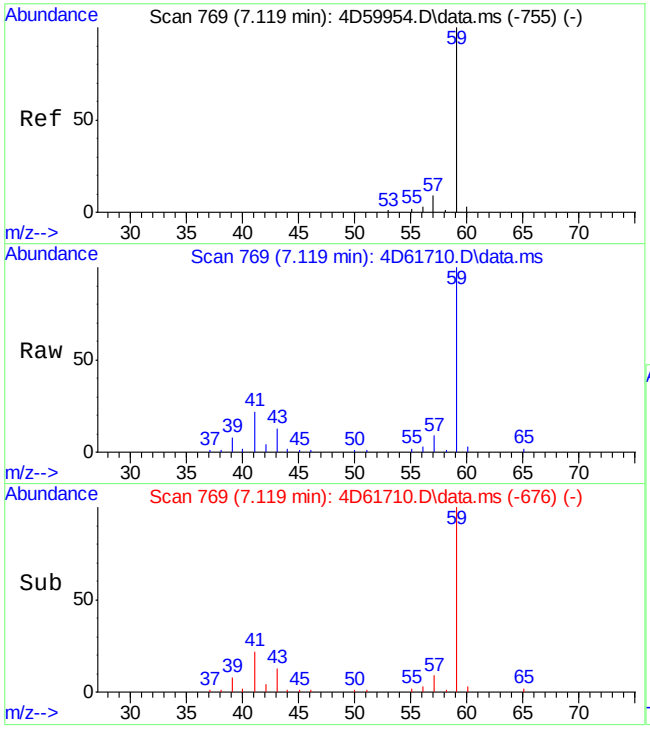
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61710.D
Acq On : 31 Jul 2015 9:36 pm
Operator : ximenac
Sample : jc300-4
Misc : MS88773,V4D2729,5,,,,10
ALS Vial : 25 Sample Multiplier: 1

Quant Time: Aug 03 10:30:23 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration



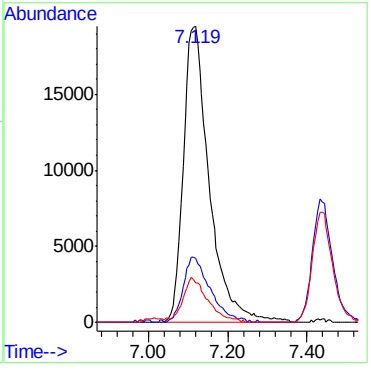
ACCUTEST LABORATORIES JC300

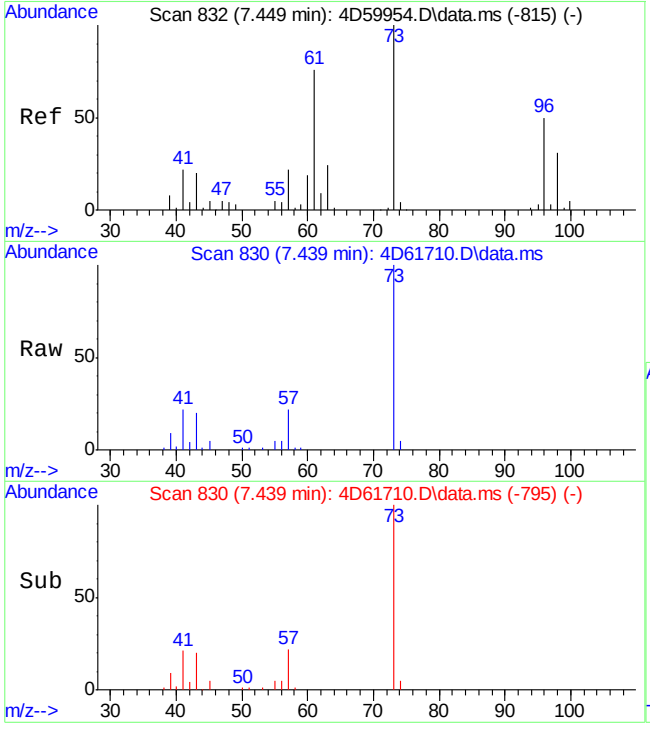


#3
tertiary butyl alcohol
Concen: 450.69 ug/L
RT: 7.119 min Scan# 769
Delta R.T. -0.010 min
Lab File: 4D61710.D
Acq: 31 Jul 2015 9:36 pm

Tgt Ion: 59 Resp: 88546

Ion	Ratio	Lower	Upper
59	100		
41	21.7	0.0	54.5
43	13.2	0.0	45.4

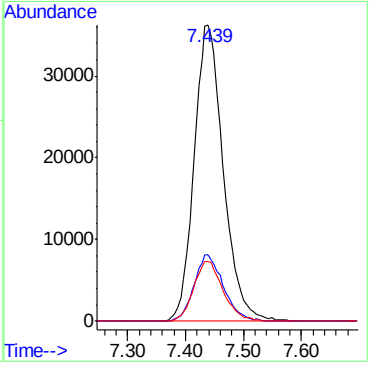


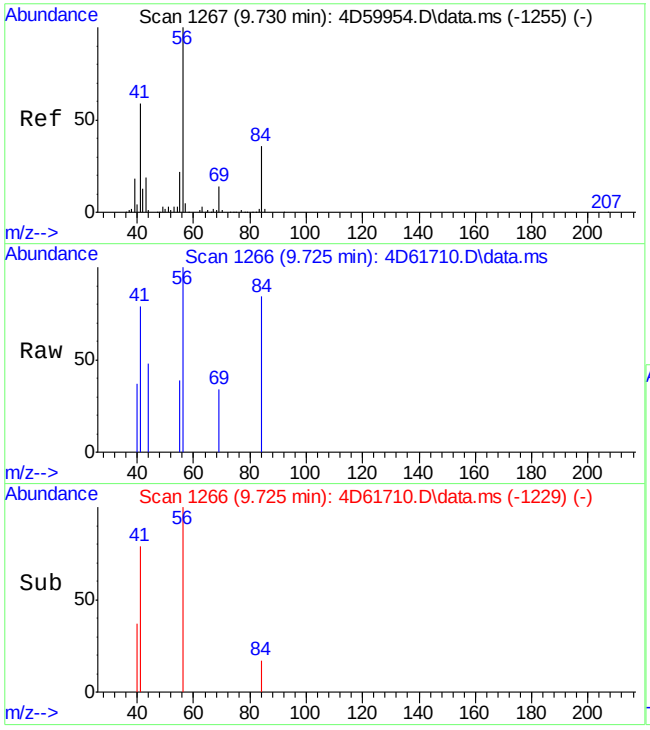


#28
methyl tert butyl ether
Concen: 22.08 ug/L
RT: 7.439 min Scan# 830
Delta R.T. -0.015 min
Lab File: 4D61710.D
Acq: 31 Jul 2015 9:36 pm

Tgt Ion: 73 Resp: 126751

Ion	Ratio	Lower	Upper
73	100		
57	22.2	0.0	52.0
43	20.0	0.0	49.4

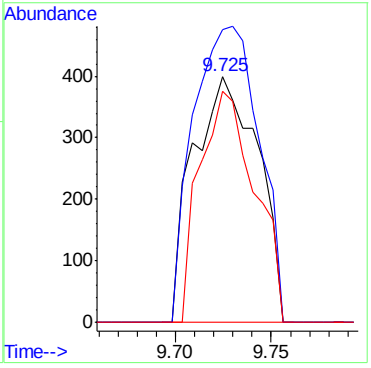


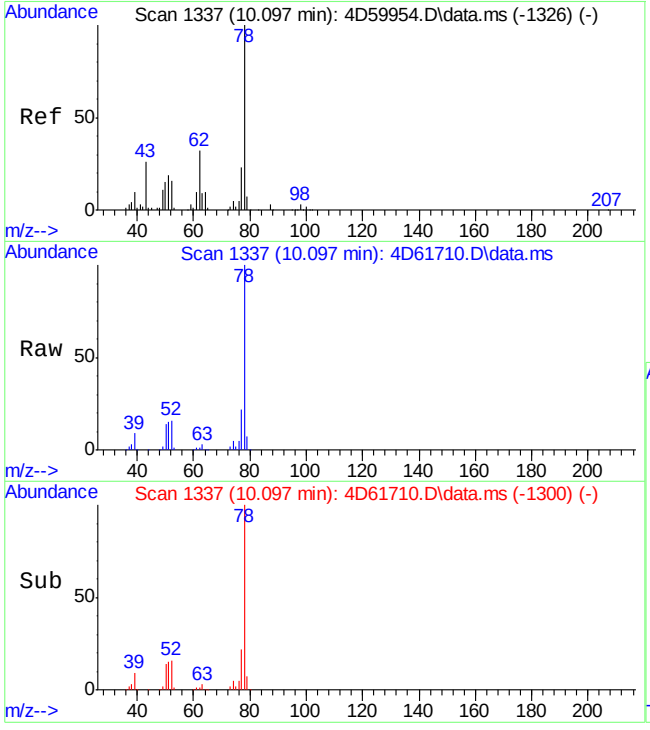


#54
cyclohexane
Concen: 0.37 ug/L
RT: 9.725 min Scan# 1266
Delta R.T. -0.005 min
Lab File: 4D61710.D
Acq: 31 Jul 2015 9:36 pm

Tgt Ion: 84 Resp: 933

Ion	Ratio	Lower	Upper
84	100		
56	122.5	236.1	296.1#
41	80.1	126.6	186.6#

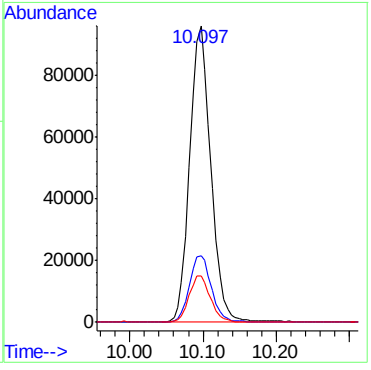




#59
benzene
Concen: 24.10 ug/L
RT: 10.097 min Scan# 1337
Delta R.T. -0.005 min
Lab File: 4D61710.D
Acq: 31 Jul 2015 9:36 pm

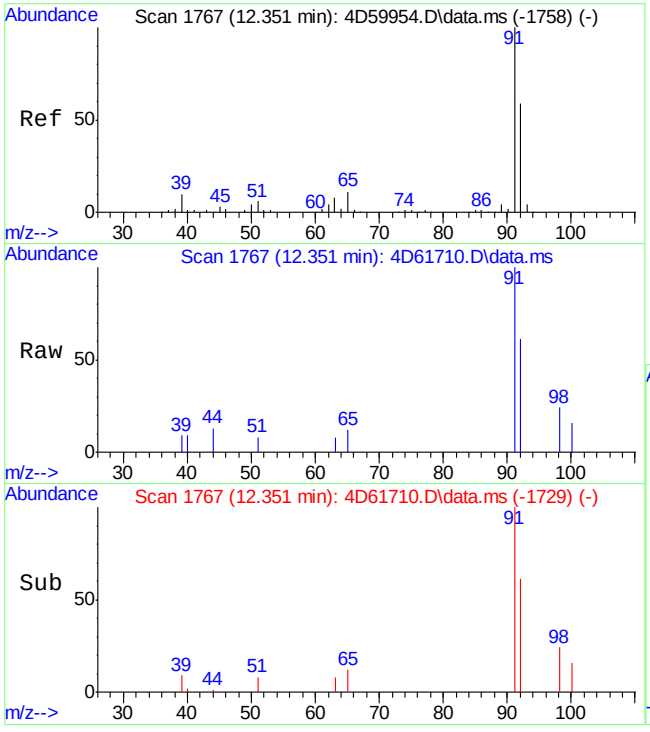
Tgt Ion: 78 Resp: 192350

Ion	Ratio	Lower	Upper
78	100		
77	22.3	0.0	53.0
52	15.6	0.0	45.4



7.1.5

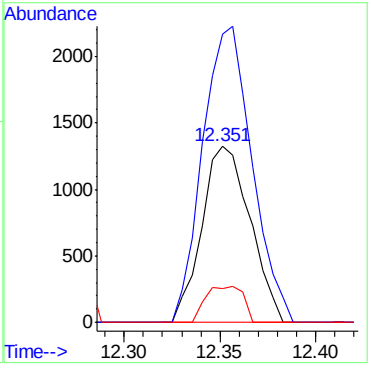
7

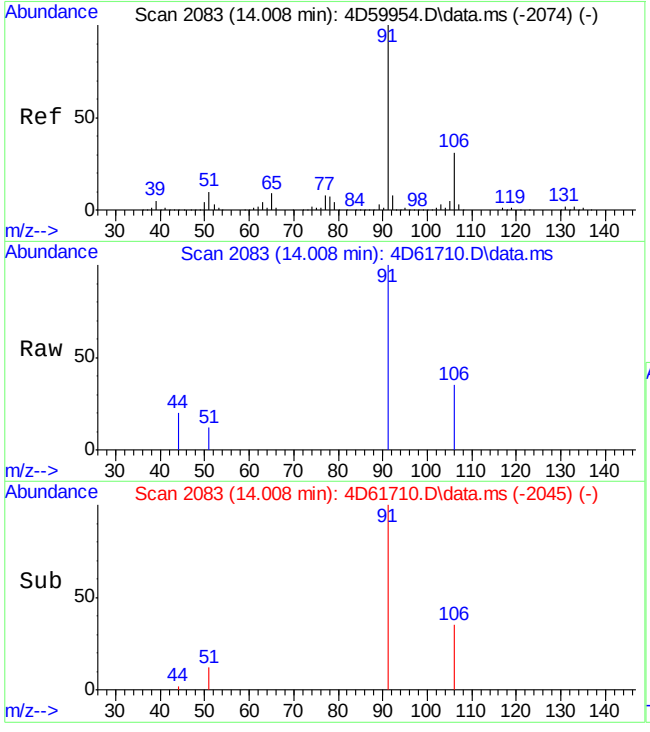


#77
toluene
Concen: 0.46 ug/L
RT: 12.351 min Scan# 1767
Delta R.T. 0.000 min
Lab File: 4D61710.D
Acq: 31 Jul 2015 9:36 pm

Tgt Ion: 92 Resp: 2306

Ion	Ratio	Lower	Upper
92	100		
91	163.3	140.3	200.3
65	19.4	0.0	48.9

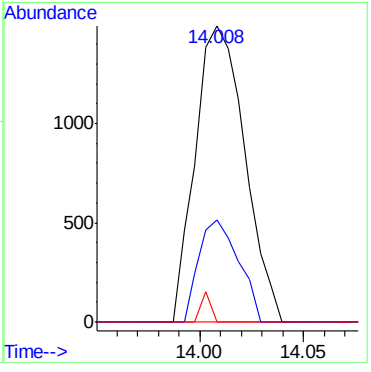


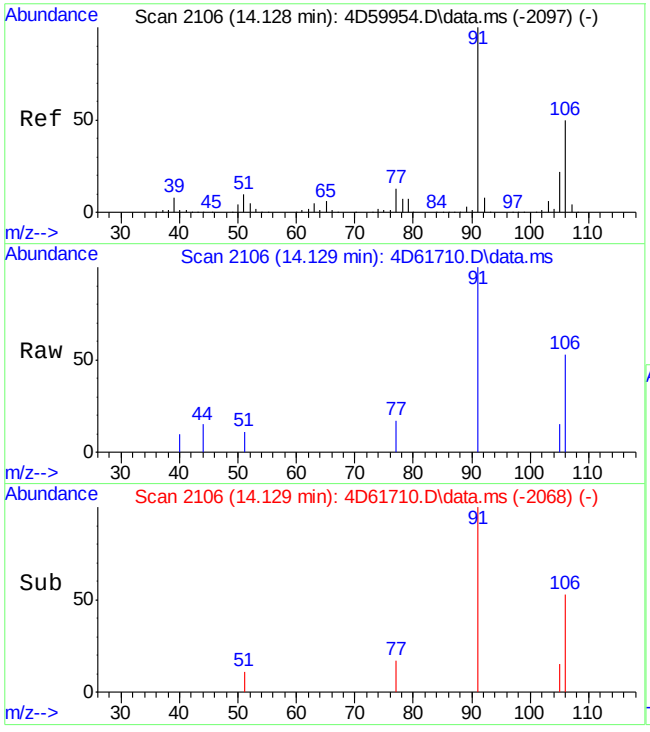


#92
ethylbenzene
Concen: 0.25 ug/L
RT: 14.008 min Scan# 2083
Delta R.T. 0.000 min
Lab File: 4D61710.D
Acq: 31 Jul 2015 9:36 pm

Tgt Ion: 91 Resp: 2467

Ion	Ratio	Lower	Upper
91	100		
106	34.6	0.8	60.8
77	0.0	0.0	38.3

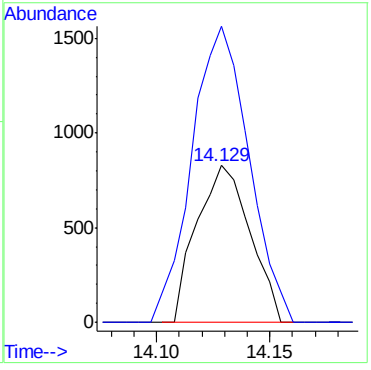




#93
m,p-xylene
Concen: 0.37 ug/L
RT: 14.129 min Scan# 2106
Delta R.T. -0.000 min
Lab File: 4D61710.D
Acq: 31 Jul 2015 9:36 pm

Tgt Ion:106 Resp: 1353

Ion	Ratio	Lower	Upper
106	100		
91	188.7	140.6	261.2



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61711.D
Acq On : 31 Jul 2015 10:02 pm
Operator : ximenac
Sample : jc300-5
Misc : MS88773,V4D2729,5,,,,100
ALS Vial : 26 Sample Multiplier: 1

Quant Time: Aug 03 10:31:20 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

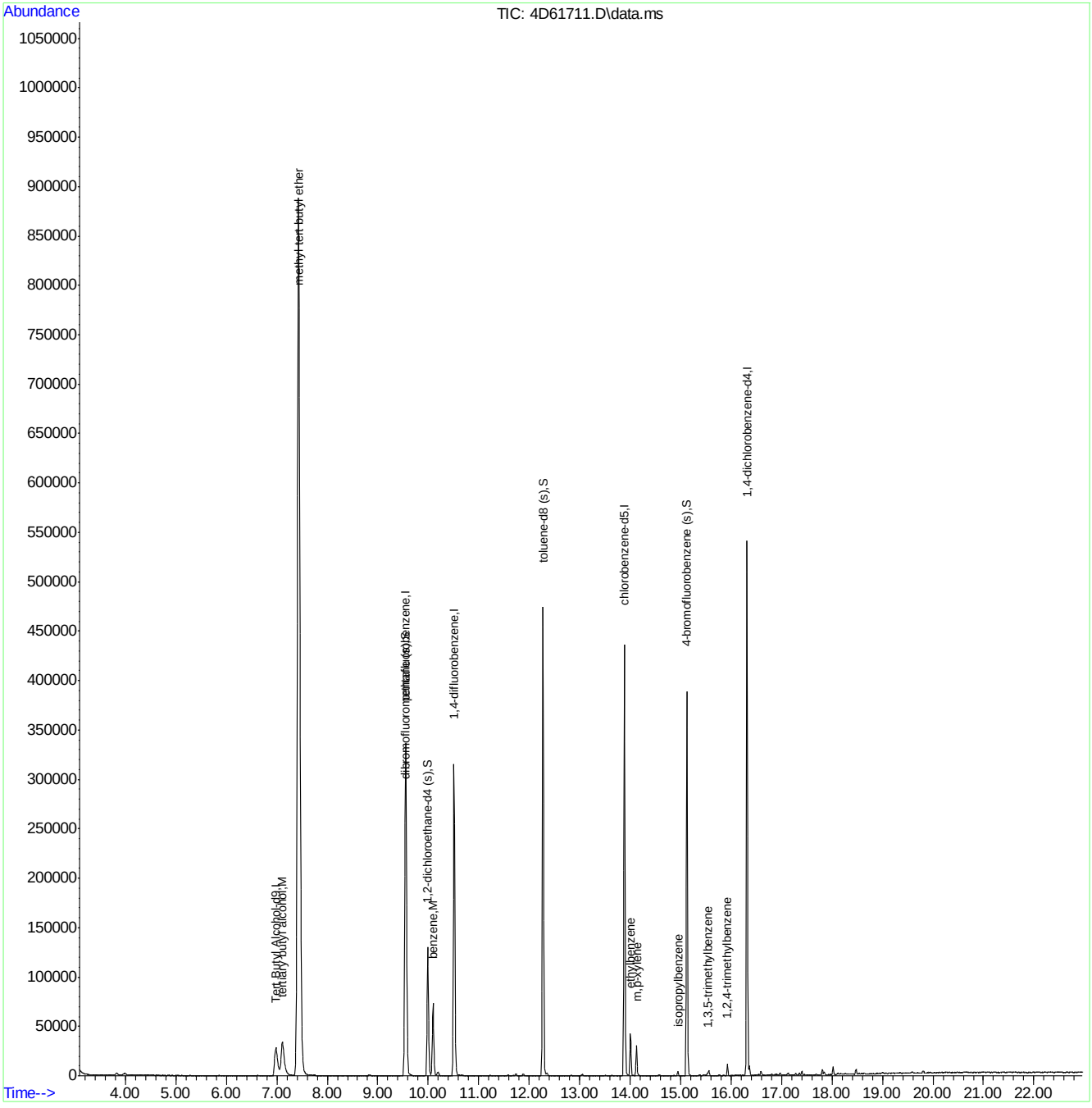
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.977	65	74764	500.00	ug/L	-0.02
4) pentafluorobenzene	9.557	168	207111	50.00	ug/L	-0.01
51) 1,4-difluorobenzene	10.511	114	272413	50.00	ug/L	-0.01
83) chlorobenzene-d5	13.887	117	240936	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	131472	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.541	113	97735	53.35	ug/L	0.00
Spiked Amount 50.000	Range 76 - 120		Recovery = 106.70%			
46) 1,2-dichloroethane-d4 (s)	9.987	65	96234	51.84	ug/L	-0.01
Spiked Amount 50.000	Range 73 - 122		Recovery = 103.68%			
75) toluene-d8 (s)	12.273	98	314360	50.59	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 101.18%			
100) 4-bromofluorobenzene (s)	15.125	95	122833	49.61	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 99.22%			
Target Compounds						Qvalue
3) tertiary butyl alcohol	7.108	59	82970	409.03	ug/L	93
28) methyl tert butyl ether	7.433	73	1534857	254.31	ug/L	99
59) benzene	10.097	78	72397	8.65	ug/L	99
92) ethylbenzene	14.008	91	30254	2.94	ug/L	99
93) m,p-xylene	14.129	106	8975	2.31	ug/L	99
99) isopropylbenzene	14.946	105	3307	0.33	ug/L	91
109) 1,3,5-trimethylbenzene	15.534	105	2107	0.25	ug/L	97
112) 1,2,4-trimethylbenzene	15.927	105	6445	0.75	ug/L	89

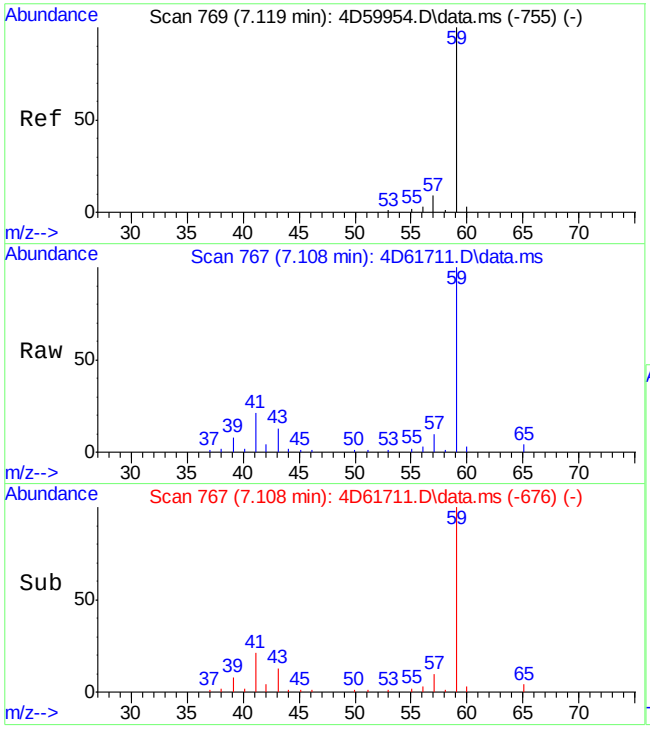
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61711.D
Acq On : 31 Jul 2015 10:02 pm
Operator : ximenac
Sample : jc300-5
Misc : MS88773,V4D2729,5,,,,100
ALS Vial : 26 Sample Multiplier: 1

Quant Time: Aug 03 10:31:20 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

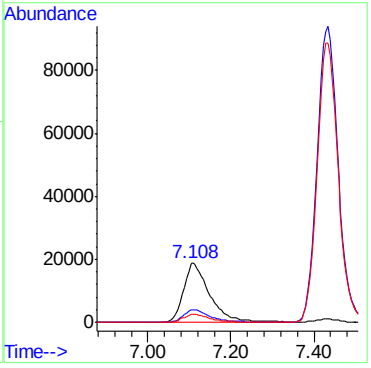


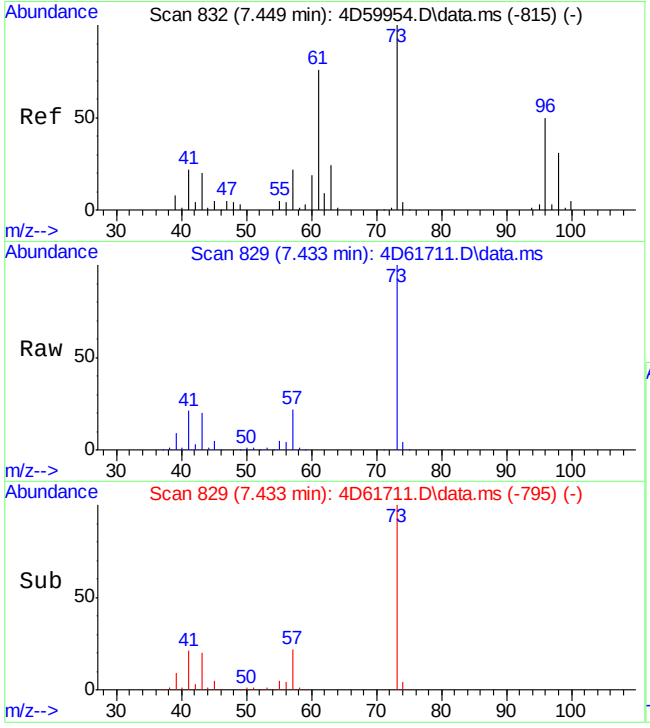


#3
tertiary butyl alcohol
Concen: 409.03 ug/L
RT: 7.108 min Scan# 767
Delta R.T. -0.021 min
Lab File: 4D61711.D
Acq: 31 Jul 2015 10:02 pm

Tgt Ion: 59 Resp: 82970

Ion	Ratio	Lower	Upper
59	100		
41	20.8	0.0	54.5
43	13.1	0.0	45.4

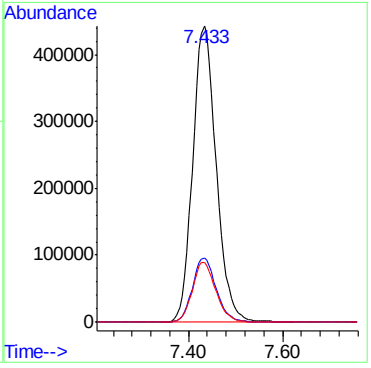


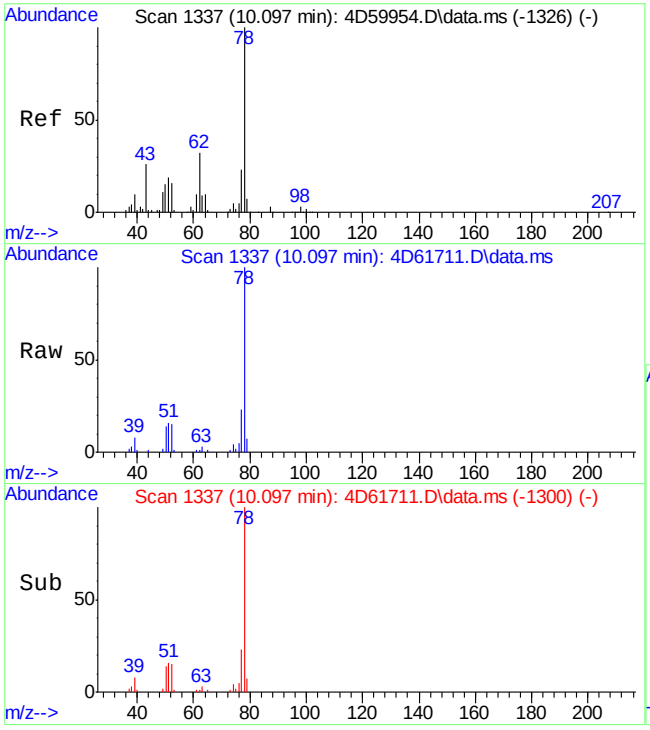


#28
methyl tert butyl ether
Concen: 254.31 ug/L
RT: 7.433 min Scan# 829
Delta R.T. -0.021 min
Lab File: 4D61711.D
Acq: 31 Jul 2015 10:02 pm

Tgt Ion: 73 Resp: 1534857

Ion	Ratio	Lower	Upper
73	100		
57	21.7	0.0	52.0
43	20.1	0.0	49.4

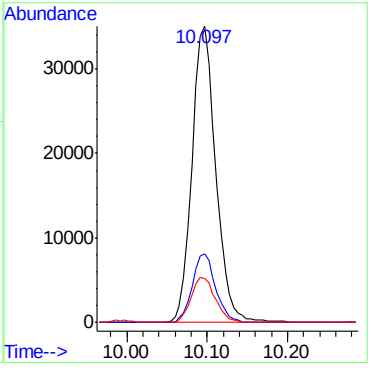


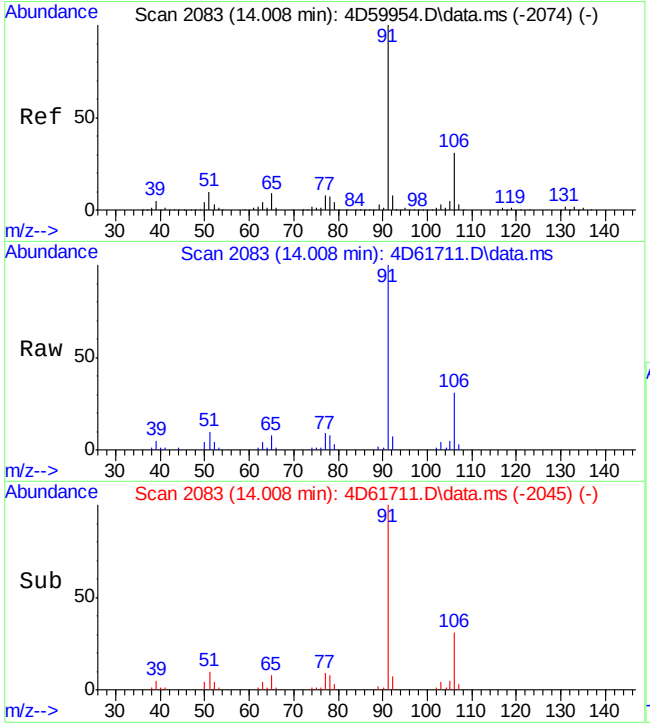


#59
benzene
Concen: 8.65 ug/L
RT: 10.097 min Scan# 1337
Delta R.T. -0.005 min
Lab File: 4D61711.D
Acq: 31 Jul 2015 10:02 pm

Tgt Ion: 78 Resp: 72397

Ion	Ratio	Lower	Upper
78	100		
77	23.0	0.0	53.0
52	14.8	0.0	45.4

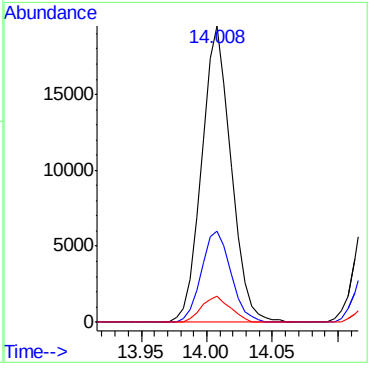


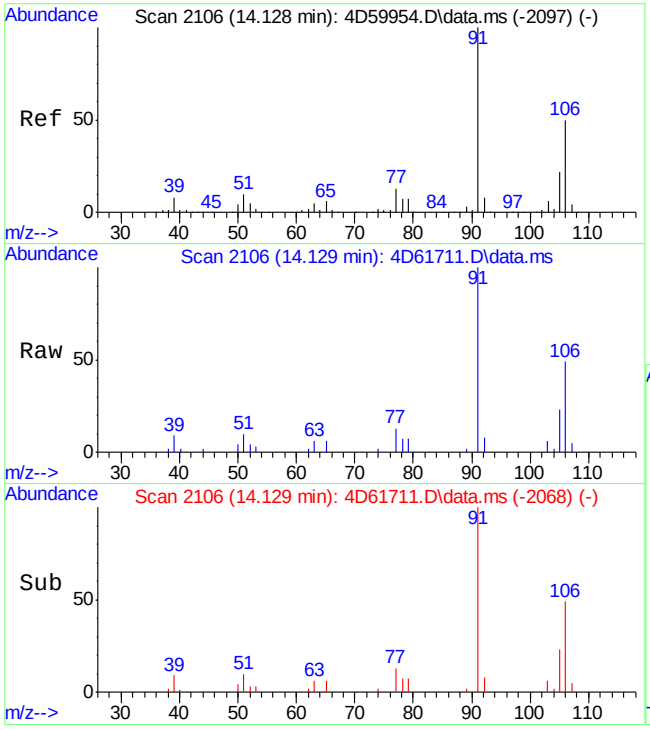


#92
ethylbenzene
Concen: 2.94 ug/L
RT: 14.008 min Scan# 2083
Delta R.T. -0.000 min
Lab File: 4D61711.D
Acq: 31 Jul 2015 10:02 pm

Tgt Ion: 91 Resp: 30254

Ion	Ratio	Lower	Upper
91	100		
106	30.6	0.8	60.8
77	8.8	0.0	38.3

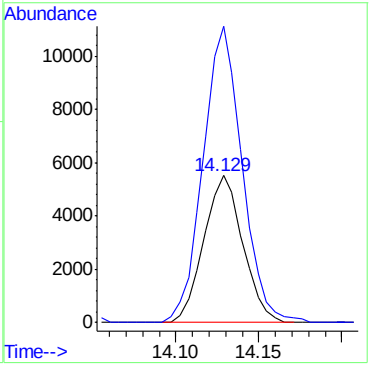


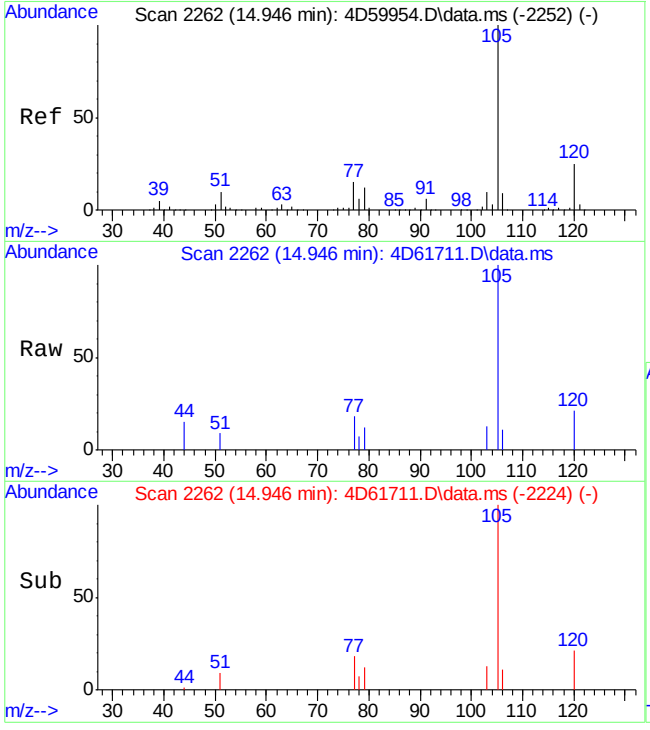


#93
m,p-xylene
Concen: 2.31 ug/L
RT: 14.129 min Scan# 2106
Delta R.T. -0.000 min
Lab File: 4D61711.D
Acq: 31 Jul 2015 10:02 pm

Tgt Ion:106 Resp: 8975

Ion	Ratio	Lower	Upper
106	100		
91	202.1	140.6	261.2

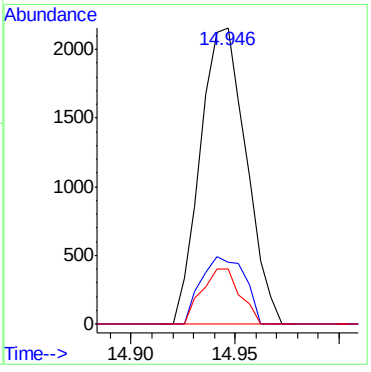


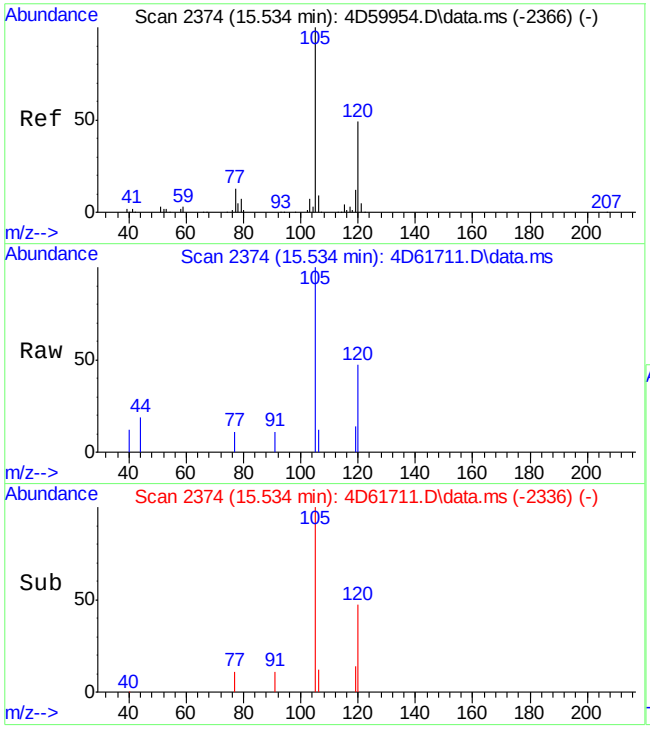


#99
isopropylbenzene
Concen: 0.33 ug/L
RT: 14.946 min Scan# 2262
Delta R.T. -0.001 min
Lab File: 4D61711.D
Acq: 31 Jul 2015 10:02 pm

Tgt Ion:105 Resp: 3307

Ion	Ratio	Lower	Upper
105	100		
120	20.9	0.0	55.5
77	18.5	0.0	44.8

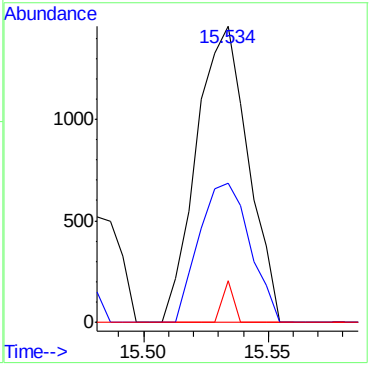


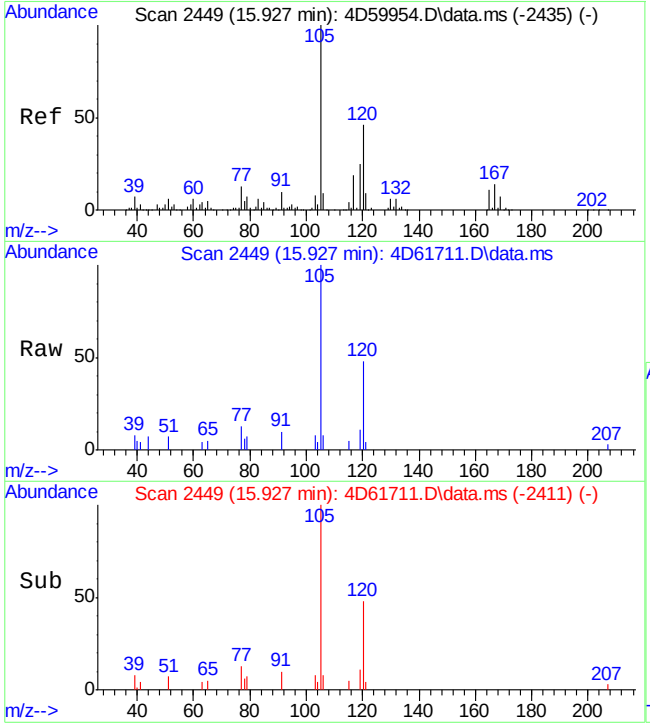


#109
1,3,5-trimethylbenzene
Concen: 0.25 ug/L
RT: 15.534 min Scan# 2374
Delta R.T. -0.000 min
Lab File: 4D61711.D
Acq: 31 Jul 2015 10:02 pm

Tgt Ion:105 Resp: 2107

Ion	Ratio	Lower	Upper
105	100		
120	47.2	19.3	79.3
119	14.1	0.0	42.6

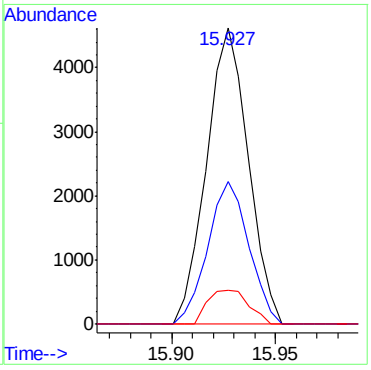




#112
1,2,4-trimethylbenzene
Concen: 0.75 ug/L
RT: 15.927 min Scan# 2449
Delta R.T. -0.000 min
Lab File: 4D61711.D
Acq: 31 Jul 2015 10:02 pm

Tgt Ion:105 Resp: 6445

Ion	Ratio	Lower	Upper
105	100		
120	48.1	16.1	76.1
119	11.4	0.0	54.6



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61722.D
Acq On : 3 Aug 2015 1:26 pm
Operator : ximenac
Sample : jc300-5
Misc : MS88950,V4D2730,5,,,,1000
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 04 09:34:02 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

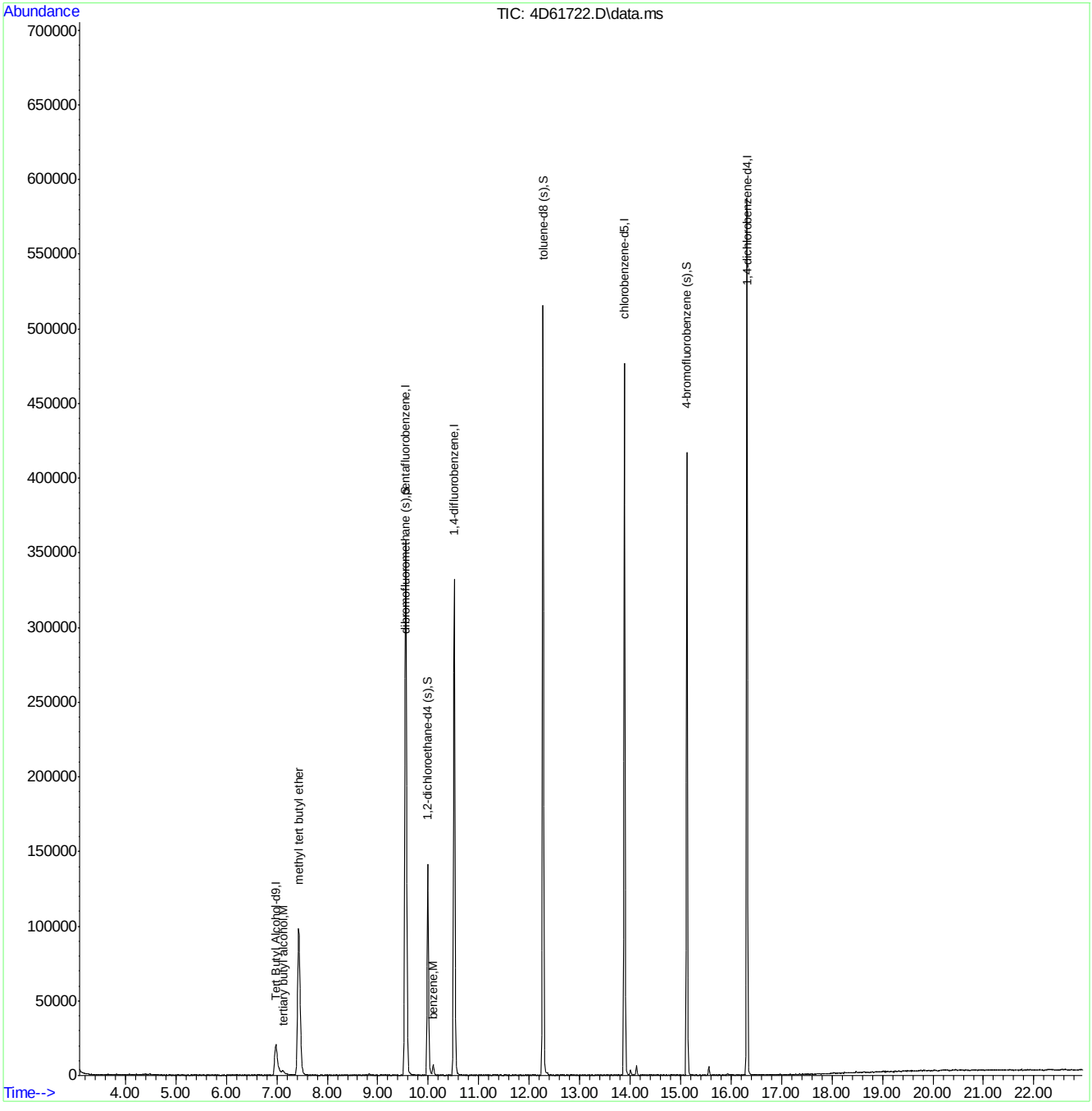
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.977	65	58589	500.00	ug/L	-0.02
4) pentafluorobenzene	9.557	168	224071	50.00	ug/L	-0.01
51) 1,4-difluorobenzene	10.516	114	293595	50.00	ug/L	0.00
83) chlorobenzene-d5	13.887	117	266968	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	141787	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.541	113	105516	53.24	ug/L	0.00
Spiked Amount 50.000	Range 76 - 120		Recovery = 106.48%			
46) 1,2-dichloroethane-d4 (s)	9.992	65	102943	51.26	ug/L	0.00
Spiked Amount 50.000	Range 73 - 122		Recovery = 102.52%			
75) toluene-d8 (s)	12.273	98	339596	50.71	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 101.42%			
100) 4-bromofluorobenzene (s)	15.125	95	132522	49.63	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 99.26%			
Target Compounds						Qvalue
3) tertiary butyl alcohol	7.119	59	5969	37.55	ug/L	91
28) methyl tert butyl ether	7.438	73	172030	26.35	ug/L	99
59) benzene	10.097	78	7697	0.85	ug/L	95

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

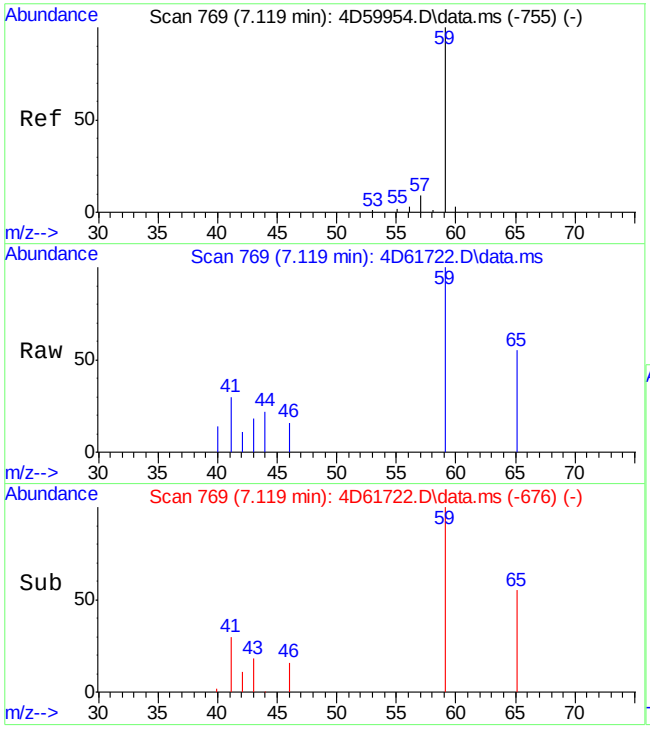
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61722.D
Acq On : 3 Aug 2015 1:26 pm
Operator : ximenac
Sample : jc300-5
Misc : MS88950,V4D2730,5,,,,1000
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 04 09:34:02 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration



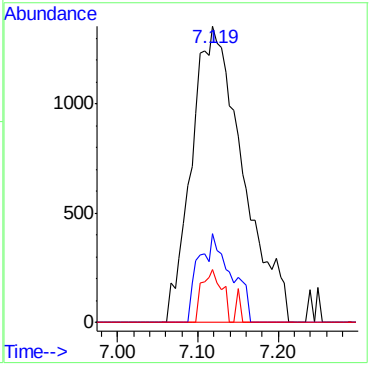
M4D2625.M Tue Aug 04 09:34:08 2015 RPT1 Page: 2

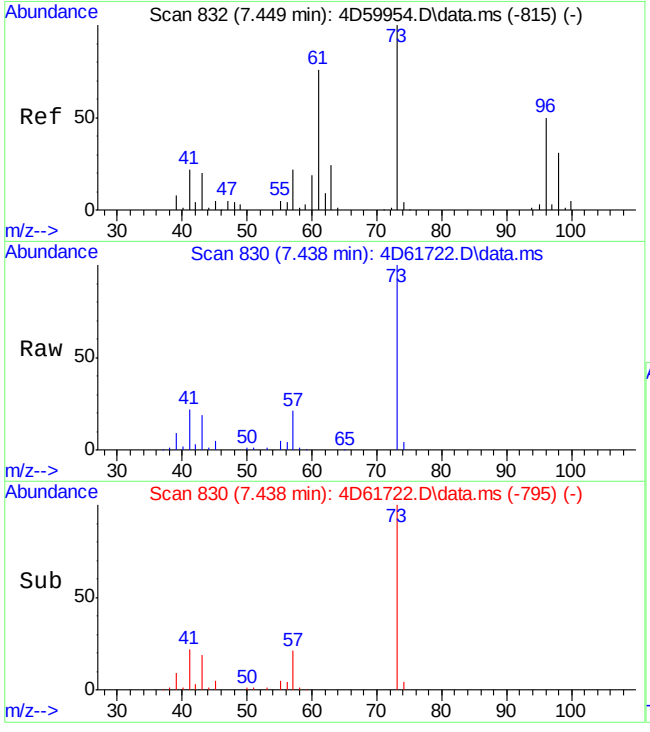


#3
tertiary butyl alcohol
Concen: 37.55 ug/L
RT: 7.119 min Scan# 769
Delta R.T. -0.011 min
Lab File: 4D61722.D
Acq: 3 Aug 2015 1:26 pm

Tgt Ion: 59 Resp: 5969

Ion	Ratio	Lower	Upper
59	100		
41	29.9	0.0	54.5
43	18.0	0.0	45.4

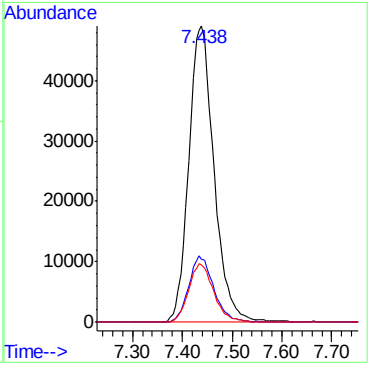


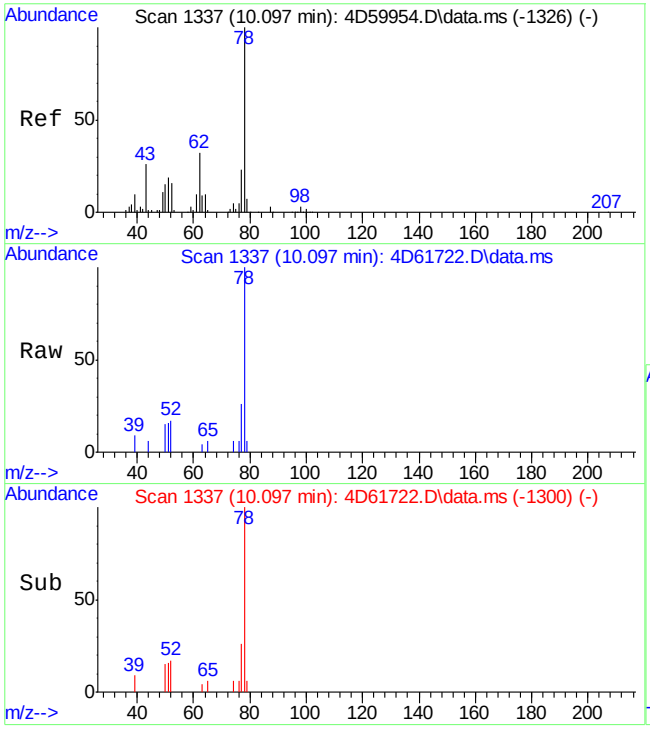


#28
methyl tert butyl ether
Concen: 26.35 ug/L
RT: 7.438 min Scan# 830
Delta R.T. -0.016 min
Lab File: 4D61722.D
Acq: 3 Aug 2015 1:26 pm

Tgt Ion: 73 Resp: 172030

Ion	Ratio	Lower	Upper
73	100		
57	21.1	0.0	52.0
43	19.3	0.0	49.4

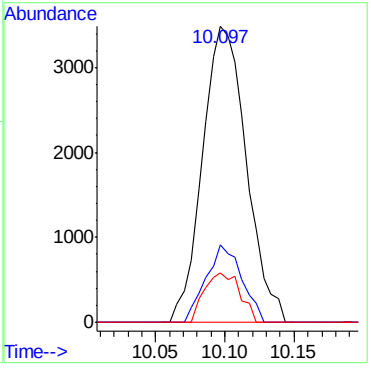




#59
benzene
Concen: 0.85 ug/L
RT: 10.097 min Scan# 1337
Delta R.T. -0.005 min
Lab File: 4D61722.D
Acq: 3 Aug 2015 1:26 pm

Tgt Ion: 78 Resp: 7697

Ion	Ratio	Lower	Upper
78	100		
77	26.2	0.0	53.0
52	16.8	0.0	45.4



7.1.7

7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61712.D
Acq On : 31 Jul 2015 10:29 pm
Operator : ximenac
Sample : jc300-6
Misc : MS88773,V4D2729,5,,,,5
ALS Vial : 27 Sample Multiplier: 1

Quant Time: Aug 03 10:32:53 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

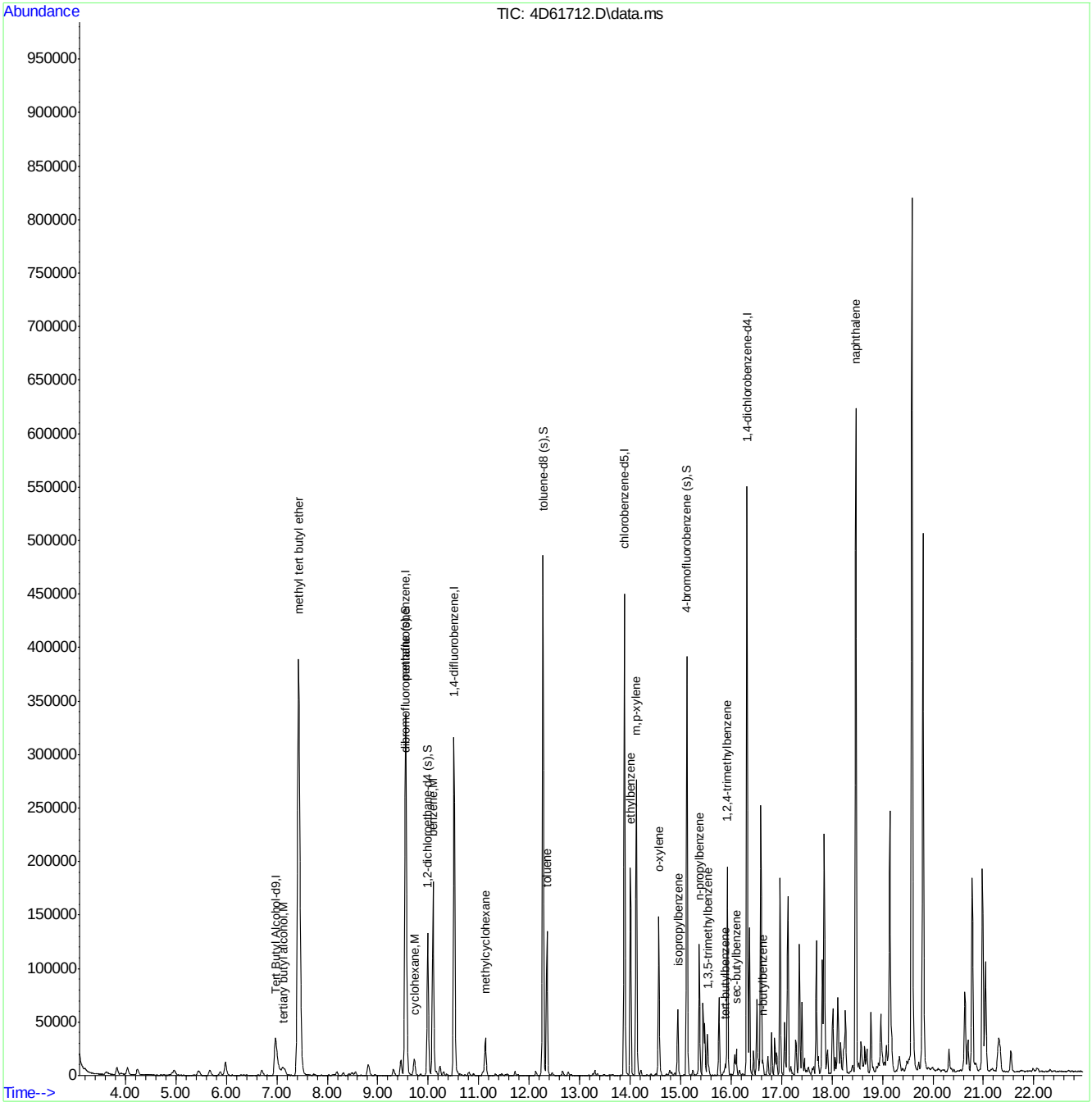
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.977	65	74690	500.00	ug/L	-0.02
4) pentafluorobenzene	9.557	168	207187	50.00	ug/L	-0.01
51) 1,4-difluorobenzene	10.516	114	270439	50.00	ug/L	0.00
83) chlorobenzene-d5	13.887	117	244228	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	131135	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.541	113	98022	53.49	ug/L	0.00
Spiked Amount 50.000	Range 76 - 120		Recovery = 106.98%			
46) 1,2-dichloroethane-d4 (s)	9.992	65	98353	52.96	ug/L	0.00
Spiked Amount 50.000	Range 73 - 122		Recovery = 105.92%			
75) toluene-d8 (s)	12.273	98	313796	50.86	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 101.72%			
100) 4-bromofluorobenzene (s)	15.125	95	124297	50.33	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 100.66%			
Target Compounds						Qvalue
3) tertiary butyl alcohol	7.119	59	14767	72.87	ug/L	94
28) methyl tert butyl ether	7.433	73	661734	109.60	ug/L	99
54) cyclohexane	9.730	84	7268	2.79	ug/L #	33
59) benzene	10.097	78	177577	21.37	ug/L	99
70) methylcyclohexane	11.135	83	15387	5.00	ug/L	94
77) toluene	12.351	92	57244	10.96	ug/L	99
92) ethylbenzene	14.008	91	134075	12.86	ug/L	99
93) m,p-xylene	14.123	106	77704	19.72	ug/L	98
94) o-xylene	14.569	106	39359	10.03	ug/L	99
99) isopropylbenzene	14.946	105	41244	4.12	ug/L	98
106) n-propylbenzene	15.371	91	92087	7.95	ug/L	99
109) 1,3,5-trimethylbenzene	15.534	105	20132	2.41	ug/L	96
110) tert-butylbenzene	15.885	119	5567	0.79	ug/L	90
112) 1,2,4-trimethylbenzene	15.927	105	100136	11.67	ug/L	91
113) sec-butylbenzene	16.105	105	17019	1.55	ug/L	98
118) n-butylbenzene	16.635	92	4070	0.87	ug/L	91
123) naphthalene	18.470	128	460351	47.69	ug/L	99

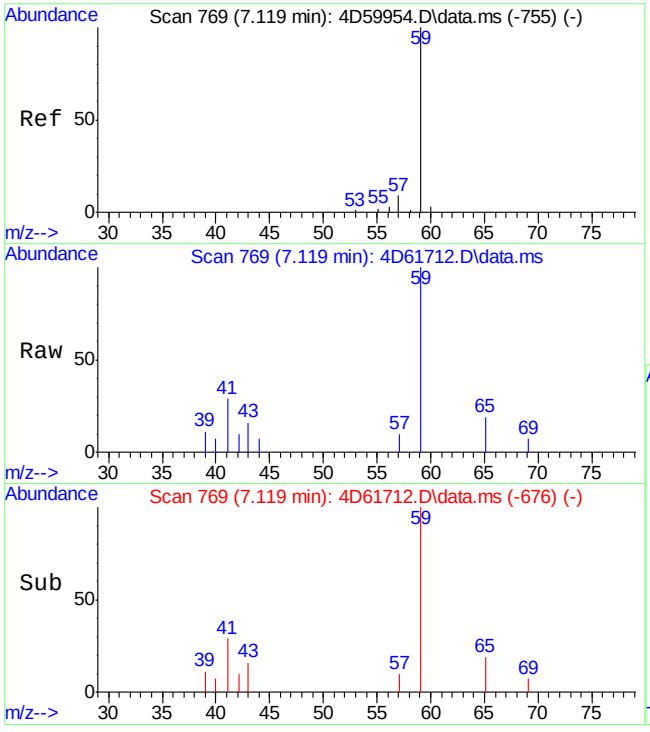
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61712.D
Acq On : 31 Jul 2015 10:29 pm
Operator : ximenac
Sample : jc300-6
Misc : MS88773,V4D2729,5,,,,5
ALS Vial : 27 Sample Multiplier: 1

Quant Time: Aug 03 10:32:53 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

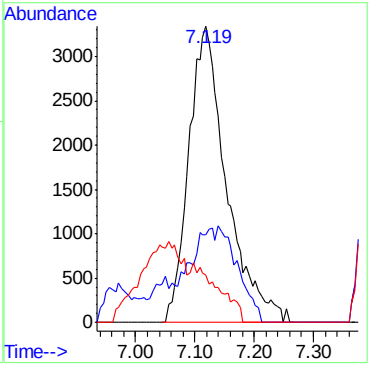


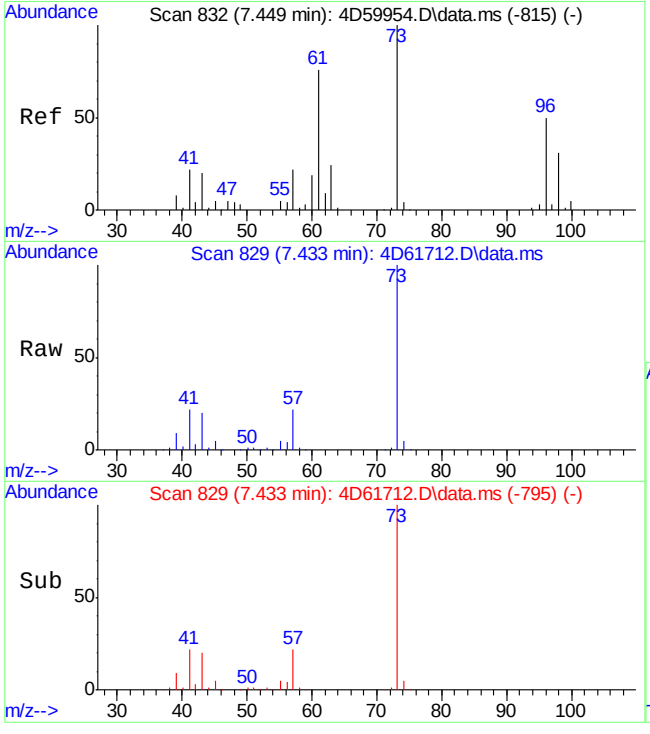


#3
tertiary butyl alcohol
Concen: 72.87 ug/L
RT: 7.119 min Scan# 769
Delta R.T. -0.011 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion: 59 Resp: 14767

Ion	Ratio	Lower	Upper
59	100		
41	29.4	0.0	54.5
43	15.8	0.0	45.4

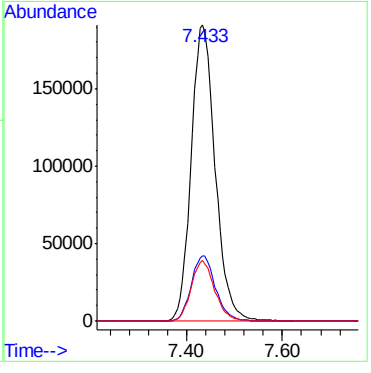


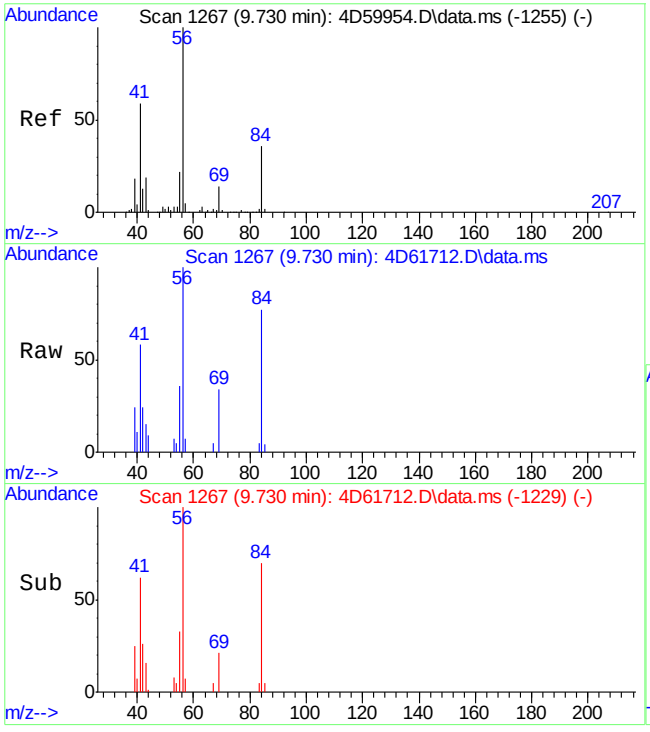


#28
methyl tert butyl ether
Concen: 109.60 ug/L
RT: 7.433 min Scan# 829
Delta R.T. -0.021 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion: 73 Resp: 661734

Ion	Ratio	Lower	Upper
73	100		
57	21.9	0.0	52.0
43	20.5	0.0	49.4

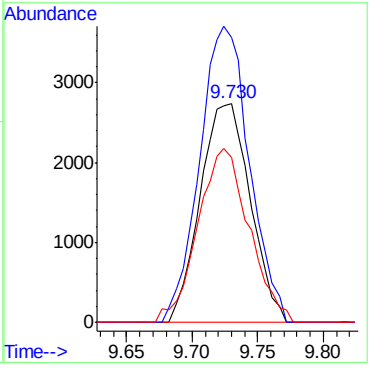


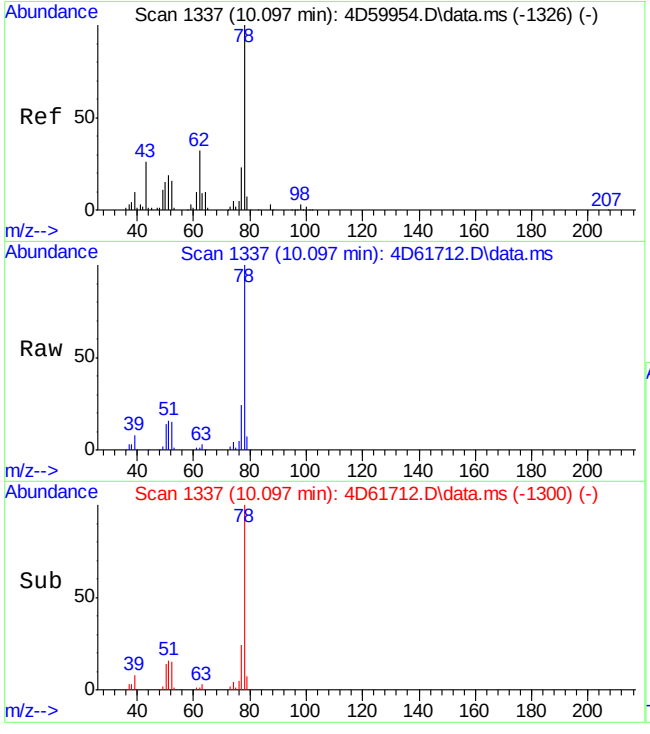


#54
cyclohexane
Concen: 2.79 ug/L
RT: 9.730 min Scan# 1267
Delta R.T. -0.000 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion: 84 Resp: 7268

Ion	Ratio	Lower	Upper
84	100		
56	134.5	236.1	296.1#
41	81.3	126.6	186.6#

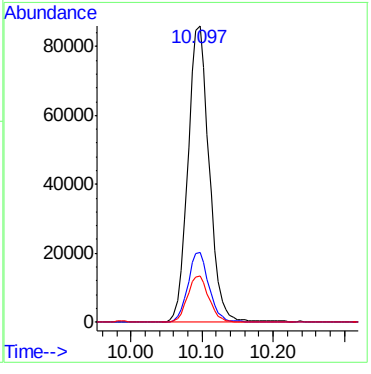




#59
benzene
Concen: 21.37 ug/L
RT: 10.097 min Scan# 1337
Delta R.T. -0.005 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

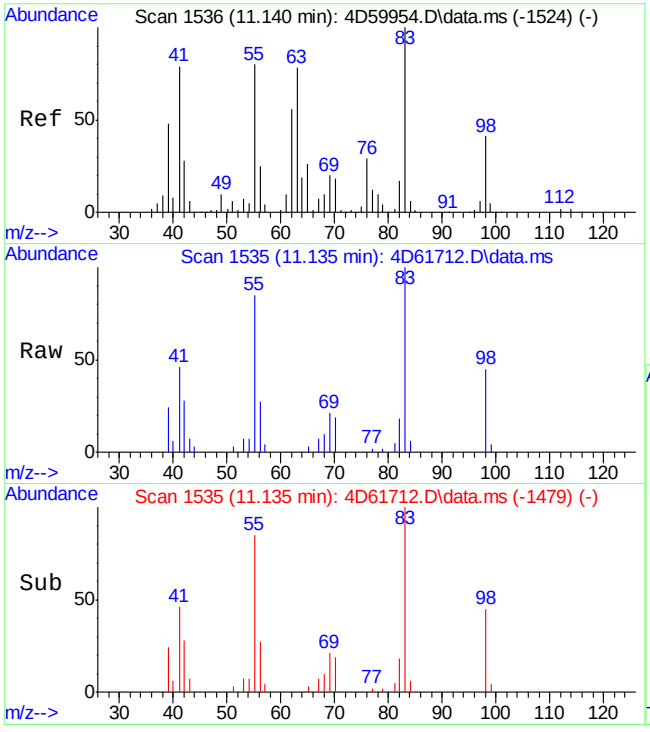
Tgt Ion: 78 Resp: 177577

Ion	Ratio	Lower	Upper
78	100		
77	23.7	0.0	53.0
52	15.4	0.0	45.4



7.1.8

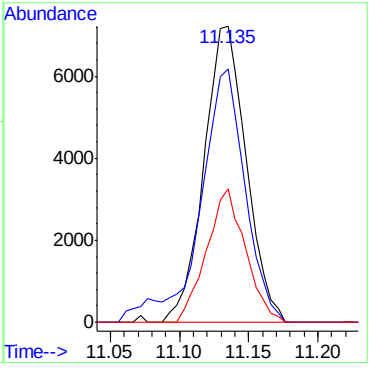
7

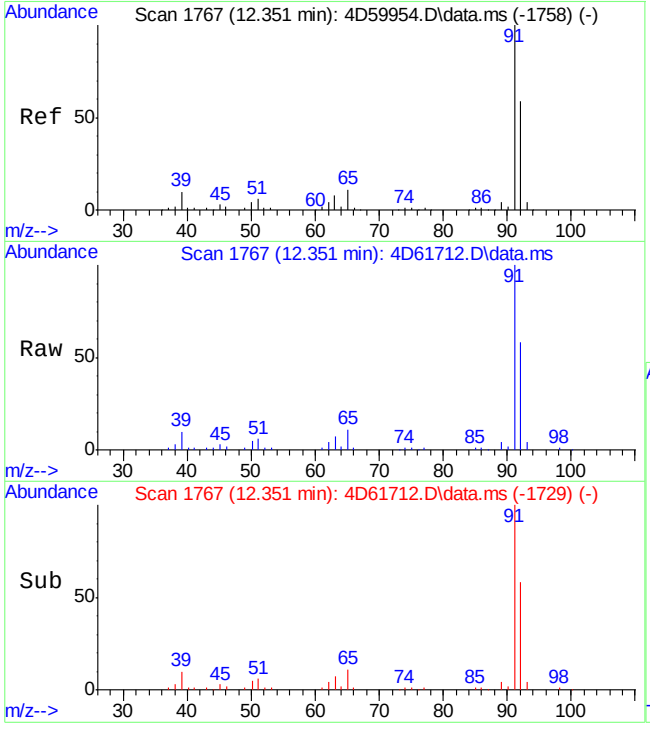


#70
methylcyclohexane
Concen: 5.00 ug/L
RT: 11.135 min Scan# 1535
Delta R.T. -0.005 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion: 83 Resp: 15387

Ion	Ratio	Lower	Upper
83	100		
55	85.5	50.4	110.4
98	45.0	10.7	70.7

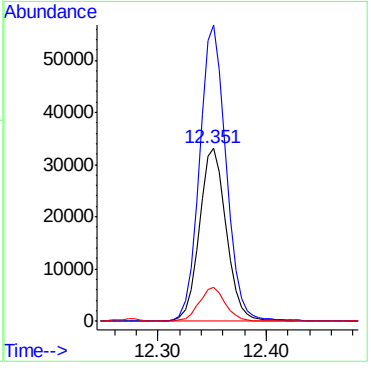


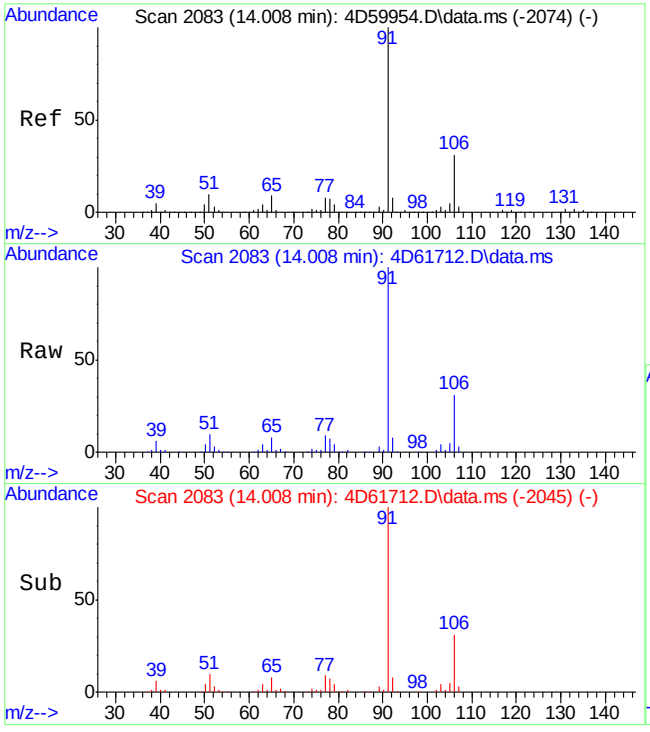


#77
toluene
Concen: 10.96 ug/L
RT: 12.351 min Scan# 1767
Delta R.T. 0.000 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion: 92 Resp: 57244

Ion	Ratio	Lower	Upper
92	100		
91	171.4	140.3	200.3
65	19.4	0.0	48.9

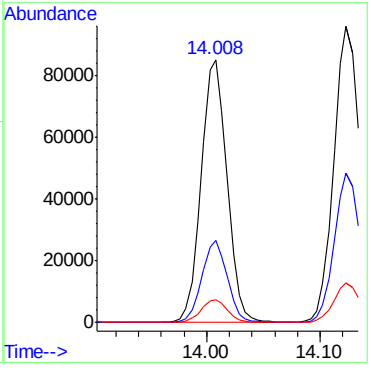


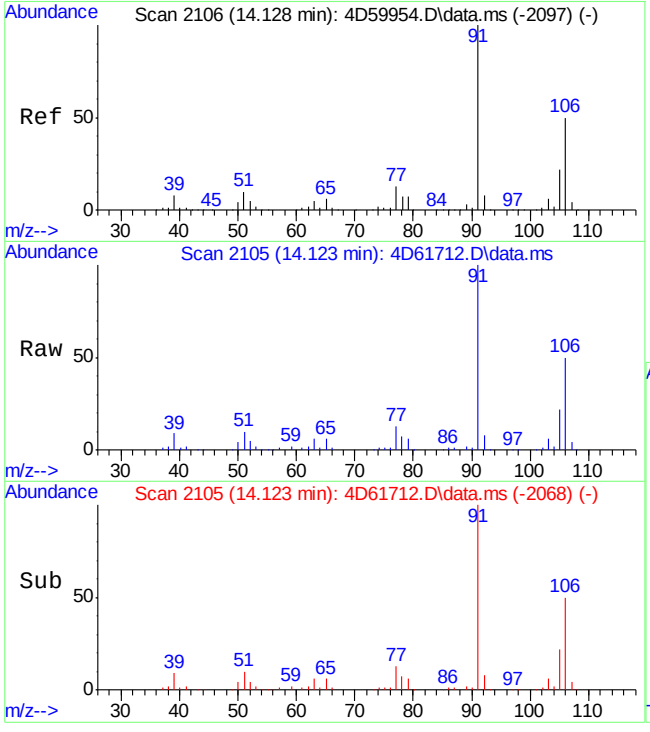


#92
ethylbenzene
Concen: 12.86 ug/L
RT: 14.008 min Scan# 2083
Delta R.T. -0.000 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion: 91 Resp: 134075

Ion	Ratio	Lower	Upper
91	100		
106	31.2	0.8	60.8
77	8.5	0.0	38.3

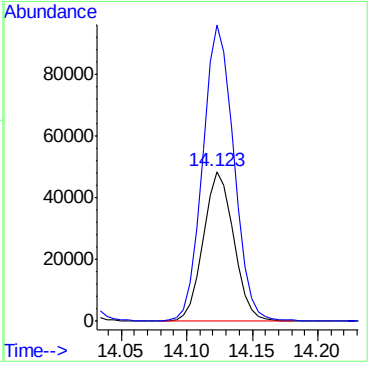




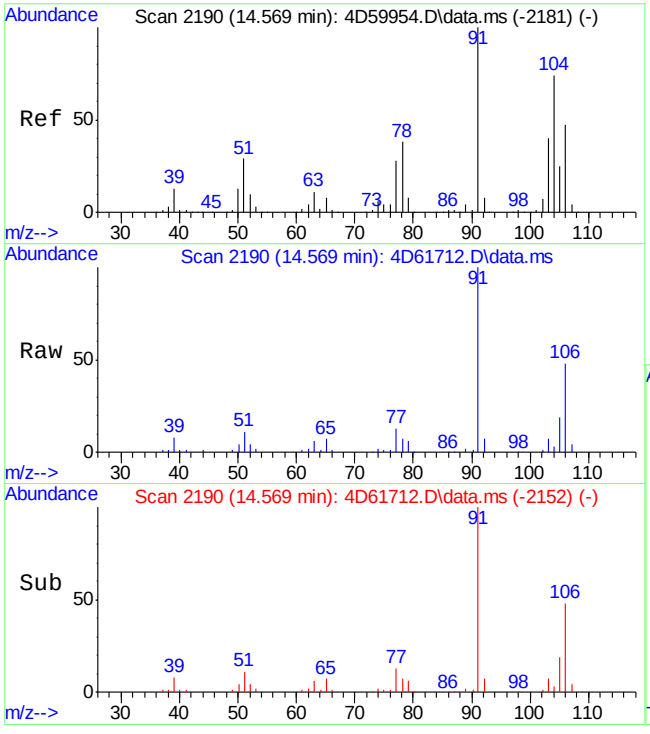
#93
m,p-xylene
Concen: 19.72 ug/L
RT: 14.123 min Scan# 2105
Delta R.T. -0.006 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion:106 Resp: 77704

Ion	Ratio	Lower	Upper
106	100		
91	198.3	140.6	261.2



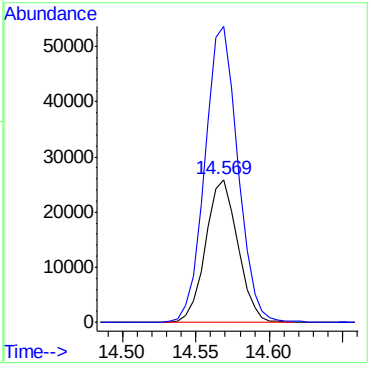
ACCUTEST LABORATORIES JC300

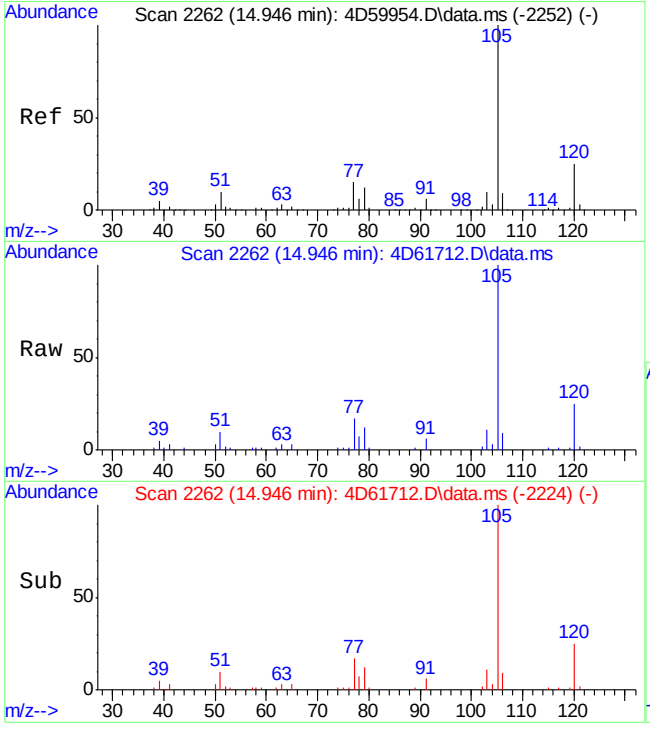


#94
o-xylene
Concen: 10.03 ug/L
RT: 14.569 min Scan# 2190
Delta R.T. -0.000 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion:106 Resp: 39359

Ion	Ratio	Lower	Upper
106	100		
91	207.7	146.3	271.7

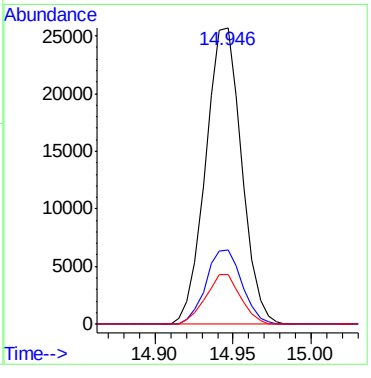




#99
isopropylbenzene
Concen: 4.12 ug/L
RT: 14.946 min Scan# 2262
Delta R.T. -0.001 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

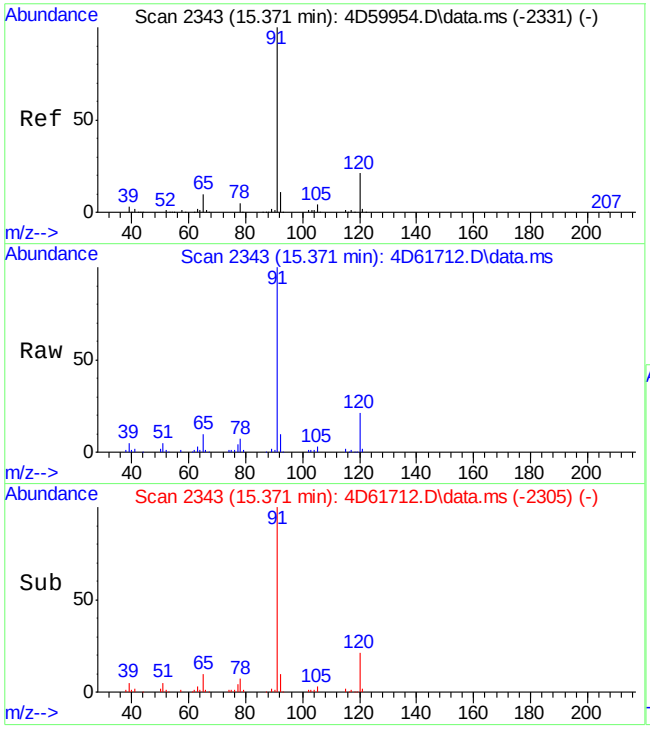
Tgt Ion:105 Resp: 41244

Ion	Ratio	Lower	Upper
105	100		
120	25.1	0.0	55.5
77	16.6	0.0	44.8



7.1.8

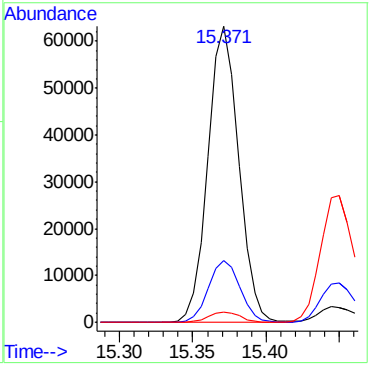
7

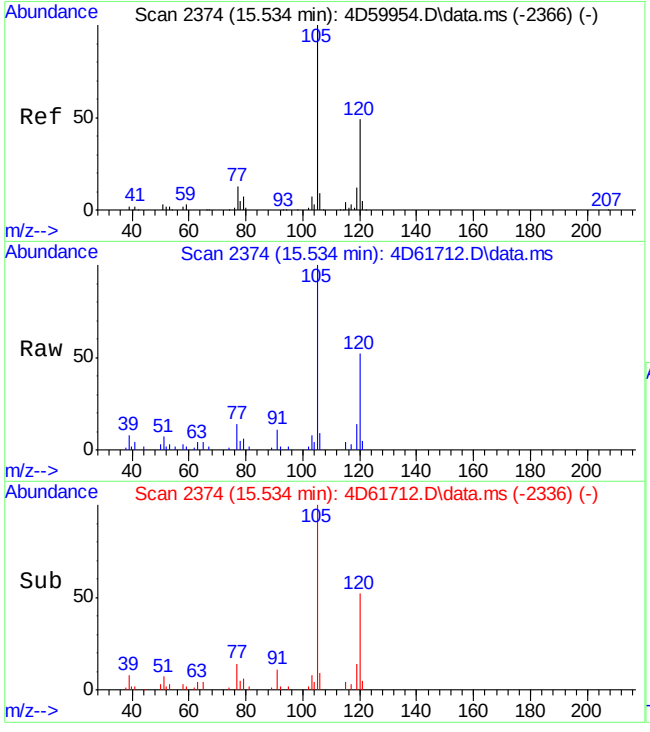


#106
n-propylbenzene
Concen: 7.95 ug/L
RT: 15.371 min Scan# 2343
Delta R.T. 0.000 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion: 91 Resp: 92087

Ion	Ratio	Lower	Upper
91	100		
120	21.0	0.0	51.4
105	3.4	0.0	33.6

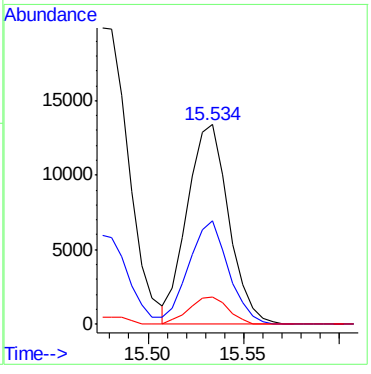




#109
1,3,5-trimethylbenzene
Concen: 2.41 ug/L
RT: 15.534 min Scan# 2374
Delta R.T. -0.000 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

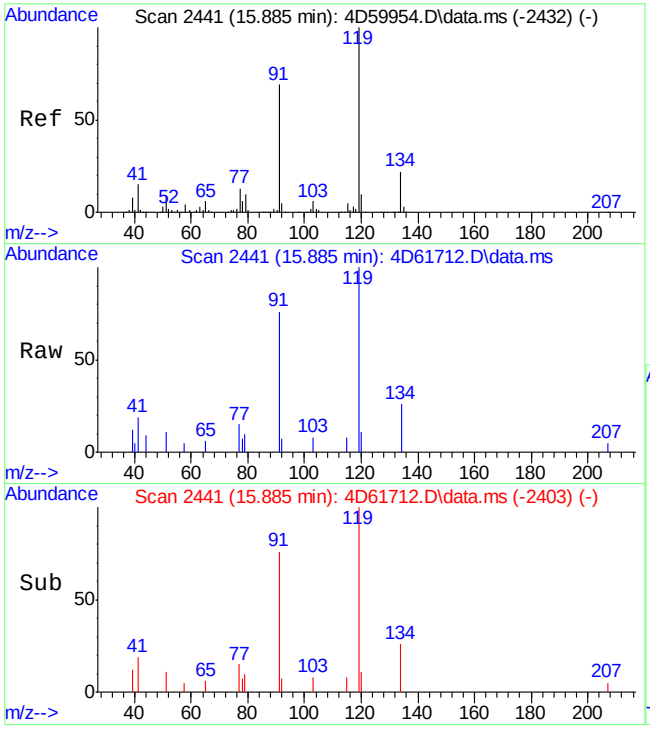
Tgt Ion:105 Resp: 20132

Ion	Ratio	Lower	Upper
105	100		
120	51.9	19.3	79.3
119	13.7	0.0	42.6



7.1.8

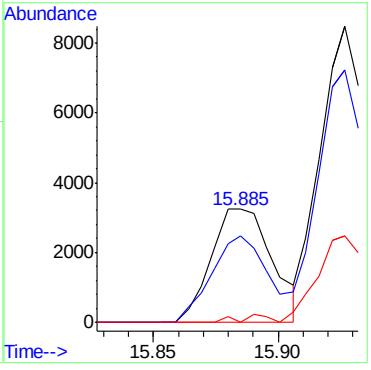
7

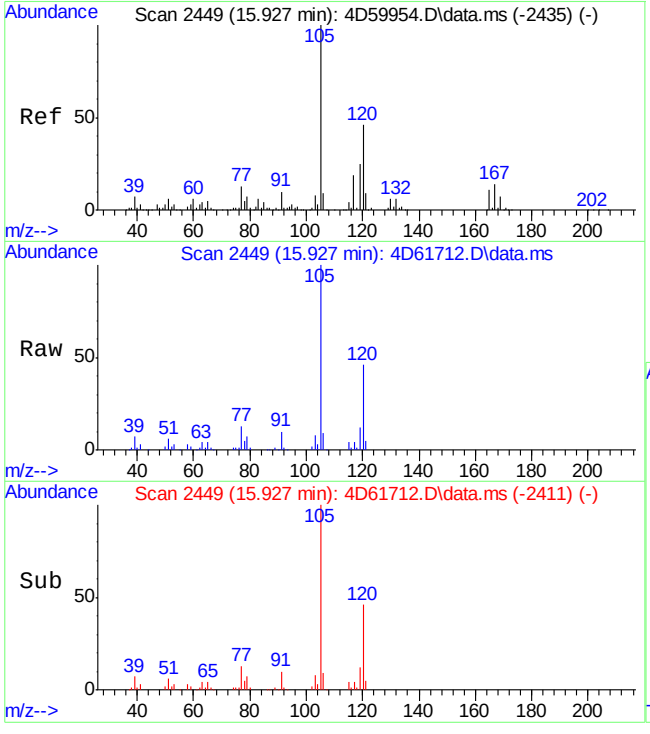


#110
tert-butylbenzene
Concen: 0.79 ug/L
RT: 15.885 min Scan# 2441
Delta R.T. -0.000 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion:119 Resp: 5567

Ion	Ratio	Lower	Upper
119	100		
91	76.4	38.0	98.0
117	0.0	0.0	33.4

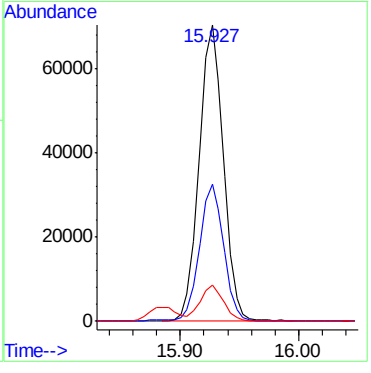




#112
1,2,4-trimethylbenzene
Concen: 11.67 ug/L
RT: 15.927 min Scan# 2449
Delta R.T. -0.000 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

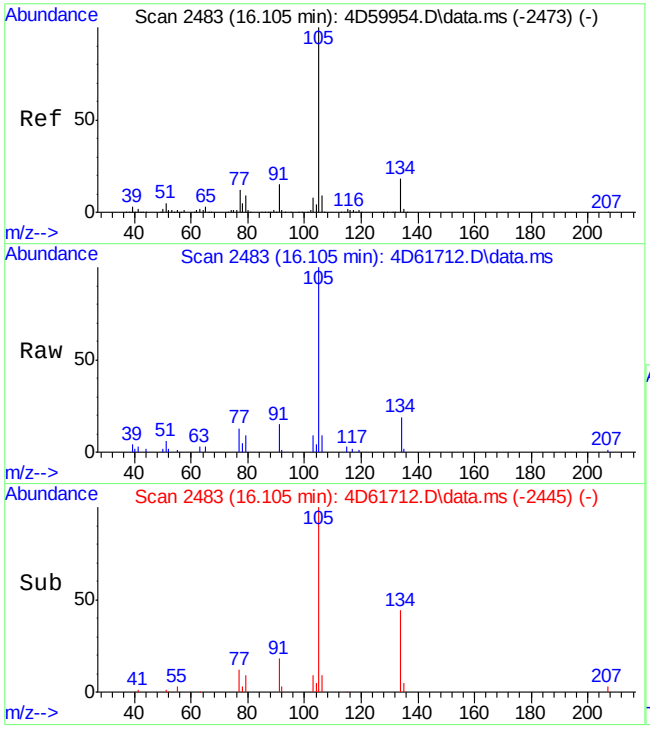
Tgt Ion:105 Resp: 100136

Ion	Ratio	Lower	Upper
105	100		
120	46.1	16.1	76.1
119	12.0	0.0	54.6



7.1.8

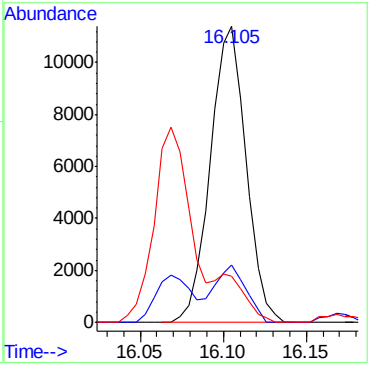
7

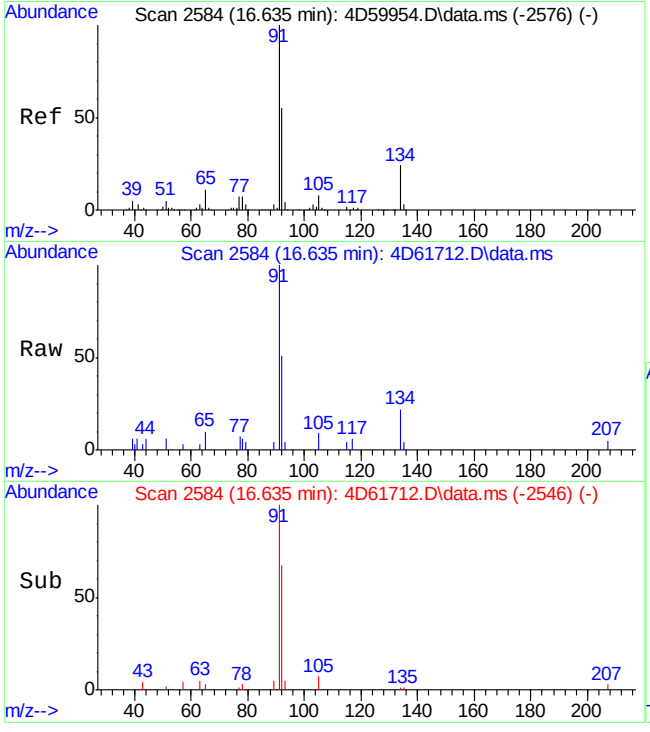


#113
sec-butylbenzene
Concen: 1.55 ug/L
RT: 16.105 min Scan# 2483
Delta R.T. 0.000 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion:105 Resp: 17019

Ion	Ratio	Lower	Upper
105	100		
134	19.4	0.0	47.9
91	15.5	0.0	45.1

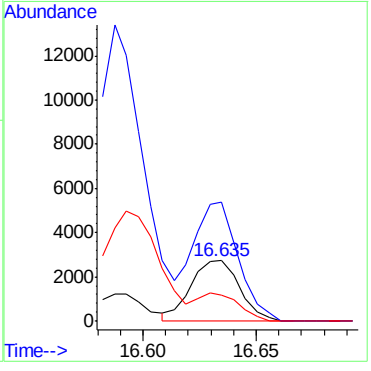




#118
n-butylbenzene
Concen: 0.87 ug/L
RT: 16.635 min Scan# 2584
Delta R.T. -0.000 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

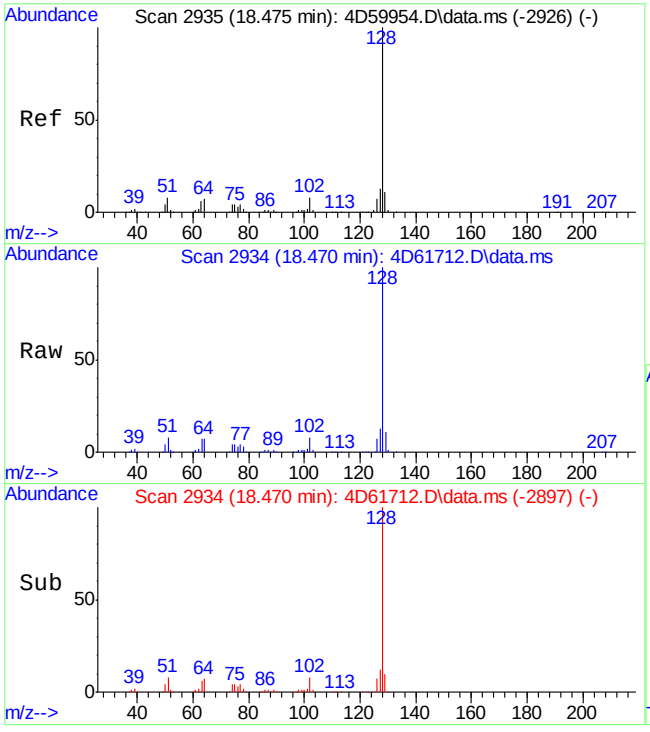
Tgt Ion: 92 Resp: 4070

Ion	Ratio	Lower	Upper
92	100		
91	197.4	152.1	212.1
134	43.7	13.7	73.7



7.1.8

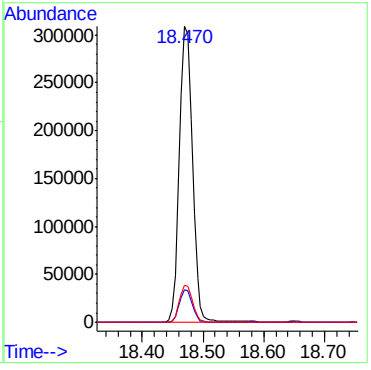
7



#123
naphthalene
Concen: 47.69 ug/L
RT: 18.470 min Scan# 2934
Delta R.T. -0.005 min
Lab File: 4D61712.D
Acq: 31 Jul 2015 10:29 pm

Tgt Ion:128 Resp: 460351

Ion	Ratio	Lower	Upper
128	100		
129	11.0	0.0	40.7
127	12.5	0.0	42.9



7.1.8

7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61704.D
Acq On : 31 Jul 2015 6:53 pm
Operator : ximenac
Sample : jc300-7
Misc : MS88950,V4D2729,5,,,,1
ALS Vial : 19 Sample Multiplier: 1

Quant Time: Aug 03 10:17:35 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration

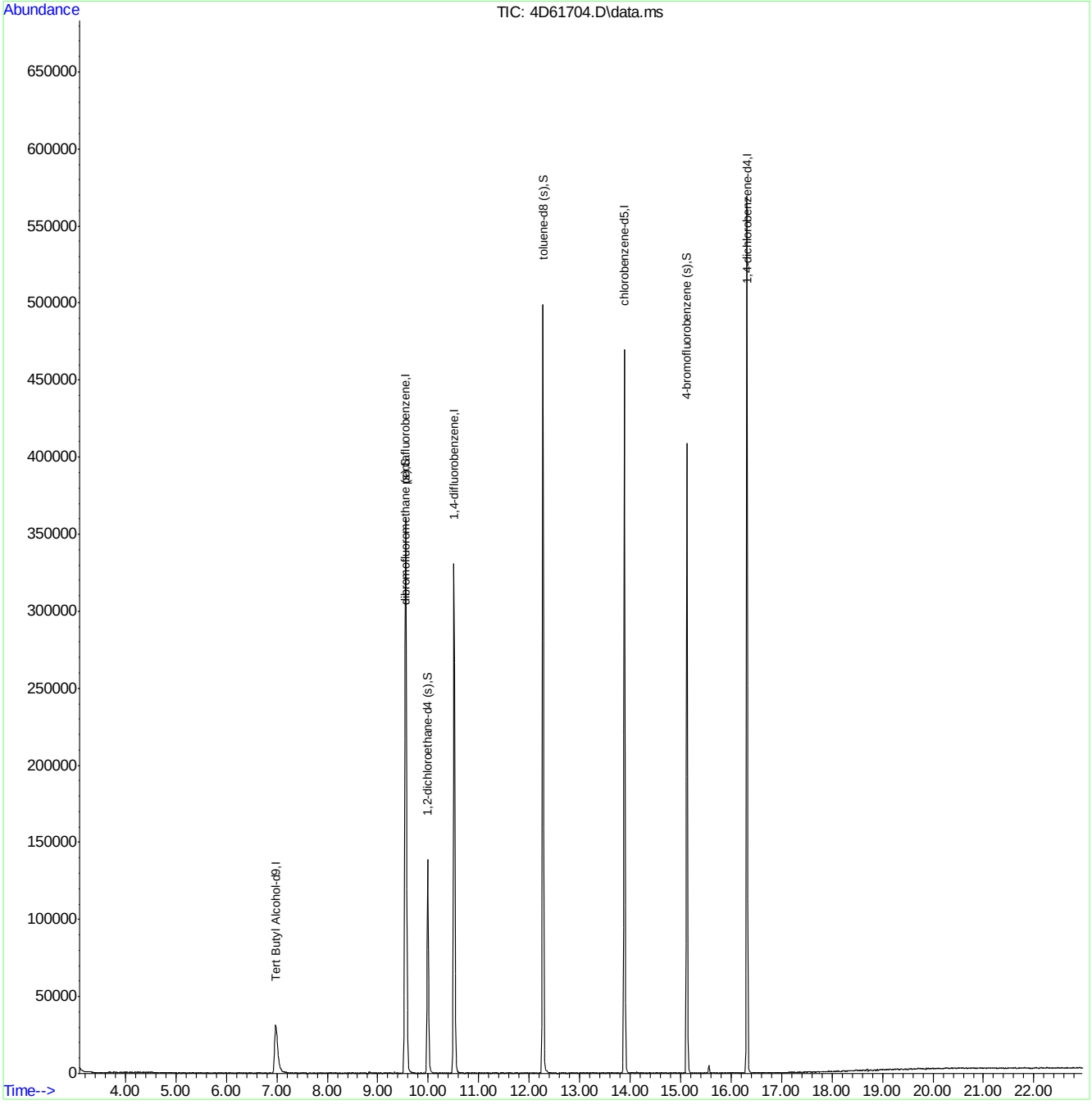
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.977	65	84181	500.00	ug/L	-0.02
4) pentafluorobenzene	9.557	168	220786	50.00	ug/L	-0.01
51) 1,4-difluorobenzene	10.511	114	289407	50.00	ug/L	-0.01
83) chlorobenzene-d5	13.882	117	258217	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	139086	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.541	113	104670	53.60	ug/L	0.00
Spiked Amount 50.000	Range 76 - 120		Recovery = 107.20%			
46) 1,2-dichloroethane-d4 (s)	9.992	65	102623	51.86	ug/L	0.00
Spiked Amount 50.000	Range 73 - 122		Recovery = 103.72%			
75) toluene-d8 (s)	12.273	98	331069	50.15	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 100.30%			
100) 4-bromofluorobenzene (s)	15.125	95	129020	49.26	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 98.52%			
Target Compounds						Qvalue

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61704.D
Acq On : 31 Jul 2015 6:53 pm
Operator : ximenac
Sample : jc300-7
Misc : MS88950,V4D2729,5,,,,1
ALS Vial : 19 Sample Multiplier: 1

Quant Time: Aug 03 10:17:35 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Fri May 29 09:54:29 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61689.D
Acq On : 31 Jul 2015 11:55 am
Operator : ximenac
Sample : mb
Misc : MS88773,V4D2729,5,,,,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jul 31 13:06:59 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Tue Apr 28 10:34:28 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.977	65	82656	500.00	ug/L	-0.02
4) pentafluorobenzene	9.562	168	226833	50.00	ug/L	0.00
51) 1,4-difluorobenzene	10.516	114	298535	50.00	ug/L	0.00
83) chlorobenzene-d5	13.887	117	265498	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	142196	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.541	113	104930	52.30	ug/L	0.00
Spiked Amount 50.000	Range 76 - 120		Recovery = 104.60%			
46) 1,2-dichloroethane-d4 (s)	9.992	65	102311	50.32	ug/L	0.00
Spiked Amount 50.000	Range 73 - 122		Recovery = 100.64%			
75) toluene-d8 (s)	12.273	98	342202	50.25	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 100.50%			
100) 4-bromofluorobenzene (s)	15.125	95	134193	50.11	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 100.22%			

Target Compounds Qvalue

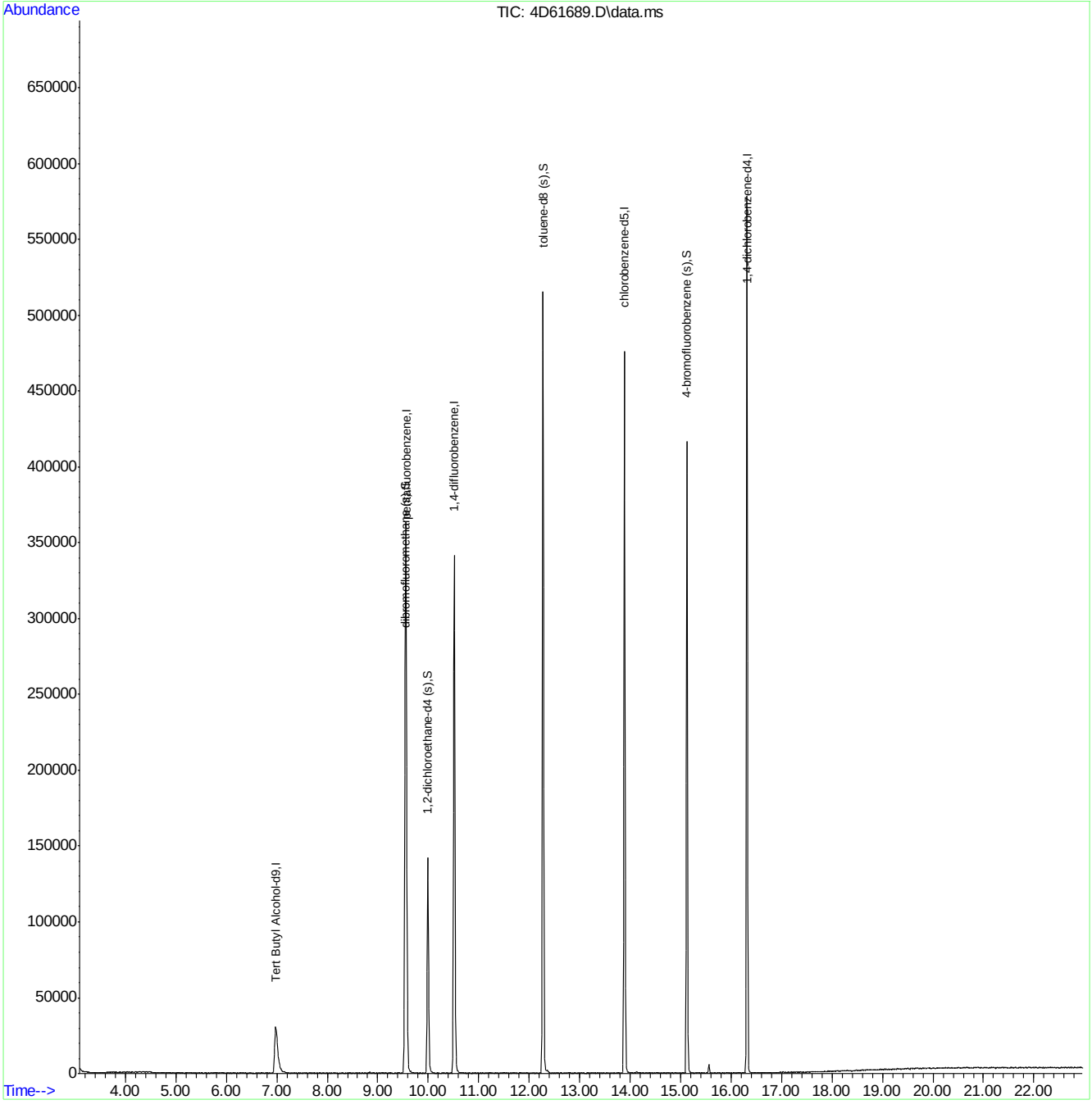
(#) = qualifier out of range (m) = manual integration (+) = signals summed

ACCUTEST LABORATORIES JC300

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61689.D
Acq On : 31 Jul 2015 11:55 am
Operator : ximenac
Sample : mb
Misc : MS88773,V4D2729,5,,,,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jul 31 13:06:59 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Tue Apr 28 10:34:28 2015
Response via : Initial Calibration



M4D2625.M Fri Jul 31 13:07:06 2015 RPT1 Page: 2

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61718.D
Acq On : 3 Aug 2015 11:19 am
Operator : ximenac
Sample : mb
Misc : MS88773,V4D2730,5,,,,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Aug 04 09:27:30 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Tue Apr 28 10:34:28 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	6.982	65	73762	500.00	ug/L	-0.02
4) pentafluorobenzene	9.557	168	203175	50.00	ug/L	-0.01
51) 1,4-difluorobenzene	10.511	114	270829	50.00	ug/L	-0.01
83) chlorobenzene-d5	13.887	117	246058	50.00	ug/L	0.00
98) 1,4-dichlorobenzene-d4	16.315	152	130485	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.541	113	96942	53.94	ug/L	0.00
Spiked Amount 50.000	Range 76 - 120		Recovery = 107.88%			
46) 1,2-dichloroethane-d4 (s)	9.987	65	95912	52.67	ug/L	-0.01
Spiked Amount 50.000	Range 73 - 122		Recovery = 105.34%			
75) toluene-d8 (s)	12.273	98	309393	50.08	ug/L	0.00
Spiked Amount 50.000	Range 84 - 119		Recovery = 100.16%			
100) 4-bromofluorobenzene (s)	15.125	95	123633	50.31	ug/L	0.00
Spiked Amount 50.000	Range 78 - 117		Recovery = 100.62%			

Target Compounds Qvalue

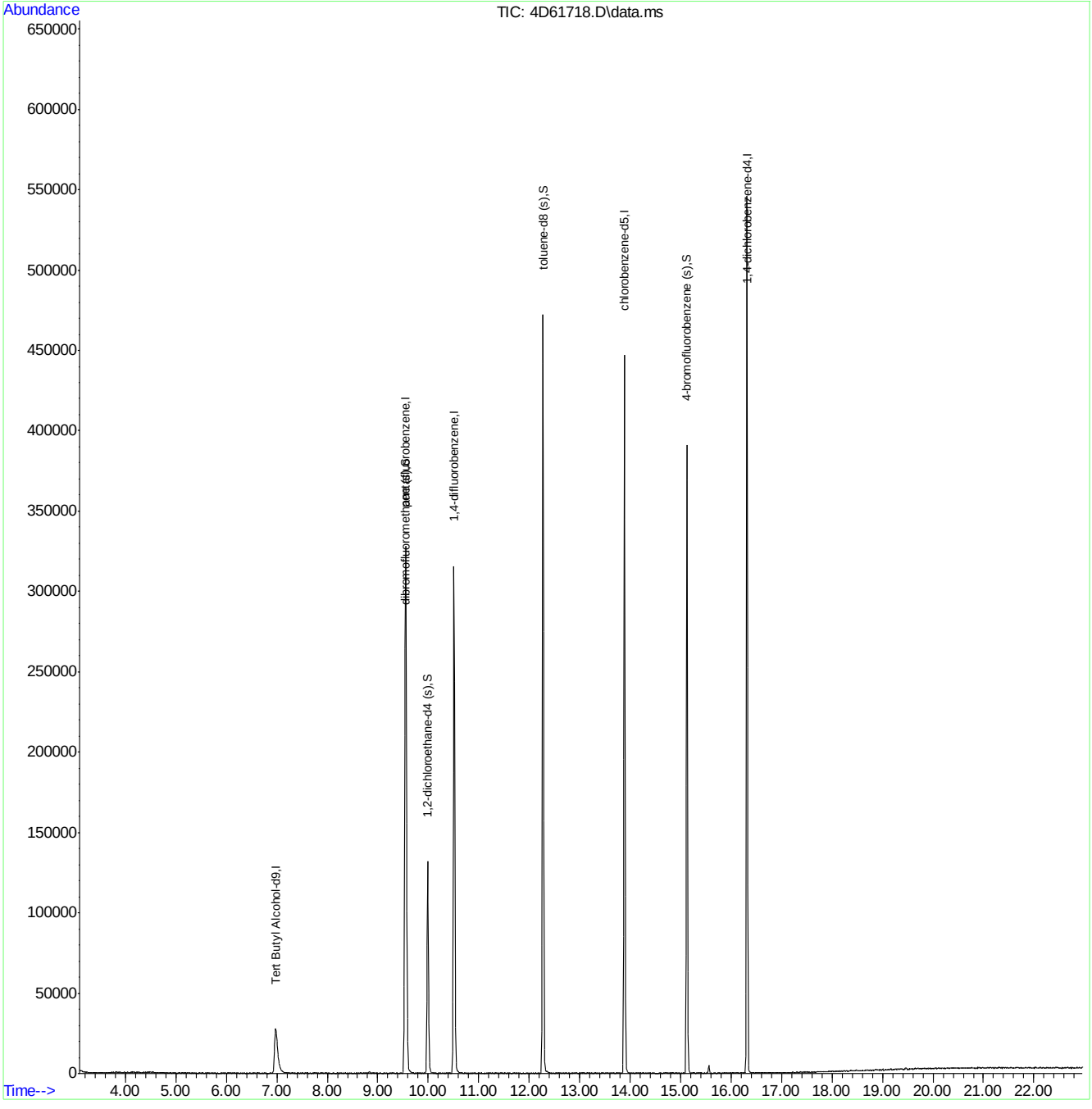
(#) = qualifier out of range (m) = manual integration (+) = signals summed

ACCUTEST LABORATORIES JC300

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\
Data File : 4D61718.D
Acq On : 3 Aug 2015 11:19 am
Operator : ximenac
Sample : mb
Misc : MS88773,V4D2730,5,,,,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Aug 04 09:27:30 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4D2625.M
Quant Title : SW-846 Method 8260B/8260C
QLast Update : Tue Apr 28 10:34:28 2015
Response via : Initial Calibration



M4D2625.M Tue Aug 04 09:27:38 2015 RPT1 Page: 2

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: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85953-MB1	Z103252.D	1	07/31/15	BP	07/30/15	OP85953	EZ5150

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

JC300-2, JC300-3, JC300-4

CAS No.	Compound	Result	RL	MDL	Units	Q
105-67-9	2,4-Dimethylphenol	ND	5.0	1.8	ug/l	
51-28-5	2,4-Dinitrophenol	ND	10	6.5	ug/l	
95-48-7	2-Methylphenol	ND	2.0	1.3	ug/l	
	3&4-Methylphenol	ND	2.0	1.1	ug/l	
100-02-7	4-Nitrophenol	ND	10	0.91	ug/l	
108-95-2	Phenol	ND	2.0	0.55	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.27	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.58	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.23	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	0.55	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.29	ug/l	
110-86-1	Pyridine	ND	2.0	0.29	ug/l	
91-22-5	Quinoline	ND	5.0	0.35	ug/l	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	46%	12-110%
4165-62-2	Phenol-d5	28%	10-110%
118-79-6	2,4,6-Tribromophenol	74%	42-154%
4165-60-0	Nitrobenzene-d5	74%	29-139%
321-60-8	2-Fluorobiphenyl	73%	33-129%
1718-51-0	Terphenyl-d14	94%	10-140%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Internal standard added for SIM test	6.32	4.2	ug/l	J
	Internal standard added for SIM test	7.76	4.3	ug/l	J
	Total TIC, Semi-Volatile		0	ug/l	

Method Blank Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85942A-MB1	3M56643.D	1	07/30/15	AD	07/30/15	OP85942A	E3M2617

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

JC300-1, JC300-5

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.10	0.013	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.050	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.050	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.021	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.026	ug/l	
218-01-9	Chrysene	ND	0.10	0.015	ug/l	
86-73-7	Fluorene	ND	0.10	0.027	ug/l	
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	
85-01-8	Phenanthrene	ND	0.10	0.016	ug/l	
129-00-0	Pyrene	ND	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	57%	23-131%
321-60-8	2-Fluorobiphenyl	66%	24-120%
1718-51-0	Terphenyl-d14	59%	10-125%

Method Blank Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85953A-MB1	3M56667.D	1	07/31/15	LK	07/30/15	OP85953A	E3M2618

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

JC300-2, JC300-3, JC300-4

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.10	0.013	ug/l	
120-12-7	Anthracene	ND	0.10	0.013	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.050	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.050	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.021	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.026	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.10	0.019	ug/l	
218-01-9	Chrysene	ND	0.10	0.015	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.10	0.035	ug/l	
206-44-0	Fluoranthene	0.150	0.10	0.011	ug/l	
86-73-7	Fluorene	ND	0.10	0.027	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.10	0.031	ug/l	
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	
85-01-8	Phenanthrene	0.138	0.10	0.016	ug/l	
129-00-0	Pyrene	0.111	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	36%	10-110%
4165-62-2	Phenol-d5	27%	10-110%
118-79-6	2,4,6-Tribromophenol	70%	10-157%
4165-60-0	Nitrobenzene-d5	49%	23-131%
321-60-8	2-Fluorobiphenyl	55%	24-120%
1718-51-0	Terphenyl-d14	61%	10-125%

Method Blank Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85975A-MB1	4M59377.D	1	08/01/15	AD	07/31/15	OP85975A	E4M2592

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

JC300-6

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.10	0.013	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.050	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.050	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.10	0.021	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.10	0.026	ug/l	
218-01-9	Chrysene	ND	0.10	0.015	ug/l	
86-73-7	Fluorene	ND	0.10	0.027	ug/l	
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	
85-01-8	Phenanthrene	ND	0.10	0.016	ug/l	
129-00-0	Pyrene	ND	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	91%	23-131%
321-60-8	2-Fluorobiphenyl	97%	24-120%
1718-51-0	Terphenyl-d14	85%	10-125%

Method Blank Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85975A-MB1	5P20382.D	1	08/12/15	AP	07/31/15	OP85975A	E5P1049

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

JC300-6

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.10	0.013	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.50	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.50	0.030	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.0	0.021	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.0	0.026	ug/l	
218-01-9	Chrysene	ND	0.10	0.015	ug/l	
86-73-7	Fluorene	ND	0.10	0.027	ug/l	
91-20-3	Naphthalene	ND	0.10	0.013	ug/l	
85-01-8	Phenanthrene	ND	0.10	0.016	ug/l	
129-00-0	Pyrene	ND	0.10	0.013	ug/l	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	81%	23-131%
321-60-8	2-Fluorobiphenyl	82%	24-120%
1718-51-0	Terphenyl-d14	83%	10-125%

Blank Spike Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85975A-BS12	4M59378.D	1	08/01/15	AD	07/31/15	OP85975A	E4M2592

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

JC300-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
120-12-7	Anthracene	1	0.853	85	48-136
56-55-3	Benzo(a)anthracene	1	0.932	93	33-136
50-32-8	Benzo(a)pyrene	1	0.975	98	44-123
205-99-2	Benzo(b)fluoranthene	1	1.02	102	32-146
191-24-2	Benzo(g,h,i)perylene	1	0.839	84	47-129
218-01-9	Chrysene	1	0.877	88	43-143
86-73-7	Fluorene	1	0.843	84	49-125
91-20-3	Naphthalene	1	0.866	87	36-128
85-01-8	Phenanthrene	1	0.845	85	41-129
129-00-0	Pyrene	1	0.907	91	47-130

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	83%	23-131%
321-60-8	2-Fluorobiphenyl	84%	24-120%
1718-51-0	Terphenyl-d14	85%	10-125%

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85953-BS1	Z103253.D	1	07/31/15	BP	07/30/15	OP85953	EZ5150
OP85953-BSD	Z103254.D	1	07/31/15	BP	07/30/15	OP85953	EZ5150

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

JC300-2, JC300-3, JC300-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
105-67-9	2,4-Dimethylphenol	50	36.8	74	38.4	77	4	41-137/30
51-28-5	2,4-Dinitrophenol	100	80.0	80	83.9	84	5	38-154/30
95-48-7	2-Methylphenol	50	33.6	67	37.5	75	11	39-112/30
	3&4-Methylphenol	50	32.9	66	35.4	71	7	36-107/30
100-02-7	4-Nitrophenol	50	23.5	47	23.3	47	1	13-121/30
108-95-2	Phenol	50	20.3	41	21.5	43	6	10-110/30
92-52-4	1,1'-Biphenyl	50	39.7	79	40.5	81	2	55-122/30
84-74-2	Di-n-butyl phthalate	50	38.7	77	41.8	84	8	47-157/30
84-66-2	Diethyl phthalate	50	39.0	78	40.9	82	5	36-147/30
117-81-7	bis(2-Ethylhexyl)phthalate	50	37.6	75	40.6	81	8	44-157/30
91-57-6	2-Methylnaphthalene	50	36.7	73	37.4	75	2	46-112/30
110-86-1	Pyridine	50	24.5	49	25.2	50	3	10-110/30
91-22-5	Quinoline	50	35.3	71	38.0	76	7	47-134/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
367-12-4	2-Fluorophenol	57%	57%	12-110%
4165-62-2	Phenol-d5	38%	39%	10-110%
118-79-6	2,4,6-Tribromophenol	86%	87%	42-154%
4165-60-0	Nitrobenzene-d5	75%	73%	29-139%
321-60-8	2-Fluorobiphenyl	84%	85%	33-129%
1718-51-0	Terphenyl-d14	96%	107%	10-140%

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85942A-BS12	3M56644.D	1	07/30/15	AD	07/30/15	OP85942A	E3M2617
OP85942A-BSD12	3M56645.D	1	07/30/15	AD	07/30/15	OP85942A	E3M2617

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

JC300-1, JC300-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
120-12-7	Anthracene	1	0.697	70	0.789	79	12	48-136/30
56-55-3	Benzo(a)anthracene	1	0.662	66	0.727	73	9	33-136/30
50-32-8	Benzo(a)pyrene	1	0.600	60	0.600	60	0	44-123/30
205-99-2	Benzo(b)fluoranthene	1	0.649	65	0.677	68	4	32-146/30
191-24-2	Benzo(g,h,i)perylene	1	0.515	52	0.436	44* [a]	17	47-129/30
218-01-9	Chrysene	1	0.601	60	0.738	74	20	43-143/30
86-73-7	Fluorene	1	0.752	75	0.877	88	15	49-125/30
91-20-3	Naphthalene	1	0.647	65	0.796	80	21	36-128/30
85-01-8	Phenanthrene	1	0.719	72	0.829	83	14	41-129/30
129-00-0	Pyrene	1	0.741	74	0.839	84	12	47-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
4165-60-0	Nitrobenzene-d5	47%	57%	23-131%
321-60-8	2-Fluorobiphenyl	57%	64%	24-120%
1718-51-0	Terphenyl-d14	53%	57%	10-125%

(a) Outside of in house control limits.

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85953A-BS12	3M56668.D	1	07/31/15	LK	07/30/15	OP85953A	E3M2618
OP85953A-BSD12	3M56669.D	1	07/31/15	LK	07/30/15	OP85953A	E3M2618

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

JC300-2, JC300-3, JC300-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	1	0.644	64	0.900	90	33* [a]	45-125/30
120-12-7	Anthracene	1	0.604	60	0.887	89	38* [a]	48-136/30
56-55-3	Benzo(a)anthracene	1	0.616	62	0.891	89	36* [a]	33-136/30
50-32-8	Benzo(a)pyrene	1	0.559	56	0.832	83	39* [a]	44-123/30
205-99-2	Benzo(b)fluoranthene	1	0.535	54	0.779	78	37* [a]	32-146/30
191-24-2	Benzo(g,h,i)perylene	1	0.505	51	0.738	74	37* [a]	47-129/30
207-08-9	Benzo(k)fluoranthene	1	0.639	64	0.979	98	42* [a]	34-154/30
218-01-9	Chrysene	1	0.548	55	0.821	82	40* [a]	43-143/30
53-70-3	Dibenzo(a,h)anthracene	1	0.589	59	0.865	87	38* [a]	43-144/30
206-44-0	Fluoranthene	1	0.628	63	0.928	93	39* [a]	46-122/30
86-73-7	Fluorene	1	0.632	63	0.942	94	39* [a]	49-125/30
193-39-5	Indeno(1,2,3-cd)pyrene	1	0.539	54	0.779	78	36* [a]	45-142/30
91-20-3	Naphthalene	1	0.539	54	0.734	73	31* [a]	36-128/30
85-01-8	Phenanthrene	1	0.614	61	0.882	88	36* [a]	41-129/30
129-00-0	Pyrene	1	0.644	64	0.945	95	38* [a]	47-130/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
367-12-4	2-Fluorophenol	30%	37%	10-110%
4165-62-2	Phenol-d5	24%	29%	10-110%
118-79-6	2,4,6-Tribromophenol	54%	75%	10-157%
4165-60-0	Nitrobenzene-d5	39%	54%	23-131%
321-60-8	2-Fluorobiphenyl	43%	61%	24-120%
1718-51-0	Terphenyl-d14	55%	65%	10-125%

(a) Analytical precision exceeds in-house control limits.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85975A-MS	4M59394.D	1	08/02/15	AD	07/31/15	OP85975A	E4M2592
OP85975A-MSD	4M59395.D	1	08/02/15	AD	07/31/15	OP85975A	E4M2592
JC346-2	4M59416.D	1	08/03/15	LK	07/31/15	OP85975A	E4M2593

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

JC300-6

CAS No.	Compound	JC346-2 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
120-12-7	Anthracene	0.160		2	2.80	132* [a]	2	2.71	128* [a]	3	55-121/21
56-55-3	Benzo(a)anthracene	1.72		2	8.15	322* [a]	2	8.13	321* [a]	0	51-120/20
50-32-8	Benzo(a)pyrene	1.24		2	7.59	318* [a]	2	7.76	326* [a]	2	45-128/20
205-99-2	Benzo(b)fluoranthene	1.90		2	10.9	450* [a]	2	11.0	455* [a]	1	38-137/28
191-24-2	Benzo(g,h,i)perylene	0.832		2	4.89	203* [a]	2	5.11	214* [a]	4	34-138/23
218-01-9	Chrysene	1.29		2	9.26	399* [a]	2	9.26	399* [a]	0	50-123/21
86-73-7	Fluorene	ND		2	1.84	92	2	1.67	84	10	53-122/22
91-20-3	Naphthalene	ND		2	1.93	97	2	1.55	78	22* [b]	36-119/21
85-01-8	Phenanthrene	0.834		2	6.78	297* [a]	2	6.96	306* [a]	3	49-126/20
129-00-0	Pyrene	2.04		2	12.6	528* [a]	2	12.5	523* [a]	1	52-122/22

CAS No.	Surrogate Recoveries	MS	MSD	JC346-2	Limits
4165-60-0	Nitrobenzene-d5	84%	71%	59%	23-131%
321-60-8	2-Fluorobiphenyl	73%	66%	57%	24-120%
1718-51-0	Terphenyl-d14	47%	42%	36%	10-125%

(a) Outside control limits due to matrix interference.
(b) Analytical precision exceeds in-house control limits.

* = Outside of Control Limits.

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2611-DFTPP
Lab File ID: 3M56531.D
Instrument ID: GCMS3M
Injection Date: 07/25/15
Injection Time: 17:20

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	48743	41.7		Pass
68	Less than 2.0% of mass 69	1132	0.97	(1.94) [a]	Pass
69	Mass 69 relative abundance	58381	50.0		Pass
70	Less than 2.0% of mass 69	283	0.24	(0.48) [a]	Pass
127	40.0 - 60.0% of mass 198	66398	56.8		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	116856	100.0		Pass
199	5.0 - 9.0% of mass 198	8287	7.09		Pass
275	10.0 - 30.0% of mass 198	27489	23.5		Pass
365	1.0 - 100.0% of mass 198	4105	3.51		Pass
441	Present, but less than mass 443	17194	14.7	(84.5) [b]	Pass
442	40.0 - 100.0% of mass 198	110955	95.0		Pass
443	17.0 - 23.0% of mass 442	20338	17.4	(18.3) [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
E3M2611-ICC2611	3M56532.D	07/25/15	17:35	00:15	Initial cal 1.0
E3M2611-IC2611	3M56533.D	07/25/15	18:05	00:45	Initial cal 0.5
E3M2611-IC2611	3M56534.D	07/25/15	18:35	01:15	Initial cal 0.2
E3M2611-IC2611	3M56535.D	07/25/15	19:05	01:45	Initial cal 0.1
E3M2611-IC2611	3M56536.D	07/25/15	19:35	02:15	Initial cal 0.05
E3M2611-IC2611	3M56537.D	07/25/15	20:05	02:45	Initial cal 0.02
E3M2611-IC2611	3M56538.D	07/25/15	20:35	03:15	Initial cal 0.01
E3M2611-IC2611	3M56539.D	07/25/15	21:05	03:45	Initial cal 5.0
E3M2611-IC2611	3M56540.D	07/25/15	21:36	04:16	Initial cal 2.5
E3M2611-ICV2611	3M56541.D	07/25/15	22:06	04:46	Initial cal verification 1.0
E3M2611-ICV2611	3M56542.D	07/25/15	22:36	05:16	Initial cal verification 1.0
E3M2611-ICV2611	3M56543.D	07/25/15	23:06	05:46	Initial cal verification 1.0

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2617-DFTPP
Lab File ID: 3M56636.D
Instrument ID: GCMS3M
Injection Date: 07/30/15
Injection Time: 17:22

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	47366	39.1		Pass
68	Less than 2.0% of mass 69	776	0.64	(1.36) [a]	Pass
69	Mass 69 relative abundance	57146	47.2		Pass
70	Less than 2.0% of mass 69	239	0.20	(0.42) [a]	Pass
127	40.0 - 60.0% of mass 198	66476	54.9		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	121112	100.0		Pass
199	5.0 - 9.0% of mass 198	8363	6.91		Pass
275	10.0 - 30.0% of mass 198	30586	25.3		Pass
365	1.0 - 100.0% of mass 198	4415	3.65		Pass
441	Present, but less than mass 443	19178	15.8	(84.0) [b]	Pass
442	40.0 - 100.0% of mass 198	117960	97.4		Pass
443	17.0 - 23.0% of mass 442	22834	18.9	(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
E3M2617-CC2611	3M56637.D	07/30/15	17:34	00:12	Continuing cal 1.0
OP85932A-MB1	3M56638.D	07/30/15	18:11	00:49	Method Blank
OP85932A-BS12	3M56639A.D	07/30/15	19:33	02:11	Blank Spike
OP85932A-BSD12	3M56640.D	07/30/15	20:04	02:42	Blank Spike Duplicate
ZZZZZZ	3M56641.D	07/30/15	20:34	03:12	(unrelated sample)
ZZZZZZ	3M56642.D	07/30/15	21:04	03:42	(unrelated sample)
OP85942A-MB1	3M56643.D	07/30/15	21:35	04:13	Method Blank
OP85942A-BS12	3M56644.D	07/30/15	22:05	04:43	Blank Spike
OP85942A-BSD12	3M56645.D	07/30/15	22:35	05:13	Blank Spike Duplicate
ZZZZZZ	3M56646.D	07/30/15	23:05	05:43	(unrelated sample)
ZZZZZZ	3M56647.D	07/30/15	23:36	06:14	(unrelated sample)
ZZZZZZ	3M56648.D	07/31/15	00:06	06:44	(unrelated sample)
OP85969A-MB1	3M56652.D	07/31/15	00:36	07:14	Method Blank
OP85969A-BS12	3M56653.D	07/31/15	01:07	07:45	Blank Spike
OP85969A-BSD12	3M56654.D	07/31/15	01:37	08:15	Blank Spike Duplicate
ZZZZZZ	3M56655.D	07/31/15	02:07	08:45	(unrelated sample)
ZZZZZZ	3M56656.D	07/31/15	02:37	09:15	(unrelated sample)
ZZZZZZ	3M56657.D	07/31/15	03:07	09:45	(unrelated sample)
ZZZZZZ	3M56658.D	07/31/15	03:37	10:15	(unrelated sample)

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2617-DFTPP
Lab File ID: 3M56636.D
Instrument ID: GCMS3M
Injection Date: 07/30/15
Injection Time: 17:22

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	3M56659.D	07/31/15	04:07	10:45	(unrelated sample)
ZZZZZZ	3M56660.D	07/31/15	04:37	11:15	(unrelated sample)
ZZZZZZ	3M56661.D	07/31/15	05:07	11:45	(unrelated sample)

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2618-DFTPP
Lab File ID: 3M56665.D
Instrument ID: GCMS3M
Injection Date: 07/31/15
Injection Time: 09:32

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	61344	44.9		Pass
68	Less than 2.0% of mass 69	204	0.15	(0.28) [a]	Pass
69	Mass 69 relative abundance	72029	52.8		Pass
70	Less than 2.0% of mass 69	635	0.47	(0.88) [a]	Pass
127	40.0 - 60.0% of mass 198	79549	58.3		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	136515	100.0		Pass
199	5.0 - 9.0% of mass 198	9274	6.79		Pass
275	10.0 - 30.0% of mass 198	30814	22.6		Pass
365	1.0 - 100.0% of mass 198	4785	3.51		Pass
441	Present, but less than mass 443	17067	12.5	(81.3) [b]	Pass
442	40.0 - 100.0% of mass 198	106772	78.2		Pass
443	17.0 - 23.0% of mass 442	20999	15.4	(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
E3M2618-CC2611	3M56666.D	07/31/15	09:57	00:25	Continuing cal .5
OP85953A-MB1	3M56667.D	07/31/15	10:30	00:58	Method Blank
OP85953A-BS12	3M56668.D	07/31/15	11:00	01:28	Blank Spike
OP85953A-BSD12	3M56669.D	07/31/15	11:30	01:58	Blank Spike Duplicate
ZZZZZZ	3M56672.D	07/31/15	12:00	02:28	(unrelated sample)
ZZZZZZ	3M56670.D	07/31/15	13:01	03:29	(unrelated sample)
ZZZZZZ	3M56671.D	07/31/15	13:31	03:59	(unrelated sample)
JC300-2	3M56674.D	07/31/15	14:01	04:29	AOI4_MW-504_072915
JC300-3	3M56675.D	07/31/15	14:32	05:00	AOI4_MW-505_072915
JC300-4	3M56676.D	07/31/15	15:02	05:30	AOI4_MW-506_072915
ZZZZZZ	3M56678.D	07/31/15	16:03	06:31	(unrelated sample)
ZZZZZZ	3M56679.D	07/31/15	16:33	07:01	(unrelated sample)
ZZZZZZ	3M56680.D	07/31/15	17:03	07:31	(unrelated sample)
JC300-1	3M56681.D	07/31/15	17:33	08:01	AOI5_MW-510_072915
JC300-5	3M56682.D	07/31/15	18:04	08:32	AOI4_MW-508_072915
JC300-6	3M56683.D	07/31/15	18:34	09:02	AOI4_MW-507_072915

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E4M2577-DFTPP
Lab File ID: 4M59177A.D
Instrument ID: GCMS4M
Injection Date: 07/23/15
Injection Time: 09:22

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	39288	36.3		Pass
68	Less than 2.0% of mass 69	665	0.61	(1.30) [a]	Pass
69	Mass 69 relative abundance	51271	47.4		Pass
70	Less than 2.0% of mass 69	391	0.36	(0.76) [a]	Pass
127	40.0 - 60.0% of mass 198	61624	57.0		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	108189	100.0		Pass
199	5.0 - 9.0% of mass 198	7387	6.83		Pass
275	10.0 - 30.0% of mass 198	26123	24.1		Pass
365	1.0 - 100.0% of mass 198	3443	3.18		Pass
441	Present, but less than mass 443	13860	12.8	(82.0) [b]	Pass
442	40.0 - 100.0% of mass 198	89392	82.6		Pass
443	17.0 - 23.0% of mass 442	16908	15.6	(18.9) [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
E4M2577-ICC2577	4M59178.D	07/23/15	09:39	00:17	Initial cal 1.0
E4M2577-IC2577	4M59179.D	07/23/15	10:09	00:47	Initial cal 0.5
E4M2577-IC2577	4M59180.D	07/23/15	10:39	01:17	Initial cal 0.2
E4M2577-IC2577	4M59181.D	07/23/15	11:10	01:48	Initial cal 0.1
E4M2577-IC2577	4M59182.D	07/23/15	11:41	02:19	Initial cal 0.05
E4M2577-IC2577	4M59183.D	07/23/15	12:12	02:50	Initial cal 0.02
E4M2577-IC2577	4M59184.D	07/23/15	12:43	03:21	Initial cal 0.01
E4M2577-IC2577	4M59185.D	07/23/15	13:15	03:53	Initial cal 5.0
E4M2577-IC2577	4M59186.D	07/23/15	13:46	04:24	Initial cal 2.5
E4M2577-ICV2577	4M59187.D	07/23/15	14:18	04:56	Initial cal verification 1.0
E4M2577-ICV2577	4M59188.D	07/23/15	14:50	05:28	Initial cal verification 1.0

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E4M2580-DFTPP
Lab File ID: 4M59205.D
Instrument ID: GCMS4M
Injection Date: 07/24/15
Injection Time: 08:31

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	25752	33.4		Pass
68	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
69	Mass 69 relative abundance	34331	44.6		Pass
70	Less than 2.0% of mass 69	283	0.37	(0.82) [a]	Pass
127	40.0 - 60.0% of mass 198	42951	55.8		Pass
197	Less than 1.0% of mass 198	435	0.56		Pass
198	Base peak, 100% relative abundance	77040	100.0		Pass
199	5.0 - 9.0% of mass 198	5044	6.55		Pass
275	10.0 - 30.0% of mass 198	17910	23.2		Pass
365	1.0 - 100.0% of mass 198	2760	3.58		Pass
441	Present, but less than mass 443	9479	12.3	(74.9) [b]	Pass
442	40.0 - 100.0% of mass 198	66869	86.8		Pass
443	17.0 - 23.0% of mass 442	12654	16.4	(18.9) [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
E4M2580-ICV2577	4M59206.D	07/24/15	08:50	00:19	Initial cal verification 1

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E4M2592-DFTPP
Lab File ID: 4M59374.D
Instrument ID: GCMS4M
Injection Date: 08/01/15
Injection Time: 15:47

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	34439	30.6		Pass
68	Less than 2.0% of mass 69	275	0.24	(0.62) [a]	Pass
69	Mass 69 relative abundance	44328	39.3		Pass
70	Less than 2.0% of mass 69	466	0.41	(1.05) [a]	Pass
127	40.0 - 60.0% of mass 198	57373	50.9		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	112661	100.0		Pass
199	5.0 - 9.0% of mass 198	7677	6.81		Pass
275	10.0 - 30.0% of mass 198	30075	26.7		Pass
365	1.0 - 100.0% of mass 198	4045	3.59		Pass
441	Present, but less than mass 443	14789	13.1	(76.7) [b]	Pass
442	40.0 - 100.0% of mass 198	100725	89.4		Pass
443	17.0 - 23.0% of mass 442	19282	17.1	(19.1) [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
E4M2592-CC2577	4M59376.D	08/01/15	16:30	00:43	Continuing cal 0.5
OP85975A-MB1	4M59377.D	08/01/15	17:10	01:23	Method Blank
OP85975A-BS12	4M59378.D	08/01/15	17:42	01:55	Blank Spike
ZZZZZZ	4M59383.D	08/01/15	20:15	04:28	(unrelated sample)
ZZZZZZ	4M59385.D	08/01/15	21:15	05:28	(unrelated sample)
ZZZZZZ	4M59386.D	08/01/15	21:45	05:58	(unrelated sample)
ZZZZZZ	4M59387.D	08/01/15	22:15	06:28	(unrelated sample)
ZZZZZZ	4M59388.D	08/01/15	22:45	06:58	(unrelated sample)
ZZZZZZ	4M59389.D	08/01/15	23:15	07:28	(unrelated sample)
ZZZZZZ	4M59390.D	08/01/15	23:45	07:58	(unrelated sample)
ZZZZZZ	4M59391.D	08/02/15	00:15	08:28	(unrelated sample)
ZZZZZZ	4M59392.D	08/02/15	00:44	08:57	(unrelated sample)
JC300-6	4M59393.D	08/02/15	01:14	09:27	AOI4_MW-507_072915
OP85975A-MS	4M59394.D	08/02/15	01:44	09:57	Matrix Spike
OP85975A-MSD	4M59395.D	08/02/15	02:14	10:27	Matrix Spike Duplicate

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E5P1005-DFTPP
Lab File ID: 5P19428.D
Instrument ID: GCMS5P
Injection Date: 07/09/15
Injection Time: 15:29

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	165097	38.0		Pass
68	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
69	Mass 69 relative abundance	209194	48.2		Pass
70	Less than 2.0% of mass 69	3284	0.76	(1.57) [a]	Pass
127	40.0 - 60.0% of mass 198	211354	48.7		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	434026	100.0		Pass
199	5.0 - 9.0% of mass 198	30522	7.03		Pass
275	10.0 - 30.0% of mass 198	111568	25.7		Pass
365	1.0 - 100.0% of mass 198	14298	3.29		Pass
441	Present, but less than mass 443	48344	11.1	(79.1) [b]	Pass
442	40.0 - 100.0% of mass 198	307285	70.8		Pass
443	17.0 - 23.0% of mass 442	61146	14.1	(19.9) [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
E5P1005-IC1005	5P19429.D	07/09/15	15:41	00:12	Initial cal 2
E5P1005-IC1005	5P19430.D	07/09/15	16:07	00:38	Initial cal 100
E5P1005-IC1005	5P19431.D	07/09/15	16:34	01:05	Initial cal 1
E5P1005-IC1005	5P19432.D	07/09/15	17:00	01:31	Initial cal 80
E5P1005-IC1005	5P19433.D	07/09/15	17:26	01:57	Initial cal 5
E5P1005-ICC1005	5P19434.D	07/09/15	17:52	02:23	Initial cal 50
E5P1005-IC1005	5P19435.D	07/09/15	18:18	02:49	Initial cal 10
E5P1005-IC1005	5P19436.D	07/09/15	18:44	03:15	Initial cal 25
E5P1005-ICV1005	5P19438.D	07/09/15	19:37	04:08	Initial cal verification 50
E5P1005-ICV1005	5P19439.D	07/09/15	20:03	04:34	Initial cal verification 50
E5P1005-ICV1005	5P19440.D	07/09/15	20:29	05:00	Initial cal verification 50
E5P1005-ICV1005	5P19441A.D	07/09/15	23:01	07:32	Initial cal verification 50

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E5P1006-DFTPP
Lab File ID: 5P19443.D
Instrument ID: GCMS5P
Injection Date: 07/10/15
Injection Time: 16:39

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	96614	34.8		Pass
68	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
69	Mass 69 relative abundance	124830	45.0		Pass
70	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
127	40.0 - 60.0% of mass 198	130344	47.0		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	277602	100.0		Pass
199	5.0 - 9.0% of mass 198	18245	6.57		Pass
275	10.0 - 30.0% of mass 198	73445	26.5		Pass
365	1.0 - 100.0% of mass 198	10124	3.65		Pass
441	Present, but less than mass 443	33432	12.0	(77.6) [b]	Pass
442	40.0 - 100.0% of mass 198	230720	83.1		Pass
443	17.0 - 23.0% of mass 442	43064	15.5	(18.7) [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
E5P1006-IC1006	5P19444A.D	07/10/15	17:20	00:41	Initial cal 1
E5P1006-IC1006	5P19445A.D	07/10/15	17:46	01:07	Initial cal 2
E5P1006-IC1006	5P19446A.D	07/10/15	18:12	01:33	Initial cal 5
E5P1006-IC1006	5P19447.D	07/10/15	18:38	01:59	Initial cal 10
E5P1006-IC1006	5P19448.D	07/10/15	19:04	02:25	Initial cal 25
E5P1006-ICC1006	5P19449.D	07/10/15	19:30	02:51	Initial cal 50
E5P1006-IC1006	5P19450.D	07/10/15	19:56	03:17	Initial cal 80
E5P1006-IC1006	5P19451.D	07/10/15	20:22	03:43	Initial cal 100
E5P1006-ICV1006	5P19453.D	07/10/15	21:14	04:35	Initial cal verification 50
E5P1006-ICV1006	5P19454.D	07/10/15	21:40	05:01	Initial cal verification 50
E5P1006-ICV1006	5P19455.D	07/10/15	22:06	05:27	Initial cal verification 50
E5P1006-ICV1006	5P19456.D	07/10/15	22:32	05:53	Initial cal verification 50

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E5P1033-DFTPP
Lab File ID: 5P19996.D
Instrument ID: GCMS5P
Injection Date: 07/30/15
Injection Time: 15:45

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	181576	33.0		Pass
68	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
69	Mass 69 relative abundance	220621	40.1		Pass
70	Less than 2.0% of mass 69	1495	0.27	(0.68) [a]	Pass
127	40.0 - 60.0% of mass 198	254931	46.3		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	550339	100.0		Pass
199	5.0 - 9.0% of mass 198	39735	7.22		Pass
275	10.0 - 30.0% of mass 198	142856	26.0		Pass
365	1.0 - 100.0% of mass 198	18633	3.39		Pass
441	Present, but less than mass 443	60688	11.0	(76.6) [b]	Pass
442	40.0 - 100.0% of mass 198	407893	74.1		Pass
443	17.0 - 23.0% of mass 442	79253	14.4	(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
E5P1033-CC1005	5P19997.D	07/30/15	15:57	00:12	Continuing cal 25
E5P1033-CC1006	5P19998.D	07/30/15	16:23	00:38	Continuing cal 25
OP85942-BS1	5P20001.D	07/30/15	17:42	01:57	Blank Spike
OP85942-BSD	5P20002.D	07/30/15	18:08	02:23	Blank Spike Duplicate
OP85942-MB1	5P20022A.D	07/30/15	19:31	03:46	Method Blank
JC300-5	5P20008.D	07/30/15	22:08	06:23	AOI4_MW-508_072915
OP85895-MS	5P20010.D	07/30/15	23:00	07:15	Matrix Spike
OP85895-MSD	5P20011.D	07/30/15	23:26	07:41	Matrix Spike Duplicate
ZZZZZZ	5P20012.D	07/30/15	23:53	08:08	(unrelated sample)
ZZZZZZ	5P20013.D	07/31/15	00:19	08:34	(unrelated sample)
ZZZZZZ	5P20014.D	07/31/15	00:45	09:00	(unrelated sample)
ZZZZZZ	5P20015.D	07/31/15	01:11	09:26	(unrelated sample)
ZZZZZZ	5P20016.D	07/31/15	01:37	09:52	(unrelated sample)

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E5P1049-DFTPP
Lab File ID: 5P20370.D
Instrument ID: GCMS5P
Injection Date: 08/12/15
Injection Time: 09:06

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	428965	35.3		Pass
68	Less than 2.0% of mass 69	1343	0.11	(0.26) [a]	Pass
69	Mass 69 relative abundance	512729	42.2		Pass
70	Less than 2.0% of mass 69	2701	0.22	(0.53) [a]	Pass
127	40.0 - 60.0% of mass 198	582933	48.0		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	1214848	100.0		Pass
199	5.0 - 9.0% of mass 198	75888	6.25		Pass
275	10.0 - 30.0% of mass 198	333952	27.5		Pass
365	1.0 - 100.0% of mass 198	49093	4.04		Pass
441	Present, but less than mass 443	144200	11.9	(77.2) [b]	Pass
442	40.0 - 100.0% of mass 198	942933	77.6		Pass
443	17.0 - 23.0% of mass 442	186724	15.4	(19.8) [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
E5P1049-CC1005	5P20371.D	08/12/15	09:20	00:14	Continuing cal 25
E5P1049-CC1006	5P20372.D	08/12/15	09:49	00:43	Continuing cal 25
OP86244A-MB1	5P20373.D	08/12/15	10:14	01:08	Method Blank
OP86244A-BS1	5P20374.D	08/12/15	10:40	01:34	Blank Spike
OP86244A-BSD	5P20375.D	08/12/15	11:06	02:00	Blank Spike Duplicate
OP86134A-MB1	5P20376.D	08/12/15	11:32	02:26	Method Blank
OP86134A-BS1	5P20377.D	08/12/15	11:58	02:52	Blank Spike
OP86134A-BSD	5P20378.D	08/12/15	12:24	03:18	Blank Spike Duplicate
OP85975A-MB1	5P20382.D	08/12/15	12:50	03:44	Method Blank
JC300-6	5P20383.D	08/12/15	13:16	04:10	AOI4_MW-507_072915
ZZZZZZ	5P20379.D	08/12/15	13:42	04:36	(unrelated sample)
ZZZZZZ	5P20380.D	08/12/15	14:08	05:02	(unrelated sample)

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: EZ5116-DFTPP
Lab File ID: Z102668.D
Instrument ID: GCMSZ
Injection Date: 07/02/15
Injection Time: 21:43

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	75169	31.3		Pass
68	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
69	Mass 69 relative abundance	94775	39.4		Pass
70	Less than 2.0% of mass 69	404	0.17	(0.43) [a]	Pass
127	40.0 - 60.0% of mass 198	119584	49.7		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	240469	100.0		Pass
199	5.0 - 9.0% of mass 198	16751	6.97		Pass
275	10.0 - 30.0% of mass 198	66384	27.6		Pass
365	1.0 - 100.0% of mass 198	10895	4.53		Pass
441	Present, but less than mass 443	36543	15.2	(78.0) [b]	Pass
442	40.0 - 100.0% of mass 198	237840	98.9		Pass
443	17.0 - 23.0% of mass 442	46842	19.5	(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
EZ5116-IC5116	Z102669.D	07/02/15	22:05	00:22	Initial cal 100
EZ5116-IC5116	Z102670.D	07/02/15	22:36	00:53	Initial cal 80
EZ5116-ICC5116	Z102671.D	07/02/15	23:07	01:24	Initial cal 50
EZ5116-IC5116	Z102672.D	07/02/15	23:37	01:54	Initial cal 25
EZ5116-IC5116	Z102673.D	07/03/15	00:08	02:25	Initial cal 10
EZ5116-IC5116	Z102674.D	07/03/15	00:39	02:56	Initial cal 5
EZ5116-IC5116	Z102675.D	07/03/15	01:10	03:27	Initial cal 2
EZ5116-IC5116	Z102676.D	07/03/15	01:41	03:58	Initial cal 1
EZ5116-ICV5116	Z102679.D	07/03/15	03:13	05:30	Initial cal verification 50
EZ5116-ICV5116	Z102680.D	07/03/15	03:44	06:01	Initial cal verification 50
EZ5116-ICV5116	Z102682.D	07/03/15	04:46	07:03	Initial cal verification 50
EZ5116-ICV5116	Z102683.D	07/03/15	05:17	07:34	Initial cal verification 50

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: EZ5119-DFTPP
Lab File ID: Z102725.D
Instrument ID: GCMSZ
Injection Date: 07/07/15
Injection Time: 11:48

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	62076	38.2		Pass
68	Less than 2.0% of mass 69	6	0.00	(0.01) [a]	Pass
69	Mass 69 relative abundance	52476	32.3		Pass
70	Less than 2.0% of mass 69	276	0.17	(0.53) [a]	Pass
127	40.0 - 60.0% of mass 198	74475	45.8		Pass
197	Less than 1.0% of mass 198	570	0.35		Pass
198	Base peak, 100% relative abundance	162685	100.0		Pass
199	5.0 - 9.0% of mass 198	10924	6.71		Pass
275	10.0 - 30.0% of mass 198	30644	18.8		Pass
365	1.0 - 100.0% of mass 198	3946	2.43		Pass
441	Present, but less than mass 443	16637	10.2	(77.3) [b]	Pass
442	40.0 - 100.0% of mass 198	113274	69.6		Pass
443	17.0 - 23.0% of mass 442	21523	13.2	(19.0) [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
EZ5119-IC5119	Z102726.D	07/07/15	12:03	00:15	Initial cal 2
EZ5119-IC5119	Z102727.D	07/07/15	12:34	00:46	Initial cal 100
EZ5119-IC5119	Z102728.D	07/07/15	13:06	01:18	Initial cal 1
EZ5119-IC5119	Z102729.D	07/07/15	13:38	01:50	Initial cal 5
EZ5119-IC5119	Z102730.D	07/07/15	14:10	02:22	Initial cal 10
EZ5119-IC5119	Z102731.D	07/07/15	14:41	02:53	Initial cal 25
EZ5119-ICC5119	Z102732.D	07/07/15	15:12	03:24	Initial cal 50
EZ5119-IC5119	Z102733.D	07/07/15	15:44	03:56	Initial cal 80
EZ5119-ICV5119	Z102735.D	07/07/15	16:53	05:05	Initial cal verification 50
EZ5119-ICV5119	Z102736.D	07/07/15	17:25	05:37	Initial cal verification 50

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: EZ5121-DFTPP
Lab File ID: Z102745.D
Instrument ID: GCMSZ
Injection Date: 07/07/15
Injection Time: 23:48

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	67301	48.6		Pass
68	Less than 2.0% of mass 69	803	0.58	(1.45) [a]	Pass
69	Mass 69 relative abundance	55504	40.1		Pass
70	Less than 2.0% of mass 69	197	0.14	(0.35) [a]	Pass
127	40.0 - 60.0% of mass 198	72648	52.5		Pass
197	Less than 1.0% of mass 198	299	0.22		Pass
198	Base peak, 100% relative abundance	138453	100.0		Pass
199	5.0 - 9.0% of mass 198	9682	6.99		Pass
275	10.0 - 30.0% of mass 198	24604	17.8		Pass
365	1.0 - 100.0% of mass 198	2722	1.97		Pass
441	Present, but less than mass 443	12688	9.16	(86.9) [b]	Pass
442	40.0 - 100.0% of mass 198	78826	56.9		Pass
443	17.0 - 23.0% of mass 442	14594	10.5	(18.5) [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
EZ5121-ICV5119	Z102746.D	07/08/15	00:03	00:15	Initial cal verification 50
EZ5121-ICV5119	Z102747.D	07/08/15	00:34	00:46	Initial cal verification 50
EZ5121-ICV5119	Z102748.D	07/08/15	01:06	01:18	Initial cal verification 50
EZ5121-ICV5119	Z102749.D	07/08/15	01:37	01:49	Initial cal verification 50

Instrument Performance Check (DFTPP)

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: EZ5150-DFTPP
Lab File ID: Z103248.D
Instrument ID: GCMSZ
Injection Date: 07/31/15
Injection Time: 08:46

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	56225	33.0		Pass
68	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
69	Mass 69 relative abundance	73756	43.3		Pass
70	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
127	40.0 - 60.0% of mass 198	82854	48.7		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	170260	100.0		Pass
199	5.0 - 9.0% of mass 198	11823	6.94		Pass
275	10.0 - 30.0% of mass 198	42576	25.0		Pass
365	1.0 - 100.0% of mass 198	6387	3.75		Pass
441	Present, but less than mass 443	21122	12.4	(79.9) [b]	Pass
442	40.0 - 100.0% of mass 198	141605	83.2		Pass
443	17.0 - 23.0% of mass 442	26450	15.5	(18.7) [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
EZ5150-CC5119	Z103250.D	07/31/15	10:14	01:28	Continuing cal 25
EZ5150-CC5116	Z103251.D	07/31/15	11:02	02:16	Continuing cal 25
OP85953-MB1	Z103252.D	07/31/15	11:33	02:47	Method Blank
OP85953-BS1	Z103253.D	07/31/15	12:05	03:19	Blank Spike
OP85953-BSD	Z103254.D	07/31/15	12:36	03:50	Blank Spike Duplicate
ZZZZZZ	Z103255.D	07/31/15	13:07	04:21	(unrelated sample)
OP85767-MB1	Z103256.D	07/31/15	13:38	04:52	Method Blank
ZZZZZZ	Z103257.D	07/31/15	14:10	05:24	(unrelated sample)
ZZZZZZ	Z103261.D	07/31/15	15:44	06:58	(unrelated sample)
ZZZZZZ	Z103267.D	07/31/15	17:50	09:04	(unrelated sample)
ZZZZZZ	Z103268.D	07/31/15	18:21	09:35	(unrelated sample)
JC300-2	Z103269.D	07/31/15	18:53	10:07	AOI4_MW-504_072915
JC300-3	Z103270.D	07/31/15	19:24	10:38	AOI4_MW-505_072915
JC300-4	Z103271.D	07/31/15	19:55	11:09	AOI4_MW-506_072915
ZZZZZZ	Z103272.D	07/31/15	20:27	11:41	(unrelated sample)

Semivolatile Internal Standard Area Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	E3M2617-CC2611	**Injection Date:**	07/30/15
Lab File ID:	3M56637.D	**Injection Time:**	17:34
Instrument ID:	GCMS3M	**Method:**	SW846 8270D BY SIM

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
Check Std	57645	8.85	99814	11.80	141156	16.03	112865	20.65
Upper Limit [a]	115290	9.35	199628	12.30	282312	16.53	225730	21.15
Lower Limit [b]	28823	8.35	49907	11.30	70578	15.53	56433	20.15

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
OP85932A-MB1	73848	8.85	119986	11.80	157609	16.03	130970	20.65
OP85932A-BS12	62261	8.85	97004	11.80	127003	16.01	97490	20.65
OP85932A-BSD12	65291	8.85	98001	11.80	130595	16.01	98313	20.65
ZZZZZZ	63735	8.85	90782	11.80	121883	16.01	94853	20.65
ZZZZZZ	60954	8.85	84607	11.80	122674	16.01	97228	20.65
OP85942A-MB1	69712	8.85	95172	11.80	129603	16.01	102844	20.65
OP85942A-BS12	68708	8.85	92095	11.80	128491	16.01	96569	20.63
OP85942A-BSD12	63329	8.85	90431	11.80	122489	16.01	93481	20.63
ZZZZZZ	65638	8.85	90482	11.80	125550	16.01	100380	20.63
ZZZZZZ	63666	8.85	85446	11.80	120310	16.01	95232	20.63
ZZZZZZ	69106	8.85	85332	11.80	114368	16.01	99369	20.65
OP85969A-MB1	64202	8.85	82907	11.80	117002	16.01	93101	20.63
OP85969A-BS12	63668	8.85	87769	11.80	120877	16.01	93059	20.63
OP85969A-BSD12	63418	8.85	89854	11.80	124773	16.01	96178	20.63
ZZZZZZ	55024	8.85	82859	11.80	111137	16.01	93713	20.63
ZZZZZZ	65963	8.85	81745	11.80	118949	16.01	97538	20.63
ZZZZZZ	54416	8.85	80471	11.80	113468	16.03	98231	20.63
ZZZZZZ	61077	8.85	87257	11.80	118681	16.01	101956	20.63
ZZZZZZ	68357	8.85	89485	11.80	128891	16.01	102478	20.63
ZZZZZZ	64591	8.85	85375	11.80	125964	16.01	103557	20.63
ZZZZZZ	64467	8.85	84444	11.80	119859	16.01	95004	20.63

IS 1 = 1-Methylnaphthalene-d10
IS 2 = Fluorene-d10
IS 3 = Fluoranthene-d10
IS 4 = Benzo(a)pyrene-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: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	E3M2618-CC2611	**Injection Date:**	07/31/15
Lab File ID:	3M56666.D	**Injection Time:**	09:57
Instrument ID:	GCMS3M	**Method:**	SW846 8270D BY SIM

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
Check Std	59326	8.85	84222	11.78	122055	16.01	94990	20.63
Upper Limit [a]	118652	9.35	168444	12.28	244110	16.51	189980	21.13
Lower Limit [b]	29663	8.35	42111	11.28	61028	15.51	47495	20.13

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
OP85953A-MB1	66926	8.85	90172	11.78	125266	16.01	99715	20.63
OP85953A-BS12	64452	8.85	88523	11.78	124540	16.01	95205	20.63
OP85953A-BSD12	61807	8.85	87248	11.78	122098	16.01	96080	20.63
ZZZZZZ	58491	8.85	80001	11.78	117872	16.01	93880	20.63
ZZZZZZ	70992	8.85	91291	11.80	130369	16.01	104889	20.63
ZZZZZZ	76076	8.85	100580	11.80	141311	16.01	113177	20.63
JC300-2	71947	8.85	94708	11.78	136046	16.01	106552	20.63
JC300-3	65280	8.85	79305	11.80	108693	16.01	91076	20.63
JC300-4	66815	8.85	90118	11.80	127045	16.01	100086	20.63
ZZZZZZ	69595	8.85	93623	11.80	133273	16.01	115296	20.63
ZZZZZZ	74494	8.85	94536	11.80	135294	16.01	109334	20.63
ZZZZZZ	75156	8.85	97448	11.80	138658	16.01	108575	20.63
JC300-1	73333	8.85	96221	11.80	139195	16.01	110604	20.63
JC300-5	74693	8.85	102428	11.80	149135	16.01	120923	20.63
JC300-6 [c]	75160	8.85	99584	11.80	134271	16.01	112935	20.63

IS 1 = 1-Methylnaphthalene-d10
IS 2 = Fluorene-d10
IS 3 = Fluoranthene-d10
IS 4 = Benzo(a)pyrene-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) Confirmation run for surrogate recoveries.

Semivolatile Internal Standard Area Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	E4M2592-CC2577	**Injection Date:**	08/01/15
Lab File ID:	4M59376.D	**Injection Time:**	16:30
Instrument ID:	GCMS4M	**Method:**	SW846 8270D BY SIM

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
Check Std	35608	9.94	75598	12.92	114462	17.07	75214	21.65
Upper Limit [a]	71216	10.44	151196	13.42	228924	17.57	150428	22.15
Lower Limit [b]	17804	9.44	37799	12.42	57231	16.57	37607	21.15

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT
OP85975A-MB1	29393	9.96	60272	12.92	89524	17.07	58465	21.65
OP85975A-BS12	28366	9.96	57119	12.92	83780	17.07	57091	21.65
ZZZZZZ	28986	9.96	49069	12.92	75615	17.09	53344	21.65
ZZZZZZ	31544	9.96	55445	12.92	84499	17.07	62676	21.65
ZZZZZZ	23148	9.96	40079	12.92	60225	17.09	43606	21.65
ZZZZZZ	30930	9.96	48562	12.92	81370	17.09	58520	21.66
ZZZZZZ	29174	9.96	46771	12.92	74925	17.09	52934	21.66
ZZZZZZ	30797	9.96	51070	12.92	79785	17.09	58479	21.66
ZZZZZZ	30243	9.96	45707	12.92	76338	17.09	53863	21.66
ZZZZZZ	44062	9.96	86070	12.92	124134	17.07	90982	21.65
ZZZZZZ	28210	9.96	46419	12.92	72116	17.09	53822	21.66
JC300-6	34611	9.96	65481	12.94	86955	17.09	63789	21.66
OP85975A-MS	35085	9.96	57003	12.92	91175	17.09	65298	21.66
OP85975A-MSD	28685	9.96	44515	12.92	75994	17.09	53004	21.66

IS 1 = 1-Methylnaphthalene-d10
IS 2 = Fluorene-d10
IS 3 = Fluoranthene-d10
IS 4 = Benzo(a)pyrene-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: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	E5P1033-CC1005	**Injection Date:**	07/30/15
Lab File ID:	5P19997.D	**Injection Time:**	15:57
Instrument ID:	GCMS5P	**Method:**	SW846 8270D

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	523900	4.68	1952548	6.12	1158752	8.22	1960798	10.02	2067807	13.72	2051352	15.78
Upper Limit [a]	1047800	5.18	3905096	6.62	2317504	8.72	3921596	10.52	4135614	14.22	4102704	16.28
Lower Limit [b]	261950	4.18	976274	5.62	579376	7.72	980399	9.52	1033904	13.22	1025676	15.28

Lab Sample ID	IS 1 AREA	IS 1 RT	IS 2 AREA	IS 2 RT	IS 3 AREA	IS 3 RT	IS 4 AREA	IS 4 RT	IS 5 AREA	IS 5 RT	IS 6 AREA	IS 6 RT
OP85942-BS1 [c]	447472	4.67	1703917	6.12	1052311	8.22	1756002	10.01	1870363	13.71	1909274	15.77
OP85942-BSD	458333	4.67	1695195	6.12	1023901	8.22	1678706	10.01	1799885	13.71	1709411	15.77
OP85942-MB1	485567	4.67	1889216	6.12	1137023	8.21	1872636	10.01	1925202	13.70	1890964	15.77
JC300-5	465838	4.66	1807144	6.12	1082826	8.21	1832011	10.00	1852212	13.70	1848018	15.76
OP85895-MS	566861	4.67	2074433	6.12	1238636	8.21	1956632	10.01	2045884	13.70	1851810	15.76
OP85895-MSD	546617	4.67	1995989	6.12	1187171	8.21	1990804	10.01	2019853	13.70	1795621	15.76
ZZZZZZ	413831	4.66	1512399	6.12	885944	8.21	1465449	10.00	1692465	13.70	1878874	15.78
ZZZZZZ	486846	4.67	2459594	6.13	2105507	8.27	2944673	10.05	2962104	13.75	2899984	15.81
ZZZZZZ	581298	4.67	2134844	6.12	1260998	8.22	1990783	10.01	2325328	13.72	2327403	15.78
ZZZZZZ	577759	4.67	2223308	6.12	1357636	8.22	2235227	10.01	2374324	13.71	2426805	15.78
ZZZZZZ	434384	4.68	1743369	6.13	1141547	8.22	1949987	10.02	3113597	13.75	3428138	15.84

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) low, full list rx

Semivolatile Internal Standard Area Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	E5P1049-CC1005	**Injection Date:**	08/12/15
Lab File ID:	5P20371.D	**Injection Time:**	09:20
Instrument ID:	GCMS5P	**Method:**	SW846 8270D

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	396430	4.59	1529514	6.04	1025278	8.14	1853042	9.93	2054700	13.62	1816319	15.69
Upper Limit [a]	792860	5.09	3059028	6.54	2050556	8.64	3706084	10.43	4109400	14.12	3632638	16.19
Lower Limit [b]	198215	4.09	764757	5.54	512639	7.64	926521	9.43	1027350	13.12	908160	15.19

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
OP86244A-MB1	393754	4.59	1600931	6.04	1091867	8.14	1896417	9.93	2128860	13.62	1848417	15.69
OP86244A-BS1	345061	4.59	1411411	6.04	930619	8.14	1659486	9.93	1838127	13.62	1622013	15.69
OP86244A-BSD	314593	4.59	1337843	6.04	891693	8.14	1569764	9.93	1763023	13.62	1562597	15.69
OP86134A-MB1	481809	4.59	1966346	6.04	1442646	8.14	2278531	9.93	2286833	13.62	2006384	15.69
OP86134A-BS1	515583	4.59	2159915	6.04	1513238	8.14	2444903	9.93	2634952	13.62	2251611	15.69
OP86134A-BSD	521790	4.59	2213149	6.04	1550503	8.14	2423530	9.93	2556557	13.62	2166820	15.69
OP85975A-MB1	360301	4.59	1546405	6.04	1091347	8.14	1955717	9.93	1990313	13.62	2008087	15.69
JC300-6	417613	4.59	1683127	6.04	1097164	8.14	1870772	9.93	1964740	13.62	1922450	15.69
ZZZZZZ	352653	4.59	1603943	6.05	1653361	8.16	2667585	9.95	1943973	13.64	1934784	15.71
ZZZZZZ	388269	4.60	2537635	6.05	2623795*	8.19	3880322*	9.98	2239076	13.65	2251634	15.71

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: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	EZ5150-CC5119	**Injection Date:**	07/31/15
Lab File ID:	Z103250.D	**Injection Time:**	10:14
Instrument ID:	GCMSZ	**Method:**	SW846 8270D

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	288647	4.83	1064009	5.75	740575	7.19	1294757	9.12	1251415	14.43	858076	17.48
Upper Limit [a]	577294	5.33	2128018	6.25	1481150	7.69	2589514	9.62	2502830	14.93	1716152	17.98
Lower Limit [b]	144324	4.33	532005	5.25	370288	6.69	647379	8.62	625708	13.93	429038	16.98

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
OP85953-MB1	313719	4.83	1154748	5.75	786560	7.19	1355914	9.12	1383106	14.42	1018792	17.47
OP85953-BS1	325562	4.83	1325959	5.75	790424	7.19	1328502	9.12	1279853	14.43	968531	17.47
OP85953-BSD	287891	4.83	1186182	5.75	708526	7.19	1205667	9.12	1230049	14.42	960507	17.47
ZZZZZZ	327801	4.83	1179672	5.75	760901	7.19	1309264	9.11	1208018	14.42	1026215	17.47
OP85767-MB1	335027	4.83	1219876	5.75	811134	7.19	1384325	9.11	1364514	14.41	1142368	17.47
ZZZZZZ	254154	4.83	859178	5.75	578155	7.19	879434	9.11	791462	14.44	826714	17.54
ZZZZZZ	246839	4.83	911854	5.75	614317	7.20	1046253	9.13	661013	14.44	568100	17.49
ZZZZZZ	320942	4.83	1125067	5.75	552801	7.20	808416	9.13	770259	14.45	707019	17.51
ZZZZZZ	282108	4.83	1056229	5.75	695046	7.20	1191784	9.12	775851	14.44	646453	17.49
JC300-2	300987	4.83	1105720	5.75	738902	7.19	1271570	9.12	952038	14.44	728965	17.49
JC300-3	279227	4.83	1007756	5.75	646576	7.19	1039586	9.12	764606	14.44	638118	17.49
JC300-4	290692	4.83	1057991	5.75	703374	7.19	1208409	9.12	932013	14.44	707847	17.49
ZZZZZZ	314223	4.83	1157205	5.75	781781	7.19	1370068	9.12	1305430	14.43	790210	17.49

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 Surrogate Recovery Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8270D **Matrix:** AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
JC300-2	Z103269.D	50	32	77	82	85	121
JC300-3	Z103270.D	44	27	96	75	82	94
JC300-4	Z103271.D	34	21	71	70	67	62
OP85953-BS1	Z103253.D	57	38	86	75	84	96
OP85953-BSD	Z103254.D	57	39	87	73	85	107
OP85953-MB1	Z103252.D	46	28	74	74	73	94

Surrogate Compounds	Recovery Limits
S1 = 2-Fluorophenol	12-110%
S2 = Phenol-d5	10-110%
S3 = 2,4,6-Tribromophenol	42-154%
S4 = Nitrobenzene-d5	29-139%
S5 = 2-Fluorobiphenyl	33-129%
S6 = Terphenyl-d14	10-140%

Semivolatile Surrogate Recovery Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8270D BY SIM **Matrix:** AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
JC300-1	3M56681.D	47	45	21
JC300-2	3M56674.D	52	64	59
JC300-3	3M56675.D	48	65	59
JC300-4	3M56676.D	46	52	36
JC300-5	5P20008.D	83	83	46
JC300-5	3M56682.D	55	63	32
JC300-6	5P20383.D	11* [a]	55	26
JC300-6	4M59393.D	15* [b]	46	25
JC300-6	3M56683.D	1* [c]	9* [c]	4* [c]
OP85942A-BS12	3M56644.D	47	57	53
OP85942A-BSD12	3M56645.D	57	64	57
OP85942A-MB1	3M56643.D	57	66	59
OP85953A-BS12	3M56668.D	39	43	55
OP85953A-BSD12	3M56669.D	54	61	65
OP85953A-MB1	3M56667.D	49	55	61
OP85975A-BS12	4M59378.D	83	84	85
OP85975A-MB1	4M59377.D	91	97	85
OP85975A-MB1	5P20382.D	81	82	83
OP85975A-MS	4M59394.D	84	73	47
OP85975A-MSD	4M59395.D	71	66	42

Surrogate Compounds	Recovery Limits
S1 = Nitrobenzene-d5	23-131%
S2 = 2-Fluorobiphenyl	24-120%
S3 = Terphenyl-d14	10-125%

(a) Outside control limits due to dilution and matrix interference.
(b) Outside control limits due to matrix interference. Confirmed by re-extraction.
(c) Outside control limits due to matrix interference.

Initial Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2611-ICC2611
Lab FileID: 3M56532.D

```
                        Response Factor Report  MS3M

Method       : C:\MSDCHEM\1\METHODS\M3M2611SIM.M (RTE Integrator)
Title        : Semi Volatile Extractables by GC/MS
Last Update  : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

Calibration Files
2.5 =3m56540.D   1.0 =3m56532.D   0.5 =3m56533.D   0.2 =3m56534.D
0.1 =3m56535.D   0.05=3m56536.D   0.02=3m56537.D   0.01=3m56538.D
5   =3m56539.D       =                =                =

Compound
            2.5   1.0   0.5   0.2   0.1   0.05  0.02  0.01  5            Avg    %RSD
-----------------------------------------------------------------------------

1) I   1-Methylnaphthalene-d ----------------ISTD---------------------
2)  1,4-dioxane
                                                                      0.000#  -1.00
3)  2-Fluorophenol
          0.499 0.574 0.728 0.973 0.739 0.761 0.762 0.725             0.720   19.51
4)  Phenol-d5
          0.721 0.857 0.985 1.328 1.057 1.064 0.988 1.045             1.006   17.43
5)  Phenol
          0.848 0.967 1.061 1.327 1.108 1.073 1.066 1.073 0.769       1.032   15.53
6)  bis(2-Chloroethyl)ether
          0.701 0.783 0.826 0.793 0.756 0.688 0.511 0.707 0.685       0.717   12.89
7)  Nitrobenzene-d5
          0.687 0.813 0.934 1.221 1.007 0.966 0.958 0.988             0.947   16.28
8)  Naphthalene
          2.573 2.998 3.322 4.048 3.199 3.144 3.270 3.194 2.285       3.115   15.84
9)  Hexachlorobutadiene
          0.412 0.472 0.504 0.622 0.489 0.474 0.481       0.386       0.480   14.63
10)  2-Methylnaphthalene
          1.250 1.466 1.679 2.277 1.846 1.861 1.945                   1.761   19.01
11)  1-Methylnaphthalene
          1.325 1.542 1.646 2.005 1.528 1.544 1.654 1.757 1.205       1.578   14.74
12)  Hexachlorocyclopentadiene
                                                                      0.000#  -1.00

13) I   Fluorene-d10          ----------------ISTD---------------------
14)  2-Fluorobiphenyl
          0.682 0.821 0.982 1.320 1.147 1.205 1.264 1.354             1.097   22.30
15)  Acenaphthylene
          1.506 1.800 2.025 2.349 1.750 1.723 1.874 2.133 1.260       1.824   17.87
16)  Acenaphthene
          0.872 1.072 1.243 1.521 1.200 1.251 1.371                   1.219   17.02
17)  4,6-dinitro-2-methylphenol
          0.191 0.185 0.166 0.148 0.065 0.043 0.042       0.160       0.125   51.19
           ---- Quadratic regression ----  Coefficient =  0.9992
             Response Ratio = -0.01732 + 0.22124 *A + -0.00921 *A^2

18)  Fluorene
          0.974 1.159 1.281 1.503 1.137 1.125 1.328 1.589 0.865       1.218   19.21
19)  2,4,6-Tribromophenol
          0.122 0.148 0.173 0.206 0.163 0.164 0.162 0.147 0.115       0.156   17.30

20) I   Fluoranthene-d10      ----------------ISTD---------------------
21)  Hexachlorobenzene
          0.272 0.303 0.334 0.388 0.301 0.324 0.352 0.439 0.241       0.328   18.20
```

Initial Calibration Summary

Job Number: JC300 **Sample:** E3M2611-ICC2611
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 3M56532.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
22)  Pentachlorophenol
           0.121 0.147 0.139 0.122 0.067 0.054 0.056       0.117        0.103   36.86
            ---- Quadratic regression ----  Coefficient =  0.9984
              Response Ratio = -0.00104 + 0.13467 *A + -0.00288 *A^2

23)  Phenanthrene
           1.064 1.265 1.476 1.759 1.417 1.513 1.770                    1.466   17.28
24)  Anthracene
           1.057 1.216 1.385 1.680 1.318 1.351 1.630       0.913        1.319   19.80
25)  Fluoranthene
           1.031 1.165 1.321 1.571 1.247 1.407             0.920        1.237   17.94
26)  Pyrene
           1.196 1.415 1.653 1.908 1.468 1.583             1.043        1.467   19.66
27)  Terphenyl-d14
           0.434 0.525 0.631 0.830 0.731 0.792 0.875                    0.688   23.86
28)  Benzo[a]anthracene
           1.088 1.347 1.578 1.745 1.289 1.402                          1.408   16.29
29)  Chrysene
           0.899 1.121 1.412 1.751 1.391 1.629                          1.367   23.08
            ---- Quadratic regression ----  Coefficient =  0.9969
              Response Ratio = 0.01239 + 1.27742 *A + -0.64009 *A^2


30) I   Benzo(a)pyrene-d12    ----------------ISTD---------------------
31)  Benzo[b]fluoranthene
           1.686 1.915 2.206 2.475 1.811 1.966 2.268       1.495        1.978   16.37
32)  Benzo[k]fluoranthene
           0.982 1.253 1.576 2.080 1.705 2.033                          1.605   26.90
            ---- Quadratic regression ----  Coefficient =  0.9966
              Response Ratio = 0.01793 + 1.41493 *A + -0.74151 *A^2

33)  Benzo[a]pyrene
           1.093 1.326 1.459 1.605 1.241 1.299 1.707                    1.390   15.38
34)  Indeno[1,2,3-cd]pyrene
           1.535 1.788 2.052 2.435 1.958 2.207 2.806                    2.112   19.91
35)  Dibenz[a,h]anthracene
           1.095 1.369 1.634 2.008 1.539 1.821                          1.578   20.55
            ---- Quadratic regression ----  Coefficient =  0.9982
              Response Ratio = 0.01004 + 1.56121 *A + -0.77457 *A^2

36)  Benzo[g,h,i]perylene
           1.224 1.474 1.687 2.018 1.621 1.855 2.205                    1.726   19.20
-------------------------------------------------------------------------------
(#) = Out of Range  ###  Number of calibration levels exceeded format  ###

          M3M2611SIM.M        Mon Jul 27 11:34:14 2015   RPT1
```

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2611-ICV2611
Lab FileID: 3M56541.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3M2611\3m56541.D          Vial: 11
Acq On    : 25 Jul 2015  10:06 pm                    Operator: ashleyd
Sample    : icv2611-1.0                              Inst    : MS3M
Misc      : op85770a,e3m2611                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M3M2611SIM.M (RTE Integrator)
Title        : Semi Volatile Extractables by GC/MS
Last Update  : Mon Jul 27 11:23:44 2015
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-Methylnaphthalene-d10	1.000	1.000	0.0	173	0.00	8.87
5		Phenol	1.032	1.021	1.1	183	0.00	4.75
13	I	Fluorene-d10	1.000	1.000	0.0	158	0.00	11.82
		----------	True	Calc.	% Drift	----------		
17	t	4,6-dinitro-2-methylpheno	5.000	4.527	9.5	152	-0.04	12.08
20	I	Fluoranthene-d10	1.000	1.000	0.0	159	0.00	16.04
		----------	True	Calc.	% Drift	----------		
22	t	Pentachlorophenol	5.000	4.557	8.9	128	-0.02	13.43

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3m56532.D M3M2611SIM.M Mon Jul 27 11:34:01 2015 RPT1

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2611-ICV2611
Lab FileID: 3M56542.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\E3M2611\3m56542.D Vial: 12
Acq On : 25 Jul 2015 10:36 pm Operator: ashleyd
Sample : icv2611-1.0 Inst : MS3M
Misc : op85770a,e3m2611 Multiplr: 1.00
MS Integration Params: lscint.p

Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M (RTE Integrator)
Title : Semi Volatile Extractables by GC/MS
Last Update : Mon Jul 27 11:23:44 2015
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-Methylnaphthalene-d10	1.000	1.000	0.0	113	0.00	8.87
6	t	bis(2-Chloroethyl)ether	0.717	0.852	-18.8	123	0.00	4.80
8	t	Naphthalene	3.115	2.647	15.0	100	-0.01	7.42
9	t	Hexachlorobutadiene	0.480	0.414	13.8	99	0.00	7.72
10	t	2-Methylnaphthalene	1.761	1.370	22.2	105	0.00	8.76
13	I	Fluorene-d10	1.000	1.000	0.0	102	0.00	11.82
15	t	Acenaphthylene	1.824	1.561	14.4	88	0.00	10.49
16	t	Acenaphthene	1.219	1.041	14.6	99	0.00	10.85
18	t	Fluorene	1.218	1.079	11.4	95	0.00	11.88
20	I	Fluoranthene-d10	1.000	1.000	0.0	98	0.00	16.04
21	t	Hexachlorobenzene	0.328	0.298	9.1	96	0.00	12.98
23	t	Phenanthrene	1.466	1.257	14.3	97	-0.02	13.76
24	t	Anthracene	1.319	1.130	14.3	91	0.00	13.86
25	t	Fluoranthene	1.237	1.106	10.6	93	0.00	16.07
26	t	Pyrene	1.467	1.296	11.7	89	-0.02	16.46
28	t	Benzo[a]anthracene	1.408	1.163	17.4	84	0.00	18.58
		----------	True	Calc.	% Drift		----------	
29	t	Chrysene	1.000	0.819	18.1	86	0.00	18.64
		----------	AvgRF	CCRF	% Dev		----------	
30	I	Benzo(a)pyrene-d12	1.000	1.000	0.0	95	0.00	20.66
31	t	Benzo[b]fluoranthene	1.978	1.766	10.7	87	-0.02	20.25
		----------	True	Calc.	% Drift		----------	
32	t	Benzo[k]fluoranthene	1.000	0.866	13.4	87	0.00	20.29
		----------	AvgRF	CCRF	% Dev		----------	
33	t	Benzo[a]pyrene	1.390	1.149	17.3	82	0.00	20.69
34	t	Indeno[1,2,3-cd]pyrene	2.112	1.759	16.7	93	-0.02	22.12
		----------	True	Calc.	% Drift		----------	
35	t	Dibenz[a,h]anthracene	1.000	0.932	6.8	92	0.00	22.16
		----------	AvgRF	CCRF	% Dev		----------	
36	t	Benzo[g,h,i]perylene	1.726	1.317	23.7	84	0.00	22.44

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2611-ICV2611
Lab FileID: 3M56542.D

```
(#) = Out of Range              SPCC's out = 0  CCC's out = 0
 3m56532.D  M3M2611SIM.M       Mon Jul 27 11:34:03 2015   RPT1
```

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2611-ICV2611
Lab FileID: 3M56543.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3M2611\3m56543.D          Vial: 13
Acq On    : 25 Jul 2015  11:06 pm                    Operator: ashleyd
Sample    : icv2611-1.0                              Inst    : MS3M
Misc      : op85770a,e3m2611                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M3M2611SIM.M (RTE Integrator)
Title        : Semi Volatile Extractables by GC/MS
Last Update  : Mon Jul 27 11:23:44 2015
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-Methylnaphthalene-d10	1.000	1.000	0.0	130	0.00	8.87
11	t	1-Methylnaphthalene	1.578	1.363	13.6	115	-0.02	8.93

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3m56532.D M3M2611SIM.M Mon Jul 27 11:34:05 2015 RPT1

8.8.4

8

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2617-CC2611
Lab FileID: 3M56637.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3M2617\3m56637.D          Vial: 2
Acq On    : 30 Jul 2015   5:34 pm                    Operator: ashleyd
Sample    : cc2611-1.0                               Inst    : MS3M
Misc      : op85824a,e3m2617,1000                    Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M3M2611SIM.M (RTE Integrator)
Title        : Semi Volatile Extractables by GC/MS
Last Update  : Mon Jul 27 11:23:44 2015
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-Methylnaphthalene-d10	1.000	1.000	0.0	83	-0.02	8.85
2	t	1,4-dioxane		----------NA----------				
3	S	2-Fluorophenol	0.720	0.637	11.5	92	0.02	3.40
4	S	Phenol-d5	1.006	0.850	15.5	82	0.05	4.79
5		Phenol	1.032	0.932	9.7	80	0.06	4.81
6	t	bis(2-Chloroethyl)ether	0.717	0.887	-23.7#	94	-0.02	4.78
7	S	Nitrobenzene-d5	0.947	0.797	15.8	81	-0.01	6.09
8	t	Naphthalene	3.115	2.991	4.0	83	-0.03	7.40
9	t	Hexachlorobutadiene	0.480	0.463	3.5	81	-0.01	7.71
10	t	2-Methylnaphthalene	1.761	1.885	-7.0	106	-0.02	8.74
11	t	1-Methylnaphthalene	1.578	1.522	3.5	82	-0.02	8.93
12		Hexachlorocyclopentadiene	0.000	0.130	0.0	0#	-0.02	9.09
13	I	Fluorene-d10	1.000	1.000	0.0	82	-0.02	11.80
14	S	2-Fluorobiphenyl	1.097	0.842	23.2#	84	-0.02	9.52
15	t	Acenaphthylene	1.824	1.767	3.1	80	-0.02	10.48
16	t	Acenaphthene	1.219	1.073	12.0	82	-0.02	10.83
		----------	True	Calc.	% Drift	----------		
17	t	4,6-dinitro-2-methylpheno	5.000	3.459	30.8#	59	-0.04	12.08
		----------	AvgRF	CCRF	% Dev	----------		
18	t	Fluorene	1.218	1.132	7.1	80	-0.02	11.86
19	S	2,4,6-Tribromophenol	0.156	0.148	5.1	81	-0.02	12.37
20	I	Fluoranthene-d10	1.000	1.000	0.0	84	-0.02	16.03
21	t	Hexachlorobenzene	0.328	0.291	11.3	80	-0.03	12.95
		----------	True	Calc.	% Drift	----------		
22	t	Pentachlorophenol	5.000	2.184	56.3#	33	0.00	13.45
		----------	AvgRF	CCRF	% Dev	----------		
23	t	Phenanthrene	1.466	1.248	14.9	82	-0.03	13.74
24	t	Anthracene	1.319	1.130	14.3	78	-0.03	13.83
25	t	Fluoranthene	1.237	1.114	9.9	80	-0.02	16.06
26	t	Pyrene	1.467	1.369	6.7	81	-0.03	16.45
27	S	Terphenyl-d14	0.688	0.521	24.3#	83	-0.03	16.85
28	t	Benzo[a]anthracene	1.408	1.246	11.5	77	-0.02	18.56
		----------	True	Calc.	% Drift	----------		
29	t	Chrysene	1.000	0.889	11.1	79	-0.03	18.61

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2617-CC2611
Lab FileID: 3M56637.D

			AvgRF	CCRF	% Dev			
30	I	Benzo(a)pyrene-d12	1.000	1.000	0.0	85	-0.02	20.65
31	t	Benzo[b]fluoranthene	1.978	1.619	18.1	72	-0.03	20.23
			True	Calc.	% Drift			
32	t	Benzo[k]fluoranthene	1.000	1.032	-3.2	91	-0.03	20.26
			AvgRF	CCRF	% Dev			
33	t	Benzo[a]pyrene	1.390	1.195	14.0	77	-0.02	20.68
34	t	Indeno[1,2,3-cd]pyrene	2.112	1.691	19.9	81	-0.04	22.10
			True	Calc.	% Drift			
35	t	Dibenz[a,h]anthracene	1.000	0.852	14.8	77	-0.02	22.14
			AvgRF	CCRF	% Dev			
36	t	Benzo[g,h,i]perylene	1.726	1.439	16.6	83	-0.04	22.40

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3m56532.D M3M2611SIM.M Fri Jul 31 10:12:19 2015 RPT1

8.8.5

8

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: E3M2618-CC2611
Lab FileID: 3M56666.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E3M2618\3m56666.D          Vial: 2
Acq On    : 31 Jul 2015   9:57 am                    Operator: linseyk
Sample    : cc2611-.5                                Inst    : MS3M
Misc      : op85969a,e3m2618,1000                    Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M3M2611SIM.M (RTE Integrator)
Title        : Semi Volatile Extractables by GC/MS
Last Update  : Mon Jul 27 11:23:44 2015
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-Methylnaphthalene-d10	1.000	1.000	0.0	85	-0.02	8.85
2	t	1,4-dioxane		----------NA----------				
3	S	2-Fluorophenol	0.720	0.674	6.4	79	0.00	3.39
4	S	Phenol-d5	1.006	0.901	10.4	78	0.04	4.78
5		Phenol	1.032	0.947	8.2	76	0.04	4.79
6	t	bis(2-Chloroethyl)ether	0.717	0.799	-11.4	82	-0.02	4.78
7	S	Nitrobenzene-d5	0.947	0.846	10.7	77	-0.03	6.08
8	t	Naphthalene	3.115	2.966	4.8	76	-0.04	7.39
9	t	Hexachlorobutadiene	0.480	0.446	7.1	75	-0.03	7.69
10	t	2-Methylnaphthalene	1.761	1.945	-10.4	98	-0.04	8.72
11	t	1-Methylnaphthalene	1.578	1.698	-7.6	88	-0.04	8.91
12		Hexachlorocyclopentadiene		----------NA----------				
13	I	Fluorene-d10	1.000	1.000	0.0	72	-0.04	11.78
14	S	2-Fluorobiphenyl	1.097	1.047	4.6	77	-0.03	9.50
15	t	Acenaphthylene	1.824	2.055	-12.7	73	-0.03	10.46
16	t	Acenaphthene	1.219	1.304	-7.0	76	-0.03	10.82
		----------	True	Calc.	% Drift	----------		
17	t	4,6-dinitro-2-methylpheno	2.500	0.912	63.5#	23	-0.04	12.08
		----------	AvgRF	CCRF	% Dev	----------		
18	t	Fluorene	1.218	1.299	-6.7	73	-0.04	11.84
19	S	2,4,6-Tribromophenol	0.156	0.171	-9.6	72	-0.02	12.37
20	I	Fluoranthene-d10	1.000	1.000	0.0	75	-0.03	16.01
21	t	Hexachlorobenzene	0.328	0.318	3.0	72	-0.03	12.95
		----------	True	Calc.	% Drift	----------		
22	t	Pentachlorophenol	2.500	0.942	62.3#	26	-0.02	13.43
		----------	AvgRF	CCRF	% Dev	----------		
23	t	Phenanthrene	1.466	1.404	4.2	71	-0.05	13.73
24	t	Anthracene	1.319	1.301	1.4	71	-0.03	13.83
25	t	Fluoranthene	1.237	1.194	3.5	68	-0.03	16.04
26	t	Pyrene	1.467	1.463	0.3	66	-0.05	16.43
27	S	Terphenyl-d14	0.688	0.606	11.9	72	-0.05	16.83
28	t	Benzo[a]anthracene	1.408	1.365	3.1	65	-0.03	18.55
		----------	True	Calc.	% Drift	----------		
29	t	Chrysene	0.500	0.423	15.4	60	-0.05	18.59

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E3M2618-CC2611
Lab FileID: 3M56666.D

			AvgRF	CCRF	% Dev			
30	I	Benzo(a)pyrene-d12	1.000	1.000	0.0	73	-0.03	20.63
31	t	Benzo[b]fluoranthene	1.978	1.776	10.2	59	-0.05	20.22
			True	Calc.	% Drift			
32	t	Benzo[k]fluoranthene	0.500	0.567	-13.4	76	-0.03	20.26
			AvgRF	CCRF	% Dev			
33	t	Benzo[a]pyrene	1.390	1.241	10.7	62	-0.03	20.66
34	t	Indeno[1,2,3-cd]pyrene	2.112	1.848	12.5	66	-0.06	22.09
			True	Calc.	% Drift			
35	t	Dibenz[a,h]anthracene	0.500	0.470	6.0	66	-0.04	22.12
			AvgRF	CCRF	% Dev			
36	t	Benzo[g,h,i]perylene	1.726	1.455	15.7	63	-0.04	22.41

(#) = Out of Range SPCC's out = 0 CCC's out = 0
3m56533.D M3M2611SIM.M Fri Jul 31 13:20:41 2015 RPT1

8.8.6

8

Initial Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E4M2577-ICC2577
Lab FileID: 4M59178.D

```
                        Response Factor Report  GCMS4M

Method       : C:\MSDCHEM\1\METHODS\M4M2577SIM.M (RTE Integrator)
Title        : Semi Volatile  GC/MS,zb-5 15m x .25mm x .50um
Last Update  : Thu Jul 23 15:44:49 2015
Response via : Initial Calibration

Calibration Files
0.05=4m59182.D   .2  =4m59180.D   2.5 =4m59186.D   .02 =4m59183.D
.1  =4m59181.D   1   =4m59178.D   .01 =4m59184.D   .5  =4m59179.D
5   =4m59185.D       =                =                =

Compound
            0.05  .2    2.5   .02   .1    1     .01   .5    5            Avg    %RSD
-----------------------------------------------------------------------------

1) I   1-Methylnaphthalene-d ----------------ISTD---------------------
2)  2-Fluorophenol
          0.579 0.778 0.543 0.529 0.594 0.609       0.657 0.547        0.605   13.46
3)  Phenol-d5
          1.100 1.478 1.057       1.127 1.171       1.261 1.064        1.180   12.65
4)  Phenol
          1.172 1.556 1.095 1.072 1.202 1.212       1.316 1.077        1.213   13.32
5)  bis(2-Chloroethyl)ether
          0.814 1.036 0.712 0.776 0.807 0.799 0.821 0.878 0.721        0.818   11.74
6)  Nitrobenzene-d5
          0.973 1.307 0.962       1.001 1.032       1.124 0.913        1.045   12.77
7)  Naphthalene
          3.147 3.932 2.787       3.172 3.000       3.320 2.763        3.160   12.56
8)  Hexachlorobutadiene
          0.596 0.736 0.522       0.594 0.547       0.613 0.517        0.589   12.74
9)  2-Methylnaphthalene
                1.608 1.233       1.227 1.297       1.376 1.277        1.336   10.75
10)  Hexachlorocyclopentadiene
                0.376 0.348       0.273 0.348       0.359 0.361        0.344   10.59
11)  2-Fluorobiphenyl
          1.593 2.090 1.233       1.623 1.523       1.749 1.258        1.581   18.59

12) I   Fluorene-d10          ----------------ISTD---------------------
13)  Acenaphthylene
          0.864 1.185 1.138 1.030 0.817 0.992       1.028 1.157        1.027   13.05
14)  Acenaphthene
                0.819 0.777       0.571 0.694       0.706 0.787        0.726   12.41
15)  Dibenzofuran
          0.962 1.314 1.255       0.913 1.089       1.134 1.204        1.124   13.20
16)  Fluorene
          1.218 1.455 1.157       1.125 1.145       1.269 1.140        1.216    9.64
17)  2,4,6-Tribromophenol
                0.193 0.168       0.131 0.168       0.179 0.166        0.167   12.15
18)  Hexachlorobenzene
          0.382 0.470 0.403 0.485 0.345 0.362 0.583 0.391 0.386        0.423   17.91
19)  Pentachlorophenol
          0.117 0.207 0.268       0.122 0.247       0.215 0.283        0.208   31.86
           ---- Quadratic regression ----  Coefficient =  0.9999
             Response Ratio = -0.01663 + 0.25765 *A + 0.00445 *A^2

20)  Phenanthrene
          1.620 2.055 1.795       1.546 1.655       1.798 1.728        1.742    9.51
21)  Anthracene
          1.395 1.819 1.741       1.282 1.567       1.629 1.731        1.595   12.28
```

8.8.7

8

Initial Calibration Summary

Job Number: JC300 **Sample:** E4M2577-ICC2577
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 4M59178.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
22) I   Fluoranthene-d10      ----------------ISTD---------------------
23)  Fluoranthene
          1.197 1.403 1.235       1.027 1.123       1.212 1.243        1.206    9.59
24)  Pyrene
          1.094 1.409 1.156       1.029 1.174       1.225 1.167        1.179   10.12
25)  Terphenyl-d14
                0.758 0.726       0.537 0.648       0.652 0.636        0.659   11.72
26)  Benzo[a]anthracene
          0.807 1.034 0.936       0.717 0.903       0.927 1.039        0.909   12.75
27)  Chrysene
          0.875 1.081 1.007       0.760 0.868       0.959 1.013        0.938   11.68

28) I   Benzo(a)pyrene-d12    ----------------ISTD---------------------
29)  Benzo[b]fluoranthene
          1.443 1.781 1.592       1.267 1.505       1.594 1.530        1.530   10.28
30)  Benzo[k]fluoranthene
                1.552 1.168       1.110 1.256       1.323 1.132        1.257   13.16
31)  Benzo[a]pyrene
          1.212 1.498 1.216       1.078 1.203       1.252 1.181        1.234   10.41
32)  Indeno[1,2,3-cd]pyrene
          1.254 1.641 1.332       1.162 1.381       1.468 1.337        1.368   11.26
33)  Dibenz[a,h]anthracene
          1.030 1.369 1.109       0.946 1.162       1.242 1.104        1.137   12.20
34)  Benzo[g,h,i]perylene
          1.109 1.392 1.091       1.028 1.145       1.214 1.086        1.152   10.43

35) I   1-Methylnaphthalene-d ----------------ISTD---------------------
36)  1,4-Dioxane
                                                                        0.000#  -1.00
37)  1-Methylnaphthalene
          1.424 1.845 1.344 1.484 1.395 1.446       1.582 1.340        1.483   11.20

38) I   Fluorene-d10a         ----------------ISTD---------------------
39)  4,6-dinitro-2-methylphenol
                0.123 0.201       0.065 0.174       0.142 0.202        0.151   34.99
            ---- Quadratic regression ----  Coefficient =  0.9995
              Response Ratio = -0.02786 + 0.20707 *A + -0.00012 *A^2

40)  1,2-Diphenylhydrazine
                1.130 1.038       0.844 0.926       1.006 1.069        1.002   10.26
41)  n-nitrosodiphenylamine
                0.892 0.956       0.612 0.767       0.779 1.009        0.836   17.39
-----------------------------------------------------------------------------
(#) = Out of Range  ###  Number of calibration levels exceeded format  ###

          M4M2577SIM.M        Fri Jul 24 11:14:10 2015   MANAGER
```

8.8.7

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E4M2577-ICV2577
Lab FileID: 4M59187.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E4M2577\4m59187.D          Vial: 11
Acq On    : 23 Jul 2015   2:18 pm                    Operator: linseyk
Sample    : icv2577-1.0                              Inst    : GCMS4M
Misc      : op85637a,e4m2577                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M4M2577SIM.M (RTE Integrator)
Title        : Semi Volatile  GC/MS,zb-5 15m x .25mm x .50um
Last Update  : Thu Jul 23 15:44:49 2015
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-Methylnaphthalene-d10	1.000	1.000	0.0	141	0.00	10.06
10	t	Hexachlorocyclopentadiene	0.344	0.374	-8.7	152	0.02	10.31
12	I	Fluorene-d10	1.000	1.000	0.0	123	0.00	13.03
		----------	AvgRF	CCRF	% Dev	----------		
22	I	Fluoranthene-d10	1.000	1.000	0.0	123	0.00	17.18
28	I	Benzo(a)pyrene-d12	1.000	1.000	0.0	130	0.01	21.77
35	I	1-Methylnaphthalene-d10a	1.000	1.000	0.0	141	0.00	10.06
37	t	1-Methylnaphthalene	1.483	1.624	-9.5	158	0.00	10.12
38	I	Fluorene-d10a	1.000	1.000	0.0	123	0.00	13.03

(#) = Out of Range SPCC's out = 0 CCC's out = 0
4m59178.D M4M2577SIM.M Fri Jul 24 10:48:11 2015 MANAGER

8.8.8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E4M2577-ICV2577
Lab FileID: 4M59188.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E4M2577\4m59188.D          Vial: 12
Acq On    : 23 Jul 2015   2:50 pm                    Operator: linseyk
Sample    : icv2577-1.0                              Inst    : GCMS4M
Misc      : op85637a,e4m2577                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M4M2577SIM.M (RTE Integrator)
Title        : Semi Volatile  GC/MS,zb-5 15m x .25mm x .50um
Last Update  : Thu Jul 23 15:44:49 2015
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-Methylnaphthalene-d10	1.000	1.000	0.0	93	0.00	10.06
5	t	bis(2-Chloroethyl)ether	0.818	0.853	-4.3	100	0.00	5.84
7	t	Naphthalene	3.160	3.215	-1.7	100	0.00	8.59
8	t	Hexachlorobutadiene	0.589	0.620	-5.3	106	0.00	8.89
9	t	2-Methylnaphthalene	1.336	1.413	-5.8	102	0.00	9.94
12	I	Fluorene-d10	1.000	1.000	0.0	77	0.00	13.03
13	t	Acenaphthylene	1.027	1.118	-8.9	87	0.00	11.70
14	t	Acenaphthene	0.726	0.937	-29.1	105	0.00	12.05
15	t	Dibenzofuran	1.124	1.373	-22.2	98	0.00	12.41
16	t	Fluorene	1.216	1.295	-6.5	88	0.00	13.07
18	t	Hexachlorobenzene	0.423	0.435	-2.8	93	0.00	14.21
		----------	AvgRF	CCRF	% Dev	----------		
20	t	Phenanthrene	1.742	1.867	-7.2	87	0.00	14.98
21	t	Anthracene	1.595	1.692	-6.1	84	0.00	15.09
22	I	Fluoranthene-d10	1.000	1.000	0.0	70	0.00	17.18
23	t	Fluoranthene	1.206	1.425	-18.2	89	0.00	17.22
24	t	Pyrene	1.179	1.293	-9.7	77	0.02	17.62
26	t	Benzo[a]anthracene	0.909	1.025	-12.8	79	0.00	19.69
27	t	Chrysene	0.938	1.132	-20.7	91	0.00	19.74
28	I	Benzo(a)pyrene-d12	1.000	1.000	0.0	71	0.01	21.77
29	t	Benzo[b]fluoranthene	1.530	1.522	0.5	71	0.01	21.34
30	t	Benzo[k]fluoranthene	1.257	1.276	-1.5	72	0.01	21.39
31	t	Benzo[a]pyrene	1.234	1.350	-9.4	79	0.01	21.80
32	t	Indeno[1,2,3-cd]pyrene	1.368	1.355	1.0	69	0.01	23.40
33	t	Dibenz[a,h]anthracene	1.137	1.137	0.0	69	0.03	23.44
34	t	Benzo[g,h,i]perylene	1.152	1.187	-3.0	73	0.03	23.82
35	I	1-Methylnaphthalene-d10a	1.000	1.000	0.0	93	0.00	10.06
38	I	Fluorene-d10a	1.000	1.000	0.0	77	0.00	13.03
		----------	AvgRF	CCRF	% Dev	----------		
40	t	1,2-Diphenylhydrazine	1.002	1.030	-2.8	86	0.00	13.43
41	t	n-nitrosodiphenylamine	0.836	0.833	0.4	84	0.00	13.38

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E4M2577-ICV2577
Lab FileID: 4M59188.D

```
4m59178.D  M4M2577SIM.M       Fri Jul 24 10:48:14 2015   MANAGER
```

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E4M2580-ICV2577
Lab FileID: 4M59206.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\E4M2580\4m59206.D          Vial: 2
Acq On    : 24 Jul 2015   8:50 am                    Operator: ashleyd
Sample    : icv2577-1                                Inst    : GCMS4M
Misc      : op85637a,e4m2580                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M4M2577SIM.M (RTE Integrator)
Title        : Semi Volatile  GC/MS,zb-5 15m x .25mm x .50um
Last Update  : Thu Jul 23 15:44:49 2015
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-Methylnaphthalene-d10	1.000	1.000	0.0	175	-0.02	10.04
4	t	Phenol	1.213	0.981	19.1	142	-0.01	5.70
12	I	Fluorene-d10	1.000	1.000	0.0	135	-0.02	13.01
		----------	True	Calc.	% Drift	----------		
19	t	Pentachlorophenol	5.000	5.184	-3.7	142	-0.02	14.59
		----------	AvgRF	CCRF	% Dev	----------		
22	I	Fluoranthene-d10	1.000	1.000	0.0	158	-0.02	17.17
28	I	Benzo(a)pyrene-d12	1.000	1.000	0.0	166	-0.01	21.74
35	I	1-Methylnaphthalene-d10a	1.000	1.000	0.0	175	-0.02	10.04
38	I	Fluorene-d10a	1.000	1.000	0.0	135	-0.02	13.01
		----------	True	Calc.	% Drift	----------		
39	t	4,6-dinitro-2-methylpheno	5.000	4.407	11.9	124	-0.02	13.21

(#) = Out of Range SPCC's out = 0 CCC's out = 0
4m59178.D M4M2577SIM.M Fri Jul 24 11:13:59 2015 MANAGER

8.8.10

8

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: E4M2592-CC2577
Lab FileID: 4M59376.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\E4M2592\4m59376.D Vial: 2
Acq On : 1 Aug 2015 4:30 pm Operator: ashleyd
Sample : cc2577-0.5 Inst : GCMS4M
Misc : op85892a,e4m2592 Multiplr: 1.00
MS Integration Params: lscint.p

Method : C:\MSDCHEM\1\METHODS\M4M2577SIM.M (RTE Integrator)
Title : Semi Volatile GC/MS,zb-5 15m x .25mm x .50um
Last Update : Wed Jul 29 15:06:17 2015
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-Methylnaphthalene-d10	1.000	1.000	0.0	114	-0.12	9.94
2	S	2-Fluorophenol	0.605	0.712	-17.7	124	-0.07	4.24
3	S	Phenol-d5	1.180	1.355	-14.8	123	-0.07	5.63
4	t	Phenol	1.213	1.412	-16.4	122	-0.07	5.65
5	t	bis(2-Chloroethyl)ether	0.818	0.943	-15.3	123	-0.08	5.76
6	S	Nitrobenzene-d5	1.045	1.173	-12.2	119	-0.11	7.12
7	t	Naphthalene	3.160	3.573	-13.1	123	-0.11	8.48
8	t	Hexachlorobutadiene	0.589	0.736	-25.0#	137	-0.11	8.79
9	t	2-Methylnaphthalene	1.336	1.347	-0.8	112	-0.10	9.84
10	t	Hexachlorocyclopentadiene	0.344	0.344	0.0	109	-0.10	10.18
11	S	2-Fluorobiphenyl	1.581	1.798	-13.7	117	-0.10	10.59
12	I	Fluorene-d10	1.000	1.000	0.0	135	-0.11	12.92
13	t	Acenaphthylene	1.027	0.905	11.9	119	-0.11	11.59
14	t	Acenaphthene	0.726	0.616	15.2	118	-0.11	11.94
15	t	Dibenzofuran	1.124	0.991	11.8	118	-0.11	12.30
16	t	Fluorene	1.216	1.226	-0.8	130	-0.11	12.96
17	S	2,4,6-Tribromophenol	0.167	0.149	10.8	112	-0.10	13.47
18	t	Hexachlorobenzene	0.423	0.388	8.3	134	-0.12	14.08
		----------	True	Calc.	% Drift	----------		
19	t	Pentachlorophenol	2.500	1.781	28.8#	99	-0.11	14.50
		----------	AvgRF	CCRF	% Dev	----------		
20	t	Phenanthrene	1.742	1.707	2.0	128	-0.11	14.87
21	t	Anthracene	1.595	1.619	-1.5	134	-0.12	14.96
22	I	Fluoranthene-d10	1.000	1.000	0.0	133	-0.11	17.07
23	t	Fluoranthene	1.206	1.173	2.7	129	-0.11	17.11
24	t	Pyrene	1.179	1.228	-4.2	133	-0.11	17.49
25	S	Terphenyl-d14	0.659	0.675	-2.4	138	-0.11	17.86
26	t	Benzo[a]anthracene	0.909	1.021	-12.3	147	-0.13	19.56
27	t	Chrysene	0.938	0.963	-2.7	134	-0.13	19.61
28	I	Benzo(a)pyrene-d12	1.000	1.000	0.0	122	-0.11	21.65
29	t	Benzo[b]fluoranthene	1.530	1.669	-9.1	128	-0.11	21.22
30	t	Benzo[k]fluoranthene	1.257	1.598	-27.1#	148	-0.11	21.26
31	t	Benzo[a]pyrene	1.234	1.458	-18.2	142	-0.11	21.67
32	t	Indeno[1,2,3-cd]pyrene	1.368	1.634	-19.4	136	-0.15	23.23
33	t	Dibenz[a,h]anthracene	1.137	1.383	-21.6#	136	-0.15	23.26
34	t	Benzo[g,h,i]perylene	1.152	1.328	-15.3	134	-0.17	23.63

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E4M2592-CC2577
Lab FileID: 4M59376.D

35	I	1-Methylnaphthalene-d10a	1.000	1.000	0.0	114	-0.12	9.94
36	t	1,4-Dioxane		----------NA----------				
37	t	1-Methylnaphthalene	1.483	1.519	-2.4	110	-0.10	10.02
38	I	Fluorene-d10a	1.000	1.000	0.0	135	-0.11	12.92
		----------	True	Calc.	% Drift	----------		
39	t	4,6-dinitro-2-methylpheno	2.500	1.984	20.6#	114	-0.11	13.12
		----------	AvgRF	CCRF	% Dev	----------		
40	t	1,2-Diphenylhydrazine	1.002	1.047	-4.5	140	-0.11	13.32
41	t	n-nitrosodiphenylamine	0.836	0.732	12.4	127	-0.11	13.27

(#) = Out of Range SPCC's out = 0 CCC's out = 0
4m59179.D M4M2577SIM.M Mon Aug 03 09:03:09 2015 MANAGER

8.8.11

8

Initial Calibration Summary

Job Number: JC300 **Sample:** E5P1005-ICC1005
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 5P19434.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Response Factor Report MS5P

Method : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
Title : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
Last Update : Fri Jul 10 17:05:06 2015
Response via : Initial Calibration

Calibration Files
2 =5p19429.D 5 =5p19433.D 25 =5p19436.D 80 =5p19432.D
100 =5p19430.D 50 =5p19434.D 1 =5p19431.D 10 =5p19435.D

Compound	2	5	25	80	100	50	1	10	Avg	%RSD
1) I 1,4-Dichlorobenzene-d	----------ISTD----------									
2) 1,4-Dioxane	0.542	0.535	0.568	0.520	0.533	0.566	0.551	0.503	0.540	4.10
3) Pyridine	1.084	1.208	1.293	1.189	1.320	1.327	0.903	1.164	1.186	11.95
4) N-Nitrosodim	0.609	0.751	0.802	0.855	0.856	0.838		0.615	0.761	14.19
5) 2-Fluorophen	0.731	0.906	1.181	1.277	1.186	1.241	1.009	1.064	1.074	17.36
6) Indene	2.534	2.668	2.629	2.504	2.538	2.646	2.490	2.598	2.576	2.64
7) Cumene	3.160	3.540	3.377	3.180	3.150	3.327	3.044	3.198	3.247	4.86
8) Phenol-d5	1.409	1.594	1.748	1.605	1.630	1.746	1.303	1.583	1.577	9.73
9) Phenol	1.597	1.748	1.725	1.702	1.740	1.794	1.425	1.604	1.667	7.19
10) Aniline	1.680	1.887	2.069	1.707	1.727	2.012	1.431	1.839	1.794	11.36
11) bis(2-Chloro	1.373	1.417	1.335	1.227	1.239	1.305	1.031	1.367	1.287	9.51
12) 2-Chlorophen	1.236	1.325	1.412	1.337	1.365	1.435	1.078	1.393	1.323	8.80
13) Decane	1.247	1.353	1.288	1.179	1.186	1.262	1.413	1.265	1.274	6.19
14) 1,3-Dichloro	1.560	1.696	1.620	1.505	1.524	1.617	1.519	1.521	1.570	4.31
15) 1,4-Dichloro	1.697	1.746	1.636	1.541	1.575	1.654	1.454	1.599	1.613	5.69
16) Benzyl alcoh	0.687	0.698	0.816	0.796	0.816	0.838	0.591	0.733	0.747	11.41
17) 1,2-Dichloro	1.568	1.566	1.562	1.471	1.486	1.553	1.376	1.482	1.508	4.47
18) Acetophenone	1.839	1.876	2.087	1.881	1.848	2.100	1.834	1.817	1.910	6.03
19) 2-Methylphen	1.042	1.297	1.235	1.210	1.237	1.342	1.336	1.220	1.240	7.68
20) 2,2'-oxybis(	1.747	1.789	1.767	1.624	1.653	1.749	1.728	1.715	1.721	3.29
21) 3&4-Methylph	0.901	1.359	1.290	1.350	1.356	1.401	1.020	1.359	1.255	14.86
22) n-Nitroso-di	0.937	1.108	1.084	1.028	1.035	1.084	0.976	1.032	1.035	5.58
23) Hexachloroet	0.519	0.544	0.552	0.507	0.511	0.541	0.513	0.519	0.526	3.31
24) I Naphthalene-d8	----------ISTD----------									
25) Nitrobenzene	0.307	0.361	0.366	0.346	0.335	0.364	0.307	0.332	0.340	6.99
26) Nitrobenzene	0.339	0.391	0.374	0.353	0.356	0.364	0.290	0.353	0.353	8.42
27) Quinoline	0.649	0.650	0.721	0.694	0.708	0.739	0.682	0.688	0.691	4.56
28) Isophorone	0.577	0.585	0.645	0.603	0.604	0.637	0.531	0.602	0.598	6.00
29) 2-Nitropheno	0.150	0.181	0.190	0.191	0.194	0.200	0.161	0.180	0.181	9.44
30) 2,4-Dimethyl	0.269	0.292	0.342	0.343	0.337	0.345	0.246	0.321	0.312	12.33
31) Benzoic acid		0.098	0.171	0.282	0.280	0.237		0.189	0.210	34.03
----- Quadratic regression -----								Coefficient =		0.9964
Response Ratio = -0.02016 + 0.22014 *A + 0.02962 *A^2										
32) bis(2-Chloro	0.363	0.397	0.418	0.390	0.391	0.409	0.329	0.376	0.384	7.33
33) 2,4-Dichloro	0.243	0.271	0.273	0.291	0.295	0.291	0.191	0.285	0.267	13.06
34) 2,6-Dichloro	0.269	0.286	0.295	0.283	0.283	0.294	0.278	0.279	0.283	3.04
35) 1,3,5-Trichl	0.318	0.358	0.342	0.324	0.328	0.339	0.340	0.335	0.335	3.71
36) 1,2,4-Trichl	0.309	0.333	0.332	0.315	0.310	0.326	0.329	0.316	0.321	3.05
37) 1,2,3-Trichl	0.297	0.331	0.324	0.308	0.304	0.320	0.336	0.302	0.315	4.58
38) Naphthalene	1.029	1.085	1.048	1.003	0.997	1.048	1.027	1.006	1.031	2.85
39) 4-Chloroanil	0.342	0.422	0.415	0.418	0.408	0.443	0.344	0.446	0.405	9.97
40) 2,3-Dichloro	0.360	0.372	0.377	0.354	0.352	0.376	0.366	0.349	0.363	3.02
41) Caprolactam	0.116	0.117	0.141	0.137	0.136	0.144	0.112	0.139	0.130	10.18
42) Hexachlorobu	0.171	0.174	0.180	0.171	0.169	0.178	0.210	0.173	0.178	7.57

Initial Calibration Summary

Job Number: JC300 **Sample:** E5P1005-ICC1005
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 5P19434.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
43) 4-Chloro-3-m 0.219 0.292 0.321 0.312 0.299 0.325 0.282 0.304 0.294  11.44
44) 2-Methylnaph 0.586 0.598 0.605 0.576 0.574 0.599 0.553 0.582 0.584   2.90
45) 1-Methylnaph 0.720 0.732 0.737 0.695 0.705 0.727 0.722 0.691 0.716   2.40
46) Dimethylnaph 0.629 0.638 0.653 0.627 0.613 0.650 0.597 0.629 0.629   2.96

47) I   Acenaphthene-d10      ----------------ISTD---------------------
48) Hexachlorocy       0.165 0.265 0.300 0.299 0.298       0.185 0.252  24.30
            ----- Linear regression -----  Coefficient =  0.9995
              Response Ratio = -0.04748 + 0.31021 *A

49) 2,4,6-Trichl 0.286 0.342 0.341 0.335 0.332 0.345 0.298 0.308 0.324   7.04
50) 2,4,5-Trichl 0.296 0.357 0.395 0.380 0.358 0.392 0.303 0.353 0.354  10.55
51) 2-Fluorobiph 1.262 1.291 1.261 1.167 1.169 1.233 1.456 1.204 1.255   7.37
52) 2-Chloronaph 1.026 1.160 1.153 1.079 1.069 1.133 1.054 1.042 1.090   4.78
53) Biphenyl     1.471 1.552 1.522 1.433 1.421 1.504 1.489 1.408 1.475   3.47
54) 2-Nitroanili 0.237 0.341 0.342 0.330 0.322 0.359 0.234 0.331 0.312  15.60
55) Dimethylphth 1.250 1.354 1.425 1.360 1.319 1.418 1.316 1.308 1.344   4.35
56) Acenaphthyle 1.750 1.797 1.836 1.760 1.708 1.833 1.870 1.699 1.781   3.51
57) 2,6-Dinitrot 0.194 0.263 0.293 0.285 0.279 0.290 0.218 0.250 0.259  13.99
58) 3-Nitroanili 0.205 0.278 0.305 0.324 0.307 0.324       0.298 0.292  14.14
59) Acenaphthene 1.259 1.224 1.174 1.092 1.078 1.149 1.302 1.101 1.172   7.07
60) 2,4-Dinitrop 0.051 0.084 0.156 0.191 0.193 0.178       0.086 0.134  43.97
         ----- Quadratic regression -----                Coefficient =  0.9991
              Response Ratio = -0.02725 + 0.17657 *A + 0.00461 *A^2

61) 4-Nitropheno 0.091 0.126 0.127 0.158 0.152 0.158 0.145 0.126 0.135  16.75
62) Dibenzofuran 1.433 1.584 1.614 1.550 1.468 1.598 1.479 1.501 1.528   4.40
63) 2,4-Dinitrot 0.237 0.377 0.411 0.400 0.397 0.421 0.251 0.382 0.360  20.19
         ----- Quadratic regression -----                Coefficient =  0.9998
              Response Ratio = -0.00912 + 0.44268 *A + -0.01735 *A^2

64) 2,3,4,6-Tetr 0.217 0.260 0.302 0.296 0.296 0.306 0.276 0.267 0.277  10.72
65) Diethylphtha 1.285 1.411 1.440 1.355 1.329 1.437 1.263 1.346 1.358   4.91
66) Fluorene     1.232 1.324 1.278 1.233 1.209 1.278 1.501 1.193 1.281   7.69
67) 4-Chlorophen 0.647 0.673 0.661 0.644 0.628 0.670 0.645 0.617 0.648   3.00
68) 4-Nitroanili 0.184 0.280 0.298 0.307 0.313 0.312       0.277 0.281  16.09

69) I   Phenanthrene-d10      ----------------ISTD---------------------
70) 4,6-Dinitro-       0.080 0.127 0.147 0.148 0.151       0.105 0.127  22.58
            ----- Linear regression -----  Coefficient =  0.9989
              Response Ratio = -0.01044 + 0.15282 *A

71) n-Nitrosodip 0.541 0.600 0.583 0.554 0.547 0.581 0.524 0.542 0.559   4.65
72) 1,2-Diphenyl 0.672 0.754 0.782 0.728 0.722 0.773 0.693 0.731 0.732   5.16
73) 2,4,6-Tribro 0.095 0.100 0.104 0.101 0.099 0.104 0.120 0.091 0.102   8.28
74) 4-Bromopheny 0.215 0.236 0.231 0.213 0.217 0.235 0.208 0.202 0.220   5.83
75) Hexachlorobe 0.225 0.223 0.225 0.212 0.209 0.226 0.237 0.217 0.222   4.02
76) Pentachlorop 0.083 0.109 0.129 0.141 0.141 0.138       0.112 0.122  17.80
77) Phenanthrene 1.174 1.159 1.106 1.052 1.035 1.104 1.383 1.047 1.132  10.02
78) Anthracene   1.146 1.169 1.139 1.082 1.070 1.146 1.351 1.061 1.145   8.06
79) Carbazole    0.996 1.092 1.104 1.063 1.034 1.116 1.073 1.059 1.067   3.65
80) Di-n-butylph 1.227 1.388 1.511 1.415 1.394 1.513 1.195 1.351 1.374   8.44
81) Fluoranthene 1.163 1.192 1.185 1.144 1.125 1.182 1.345 1.112 1.181   6.14
82) Octadecane   0.433 0.445 0.456 0.437 0.431 0.453 0.412 0.440 0.438   3.19

83) I   Chrysene-d12          ----------------ISTD---------------------
84) Pyrene       1.297 1.203 1.199 1.073 1.082 1.198 1.408 1.146 1.201   9.22
85) Terphenyl-d1 0.787 0.721 0.669 0.609 0.620 0.672 1.040 0.642 0.720  19.68
86) Butylbenzylp 0.491 0.571 0.625 0.577 0.582 0.629 0.481 0.559 0.564   9.64
87) Butyl steara 0.236 0.247 0.305 0.270 0.275 0.294 0.226 0.265 0.265  10.35
```

Initial Calibration Summary

Job Number: JC300 **Sample:** E5P1005-ICC1005
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 5P19434.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
 88) Benzo[a]anth 1.195 1.112 1.110 1.019 1.025 1.121 1.403 1.033 1.127  11.23
 89) 3,3'-Dichlor 0.321 0.394 0.419 0.414 0.412 0.432 0.376 0.385 0.394   8.83
 90) Chrysene     1.093 1.057 1.041 0.959 0.944 1.018 1.226 0.972 1.039   8.79
 91) bis(2-Ethylh 0.667 0.796 0.896 0.843 0.849 0.916 0.658 0.790 0.802  12.01

 92) I   Perylene-d12          ----------------ISTD---------------------
 93) Di-n-octylph 1.081 1.312 1.552 1.335 1.376 1.629 1.038 1.333 1.332  15.24
 94) Benzo[b]fluo 1.111 1.153 1.133 0.980 1.025 1.226 1.205 1.041 1.109   7.91
 95) Benzo[k]fluo 1.068 1.147 1.169 0.973 0.975 1.131 1.288 1.051 1.100   9.63
 96) Benzo[a]pyre 0.981 1.008 1.039 0.897 0.899 1.073 1.079 0.936 0.989   7.41
 97) Indeno[1,2,3 1.202 1.316 1.304 1.110 1.124 1.336 1.451 1.167 1.251   9.55
 98) Dibenz(a,h)a 0.812 0.930 0.963 0.843 0.856 1.008 0.883 0.829 0.890   7.85
 99) Dibenz[a,h]a 1.037 1.071 1.093 0.947 0.966 1.115 1.246 0.967 1.055   9.44
100) 7,12-Dimethy 0.435 0.499 0.573 0.486 0.501 0.594 0.444 0.468 0.500  11.39
101) Benzo[g,h,i] 0.990 1.065 1.048 0.910 0.929 1.086 1.178 0.940 1.018   9.08
 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

          M5P1005.M         Fri Jul 10 17:05:51 2015   RPT1
```

8.8.12

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: E5P1005-ICV1005
Lab FileID: 5P19438.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\e5p1005\5p19438.D          Vial: 11
Acq On    :  9 Jul 2015   7:37 pm                    Operator: alicjap
Sample    : icv1005-50                               Inst    : MS5P
Misc      : op85060,e5p1005                          Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
Last Update  : Mon Jul 13 10:16:35 2015
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	89	0.01	4.80
3	t	Pyridine	1.186	1.146	3.4	77	0.01	2.28
10		Aniline	1.794	1.975	-10.1	87	0.00	4.46
16	t	Benzyl alcohol	0.747	0.898	-20.2	95	0.00	4.98
24	I	Naphthalene-d8	1.000	1.000	0.0	90	0.00	6.24
39	t	4-Chloroaniline	0.405	0.360	11.1	74	0.00	6.36
44	t	2-Methylnaphthalene	0.584	0.603	-3.3	91	0.00	7.10
54	t	2-Nitroaniline	0.312	0.328	-5.1	80	-0.01	7.83
58	t	3-Nitroaniline	0.292	0.297	-1.7	81	-0.01	8.33
62	t	Dibenzofuran	1.528	1.526	0.1	84	0.00	8.60
68	t	4-Nitroaniline	0.281	0.287	-2.1	81	-0.02	9.07
69	I	Phenanthrene-d10	1.000	1.000	0.0	87	0.00	10.14
79	t	Carbazole	1.067	0.991	7.1	77	0.00	10.46

```
(#) = Out of Range              SPCC's out = 0  CCC's out = 0
 5p19449b.D M5P1005.M        Mon Jul 13 15:19:54 2015   RPT1
```

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: E5P1005-ICV1005
Lab FileID: 5P19439.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\e5p1005\5p19439.D          Vial: 12
Acq On    :  9 Jul 2015   8:03 pm                    Operator: alicjap
Sample    : icv1005-50                               Inst    : MS5P
Misc      : op85060,e5p1005                          Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
Last Update  : Mon Jul 13 15:20:53 2015
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	87	0.00	4.80
4	t	N-Nitrosodimethylamine	0.761	0.753	1.1	78	0.00	2.15
11	t	bis(2-Chloroethyl)ether	1.287	1.206	6.3	80	-0.02	4.51
14	t	1,3-Dichlorobenzene	1.570	1.519	3.2	81	-0.01	4.73
15	t	1,4-Dichlorobenzene	1.613	1.619	-0.4	85	0.00	4.81
17	t	1,2-Dichlorobenzene	1.508	1.517	-0.6	85	0.00	4.98
20	t	2,2'-oxybis(1-Chloropropa	1.721	1.556	9.6	77	0.00	5.12
22	t	n-Nitroso-di-n-propylamin	1.035	0.917	11.4	73	0.00	5.27
23	t	Hexachloroethane	0.526	0.524	0.4	84	0.00	5.35
24	I	Naphthalene-d8	1.000	1.000	0.0	87	0.00	6.24
26	t	Nitrobenzene	0.353	0.330	6.5	79	-0.01	5.44
28	t	Isophorone	0.598	0.644	-7.7	88	0.00	5.72
32	t	bis(2-Chloroethoxy)methan	0.384	0.369	3.9	78	-0.01	5.99
36	t	1,2,4-Trichlorobenzene	0.321	0.313	2.5	83	0.00	6.19
38	t	Naphthalene	1.031	1.024	0.7	85	0.00	6.27
42	t	Hexachlorobutadiene	0.178	0.173	2.8	84	0.00	6.44
47	I	Acenaphthene-d10	1.000	1.000	0.0	85	0.00	8.34
52	t	2-Chloronaphthalene	1.090	1.077	1.2	81	0.00	7.68
55	t	Dimethylphthalate	1.344	1.209	10.0	72	0.00	8.06
56	t	Acenaphthylene	1.781	1.614	9.4	75	0.00	8.17
57	t	2,6-Dinitrotoluene	0.259	0.264	-1.9	77	0.00	8.13
59	t	Acenaphthene	1.172	1.171	0.1	86	0.00	8.38
		----------	True	Calc.	% Drift	----------		
63	t	2,4-Dinitrotoluene	50.000	43.267	13.5	72	0.00	8.62
		----------	AvgRF	CCRF	% Dev	----------		
65	t	Diethylphthalate	1.358	1.217	10.4	72	0.00	8.92
66	t	Fluorene	1.281	1.266	1.2	84	0.00	9.01
67	t	4-Chlorophenyl-phenylethe	0.648	0.577	11.0	73	0.00	9.02
69	I	Phenanthrene-d10	1.000	1.000	0.0	85	0.00	10.14
		----------	AvgRF	CCRF	% Dev	----------		
71	t	n-Nitrosodiphenylamine	0.559	0.521	6.8	76	0.00	9.18
72	t	1,2-Diphenylhydrazine	0.732	0.758	-3.6	83	0.00	9.21
74	t	4-Bromophenyl-phenylether	0.220	0.202	8.2	73	0.00	9.61
75	t	Hexachlorobenzene	0.222	0.208	6.3	78	0.00	9.68
77	t	Phenanthrene	1.132	1.049	7.3	81	0.00	10.17
78	t	Anthracene	1.145	1.078	5.9	80	0.00	10.23
80	t	Di-n-butylphthalate	1.374	1.280	6.8	72	0.00	10.96
81	t	Fluoranthene	1.181	1.131	4.2	81	0.00	11.74

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E5P1005-ICV1005
Lab FileID: 5P19439.D

83	I	Chrysene-d12	1.000	1.000	0.0	87	0.00	13.85
84	t	Pyrene	1.201	1.109	7.7	80	0.00	12.05
86	t	Butylbenzylphthalate	0.564	0.527	6.6	73	0.00	13.09
88	t	Benzo[a]anthracene	1.127	1.007	10.6	78	0.00	13.84
89	t	3,3'-Dichlorobenzidine	0.394	0.303	23.1	61	0.00	13.84
90	t	Chrysene	1.039	0.977	6.0	83	0.00	13.89
91	t	bis(2-Ethylhexyl)phthalat	0.802	0.742	7.5	70	0.00	14.01
92	I	Perylene-d12	1.000	1.000	0.0	84	0.00	15.91
93	t	Di-n-octylphthalate	1.332	1.414	-6.2	73	0.00	14.96
94	t	Benzo[b]fluoranthene	1.109	1.069	3.6	73	0.00	15.40
95	t	Benzo[k]fluoranthene	1.100	1.132	-2.9	84	0.00	15.44
96	t	Benzo[a]pyrene	0.989	1.061	-7.3	83	0.00	15.83
97	t	Indeno[1,2,3-cd]pyrene	1.251	1.248	0.2	78	0.00	17.31
99	t	Dibenz[a,h]anthracene	1.055	1.059	-0.4	79	0.00	17.35
101	t	Benzo[g,h,i]perylene	1.018	1.033	-1.5	80	0.01	17.70

(#) = Out of Range SPCC's out = 0 CCC's out = 0
5p19449b.D M5P1005.M Mon Jul 13 15:22:45 2015 RPT1

8.8.14

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E5P1005-ICV1005
Lab FileID: 5P19440.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\e5p1005\5p19440.D          Vial: 13
Acq On    :  9 Jul 2015   8:29 pm                    Operator: alicjap
Sample    : icv1005-50                               Inst    : MS5P
Misc      : op85060,e5p1005                          Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
Last Update  : Mon Jul 13 15:20:53 2015
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	90	0.00	4.79
2	t	1,4-Dioxane	0.540	0.467	13.5	75	-0.02	1.87
6	t	Indene	2.576	2.309	10.4	79	0.00	5.07
7	t	Cumene	3.247	3.169	2.4	86	0.00	3.94
13	t	Decane	1.274	1.172	8.0	84	0.00	4.64
18	t	Acetophenone	1.910	1.746	8.6	75	-0.02	5.25
24	I	Naphthalene-d8	1.000	1.000	0.0	87	0.00	6.24
27	t	Quinoline	0.691	0.646	6.5	76	-0.01	6.67
40	t	2,3-Dichloroaniline	0.363	0.294	19.0	68	0.00	7.45
41	t	Caprolactam	0.130	0.123	5.4	74	0.00	6.76
45	t	1-Methylnaphthalene	0.716	0.646	9.8	77	0.00	7.21
46	t	Dimethylnaphthalene	0.629	0.573	8.9	77	0.00	7.85
47	I	Acenaphthene-d10	1.000	1.000	0.0	83	0.00	8.34
		----------	True	Calc.	% Drift	----------		
48	t	Hexachlorocyclopentadiene	100.000	83.164	16.8	62	0.00	7.30
		----------	AvgRF	CCRF	% Dev	----------		
53	t	Biphenyl	1.475	1.388	5.9	77	0.00	7.67
69	I	Phenanthrene-d10	1.000	1.000	0.0	82	0.00	10.14
82	t	Octadecane	0.438	0.430	1.8	78	0.00	10.09
92	I	Perylene-d12	1.000	1.000	0.0	72	0.00	15.90
100	t	7,12-Dimethylbenz(a)anthr	0.500	0.401	19.8	49#	0.00	15.39

(#) = Out of Range SPCC's out = 0 CCC's out = 0
5p19449b.D M5P1005.M Mon Jul 13 15:31:52 2015 RPT1

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E5P1005-ICV1005
Lab FileID: 5P19441A.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\e5p1005\5p19441a.D        Vial: 14
Acq On    :  9 Jul 2015  11:01 pm                   Operator: alicjap
Sample    : icv1005-50                              Inst    : MS5P
Misc      : op85060,e5p1005                         Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
Last Update  : Mon Jul 13 15:20:53 2015
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	116	0.00	4.79
5	S	2-Fluorophenol	1.074	1.236	-15.1	115	-0.04	3.45
8	S	Phenol-d5	1.577	1.492	5.4	99	-0.02	4.44
24	I	Naphthalene-d8	1.000	1.000	0.0	110	0.00	6.24
25	S	Nitrobenzene-d5	0.340	0.347	-2.1	105	-0.02	5.42
47	I	Acenaphthene-d10	1.000	1.000	0.0	105	0.00	8.34
51	S	2-Fluorobiphenyl	1.255	1.216	3.1	104	0.00	7.55
69	I	Phenanthrene-d10	1.000	1.000	0.0	108	0.00	10.14
73	S	2,4,6-Tribromophenol	0.102	0.079	22.5	83	0.00	9.30
83	I	Chrysene-d12	1.000	1.000	0.0	92	0.00	13.85
85	S	Terphenyl-d14	0.720	0.779	-8.2	107	0.00	12.32

```
(#) = Out of Range              SPCC's out = 0  CCC's out = 0
 5p19449b.D M5P1005.M        Mon Jul 13 15:25:45 2015   RPT1
```

8.8.16

8

Initial Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: E5P1006-ICC1006
Lab FileID: 5P19449.D

```
                         Response Factor Report  MS5P

  Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
  Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
  Last Update  : Mon Jul 13 10:16:35 2015
  Response via : Initial Calibration

  Calibration Files
  2   =5p19445a.D  5   =5p19446a.D  25  =5p19448.D  80  =5p19450.D
  100 =5p19451.D  50  =5p19449.D  1   =5p19444a.D  10  =5p19447.D

   Compound         2     5     25    80    100   50    1     10    Avg %RSD
  ---------------------------------------------------------------------------
102)     1,4-Dichlorobenzene-d ----------------ISTD---------------------
103) Benzaldehyde 0.883 0.957 1.042 1.089 1.071 1.127 1.066 0.918 1.019   8.66

104)     Acenaphthene-d10a     ----------------ISTD---------------------
105) 1,2,4,5-Tetr 0.436 0.508 0.480 0.501 0.514 0.495 0.506 0.487 0.491   5.06

106)     Chrysene-d12a         ----------------ISTD---------------------
107) Benzidine    0.406 0.530 0.670 0.674 0.563 0.705       0.601 0.593  17.57
108) 1-chloroocta 0.218 0.244 0.259 0.268 0.267 0.272 0.204 0.251 0.248  10.05

109)     Phenanthrene-d10a     ----------------ISTD---------------------
110) o-terphenyl  0.444 0.511 0.514 0.544 0.528 0.529 0.491 0.528 0.511   6.14
111) Atrazine     0.074 0.077 0.089 0.103 0.100 0.096 0.073 0.091 0.088  13.52

112) I   Naphthalene-d8a       ----------------ISTD---------------------
113) Hydroquinone       0.225 0.295 0.354 0.328 0.328       0.238 0.295  17.85
 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

           M5P1005.M         Mon Jul 13 10:16:45 2015   RPT1
```

8.8.17

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: E5P1006-ICV1006
Lab FileID: 5P19453.D

Evaluate Continuing Calibration Report

```
  Data File : C:\msdchem\1\DATA\e5p1006\5p19453.D          Vial: 11
  Acq On    : 10 Jul 2015   9:14 pm                    Operator: alicjap
  Sample    : icv1006-50                               Inst    : MS5P
  Misc      : op85060,e5p1006                          Multiplr: 1.00
  MS Integration Params: lscint.p

  Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
  Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
  Last Update  : Mon Jul 13 15:20:53 2015
  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	98	0.00	8.34
105	1,2,4,5-Tetrachlorobenzen	0.491	0.501	-2.0	100	0.00	7.31

(#) = Out of Range SPCC's out = 0 CCC's out = 0
5p19449b.D M5P1005.M Mon Jul 13 15:37:22 2015 RPT1

8.8.18

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: E5P1006-ICV1006
Lab FileID: 5P19454.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\e5p1006\5p19454.D          Vial: 12
Acq On    : 10 Jul 2015   9:40 pm                    Operator: alicjap
Sample    : icv1006-50                               Inst    : MS5P
Misc      : op85060,e5p1006                          Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
Last Update  : Mon Jul 13 15:20:53 2015
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	119	0.00	4.79
103	Benzaldehyde	1.019	1.026	-0.7	109	0.00	4.32
109	Phenanthrene-d10a	1.000	1.000	0.0	103	0.00	10.13
111	Atrazine	0.088	0.101	-14.8	109	-0.01	9.85

(#) = Out of Range SPCC's out = 0 CCC's out = 0
5p19449b.D M5P1005.M Mon Jul 13 15:38:18 2015 RPT1

8.8.19

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: E5P1006-ICV1006
Lab FileID: 5P19455.D

Evaluate Continuing Calibration Report

```
  Data File : C:\msdchem\1\DATA\e5p1006\5p19455.D          Vial: 13
  Acq On    : 10 Jul 2015  10:06 pm                    Operator: alicjap
  Sample    : icv1006-50                               Inst    : MS5P
  Misc      : op85060,e5p1006                          Multiplr: 1.00
  MS Integration Params: lscint.p

  Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
  Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
  Last Update  : Mon Jul 13 15:20:53 2015
  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.
106	Chrysene-d12a	1.000	1.000	0.0	116	0.00	13.84
107	Benzidine	0.593	0.980	-65.3#	161	0.00	11.97

(#) = Out of Range SPCC's out = 0 CCC's out = 0
5p19449b.D M5P1005.M Mon Jul 13 15:39:06 2015 RPT1

8.8.20

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: E5P1006-ICV1006
Lab FileID: 5P19456.D

```
                    Evaluate Continuing Calibration Report

  Data File : C:\msdchem\1\DATA\e5p1006\5p19456.D          Vial: 14
  Acq On    : 10 Jul 2015  10:32 pm                    Operator: alicjap
  Sample    : icv1006-50                               Inst    : MS5P
  Misc      : op85060,e5p1006                          Multiplr: 1.00
  MS Integration Params: lscint.p

  Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
  Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
  Last Update  : Mon Jul 13 15:20:53 2015
  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.
  ---------------------------------------------------------------------------
112 I   Naphthalene-d8a            1.000   1.000      0.0   98   0.00    6.24
113     Hydroquinone               0.295   0.334    -13.2   99  -0.01    6.83
 ---------------------------------------------------------------------------
 ---------------------------------------------------------------------------

    (#) = Out of Range              SPCC's out = 0  CCC's out = 0
     5p19449b.D M5P1005.M        Mon Jul 13 15:40:06 2015   RPT1
```

Continuing Calibration Summary

Job Number: JC300 **Sample:** E5P1033-CC1005
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 5P19997.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\e5p1033\5p19997.D          Vial: 2
Acq On    : 30 Jul 2015   3:57 pm                    Operator: sarad
Sample    : cc1005-25                                Inst    : MS5P
Misc      : op85895,e5p1033                          Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
Last Update  : Thu Jul 30 16:20:39 2015
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	94	0.00	4.68
2	t	1,4-Dioxane	0.540	0.522	3.3	86	-0.02	1.76
3	t	Pyridine	1.186	1.241	-4.6	90	-0.01	2.07
4	t	N-Nitrosodimethylamine	0.761	0.702	7.8	82	-0.02	2.04
5	S	2-Fluorophenol	1.074	1.211	-12.8	96	0.00	3.36
6	t	Indene	2.576	2.515	2.4	90	0.00	4.95
7	t	Cumene	3.247	3.282	-1.1	91	0.00	3.81
8	S	Phenol-d5	1.577	1.552	1.6	83	0.00	4.37
9	t	Phenol	1.667	1.500	10.0	81	0.00	4.38
10		Aniline	1.794	1.605	10.5	73	0.00	4.33
11	t	bis(2-Chloroethyl)ether	1.287	1.224	4.9	86	0.00	4.40
12	t	2-Chlorophenol	1.323	1.358	-2.6	90	0.00	4.47
13	t	Decane	1.274	1.125	11.7	82	0.00	4.52
14	t	1,3-Dichlorobenzene	1.570	1.556	0.9	90	0.00	4.61
15	t	1,4-Dichlorobenzene	1.613	1.612	0.1	92	0.00	4.69
16	t	Benzyl alcohol	0.747	0.753	-0.8	86	0.00	4.86
17	t	1,2-Dichlorobenzene	1.508	1.538	-2.0	92	0.00	4.86
18	t	Acetophenone	1.910	1.805	5.5	81	0.00	5.14
19	t	2-Methylphenol	1.240	1.220	1.6	93	0.00	5.03
20	t	2,2'-oxybis(1-Chloropropa	1.721	1.519	11.7	81	0.00	5.00
21	t	3&4-Methylphenol	1.255	1.289	-2.7	94	0.00	5.21
22	t	n-Nitroso-di-n-propylamin	1.035	0.955	7.7	83	0.00	5.15
23	t	Hexachloroethane	0.526	0.555	-5.5	94	0.00	5.23
24	I	Naphthalene-d8	1.000	1.000	0.0	87	0.00	6.12
25	S	Nitrobenzene-d5	0.340	0.345	-1.5	82	0.00	5.31
26	t	Nitrobenzene	0.353	0.364	-3.1	85	0.00	5.33
27	t	Quinoline	0.691	0.723	-4.6	88	0.00	6.56
28	t	Isophorone	0.598	0.614	-2.7	83	0.00	5.60
29	t	2-Nitrophenol	0.181	0.200	-10.5	92	0.00	5.70
30	t	2,4-Dimethylphenol	0.312	0.317	-1.6	81	0.00	5.80
		----------	True	Calc.	% Drift	----------		
31	t	Benzoic acid	25.000	29.324	-17.3	128	0.02	6.01
		----------	AvgRF	CCRF	% Dev	----------		
32	t	bis(2-Chloroethoxy)methan	0.384	0.392	-2.1	82	0.00	5.88
33	t	2,4-Dichlorophenol	0.267	0.288	-7.9	92	0.00	6.01
34	t	2,6-Dichlorophenol	0.283	0.299	-5.7	89	0.00	6.26
35		1,3,5-Trichlorobenzene	0.335	0.370	-10.4	94	0.00	5.71
36	t	1,2,4-Trichlorobenzene	0.321	0.339	-5.6	89	0.00	6.07
37		1,2,3-Trichlorobenzene	0.315	0.340	-7.9	92	0.00	6.33

Continuing Calibration Summary

Job Number: JC300 **Sample:** E5P1033-CC1005
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 5P19997.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

38	t	Naphthalene	1.031	1.057	-2.5	88	0.00	6.15
39	t	4-Chloroaniline	0.405	0.426	-5.2	90	0.00	6.25
40	t	2,3-Dichloroaniline	0.363	0.378	-4.1	88	0.00	7.33
41	t	Caprolactam	0.130	0.134	-3.1	83	0.00	6.68
42	t	Hexachlorobutadiene	0.178	0.201	-12.9	98	0.00	6.31
43	t	4-Chloro-3-methylphenol	0.294	0.304	-3.4	83	0.00	6.90
44	t	2-Methylnaphthalene	0.584	0.593	-1.5	85	0.00	6.98
45	t	1-Methylnaphthalene	0.716	0.730	-2.0	86	0.00	7.09
46	t	Dimethylnaphthalene	0.629	0.660	-4.9	88	0.00	7.73
47	I	Acenaphthene-d10	1.000	1.000	0.0	87	0.00	8.22
		----------	True	Calc.	% Drift	----------		
48	t	Hexachlorocyclopentadiene	50.000	32.040	35.9#	53	0.00	7.17
		----------	AvgRF	CCRF	% Dev	----------		
49	t	2,4,6-Trichlorophenol	0.324	0.363	-12.0	93	0.00	7.36
50	t	2,4,5-Trichlorophenol	0.354	0.402	-13.6	88	0.00	7.42
51	S	2-Fluorobiphenyl	1.255	1.274	-1.5	88	0.00	7.43
52	t	2-Chloronaphthalene	1.090	1.128	-3.5	85	0.00	7.56
53	t	Biphenyl	1.475	1.510	-2.4	86	0.00	7.54
54	t	2-Nitroaniline	0.312	0.307	1.6	78	0.00	7.71
55	t	Dimethylphthalate	1.344	1.443	-7.4	88	0.00	7.94
56	t	Acenaphthylene	1.781	1.833	-2.9	87	0.00	8.05
57	t	2,6-Dinitrotoluene	0.259	0.301	-16.2	89	0.00	8.01
58	t	3-Nitroaniline	0.292	0.312	-6.8	89	0.00	8.22
59	t	Acenaphthene	1.172	1.166	0.5	86	0.00	8.26
		----------	True	Calc.	% Drift	----------		
60	t	2,4-Dinitrophenol	50.000	42.082	15.8	73	0.01	8.38
		----------	AvgRF	CCRF	% Dev	----------		
61	t	4-Nitrophenol	0.135	0.130	3.7	89	0.01	8.55
62	t	Dibenzofuran	1.528	1.578	-3.3	85	0.00	8.47
		----------	True	Calc.	% Drift	----------		
63	t	2,4-Dinitrotoluene	25.000	24.649	1.4	87	0.00	8.52
		----------	AvgRF	CCRF	% Dev	----------		
64		2,3,4,6-Tetrachlorophenol	0.277	0.302	-9.0	87	0.00	8.66
65	t	Diethylphthalate	1.358	1.441	-6.1	87	0.00	8.79
66	t	Fluorene	1.281	1.285	-0.3	87	0.00	8.88
67	t	4-Chlorophenyl-phenylethe	0.648	0.686	-5.9	90	0.00	8.90
68	t	4-Nitroaniline	0.281	0.307	-9.3	90	0.00	8.96
69	I	Phenanthrene-d10	1.000	1.000	0.0	88	0.00	10.02
		----------	True	Calc.	% Drift	----------		
70	t	4,6-Dinitro-2-methylpheno	25.000	23.457	6.2	88	0.01	9.02
		----------	AvgRF	CCRF	% Dev	----------		
71	t	n-Nitrosodiphenylamine	0.559	0.580	-3.8	87	0.00	9.06
72	t	1,2-Diphenylhydrazine	0.732	0.713	2.6	80	0.00	9.09
73	S	2,4,6-Tribromophenol	0.102	0.109	-6.9	92	0.00	9.19
74	t	4-Bromophenyl-phenylether	0.220	0.237	-7.7	90	0.00	9.49
75	t	Hexachlorobenzene	0.222	0.240	-8.1	94	0.00	9.56
76	t	Pentachlorophenol	0.122	0.116	4.9	79	0.01	9.83
77	t	Phenanthrene	1.132	1.089	3.8	87	0.00	10.04
78	t	Anthracene	1.145	1.112	2.9	86	0.00	10.11
79	t	Carbazole	1.067	1.070	-0.3	85	0.01	10.34

Continuing Calibration Summary

Job Number: JC300 **Sample:** E5P1033-CC1005
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 5P19997.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

80	t	Di-n-butylphthalate	1.374	1.501	-9.2	87	0.00	10.83
81	t	Fluoranthene	1.181	1.208	-2.3	90	-0.01	11.61
82	t	Octadecane	0.438	0.414	5.5	80	0.00	9.96
83	I	Chrysene-d12	1.000	1.000	0.0	89	0.02	13.72
84	t	Pyrene	1.201	1.201	0.0	89	-0.01	11.92
85	S	Terphenyl-d14	0.720	0.695	3.5	93	0.01	12.19
86	t	Butylbenzylphthalate	0.564	0.643	-14.0	92	0.01	12.94
87		Butyl stearate	0.265	0.287	-8.3	84	0.01	13.10
88	t	Benzo[a]anthracene	1.127	1.113	1.2	90	0.02	13.70
89	t	3,3'-Dichlorobenzidine	0.394	0.428	-8.6	91	0.02	13.70
90	t	Chrysene	1.039	1.044	-0.5	90	0.02	13.76
91	t	bis(2-Ethylhexyl)phthalat	0.802	0.919	-14.6	92	0.01	13.86
92	I	Perylene-d12	1.000	1.000	0.0	91	0.03	15.78
93	t	Di-n-octylphthalate	1.332	1.619	-21.5#	95	0.01	14.81
94	t	Benzo[b]fluoranthene	1.109	1.154	-4.1	92	-0.03	15.27
95	t	Benzo[k]fluoranthene	1.100	1.138	-3.5	88	0.00	15.31
96	t	Benzo[a]pyrene	0.989	1.026	-3.7	90	0.02	15.70
97	t	Indeno[1,2,3-cd]pyrene	1.251	1.346	-7.6	94	0.04	17.18
98	t	Dibenz(a,h)acridine	0.890	1.019	-14.5	96	0.03	16.86
99	t	Dibenz[a,h]anthracene	1.055	1.152	-9.2	96	0.03	17.19
100	t	7,12-Dimethylbenz(a)anthr	0.500	0.529	-5.8	84	0.02	15.25
101	t	Benzo[g,h,i]perylene	1.018	1.093	-7.4	95	0.04	17.55

(#) = Out of Range SPCC's out = 0 CCC's out = 0
5p19448b.D M5P1005.M Thu Jul 30 16:46:37 2015 RPT1

8.8.22

8

Continuing Calibration Summary

Job Number: JC300 **Sample:** E5P1033-CC1006
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 5P19998.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\e5p1033\5p19998.D          Vial: 3
Acq On    : 30 Jul 2015   4:23 pm                    Operator: sarad
Sample    : cc1006-25                                Inst    : MS5P
Misc      : op85895,e5p1033                          Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M5P1005eph.M (RTE Integrator)
Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
Last Update  : Mon Jul 13 10:16:35 2015
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	131	-0.12	4.67
103		Benzaldehyde	1.019	0.919	9.8	115	-0.11	4.21
104		Acenaphthene-d10a	1.000	1.000	0.0	125	-0.12	8.22
105		1,2,4,5-Tetrachlorobenzen	0.491	0.486	1.0	126	-0.12	7.19
106		Chrysene-d12a	1.000	1.000	0.0	133	-0.13	13.71
107		Benzidine	0.593	0.409	31.0#	81	-0.13	11.84
108	s	1-chlorooctadecane	0.248	0.228	8.1	117	-0.14	11.53
109		Phenanthrene-d10a	1.000	1.000	0.0	120	-0.12	10.02
110	s	o-terphenyl	0.511	0.539	-5.5	126	-0.14	10.52
111		Atrazine	0.088	0.102	-15.9	138	-0.13	9.73
112	I	Naphthalene-d8a	1.000	1.000	0.0	125	-0.12	6.12
113		Hydroquinone	0.295	0.267	9.5	113	-0.09	6.75

(#) = Out of Range SPCC's out = 0 CCC's out = 0
5p19448b.D M5P1005eph.M Thu Jul 30 18:14:29 2015 RPT1

8.8.23

8

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: E5P1049-CC1005
Lab FileID: 5P20371.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\e5p1049\5p20371.D          Vial: 2
Acq On    : 12 Aug 2015   9:20 am                    Operator: alicjap
Sample    : cc1005-25                                Inst    : MS5P
Misc      : op86210,e5p1049                          Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M5P1005.M (RTE Integrator)
Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
Last Update  : Thu Jul 23 22:16:59 2015
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	71	-0.13	4.59
2	t	1,4-Dioxane	0.540	0.329	39.1#	41#	-0.12	1.70
3	t	Pyridine	1.186	0.637	46.3#	35#	-0.11	2.01
4	t	N-Nitrosodimethylamine	0.761	0.336	55.8#	30#	-0.09	2.00
5	S	2-Fluorophenol	1.074	0.625	41.8#	38#	-0.09	3.30
6	t	Indene	2.576	2.184	15.2	59	-0.14	4.87
7	t	Cumene	3.247	2.856	12.0	60	-0.14	3.73
8	S	Phenol-d5	1.577	1.173	25.6#	48#	-0.10	4.30
9	t	Phenol	1.667	1.107	33.6#	45#	-0.10	4.31
10		Aniline	1.794	1.114	37.9#	38#	-0.13	4.25
11	t	bis(2-Chloroethyl)ether	1.287	1.049	18.5	56	-0.13	4.32
12	t	2-Chlorophenol	1.323	1.200	9.3	60	-0.12	4.39
13	t	Decane	1.274	1.034	18.8	57	-0.14	4.44
14	t	1,3-Dichlorobenzene	1.570	1.398	11.0	61	-0.13	4.53
15	t	1,4-Dichlorobenzene	1.613	1.462	9.4	63	-0.13	4.61
16	t	Benzyl alcohol	0.747	0.528	29.3#	46#	-0.12	4.79
17	t	1,2-Dichlorobenzene	1.508	1.389	7.9	63	-0.14	4.78
18	t	Acetophenone	1.910	1.592	16.6	54	-0.13	5.07
19	t	2-Methylphenol	1.240	0.985	20.6#	57	-0.11	4.96
20	t	2,2'-oxybis(1-Chloropropa	1.721	1.192	30.7#	48#	-0.14	4.92
21	t	3&4-Methylphenol	1.255	0.949	24.4#	52	-0.10	5.14
22	t	n-Nitroso-di-n-propylamin	1.035	0.846	18.3	55	-0.13	5.08
23	t	Hexachloroethane	0.526	0.608	-15.6	78	-0.14	5.14
24	I	Naphthalene-d8	1.000	1.000	0.0	68	-0.13	6.04
25	S	Nitrobenzene-d5	0.340	0.346	-1.8	65	-0.12	5.24
26	t	Nitrobenzene	0.353	0.324	8.2	59	-0.13	5.26
27	t	Quinoline	0.691	0.631	8.7	60	-0.13	6.48
28	t	Isophorone	0.598	0.579	3.2	61	-0.14	5.53
29	t	2-Nitrophenol	0.181	0.182	-0.6	66	-0.13	5.63
30	t	2,4-Dimethylphenol	0.312	0.355	-13.8	71	-0.12	5.73
		----------	True	Calc.	% Drift	----------		
31	t	Benzoic acid	25.000	14.792	40.8#	42	-0.10	5.95
		----------	AvgRF	CCRF	% Dev	----------		
32	t	bis(2-Chloroethoxy)methan	0.384	0.279	27.3#	46#	-0.13	5.80
33	t	2,4-Dichlorophenol	0.267	0.279	-4.5	70	-0.11	5.94
34	t	2,6-Dichlorophenol	0.283	0.292	-3.2	68	-0.13	6.18
35		1,3,5-Trichlorobenzene	0.335	0.355	-6.0	71	-0.14	5.62
36	t	1,2,4-Trichlorobenzene	0.321	0.333	-3.7	69	-0.13	5.99
37		1,2,3-Trichlorobenzene	0.315	0.332	-5.4	70	-0.14	6.25

Continuing Calibration Summary

Job Number: JC300 **Sample:** E5P1049-CC1005
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 5P20371.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

38	t	Naphthalene	1.031	0.975	5.4	64	-0.14	6.07
39	t	4-Chloroaniline	0.405	0.389	4.0	64	-0.12	6.18
40	t	2,3-Dichloroaniline	0.363	0.366	-0.8	66	-0.12	7.26
41	t	Caprolactam	0.130	0.118	9.2	57	-0.15	6.60
42	t	Hexachlorobutadiene	0.178	0.244	-37.1#	93	-0.14	6.23
43	t	4-Chloro-3-methylphenol	0.294	0.290	1.4	62	-0.10	6.83
44	t	2-Methylnaphthalene	0.584	0.598	-2.4	67	-0.13	6.90
45	t	1-Methylnaphthalene	0.716	0.715	0.1	66	-0.13	7.01
46	t	Dimethylnaphthalene	0.629	0.677	-7.6	71	-0.13	7.65
47	I	Acenaphthene-d10	1.000	1.000	0.0	77	-0.13	8.14
		----------	True	Calc.	% Drift	----------		
48	t	Hexachlorocyclopentadiene	50.000	19.990	60.0#	25	-0.14	7.09
		----------	AvgRF	CCRF	% Dev	----------		
49	t	2,4,6-Trichlorophenol	0.324	0.326	-0.6	73	-0.12	7.28
50	t	2,4,5-Trichlorophenol	0.354	0.339	4.2	66	-0.11	7.35
51	S	2-Fluorobiphenyl	1.255	1.217	3.0	74	-0.13	7.35
52	t	2-Chloronaphthalene	1.090	1.025	6.0	68	-0.13	7.48
53	t	Biphenyl	1.475	1.380	6.4	70	-0.13	7.46
54	t	2-Nitroaniline	0.312	0.306	1.9	69	-0.12	7.65
55	t	Dimethylphthalate	1.344	1.283	4.5	69	-0.13	7.87
56	t	Acenaphthylene	1.781	1.677	5.8	70	-0.13	7.97
57	t	2,6-Dinitrotoluene	0.259	0.254	1.9	67	-0.12	7.94
58	t	3-Nitroaniline	0.292	0.257	12.0	65	-0.11	8.15
59	t	Acenaphthene	1.172	1.107	5.5	72	-0.14	8.18
		----------	True	Calc.	% Drift	----------		
60	t	2,4-Dinitrophenol	50.000	36.352	27.3#	54	-0.07	8.34
		----------	AvgRF	CCRF	% Dev	----------		
61	t	4-Nitrophenol	0.135	0.193	-43.0#	116	-0.04	8.52
62	t	Dibenzofuran	1.528	1.501	1.8	71	-0.13	8.39
		----------	True	Calc.	% Drift	----------		
63	t	2,4-Dinitrotoluene	25.000	24.498	2.0	76	-0.10	8.45
		----------	AvgRF	CCRF	% Dev	----------		
64		2,3,4,6-Tetrachlorophenol	0.277	0.255	7.9	65	-0.11	8.59
65	t	Diethylphthalate	1.358	1.387	-2.1	74	-0.13	8.72
66	t	Fluorene	1.281	1.260	1.6	76	-0.13	8.81
67	t	4-Chlorophenyl-phenylethe	0.648	0.642	0.9	74	-0.13	8.82
68	t	4-Nitroaniline	0.281	0.286	-1.8	74	-0.11	8.91
69	I	Phenanthrene-d10	1.000	1.000	0.0	83	-0.13	9.93
		----------	True	Calc.	% Drift	----------		
70	t	4,6-Dinitro-2-methylpheno	25.000	18.556	25.8#	63	-0.09	8.97
		----------	AvgRF	CCRF	% Dev	----------		
71	t	n-Nitrosodiphenylamine	0.559	0.464	17.0	66	-0.13	8.98
72	t	1,2-Diphenylhydrazine	0.732	0.681	7.0	72	-0.13	9.01
73	S	2,4,6-Tribromophenol	0.102	0.107	-4.9	85	-0.12	9.12
74	t	4-Bromophenyl-phenylether	0.220	0.224	-1.8	81	-0.13	9.40
75	t	Hexachlorobenzene	0.222	0.242	-9.0	89	-0.13	9.48
76	t	Pentachlorophenol	0.122	0.084	31.1#	54	-0.11	9.76
77	t	Phenanthrene	1.132	1.023	9.6	77	-0.13	9.96
78	t	Anthracene	1.145	1.056	7.8	77	-0.13	10.03
79	t	Carbazole	1.067	0.954	10.6	72	-0.12	10.26

Continuing Calibration Summary

Job Number: JC300 **Sample:** E5P1049-CC1005
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 5P20371.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

80	t	Di-n-butylphthalate	1.374	1.298	5.5	71	-0.14	10.74
81	t	Fluoranthene	1.181	1.167	1.2	82	-0.14	11.52
82	t	Octadecane	0.438	0.355	18.9	65	-0.14	9.88
83	I	Chrysene-d12	1.000	1.000	0.0	89	-0.13	13.62
84	t	Pyrene	1.201	1.104	8.1	82	-0.14	11.83
85	S	Terphenyl-d14	0.720	0.742	-3.1	98	-0.14	12.10
86	t	Butylbenzylphthalate	0.564	0.512	9.2	73	-0.15	12.85
87		Butyl stearate	0.265	0.208	21.5#	61	-0.15	13.00
88	t	Benzo[a]anthracene	1.127	1.054	6.5	84	-0.14	13.61
89	t	3,3'-Dichlorobenzidine	0.394	0.392	0.5	83	-0.14	13.61
90	t	Chrysene	1.039	0.935	10.0	80	-0.14	13.67
91	t	bis(2-Ethylhexyl)phthalat	0.802	0.699	12.8	69	-0.15	13.76
92	I	Perylene-d12	1.000	1.000	0.0	80	-0.13	15.69
93	t	Di-n-octylphthalate	1.332	1.357	-1.9	70	-0.15	14.72
94	t	Benzo[b]fluoranthene	1.109	1.186	-6.9	84	-0.13	15.18
95	t	Benzo[k]fluoranthene	1.100	1.085	1.4	74	-0.14	15.22
96	t	Benzo[a]pyrene	0.989	0.987	0.2	76	-0.13	15.62
97	t	Indeno[1,2,3-cd]pyrene	1.251	1.170	6.5	72	-0.14	17.08
98	t	Dibenz(a,h)acridine	0.890	0.865	2.8	72	-0.13	16.77
99	t	Dibenz[a,h]anthracene	1.055	0.999	5.3	73	-0.15	17.09
100	t	7,12-Dimethylbenz(a)anthr	0.500	0.521	-4.2	73	-0.15	15.16
101	t	Benzo[g,h,i]perylene	1.018	0.906	11.0	69	-0.15	17.44

(#) = Out of Range SPCC's out = 0 CCC's out = 0
5p19448b.D M5P1005.M Wed Aug 12 13:12:42 2015 RPT1

8.8.24

8

Continuing Calibration Summary

Job Number: JC300 **Sample:** E5P1049-CC1006
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** 5P20372.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\e5p1049\5p20372.D          Vial: 3
Acq On    : 12 Aug 2015   9:49 am                     Operator: alicjap
Sample    : cc1006-25                                 Inst    : MS5P
Misc      : op86210,e5p1049                           Multiplr: 1.00
MS Integration Params: lscint.p

Method       : C:\MSDCHEM\1\METHODS\M5P1005eph.M (RTE Integrator)
Title        : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
Last Update  : Wed Aug 12 13:14:21 2015
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	53	0.00	4.59
103		Benzaldehyde	1.019	0.788	22.7#	40#	0.00	4.14
104		Acenaphthene-d10a	1.000	1.000	0.0	65	0.00	8.14
105		1,2,4,5-Tetrachlorobenzen	0.491	0.549	-11.8	75	0.00	7.11
106		Chrysene-d12a	1.000	1.000	0.0	77	0.00	13.62
107		Benzidine	0.593	0.468	21.1#	53	0.00	11.76
108	s	1-chlorooctadecane	0.248	0.210	15.3	62	0.00	11.44
109		Phenanthrene-d10a	1.000	1.000	0.0	68	0.00	9.93
110	s	o-terphenyl	0.511	0.596	-16.6	79	0.00	10.44
111		Atrazine	0.088	0.107	-21.6#	82	0.00	9.66
112	I	Naphthalene-d8a	1.000	1.000	0.0	56	0.00	6.04
113		Hydroquinone	0.295	0.237	19.7	45#	0.00	6.71

(#) = Out of Range SPCC's out = 0 CCC's out = 0
5p19448b.D M5P1005eph.M Wed Aug 12 13:15:17 2015 RPT1

8.8.25

8

Initial Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: EZ5116-ICC5116
Lab FileID: Z102671.D

```
                    Response Factor Report  MSZ

  Method       : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
  Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
  Last Update  : Wed Jul 08 09:21:45 2015
  Response via : Initial Calibration

  Calibration Files
  100 =z102669.D  80  =z102670.D  50  =z102671.D  25  =z102672.D
  10  =z102673.D  5   =z102674.D  2   =z102675.D  1   =z102676.D

   Compound         100   80    50    25    10    5     2     1     Avg %RSD
  ---------------------------------------------------------------------------
102)     1,4-Dichlorobenzene-d ----------------ISTD---------------------
103) Benzaldehyde 1.083 1.077 1.103 1.050 1.097 1.065 0.972 1.009 1.057   4.28

104)     Phenanthrene-d10a     ----------------ISTD---------------------
105) 1-chloroocta 0.293 0.301 0.299 0.293 0.285 0.270 0.237 0.241 0.277   9.16
106) o-terphenyl  0.546 0.550 0.534 0.520 0.530 0.516 0.484 0.484 0.520   4.84
107) Atrazine     0.104 0.106 0.102 0.100 0.095 0.091 0.085 0.076 0.095  10.90

108)     Chrysene-d12a         ----------------ISTD---------------------
109) Benzidine    0.613 0.676 0.704 0.679 0.649 0.574 0.466 0.433 0.599  16.91

110)     Acenaphthene-d10a     ----------------ISTD---------------------
111) 1,2,4,5-Tetr 0.535 0.519 0.522 0.509 0.524 0.516 0.508 0.529 0.520   1.81

112) I   Naphthalene-d8a       ----------------ISTD---------------------
113) Hydroquinone 0.328 0.346 0.341 0.314 0.294 0.272 0.236 0.217 0.294  16.39
 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

           MZ5119.M          Wed Jul 08 09:22:41 2015   RTE
```

8.8.26

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: EZ5116-ICV5116
Lab FileID: Z102679.D

Evaluate Continuing Calibration Report

```
  Data File : C:\msdchem\1\DATA\EZ5116\z102679.D          Vial: 12
  Acq On    :  3 Jul 2015   3:13 am                   Operator: sarad
  Sample    : icv5116-50                              Inst    : MSZ
  Misc      : op85151,ez5116                          Multiplr: 1.00
  MS Integration Params: RTEINT.P

  Method       : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
  Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
  Last Update  : Wed Jul 08 09:21:45 2015
  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	Acenaphthene-d10a	1.000	1.000	0.0	108	0.00	7.33
111	1,2,4,5-Tetrachlorobenzen	0.520	0.518	0.4	107	0.00	6.52

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102671a.D MZ5119.M Wed Jul 08 09:24:46 2015 RTE

8.8.27

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: EZ5116-ICV5116
Lab FileID: Z102680.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\EZ5116\z102680.D          Vial: 13
Acq On    :  3 Jul 2015   3:44 am                   Operator: sarad
Sample    : icv5116-50                              Inst    : MSZ
Misc      : op85151,ez5116                          Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Wed Jul 08 09:21:45 2015
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	125	0.00	4.93
103	Benzaldehyde	1.057	1.063	-0.6	121	0.00	4.61
104	Phenanthrene-d10a	1.000	1.000	0.0	103	0.00	9.29
107	Atrazine	0.095	0.102	-7.4	102	0.01	8.86

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102671a.D MZ5119.M Wed Jul 08 09:25:50 2015 RTE

8.8.28

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: EZ5116-ICV5116
Lab FileID: Z102682.D

Evaluate Continuing Calibration Report

```
  Data File : C:\msdchem\1\DATA\EZ5116\z102682.D          Vial: 15
  Acq On    :  3 Jul 2015   4:46 am                   Operator: sarad
  Sample    : icv5116-50                              Inst    : MSZ
  Misc      : op85151,ez5116                          Multiplr: 1.00
  MS Integration Params: RTEINT.P

  Method       : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
  Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
  Last Update  : Wed Jul 08 09:21:45 2015
  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.
108	Chrysene-d12a	1.000	1.000	0.0	174	0.00	14.65
109	Benzidine	0.599	0.774	-29.2	191	0.01	11.86

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102671a.D MZ5119.M Wed Jul 08 09:30:45 2015 RTE

8.8.29

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: EZ5116-ICV5116
Lab FileID: Z102683.D

Evaluate Continuing Calibration Report

```
  Data File : C:\msdchem\1\DATA\EZ5116\z102683.D          Vial: 16
  Acq On    :  3 Jul 2015   5:17 am                   Operator: sarad
  Sample    : icv5116-50                              Inst    : MSZ
  Misc      : op85151,ez5116                          Multiplr: 1.00
  MS Integration Params: RTEINT.P

  Method       : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
  Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
  Last Update  : Wed Jul 08 09:21:45 2015
  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.
112 I	Naphthalene-d8a	1.000	1.000	0.0	167	0.00	5.85
113	Hydroquinone	0.294	0.402	-36.7#	197	0.02	6.14

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102671a.D MZ5119.M Wed Jul 08 09:32:07 2015 RTE

8.8.30

8

Initial Calibration Summary

Job Number: JC300 **Sample:** EZ5119-ICC5119
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** Z102732.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Response Factor Report MSZ

Method : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update : Tue Jul 07 16:18:13 2015
Response via : Initial Calibration

Calibration Files
100 =z102727.D 80 =z102733.D 50 =z102732.D 25 =z102731.D
10 =z102730.D 5 =z102729.D 2 =z102726.D 1 =z102728.D

Compound	100	80	50	25	10	5	2	1	Avg	%RSD
1) I 1,4-Dichlorobenzene-d	----------ISTD----------									
2) 1,4-Dioxane	0.472	0.503	0.528	0.502	0.490	0.470	0.466	0.424	0.482	6.51
3) Pyridine	1.310	1.350	1.422	1.401	1.287	1.333	1.247	1.339	1.336	4.26
4) N-Nitrosodim	0.840	0.882	0.904	0.886	0.878	0.883	0.804	0.738	0.852	6.58
5) 2-Fluorophen	1.376	1.396	1.407	1.323	1.238	1.243	1.238	1.255	1.310	5.72
6) Indene	2.983	2.914	2.927	2.668	2.439	2.497	2.369	2.219	2.627	11.01
7) Cumene	3.375	3.314	3.413	3.168	3.037	3.010	2.852	2.754	3.115	7.82
8) Phenol-d5	1.890	1.859	1.886	1.794	1.660	1.735	1.571	1.626	1.753	7.08
9) Phenol	2.101	1.969	1.930	1.806	1.720	1.723	1.645	1.653	1.818	9.10
10) Aniline	2.051	2.014	2.084	2.052	2.022	2.116	2.016	1.925	2.035	2.79
11) bis(2-Chloro	1.432	1.425	1.457	1.403	1.368	1.410	1.295	1.366	1.394	3.64
12) 2-Chlorophen	1.550	1.507	1.526	1.432	1.331	1.424	1.269	1.316	1.419	7.41
13) Decane	2.218	2.136	2.457	2.531	2.467	2.615	2.427	2.391	2.405	6.56
14) 1,3-Dichloro	1.630	1.601	1.589	1.499	1.409	1.430	1.426	1.379	1.495	6.59
15) 1,4-Dichloro	1.678	1.654	1.615	1.541	1.439	1.447	1.405	1.475	1.532	6.91
16) Benzyl alcoh	0.922	0.913	0.914	0.869	0.800	0.858	0.758	0.779	0.852	7.62
17) 1,2-Dichloro	1.600	1.553	1.532	1.436	1.346	1.347	1.319	1.344	1.435	7.83
18) Acetophenone	2.003	2.015	2.136	1.977	1.785	1.857	1.779	1.718	1.909	7.60
19) 2-Methylphen	1.425	1.390	1.376	1.281	1.245	1.245	1.160	1.244	1.296	7.08
20) 2,2'-oxybis(	0.570	0.551	0.548	0.506	0.469	0.475	0.447	0.415	0.498	11.08
21) 3&4-Methylph	1.572	1.595	1.677	1.495	1.364	1.392	1.301	1.281	1.460	10.05
22) n-Nitroso-di	0.944	0.937	1.068	1.059	0.991	0.967	0.911	0.986	0.983	5.74
23) Hexachloroet	0.484	0.461	0.453	0.429	0.407	0.408	0.390	0.400	0.429	7.84
24) I Naphthalene-d8	----------ISTD----------									
25) Nitrobenzene	0.319	0.313	0.323	0.317	0.295	0.319	0.305	0.307	0.312	2.96
26) Nitrobenzene	0.340	0.335	0.347	0.338	0.322	0.331	0.322	0.326	0.332	2.69
27) Quinoline	0.782	0.771	0.785	0.751	0.683	0.701	0.673	0.710	0.732	6.24
28) Isophorone	0.651	0.645	0.672	0.645	0.590	0.611	0.589	0.570	0.622	5.88
29) 2-Nitropheno	0.218	0.208	0.205	0.188	0.171	0.173	0.154	0.170	0.186	12.00
30) 2,4-Dimethyl	0.339	0.333	0.332	0.321	0.286	0.277	0.276	0.293	0.307	8.69
31) Benzoic Acid	0.260	0.259	0.252	0.225	0.173				0.234	15.75
32) bis(2-Chloro	0.470	0.460	0.470	0.453	0.408	0.423	0.420	0.404	0.438	6.31
33) 2,4-Dichloro	0.319	0.310	0.298	0.280	0.255	0.254	0.254	0.240	0.276	10.75
34) 2,6-Dichloro	0.325	0.312	0.296	0.275	0.252	0.250	0.243	0.236	0.274	12.35
35) 1,3,5-Trichl	0.359	0.350	0.334	0.310	0.272	0.281	0.255	0.280	0.305	12.74
36) 1,2,4-Trichl	0.318	0.309	0.305	0.282	0.252	0.266	0.234	0.239	0.276	11.89
37) 1,2,3-Trichl	0.318	0.308	0.301	0.280	0.250	0.267	0.235	0.266	0.278	10.42
38) Naphthalene	1.176	1.142	1.136	1.067	0.967	0.991	0.955	0.938	1.047	9.13
39) 4-Chloroanil	0.507	0.486	0.484	0.446	0.399	0.418	0.405	0.411	0.445	9.51
40) 2,3-Dichloro	0.439	0.435	0.425	0.387	0.334	0.346	0.312	0.334	0.376	13.66
41) Caprolactam	0.228	0.226	0.239	0.239	0.217	0.240	0.234	0.252	0.234	4.52
42) Hexachlorobu	0.167	0.159	0.150	0.139	0.121	0.131	0.115	0.117	0.137	14.40
43) 4-Chloro-3-m	0.297	0.292	0.299	0.288	0.251	0.267	0.248	0.280	0.278	7.25
44) 2-Methylnaph	0.626	0.608	0.602	0.557	0.492	0.495	0.491	0.508	0.547	10.58
45) 1-Methylnaph	0.681	0.656	0.642	0.607	0.536	0.558	0.523	0.525	0.591	10.74

Initial Calibration Summary

Job Number: JC300 **Sample:** EZ5119-ICC5119
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** Z102732.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
46) Dimethylnaph 0.704 0.685 0.660 0.602 0.539 0.548 0.519 0.535 0.599  12.44

47) I   Acenaphthene-d10      ----------------ISTD---------------------
48) Hexachlorocy 0.461 0.434 0.407 0.333 0.254 0.246 0.215       0.336  29.76
         ----- Quadratic regression -----                Coefficient =  0.9995
              Response Ratio = -0.03374 + 0.35142 *A + 0.02328 *A^2

49) 2,4,6-Trichl 0.438 0.419 0.404 0.350 0.305 0.294 0.283 0.262 0.344  19.80
50) 2,4,5-Trichl 0.392 0.373 0.367 0.337 0.311 0.292 0.290 0.254 0.327  14.77
51) 2-Fluorobiph 1.386 1.316 1.294 1.175 1.044 1.089 1.162 1.225 1.211   9.62
52) 2-Chloronaph 1.249 1.179 1.184 1.082 0.974 0.999 0.949 0.932 1.069  11.47
53) Biphenyl     1.795 1.698 1.662 1.510 1.303 1.364 1.300 1.268 1.487  13.97
54) 2-Nitroanili 0.338 0.323 0.342 0.325 0.298 0.305 0.293 0.262 0.311   8.59
55) Dimethylphth 1.444 1.368 1.370 1.258 1.118 1.172 1.092 1.074 1.237  11.60
56) Acenaphthyle 2.089 1.977 1.974 1.791 1.610 1.691 1.578 1.681 1.799  10.64
57) 2,6-Dinitrot 0.287 0.279 0.285 0.266 0.225 0.232 0.220 0.207 0.250  13.00
58) 3-Nitroanili 0.353 0.335 0.348 0.330 0.284 0.288 0.303 0.258 0.312  10.87
59) Acenaphthene 1.289 1.230 1.225 1.101 0.954 1.001 1.065 1.041 1.113  10.88
60) 2,4-Dinitrop 0.201 0.195 0.184 0.147 0.102 0.086 0.060       0.139  40.92
         ----- Quadratic regression -----                Coefficient =  0.9992
              Response Ratio = -0.02448 + 0.17093 *A + 0.00723 *A^2

61) 4-Nitropheno 0.131 0.126 0.133 0.122 0.113 0.116 0.110 0.101 0.119   9.14
62) Dibenzofuran 1.687 1.579 1.579 1.444 1.281 1.323 1.295 1.246 1.429  11.72
63) 2,4-Dinitrot 0.381 0.372 0.385 0.353 0.314 0.323 0.298 0.292 0.340  11.12
64) 2,3,4,6-Tetr 0.323 0.307 0.297 0.261 0.231 0.224 0.221 0.198 0.258  17.91
65) Diethylphtha 1.462 1.385 1.414 1.285 1.151 1.183 1.118 1.113 1.264  11.20
66) Fluorene     1.589 1.494 1.478 1.324 1.148 1.180 1.208 1.289 1.339  12.24
67) 4-Chlorophen       0.685 0.646 0.566 0.481 0.497 0.464 0.419 0.537  18.43
68) 4-Nitroanili 0.360 0.353 0.370 0.360 0.318 0.336 0.302 0.274 0.334  10.05

69) I   Phenanthrene-d10      ----------------ISTD---------------------
70) 4,6-Dinitro- 0.148 0.143 0.140 0.125 0.095 0.086 0.064       0.114  28.64
         ----- Quadratic regression -----                Coefficient =  0.9997
              Response Ratio = -0.00671 + 0.13525 *A + 0.00609 *A^2

71) n-Nitrosodip 0.711 0.681 0.668 0.607 0.535 0.569 0.510 0.492 0.597  13.91
72) 1,2-Diphenyl 0.907 0.872 0.907 0.879 0.796 0.836 0.768 0.763 0.841   7.03
73) 2,4,6-Tribro 0.125 0.122 0.115 0.101 0.089 0.098 0.109 0.139 0.112  14.59
74) 4-Bromopheny 0.259 0.251 0.239 0.215 0.190 0.191 0.167 0.175 0.211  16.76
75) Hexachlorobe 0.261 0.247 0.239 0.215 0.186 0.190 0.181 0.189 0.214  14.73
76) Pentachlorop 0.208 0.197 0.178 0.149 0.121 0.120 0.103       0.154  26.82
         ----- Quadratic regression -----                Coefficient =  0.9998
              Response Ratio = -0.01110 + 0.14955 *A + 0.01226 *A^2

77) Phenanthrene 1.278 1.207 1.193 1.084 0.975 1.037 1.064 1.204 1.130   9.24
78) Anthracene   1.306 1.221 1.203 1.117 0.988 1.048 1.051 1.170 1.138   9.32
79) Carbazole    1.372 1.314 1.329 1.219 1.087 1.127 1.109 1.100 1.207   9.69
80) Di-n-butylph 1.874 1.796 1.811 1.642 1.420 1.442 1.282 1.260 1.566  15.73
81) Fluoranthene 1.392 1.342 1.330 1.192 1.047 1.096 1.083 1.232 1.214  10.85
82) Octadecane   0.853 0.814 0.877 0.864 0.778 0.776 0.802 0.772 0.817   5.16

83) I   Chrysene-d12          ----------------ISTD---------------------
84) Pyrene       1.054 1.062 1.187 1.184 1.109 1.185 1.203 1.368 1.169   8.54
85) Butyl steara 0.470 0.469 0.574 0.592 0.530 0.549 0.558 0.511 0.532   8.55
86) Terphenyl-d1 0.538 0.547 0.593 0.580 0.547 0.589 0.699 0.809 0.613  15.40
87) Butylbenzylp 0.594 0.598 0.679 0.672 0.616 0.623 0.586 0.549 0.615   7.11
88) Benzo[a]anth 0.945 0.970 1.090 1.057 0.978 1.081 1.147 1.344 1.076  11.93
89) 3,3'-Dichlor 0.409 0.411 0.445 0.441 0.400 0.415 0.400 0.419 0.418   4.06
90) Chrysene     0.782 0.811 0.899 0.885 0.817 0.872 0.889 1.005 0.870   7.99
```

Initial Calibration Summary

Job Number: JC300 **Sample:** EZ5119-ICC5119
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** Z102732.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
 91) bis(2-Ethylh 0.809 0.801 0.896 0.884 0.806 0.823 0.764 0.748 0.816   6.35

 92) I   Perylene-d12          ----------------ISTD---------------------
 93) Di-n-octylph 2.172 1.961 2.223 2.014 1.579 1.683 1.537 1.442 1.827  16.60
 94) Benzo[b]fluo 1.408 1.269 1.403 1.285 1.010 1.096 1.009 1.219 1.212  13.19
 95) Benzo[k]fluo 1.104 1.049 1.224 1.091 0.903 1.014 0.970 1.153 1.064   9.62
 96) Benzo[a]pyre 1.057 1.001 1.169 1.059 0.851 0.941 0.882 1.053 1.002  10.52
 97) Indeno[1,2,3 0.916 0.894 1.044 0.931 0.734 0.781 0.786 0.849 0.867  11.59
 98) Dibenz(a,h)a 0.860 0.853 0.990 0.887 0.704 0.738 0.690 0.662 0.798  14.51
 99) Dibenz[a,h]a 0.915 0.895 1.032 0.876 0.708 0.768 0.716 0.815 0.841  13.14
100) 7,12-Dimethy 0.662 0.589 0.649 0.572 0.430 0.455 0.403       0.537  19.83
101) Benzo[g,h,i] 0.833 0.827 0.977 0.888 0.705 0.756 0.697 0.781 0.808  11.67
 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

          MZ5119.M          Wed Jul 08 08:48:45 2015   RTE
```

8.8.31

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: EZ5119-ICV5119
Lab FileID: Z102735.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\EZ5119\z102735.D          Vial: 11
Acq On    :  7 Jul 2015   4:53 pm                   Operator: alicjap
Sample    : icv5119-50                              Inst    : MSZ
Misc      : op85151,ez5119,                         Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Tue Jul 07 16:18:13 2015
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	102	0.00	4.92
3	t	Pyridine	1.336	1.633	-22.2	118	0.09	2.92
10	t	Aniline	2.035	2.376	-16.8	117	0.00	4.68
16	t	Benzyl alcohol	0.852	0.990	-16.2	111	0.00	5.01
24	I	Naphthalene-d8	1.000	1.000	0.0	112	0.00	5.83
39	t	4-Chloroaniline	0.445	0.440	1.1	102	0.00	5.88
44	t	2-Methylnaphthalene	0.547	0.577	-5.5	107	0.00	6.36
47	I	Acenaphthene-d10	1.000	1.000	0.0	115	0.00	7.31
54	t	2-Nitroaniline	0.311	0.298	4.2	100	0.00	6.85
58	t	3-Nitroaniline	0.312	0.305	2.2	101	-0.01	7.24
62	t	Dibenzofuran	1.429	1.474	-3.1	107	0.00	7.53
68	t	4-Nitroaniline	0.334	0.286	14.4	89	-0.02	7.94
69	I	Phenanthrene-d10	1.000	1.000	0.0	117	0.00	9.26
79	t	Carbazole	1.207	1.042	13.7	92	-0.01	9.66

```
(#) = Out of Range              SPCC's out = 0  CCC's out = 0
 z102732.D  MZ5119.M         Tue Jul 07 17:24:05 2015   RTE
```

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: EZ5119-ICV5119
Lab FileID: Z102736.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\EZ5119\z102736.D Vial: 12
Acq On : 7 Jul 2015 5:25 pm Operator: alicjap
Sample : icv5119-50 Inst : MSZ
Misc : op85151,ez5119, Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update : Tue Jul 07 16:18:13 2015
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	112	0.00	4.91
4	t	N-Nitrosodimethylamine	0.852	0.770	9.6	95	0.00	2.80
11	t	bis(2-Chloroethyl)ether	1.394	1.358	2.6	104	0.00	4.71
14	t	1,3-Dichlorobenzene	1.495	1.535	-2.7	108	0.00	4.88
15	t	1,4-Dichlorobenzene	1.532	1.543	-0.7	107	0.00	4.93
17	t	1,2-Dichlorobenzene	1.435	1.470	-2.4	108	0.00	5.04
20	t	2,2'-oxybis(1-Chloropropa	0.498	0.421	15.5	86	0.00	5.11
22	t	n-Nitroso-di-n-propylamin	0.983	0.823	16.3	86	-0.01	5.20
23	t	Hexachloroethane	0.429	0.441	-2.8	109	0.00	5.29
24	I	Naphthalene-d8	1.000	1.000	0.0	107	0.00	5.83
26	t	Nitrobenzene	0.332	0.329	0.9	102	0.00	5.32
28	t	Isophorone	0.622	0.667	-7.2	106	-0.01	5.49
32	t	bis(2-Chloroethoxy)methan	0.438	0.437	0.2	99	0.00	5.64
36	t	1,2,4-Trichlorobenzene	0.276	0.300	-8.7	105	0.00	5.79
38	t	Naphthalene	1.047	1.105	-5.5	104	0.00	5.85
42	t	Hexachlorobutadiene	0.137	0.146	-6.6	104	0.00	5.94
47	I	Acenaphthene-d10	1.000	1.000	0.0	108	0.00	7.31
		----------	True	Calc.	% Drift	----------		
48	t	Hexachlorocyclopentadiene	100.000	90.196	9.8	84	0.00	6.49
		----------	AvgRF	CCRF	% Dev	----------		
52	t	2-Chloronaphthalene	1.069	1.104	-3.3	101	0.00	6.77
55	t	Dimethylphthalate	1.237	1.146	7.4	91	0.00	7.01
56	t	Acenaphthylene	1.799	1.650	8.3	91	0.00	7.16
57	t	2,6-Dinitrotoluene	0.250	0.241	3.6	92	0.00	7.07
59	t	Acenaphthene	1.113	1.130	-1.5	100	0.00	7.34
63	t	2,4-Dinitrotoluene	0.340	0.303	10.9	85	-0.01	7.49
65	t	Diethylphthalate	1.264	1.114	11.9	85	-0.01	7.77
66	t	Fluorene	1.339	1.294	3.4	95	0.00	7.93
67	t	4-Chlorophenyl-phenylethe	0.537	0.524	2.4	88	0.00	7.92
69	I	Phenanthrene-d10	1.000	1.000	0.0	104	0.00	9.26
71	t	n-Nitrosodiphenylamine	0.597	0.557	6.7	87	0.00	8.06
72	t	1,2-Diphenylhydrazine	0.841	0.828	1.5	95	-0.01	8.12
74	t	4-Bromophenyl-phenylether	0.211	0.190	10.0	82	0.00	8.58
75	t	Hexachlorobenzene	0.214	0.205	4.2	89	0.00	8.68
77	t	Phenanthrene	1.130	1.086	3.9	95	-0.01	9.30
78	t	Anthracene	1.138	1.090	4.2	94	0.00	9.38
80	t	Di-n-butylphthalate	1.566	1.380	11.9	79	0.00	10.36

Initial Calibration Verification

Job Number: JC300 **Sample:** EZ5119-ICV5119
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** Z102736.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

81	t	Fluoranthene	1.214	1.124	7.4	88	-0.01	11.49
83	I	Chrysene-d12	1.000	1.000	0.0	95	-0.01	14.60
84	t	Pyrene	1.169	1.072	8.3	85	-0.01	11.94
87	t	Butylbenzylphthalate	0.615	0.540	12.2	75	0.00	13.51
88	t	Benzo[a]anthracene	1.076	0.948	11.9	82	-0.01	14.58
90	t	Chrysene	0.870	0.804	7.6	85	-0.01	14.66
91	t	bis(2-Ethylhexyl)phthalat	0.816	0.690	15.4	73	0.00	14.92
92	I	Perylene-d12	1.000	1.000	0.0	85	-0.01	17.65
93	t	Di-n-octylphthalate	1.827	1.860	-1.8	71	0.00	16.36
94	t	Benzo[b]fluoranthene	1.212	1.166	3.8	70	-0.02	16.90
95	t	Benzo[k]fluoranthene	1.064	1.117	-5.0	77	-0.03	16.95
96	t	Benzo[a]pyrene	1.002	1.119	-11.7	81	-0.02	17.54
97	t	Indeno[1,2,3-cd]pyrene	0.867	1.004	-15.8	81	-0.02	19.59
99	t	Dibenz[a,h]anthracene	0.841	0.970	-15.3	80	-0.02	19.65
101	t	Benzo[g,h,i]perylene	0.808	0.979	-21.2	85	-0.02	20.03

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102732.D MZ5119.M Tue Jul 07 17:51:24 2015 RTE

8.8.33

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: EZ5121-ICV5119
Lab FileID: Z102746.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\EZ5121\z102746.D          Vial: 2
Acq On    :  8 Jul 2015  12:03 am                   Operator: ashleyd
Sample    : icv5119-50                              Inst    : MSZ
Misc      : op85151,ez5121                          Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Wed Jul 08 08:54:00 2015
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	86	-0.01	4.90
9	t	Phenol	1.818	1.677	7.8	74	0.00	4.64
12	t	2-Chlorophenol	1.419	1.382	2.6	78	-0.01	4.75
19	t	2-Methylphenol	1.296	1.230	5.1	77	-0.01	5.08
21	t	3&4-Methylphenol	1.460	1.278	12.5	65	-0.01	5.19
24	I	Naphthalene-d8	1.000	1.000	0.0	84	-0.01	5.82
29	t	2-Nitrophenol	0.186	0.181	2.7	74	-0.01	5.54
30	t	2,4-Dimethylphenol	0.307	0.314	-2.3	79	0.00	5.57
31		Benzoic Acid	0.234	0.208	11.1	69	0.04	5.65
33	t	2,4-Dichlorophenol	0.276	0.264	4.3	74	0.00	5.72
34		2,6-Dichlorophenol	0.274	0.270	1.5	76	-0.01	5.88
43	t	4-Chloro-3-methylphenol	0.278	0.273	1.8	76	-0.01	6.22
47	I	Acenaphthene-d10	1.000	1.000	0.0	83	-0.02	7.29
49	t	2,4,6-Trichlorophenol	0.344	0.315	8.4	65	-0.01	6.57
50	t	2,4,5-Trichlorophenol	0.327	0.326	0.3	74	-0.01	6.61
		----------	True	Calc.	% Drift	----------		
60	t	2,4-Dinitrophenol	100.000	77.298	22.7	54	-0.02	7.33
		----------	AvgRF	CCRF	% Dev	----------		
61	t	4-Nitrophenol	0.119	0.118	0.8	74	-0.01	7.39
64		2,3,4,6-Tetrachlorophenol	0.258	0.240	7.0	67	-0.02	7.65
69	I	Phenanthrene-d10	1.000	1.000	0.0	88	-0.02	9.24
		----------	True	Calc.	% Drift	----------		
70	t	4,6-Dinitro-2-methylpheno	50.000	38.137	23.7	64	-0.02	7.96
		----------	True	Calc.	% Drift	----------		
76	t	Pentachlorophenol	100.000	82.670	17.3	62	-0.02	8.95

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102732.D MZ5119.M Wed Jul 08 09:01:53 2015 RTE

8.8.34

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: EZ5121-ICV5119
Lab FileID: Z102747.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\EZ5121\z102747.D          Vial: 3
Acq On    :  8 Jul 2015  12:34 am                   Operator: ashleyd
Sample    : icv5119-50                              Inst    : MSZ
Misc      : op85151,ez5121                          Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Wed Jul 08 08:54:00 2015
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	102	-0.01	4.90
2		1,4-Dioxane	0.482	0.457	5.2	88	-0.02	2.51
6	t	Indene	2.627	2.517	4.2	88	-0.01	5.09
7	t	Cumene	3.115	3.200	-2.7	96	-0.01	4.32
13	t	Decane	2.405	2.305	4.2	96	-0.01	4.79
18	t	Acetophenone	1.909	1.806	5.4	87	-0.02	5.19
24	I	Naphthalene-d8	1.000	1.000	0.0	122	-0.01	5.82
27	t	Quinoline	0.732	0.611	16.5	95	-0.02	6.07
40	t	2,3-Dichloroaniline	0.376	0.253	32.7#	73	-0.01	6.58
41	t	Caprolactam	0.234	0.171	26.9	87	0.00	6.10
45	t	1-Methylnaphthalene	0.591	0.484	18.1	92	-0.01	6.43
46	t	Dimethylnaphthalene	0.599	0.493	17.7	91	-0.01	6.88
47	I	Acenaphthene-d10	1.000	1.000	0.0	106	-0.02	7.29
53	t	Biphenyl	1.487	1.423	4.3	91	-0.01	6.73
69	I	Phenanthrene-d10	1.000	1.000	0.0	105	-0.02	9.24
82	t	Octadecane	0.817	0.774	5.3	92	-0.02	9.12
92	I	Perylene-d12	1.000	1.000	0.0	91	-0.03	17.63
100	t	7,12-Dimethylbenz(a)anthr	0.537	0.303	43.6#	43#	-0.02	16.89

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102732.D MZ5119.M Wed Jul 08 09:08:16 2015 RTE

8.8.35

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: EZ5121-ICV5119
Lab FileID: Z102748.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\EZ5121\z102748.D          Vial: 4
Acq On    :  8 Jul 2015   1:06 am                   Operator: ashleyd
Sample    : icv5119-50                              Inst    : MSZ
Misc      : op85151,ez5121                          Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Wed Jul 08 08:54:00 2015
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	90	-0.01	4.90
5	S	2-Fluorophenol	1.310	1.245	5.0	79	-0.01	3.93
8	S	Phenol-d5	1.753	1.548	11.7	73	-0.01	4.63
24	I	Naphthalene-d8	1.000	1.000	0.0	90	-0.01	5.82
25	S	Nitrobenzene-d5	0.312	0.313	-0.3	87	-0.02	5.30
47	I	Acenaphthene-d10	1.000	1.000	0.0	88	-0.02	7.29
51	S	2-Fluorobiphenyl	1.211	1.243	-2.6	85	-0.01	6.64
69	I	Phenanthrene-d10	1.000	1.000	0.0	93	-0.02	9.24
73	S	2,4,6-Tribromophenol	0.112	0.084	25.0	68	-0.02	8.21
83	I	Chrysene-d12	1.000	1.000	0.0	67	-0.03	14.57
86	S	Terphenyl-d14	0.613	0.772	-25.9	87	-0.02	12.33

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102732.D MZ5119.M Wed Jul 08 09:10:39 2015 RTE

8.8.36

8

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Sample: EZ5121-ICV5119
Lab FileID: Z102749.D

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\EZ5121\z102749.D          Vial: 5
Acq On    :  8 Jul 2015   1:37 am                   Operator: ashleyd
Sample    : icv5119-50                              Inst    : MSZ
Misc      : op85151,ez5121                          Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\MSDCHEM\1\METHODS\MZ5119.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Wed Jul 08 09:21:45 2015
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	70	-0.03	14.57
89 t	3,3'-Dichlorobenzidine	0.418	0.513	-22.7	80	-0.02	14.58

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102671a.D MZ5119.M Wed Jul 08 10:08:03 2015 RTE

8.8.37

8

Continuing Calibration Summary

Job Number: JC300 **Sample:** EZ5150-CC5119
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** Z103250.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\EZ5150\z103250.D Vial: 2
Acq On : 31 Jul 2015 10:14 am Operator: brittanp
Sample : cc5119-25 Inst : MSZ
Misc : op85861,ez5150, Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\MSDCHEM\1\METHODS\MZ5148.M (RTE Integrator)
Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update : Mon Aug 03 09:05:54 2015
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	98	0.00	4.83
2		1,4-Dioxane	0.371	0.311	16.2	92	0.00	2.42
3	t	Pyridine	1.020	0.952	6.7	86	0.00	2.75
4	t	N-Nitrosodimethylamine	0.703	0.588	16.4	89	0.00	2.71
5	S	2-Fluorophenol	1.181	1.141	3.4	96	0.00	3.87
6	t	Indene	2.386	2.238	6.2	97	0.00	5.02
7	t	Cumene	3.265	3.035	7.0	95	0.00	4.24
8	S	Phenol-d5	1.589	1.465	7.8	94	0.00	4.58
9	t	Phenol	1.671	1.625	2.8	98	0.00	4.59
10	t	Aniline	1.728	1.697	1.8	95	0.00	4.59
11	t	bis(2-Chloroethyl)ether	1.231	1.132	8.0	96	0.00	4.63
12	t	2-Chlorophenol	1.279	1.174	8.2	95	0.00	4.68
13	t	Decane	0.722	1.052	-45.7#	153	0.00	4.71
14	t	1,3-Dichlorobenzene	1.552	1.452	6.4	98	0.00	4.79
15	t	1,4-Dichlorobenzene	1.536	1.435	6.6	96	0.00	4.84
16	t	Benzyl alcohol	0.753	0.743	1.3	98	0.00	4.93
17	t	1,2-Dichlorobenzene	1.432	1.342	6.3	96	0.00	4.96
18	t	Acetophenone	1.900	1.824	4.0	99	0.00	5.12
19	t	2-Methylphenol	1.173	1.092	6.9	96	0.00	5.02
20	t	2,2'-oxybis(1-Chloropropa	0.450	0.431	4.2	102	0.00	5.02
21	t	3&4-Methylphenol	1.197	1.161	3.0	95	0.00	5.13
22	t	n-Nitroso-di-n-propylamin	1.074	1.019	5.1	97	0.00	5.12
23	t	Hexachloroethane	0.597	0.572	4.2	102	0.00	5.20
24	I	Naphthalene-d8	1.000	1.000	0.0	97	0.00	5.75
25	S	Nitrobenzene-d5	0.384	0.355	7.6	100	0.00	5.23
26	t	Nitrobenzene	0.401	0.373	7.0	99	0.00	5.24
27	t	Quinoline	0.715	0.691	3.4	100	0.00	6.00
28	t	Isophorone	0.665	0.652	2.0	101	0.00	5.41
29	t	2-Nitrophenol	0.198	0.195	1.5	98	0.00	5.47
30	t	2,4-Dimethylphenol	0.329	0.326	0.9	94	0.00	5.51
31		Benzoic Acid	0.276	0.258	6.5	91	0.00	5.58
32	t	bis(2-Chloroethoxy)methan	0.409	0.387	5.4	97	0.00	5.56
33	t	2,4-Dichlorophenol	0.310	0.307	1.0	98	0.00	5.66
34		2,6-Dichlorophenol	0.307	0.292	4.9	99	0.00	5.81
35	t	1,3,5-Trichlorobenzene	0.380	0.366	3.7	99	0.00	5.48
36	t	1,2,4-Trichlorobenzene	0.360	0.346	3.9	100	0.00	5.71
37	t	1,2,3-Trichlorobenzene	0.355	0.345	2.8	101	0.00	5.87
38	t	Naphthalene	0.988	0.925	6.4	98	0.00	5.76
39	t	4-Chloroaniline	0.388	0.379	2.3	100	0.00	5.80
40	t	2,3-Dichloroaniline	0.403	0.391	3.0	103	0.00	6.49
41	t	Caprolactam	0.104	0.134	-28.8#	136	0.00	6.06

Continuing Calibration Summary

Job Number: JC300 **Sample:** EZ5150-CC5119
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** Z103250.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

42	t	Hexachlorobutadiene	0.227	0.220	3.1	105	0.00	5.85
43	t	4-Chloro-3-methylphenol	0.325	0.311	4.3	100	0.00	6.16
44	t	2-Methylnaphthalene	0.575	0.564	1.9	102	0.00	6.27
45	t	1-Methylnaphthalene	0.624	0.605	3.0	102	0.00	6.35
46	t	Dimethylnaphthalene	0.704	0.680	3.4	102	0.00	6.79
47	I	Acenaphthene-d10	1.000	1.000	0.0	104	0.00	7.19
48	t	Hexachlorocyclopentadiene	0.360	0.326	9.4	93	0.00	6.40
49	t	2,4,6-Trichlorophenol	0.367	0.337	8.2	97	0.00	6.50
50	t	2,4,5-Trichlorophenol	0.387	0.368	4.9	101	0.00	6.54
51	S	2-Fluorobiphenyl	1.238	1.104	10.8	101	0.00	6.56
52	t	2-Chloronaphthalene	1.053	0.991	5.9	101	0.00	6.67
53	t	Biphenyl	1.415	1.305	7.8	102	0.00	6.64
54	t	2-Nitroaniline	0.310	0.302	2.6	107	0.00	6.76
55	t	Dimethylphthalate	1.340	1.269	5.3	103	0.00	6.91
56	t	Acenaphthylene	1.716	1.585	7.6	103	0.00	7.06
57	t	2,6-Dinitrotoluene	0.279	0.267	4.3	103	0.00	6.97
58	t	3-Nitroaniline	0.278	0.271	2.5	105	0.00	7.14
59	t	Acenaphthene	1.039	0.933	10.2	100	0.00	7.23
		----------	True	Calc.	% Drift	----------		
60	t	2,4-Dinitrophenol	50.000	46.686	6.6	101	0.00	7.25
		----------	AvgRF	CCRF	% Dev	----------		
61	t	4-Nitrophenol	0.221	0.183	17.2	85	0.00	7.35
62	t	Dibenzofuran	1.480	1.404	5.1	103	0.00	7.41
63	t	2,4-Dinitrotoluene	0.390	0.384	1.5	107	0.00	7.39
64		2,3,4,6-Tetrachlorophenol	0.333	0.311	6.6	99	0.00	7.55
65	t	Diethylphthalate	1.370	1.306	4.7	104	0.00	7.65
66	t	Fluorene	1.281	1.180	7.9	106	0.00	7.80
67	t	4-Chlorophenyl-phenylethe	0.697	0.659	5.5	104	0.00	7.79
68	t	4-Nitroaniline	0.292	0.288	1.4	102	0.00	7.82
69	I	Phenanthrene-d10	1.000	1.000	0.0	105	0.00	9.12
70	t	4,6-Dinitro-2-methylpheno	0.133	0.139	-4.5	106	0.00	7.87
71	t	n-Nitrosodiphenylamine	0.552	0.516	6.5	104	0.00	7.94
72	t	1,2-Diphenylhydrazine	0.719	0.652	9.3	102	0.00	8.00
73	S	2,4,6-Tribromophenol	0.131	0.121	7.6	104	0.00	8.11
74	t	4-Bromophenyl-phenylether	0.242	0.237	2.1	106	0.00	8.44
75	t	Hexachlorobenzene	0.250	0.235	6.0	108	0.00	8.55
76	t	Pentachlorophenol	0.154	0.146	5.2	96	0.00	8.85
77	t	Phenanthrene	1.094	0.957	12.5	104	0.00	9.16
78	t	Anthracene	1.106	0.984	11.0	105	0.00	9.24
79	t	Carbazole	1.041	0.984	5.5	107	0.00	9.52
80	t	Di-n-butylphthalate	1.379	1.322	4.1	106	0.00	10.20
81	t	Fluoranthene	1.259	1.122	10.9	105	0.00	11.32
82	t	Octadecane	0.313	0.387	-23.6#	140	0.00	8.99
83	I	Chrysene-d12	1.000	1.000	0.0	98	0.00	14.43
84	t	Pyrene	1.221	1.189	2.6	104	0.00	11.78
85		Butyl stearate	0.181	0.258	-42.5#	144	0.00	13.61
86	S	Terphenyl-d14	0.740	0.693	6.4	108	0.00	12.18
87	t	Butylbenzylphthalate	0.592	0.608	-2.7	103	0.00	13.34
88	t	Benzo[a]anthracene	1.147	1.027	10.5	99	0.00	14.41
89	t	3,3'-Dichlorobenzidine	0.405	0.386	4.7	99	0.00	14.43
90	t	Chrysene	0.993	0.882	11.2	98	0.00	14.48
91	t	bis(2-Ethylhexyl)phthalat	0.768	0.715	6.9	94	0.00	14.74
92	I	Perylene-d12	1.000	1.000	0.0	73	0.00	17.48
93	t	Di-n-octylphthalate	1.411	1.676	-18.8	85	0.00	16.17

Continuing Calibration Summary

Job Number: JC300 **Sample:** EZ5150-CC5119
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** Z103250.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

94	t	Benzo[b]fluoranthene	1.177	1.174	0.3	77	0.00	16.72
95	t	Benzo[k]fluoranthene	1.080	1.046	3.1	75	0.00	16.78
96	t	Benzo[a]pyrene	1.027	0.965	6.0	72	0.00	17.36
97	t	Indeno[1,2,3-cd]pyrene	0.957	0.904	5.5	72	0.00	19.42
98	t	Dibenz(a,h)acridine	0.881	0.845	4.1	71	0.00	19.04
99	t	Dibenz[a,h]anthracene	0.930	0.890	4.3	76	0.00	19.47
100	t	7,12-Dimethylbenz(a)anthr	0.486	0.567	-16.7	76	0.00	16.74
101	t	Benzo[g,h,i]perylene	0.909	0.874	3.9	74	0.00	19.85

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102672a.D MZ5148.M Mon Aug 03 09:06:56 2015 RTE

8.8.38

8

Continuing Calibration Summary

Job Number: JC300 **Sample:** EZ5150-CC5116
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** Z103251.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\EZ5150\z103251.D          Vial: 3
Acq On    : 31 Jul 2015  11:02 am                   Operator: brittanp
Sample    : cc5116-25                               Inst    : MSZ
Misc      : op85861,ez5150,                         Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\MSDCHEM\1\METHODS\MZ5148.M (RTE Integrator)
Title        : Semi Volatile  GC/MS, ZB-5MS 15m x .25mm x .25um
Last Update  : Thu Jul 30 12:03:35 2015
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	117	-0.11	4.83
103	Benzaldehyde	1.057	0.897	15.1	100	-0.10	4.51
104	Phenanthrene-d10a	1.000	1.000	0.0	122	-0.18	9.12
105 s	1-chlorooctadecane	0.277	0.259	6.5	107	-0.21	11.24
106 s	o-terphenyl	0.520	0.539	-3.7	126	-0.19	9.79
107	Atrazine	0.095	0.108	-13.7	132	-0.15	8.70
108	Chrysene-d12a	1.000	1.000	0.0	116	-0.21	14.43
109	Benzidine	0.599	0.561	6.3	96	-0.20	11.65
110	Acenaphthene-d10a	1.000	1.000	0.0	121	-0.14	7.19
111	1,2,4,5-Tetrachlorobenzen	0.520	0.491	5.6	117	-0.12	6.40
112 I	Naphthalene-d8a	1.000	1.000	0.0	109	-0.11	5.75
113	Hydroquinone	0.294	0.284	3.4	99	-0.07	6.05

(#) = Out of Range SPCC's out = 0 CCC's out = 0
z102672a.D MZ5148.M Fri Jul 31 12:17:49 2015 RTE

8.8.39

8

New Jersey

ACCUTEST LABORATORIES

GC/MS Semi-volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\EZ5150\
Data File : z103269.D
Acq On : 31 Jul 2015 6:53 pm
Operator : brittanp
Sample : jc300-2
Misc : op85953,ez5150,1000
ALS Vial : 21 Sample Multiplier: 1

Quant Time: Aug 03 09:24:09 2015
Quant Method : C:\MSDCHEM\1\METHODS\MZ5148.M
Quant Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
QLast Update : Mon Aug 03 09:14:30 2015
Response via : Initial Calibration

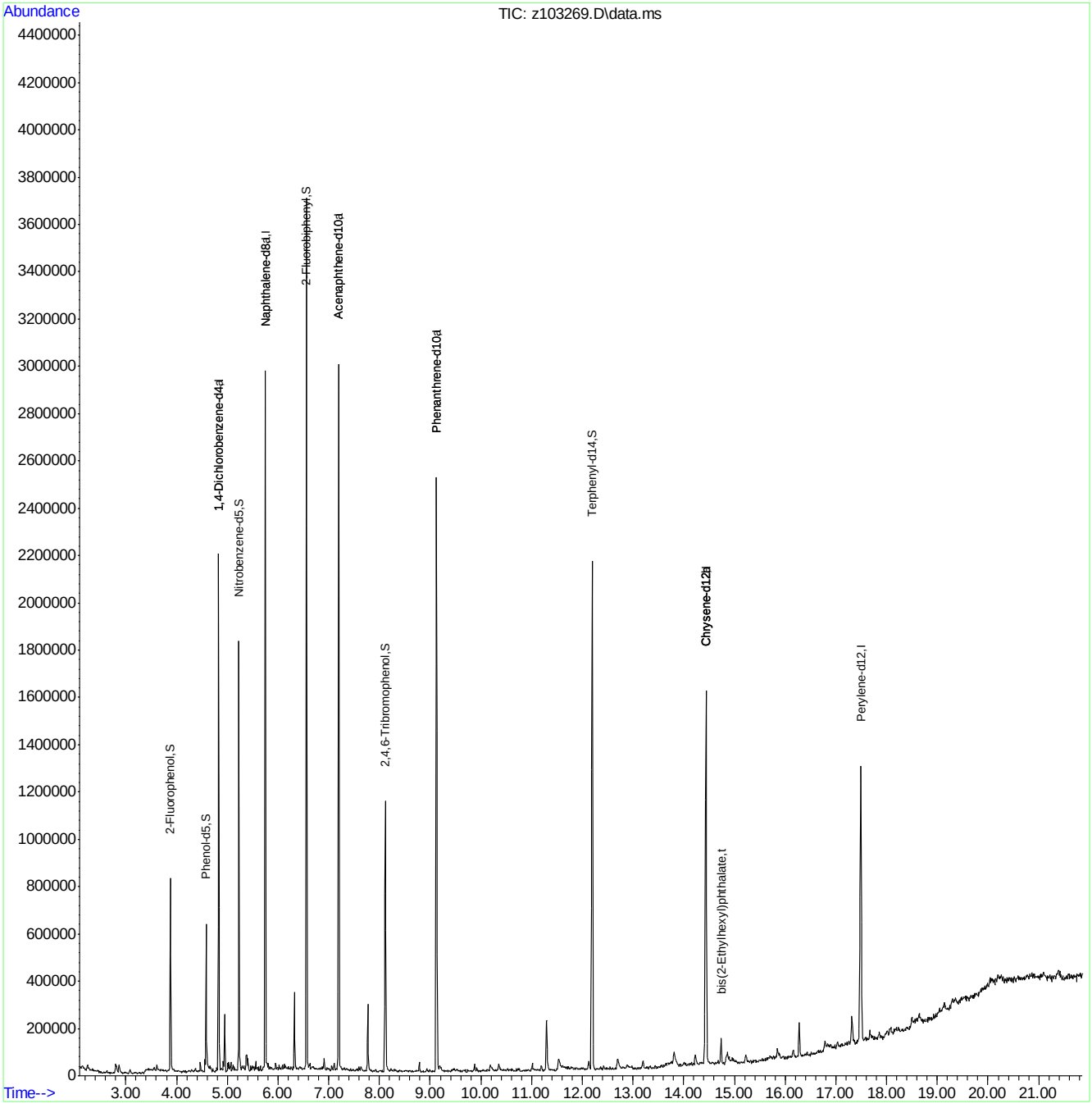
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) 1,4-Dichlorobenzene-d4	4.833	152	300987	40.00 ppm	0.00
24) Naphthalene-d8	5.752	136	1105720	40.00 ppm	0.00
47) Acenaphthene-d10	7.194	164	738902	40.00 ppm	0.00
69) Phenanthrene-d10	9.123	188	1271570	40.00 ppm	0.00
83) Chrysene-d12	14.438	240	952038	40.00 ppm	0.00
92) Perylene-d12	17.494	264	728965	40.00 ppm	0.02
102) 1,4-Dichlorobenzene-d4a	4.833	152	300987	40.00 ppm	0.00
104) Phenanthrene-d10a	9.123	188	1271570	40.00 ppm	0.00
106) Chrysene-d12a	14.438	240	952038	40.00 ppm	0.00
108) Acenaphthene-d10a	7.194	164	738902	40.00 ppm	0.00
110) Naphthalene-d8a	5.752	136	1105720	40.00 ppm	0.00
112) Chrysene-d12b	14.438	240	952038	40.00 ppm	0.00
System Monitoring Compounds					
5) 2-Fluorophenol	3.877	112	221254	24.89 ppm	0.00
Spiked Amount 50.000			Recovery	= 49.78%	
8) Phenol-d5	4.582	99	189777	15.87 ppm	0.00
Spiked Amount 50.000			Recovery	= 31.74%	
25) Nitrobenzene-d5	5.228	82	436745	41.13 ppm	0.00
Spiked Amount 50.000			Recovery	= 82.26%	
51) 2-Fluorobiphenyl	6.559	172	973192	42.54 ppm	0.00
Spiked Amount 50.000			Recovery	= 85.08%	
73) 2,4,6-Tribromophenol	8.118	330	161456	38.67 ppm	0.00
Spiked Amount 50.000			Recovery	= 77.34%	
86) Terphenyl-d14	12.195	244	1066706	60.55 ppm	0.01
Spiked Amount 50.000			Recovery	= 121.10%	
Target Compounds					Qvalue
91) bis(2-Ethylhexyl)phtha...	14.738	149	45420	2.49 ppm	90

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

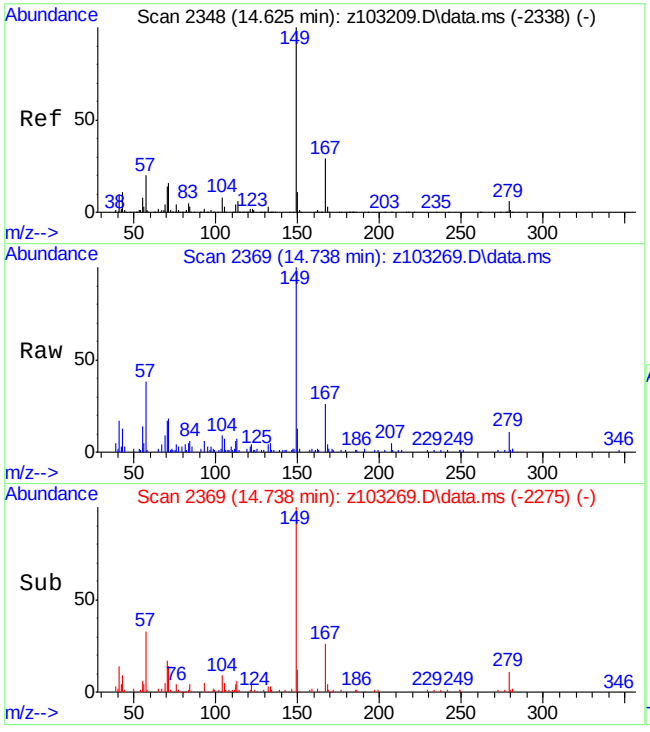
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\EZ5150\
Data File : z103269.D
Acq On : 31 Jul 2015 6:53 pm
Operator : brittanp
Sample : jc300-2
Misc : op85953,ez5150,1000
ALS Vial : 21 Sample Multiplier: 1

Quant Time: Aug 03 09:24:09 2015
Quant Method : C:\MSDCHEM\1\METHODS\MZ5148.M
Quant Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
QLast Update : Mon Aug 03 09:14:30 2015
Response via : Initial Calibration



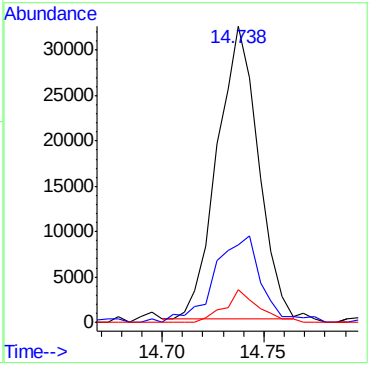
ACCUTEST LABORATORIES JC300



#91
bis(2-Ethylhexyl)phthalate
Concen: 2.49 ppm
RT: 14.738 min Scan# 2369
Delta R.T. -0.000 min
Lab File: z103269.D
Acq: 31 Jul 2015 6:53 pm

Tgt Ion:149 Resp: 45420

Ion	Ratio	Lower	Upper
149	100		
167	25.4	1.1	61.1
279	10.5	0.0	37.4



9.1.1

9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\EZ5150\
Data File : z103270.D
Acq On : 31 Jul 2015 7:24 pm
Operator : brittanp
Sample : jc300-3
Misc : op85953,ez5150,1000
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Aug 03 09:25:42 2015
Quant Method : C:\MSDCHEM\1\METHODS\MZ5148.M
Quant Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
QLast Update : Mon Aug 03 09:14:30 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) 1,4-Dichlorobenzene-d4	4.828	152	279227	40.00 ppm	0.00
24) Naphthalene-d8	5.747	136	1007756	40.00 ppm	0.00
47) Acenaphthene-d10	7.194	164	646576	40.00 ppm	0.00
69) Phenanthrene-d10	9.123	188	1039586	40.00 ppm	0.00
83) Chrysene-d12	14.438	240	764606	40.00 ppm	0.00
92) Perylene-d12	17.494	264	638118	40.00 ppm	0.02
102) 1,4-Dichlorobenzene-d4a	4.828	152	279227	40.00 ppm	0.00
104) Phenanthrene-d10a	9.123	188	1039586	40.00 ppm	0.00
106) Chrysene-d12a	14.438	240	764606	40.00 ppm	0.00
108) Acenaphthene-d10a	7.194	164	646576	40.00 ppm	0.00
110) Naphthalene-d8a	5.747	136	1007756	40.00 ppm	0.00
112) Chrysene-d12b	14.438	240	764606	40.00 ppm	0.00
System Monitoring Compounds					
5) 2-Fluorophenol	3.877	112	179931	21.82 ppm	0.00
Spiked Amount 50.000			Recovery	= 43.64%	
8) Phenol-d5	4.582	99	151505	13.65 ppm	0.00
Spiked Amount 50.000			Recovery	= 27.30%	
25) Nitrobenzene-d5	5.228	82	364705	37.69 ppm	0.00
Spiked Amount 50.000			Recovery	= 75.38%	
51) 2-Fluorobiphenyl	6.559	172	820965	41.01 ppm	0.00
Spiked Amount 50.000			Recovery	= 82.02%	
73) 2,4,6-Tribromophenol	8.118	330	163046	47.76 ppm	0.00
Spiked Amount 50.000			Recovery	= 95.52%	
86) Terphenyl-d14	12.195	244	668201	47.23 ppm	0.01
Spiked Amount 50.000			Recovery	= 94.46%	

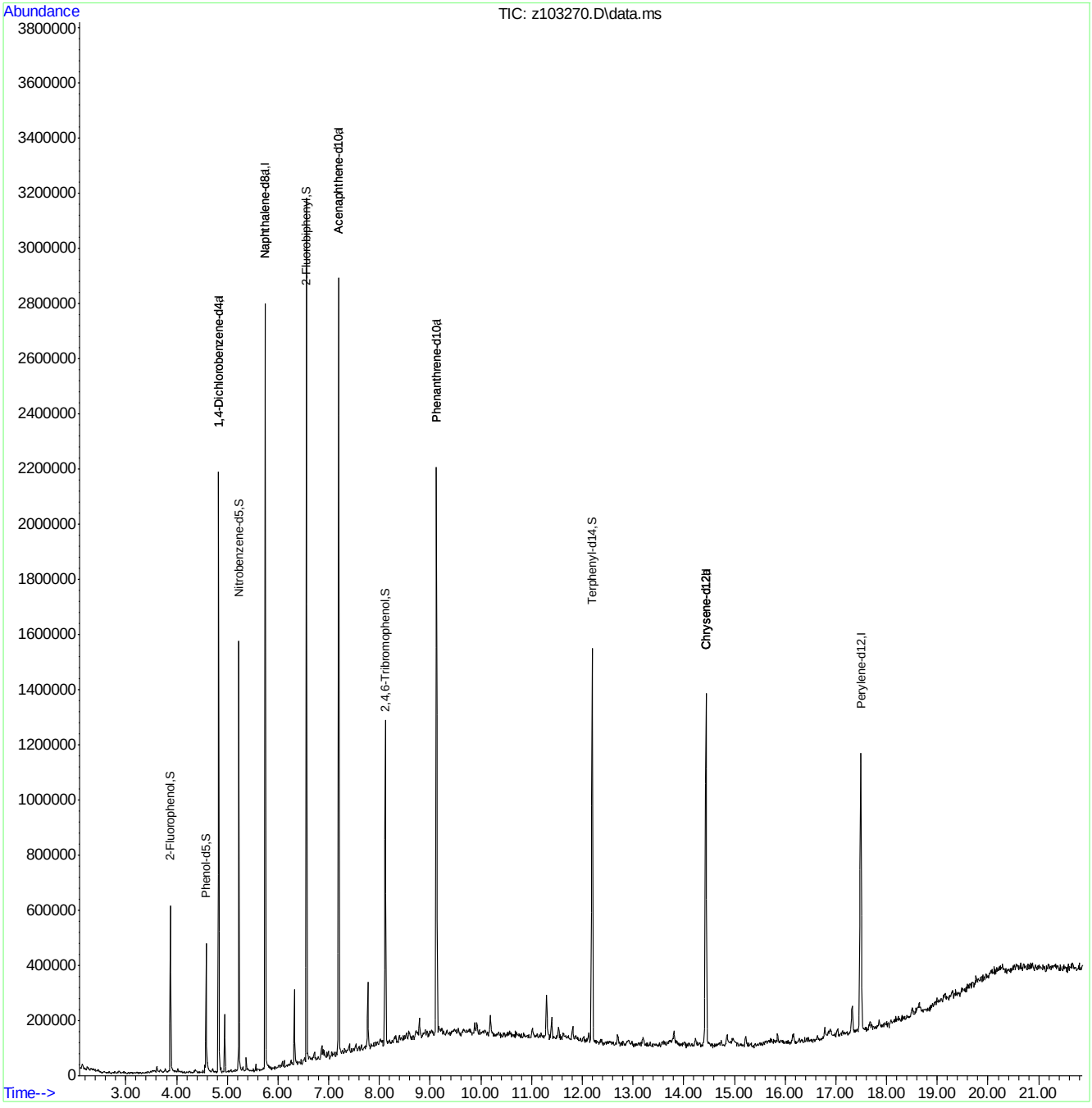
Target Compounds Qvalue

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\EZ5150\
Data File : z103270.D
Acq On : 31 Jul 2015 7:24 pm
Operator : brittanp
Sample : jc300-3
Misc : op85953,ez5150,1000
ALS Vial : 22 Sample Multiplier: 1

Quant Time: Aug 03 09:25:42 2015
Quant Method : C:\MSDCHEM\1\METHODS\MZ5148.M
Quant Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
QLast Update : Mon Aug 03 09:14:30 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\EZ5150\
Data File : z103271.D
Acq On : 31 Jul 2015 7:55 pm
Operator : brittanp
Sample : jc300-4
Misc : op85953,ez5150,1000
ALS Vial : 23 Sample Multiplier: 1

Quant Time: Aug 03 09:27:00 2015
Quant Method : C:\MSDCHEM\1\METHODS\MZ5148.M
Quant Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
QLast Update : Mon Aug 03 09:14:30 2015
Response via : Initial Calibration

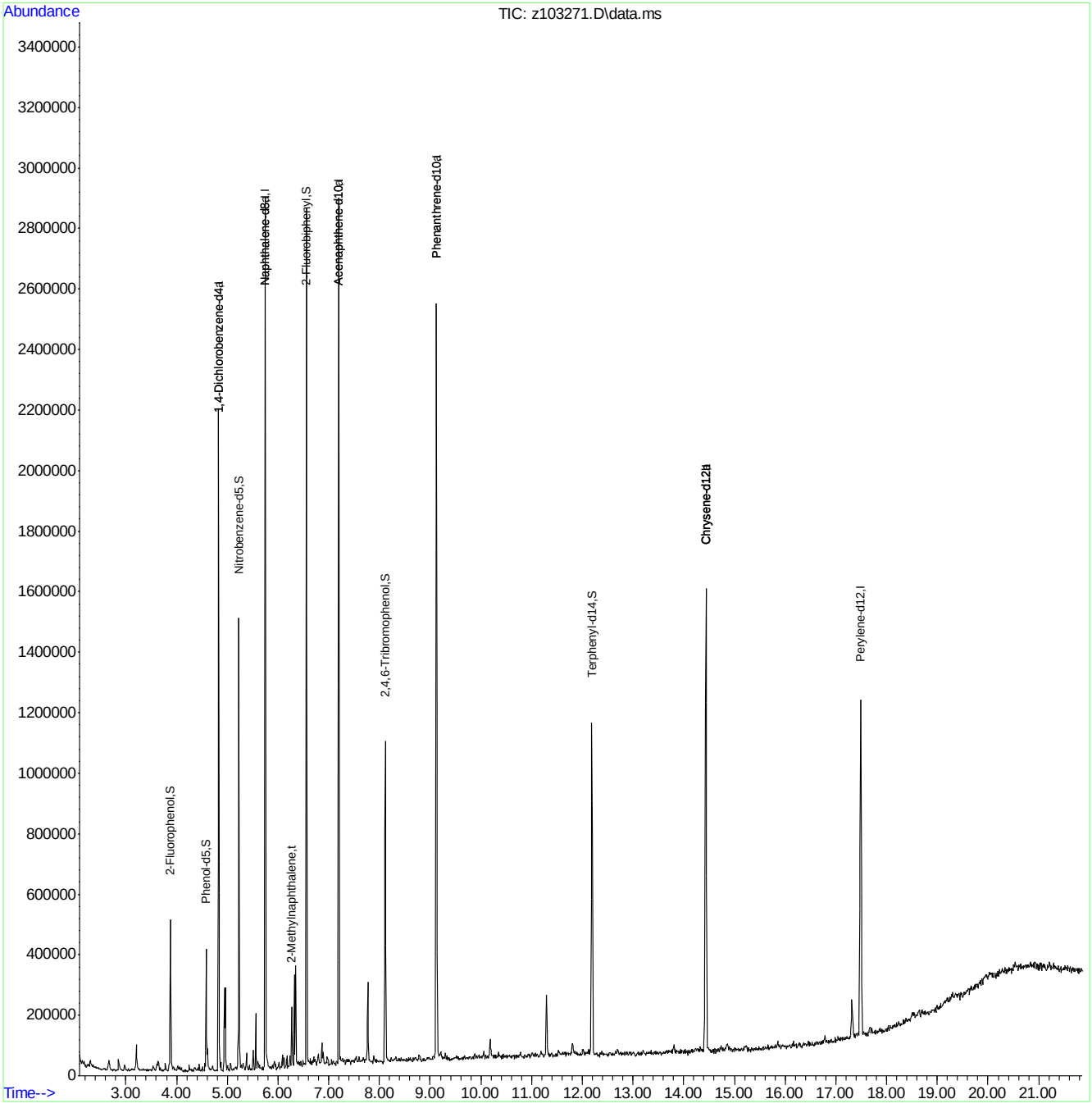
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.833	152	290692	40.00	ppm	0.00
24) Naphthalene-d8	5.746	136	1057991	40.00	ppm	0.00
47) Acenaphthene-d10	7.194	164	703374	40.00	ppm	0.00
69) Phenanthrene-d10	9.123	188	1208409	40.00	ppm	0.00
83) Chrysene-d12	14.438	240	932013	40.00	ppm	0.00
92) Perylene-d12	17.489	264	707847	40.00	ppm	0.01
102) 1,4-Dichlorobenzene-d4a	4.833	152	290692	40.00	ppm	0.00
104) Phenanthrene-d10a	9.123	188	1208409	40.00	ppm	0.00
106) Chrysene-d12a	14.438	240	932013	40.00	ppm	0.00
108) Acenaphthene-d10a	7.194	164	703374	40.00	ppm	0.00
110) Naphthalene-d8a	5.746	136	1057991	40.00	ppm	0.00
112) Chrysene-d12b	14.438	240	932013	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	3.877	112	144153	16.79	ppm	0.00
Spiked Amount 50.000			Recovery = 33.58%			
8) Phenol-d5	4.582	99	121650	10.53	ppm	0.00
Spiked Amount 50.000			Recovery = 21.06%			
25) Nitrobenzene-d5	5.228	82	354829	34.92	ppm	0.00
Spiked Amount 50.000			Recovery = 69.84%			
51) 2-Fluorobiphenyl	6.558	172	730576	33.55	ppm	0.00
Spiked Amount 50.000			Recovery = 67.10%			
73) 2,4,6-Tribromophenol	8.113	330	141348	35.62	ppm	0.00
Spiked Amount 50.000			Recovery = 71.24%			
86) Terphenyl-d14	12.189	244	535822	31.07	ppm	0.00
Spiked Amount 50.000			Recovery = 62.14%			
Target Compounds						Qvalue
44) 2-Methylnaphthalene	6.270	141	34328	2.26	ppm	97

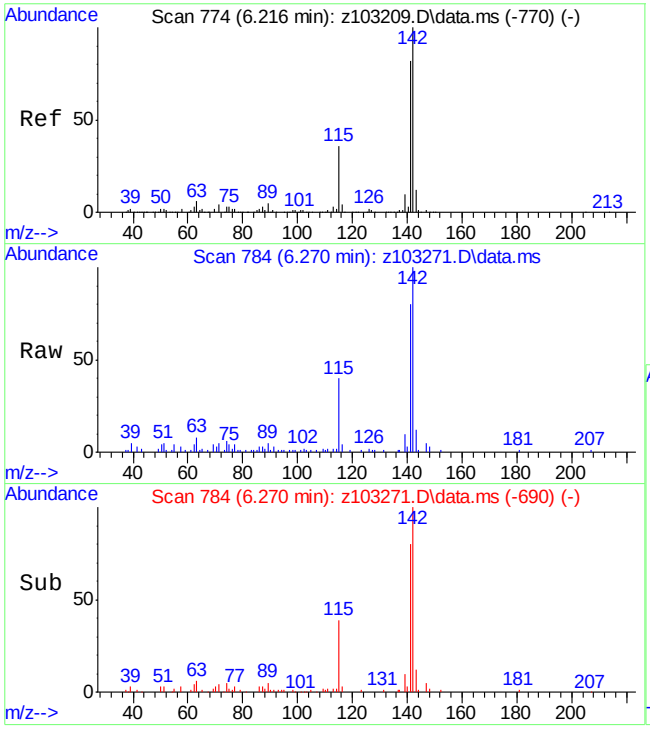
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\EZ5150\
Data File : z103271.D
Acq On : 31 Jul 2015 7:55 pm
Operator : brittanp
Sample : jc300-4
Misc : op85953,ez5150,1000
ALS Vial : 23 Sample Multiplier: 1

Quant Time: Aug 03 09:27:00 2015
Quant Method : C:\MSDCHEM\1\METHODS\MZ5148.M
Quant Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
QLast Update : Mon Aug 03 09:14:30 2015
Response via : Initial Calibration

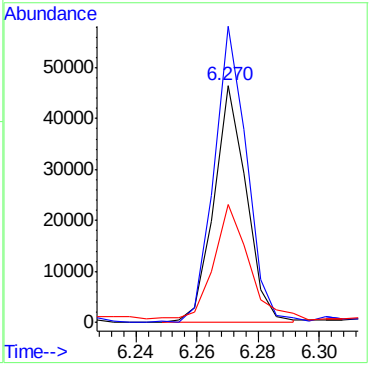




#44
2-Methylnaphthalene
Concen: 2.26 ppm
RT: 6.270 min Scan# 784
Delta R.T. -0.000 min
Lab File: z103271.D
Acq: 31 Jul 2015 7:55 pm

Tgt Ion:141 Resp: 34328

Ion	Ratio	Lower	Upper
141	100		
142	124.5	89.7	149.7
115	47.4	17.0	77.0



9.1.3

9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56681.D
Acq On : 31 Jul 2015 5:33 pm
Operator : linseyk
Sample : jc300-1
Misc : op85942a,e3m2618,980
ALS Vial : 17 Sample Multiplier: 1

Quant Time: Jul 31 19:06:12 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) 1-Methylnaphthalene-d10	8.847	150	73333	4.00 ppm	-0.02
13) Fluorene-d10	11.802	176	96221	4.00 ppm	-0.02
20) Fluoranthene-d10	16.013	212	139195	4.00 ppm	-0.03
30) Benzo(a)pyrene-d12	20.633	264	110604	4.00 ppm	-0.03
System Monitoring Compounds					
3) 2-Fluorophenol	0.000	112	0	0.00 ppm	
Spiked Amount 50.000			Recovery	= 0.00%	
4) Phenol-d5	0.000	99	0d	0.00 ppm	
Spiked Amount 50.000			Recovery	= 0.00%	
7) Nitrobenzene-d5	6.080	82	409449	23.59 ppm	-0.03
Spiked Amount 50.000			Recovery	= 47.18%	
14) 2-Fluorobiphenyl	9.519	172	599446	22.72 ppm	-0.02
Spiked Amount 50.000			Recovery	= 45.44%	
19) 2,4,6-Tribromophenol	0.000	330	0	0.00 ppm	
Spiked Amount 50.000			Recovery	= 0.00%	
27) Terphenyl-d14	16.847	244	246588	10.30 ppm	-0.03
Spiked Amount 50.000			Recovery	= 20.60%	
Target Compounds					Qvalue
26) Pyrene	16.430	202	7751	0.15 ppm	97

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

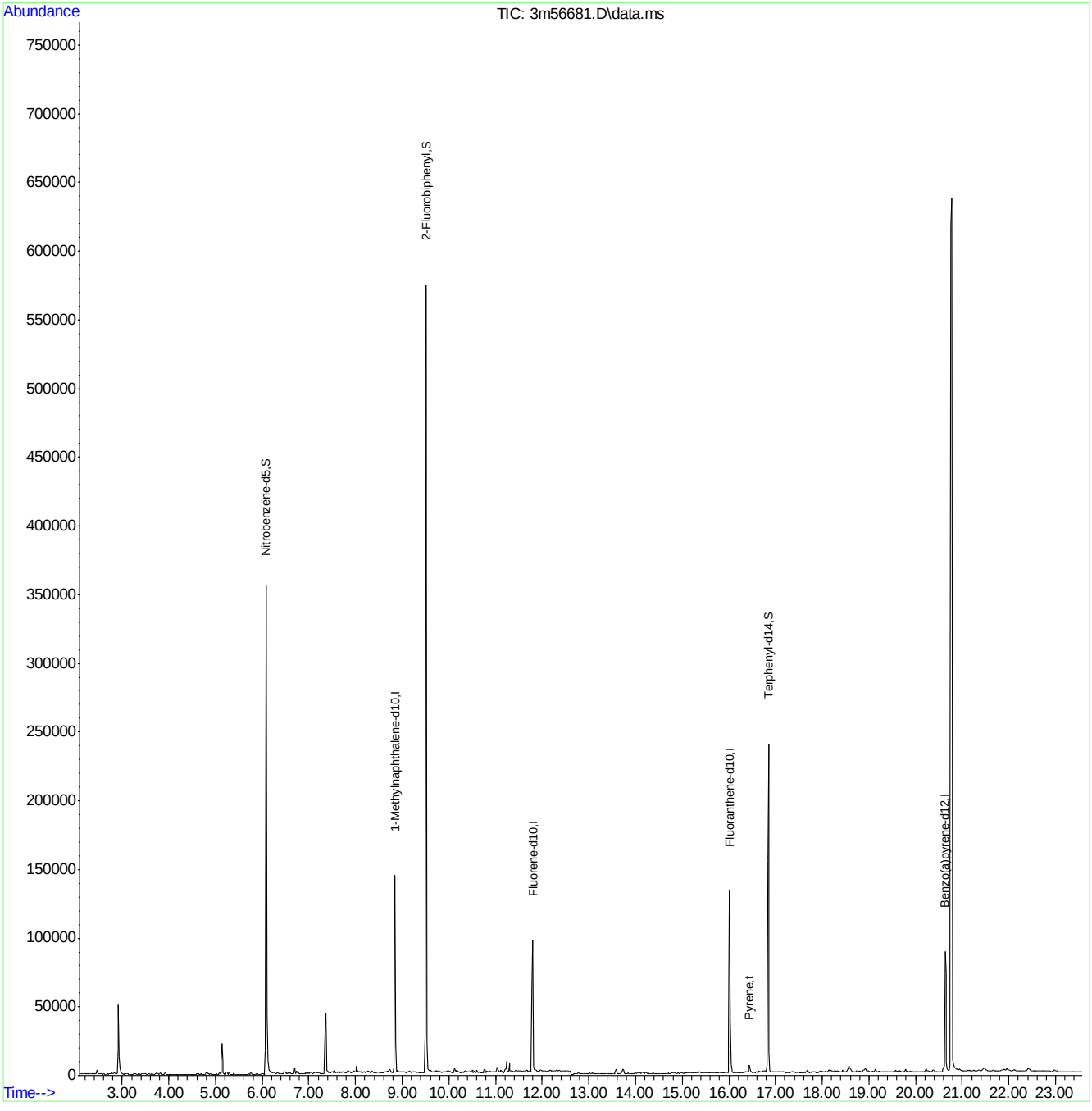
9.1.4

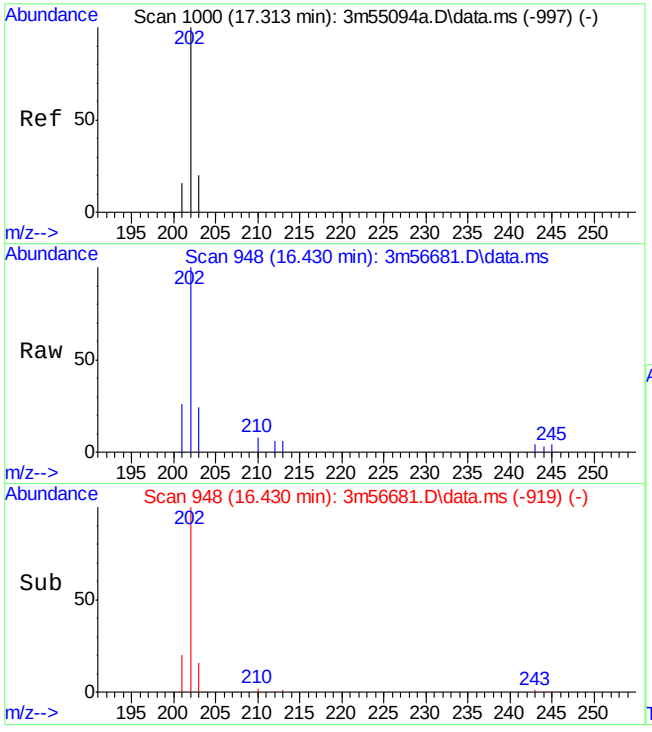
9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56681.D
Acq On : 31 Jul 2015 5:33 pm
Operator : linseyk
Sample : jc300-1
Misc : op85942a,e3m2618,980
ALS Vial : 17 Sample Multiplier: 1

Quant Time: Jul 31 19:06:12 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

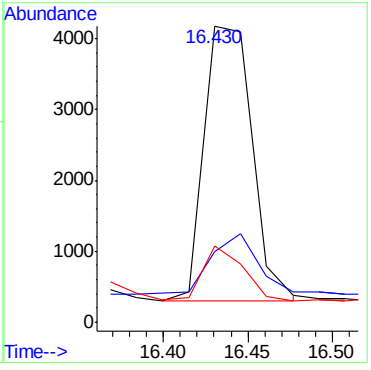




#26
Pyrene
Concen: 0.15 ppm
RT: 16.430 min Scan# 948
Delta R.T. -0.046 min
Lab File: 3m56681.D
Acq: 31 Jul 2015 5:33 pm

Tgt Ion:202 Resp: 7751

Ion	Ratio	Lower	Upper
202	100		
203	15.1	0.0	46.2
201	19.8	0.0	48.2



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56674.D
Acq On : 31 Jul 2015 2:01 pm
Operator : linseyk
Sample : jc300-2
Misc : op85953a,e3m2618,1000
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Jul 31 15:10:58 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1-Methylnaphthalene-d10	8.847	150	71947	4.00	ppm	-0.02
13) Fluorene-d10	11.783	176	94708	4.00	ppm	-0.04
20) Fluoranthene-d10	16.013	212	136046	4.00	ppm	-0.03
30) Benzo(a)pyrene-d12	20.633	264	106552	4.00	ppm	-0.03
System Monitoring Compounds						
3) 2-Fluorophenol	3.400	112	223662	17.27	ppm	0.02
Spiked Amount 50.000			Recovery = 34.54%			
4) Phenol-d5	4.776	99	250557	13.85	ppm	0.04
Spiked Amount 50.000			Recovery = 27.70%			
7) Nitrobenzene-d5	6.080	82	439052	25.78	ppm	-0.03
Spiked Amount 50.000			Recovery = 51.56%			
14) 2-Fluorobiphenyl	9.519	172	832398	32.05	ppm	-0.02
Spiked Amount 50.000			Recovery = 64.10%			
19) 2,4,6-Tribromophenol	12.368	330	141332	38.36	ppm	-0.02
Spiked Amount 50.000			Recovery = 76.72%			
27) Terphenyl-d14	16.847	244	686989	29.35	ppm	-0.03
Spiked Amount 50.000			Recovery = 58.70%			
Target Compounds						Qvalue
25) Fluoranthene	16.044	202	4593	0.11	ppm	97
26) Pyrene	16.430	202	5794	0.12	ppm	98

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

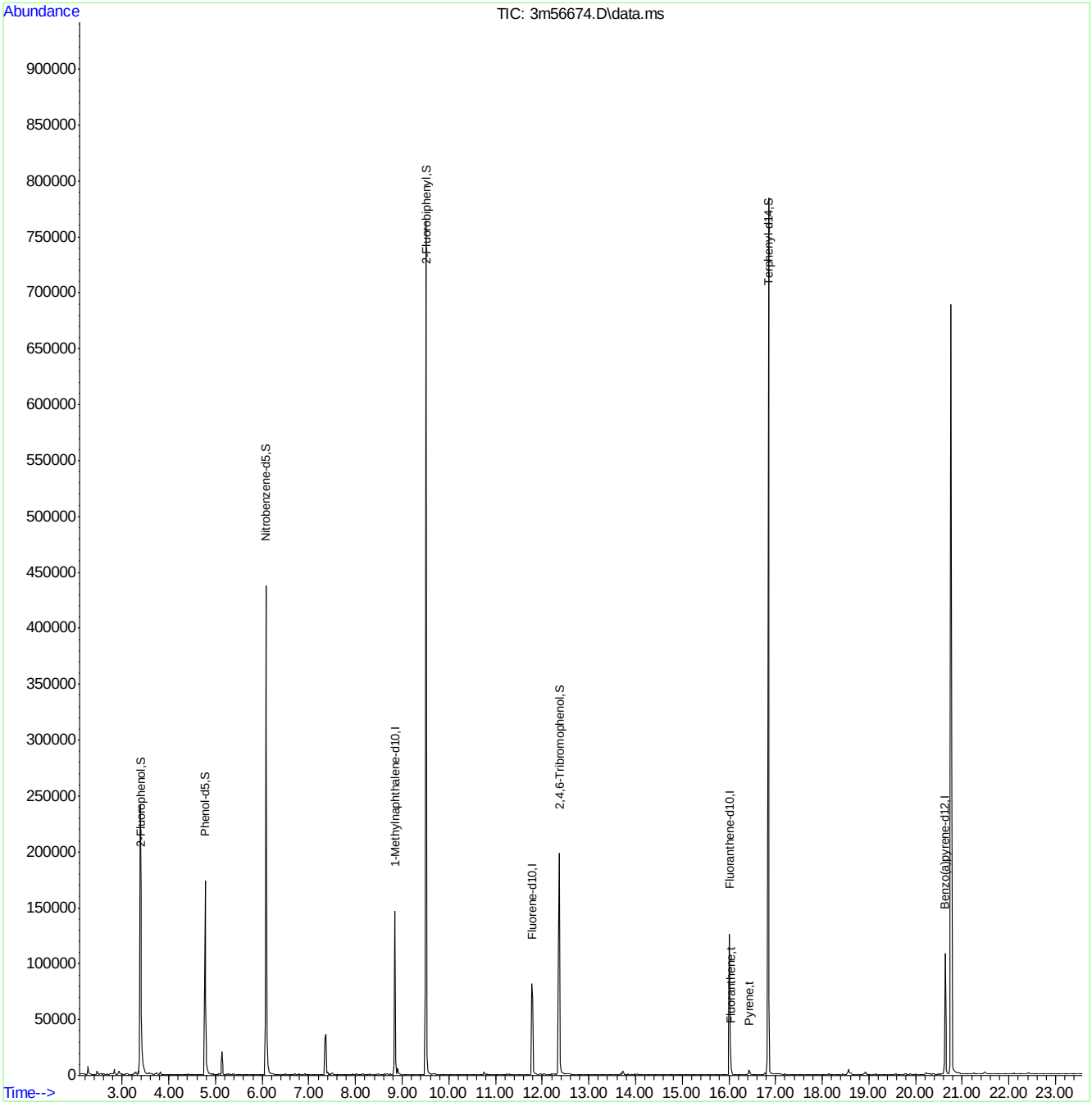
9.1.5

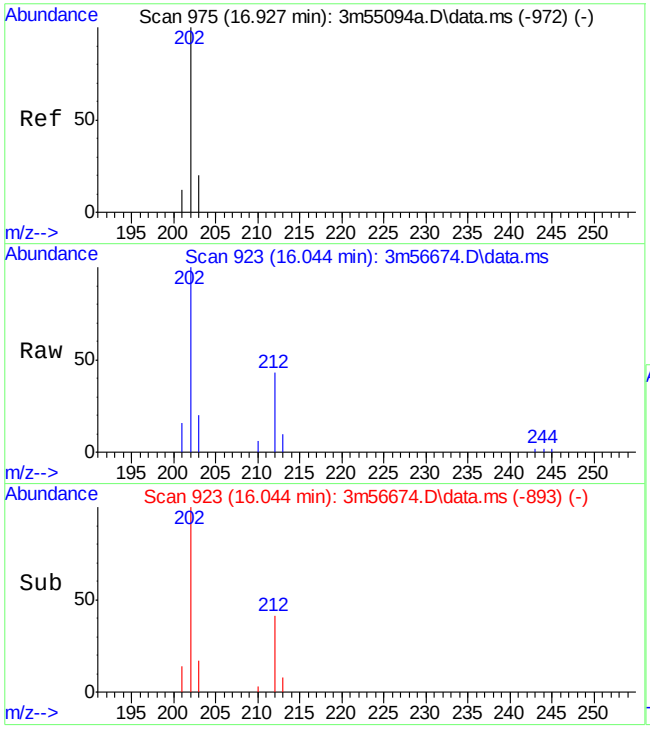
9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56674.D
Acq On : 31 Jul 2015 2:01 pm
Operator : linseyk
Sample : jc300-2
Misc : op85953a,e3m2618,1000
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Jul 31 15:10:58 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

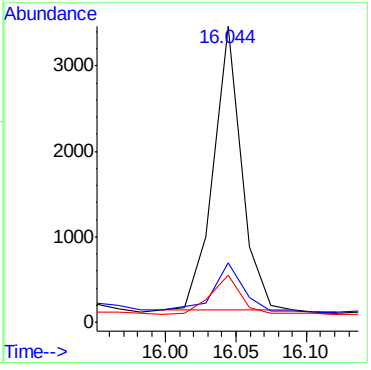


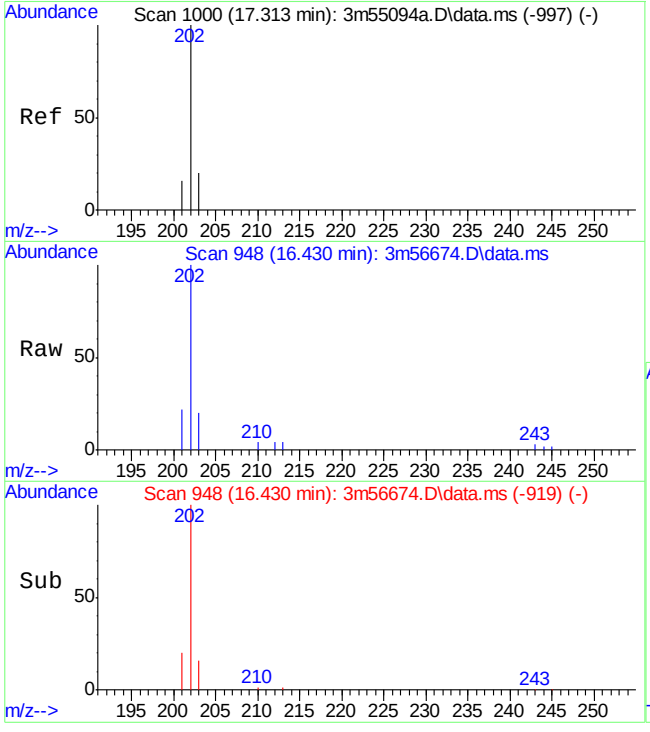


#25
Fluoranthene
Concen: 0.11 ppm
RT: 16.044 min Scan# 923
Delta R.T. -0.031 min
Lab File: 3m56674.D
Acq: 31 Jul 2015 2:01 pm

Tgt Ion:202 Resp: 4593

Ion	Ratio	Lower	Upper
202	100		
203	16.8	0.0	48.5
201	13.5	0.0	43.3

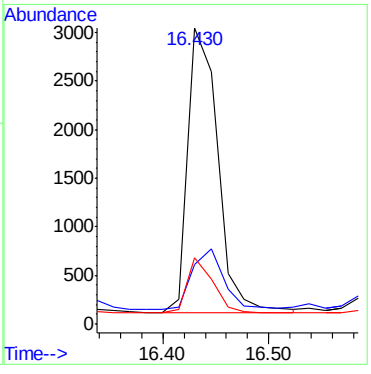




#26
Pyrene
Concen: 0.12 ppm
RT: 16.430 min Scan# 948
Delta R.T. -0.046 min
Lab File: 3m56674.D
Acq: 31 Jul 2015 2:01 pm

Tgt Ion:202 Resp: 5794

Ion	Ratio	Lower	Upper
202	100		
203	15.6	0.0	46.2
201	19.4	0.0	48.2



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56675.D
Acq On : 31 Jul 2015 2:32 pm
Operator : linseyk
Sample : jc300-3
Misc : op85953a,e3m2618,1000
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Jul 31 15:11:35 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) 1-Methylnaphthalene-d10	8.846	150	65280	4.00 ppm	-0.02
13) Fluorene-d10	11.802	176	79305	4.00 ppm	-0.02
20) Fluoranthene-d10	16.013	212	108693	4.00 ppm	-0.03
30) Benzo(a)pyrene-d12	20.633	264	91076	4.00 ppm	-0.03
System Monitoring Compounds					
3) 2-Fluorophenol	3.400	112	183809	15.64 ppm	0.02
Spiked Amount 50.000			Recovery = 31.28%		
4) Phenol-d5	4.776	99	212606	12.95 ppm	0.04
Spiked Amount 50.000			Recovery = 25.90%		
7) Nitrobenzene-d5	6.080	82	371252	24.03 ppm	-0.03
Spiked Amount 50.000			Recovery = 48.06%		
14) 2-Fluorobiphenyl	9.519	172	702144	32.29 ppm	-0.02
Spiked Amount 50.000			Recovery = 64.58%		
19) 2,4,6-Tribromophenol	12.367	330	135146	43.80 ppm	-0.02
Spiked Amount 50.000			Recovery = 87.60%		
27) Terphenyl-d14	16.847	244	555263	29.69 ppm	-0.03
Spiked Amount 50.000			Recovery = 59.38%		

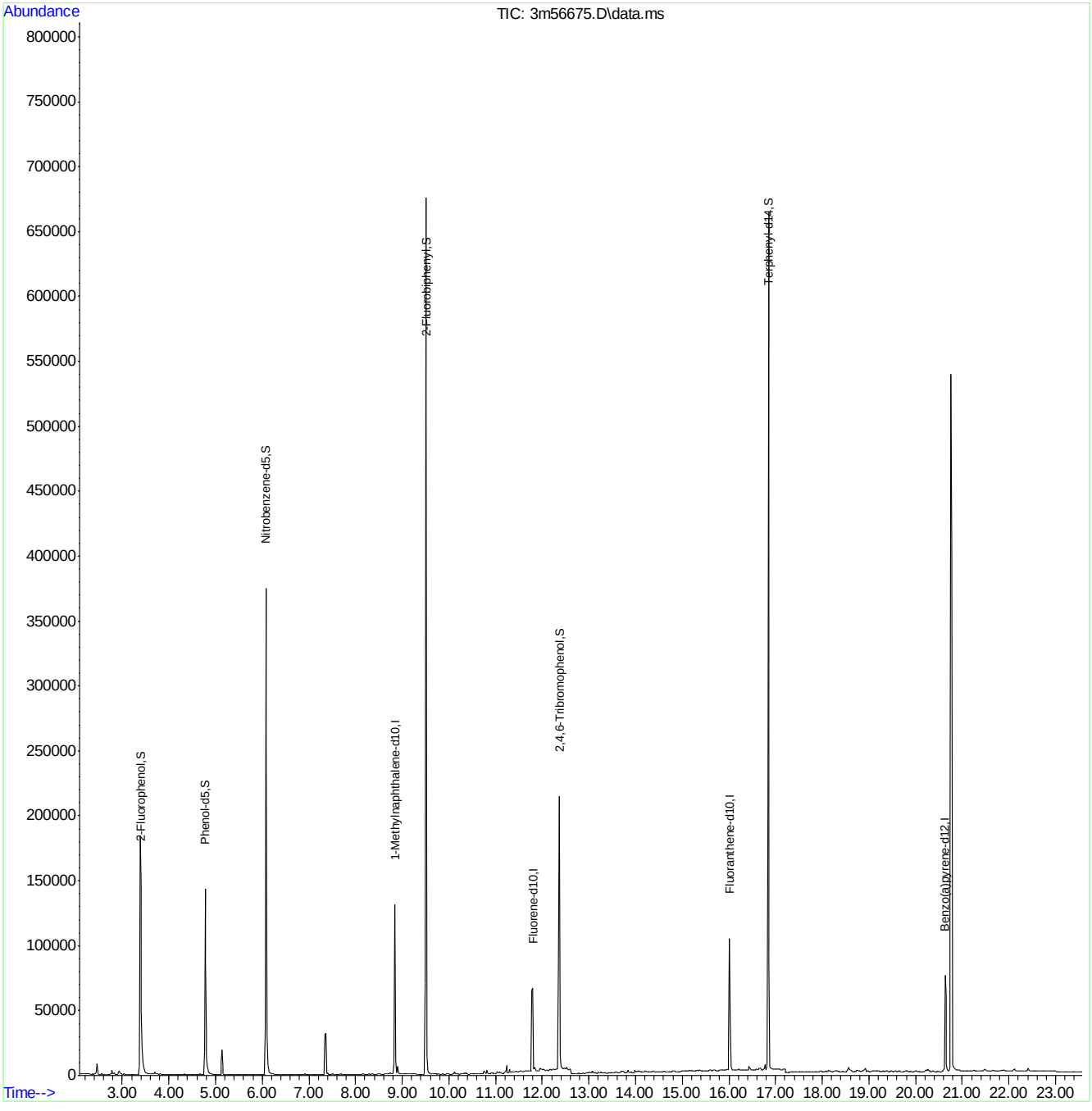
Target Compounds Qvalue

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56675.D
Acq On : 31 Jul 2015 2:32 pm
Operator : linseyk
Sample : jc300-3
Misc : op85953a,e3m2618,1000
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Jul 31 15:11:35 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56676.D
Acq On : 31 Jul 2015 3:02 pm
Operator : linseyk
Sample : jc300-4
Misc : op85953a,e3m2618,1000
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Jul 31 19:02:44 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1-Methylnaphthalene-d10	8.847	150	66815	4.00	ppm	-0.02
13) Fluorene-d10	11.802	176	90118	4.00	ppm	-0.02
20) Fluoranthene-d10	16.013	212	127045	4.00	ppm	-0.03
30) Benzo(a)pyrene-d12	20.633	264	100086	4.00	ppm	-0.03
System Monitoring Compounds						
3) 2-Fluorophenol	3.400	112	148073	12.31	ppm	0.02
Spiked Amount 50.000			Recovery = 24.62%			
4) Phenol-d5	4.776	99	177203	10.55	ppm	0.04
Spiked Amount 50.000			Recovery = 21.10%			
7) Nitrobenzene-d5	6.080	82	364081	23.02	ppm	-0.03
Spiked Amount 50.000			Recovery = 46.04%			
14) 2-Fluorobiphenyl	9.519	172	637501	25.80	ppm	-0.02
Spiked Amount 50.000			Recovery = 51.60%			
19) 2,4,6-Tribromophenol	12.367	330	117600	33.54	ppm	-0.02
Spiked Amount 50.000			Recovery = 67.08%			
27) Terphenyl-d14	16.847	244	395681	18.10	ppm	-0.03
Spiked Amount 50.000			Recovery = 36.20%			
Target Compounds						Qvalue
8) Naphthalene	7.403	128	15808	0.30	ppm	91
16) Acenaphthene	10.818	153	4553	0.17	ppm	90

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

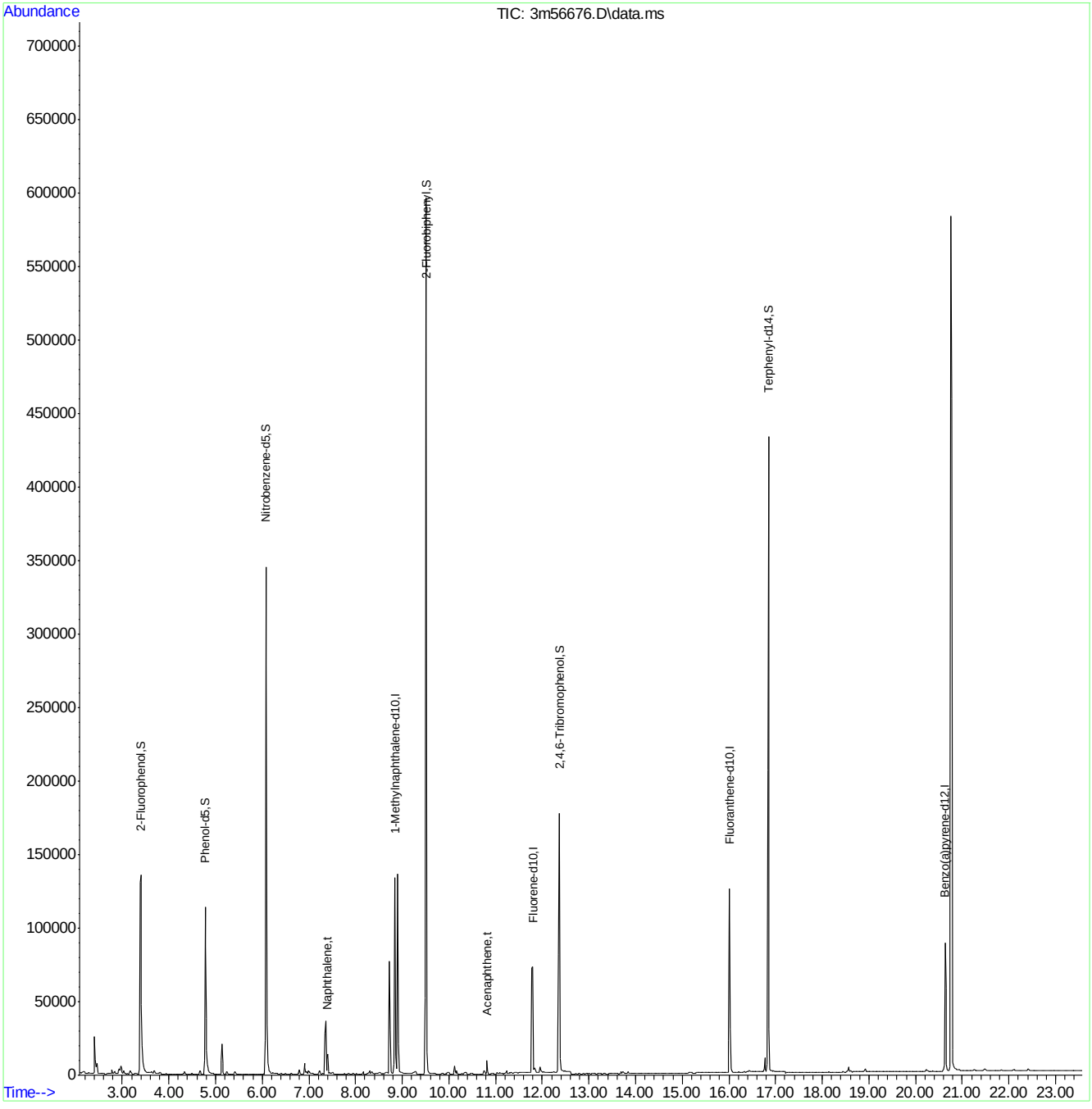
9.1.7

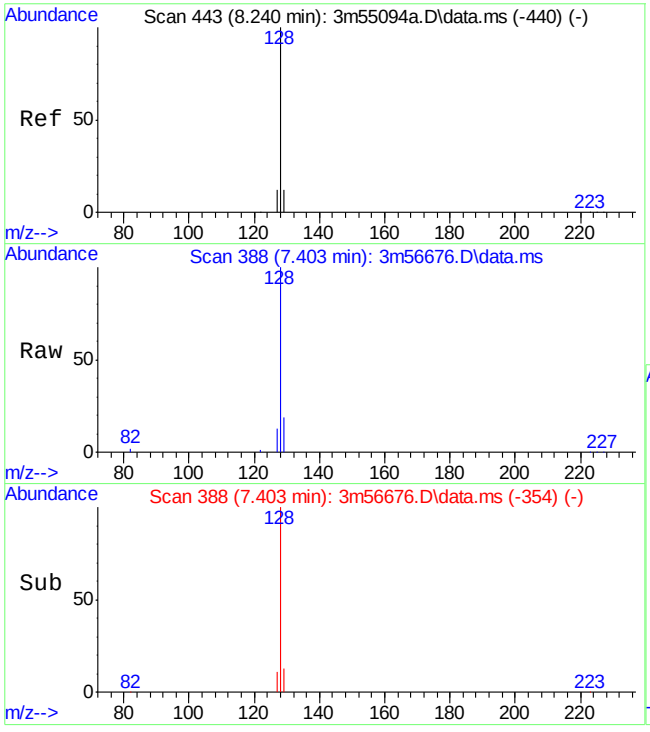
9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56676.D
Acq On : 31 Jul 2015 3:02 pm
Operator : linseyk
Sample : jc300-4
Misc : op85953a,e3m2618,1000
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Jul 31 19:02:44 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

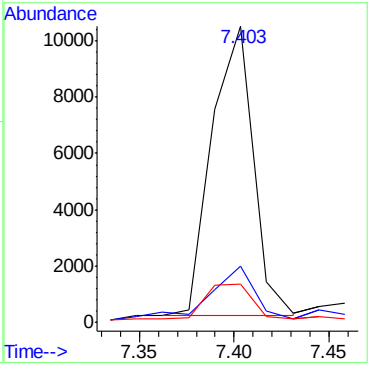


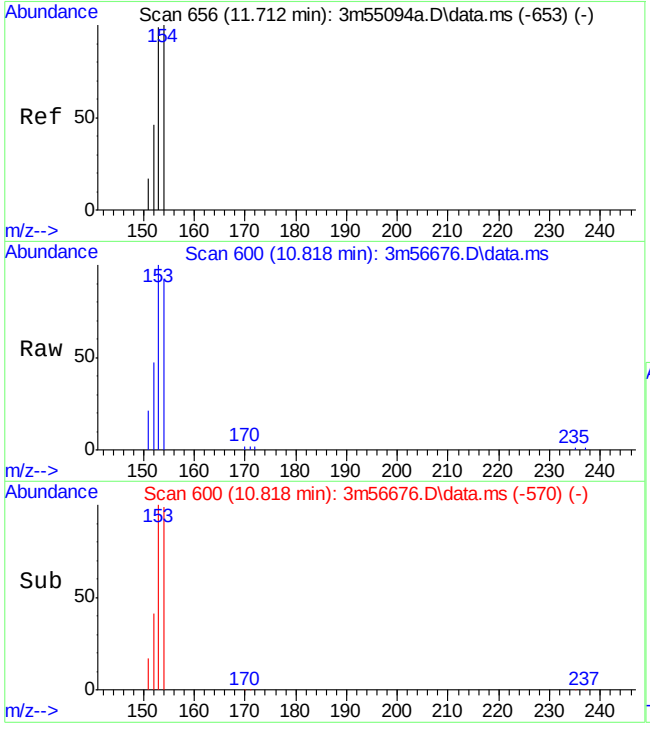


#8
Naphthalene
Concen: 0.30 ppm
RT: 7.403 min Scan# 388
Delta R.T. -0.027 min
Lab File: 3m56676.D
Acq: 31 Jul 2015 3:02 pm

Tgt Ion:128 Resp: 15808

Ion	Ratio	Lower	Upper
128	100		
129	17.0	0.0	40.8
127	12.0	0.0	43.2

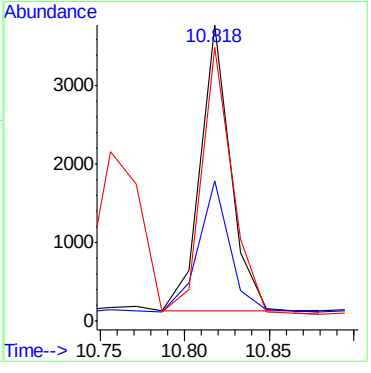




#16
Acenaphthene
Concen: 0.17 ppm
RT: 10.818 min Scan# 600
Delta R.T. -0.031 min
Lab File: 3m56676.D
Acq: 31 Jul 2015 3:02 pm

Tgt Ion:153 Resp: 4553

Ion	Ratio	Lower	Upper
153	100		
152	45.6	12.4	72.4
154	92.8	74.5	134.5



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56682.D
Acq On : 31 Jul 2015 6:04 pm
Operator : linseyk
Sample : jc300-5
Misc : op85942a,e3m2618,1000
ALS Vial : 18 Sample Multiplier: 1

Quant Time: Jul 31 19:06:43 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1-Methylnaphthalene-d10	8.847	150	74693	4.00	ppm	-0.02
13) Fluorene-d10	11.802	176	102428	4.00	ppm	-0.02
20) Fluoranthene-d10	16.013	212	149135	4.00	ppm	-0.03
30) Benzo(a)pyrene-d12	20.633	264	120923	4.00	ppm	-0.03
System Monitoring Compounds						
3) 2-Fluorophenol	0.000	112	0d	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
4) Phenol-d5	0.000	99	0d	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
7) Nitrobenzene-d5	6.094	82	487623	27.58	ppm	-0.01
Spiked Amount 50.000			Recovery	=	55.16%	
14) 2-Fluorobiphenyl	9.519	172	889458	31.67	ppm	-0.02
Spiked Amount 50.000			Recovery	=	63.34%	
19) 2,4,6-Tribromophenol	0.000	330	0d	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
27) Terphenyl-d14	16.847	244	411681	16.05	ppm	-0.03
Spiked Amount 50.000			Recovery	=	32.10%	
Target Compounds						Qvalue
8) Naphthalene	7.403	128	1421105	24.43	ppm	90
16) Acenaphthene	10.818	153	19414	0.62	ppm #	52
18) Fluorene	11.859	166	12920	0.41	ppm	91
23) Phenanthrene	13.726	178	15400	0.28	ppm	91
25) Fluoranthene	16.044	202	5123	0.11	ppm	96

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

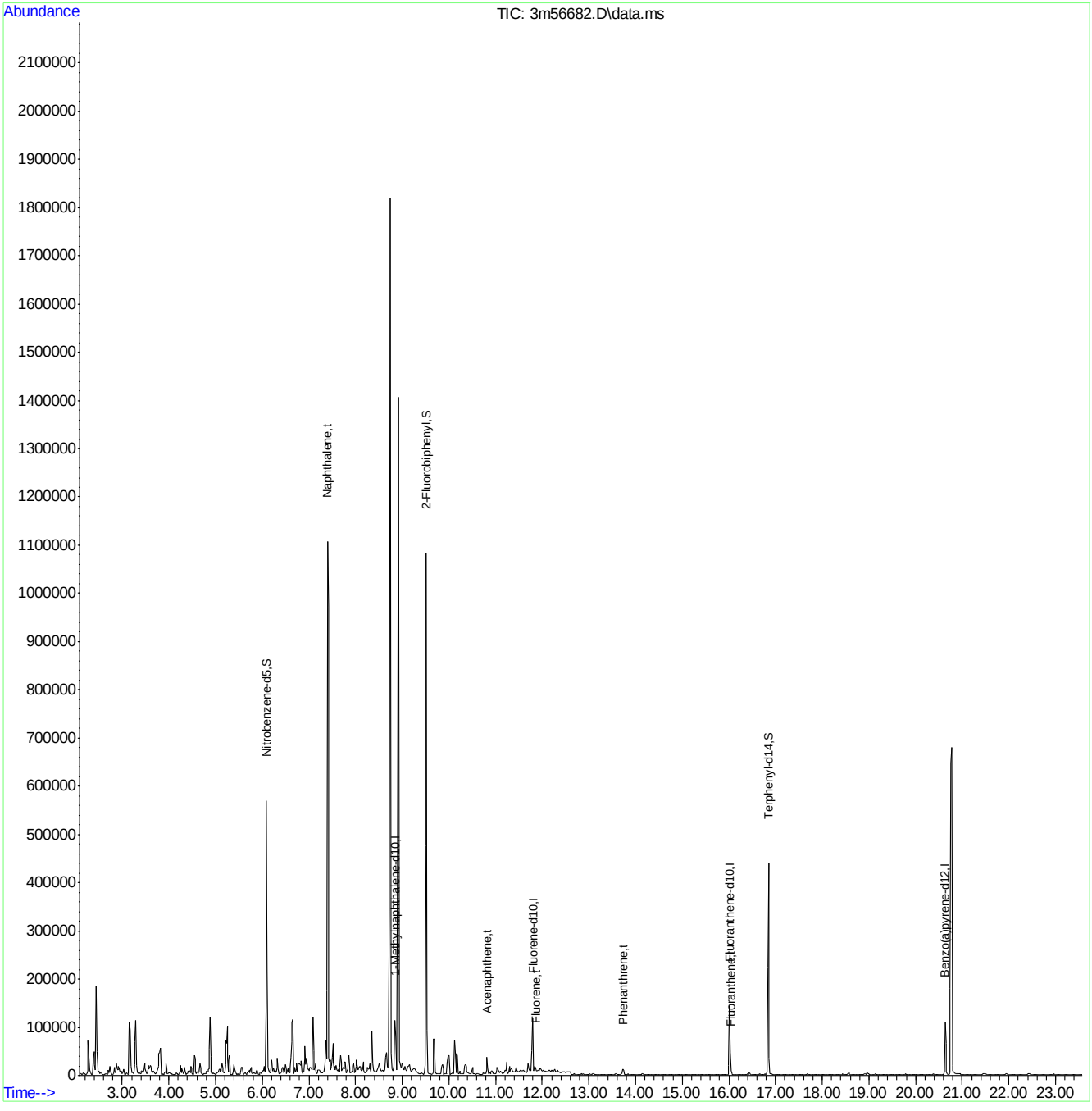
9.1.8

9

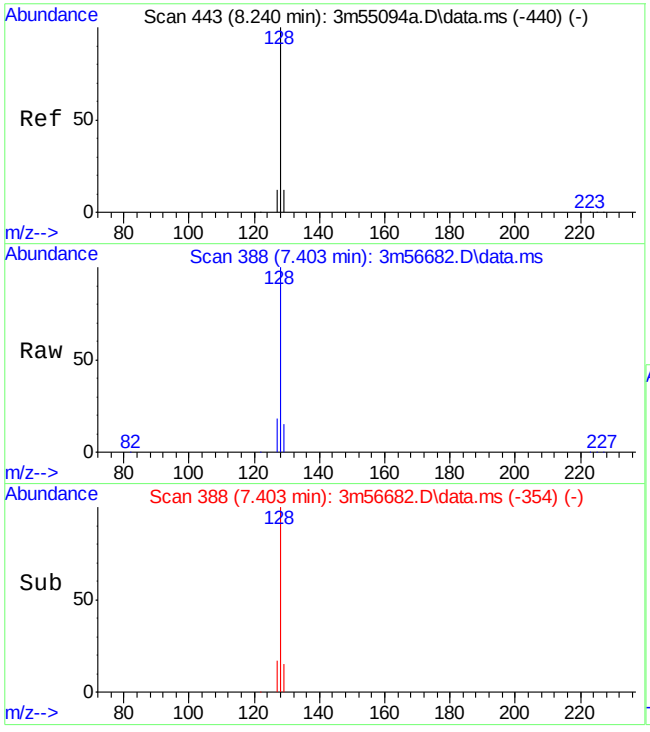
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56682.D
Acq On : 31 Jul 2015 6:04 pm
Operator : linseyk
Sample : jc300-5
Misc : op85942a,e3m2618,1000
ALS Vial : 18 Sample Multiplier: 1

Quant Time: Jul 31 19:06:43 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration



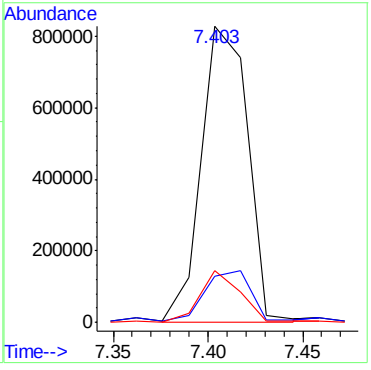
ACCUTEST LABORATORIES JC300

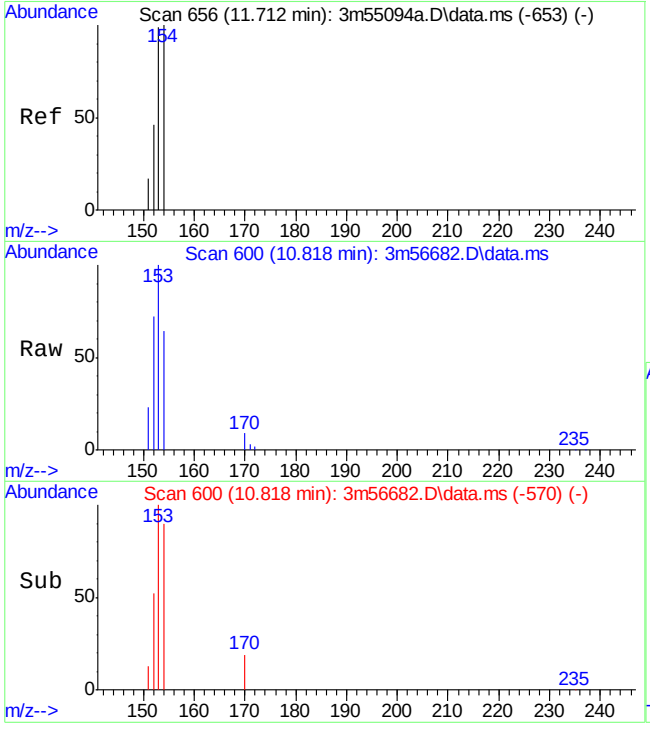


#8
Naphthalene
Concen: 24.43 ppm
RT: 7.403 min Scan# 388
Delta R.T. -0.027 min
Lab File: 3m56682.D
Acq: 31 Jul 2015 6:04 pm

Tgt Ion:128 Resp: 1421105

Ion	Ratio	Lower	Upper
128	100		
129	14.8	0.0	40.8
127	17.3	0.0	43.2

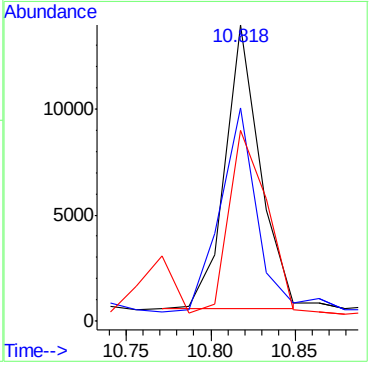


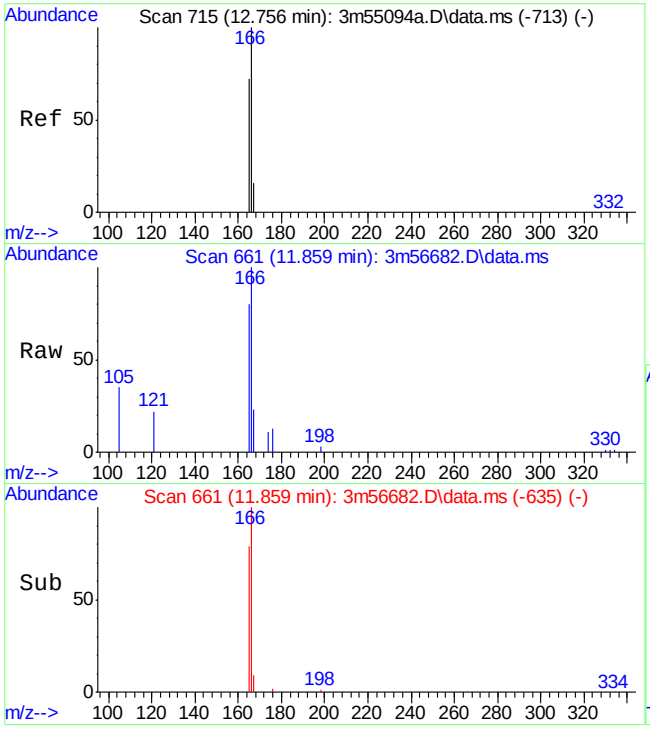


#16
Acenaphthene
Concen: 0.62 ppm
RT: 10.818 min Scan# 600
Delta R.T. -0.031 min
Lab File: 3m56682.D
Acq: 31 Jul 2015 6:04 pm

Tgt Ion:153 Resp: 19414

Ion	Ratio	Lower	Upper
153	100		
152	71.1	12.4	72.4
154	54.2	74.5	134.5#

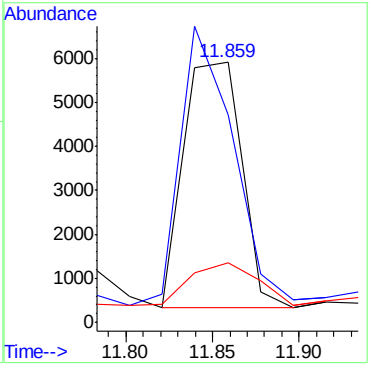


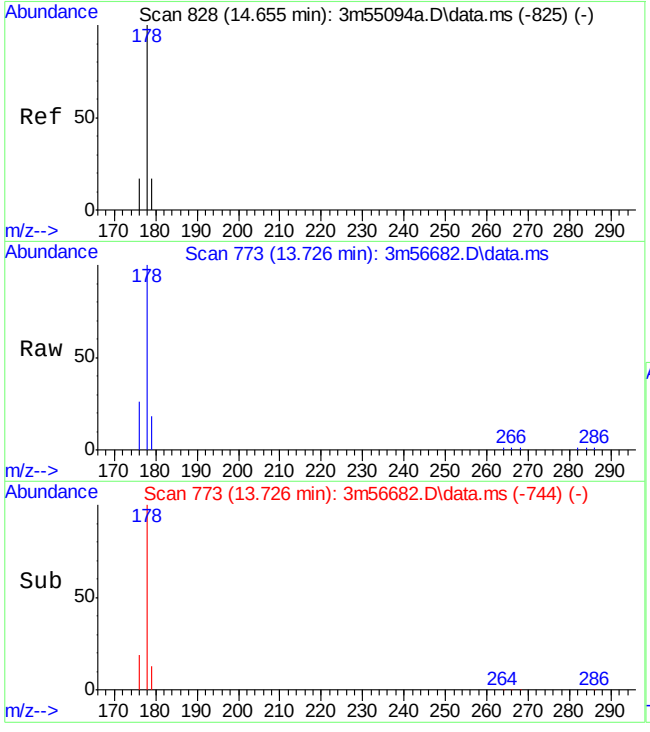


#18
Fluorene
Concen: 0.41 ppm
RT: 11.859 min Scan# 661
Delta R.T. -0.019 min
Lab File: 3m56682.D
Acq: 31 Jul 2015 6:04 pm

Tgt Ion:166 Resp: 12920

Ion	Ratio	Lower	Upper
166	100		
165	73.8	52.3	112.3
167	17.1	0.0	44.3

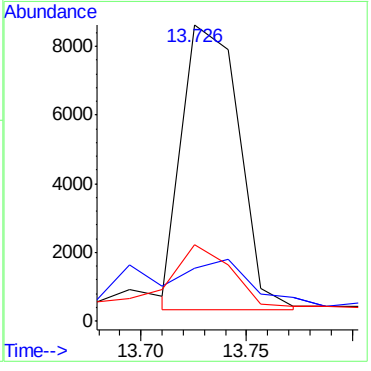


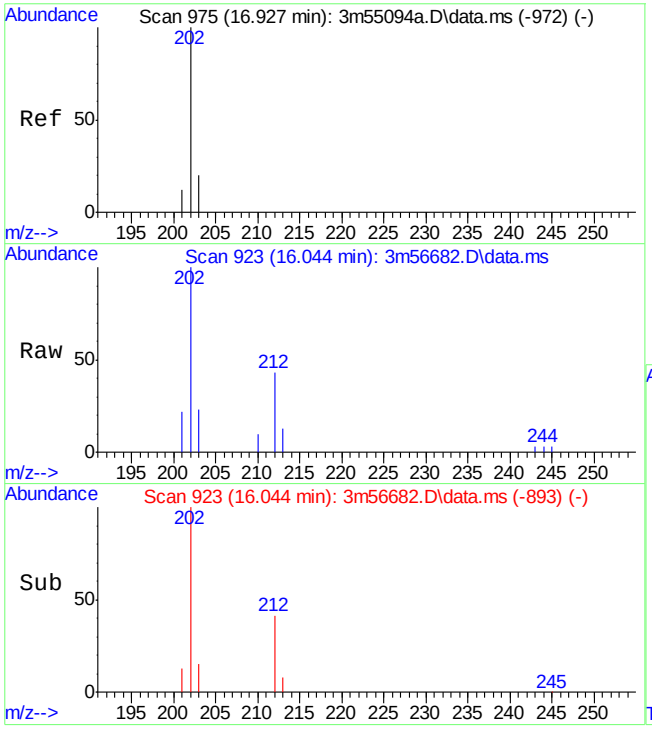


#23
Phenanthrene
Concen: 0.28 ppm
RT: 13.726 min Scan# 773
Delta R.T. -0.046 min
Lab File: 3m56682.D
Acq: 31 Jul 2015 6:04 pm

Tgt Ion:178 Resp: 15400

Ion	Ratio	Lower	Upper
178	100		
179	8.5	0.0	45.6
176	19.2	0.0	48.5

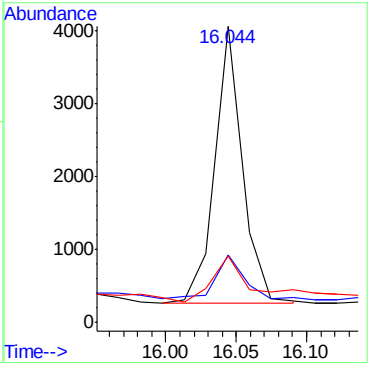




#25
Fluoranthene
Concen: 0.11 ppm
RT: 16.044 min Scan# 923
Delta R.T. -0.031 min
Lab File: 3m56682.D
Acq: 31 Jul 2015 6:04 pm

Tgt Ion:202 Resp: 5123

Ion	Ratio	Lower	Upper
202	100		
203	15.8	0.0	48.5
201	13.5	0.0	43.3



9.1.8

9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e5p1033\
Data File : 5p20008.D
Acq On : 30 Jul 2015 10:08 pm
Operator : sarad
Sample : jc300-5
Misc : op85942a,e5p1033,1000
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Aug 12 11:29:53 2015
Quant Method : C:\MSDCHEM\1\METHODS\M5P1005.M
Quant Title : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
QLast Update : Fri Jul 31 08:21:03 2015
Response via : Initial Calibration

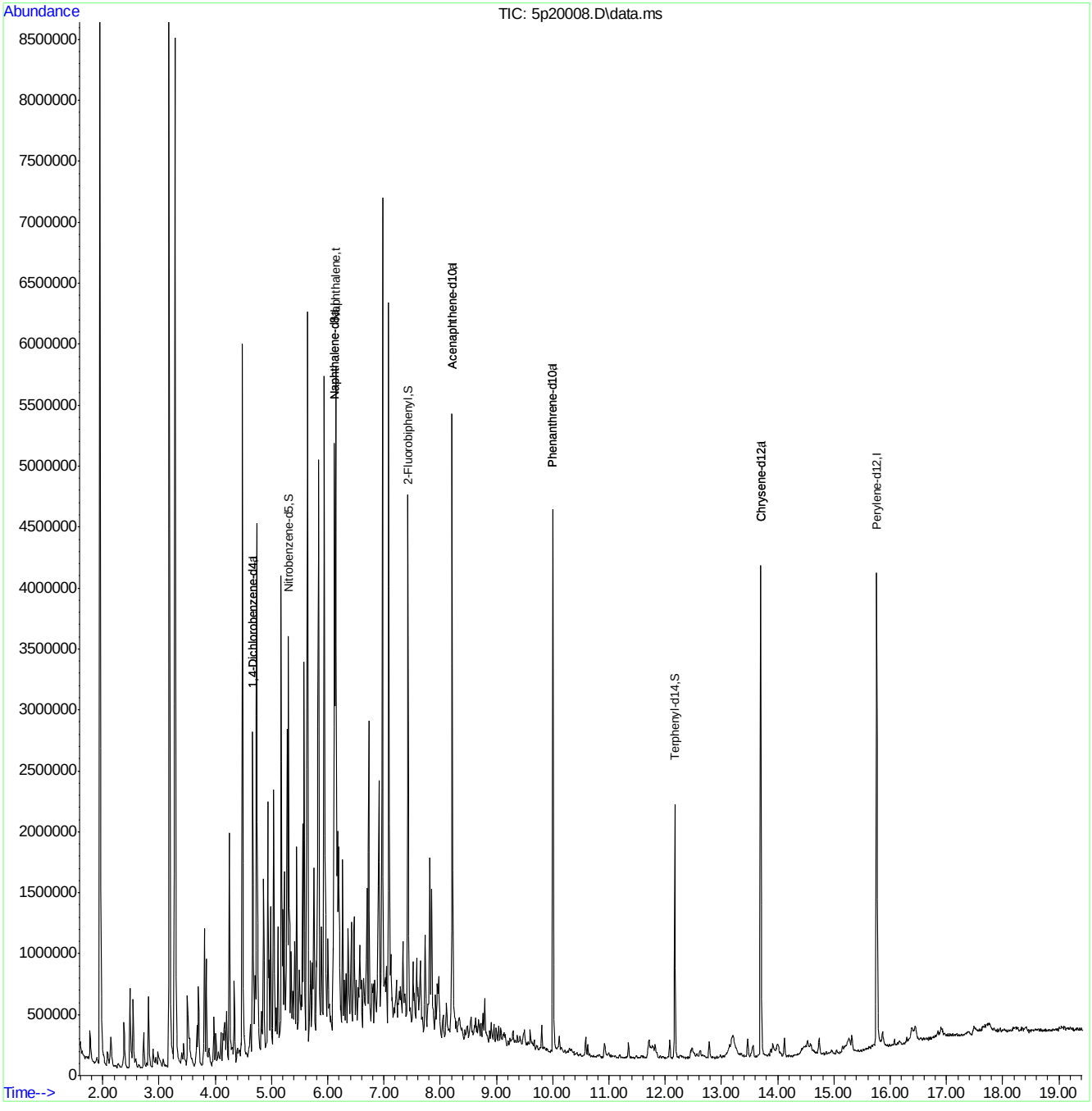
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.665	152	465838	40.00	ppm	-0.01
24) Naphthalene-d8	6.118	136	1807144	40.00	ppm	0.00
47) Acenaphthene-d10	8.212	164	1082826	40.00	ppm	-0.01
69) Phenanthrene-d10	10.002	188	1832011	40.00	ppm	-0.02
83) Chrysene-d12	13.698	240	1852212	40.00	ppm	-0.02
92) Perylene-d12	15.761	264	1848018	40.00	ppm	-0.02
102) 1,4-Dichlorobenzene-d4a	4.665	152	465838	40.00	ppm	-0.01
104) Acenaphthene-d10a	8.212	164	1082811	40.00	ppm	-0.01
106) Chrysene-d12a	13.698	240	1852212	40.00	ppm	-0.02
108) Phenanthrene-d10a	10.002	188	1832011	40.00	ppm	-0.02
110) Naphthalene-d8a	6.118	136	1807144	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0d	0.00	ppm	
Spiked Amount 50.000			Recovery = 0.00%			
8) Phenol-d5	0.000	99	0d	0.00	ppm	
Spiked Amount 50.000			Recovery = 0.00%			
25) Nitrobenzene-d5	5.300	82	634314	41.33	ppm	0.00
Spiked Amount 50.000			Recovery = 82.66%			
51) 2-Fluorobiphenyl	7.427	172	1413831	41.60	ppm	0.00
Spiked Amount 50.000			Recovery = 83.20%			
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery = 0.00%			
85) Terphenyl-d14	12.171	244	765136	22.95	ppm	-0.02
Spiked Amount 50.000			Recovery = 45.90%			
Target Compounds						Qvalue
38) Naphthalene	6.144	128	2316468	49.76	ppm	99

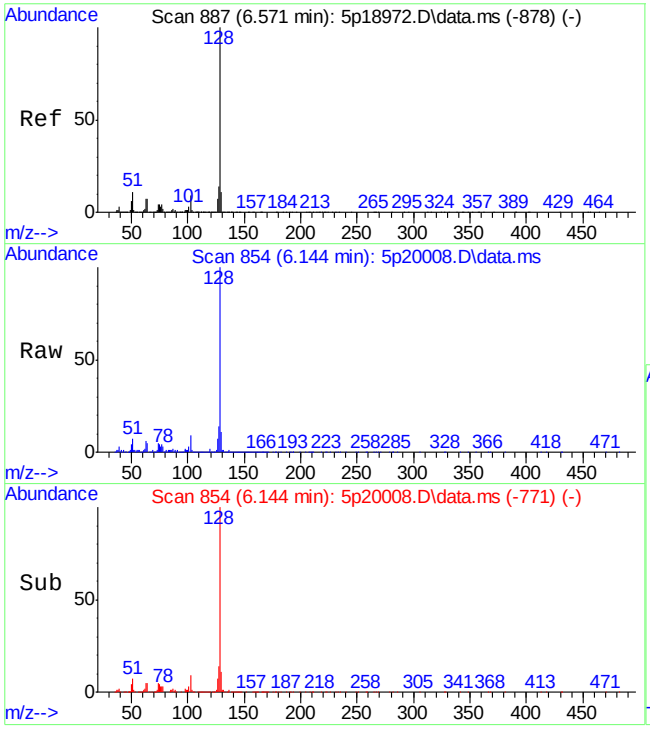
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e5p1033\
Data File : 5p20008.D
Acq On : 30 Jul 2015 10:08 pm
Operator : sarad
Sample : jc300-5
Misc : op85942a,e5p1033,1000
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Aug 12 11:29:53 2015
Quant Method : C:\MSDCHEM\1\METHODS\M5P1005.M
Quant Title : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
QLast Update : Fri Jul 31 08:21:03 2015
Response via : Initial Calibration

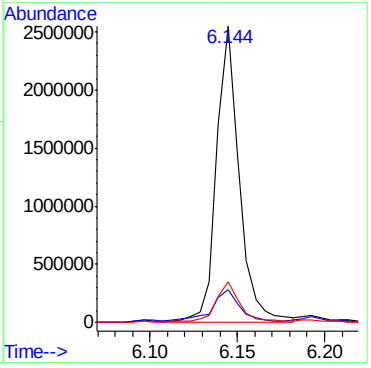




#38
Naphthalene
Concen: 49.76 ppm
RT: 6.144 min Scan# 854
Delta R.T. -0.059 min
Lab File: 5p20008.D
Acq: 30 Jul 15 10:08 pm

Tgt Ion:128 Resp: 2316468

Ion	Ratio	Lower	Upper
128	100		
129	10.5	0.0	41.0
127	13.5	0.0	43.3



9.1.9

6

Manual Integrations APPROVED (compounds with "m" flag)
Nina Pandya
08/12/15 14:04

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E4M2592\
Data File : 4m59393.D
Acq On : 2 Aug 2015 1:14 am
Operator : ashleyd
Sample : jc300-6
Misc : op85975a,e4m2592,990
ALS Vial : 19 Sample Multiplier: 1

Quant Time: Aug 03 11:09:26 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4M2577SIM.M
Quant Title : Semi Volatile GC/MS,zb-5 15m x .25mm x .50um
QLast Update : Thu Jul 23 15:03:55 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1-Methylnaphthalene-d10	9.958	152	34611	4.00	ppm	#-0.10
12) Fluorene-d10	12.940	176	65481	4.00	ppm	-0.09
22) Fluoranthene-d10	17.090	212	86955	4.00	ppm	-0.09
28) Benzo(a)pyrene-d12	21.661	264	63789	4.00	ppm	-0.10
35) 1-Methylnaphthalene-d10a	9.958	152	34153	4.00	ppm	#-0.10
38) Fluorene-d10a	12.940	176	65481	4.00	ppm	-0.09
System Monitoring Compounds						
2) 2-Fluorophenol	0.000	112	0d	0.00	ppm	
Spiked Amount 50.000	Range 11 - 58		Recovery	=	0.00%#	
3) Phenol-d5	0.000	99	0d	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
6) Nitrobenzene-d5	7.131	82	68976	7.63	ppm	-0.09
Spiked Amount 50.000			Recovery	=	15.26%	
11) 2-Fluorobiphenyl	10.594	172	311863	22.79	ppm	-0.10
Spiked Amount 50.000			Recovery	=	45.58%	
17) 2,4,6-Tribromophenol	0.000	330	0d	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
25) Terphenyl-d14	17.881	244	182284	12.71	ppm	-0.09
Spiked Amount 50.000			Recovery	=	25.42%	
Target Compounds						Qvalue
7) Naphthalene	8.508	128	5051302	184.74	ppm	98
14) Acenaphthene	11.941	153	217310	18.29	ppm #	70
16) Fluorene	12.984	166	417103	20.96	ppm	97
20) Phenanthrene	14.887	178	1368942	47.99	ppm	98
21) Anthracene	14.980	178	240404	9.21	ppm	91
23) Fluoranthene	17.128	202	50888	1.94	ppm	97
24) Pyrene	17.504	202	207589	8.10	ppm	82
26) Benzo[a]anthracene	19.575	228	9422m	0.48	ppm	
27) Chrysene	19.632	228	16153m	0.79	ppm	
31) Benzo[a]pyrene	21.688	252	3482	0.18	ppm	91
34) Benzo[g,h,i]perylene	23.657	276	2269	0.12	ppm	95

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

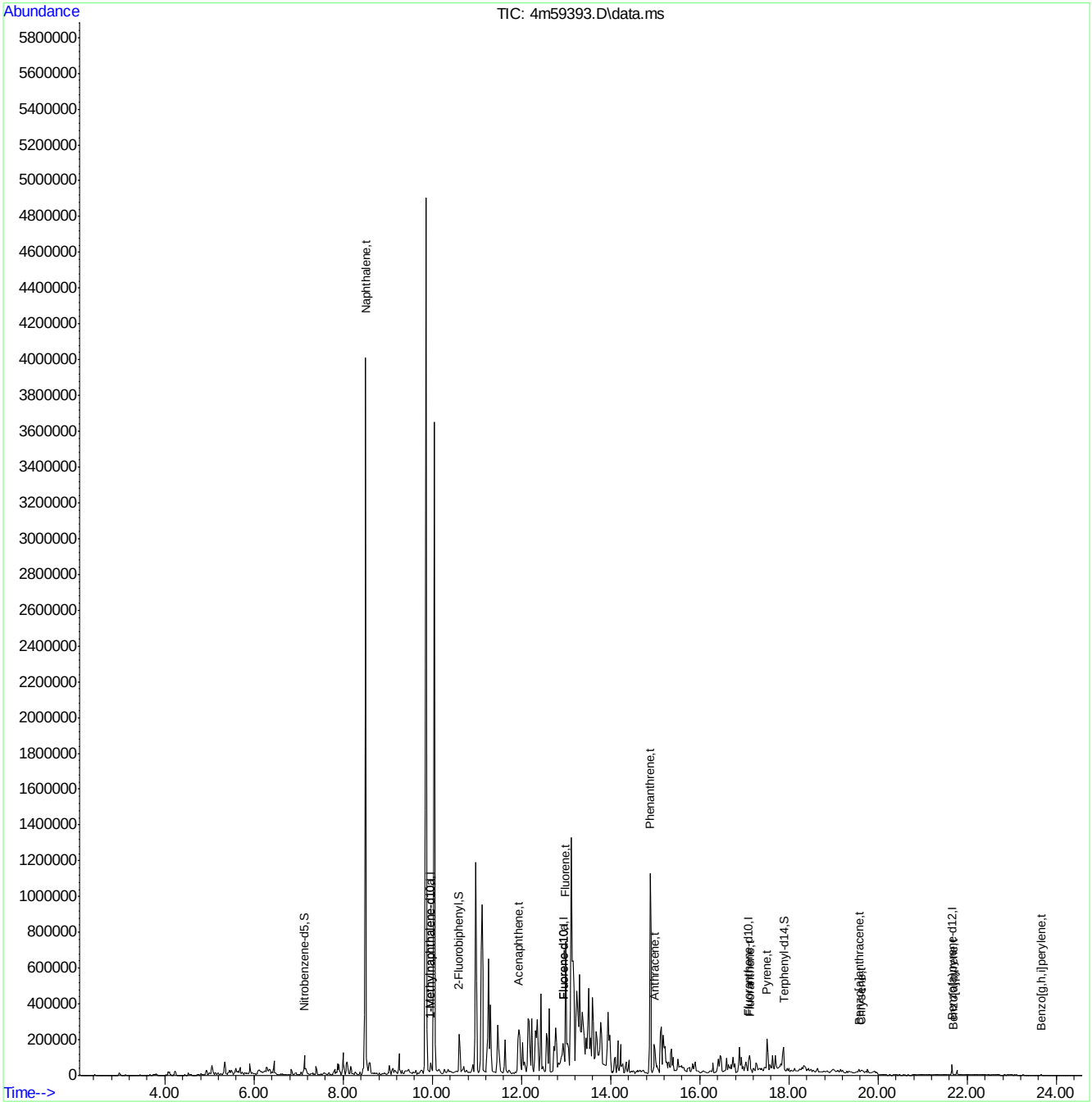
9.1.10

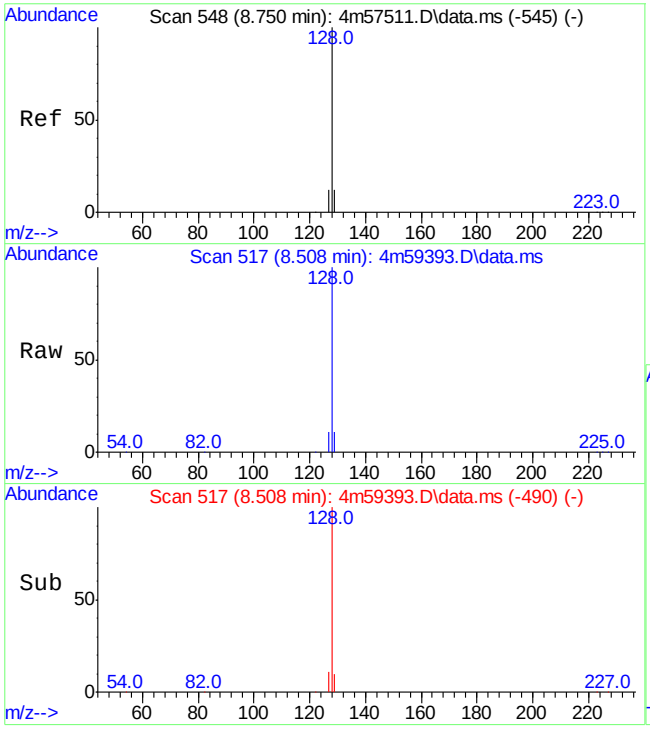
9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E4M2592\
Data File : 4m59393.D
Acq On : 2 Aug 2015 1:14 am
Operator : ashleyd
Sample : jc300-6
Misc : op85975a,e4m2592,990
ALS Vial : 19 Sample Multiplier: 1

Quant Time: Aug 03 11:09:26 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4M2577SIM.M
Quant Title : Semi Volatile GC/MS,zb-5 15m x .25mm x .50um
QLast Update : Thu Jul 23 15:03:55 2015
Response via : Initial Calibration

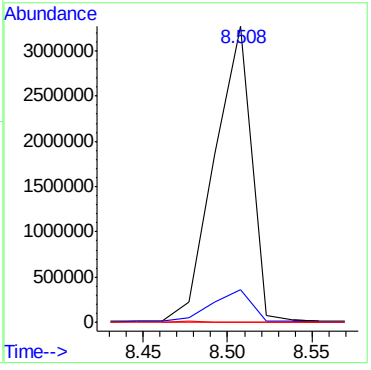


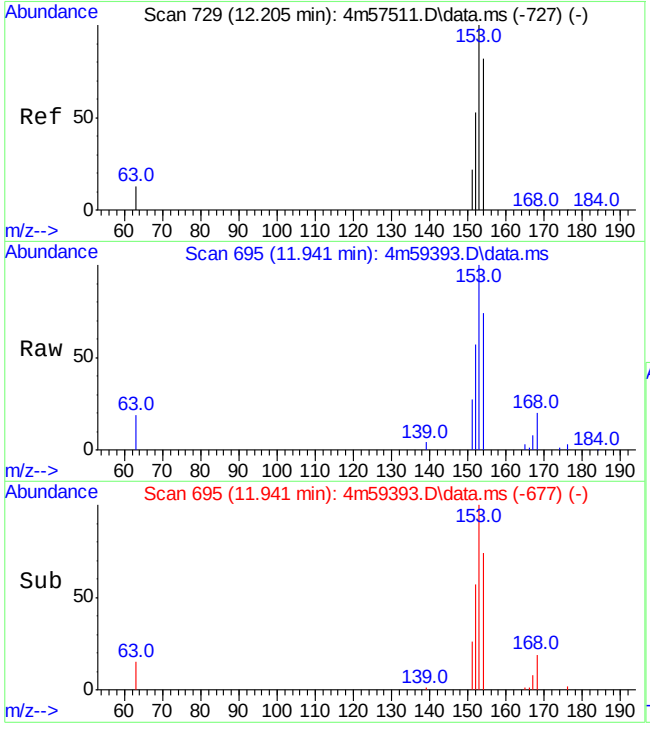


#7
Naphthalene
Concen: 184.74 ppm
RT: 8.508 min Scan# 517
Delta R.T. -0.077 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

Tgt Ion:128 Resp: 5051302

Ion	Ratio	Lower	Upper
128	100		
129	10.9	0.0	40.3
122	0.1	0.0	30.3

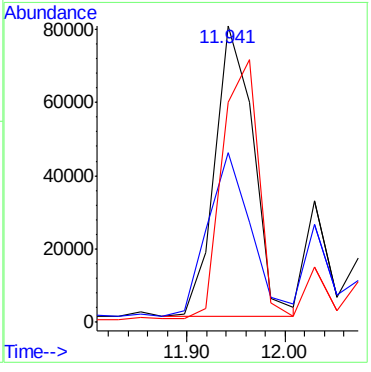




#14
Acenaphthene
Concen: 18.29 ppm
RT: 11.941 min Scan# 695
Delta R.T. -0.111 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

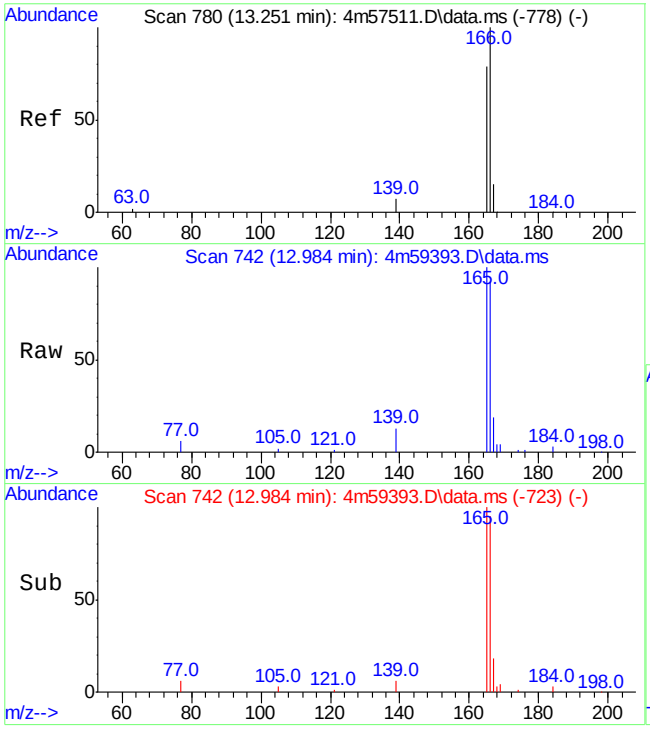
Tgt Ion:153 Resp: 217310

Ion	Ratio	Lower	Upper
153	100		
152	55.4	9.5	69.5
154	75.4	78.6	138.6#



9.1.10

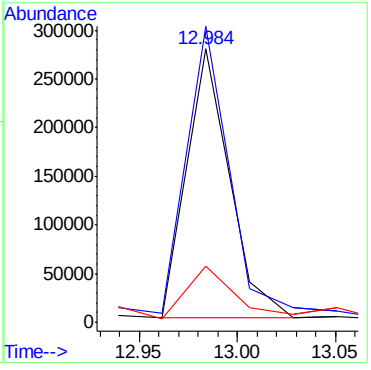
9

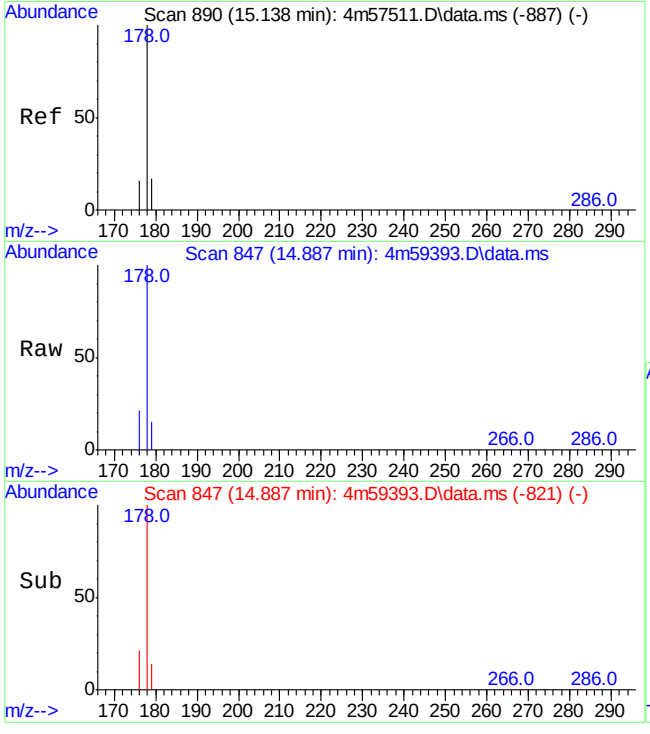


#16
Fluorene
Concen: 20.96 ppm
RT: 12.984 min Scan# 742
Delta R.T. -0.089 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

Tgt Ion:166 Resp: 417103

Ion	Ratio	Lower	Upper
166	100		
165	105.9	77.1	137.1
167	18.7	0.0	41.3

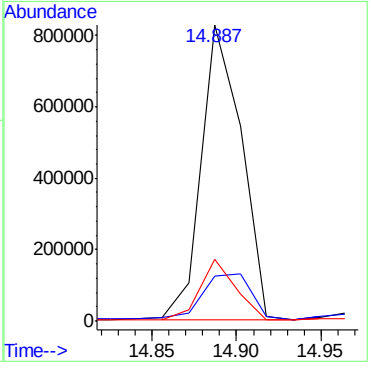




#20
Phenanthrene
Concen: 47.99 ppm
RT: 14.887 min Scan# 847
Delta R.T. -0.093 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

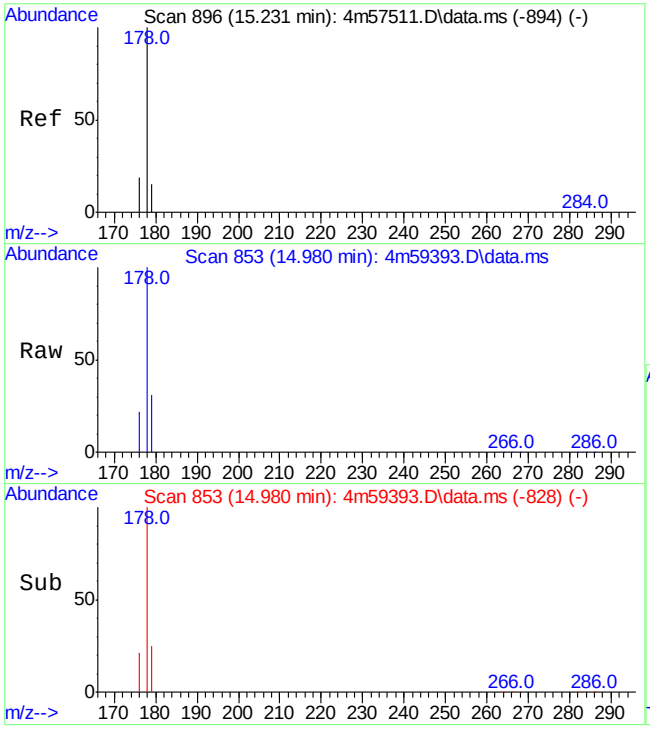
Tgt Ion:178 Resp: 1368942

Ion	Ratio	Lower	Upper
178	100		
179	14.4	0.0	44.6
176	20.5	0.0	49.2



9.1.10

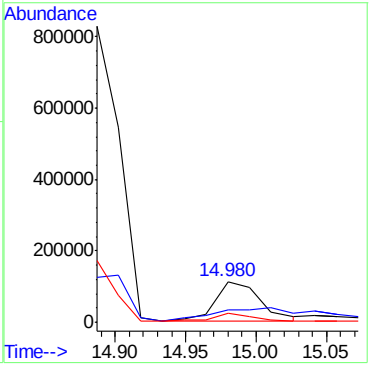
9

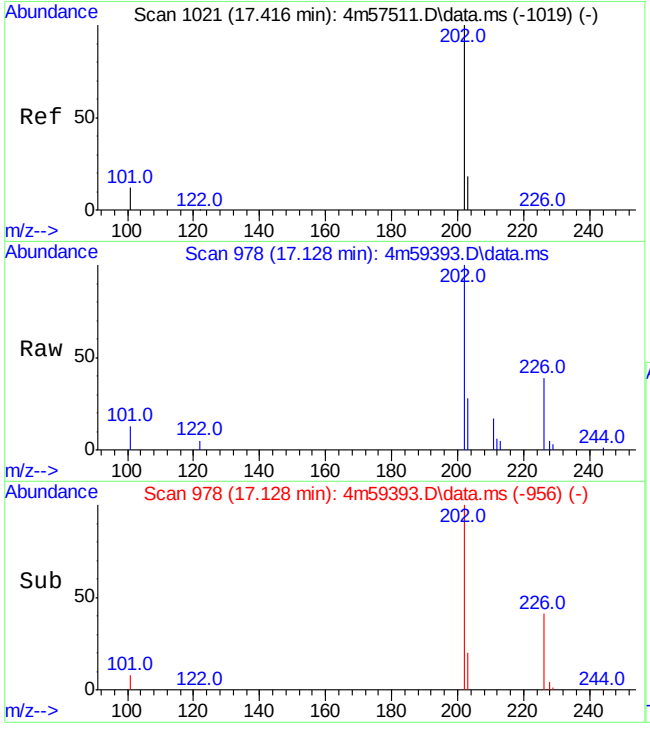


#21
Anthracene
Concen: 9.21 ppm
RT: 14.980 min Scan# 853
Delta R.T. -0.108 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

Tgt Ion:178 Resp: 240404

Ion	Ratio	Lower	Upper
178	100		
179	18.8	0.0	46.9
176	20.9	0.0	44.8

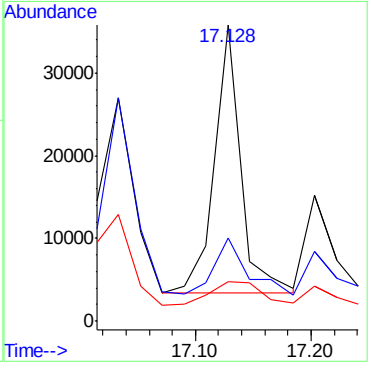




#23
Fluoranthene
Concen: 1.94 ppm
RT: 17.128 min Scan# 978
Delta R.T. -0.094 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

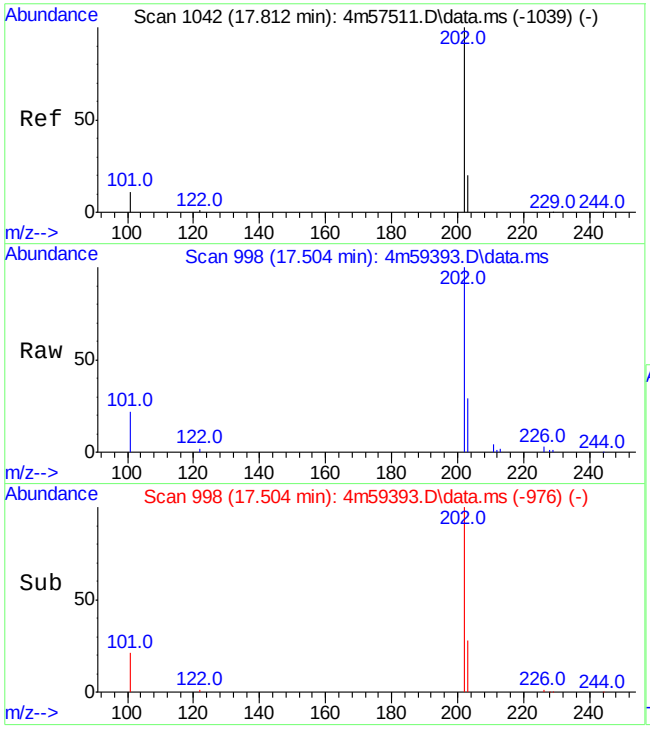
Tgt Ion:202 Resp: 50888

Ion	Ratio	Lower	Upper
202	100		
203	21.0	0.0	50.2
101	8.6	0.0	36.2



9.1.10

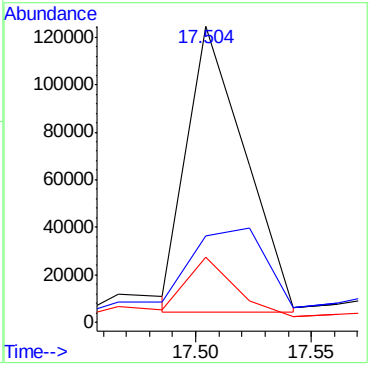
9

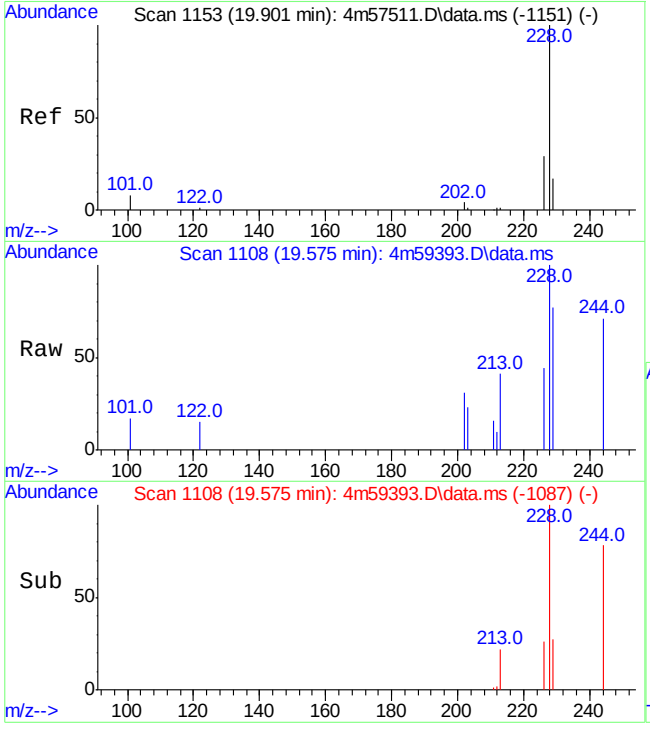


#24
Pyrene
Concen: 8.10 ppm
RT: 17.504 min Scan# 998
Delta R.T. -0.095 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

Tgt Ion:202 Resp: 207589

Ion	Ratio	Lower	Upper
202	100		
203	25.2	0.0	45.5
101	20.1	0.0	44.6

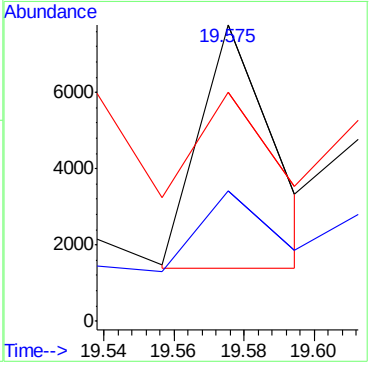




#26
Benzo[a]anthracene
Concen: 0.48 ppm m
RT: 19.575 min Scan# 1108
Delta R.T. -0.113 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

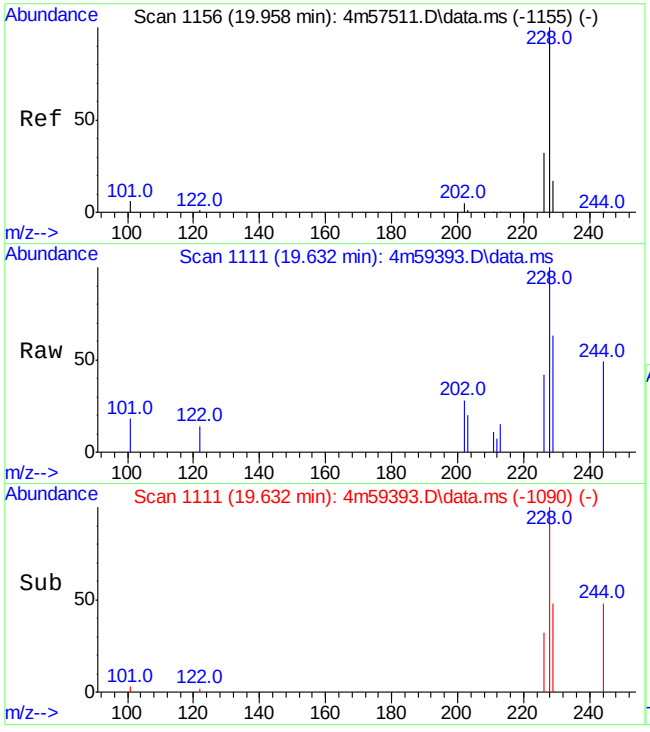
Tgt Ion:228 Resp: 9422

Ion	Ratio	Lower	Upper
228	100		
226	43.9	0.0	49.9
229	77.3	21.5	25.5#



9.1.10

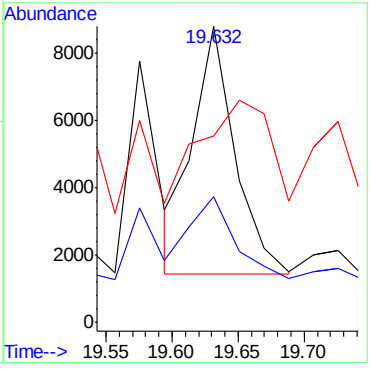
9

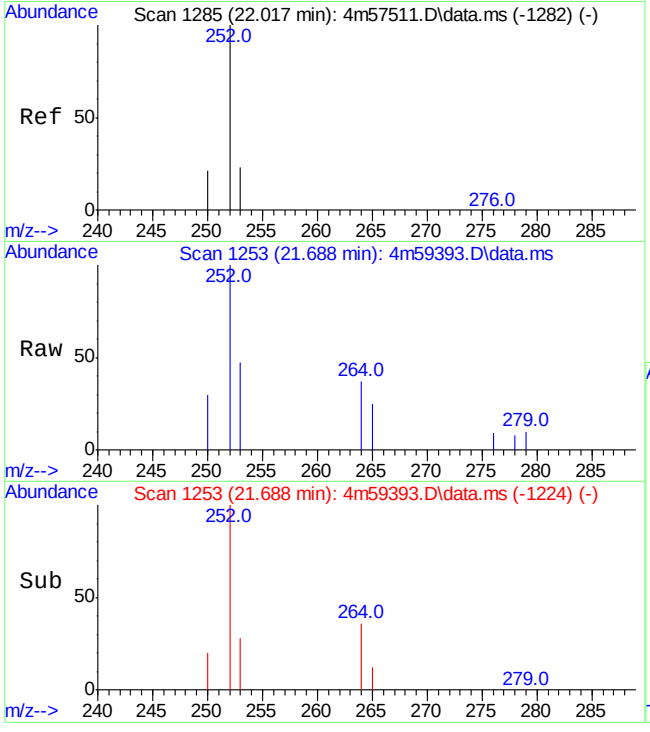


#27
Chrysene
Concen: 0.79 ppm m
RT: 19.632 min Scan# 1111
Delta R.T. -0.113 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

Tgt Ion:228 Resp: 16153

Ion	Ratio	Lower	Upper
228	100		
226	42.5	0.0	52.2
229	62.7	2.8	42.8#

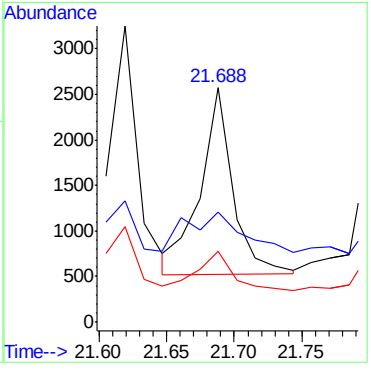




#31
Benzo[a]pyrene
Concen: 0.18 ppm
RT: 21.688 min Scan# 1253
Delta R.T. -0.097 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

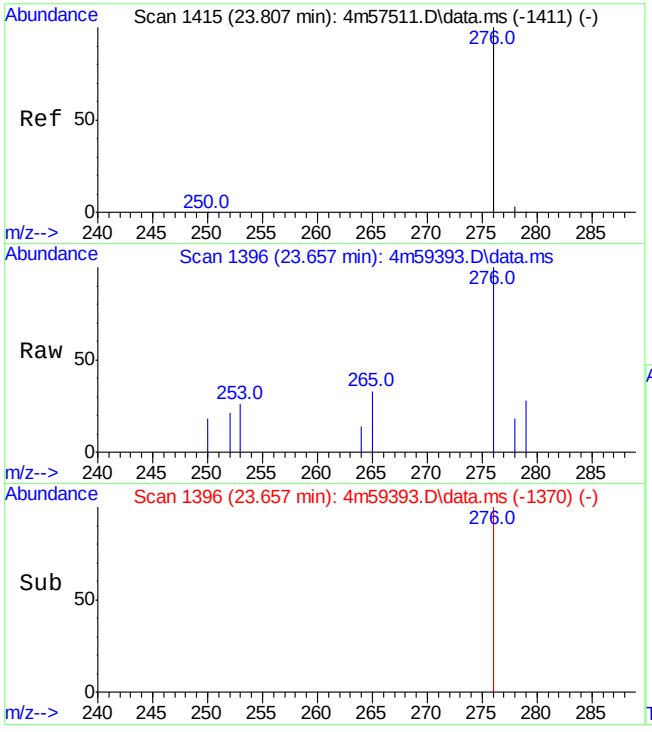
Tgt Ion:252 Resp: 3482

Ion	Ratio	Lower	Upper
252	100		
253	22.4	0.0	48.3
250	21.4	0.0	55.5



9.1.10

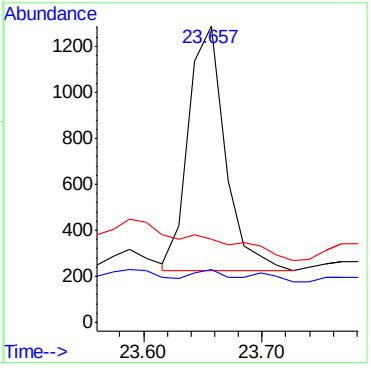
9



#34
Benzo[g,h,i]perylene
Concen: 0.12 ppm
RT: 23.657 min Scan# 1396
Delta R.T. -0.138 min
Lab File: 4m59393.D
Acq: 2 Aug 2015 1:14 am

Tgt Ion:276 Resp: 2269

Ion	Ratio	Lower	Upper
276	100		
278	4.2	0.0	32.5
279	3.6	0.0	30.2



9.1.10

9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e5p1049\
Data File : 5p20383.D
Acq On : 12 Aug 15 1:16 pm
Operator : alicjap
Sample : jc300-6
Misc : op85975a,e5p1049,990,,,1,4
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Aug 12 13:41:07 2015
Quant Method : C:\MSDCHEM\1\METHODS\M5P1005.M
Quant Title : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
QLast Update : Wed Aug 12 13:36:29 2015
Response via : Initial Calibration

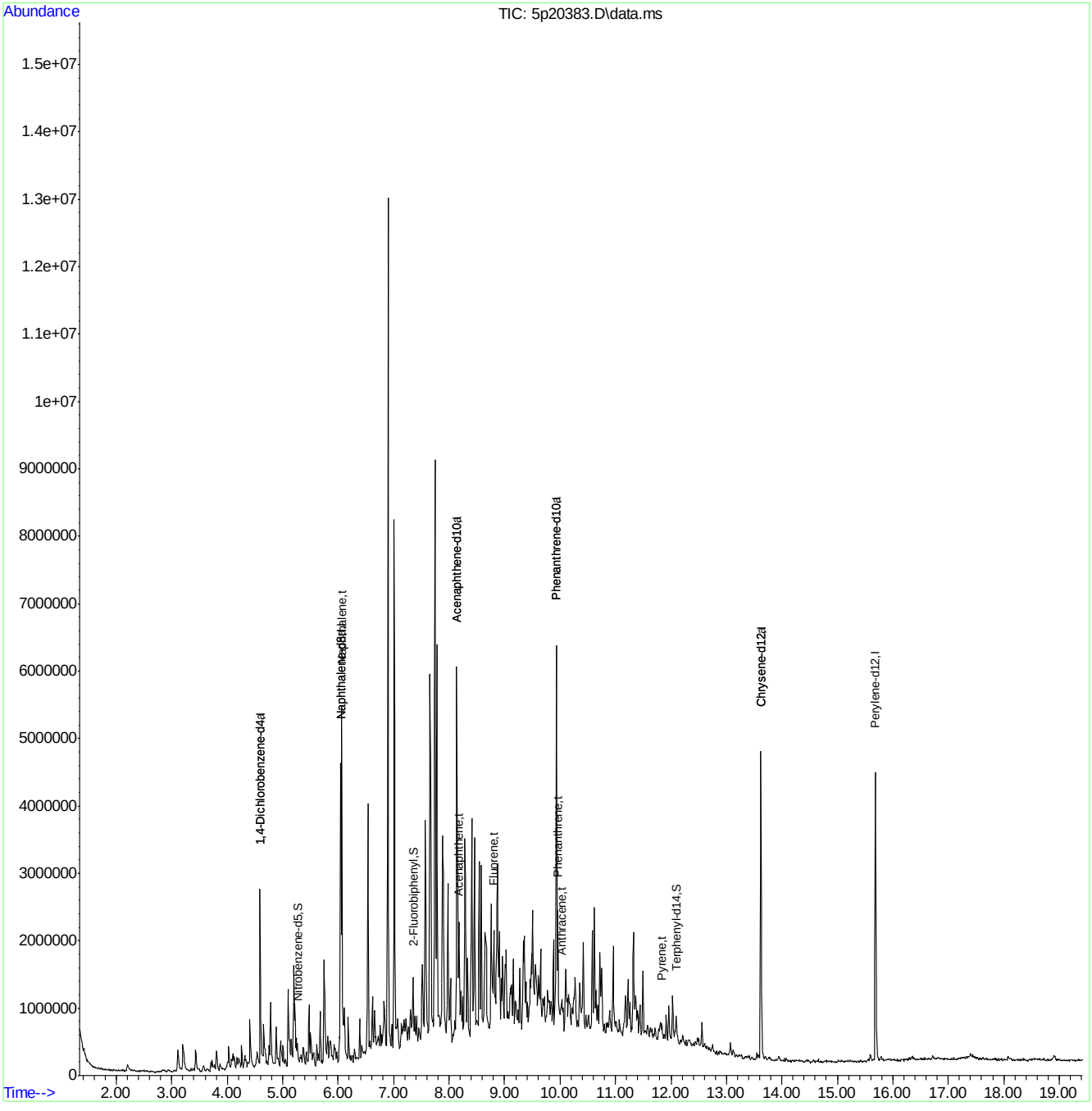
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.591	152	417613	40.00	ppm	0.00
24) Naphthalene-d8	6.044	136	1683127	40.00	ppm	0.00
47) Acenaphthene-d10	8.138	164	1097164	40.00	ppm	0.00
69) Phenanthrene-d10	9.933	188	1870772	40.00	ppm	0.00
83) Chrysene-d12	13.619	240	1964740	40.00	ppm	0.00
92) Perylene-d12	15.687	264	1922450	40.00	ppm	0.00
102) 1,4-Dichlorobenzene-d4a	4.591	152	417613	40.00	ppm	0.00
104) Acenaphthene-d10a	8.138	164	1097164	40.00	ppm	0.00
106) Chrysene-d12a	13.619	240	1964740	40.00	ppm	0.00
108) Phenanthrene-d10a	9.933	188	1870772	40.00	ppm	0.00
110) Naphthalene-d8a	6.044	136	1683127	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0d	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
8) Phenol-d5	0.000	99	0d	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
25) Nitrobenzene-d5	5.269	82	19414	1.36	ppm	0.03
Spiked Amount 50.000			Recovery	=	2.72%	
51) 2-Fluorobiphenyl	7.353	172	235867	6.85	ppm	0.00
Spiked Amount 50.000			Recovery	=	13.70%	
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
85) Terphenyl-d14	12.097	244	114489	3.24	ppm	0.00
Spiked Amount 50.000			Recovery	=	6.48%	
Target Compounds						Qvalue
38) Naphthalene	6.065	128	2008686	46.32	ppm	99
59) Acenaphthene	8.175	153	135579	4.22	ppm	88
66) Fluorene	8.806	166	173674	4.94	ppm	95
77) Phenanthrene	9.965	178	679847	12.84	ppm	98
78) Anthracene	10.029	178	105791	1.97	ppm	72
84) Pyrene	11.835	202	112299	1.90	ppm	85

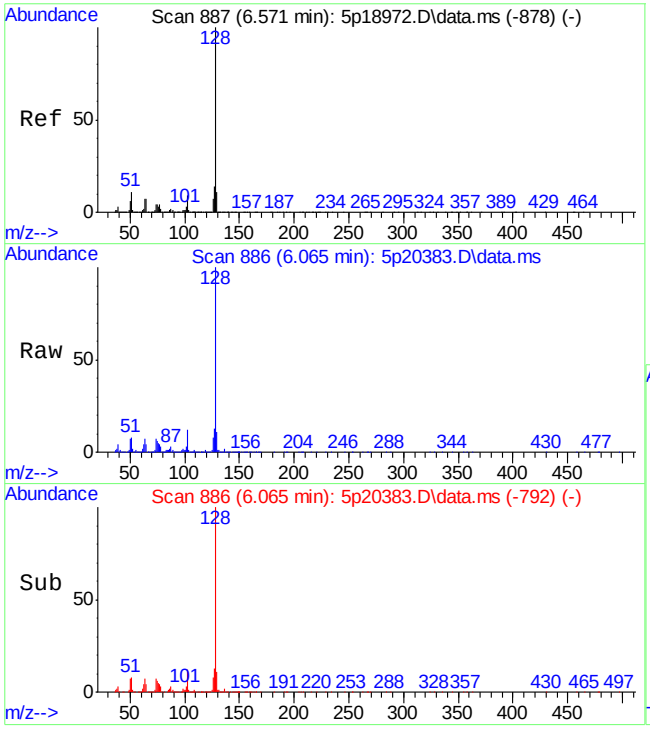
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e5p1049\
Data File : 5p20383.D
Acq On : 12 Aug 15 1:16 pm
Operator : alicjap
Sample : jc300-6
Misc : op85975a,e5p1049,990,,,1,4
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Aug 12 13:41:07 2015
Quant Method : C:\MSDCHEM\1\METHODS\M5P1005.M
Quant Title : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
QLast Update : Wed Aug 12 13:36:29 2015
Response via : Initial Calibration

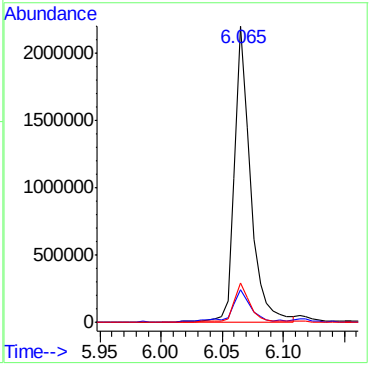


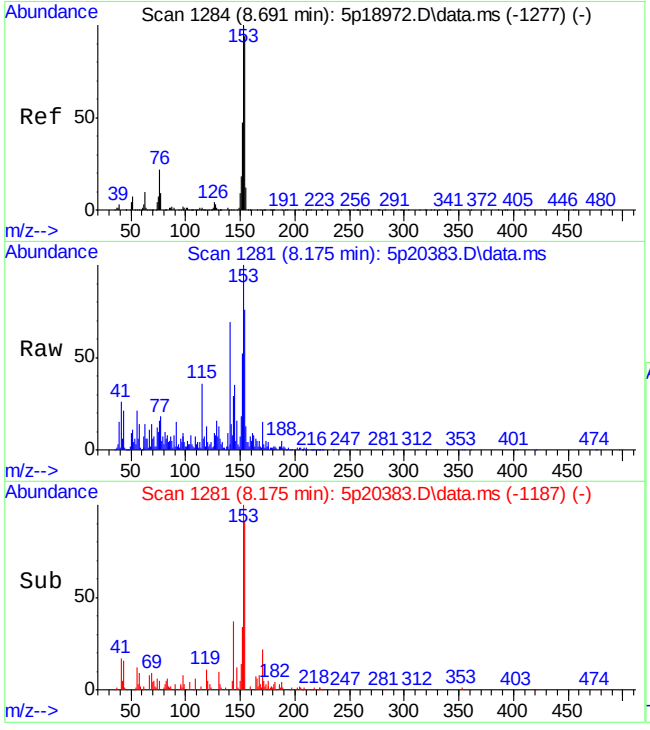


#38
Naphthalene
Concen: 46.32 ppm
RT: 6.065 min Scan# 886
Delta R.T. 0.000 min
Lab File: 5p20383.D
Acq: 12 Aug 15 1:16 pm

Tgt Ion:128 Resp: 2008686

Ion	Ratio	Lower	Upper
128	100		
129	10.7	0.0	41.0
127	13.4	0.0	43.3

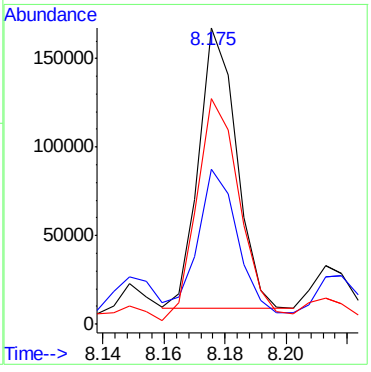




#59
Acenaphthene
Concen: 4.22 ppm
RT: 8.175 min Scan# 1281
Delta R.T. 0.000 min
Lab File: 5p20383.D
Acq: 12 Aug 15 1:16 pm

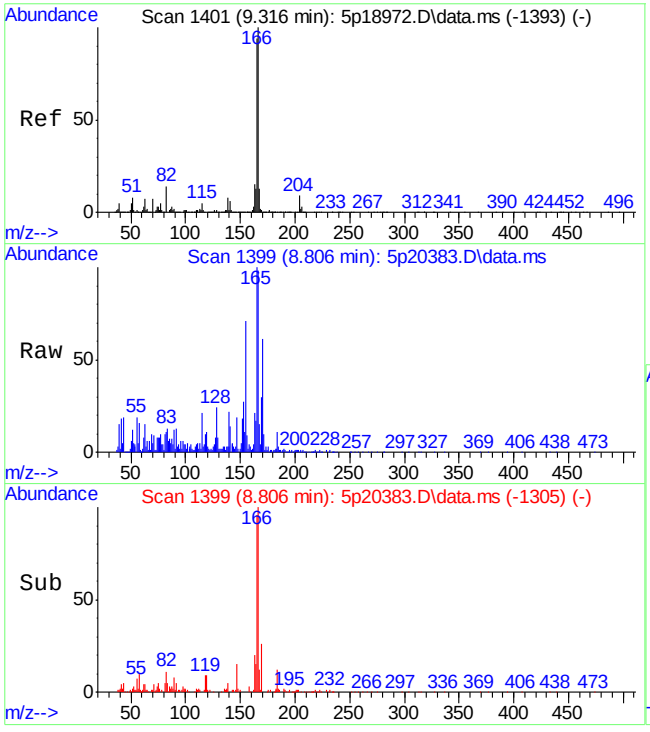
Tgt Ion:153 Resp: 135579

Ion	Ratio	Lower	Upper
153	100		
152	49.5	16.2	76.2
154	77.9	62.3	122.3



9.1.11

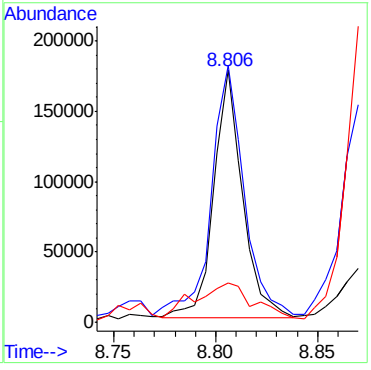
9

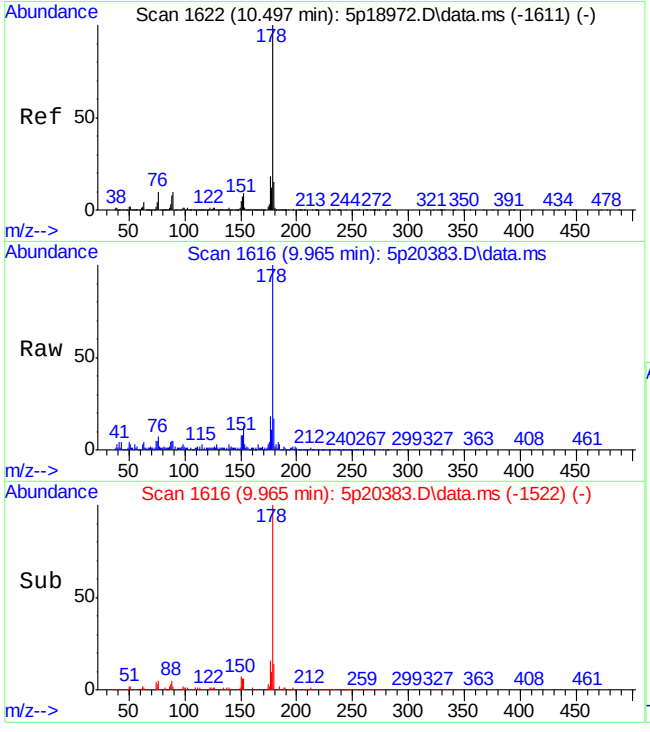


#66
Fluorene
Concen: 4.94 ppm
RT: 8.806 min Scan# 1399
Delta R.T. 0.000 min
Lab File: 5p20383.D
Acq: 12 Aug 15 1:16 pm

Tgt Ion:166 Resp: 173674

Ion	Ratio	Lower	Upper
166	100		
165	99.6	64.8	124.8
167	14.2	0.0	43.0

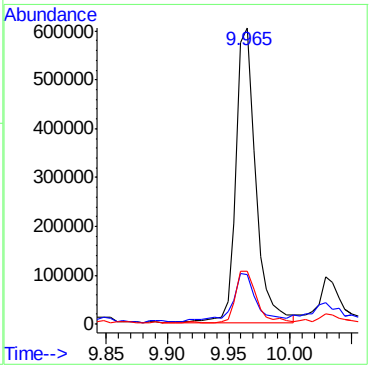




#77
Phenanthrene
Concen: 12.84 ppm
RT: 9.965 min Scan# 1616
Delta R.T. 0.000 min
Lab File: 5p20383.D
Acq: 12 Aug 15 1:16 pm

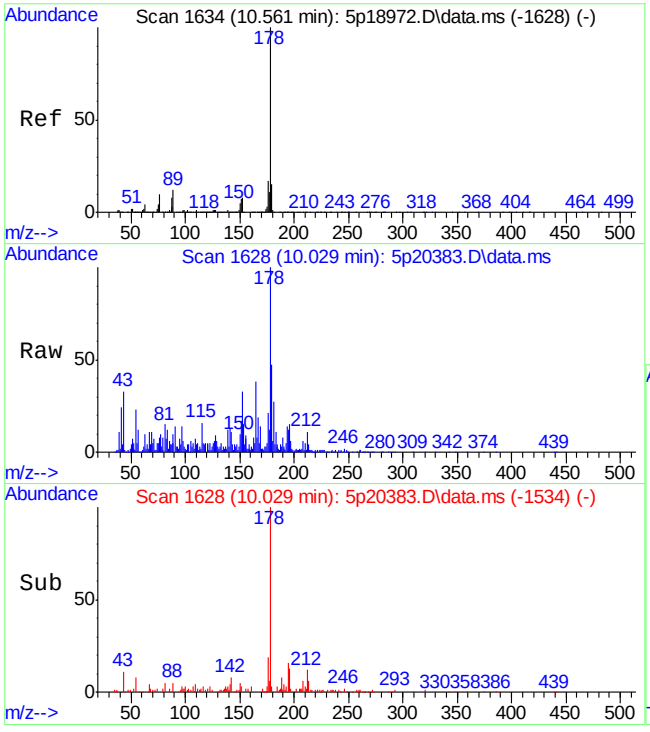
Tgt Ion:178 Resp: 679847

Ion	Ratio	Lower	Upper
178	100		
179	14.9	0.0	45.0
176	17.4	0.0	48.6



9.1.11

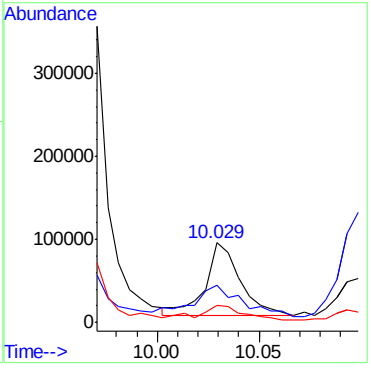
9

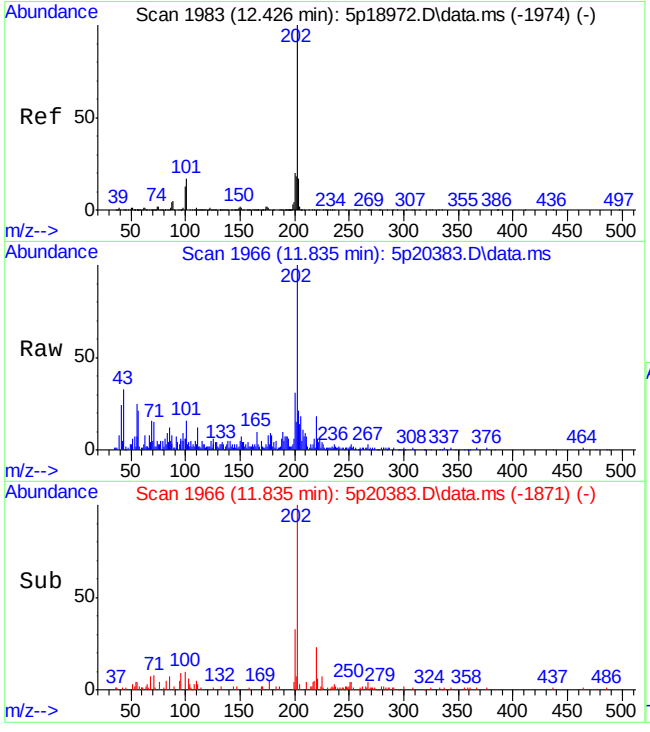


#78
Anthracene
Concen: 1.97 ppm
RT: 10.029 min Scan# 1628
Delta R.T. 0.000 min
Lab File: 5p20383.D
Acq: 12 Aug 15 1:16 pm

Tgt Ion:178 Resp: 105791

Ion	Ratio	Lower	Upper
178	100		
179	39.2	0.0	45.2
176	18.8	0.0	47.6

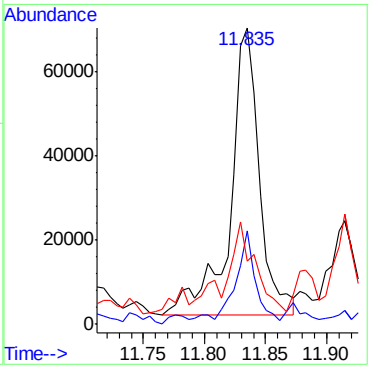




#84
Pyrene
Concen: 1.90 ppm
RT: 11.835 min Scan# 1966
Delta R.T. 0.005 min
Lab File: 5p20383.D
Acq: 12 Aug 15 1:16 pm

Tgt Ion:202 Resp: 112299

Ion	Ratio	Lower	Upper
202	100		
200	29.4	0.0	49.5
203	14.6	0.0	47.5



9.1.11

9

Manual Integrations APPROVED (compounds with "m" flag)
Nina Pandya
08/12/15 14:04

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56683.D
Acq On : 31 Jul 2015 6:34 pm
Operator : linseyk
Sample : jc300-6
Misc : op85942a,e3m2618,1000
ALS Vial : 19 Sample Multiplier: 1

Quant Time: Jul 31 19:07:39 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) 1-Methylnaphthalene-d10	8.847	150	75160	4.00 ppm	-0.02
13) Fluorene-d10	11.802	176	99584	4.00 ppm	-0.02
20) Fluoranthene-d10	16.013	212	134271	4.00 ppm	-0.03
30) Benzo(a)pyrene-d12	20.633	264	112935	4.00 ppm	-0.03
System Monitoring Compounds					
3) 2-Fluorophenol	0.000	112	0d	0.00 ppm	
Spiked Amount 50.000			Recovery	= 0.00%	
4) Phenol-d5	0.000	99	0d	0.00 ppm	
Spiked Amount 50.000			Recovery	= 0.00%	
7) Nitrobenzene-d5	6.094	82	10985	0.62 ppm	-0.01
Spiked Amount 50.000			Recovery	= 1.24%	
14) 2-Fluorobiphenyl	9.519	172	128277	4.70 ppm	-0.02
Spiked Amount 50.000			Recovery	= 9.40%	
19) 2,4,6-Tribromophenol	0.000	330	0	0.00 ppm	
Spiked Amount 50.000			Recovery	= 0.00%	
27) Terphenyl-d14	16.847	244	51191	2.22 ppm	-0.03
Spiked Amount 50.000			Recovery	= 4.44%	
Target Compounds					Qvalue
8) Naphthalene	7.404	128	819066	13.99 ppm	93
16) Acenaphthene	10.818	153	82310	2.71 ppm	79
18) Fluorene	11.859	166	104353	3.44 ppm	92
23) Phenanthrene	13.741	178	315882	6.42 ppm	94
24) Anthracene	13.834	178	65234	1.47 ppm	94
25) Fluoranthene	16.044	202	12782	0.31 ppm	94
26) Pyrene	16.446	202	66605	1.35 ppm	77
28) Benzo[a]anthracene	18.562	228	10290m	0.22 ppm	

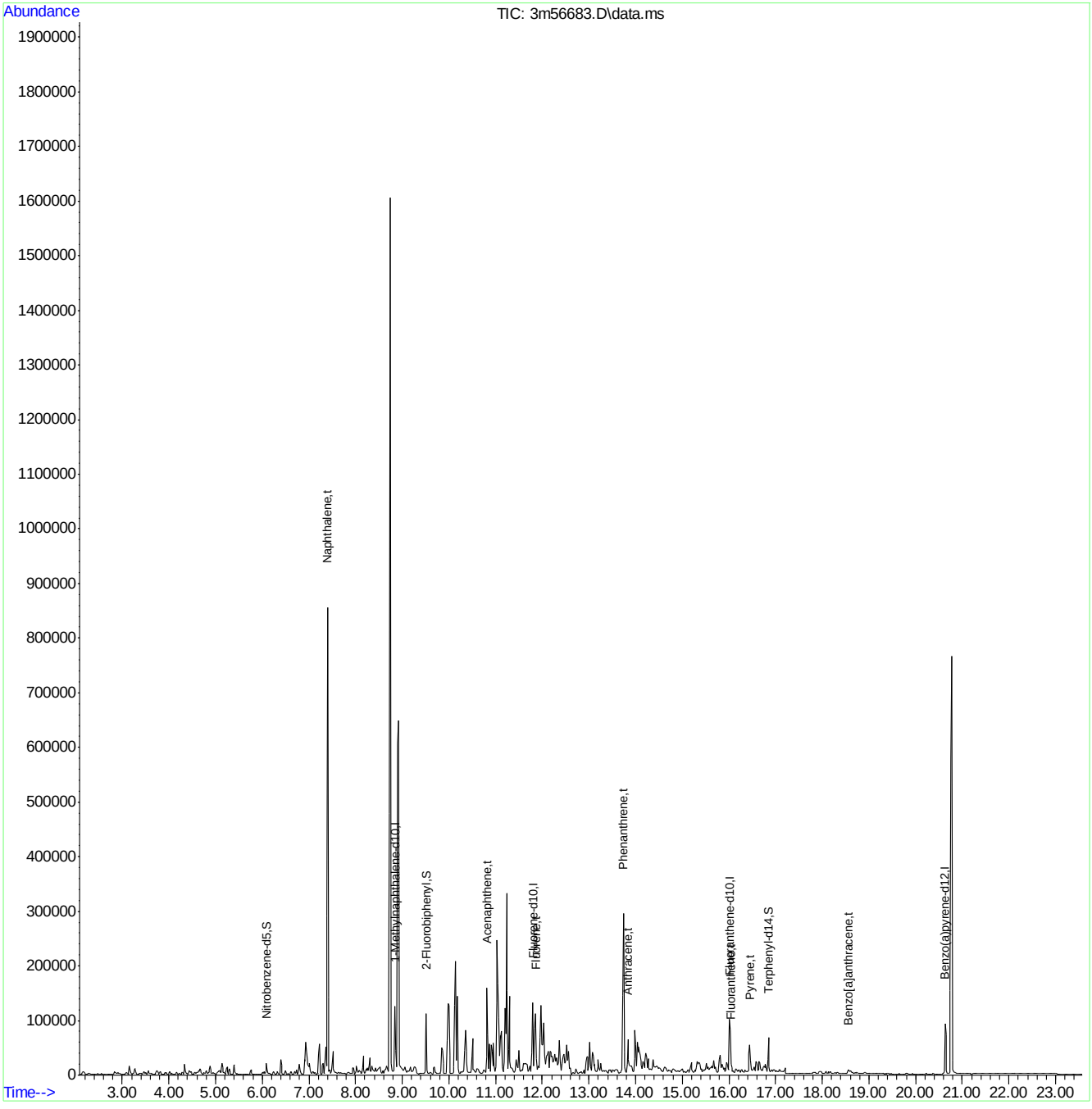
(#) = qualifier out of range (m) = manual integration (+) = signals summed

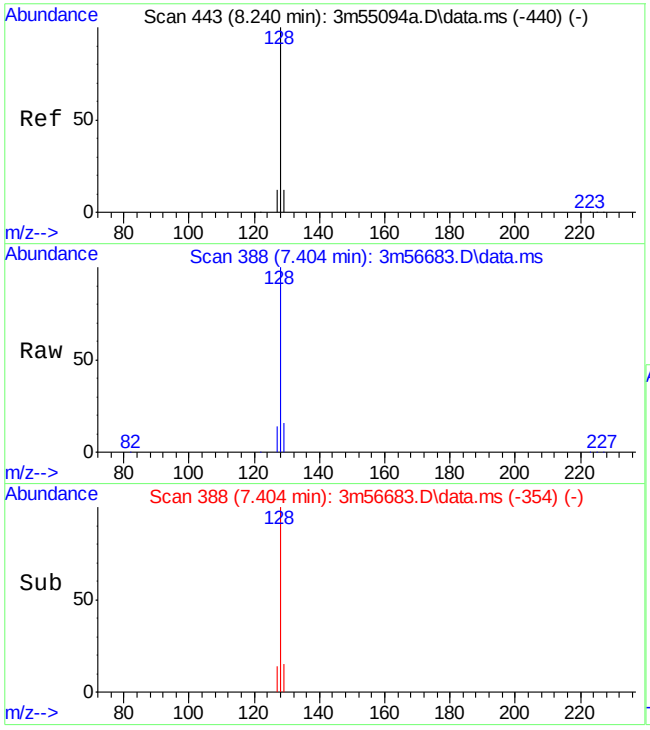
9.1.12
9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56683.D
Acq On : 31 Jul 2015 6:34 pm
Operator : linseyk
Sample : jc300-6
Misc : op85942a,e3m2618,1000
ALS Vial : 19 Sample Multiplier: 1

Quant Time: Jul 31 19:07:39 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

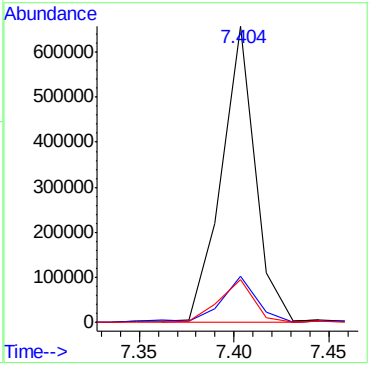


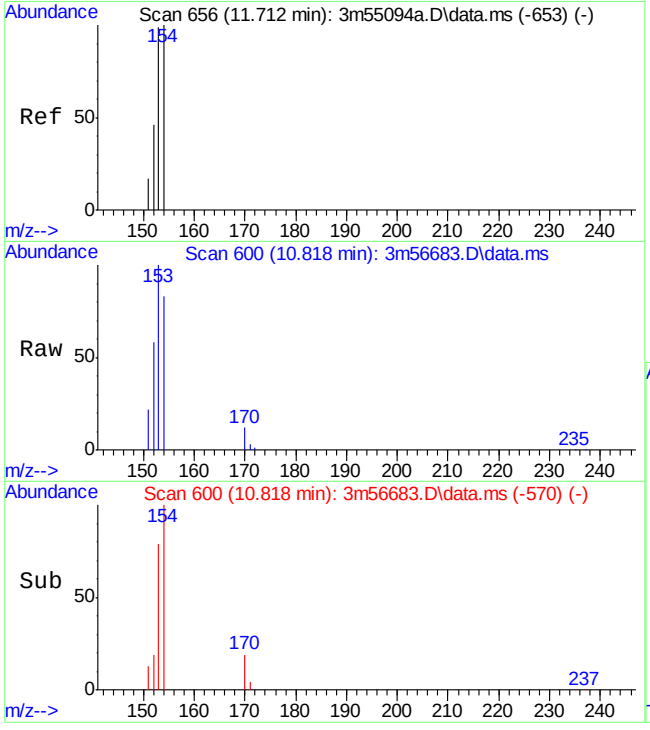


#8
Naphthalene
Concen: 13.99 ppm
RT: 7.404 min Scan# 388
Delta R.T. -0.027 min
Lab File: 3m56683.D
Acq: 31 Jul 2015 6:34 pm

Tgt Ion:128 Resp: 819066

Ion	Ratio	Lower	Upper
128	100		
129	15.3	0.0	40.8
127	14.2	0.0	43.2

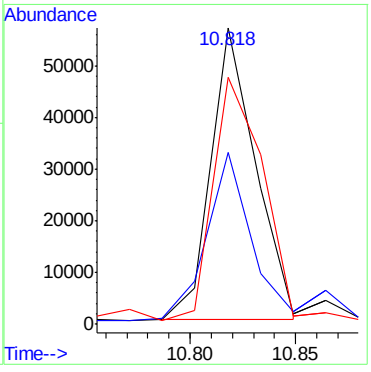


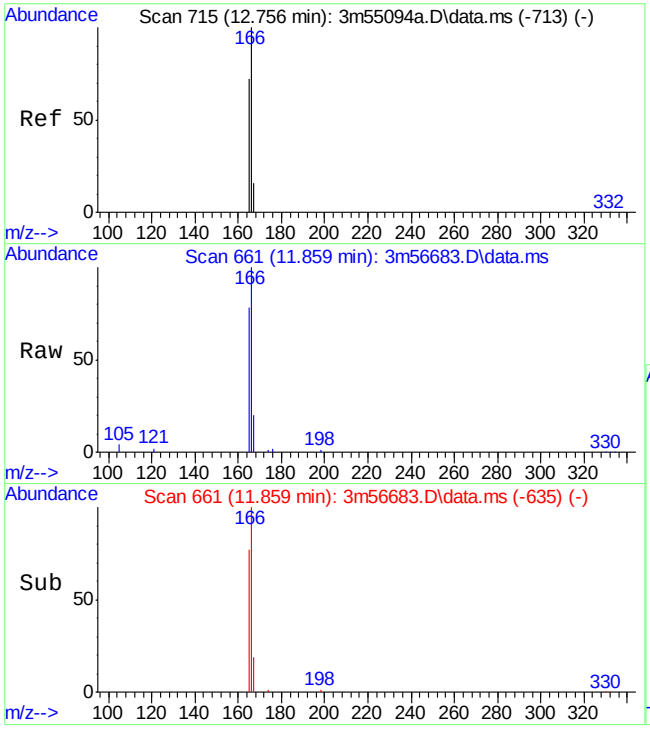


#16
Acenaphthene
Concen: 2.71 ppm
RT: 10.818 min Scan# 600
Delta R.T. -0.031 min
Lab File: 3m56683.D
Acq: 31 Jul 2015 6:34 pm

Tgt Ion:153 Resp: 82310

Ion	Ratio	Lower	Upper
153	100		
152	56.3	12.4	72.4
154	83.7	74.5	134.5

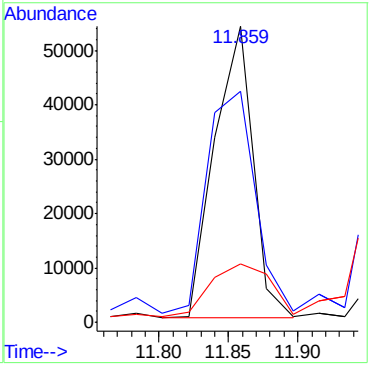


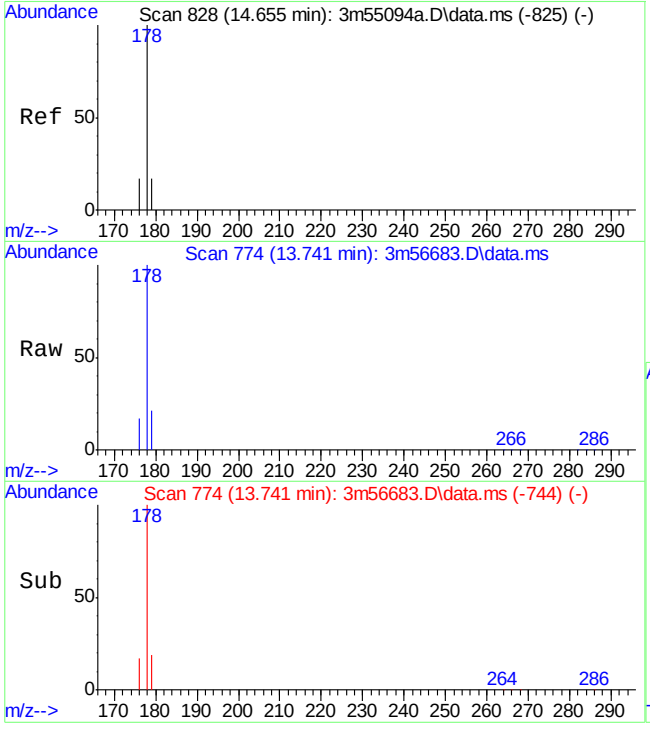


#18
Fluorene
Concen: 3.44 ppm
RT: 11.859 min Scan# 661
Delta R.T. -0.019 min
Lab File: 3m56683.D
Acq: 31 Jul 2015 6:34 pm

Tgt Ion:166 Resp: 104353

Ion	Ratio	Lower	Upper
166	100		
165	75.8	52.3	112.3
167	17.9	0.0	44.3

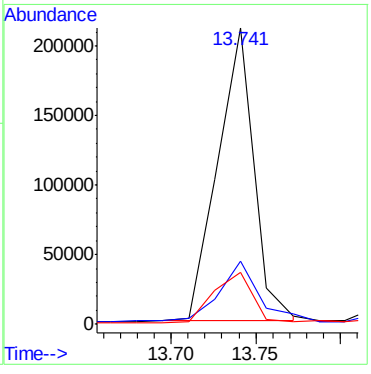




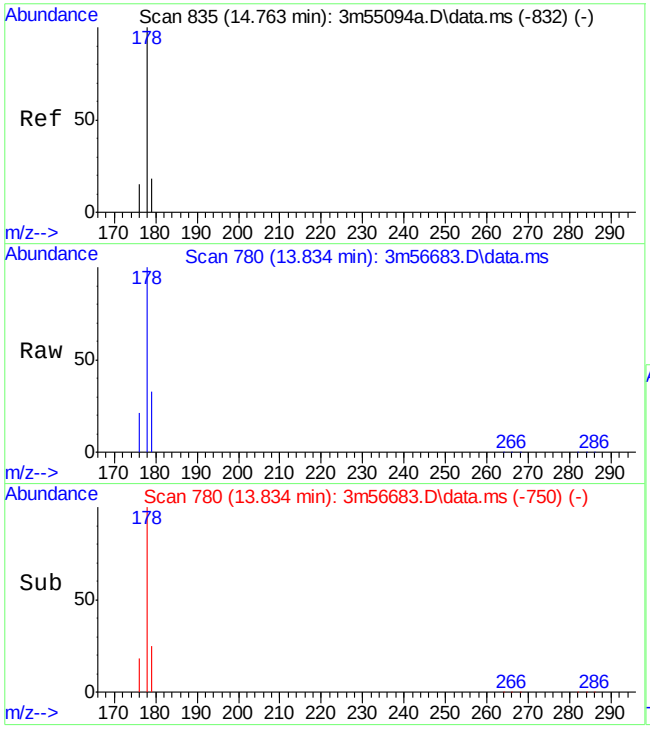
#23
Phenanthrene
Concen: 6.42 ppm
RT: 13.741 min Scan# 774
Delta R.T. -0.031 min
Lab File: 3m56683.D
Acq: 31 Jul 2015 6:34 pm

Tgt Ion:178 Resp: 315882

Ion	Ratio	Lower	Upper
178	100		
179	19.1	0.0	45.6
176	17.1	0.0	48.5



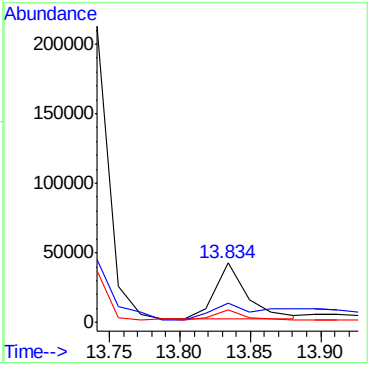
9.1.12
9

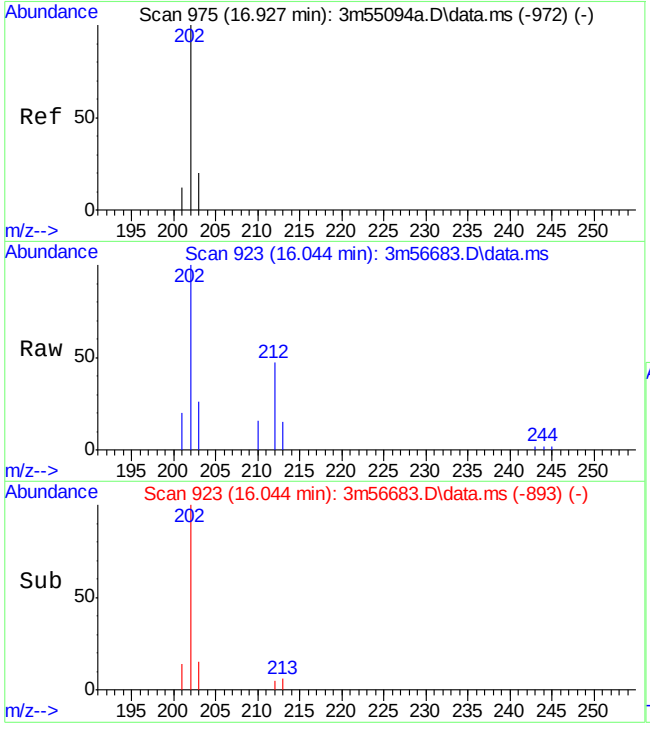


#24
Anthracene
Concen: 1.47 ppm
RT: 13.834 min Scan# 780
Delta R.T. -0.031 min
Lab File: 3m56683.D
Acq: 31 Jul 2015 6:34 pm

Tgt Ion:178 Resp: 65234

Ion	Ratio	Lower	Upper
178	100		
179	20.9	0.0	47.4
176	17.6	0.0	45.6

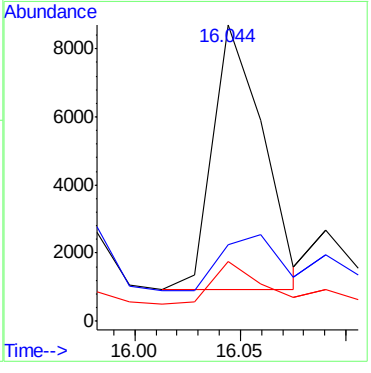


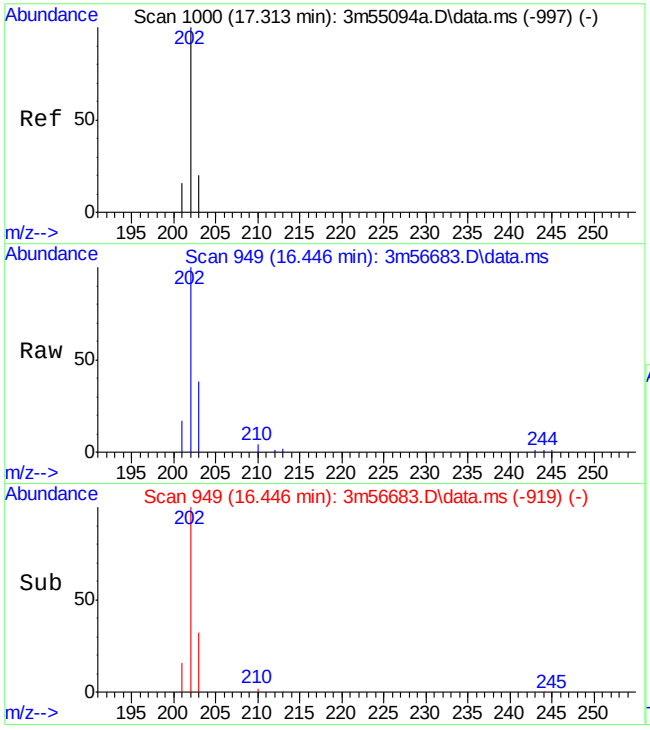


#25
Fluoranthene
Concen: 0.31 ppm
RT: 16.044 min Scan# 923
Delta R.T. -0.031 min
Lab File: 3m56683.D
Acq: 31 Jul 2015 6:34 pm

Tgt Ion:202 Resp: 12782

Ion	Ratio	Lower	Upper
202	100		
203	15.8	0.0	48.5
201	15.5	0.0	43.3

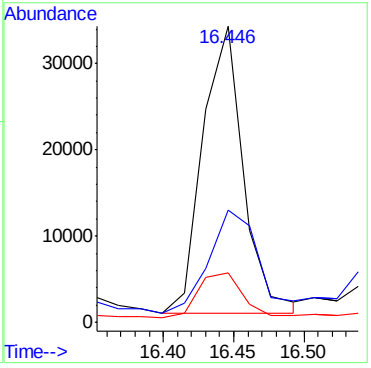


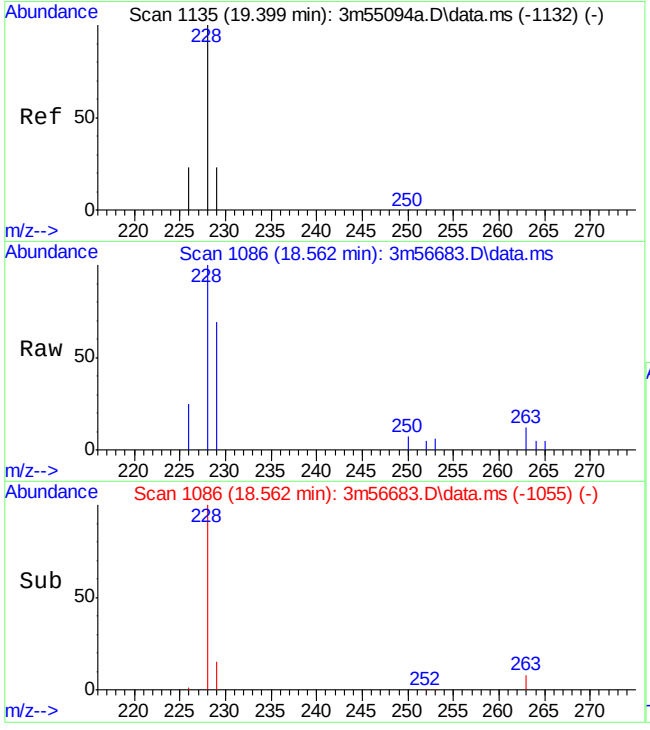


#26
Pyrene
Concen: 1.35 ppm
RT: 16.446 min Scan# 949
Delta R.T. -0.031 min
Lab File: 3m56683.D
Acq: 31 Jul 2015 6:34 pm

Tgt Ion:202 Resp: 66605

Ion	Ratio	Lower	Upper
202	100		
203	34.3	0.0	46.2
201	15.7	0.0	48.2

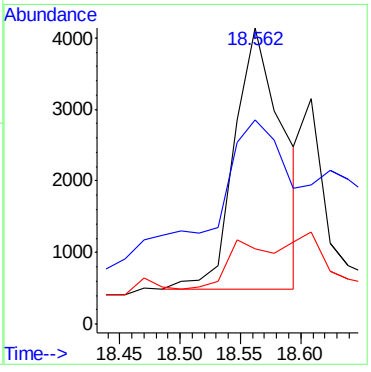




#28
Benzo[a]anthracene
Concen: 0.22 ppm m
RT: 18.562 min Scan# 1086
Delta R.T. -0.015 min
Lab File: 3m56683.D
Acq: 31 Jul 2015 6:34 pm

Tgt Ion:228 Resp: 10290

Ion	Ratio	Lower	Upper
228	100		
229	68.8	0.0	51.7#
226	25.2	0.0	53.2



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2617\
Data File : 3m56643.D
Acq On : 30 Jul 2015 9:35 pm
Operator : sarad
Sample : op85942a-mb1
Misc : op85942a,e3m2617,1000
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jul 31 12:01:57 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1-Methylnaphthalene-d10	8.846	150	69712	4.00	ppm	-0.02
13) Fluorene-d10	11.802	176	95172	4.00	ppm	-0.02
20) Fluoranthene-d10	16.013	212	129603	4.00	ppm	-0.03
30) Benzo(a)pyrene-d12	20.648	264	102844	4.00	ppm	-0.02
System Monitoring Compounds						
3) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
4) Phenol-d5	0.000	99	0d	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
7) Nitrobenzene-d5	6.094	82	470987	28.55	ppm	-0.01
Spiked Amount 50.000			Recovery	=	57.10%	
14) 2-Fluorobiphenyl	9.519	172	861996	33.03	ppm	-0.02
Spiked Amount 50.000			Recovery	=	66.06%	
19) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
27) Terphenyl-d14	16.847	244	656489	29.44	ppm	-0.03
Spiked Amount 50.000			Recovery	=	58.88%	

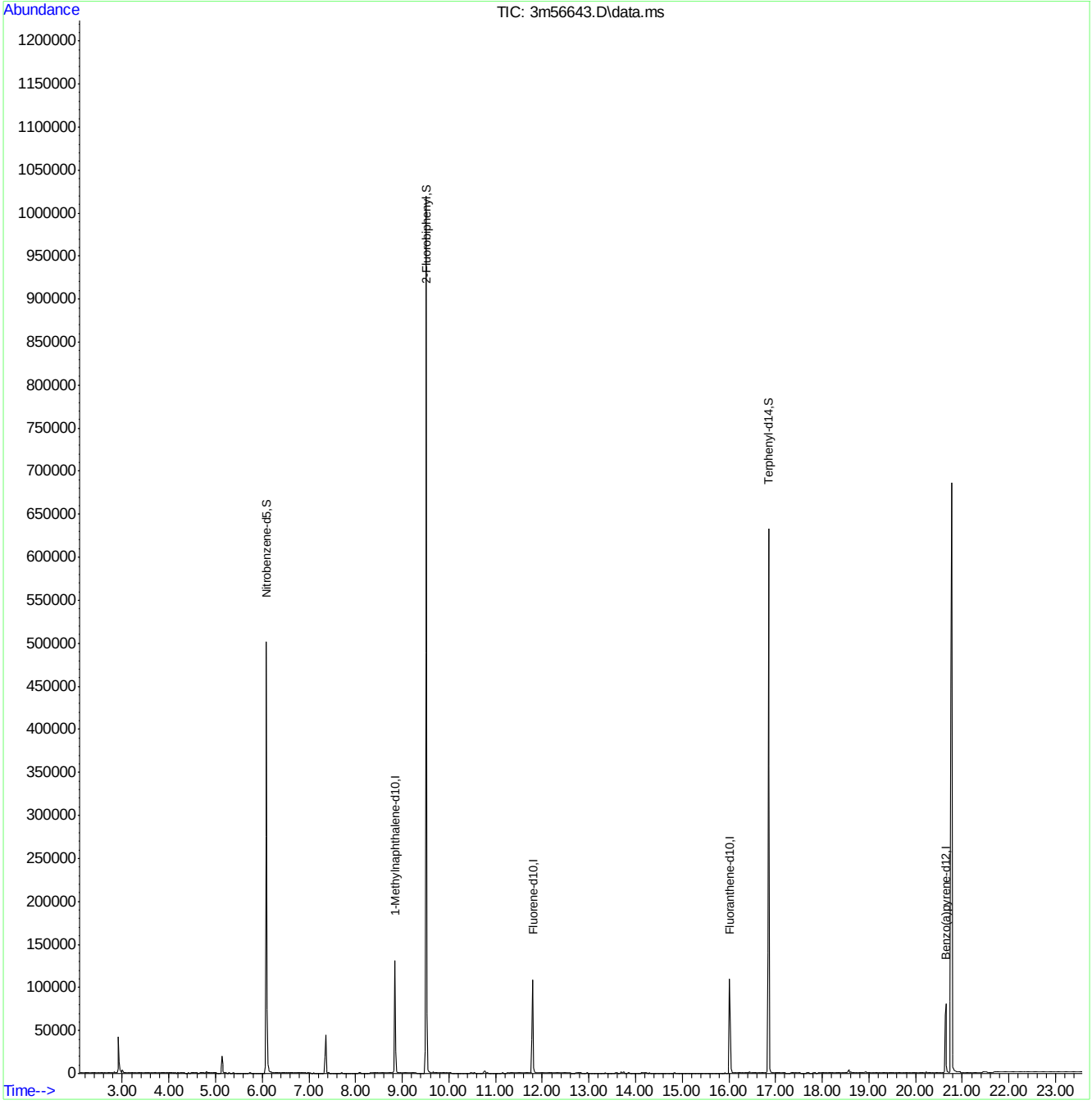
Target Compounds Qvalue

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2617\
Data File : 3m56643.D
Acq On : 30 Jul 2015 9:35 pm
Operator : sarad
Sample : op85942a-mb1
Misc : op85942a,e3m2617,1000
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jul 31 12:01:57 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration



ACCUTEST LABORATORIES JC300

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56667.D
Acq On : 31 Jul 2015 10:30 am
Operator : linseyk
Sample : op85953a-mb1
Misc : op85953a,e3m2618,1000
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 31 13:14:31 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) 1-Methylnaphthalene-d10	8.847	150	66926	4.00 ppm	-0.02
13) Fluorene-d10	11.783	176	90172	4.00 ppm	-0.04
20) Fluoranthene-d10	16.013	212	125266	4.00 ppm	-0.03
30) Benzo(a)pyrene-d12	20.633	264	99715	4.00 ppm	-0.03
System Monitoring Compounds					
3) 2-Fluorophenol	3.385	112	219323	18.21 ppm	0.00
Spiked Amount 50.000			Recovery	= 36.42%	
4) Phenol-d5	4.776	99	225705	13.41 ppm	0.04
Spiked Amount 50.000			Recovery	= 26.82%	
7) Nitrobenzene-d5	6.080	82	387834	24.48 ppm	-0.03
Spiked Amount 50.000			Recovery	= 48.96%	
14) 2-Fluorobiphenyl	9.504	172	677778	27.41 ppm	-0.03
Spiked Amount 50.000			Recovery	= 54.82%	
19) 2,4,6-Tribromophenol	12.367	330	123030	35.07 ppm	-0.02
Spiked Amount 50.000			Recovery	= 70.14%	
27) Terphenyl-d14	16.847	244	660636	30.65 ppm	-0.03
Spiked Amount 50.000			Recovery	= 61.30%	
Target Compounds					Qvalue
23) Phenanthrene	13.726	178	6343	0.14 ppm	96
25) Fluoranthene	16.044	202	5802	0.15 ppm	99
26) Pyrene	16.430	202	5118	0.11 ppm	97

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

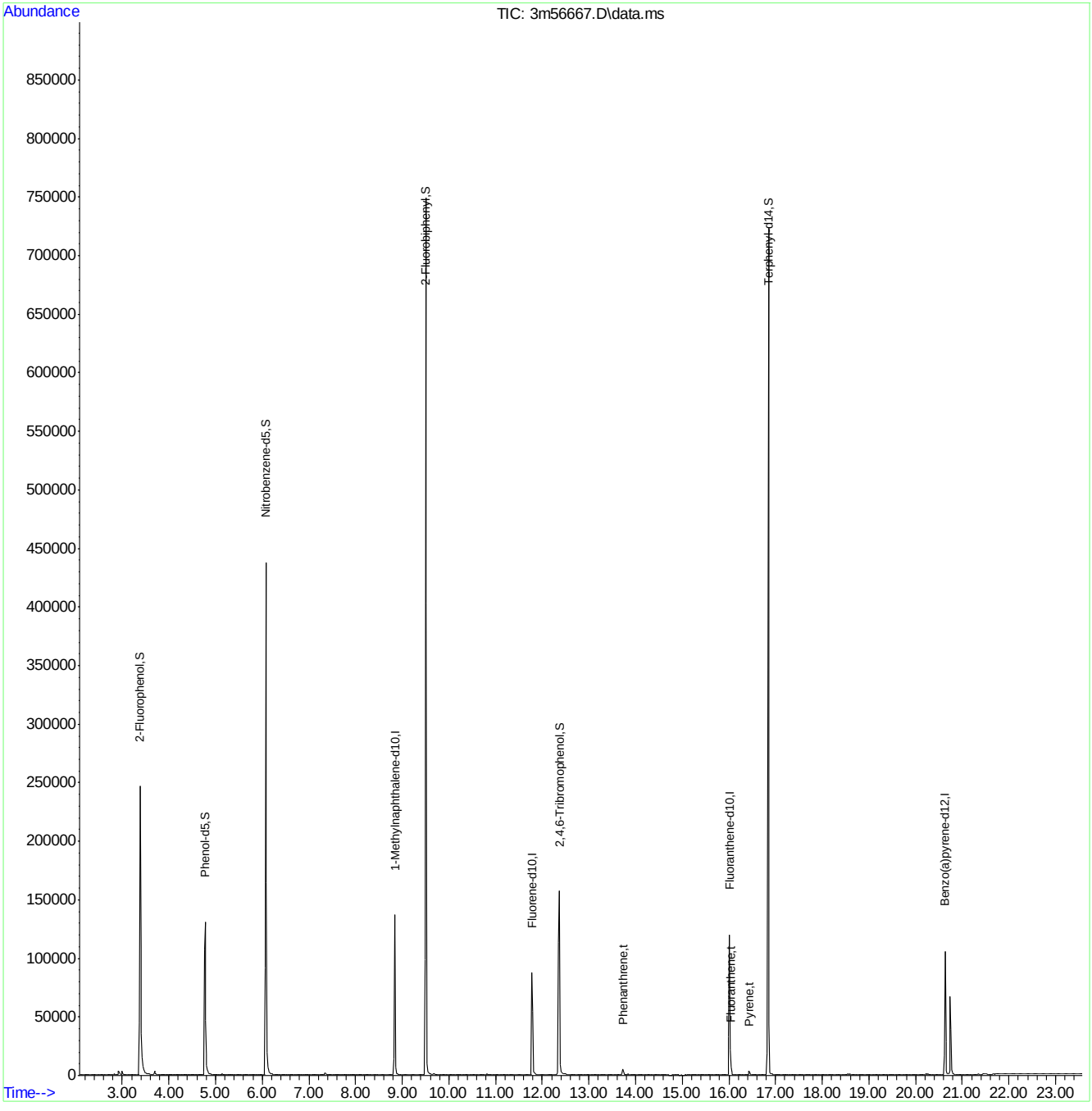
9.2.2

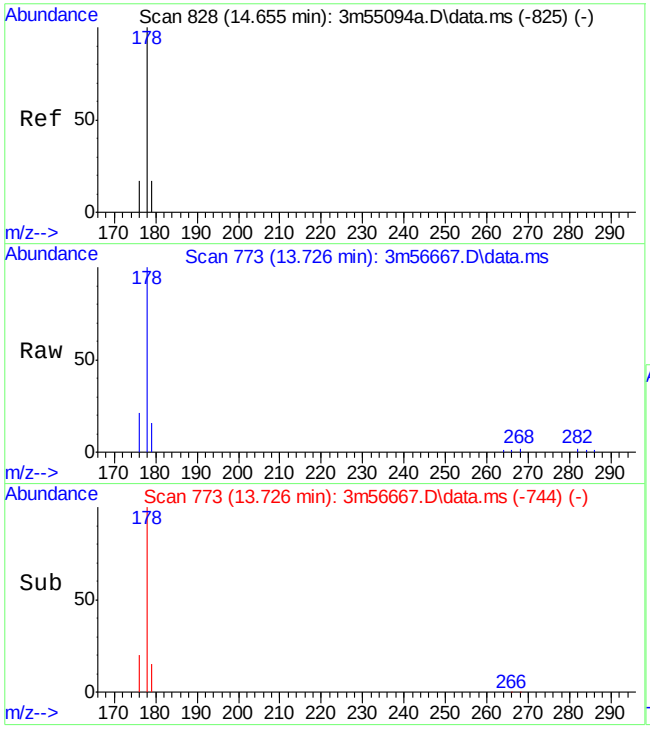
9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E3M2618\
Data File : 3m56667.D
Acq On : 31 Jul 2015 10:30 am
Operator : linseyk
Sample : op85953a-mb1
Misc : op85953a,e3m2618,1000
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 31 13:14:31 2015
Quant Method : C:\MSDCHEM\1\METHODS\M3M2611SIM.M
Quant Title : Semi Volatile Extractables by GC/MS
QLast Update : Mon Jul 27 11:23:44 2015
Response via : Initial Calibration

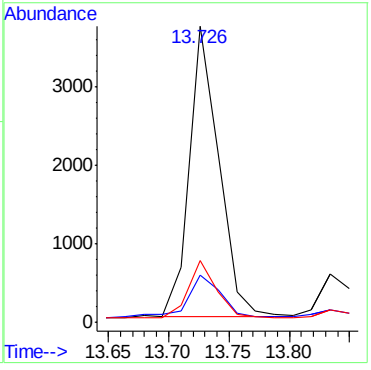


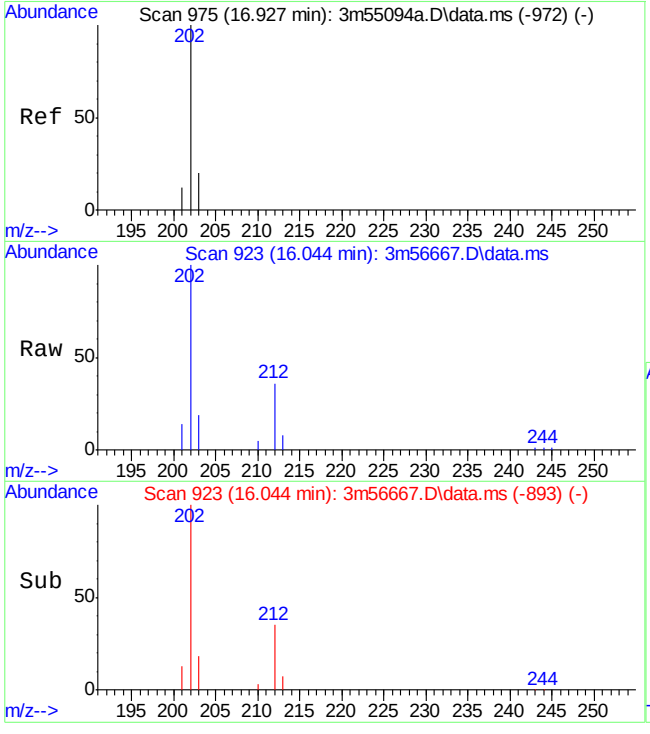


#23
Phenanthrene
Concen: 0.14 ppm
RT: 13.726 min Scan# 773
Delta R.T. -0.046 min
Lab File: 3m56667.D
Acq: 31 Jul 2015 10:30 am

Tgt Ion:178 Resp: 6343

Ion	Ratio	Lower	Upper
178	100		
179	13.9	0.0	45.6
176	20.0	0.0	48.5

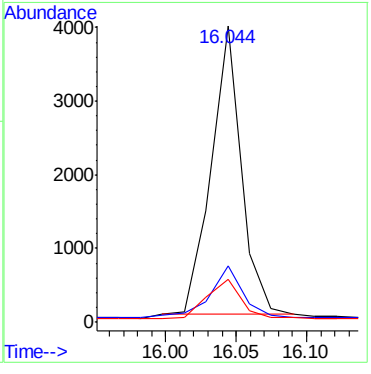


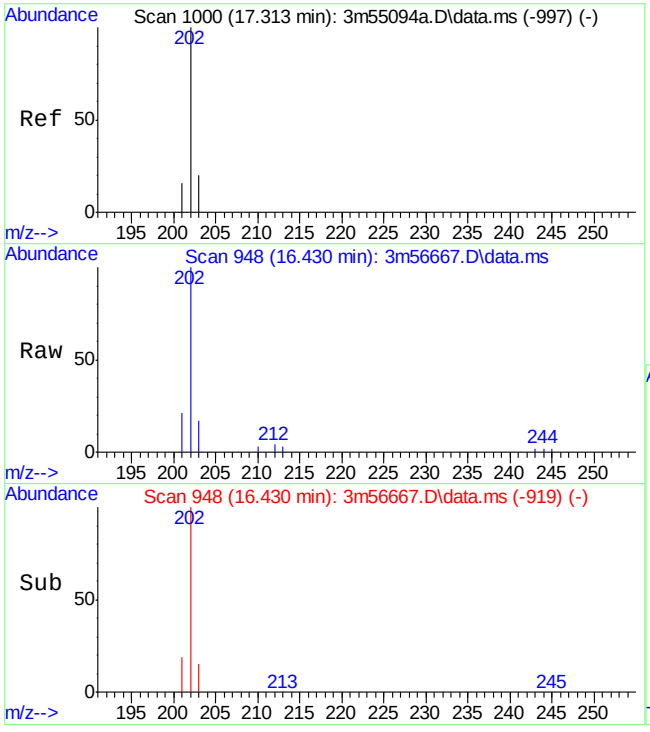


#25
Fluoranthene
Concen: 0.15 ppm
RT: 16.044 min Scan# 923
Delta R.T. -0.031 min
Lab File: 3m56667.D
Acq: 31 Jul 2015 10:30 am

Tgt Ion:202 Resp: 5802

Ion	Ratio	Lower	Upper
202	100		
203	17.6	0.0	48.5
201	13.4	0.0	43.3

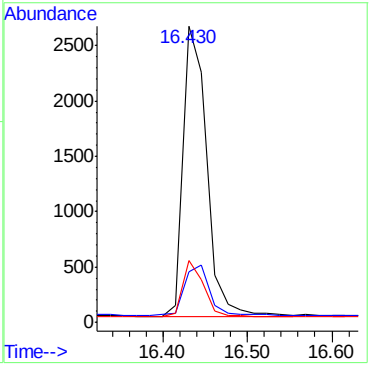




#26
Pyrene
Concen: 0.11 ppm
RT: 16.430 min Scan# 948
Delta R.T. -0.046 min
Lab File: 3m56667.D
Acq: 31 Jul 2015 10:30 am

Tgt Ion:202 Resp: 5118

Ion	Ratio	Lower	Upper
202	100		
203	15.1	0.0	46.2
201	19.3	0.0	48.2



9.2.2

9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E4M2592\
Data File : 4m59377.D
Acq On : 1 Aug 2015 5:10 pm
Operator : ashleyd
Sample : op85975a-mb1
Misc : op85975a,e4m2592,1000
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 03 09:06:34 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4M2577SIM.M
Quant Title : Semi Volatile GC/MS,zb-5 15m x .25mm x .50um
QLast Update : Thu Jul 23 15:03:55 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1-Methylnaphthalene-d10	9.959	152	29393	4.00	ppm	-0.10
12) Fluorene-d10	12.918	176	60272	4.00	ppm	-0.11
22) Fluoranthene-d10	17.072	212	89524	4.00	ppm	-0.11
28) Benzo(a)pyrene-d12	21.647	264	58465	4.00	ppm	-0.11
35) 1-Methylnaphthalene-d10a	9.959	152	29393	4.00	ppm	-0.10
38) Fluorene-d10a	12.918	176	60272	4.00	ppm	-0.11
System Monitoring Compounds						
2) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000	Range 11 - 58		Recovery = 0.00%#			
3) Phenol-d5	0.000	99	0d	0.00	ppm	
Spiked Amount 50.000			Recovery = 0.00%			
6) Nitrobenzene-d5	7.131	82	349593	45.54	ppm	-0.09
Spiked Amount 50.000			Recovery = 91.08%			
11) 2-Fluorobiphenyl	10.594	172	562460	48.41	ppm	-0.10
Spiked Amount 50.000			Recovery = 96.82%			
17) 2,4,6-Tribromophenol	0.000	330	0d	0.00	ppm	
Spiked Amount 50.000			Recovery = 0.00%			
25) Terphenyl-d14	17.862	244	624998	42.34	ppm	-0.11
Spiked Amount 50.000			Recovery = 84.68%			
Target Compounds						Qvalue

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

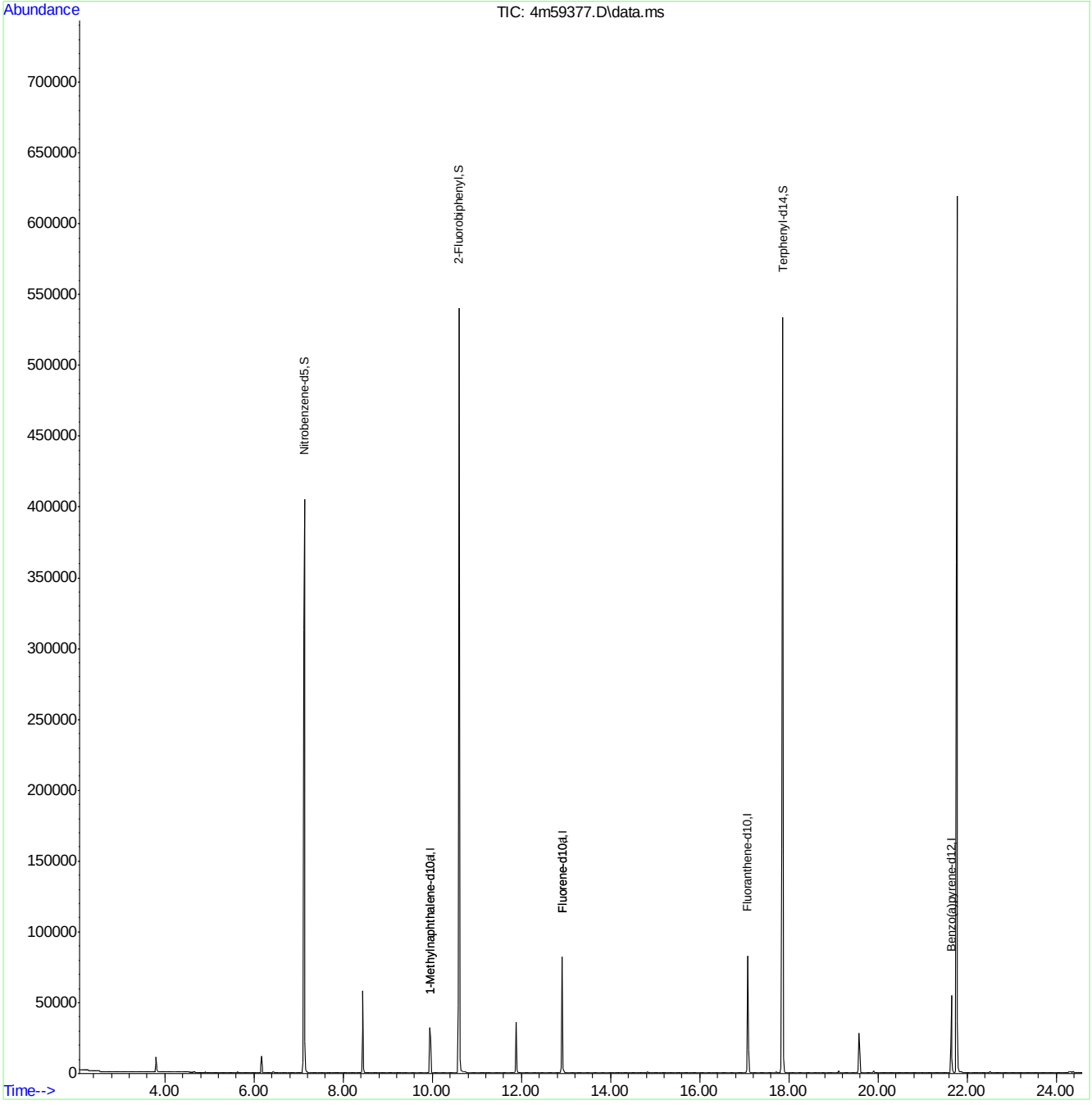
9.2.3

9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\E4M2592\
Data File : 4m59377.D
Acq On : 1 Aug 2015 5:10 pm
Operator : ashleyd
Sample : op85975a-mb1
Misc : op85975a,e4m2592,1000
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 03 09:06:34 2015
Quant Method : C:\MSDCHEM\1\METHODS\M4M2577SIM.M
Quant Title : Semi Volatile GC/MS,zb-5 15m x .25mm x .50um
QLast Update : Thu Jul 23 15:03:55 2015
Response via : Initial Calibration



ACCUTEST LABORATORIES JC300

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e5p1049\
Data File : 5p20382.D
Acq On : 12 Aug 2015 12:50 pm
Operator : alicjap
Sample : op85975a-mb1
Misc : op85975a,e5p1049,1000
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Aug 12 13:39:47 2015
Quant Method : C:\MSDCHEM\1\METHODS\M5P1005.M
Quant Title : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
QLast Update : Wed Aug 12 13:36:29 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	4.591	152	360301	40.00	ppm	0.00
24) Naphthalene-d8	6.039	136	1546405	40.00	ppm	0.00
47) Acenaphthene-d10	8.138	164	1091347	40.00	ppm	0.00
69) Phenanthrene-d10	9.933	188	1955717	40.00	ppm	0.00
83) Chrysene-d12	13.619	240	1990313	40.00	ppm	0.00
92) Perylene-d12	15.687	264	2008087	40.00	ppm	0.00
102) 1,4-Dichlorobenzene-d4a	4.591	152	360301	40.00	ppm	0.00
104) Acenaphthene-d10a	8.138	164	1091347	40.00	ppm	0.00
106) Chrysene-d12a	13.619	240	1990313	40.00	ppm	0.00
108) Phenanthrene-d10a	9.933	188	1955717	40.00	ppm	0.00
110) Naphthalene-d8a	6.039	136	1546405	40.00	ppm	0.00
System Monitoring Compounds						
5) 2-Fluorophenol	0.000	112	0	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
8) Phenol-d5	0.000	99	0	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
25) Nitrobenzene-d5	5.232	82	533833	40.65	ppm	0.00
Spiked Amount 50.000			Recovery	=	81.30%	
51) 2-Fluorobiphenyl	7.347	172	1411204	41.20	ppm	0.00
Spiked Amount 50.000			Recovery	=	82.40%	
73) 2,4,6-Tribromophenol	0.000	330	0	0.00	ppm	
Spiked Amount 50.000			Recovery	=	0.00%	
85) Terphenyl-d14	12.091	244	1487279	41.52	ppm	0.00
Spiked Amount 50.000			Recovery	=	83.04%	

Target Compounds Qvalue

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

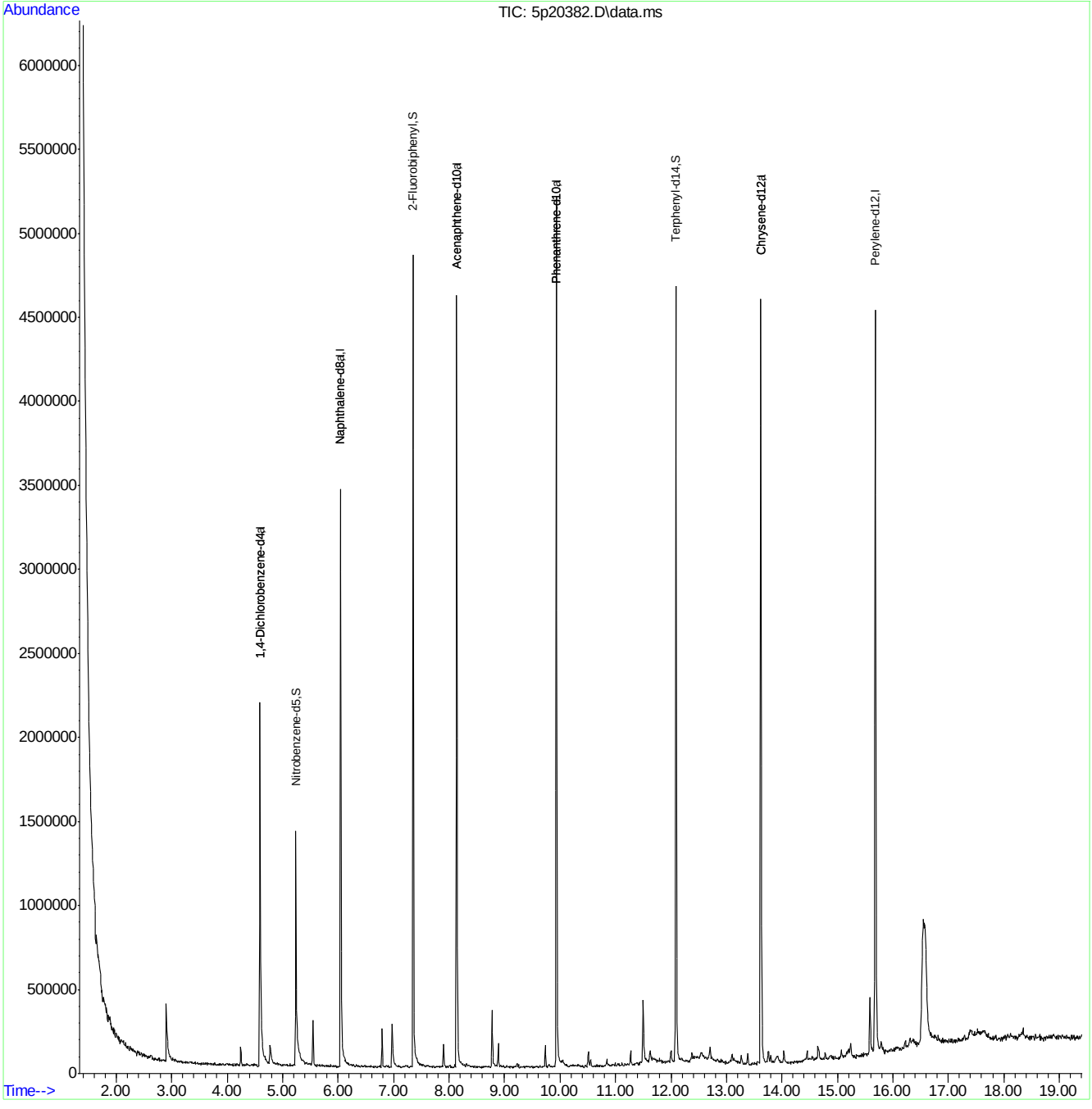
9.2.4

9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\e5p1049\
Data File : 5p20382.D
Acq On : 12 Aug 2015 12:50 pm
Operator : alicjap
Sample : op85975a-mb1
Misc : op85975a,e5p1049,1000
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Aug 12 13:39:47 2015
Quant Method : C:\MSDCHEM\1\METHODS\M5P1005.M
Quant Title : Semi Volatile GC/MS, zb-5msi 30mx .25mmx .25um
QLast Update : Wed Aug 12 13:36:29 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\EZ5150\
Data File : z103252.D
Acq On : 31 Jul 2015 11:33 am
Operator : brittanp
Sample : op85953-mb1
Misc : op85953,ez5150,1000
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jul 31 13:34:56 2015
Quant Method : C:\MSDCHEM\1\METHODS\MZ5148.M
Quant Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
QLast Update : Fri Jul 31 13:34:23 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) 1,4-Dichlorobenzene-d4	4.828	152	313719	40.00 ppm	0.00
24) Naphthalene-d8	5.747	136	1154748	40.00 ppm	0.00
47) Acenaphthene-d10	7.189	164	786560	40.00 ppm	0.00
69) Phenanthrene-d10	9.118	188	1355914	40.00 ppm	0.00
83) Chrysene-d12	14.417	240	1383106	40.00 ppm	0.00
92) Perylene-d12	17.473	264	1018792	40.00 ppm	0.00
102) 1,4-Dichlorobenzene-d4a	4.828	152	313719	40.00 ppm	0.00
104) Phenanthrene-d10a	9.118	188	1355914	40.00 ppm	0.00
108) Chrysene-d12a	14.417	240	1383106	40.00 ppm	0.00
110) Acenaphthene-d10a	7.189	164	786560	40.00 ppm	0.00
112) Naphthalene-d8a	5.747	136	1154748	40.00 ppm	0.00
114) Chrysene-d12b	14.417	240	1383106	40.00 ppm	0.00
System Monitoring Compounds					
5) 2-Fluorophenol	3.872	112	213733	23.07 ppm	0.00
Spiked Amount 50.000			Recovery	= 46.14%	
8) Phenol-d5	4.571	99	175072	14.04 ppm	0.00
Spiked Amount 50.000			Recovery	= 28.08%	
25) Nitrobenzene-d5	5.229	82	408634	36.85 ppm	0.00
Spiked Amount 50.000			Recovery	= 73.70%	
51) 2-Fluorobiphenyl	6.553	172	882988	36.26 ppm	0.00
Spiked Amount 50.000			Recovery	= 72.52%	
73) 2,4,6-Tribromophenol	8.108	330	164473	36.94 ppm	0.00
Spiked Amount 50.000			Recovery	= 73.88%	
86) Terphenyl-d14	12.179	244	1198385	46.83 ppm	0.00
Spiked Amount 50.000			Recovery	= 93.66%	
105) 1-chlorooctadecane	0.000	57	0	0.00 ppm	
Spiked Amount 50.000			Recovery	= 0.00%	
106) o-terphenyl	0.000	230	0	0.00 ppm	
Spiked Amount 50.000			Recovery	= 0.00%	
Target Compounds					Qvalue

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

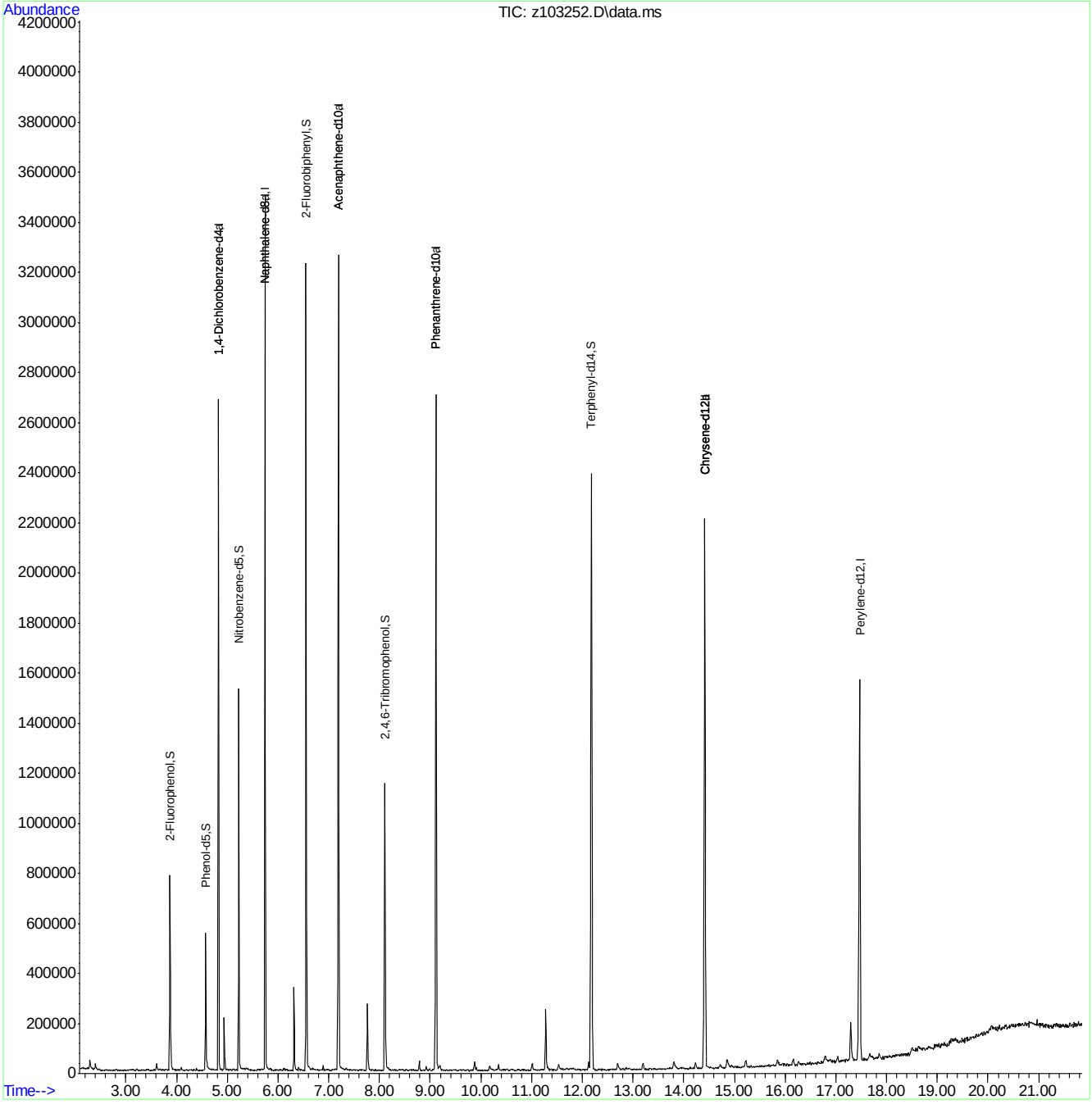
9.2.5

9

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\EZ5150\
Data File : z103252.D
Acq On : 31 Jul 2015 11:33 am
Operator : brittanp
Sample : op85953-mb1
Misc : op85953,ez5150,1000
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jul 31 13:34:56 2015
Quant Method : C:\MSDCHEM\1\METHODS\MZ5148.M
Quant Title : Semi Volatile GC/MS, ZB-5MS 15m x .25mm x .25um
QLast Update : Fri Jul 31 13:34:23 2015
Response via : Initial Calibration



New Jersey

ACCUTEST LABORATORIES

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries
- Initial and Continuing Calibration Summaries

Method Blank Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85954-MB1	7G14242.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521

The QC reported here applies to the following samples: **Method:** SW846-8011

JC300-1, JC300-2, JC300-3, JC300-4, JC300-5, JC300-6, JC300-7

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.020	0.0086	ug/l	

CAS No.	Surrogate Recoveries		Limits
3017-95-6	2-Bromo-1-chloropropane	83%	38-167%
3017-95-6	2-Bromo-1-chloropropane	82%	38-167%

Blank Spike Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85954-BS1	7G14243.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521

The QC reported here applies to the following samples: **Method:** SW846-8011

JC300-1, JC300-2, JC300-3, JC300-4, JC300-5, JC300-6, JC300-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
106-93-4	1,2-Dibromoethane	0.5	0.41	82	43-153

CAS No.	Surrogate Recoveries	BSP	Limits
3017-95-6	2-Bromo-1-chloropropane	79%	38-167%
3017-95-6	2-Bromo-1-chloropropane	80%	38-167%

10.2.1

10

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85954-MS	7G14244.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521
OP85954-MSD	7G14245.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521
JC279-1	7G14246.D	1	08/03/15	VDT	07/31/15	OP85954	G7G521

The QC reported here applies to the following samples: **Method:** SW846-8011

JC300-1, JC300-2, JC300-3, JC300-4, JC300-5, JC300-6, JC300-7

CAS No.	Compound	JC279-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
106-93-4	1,2-Dibromoethane	ND		0.875	0.82	94	0.875	0.83	95	1	42-178/30

CAS No.	Surrogate Recoveries	MS	MSD	JC279-1	Limits
3017-95-6	2-Bromo-1-chloropropane	91%	92%	60%	38-167%
3017-95-6	2-Bromo-1-chloropropane	93%	93%	56%	38-167%

10.3.1

10

* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846-8011 **Matrix:** AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 [a]	S1 [b]
JC300-1	7G14263.D	59	77
JC300-2	7G14264.D	58	58
JC300-3	7G14265.D	58	58
JC300-4	7G14266.D	48	50
JC300-5	7G14267.D	66	64
JC300-6	7G14268.D	63	68
JC300-7	7G14269.D	85	87
OP85954-BS1	7G14243.D	79	80
OP85954-MB1	7G14242.D	83	82
OP85954-MS	7G14244.D	91	93
OP85954-MSD	7G14245.D	92	93

Surrogate Compounds	Recovery Limits
S1 = 2-Bromo-1-chloropropane	38-167%

(a) Recovery from GC signal #2
(b) Recovery from GC signal #1

GC Surrogate Retention Time Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	G7G521-CC456	**Injection Date:**	08/03/15
Lab File ID:	7G14240.D	**Injection Time:**	11:24
Instrument ID:	GC7G	**Method:**	SW846-8011

	S1 [a] RT	S1 [b] RT
Check Std	1.71	2.16

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 [a] RT	S1 [b] RT
OP85954-MB1	7G14242.D	08/03/15	13:58	1.71	2.16
OP85954-BS1	7G14243.D	08/03/15	14:17	1.71	2.16
OP85954-MS	7G14244.D	08/03/15	14:36	1.71	2.16
OP85954-MSD	7G14245.D	08/03/15	14:54	1.71	2.16
JC279-1	7G14246.D	08/03/15	15:13	1.71	2.16
ZZZZZZ	7G14247.D	08/03/15	15:32	1.71	2.16
ZZZZZZ	7G14249.D	08/03/15	15:51	1.71	2.16
ZZZZZZ	7G14250.D	08/03/15	16:09	1.71	2.16

Surrogate Compounds

S1 = 2-Bromo-1-chloropropane

(a) Retention time from GC signal #2
(b) Retention time from GC signal #1

GC Surrogate Retention Time Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	G7G521-CC456	**Injection Date:**	08/03/15
Lab File ID:	7G14261.D	**Injection Time:**	19:36
Instrument ID:	GC7G	**Method:**	SW846-8011

	S1 [a] RT	S1 [b] RT
Check Std	1.71	2.16

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 [a] RT	S1 [b] RT
JC300-1	7G14263.D	08/03/15	20:13	1.71	2.16
JC300-2	7G14264.D	08/03/15	20:32	1.71	2.16
JC300-3	7G14265.D	08/03/15	20:51	1.71	2.16
JC300-4	7G14266.D	08/03/15	21:09	1.71	2.16
JC300-5	7G14267.D	08/03/15	21:28	1.71	2.16
JC300-6	7G14268.D	08/03/15	21:47	1.71	2.16
JC300-7	7G14269.D	08/03/15	22:05	1.71	2.16

Surrogate Compounds

S1 = 2-Bromo-1-chloropropane

(a) Retention time from GC signal #2
(b) Retention time from GC signal #1

Initial Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: G7G456-ICC456
Lab FileID: 7G12654.D

```
                         Response Factor Report  HP G1530A

  Method       : C:\MSDCHEM\1\METHODS\7G504M456.M (Chemstation Integrator)
  Title        : GC/ECD- EDB
  Last Update  : Tue Apr 21 13:59:46 2015
  Response via : Initial Calibration

  Calibration Files
  2   =7G12653.D   1   =7G12654.D   0.5 =7G12655.D   0.2 =7G12656.D
  0.1    =7G12657.D    0.02   =7G12658.D

        Compound              2     1     0.5   0.2   0.1   0.02  Avg    %RSD
  ---------------------------------------------------------------------------
  1) S   2-Bromo-1-Chloropro 4.141 4.447 4.711 5.055 5.282       4.727 E5   9.68
  2)     1,2-Dibromoethane   2.327 2.520 2.532 2.608 2.551 2.876 2.569 E6   6.92
  3)     1,2,3-Trichloroprop 2.453 2.585 2.495 2.063 2.317       2.383 E5   8.52
  4)     1,2-Dibromo-3-Chlor 3.713 3.674 3.533 3.659 3.472 3.137 3.531 E6   6.05

Signal #2

  1) S   2-Bromo-1-Chloropro 2.498 2.742 2.797 3.112 3.105       2.851 E5   9.15
  2)     1,2-Dibromoethane   1.273 1.368 1.400 1.396 1.380 0.943 1.293 E6  13.77
  3)     1,2,3-Trichloroprop 1.716 1.774 1.731 1.511 1.542       1.655 E5   7.22
  4)     1,2-Dibromo-3-Chlor 2.687 2.677 2.513 2.436 2.484 2.656 2.576 E6   4.29
 ---------------------------------------------------------------------------
 (#) = Out of Range

           7G504M456.M        Tue Apr 21 14:13:58 2015
```

10.6.1

10

Initial Calibration Verification

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: G7G456-ICV456
Lab FileID: 7G12659.D

Evaluate Continuing Calibration Report

```
Signal #1 : C:\msdchem\1\DATA\7g456\7G12659.D\ECD1A.CH   Vial: 8
Signal #2 : C:\msdchem\1\DATA\7g456\7G12659.D\ECD2B.CH
Acq On    : 21 Apr 2015   1:54 pm                    Operator: vinced
Sample    : icv456-1.0                               Inst    : HP G1530A
Misc      : op83050,g7g456,35,,,2,1                  Multiplr: 1.00
IntFile Signal #1: autoint1.e   IntFile Signal #2: autoint2.e

Method       : C:\MSDCHEM\1\METHODS\7G504M456.M (Chemstation Integrator)
Title        : GC/ECD- EDB
Last Update  : Tue Apr 21 13:59:46 2015
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  15%     Max. Rel. Area : 150%
```

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	RT Window
1 S	2-Bromo-1-Chloropropan	472.704	437.888 E3	7.4	98	0.00	2.25- 2.31
2	1,2-Dibromoethane	2.569	2.797 E6	-8.9	111	0.00	2.46- 2.52
3	1,2,3-Trichloropropane	238.263	279.477 E3	-17.3#	108	0.00	4.05- 4.11
4	1,2-Dibromo-3-Chloropr	3.531	3.948 E6	-11.8	107	0.00	5.74- 5.80

***** Signal #2 *****

1 S	2-Bromo-1-Chloropropan	285.093	275.777 E3	3.3	101	0.00	1.80- 1.86
2	1,2-Dibromoethane	1.293	1.605 E6	-24.1#	117	0.00	2.19- 2.25
3	1,2,3-Trichloropropane	165.500	188.336 E3	-13.8	106	0.00	3.71- 3.77
4	1,2-Dibromo-3-Chloropr	2.576	2.799 E6	-8.7	105	0.00	5.61- 5.67

(#) = Out of Range SPCC's out = 0 CCC's out = 0
7G12654.D 7G504M456.M Tue Apr 21 14:13:44 2015

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: G7G521-CC456
Lab FileID: 7G14240.D

```
                    Evaluate Continuing Calibration Report

 Signal #1 : C:\msdchem\1\DATA\7g521\7G14240.D\ECD1A.CH   Vial: 3
 Signal #2 : C:\msdchem\1\DATA\7g521\7G14240.D\ECD2B.CH
 Acq On    : 03 Aug 2015  11:24 am                    Operator: vinced
 Sample    : cc456-1.0                                Inst    : HP G1530A
 Misc      : op85867,g7g521,18.7,,,2,1                Multiplr: 1.00
 IntFile Signal #1: autoint1.e   IntFile Signal #2: autoint2.e

 Method       : C:\MSDCHEM\1\METHODS\7G504M456.M (Chemstation Integrator)
 Title        : GC/ECD- EDB
 Last Update  : Fri Jul 10 16:32:11 2015
 Response via : Multiple Level Calibration

 Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
 Max. RRF Dev :  15%     Max. Rel. Area : 150%

        Compound                AvgRF   CCRF      %Dev Area% Dev(min)RT Window
 ---------------------------------------------------------------------------
 1 S   2-Bromo-1-Chloropropan 472.704 471.010 E3   0.4  106   0.00    2.13- 2.19
 2     1,2-Dibromoethane        2.569   2.504 E6   2.5   99   0.00    2.35- 2.41
 3     1,2,3-Trichloropropane 238.263 238.489 E3  -0.1   92   0.00    3.95- 4.01
 4     1,2-Dibromo-3-Chloropr   3.531   3.739 E6  -5.9  102   0.00    5.66- 5.72

*****  Signal #2   *****

 1 S   2-Bromo-1-Chloropropan 285.093 280.312 E3   1.7  102   0.00    1.68- 1.74
 2     1,2-Dibromoethane        1.293   1.365 E6  -5.6  100   0.00    2.06- 2.12
 3     1,2,3-Trichloropropane 165.500 186.439 E3 -12.7  105   0.00    3.60- 3.66
 4     1,2-Dibromo-3-Chloropr   2.576   2.378 E6   7.7   89   0.00    5.53- 5.59
-----------------------------------------------------------------------------
-----------------------------------------------------------------------------

   (#) = Out of Range              SPCC's out = 0  CCC's out = 0
    7G12654.D  7G504M456.M       Wed Aug 05 12:06:10 2015
```

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: G7G521-CC456
Lab FileID: 7G14251.D

```
                    Evaluate Continuing Calibration Report

 Signal #1 : C:\msdchem\1\DATA\7g521\7G14251.D\ECD1A.CH   Vial: 2
 Signal #2 : C:\msdchem\1\DATA\7g521\7G14251.D\ECD2B.CH
 Acq On    : 03 Aug 2015   4:28 pm                    Operator: vinced
 Sample    : cc456-0.5                                Inst    : HP G1530A
 Misc      : op85954,g7g521,36.5,,,2,1                Multiplr: 1.00
 IntFile Signal #1: autoint1.e   IntFile Signal #2: autoint2.e

 Method       : C:\MSDCHEM\1\METHODS\7G504M456.M (Chemstation Integrator)
 Title        : GC/ECD- EDB
 Last Update  : Fri Jul 10 16:32:11 2015
 Response via : Multiple Level Calibration

 Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
 Max. RRF Dev :  15%     Max. Rel. Area : 150%

        Compound                AvgRF   CCRF      %Dev Area% Dev(min)RT Window
 ---------------------------------------------------------------------------
 1 S   2-Bromo-1-Chloropropan 472.704 531.412 E3 -12.4  113   0.00    2.13- 2.19
 2     1,2-Dibromoethane        2.569   2.753 E6  -7.2  109   0.00    2.35- 2.41
 3     1,2,3-Trichloropropane 238.263 233.485 E3   2.0   94   0.00    3.96- 4.02
 4     1,2-Dibromo-3-Chloropr   3.531   3.842 E6  -8.8  109   0.00    5.66- 5.72

*****  Signal #2   *****

 1 S   2-Bromo-1-Chloropropan 285.093 317.227 E3 -11.3  113   0.00    1.68- 1.74
 2     1,2-Dibromoethane        1.293   1.330 E6  -2.9   95   0.00    2.06- 2.12
 3     1,2,3-Trichloropropane 165.500 197.833 E3 -19.5# 114   0.00    3.61- 3.67
 4     1,2-Dibromo-3-Chloropr   2.576   2.411 E6   6.4   96   0.00    5.53- 5.59
---------------------------------------------------------------------------
---------------------------------------------------------------------------

   (#) = Out of Range              SPCC's out = 0  CCC's out = 0
    7G12655.D  7G504M456.M       Wed Aug 05 12:06:27 2015
```

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: G7G521-CC456
Lab FileID: 7G14261.D

```
                    Evaluate Continuing Calibration Report

 Signal #1 : C:\msdchem\1\DATA\7g521\7G14261.D\ECD1A.CH   Vial: 3
 Signal #2 : C:\msdchem\1\DATA\7g521\7G14261.D\ECD2B.CH
 Acq On    : 03 Aug 2015   7:36 pm                    Operator: vinced
 Sample    : cc456-1.0                                Inst    : HP G1530A
 Misc      : op85954,g7g521,38.8,,,2,1                Multiplr: 1.00
 IntFile Signal #1: autoint1.e   IntFile Signal #2: autoint2.e

 Method       : C:\MSDCHEM\1\METHODS\7G504M456.M (Chemstation Integrator)
 Title        : GC/ECD- EDB
 Last Update  : Fri Jul 10 16:32:11 2015
 Response via : Multiple Level Calibration

 Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
 Max. RRF Dev :  15%     Max. Rel. Area : 150%

        Compound                AvgRF   CCRF      %Dev Area% Dev(min)RT Window
 ---------------------------------------------------------------------------
 1 S   2-Bromo-1-Chloropropan 472.704 467.288 E3   1.1  105   0.00    2.13- 2.19
 2     1,2-Dibromoethane        2.569   2.419 E6   5.8   96   0.00    2.35- 2.41
 3     1,2,3-Trichloropropane 238.263 263.073 E3 -10.4  102   0.00    3.96- 4.02
 4     1,2-Dibromo-3-Chloropr   3.531   3.738 E6  -5.9  102   0.00    5.66- 5.72

*****  Signal #2   *****

 1 S   2-Bromo-1-Chloropropan 285.093 281.556 E3   1.2  103   0.00    1.68- 1.74
 2     1,2-Dibromoethane        1.293   1.371 E6  -6.0  100   0.00    2.06- 2.12
 3     1,2,3-Trichloropropane 165.500 195.873 E3 -18.4# 110   0.00    3.61- 3.67
 4     1,2-Dibromo-3-Chloropr   2.576   2.463 E6   4.4   92   0.00    5.53- 5.59
-----------------------------------------------------------------------------
-----------------------------------------------------------------------------

   (#) = Out of Range              SPCC's out = 0  CCC's out = 0
    7G12654.D  7G504M456.M       Wed Aug 05 12:06:12 2015
```

Continuing Calibration Summary

Job Number: JC300
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: G7G521-CC456
Lab FileID: 7G14270.D

```
                    Evaluate Continuing Calibration Report

 Signal #1 : C:\msdchem\1\DATA\7g521\7G14270.D\ECD1A.CH   Vial: 2
 Signal #2 : C:\msdchem\1\DATA\7g521\7G14270.D\ECD2B.CH
 Acq On    : 03 Aug 2015  10:24 pm                    Operator: vinced
 Sample    : cc456-0.5                                Inst    : HP G1530A
 Misc      : op85954,g7g521,38.6,,,2,1                Multiplr: 1.00
 IntFile Signal #1: autoint1.e   IntFile Signal #2: autoint2.e

 Method       : C:\MSDCHEM\1\METHODS\7G504M456.M (Chemstation Integrator)
 Title        : GC/ECD- EDB
 Last Update  : Fri Jul 10 16:32:11 2015
 Response via : Multiple Level Calibration

 Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
 Max. RRF Dev :  15%     Max. Rel. Area : 150%

        Compound                AvgRF   CCRF      %Dev Area% Dev(min)RT Window
 ---------------------------------------------------------------------------
 1 S   2-Bromo-1-Chloropropan 472.704 521.373 E3 -10.3  111   0.00    2.13- 2.19
 2     1,2-Dibromoethane        2.569   2.661 E6  -3.6  105   0.00    2.35- 2.41
 3     1,2,3-Trichloropropane 238.263 264.831 E3 -11.2  106   0.00    3.96- 4.02
 4     1,2-Dibromo-3-Chloropr   3.531   4.006 E6 -13.5  113   0.00    5.66- 5.72

*****  Signal #2   *****

 1 S   2-Bromo-1-Chloropropan 285.093 312.845 E3  -9.7  112   0.00    1.68- 1.74
 2     1,2-Dibromoethane        1.293   1.294 E6  -0.1   92   0.00    2.06- 2.12
 3     1,2,3-Trichloropropane 165.500 206.687 E3 -24.9# 119   0.00    3.61- 3.67
 4     1,2-Dibromo-3-Chloropr   2.576   2.589 E6  -0.5  103   0.00    5.53- 5.59
---------------------------------------------------------------------------
---------------------------------------------------------------------------

   (#) = Out of Range              SPCC's out = 0  CCC's out = 0
    7G12655.D  7G504M456.M       Wed Aug 05 12:06:29 2015
```

New Jersey

GC Volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14263.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 8:13 pm
Operator : vinced
Sample : jc300-1
Misc : op85954,g7g521,37.4,,,2,1
ALS Vial : 20 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:01:40 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um

Compound	RT#1	RT#2	Resp#1	Resp#2	PPB	PPB
System Monitoring Compounds						
1) S 2-Bromo-1...	2.160	1.709	3641894	1680037	7.704	5.893
Spiked Amount 10.000			Recovery	=	77.04%	58.93%
Target Compounds						

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

11.1.1

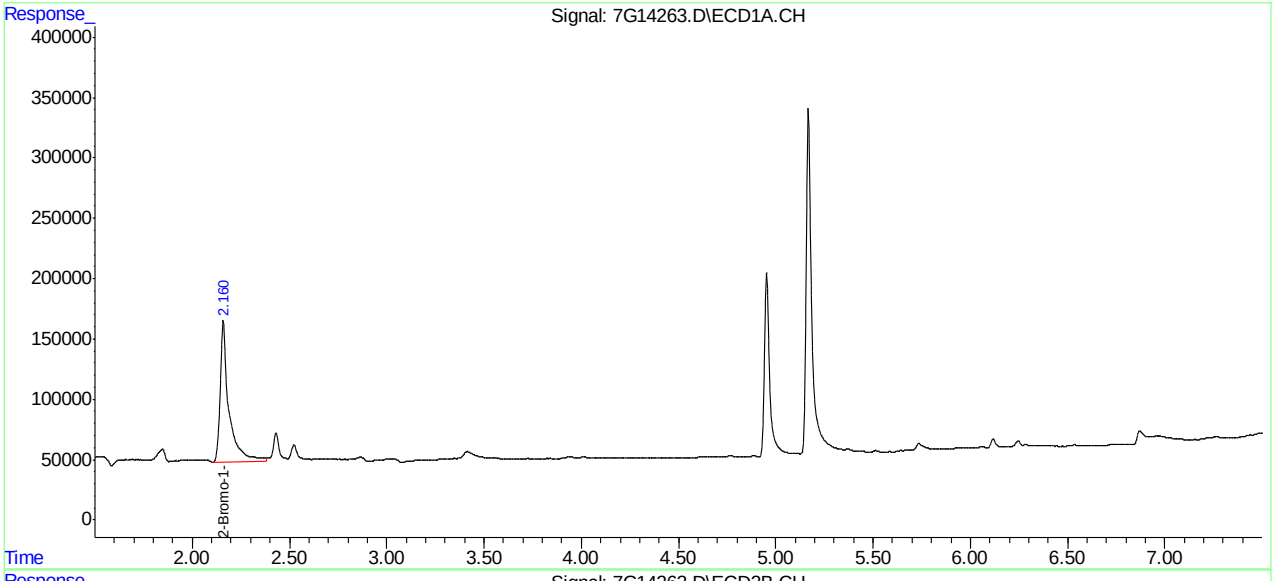
11

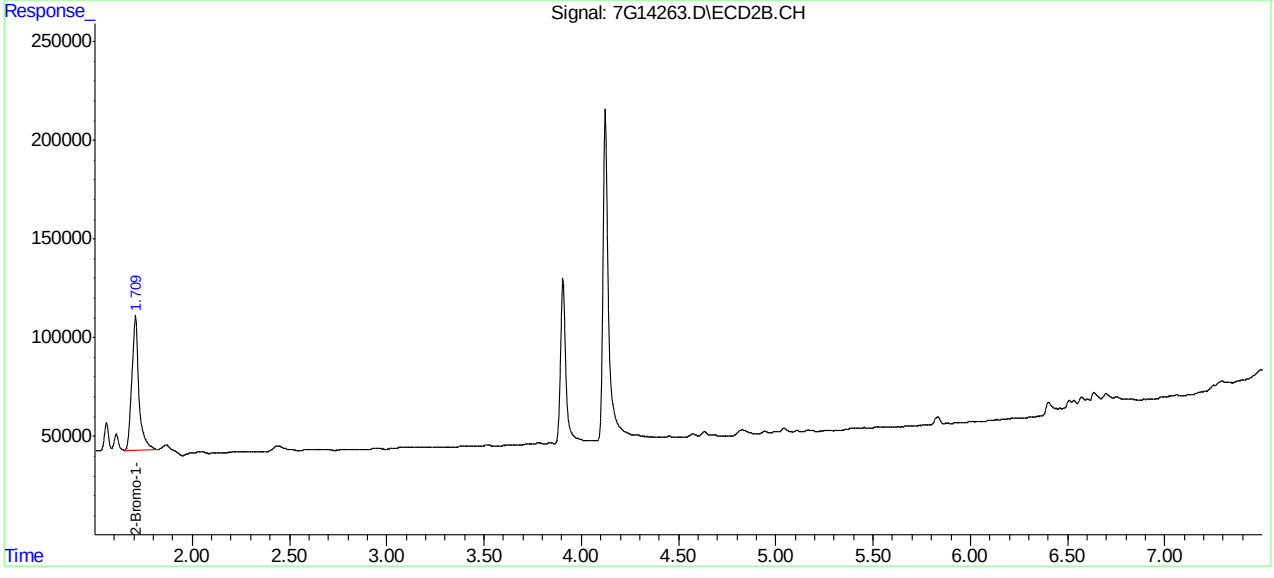
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14263.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 8:13 pm
Operator : vinced
Sample : jc300-1
Misc : op85954,g7g521,37.4,,,2,1
ALS Vial : 20 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:01:40 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um





Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14264.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 8:32 pm
Operator : vinced
Sample : jc300-2
Misc : op85954,g7g521,36.4,,,2,1
ALS Vial : 21 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:01:51 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um

Compound	RT#1	RT#2	Resp#1	Resp#2	PPB	PPB
System Monitoring Compounds						
1) S 2-Bromo-1...	2.160	1.710	2749039	1659942	5.816	5.822
Spiked Amount 10.000			Recovery	=	58.16%	58.22%
Target Compounds						

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

11.1.2

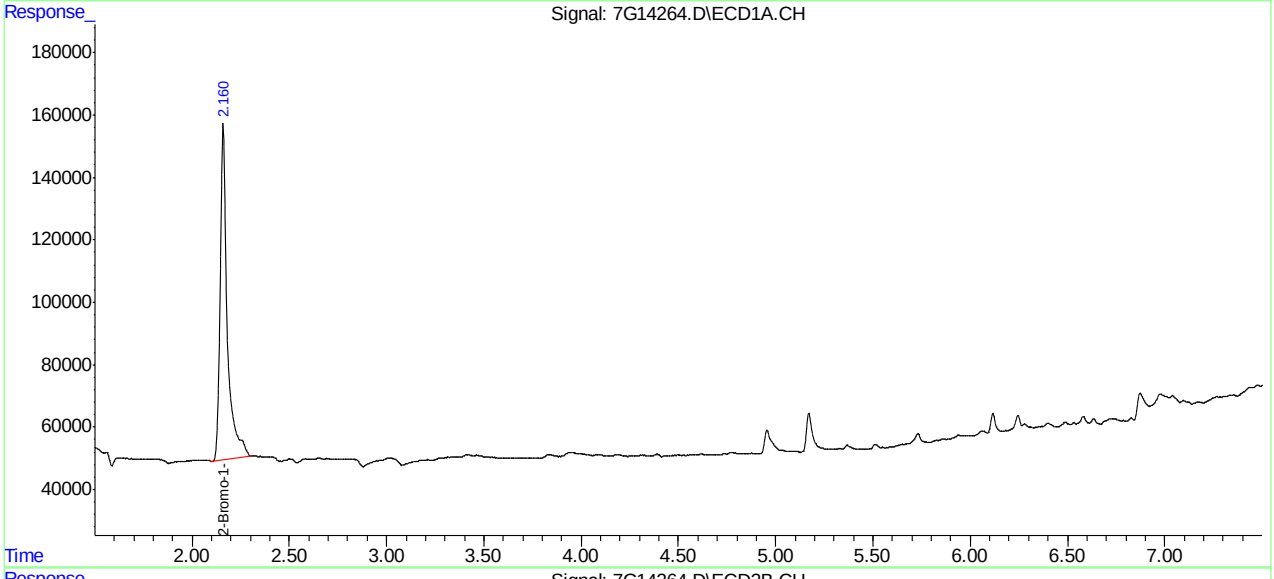
11

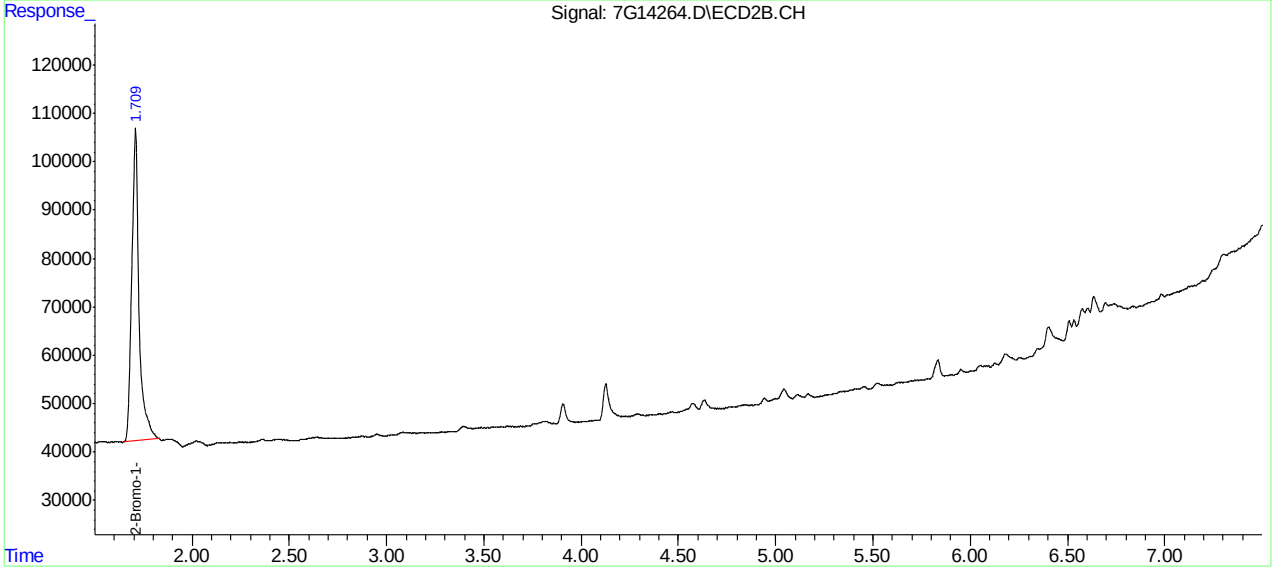
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14264.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 8:32 pm
Operator : vinced
Sample : jc300-2
Misc : op85954,g7g521,36.4,,,2,1
ALS Vial : 21 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:01:51 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um





Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14265.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 8:51 pm
Operator : vinced
Sample : jc300-3
Misc : op85954,g7g521,37.2,,,2,1
ALS Vial : 22 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:02:01 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um

Compound	RT#1	RT#2	Resp#1	Resp#2	PPB	PPB
System Monitoring Compounds						
1) S 2-Bromo-1...	2.161	1.710	2732233	1645039	5.780	5.770
Spiked Amount 10.000			Recovery	=	57.80%	57.70%
Target Compounds						

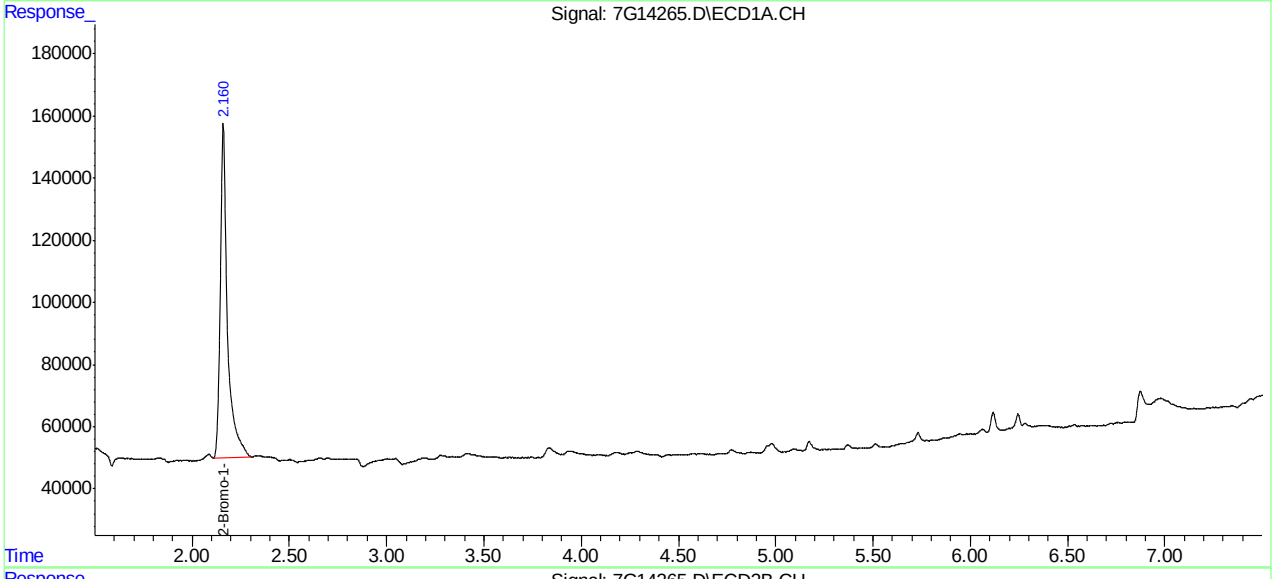
(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

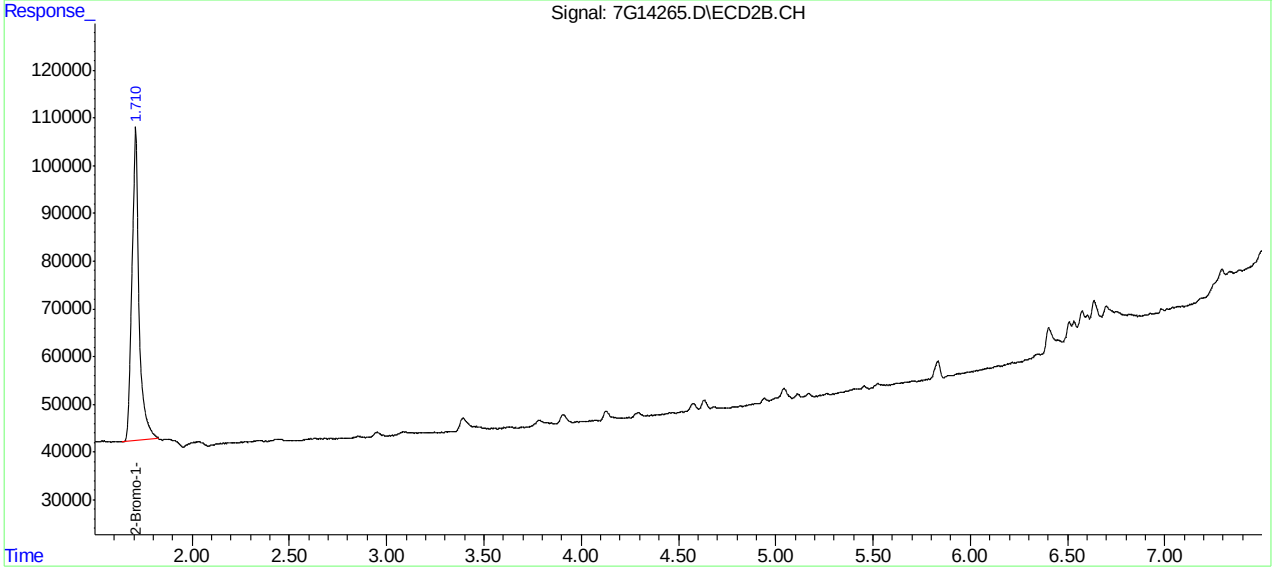
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14265.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 8:51 pm
Operator : vinced
Sample : jc300-3
Misc : op85954,g7g521,37.2,,,2,1
ALS Vial : 22 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:02:01 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um





Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14266.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 9:09 pm
Operator : vinced
Sample : jc300-4
Misc : op85954,g7g521,38.0,,,2,1
ALS Vial : 23 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:02:11 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um

Compound	RT#1	RT#2	Resp#1	Resp#2	PPB	PPB
System Monitoring Compounds						
1) S 2-Bromo-1...	2.160	1.710	2360129	1354730	4.993	4.752
Spiked Amount 10.000			Recovery	=	49.93%	47.52%
Target Compounds						

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

11.1.4

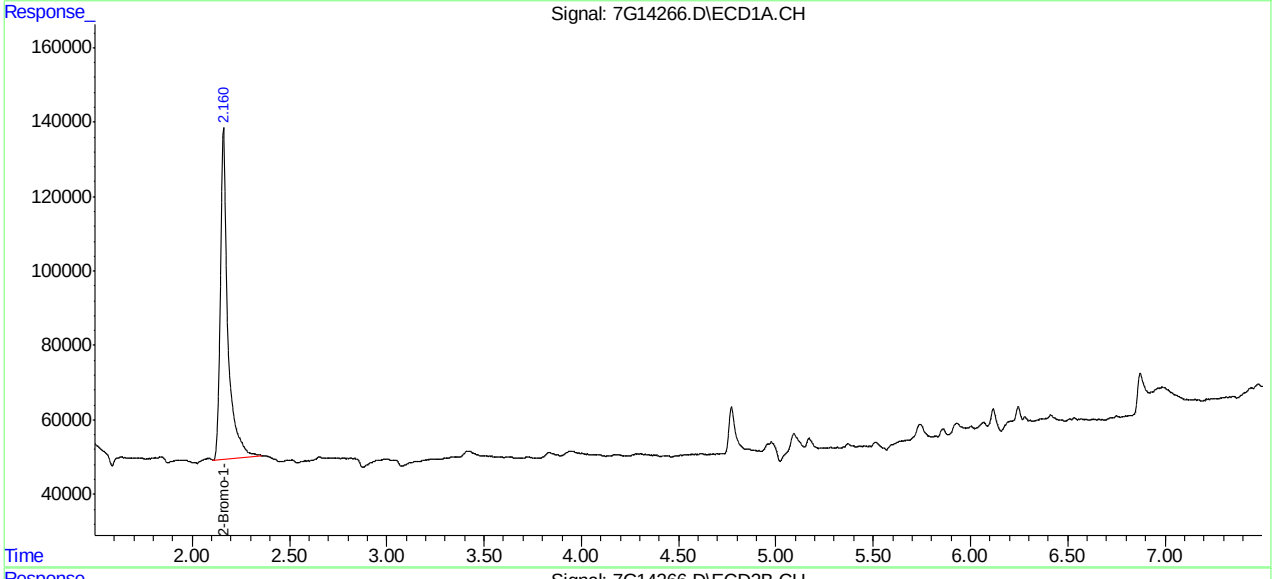
11

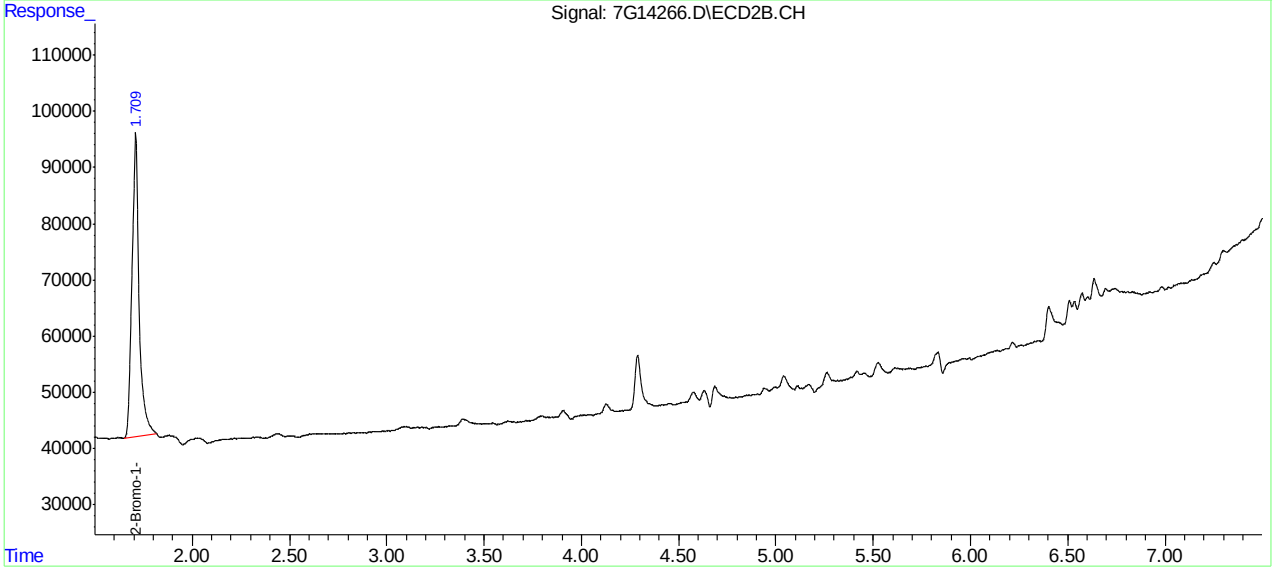
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14266.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 9:09 pm
Operator : vinced
Sample : jc300-4
Misc : op85954,g7g521,38.0,,,2,1
ALS Vial : 23 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:02:11 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um





Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14267.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 9:28 pm
Operator : vinced
Sample : jc300-5
Misc : op85954,g7g521,37.4,,,2,1
ALS Vial : 24 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:02:25 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um

Compound	RT#1	RT#2	Resp#1	Resp#2	PPB	PPB
System Monitoring Compounds						
1) S 2-Bromo-1...	2.160	1.709	3019791	1874786	6.388	6.576
Spiked Amount 10.000			Recovery	=	63.88%	65.76%
Target Compounds						

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

11.1.5

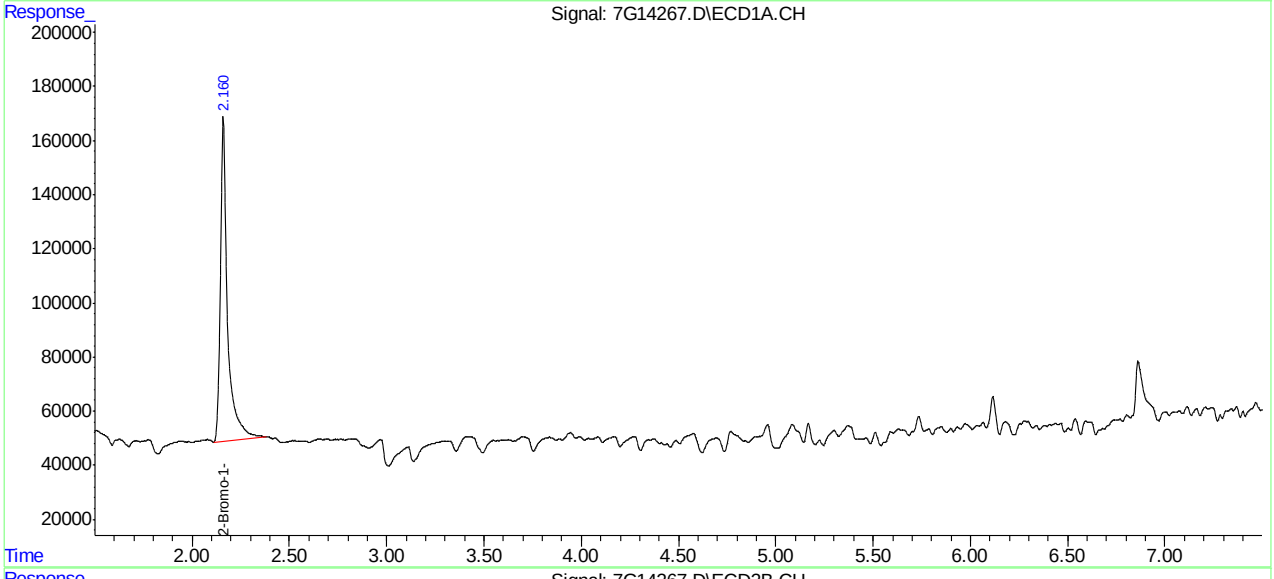
11

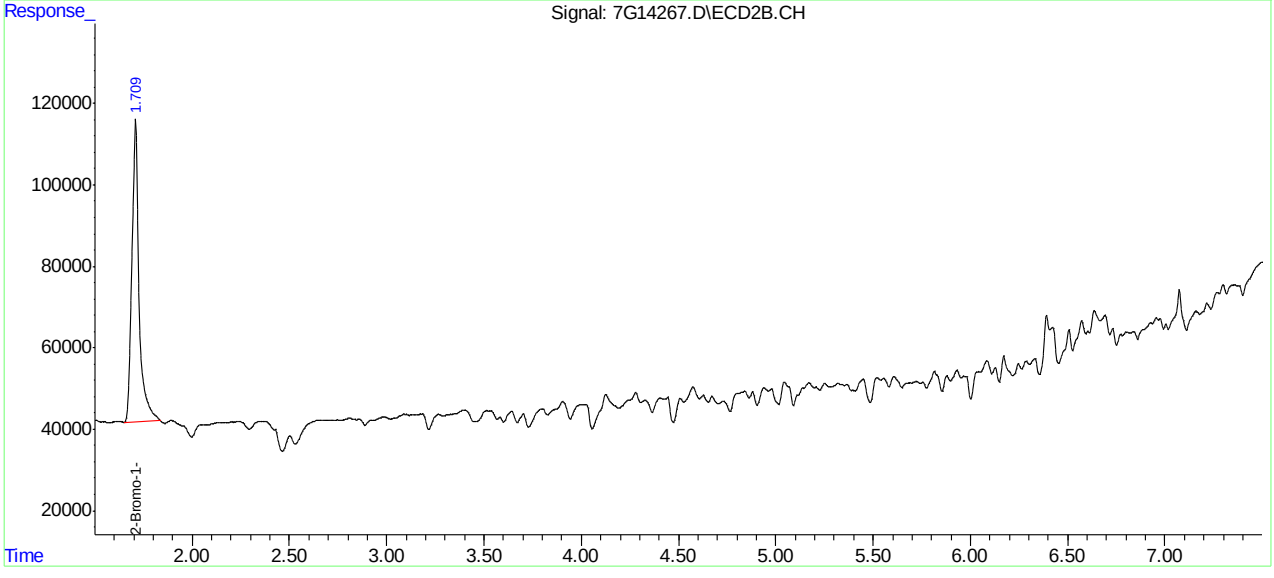
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14267.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 9:28 pm
Operator : vinced
Sample : jc300-5
Misc : op85954,g7g521,37.4,,,2,1
ALS Vial : 24 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:02:25 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um





Manual Integrations APPROVED (compounds with "m" flag)
Gwendolyn Burns
08/05/15 13:34

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14268.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 9:47 pm
Operator : vinced
Sample : jc300-6
Misc : op85954,g7g521,36.5,,,2,1
ALS Vial : 25 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:02:47 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um

Compound	RT#1	RT#2	Resp#1	Resp#2	PPB	PPB
System Monitoring Compounds						
1) S 2-Bromo-1...	2.160	1.710	3193423	1796018	6.756m	6.300
Spiked Amount 10.000			Recovery	=	67.56%	63.00%
Target Compounds						

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

11.1.6

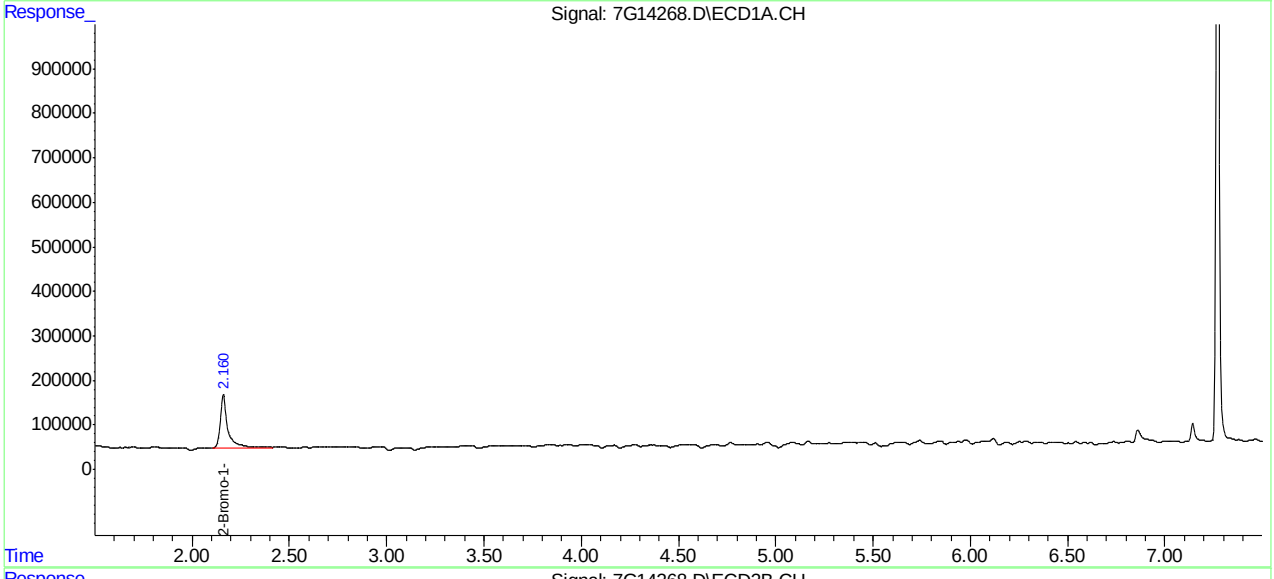
11

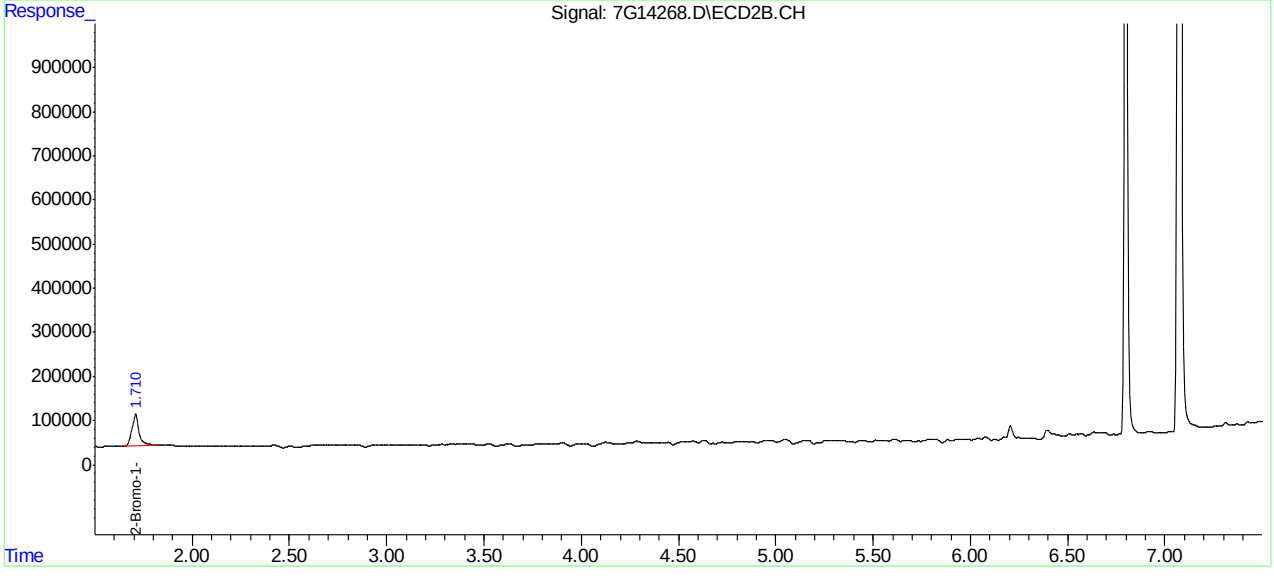
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14268.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 9:47 pm
Operator : vinced
Sample : jc300-6
Misc : op85954,g7g521,36.5,,,2,1
ALS Vial : 25 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:02:47 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um





Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14269.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 10:05 pm
Operator : vinced
Sample : jc300-7
Misc : op85954,g7g521,38.6,,,2,1
ALS Vial : 26 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:03:35 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um

Compound	RT#1	RT#2	Resp#1	Resp#2	PPB	PPB
System Monitoring Compounds						
1) S 2-Bromo-1...	2.160	1.710	4135124	2424981	8.748	8.506
Spiked Amount 10.000			Recovery	=	87.48%	85.06%
Target Compounds						

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

11.1.7

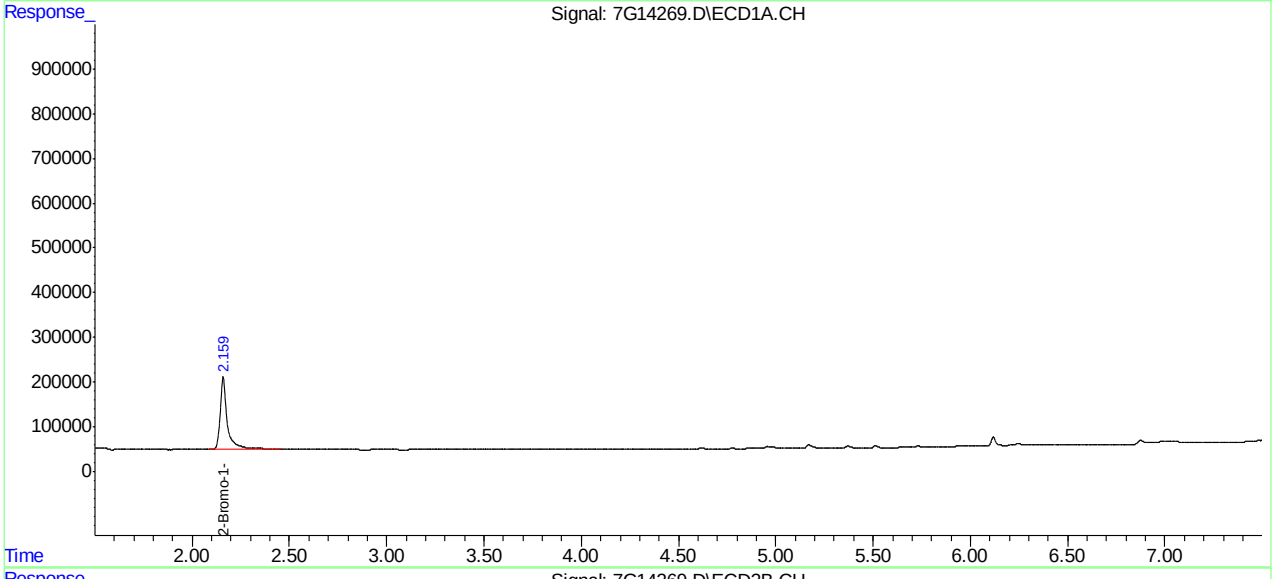
11

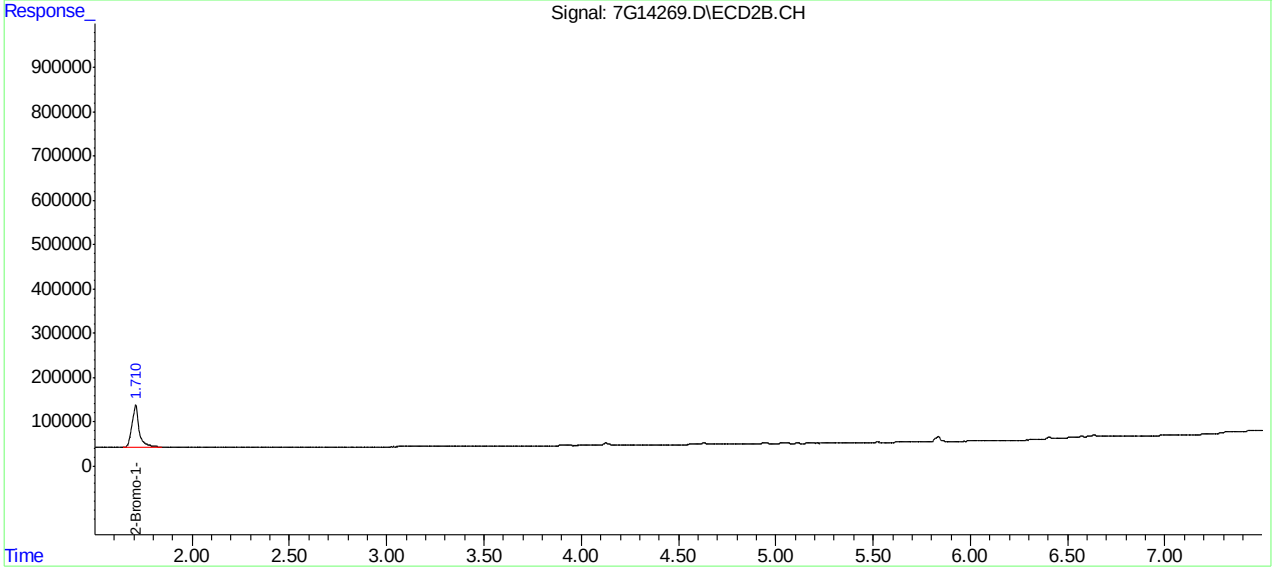
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14269.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 10:05 pm
Operator : vinced
Sample : jc300-7
Misc : op85954,g7g521,38.6,,,2,1
ALS Vial : 26 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 12:03:35 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um





Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14242.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 1:58 pm
Operator : vinced
Sample : op85954-mb1
Misc : op85954,g7g521,35.0,,,2,1
ALS Vial : 4 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 11:53:49 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um

Compound	RT#1	RT#2	Resp#1	Resp#2	PPB	PPB
System Monitoring Compounds						
1) S 2-Bromo-1...	2.160	1.709	3882886	2359211	8.214	8.275
Spiked Amount 10.000			Recovery	=	82.14%	82.75%
Target Compounds						

(f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25% (m)=manual int.

11.2.1

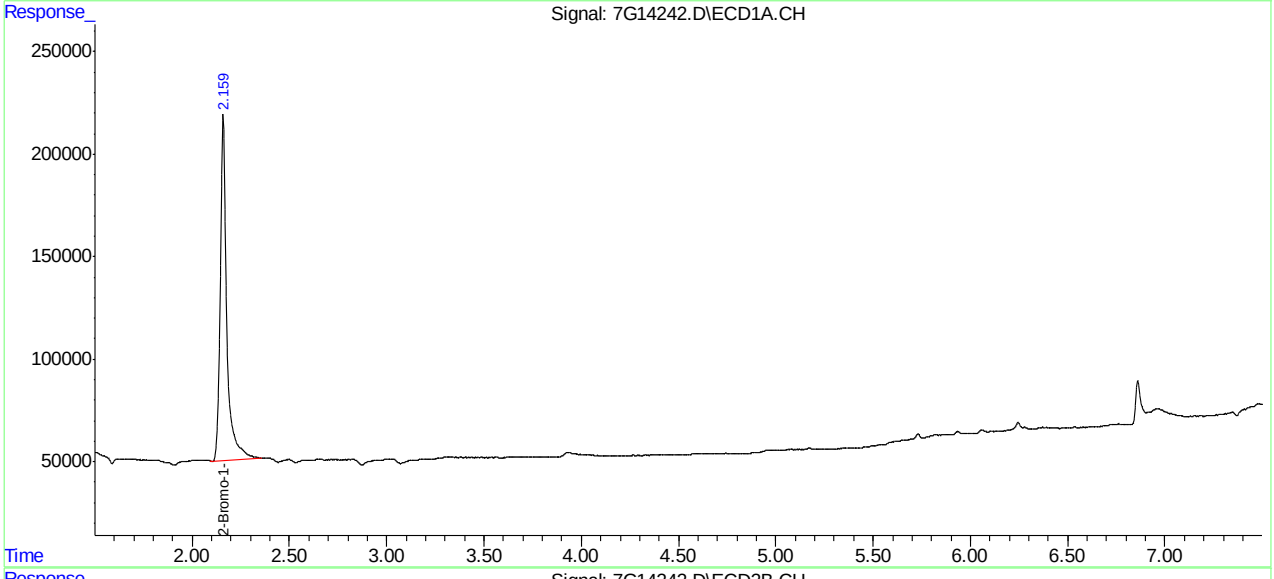
11

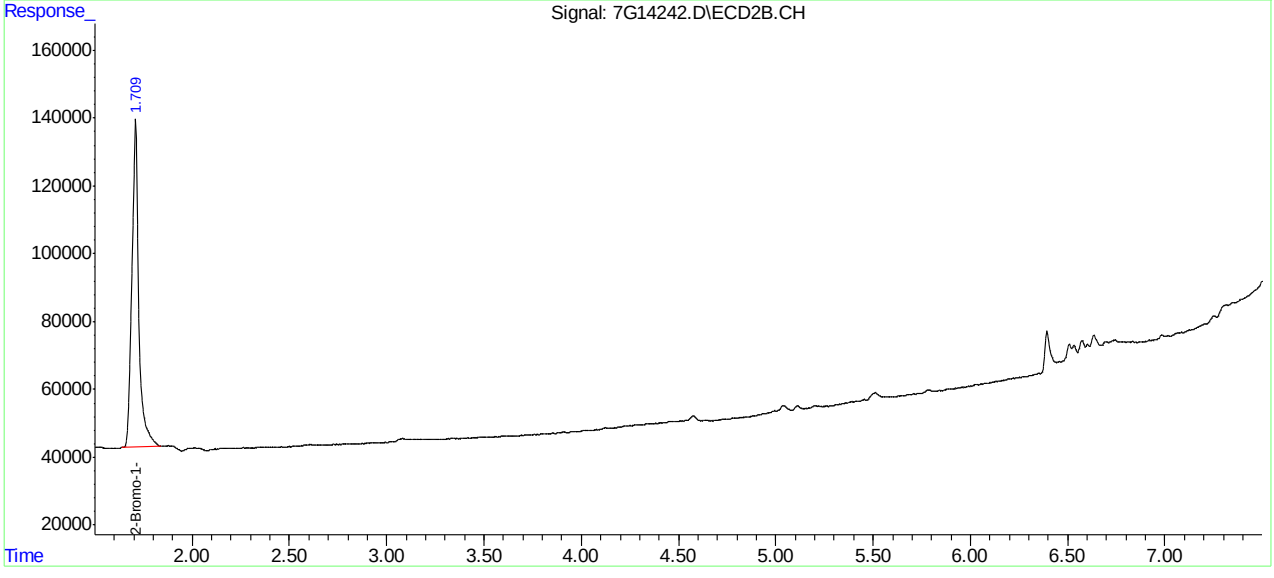
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\7g521\
Data File : 7G14242.D
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 03 Aug 2015 1:58 pm
Operator : vinced
Sample : op85954-mb1
Misc : op85954,g7g521,35.0,,,2,1
ALS Vial : 4 Sample Multiplier: 1

Integration File signal 1: autoint1.e
Integration File signal 2: autoint2.e
Quant Time: Aug 05 11:53:49 2015
Quant Method : C:\MSDCHEM\1\METHODS\7G504M456.M
Quant Title : GC/ECD- EDB
QLast Update : Fri Jul 10 16:32:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. : 1UL/COLUMN
Signal #1 Phase : RTXCLP Signal #2 Phase: RTXCLPII
Signal #1 Info : 30mx0.32mmx0.50um Signal #2 Info : 30m x 0.32mm x 0.25um





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: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:58	MA37260-STD1	1		STDA
17:06	MA37260-STD2	1		STDB
17:09	ZZZZZZ	1		
17:11	ZZZZZZ	1		
17:15	MA37260-ICV1	1		
17:18	MA37260-ICB1	1		
17:21	MA37260-CCV1	1		
17:24	MA37260-CCB1	1		
17:27	MA37260-CRI1	1		
17:30	MA37260-CRID1	1		
17:33	MA37260-CRIA1	1		
17:36	MA37260-ICSA1	1		
17:40	MA37260-ICSAB1	1		
17:43	ZZZZZZ	1		
17:46	ZZZZZZ	1		
17:49	ZZZZZZ	1		
17:52	MA37260-CRID2	1		
17:55	MA37260-CCV2	1		
17:58	MA37260-CCB2	1		
18:01	MP88118-MB1	1		
18:04	MP88118-B1	1		
18:07	MP88118-S1	1		
18:10	MP88118-S2	1		
18:13	JB99498-16R	1		(sample used for QC only; not part of login JC300)
18:16	MP88118-SD1	5		
18:19	ZZZZZZ	1		
18:22	ZZZZZZ	1		
18:25	ZZZZZZ	1		
18:29	MA37260-CCV3	1		
18:31	MA37260-CCB3	1		
18:35	ZZZZZZ	1		
18:38	ZZZZZZ	1		
18:41	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

	Time	Sample Description	Dilution Factor	PS Recov	Comments
	18:44	MP88107-B1	1		
	18:47	MP88107-MB1	1		bad reading
	18:50	MP88107-MB2	1		
	18:53	MP88107-B2	1		
	18:56	MP88107-S1	1		
	18:59	MP88107-S2	1		
	19:02	MA37260-CCV4	1		
	19:05	MA37260-CCB4	1		
	19:08	JC472-5	1		(sample used for QC only; not part of login JC300)
	19:11	MP88107-SD1	5		
	19:14	JC300-1F	1		
	19:17	JC300-2F	1		
	19:21	JC300-3F	1		
	19:24	JC300-4F	1		
	19:27	JC300-5F	1		
	19:30	JC300-6F	1		
---------->	Last reportable sample/prep for job JC300				
	19:33	ZZZZZZ	1		
	19:36	MA37260-CCV5	1		
	19:39	MA37260-CCB5	1		
	19:42	ZZZZZZ	1		
	19:45	ZZZZZZ	1		
	19:48	ZZZZZZ	1		
	19:52	ZZZZZZ	1		
	19:55	ZZZZZZ	1		
	19:58	ZZZZZZ	1		
	20:01	ZZZZZZ	1		
	20:04	ZZZZZZ	1		
	20:07	ZZZZZZ	1		
	20:10	MA37260-CCV6	1		
	20:13	MA37260-CCB6	1		
	20:16	ZZZZZZ	1		
	20:19	ZZZZZZ	1		
	20:23	MP88110-B1	1		Batch to redigestion

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
20:26	MP88110-MB1	1		
20:29	MP88110-S1	1		
20:32	MP88110-S2	1		
20:34	JC346-1	1		(sample used for QC only; not part of login JC300)
20:38	MP88110-SD1	5		
20:41	ZZZZZZ	1		
20:44	MA37260-CCV7	1		
20:47	MA37260-CCB7	1		
20:50	ZZZZZZ	1		
20:53	ZZZZZZ	1		
20:56	ZZZZZZ	1		
20:59	ZZZZZZ	1		
21:02	ZZZZZZ	1		
21:06	ZZZZZZ	1		
21:09	ZZZZZZ	1		
21:12	ZZZZZZ	1		
21:15	ZZZZZZ	1		
21:18	MA37260-CCV8	1		
21:21	MA37260-CCB8	1		
21:24	ZZZZZZ	1		
21:27	ZZZZZZ	1		
21:30	ZZZZZZ	1		
21:34	ZZZZZZ	1		
21:37	ZZZZZZ	1		
21:40	ZZZZZZ	1		
21:43	ZZZZZZ	1		
21:46	ZZZZZZ	1		
21:49	MA37260-CCV9	1		
21:52	MA37260-CCB9	1		
21:55	MA37260-CRI2	1		
21:59	MA37260-CRID3	1		
22:02	MA37260-CRIA2	1		
22:05	MA37260-ICSA2	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

	Time	Sample Description	Dilution Factor	PS Recov	Comments
	22:08	MA37260-ICSAB2	1		
	22:11	MA37260-CCV10	1		
	22:14	MA37260-CCB10	1		
---------->	Last reportable CCB for job JC300				
	22:17	MP88112-MB1	1		
	22:21	MA37260-CCV11	1		
	22:24	MA37260-CCB11	1		
	22:27	MP88112-MB1	1		Batch to redigestion
	22:30	MP88112-B1	1		
	22:33	MP88112-S1	1		
	22:36	MP88112-S2	1		
	22:39	JC339-1	1		(sample used for QC only; not part of login JC300)
	22:42	MP88112-SD1	5		
	22:45	ZZZZZZ	1		
	22:48	ZZZZZZ	1		
	22:51	MA37260-CCV12	1		
	22:54	MA37260-CCB12	1		
	22:57	ZZZZZZ	1		
	23:00	ZZZZZZ	1		
	23:03	ZZZZZZ	1		
	23:05	ZZZZZZ	1		
	23:08	ZZZZZZ	1		
	23:11	ZZZZZZ	1		
	23:14	ZZZZZZ	1		
	23:17	MP88138-B1	1		
	23:20	MP88138-MB1	1		
	23:23	MA37260-CCV13	1		
	23:26	MA37260-CCB13	1		
	23:29	MP88138-S1	1		%sol
	23:31	MP88138-S2	1		%sol
	23:34	JB99985-16	1		(sample used for QC only; not part of login JC300)
	23:37	MP88138-SD1	5		%sol
	23:40	ZZZZZZ	1		
	23:43	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
23:46	ZZZZZZ	1		
23:49	ZZZZZZ	1		
23:52	ZZZZZZ	1		
23:55	MA37260-CCV14	1		
23:57	MA37260-CCB14	1		
00:00	ZZZZZZ	1		
00:03	ZZZZZZ	1		
00:07	ZZZZZZ	1		
00:09	ZZZZZZ	1		
00:12	ZZZZZZ	1		
00:15	ZZZZZZ	1		
00:18	ZZZZZZ	1		
00:21	ZZZZZZ	1		
00:24	ZZZZZZ	1		
00:27	MA37260-CCV15	1		
00:29	MA37260-CCB15	1		
00:32	ZZZZZZ	1		
00:35	ZZZZZZ	1		
00:38	ZZZZZZ	1		
00:41	ZZZZZZ	1		
00:44	ZZZZZZ	1		
00:47	MP88160-B1	1		
00:49	MP88160-MB1	1		
00:52	MP88160-S1	1		
00:55	MP88160-S2	1		
00:58	MA37260-CCV16	1		
01:01	MA37260-CCB16	1		
01:04	JC368-73	1		(sample used for QC only; not part of login JC300)
01:07	MP88160-SD1	5		
01:10	ZZZZZZ	1		
01:13	ZZZZZZ	1		
01:16	ZZZZZZ	1		
01:18	MA37260-CCV17	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
01:21	MA37260-CCB17	1		
01:24	MA37260-CRI3	1		
01:27	MA37260-CRID4	1		
01:30	MA37260-CRIA3	1		
01:33	MA37260-ICSA3	1		
01:36	MA37260-ICSAB3	1		
01:39	MA37260-CCV18	1		
01:42	MA37260-CCB18	1		
01:45	ZZZZZZ	1		
01:48	ZZZZZZ	1		
01:51	ZZZZZZ	1		
01:54	ZZZZZZ	1		
01:57	ZZZZZZ	1		
02:00	ZZZZZZ	1		
02:03	ZZZZZZ	1		
02:06	ZZZZZZ	1		
02:09	ZZZZZZ	1		
02:12	ZZZZZZ	1		
02:15	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
16:58	MA37260-STD1	2414 R	84602 R	19591 R	5887 R
17:06	MA37260-STD2	2224	76931	19130	5161
17:09	ZZZZZZ	2302	79457	19299	5389
17:11	ZZZZZZ	2433	85056	19595	5963
17:15	MA37260-ICV1	2314	79754	19347	5405
17:18	MA37260-ICB1	2447	84987	19538	5946
17:21	MA37260-CCV1	2311	80173	18609	5400
17:24	MA37260-CCB1	2401	83864	19440	5876
17:27	MA37260-CRI1	2373	82578	19308	5755
17:30	MA37260-CRID1	No results reported for the elements associated with this internal standard.			
17:33	MA37260-CRIA1	2379	83518	19163	5811
17:36	MA37260-ICSA1	2078	71178	18276	4699
17:40	MA37260-ICSAB1	2068	70898	18342	4690
17:43	ZZZZZZ	2370	81872	19212	5822
17:46	ZZZZZZ	2419	86171	19761	6016
17:49	ZZZZZZ	2414	83931	19715	5908
17:52	MA37260-CRID2	2372	83365	19308	5810
17:55	MA37260-CCV2	2272	78025	18966	5309
17:58	MA37260-CCB2	2389	84102	19320	5866
18:01	MP88118-MB1	2400	84391	19631	5848
18:04	MP88118-B1	2275	79602	19377	5430
18:07	MP88118-S1	2265	78996	19515	5367
18:10	MP88118-S2	2252	78971	19154	5338
18:13	JB99498-16R	2338	82011	19321	5681
18:16	MP88118-SD1	2402	83067	19249	5829
18:19	ZZZZZZ	2355	82833	19495	5776
18:22	ZZZZZZ	2399	82846	19554	5722
18:25	ZZZZZZ	2345	82892	19354	5771
18:29	MA37260-CCV3	2264	78087	18856	5286
18:31	MA37260-CCB3	2382	83137	18980	5836
18:35	ZZZZZZ	2340	82089	19382	5702
18:38	ZZZZZZ	2384	83186	19537	5747
18:41	ZZZZZZ	2351	82602	19484	5717

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
18:44	MP88107-B1	2260	79316	18974	5379
18:47	MP88107-MB1	2365	999999 !a	19302	5808
18:50	MP88107-MB2	2377	83855	19273	5830
18:53	MP88107-B2	2295	79651	19078	5444
18:56	MP88107-S1	2273	78013	19221	5270
18:59	MP88107-S2	2254	77662	19222	5233
19:02	MA37260-CCV4	2267	78119	18809	5292
19:05	MA37260-CCB4	2399	83399	19334	5866
19:08	JC472-5	2375	80704	19396	5509
19:11	MP88107-SD1	2386	82504	19447	5742
19:14	JC300-1F	2322	81092	19220	5611
19:17	JC300-2F	2243	78070	19156	5315
19:21	JC300-3F	2297	80848	19368	5549
19:24	JC300-4F	2302	81996	19564	5598
19:27	JC300-5F	2228	78471	19346	5302
19:30	JC300-6F	2231	78837	19665	5338
19:33	ZZZZZZ	2386	84525	19773	5872
19:36	MA37260-CCV5	2294	79142	19198	5352
19:39	MA37260-CCB5	2392	84086	19504	5853
19:42	ZZZZZZ	2384	83985	19601	5860
19:45	ZZZZZZ	2333	81048	19449	5494
19:48	ZZZZZZ	2325	80001	19474	5425
19:52	ZZZZZZ	2287	80005	19215	5517
19:55	ZZZZZZ	2370	81256	19504	5487
19:58	ZZZZZZ	2291	78596	19103	5392
20:01	ZZZZZZ	2346	81991	19157	5670
20:04	ZZZZZZ	2176	75428	18645	5061
20:07	ZZZZZZ	2281	78890	19131	5417
20:10	MA37260-CCV6	2297	78670	19011	5352
20:13	MA37260-CCB6	2363	83868	19181	5767
20:16	ZZZZZZ	2314	80332	18957	5551
20:19	ZZZZZZ	2376	81590	19403	5568
20:23	MP88110-B1	No results reported for the elements associated with this internal standard.			

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
20:26	MP88110-MB1	No results reported for the elements associated with this internal standard.			
20:29	MP88110-S1	No results reported for the elements associated with this internal standard.			
20:32	MP88110-S2	No results reported for the elements associated with this internal standard.			
20:34	JC346-1	No results reported for the elements associated with this internal standard.			
20:38	MP88110-SD1	No results reported for the elements associated with this internal standard.			
20:41	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:44	MA37260-CCV7	2304	79226	18950	5378
20:47	MA37260-CCB7	2422	83753	19141	5896
20:50	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:53	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:56	ZZZZZZ	No results reported for the elements associated with this internal standard.			
20:59	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:02	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:06	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:09	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:12	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:15	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:18	MA37260-CCV8	2355	80937	19211	5495
21:21	MA37260-CCB8	2502	86758	19664	6094
21:24	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:27	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:30	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:34	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:37	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:40	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:43	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:46	ZZZZZZ	No results reported for the elements associated with this internal standard.			
21:49	MA37260-CCV9	2309	79484	19234	5402
21:52	MA37260-CCB9	2448	84931	19419	5969
21:55	MA37260-CRI2	2395	83742	19320	5829
21:59	MA37260-CRID3	2438	84520	19553	5919
22:02	MA37260-CRIA2	2308	84490	19409	5654
22:05	MA37260-ICSA2	2090	71819	18468	4750

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
22:08	MA37260-ICSAB2	2148	69469	18097	4850
22:11	MA37260-CCV10	2336	80331	19086	5445
22:14	MA37260-CCB10	2512	85440	19426	6058
22:17	MP88112-MB1	No results reported for the elements associated with this internal standard.			
22:21	MA37260-CCV11	2330	79621	18982	5429
22:24	MA37260-CCB11	2445	84601	19295	5972
22:27	MP88112-MB1	2418	84274	19366	5915
22:30	MP88112-B1	2339	80728	19090	5504
22:33	MP88112-S1	2292	78957	19375	5365
22:36	MP88112-S2	2284	80164	19583	5366
22:39	JC339-1	2372	81940	19912	5597
22:42	MP88112-SD1	2424	83793	19711	5856
22:45	ZZZZZZ	2440	84673	20472	5609
22:48	ZZZZZZ	2358	82073	19868	5654
22:51	MA37260-CCV12	2327	79809	19027	5428
22:54	MA37260-CCB12	2453	85332	19350	5990
22:57	ZZZZZZ	2162	72330	18634	4886
23:00	ZZZZZZ	2354	81439	19557	5597
23:03	ZZZZZZ	2372	83080	19778	5735
23:05	ZZZZZZ	2356	82147	19733	5691
23:08	ZZZZZZ	2133	71981	18807	4807
23:11	ZZZZZZ	2424	85054	19927	5862
23:14	ZZZZZZ	2348	81578	19354	5609
23:17	MP88138-B1	2339	80812	19357	5502
23:20	MP88138-MB1	2430	85542	19833	5949
23:23	MA37260-CCV13	2336	80519	19236	5456
23:26	MA37260-CCB13	2461	85629	19575	5988
23:29	MP88138-S1	2302	79490	19812	5334
23:31	MP88138-S2	2317	79922	19757	5336
23:34	JB99985-16	2466	83786	19972	5646
23:37	MP88138-SD1	2492	84578	19660	5861
23:40	ZZZZZZ	2659	90803	22587	5401
23:43	ZZZZZZ	2906	98025	24142	5413

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
23:46	ZZZZZZ	2514	86143	21239	5437
23:49	ZZZZZZ	2443	83154	20164	5659
23:52	ZZZZZZ	2490	85585	20815	5719
23:55	MA37260-CCV14	2371	81197	19450	5516
23:57	MA37260-CCB14	2509	86250	19390	6089
00:00	ZZZZZZ	2463	85747	21098	5475
00:03	ZZZZZZ	2585	89325	22867	4947
00:07	ZZZZZZ	2574	86586	20989	5593
00:09	ZZZZZZ	2635	88621	21510	5548
00:12	ZZZZZZ	2364	82156	20148	5548
00:15	ZZZZZZ	2387	83621	20115	5735
00:18	ZZZZZZ	2459	85314	20292	5726
00:21	ZZZZZZ	2326	80458	19458	5503
00:24	ZZZZZZ	2332	80390	19344	5571
00:27	MA37260-CCV15	2282	78314	18913	5351
00:29	MA37260-CCB15	2408	83847	19008	5886
00:32	ZZZZZZ	2355	80305	19359	5645
00:35	ZZZZZZ	2379	81452	19455	5595
00:38	ZZZZZZ	2353	79954	19372	5515
00:41	ZZZZZZ	2363	80476	19530	5560
00:44	ZZZZZZ	2363	81580	19552	5587
00:47	MP88160-B1	2330	80109	19033	5525
00:49	MP88160-MB1	2396	84350	19281	5904
00:52	MP88160-S1	2183	77138	19537	4910
00:55	MP88160-S2	2179	76803	19625	4936
00:58	MA37260-CCV16	2291	79187	19162	5367
01:01	MA37260-CCB16	2399	84354	19436	5892
01:04	JC368-73	2212	77956	19508	5008
01:07	MP88160-SD1	2300	81196	19372	5470
01:10	ZZZZZZ	2425	83640	20131	5512
01:13	ZZZZZZ	2370	82309	20007	5412
01:16	ZZZZZZ	2424	83339	19768	5542
01:18	MA37260-CCV17	2307	79236	18735	5394

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
Analyst: BS Run ID: MA37260
Parameters: Co,Pb,Ni,V,Zn

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
01:21	MA37260-CCB17	2451	83998	19143	5924
01:24	MA37260-CRI3	2383	82947	18838	5807
01:27	MA37260-CRID4	2435	84256	19202	5894
01:30	MA37260-CRIA3	2342	83954	19245	5782
01:33	MA37260-ICSA3	2059	71129	18069	4709
01:36	MA37260-ICSAB3	2091	71485	18123	4747
01:39	MA37260-CCV18	2339	80069	18992	5456
01:42	MA37260-CCB18	2480	84575	19190	5971
01:45	ZZZZZZ	2424	84480	19024	5924
01:48	ZZZZZZ	2415	84061	19090	5932
01:51	ZZZZZZ	2421	84210	19198	5931
01:54	ZZZZZZ	2432	85161	19083	5934
01:57	ZZZZZZ	2414	84618	18978	5911
02:00	ZZZZZZ	2471	85752	19264	5967
02:03	ZZZZZZ	2443	84752	19019	5977
02:06	ZZZZZZ	2425	80147	20018	5473
02:09	ZZZZZZ	2253	77279	18530	5244
02:12	ZZZZZZ	2229	76798	18573	5226
02:15	ZZZZZZ	2489	85634	19264	6019

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 %

(a) No samples reported for the elements associated with this internal standard.

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37260 Units: ug/l

Time:			17:18		17:24		17:58		18:31	
Sample ID:			ICB1		CCB1		CCB2		CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	10	anr							
Antimony	6.0	2.4	anr							
Arsenic	3.0	2.5	anr							
Barium	200	.2	anr							
Beryllium	1.0	.1	anr							
Bismuth	20	2.7								
Boron	100	2								
Cadmium	3.0	.4	anr							
Calcium	2000	4.5	anr							
Chromium	10	.9	anr							
Cobalt	50	.4	-0.30	<50	-0.30	<50	-0.30	<50	-0.30	<50
Copper	10	1.1	anr							
Iron	100	1.7	anr							
Lead	3.0	1.7	-0.30	<3.0	0.20	<3.0	-0.10	<3.0	-1.7	<100
Lithium	20	1.5								
Magnesium	2000	21	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.5	0.0	<10	0.20	<10	0.40	<10	-0.30	<10
Palladium	50	2								
Potassium	2000	29	anr							
Selenium	10	2.6	anr							
Silicon	200	1.9								
Silver	10	.8	anr							
Sodium	2000	9.4	anr							
Sulfur	50	4.1								
Strontium	10	.1								
Thallium	2.0	1.9	anr							
Tin	10	1.3								
Titanium	10	1.1								
Tungsten	50	1.9								
Vanadium	50	.7	0.20	<50	0.40	<50	0.20	<50	0.10	<50
Zinc	20	.3	0.80	<20	0.70	<20	0.70	<20	-0.10	<20

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37260 Units: ug/l

Time:			17:18		17:24		17:58		18:31	
Sample ID:			ICB1		CCB1		CCB2		CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zirconium	10	.3								

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37260 Units: ug/l

Time:			19:05		19:39		20:13		20:47	
Sample ID:			CCB4		CCB5		CCB6		CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	10	anr							
Antimony	6.0	2.4	anr							
Arsenic	3.0	2.5	anr							
Barium	200	.2	anr							
Beryllium	1.0	.1	anr							
Bismuth	20	2.7								
Boron	100	2								
Cadmium	3.0	.4	anr							
Calcium	2000	4.5	anr							
Chromium	10	.9	anr							
Cobalt	50	.4	-0.40	<50	-0.20	<50	-0.40	<50	-0.50	<50
Copper	10	1.1	anr							
Iron	100	1.7	anr							
Lead	3.0	1.7	0.60	<3.0	-0.50	<3.0	-0.80	<3.0	-0.30	<3.0
Lithium	20	1.5								
Magnesium	2000	21	anr							
Manganese	15	.1	anr							
Molybdenum	20	.6								
Nickel	10	.5	-0.50	<10	0.0	<10	0.10	<10	0.20	<10
Palladium	50	2								
Potassium	2000	29	anr							
Selenium	10	2.6	anr							
Silicon	200	1.9								
Silver	10	.8	anr							
Sodium	2000	9.4	anr							
Sulfur	50	4.1								
Strontium	10	.1								
Thallium	2.0	1.9	anr							
Tin	10	1.3								
Titanium	10	1.1								
Tungsten	50	1.9								
Vanadium	50	.7	0.60	<50	0.50	<50	0.0	<50	0.70	<50
Zinc	20	.3	-0.10	<20	0.10	<20	0.0	<20	0.0	<20

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37260 Units: ug/l

Time:			19:05		19:39		20:13		20:47	
Sample ID:			CCB4		CCB5		CCB6		CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zirconium	10	.3								

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37260 Units: ug/l

Time:			21:21		21:52		22:14	
Sample ID:			CCB8		CCB9		CCB10	
Metal	RL	IDL	raw	final	raw	final	raw	final
Aluminum	200	10	anr					
Antimony	6.0	2.4	anr					
Arsenic	3.0	2.5	anr					
Barium	200	.2	anr					
Beryllium	1.0	.1	anr					
Bismuth	20	2.7						
Boron	100	2						
Cadmium	3.0	.4	anr					
Calcium	2000	4.5	anr					
Chromium	10	.9	anr					
Cobalt	50	.4	-0.20	<50	-0.20	<50	-0.20	<50
Copper	10	1.1	anr					
Iron	100	1.7	anr					
Lead	3.0	1.7	-0.30	<3.0	-1.1	<3.0	0.70	<3.0
Lithium	20	1.5						
Magnesium	2000	21	anr					
Manganese	15	.1	anr					
Molybdenum	20	.6						
Nickel	10	.5	0.0	<10	-0.10	<10	0.50	<10
Palladium	50	2						
Potassium	2000	29	anr					
Selenium	10	2.6	anr					
Silicon	200	1.9						
Silver	10	.8	anr					
Sodium	2000	9.4	anr					
Sulfur	50	4.1						
Strontium	10	.1						
Thallium	2.0	1.9	anr					
Tin	10	1.3						
Titanium	10	1.1						
Tungsten	50	1.9						
Vanadium	50	.7	0.40	<50	0.40	<50	0.0	<50
Zinc	20	.3	0.10	<20	0.0	<20	18.5	<20

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37260 Units: ug/l

Time:			21:21		21:52		22:14	
Sample ID:			CCB8		CCB9		CCB10	
Metal	RL	IDL	raw	final	raw	final	raw	final
Zirconium	10	.3						

(*) Outside of QC limits
(anr) Analyte not requested

12.1.2
12

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA37260 Units: ug/l

Time:		17:15			17:21			17:55	
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2	
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	2000	2000	100.0	2000	2000	100.0	2000	2050	102.5
Copper	anr								
Iron	anr								
Lead	2000	2010	100.5	2000	2010	100.5	2000	2060	103.0
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	2000	2020	101.0	2000	2010	100.5	2000	2050	102.5
Palladium									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Sulfur									
Strontium									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	2000	2000	100.0	2000	1980	99.0	2000	2050	102.5
Zinc	2000	2020	101.0	2000	2020	101.0	2000	2070	103.5

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA37260 Units: ug/l

Time:		17:15			17:21			17:55	
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Zirconium									

(*) Outside of QC limits
(anr) Analyte not requested

12.1.3
12

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA37260 Units: ug/l

Time:		18:29			19:02			19:36	
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5	
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	2000	2050	102.5	2000	2050	102.5	2000	2040	102.0
Copper	anr								
Iron	anr								
Lead	2000	2060	103.0	2000	2070	103.5	2000	2050	102.5
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	2000	2060	103.0	2000	2070	103.5	2000	2050	102.5
Palladium									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Sulfur									
Strontium									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	2000	2050	102.5	2000	2050	102.5	2000	2030	101.5
Zinc	2000	2070	103.5	2000	2080	104.0	2000	2050	102.5

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA37260 Units: ug/l

Time:		18:29			19:02			19:36	
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Zirconium									

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA37260 Units: ug/l

Time:		20:10			20:44			21:18	
Sample ID:	CCV	CCV6		CCV	CCV7		CCV	CCV8	
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	2000	2050	102.5	2000	2030	101.5	2000	2000	100.0
Copper	anr								
Iron	anr								
Lead	2000	2060	103.0	2000	2050	102.5	2000	2020	101.0
Lithium									
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	2000	2060	103.0	2000	2040	102.0	2000	2010	100.5
Palladium									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Sulfur									
Strontium									
Thallium	anr								
Tin									
Titanium									
Tungsten									
Vanadium	2000	2040	102.0	2000	2030	101.5	2000	1990	99.5
Zinc	2000	2080	104.0	2000	2060	103.0	2000	2040	102.0

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA37260 Units: ug/l

Time:		20:10			20:44			21:18	
Sample ID:	CCV	CCV6		CCV	CCV7		CCV	CCV8	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Zirconium									

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA37260 Units: ug/l

Time:		21:49			22:11	
Sample ID:	CCV	CCV9		CCV	CCV10	
Metal	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	2000	2010	100.5	2000	2010	100.5
Copper	anr					
Iron	anr					
Lead	2000	2020	101.0	2000	2030	101.5
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	2000	2020	101.0	2000	2020	101.0
Palladium						
Potassium	anr					
Selenium	anr					
Silicon						
Silver	anr					
Sodium	anr					
Sulfur						
Strontium						
Thallium	anr					
Tin						
Titanium						
Tungsten						
Vanadium	2000	2010	100.5	2000	2000	100.0
Zinc	2000	2030	101.5	2000	2050	102.5

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA37260 Units: ug/l

Time:		21:49			22:11	
Sample ID:	CCV	CCV9		CCV	CCV10	
Metal	True	Results	% Rec	True	Results	% Rec
Zirconium						

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: CRI 70-130% CRIA 70-130% Run ID: MA37260 Units: ug/l

Time:				17:27		17:33		17:52	
Sample ID:	CRI	CRIA	CRID	CRI1		CRIA1		CRID2	
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	2000	1000	anr					
Chromium	10		2.0	anr					
Cobalt	50		3.0	53.2	106.4			3.1	103.3
Copper	10		2.0	anr					
Iron	100	500		anr					
Lead	3.0	20	2.5	3.4	113.3	21.3	106.5	1.8	72.0
Lithium	20								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	10.8	108.0			4.2	105.0
Palladium	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000	anr					
Sulfur	50								
Strontium	10								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	53.5	107.0			2.4	120.0
Zinc	20		10	23.0	115.0			11.9	119.0

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: CRI 70-130% CRIA 70-130% Run ID: MA37260 Units: ug/l

Time:				17:27		17:33		17:52	
Sample ID:	CRI	CRIA	CRID	CRI1		CRIA1		CRID2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Zirconium	10								

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: CRI 70-130% CRIA 70-130% Run ID: MA37260 Units: ug/l

Time:				21:55		21:59		22:02	
Sample ID:	CRI	CRIA	CRID	CRI2		CRID3		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	2000	1000	anr					
Chromium	10		2.0	anr					
Cobalt	50		3.0	52.9	105.8	3.1	103.3		
Copper	10		2.0	anr					
Iron	100	500		anr					
Lead	3.0	20	2.5	2.9	96.7	2.3	92.0	23.9	119.5
Lithium	20								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	10.6	106.0	4.1	102.5		
Palladium	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000	anr					
Sulfur	50								
Strontium	10								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	54.2	108.4	2.0	100.0		
Zinc	20		10	23.1	115.5	11.8	118.0		

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: CRI 70-130% CRIA 70-130% Run ID: MA37260 Units: ug/l

Time:				21:55		21:59		22:02	
Sample ID:	CRI	CRIA	CRID	CRI2		CRID3		CRIA2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Zirconium	10								

(*) Outside of QC limits
(anr) Analyte not requested

12.1.4

12

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 80 to 120 % Recovery Run ID: MA37260 Units: ug/l

Time:			17:36		17:40		22:05		22:08	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1		ICSA2		ICSAB2	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	503000	100.6	511000	102.2	505000	101.0	512000	102.4
Antimony		1000	0.90		1080	108.0	-0.10		1040	104.0
Arsenic		1000	4.5		1050	105.0	5.6		1010	101.0
Barium		500	-0.80		509	101.8	-0.60		514	102.8
Beryllium		500	-0.10		509	101.8	-0.10		508	101.6
Bismuth		500	7.7		526	105.2	9.0		508	101.6
Boron			-4.8		-1.6		-7.3		-3.4	
Cadmium		1000	1.7		1040	104.0	1.2		1010	101.0
Calcium	400000	400000	372000	93.0	374000	93.5	367000	91.8	375000	93.8
Chromium		500	0.20		503	100.6	0.10		519	103.8
Cobalt		500	0.90		507	101.4	1.4		494	98.8
Copper		500	0.70		527	105.4	0.50		545	109.0
Iron	200000	200000	183000	91.5	186000	93.0	178000	89.0	185000	92.5
Lead		1000	4.1		986	98.6	5.5		968	96.8
Lithium		500	5.4		548	109.6	6.2		552	110.4
Magnesium	500000	500000	499000	99.8	491000	98.2	488000	97.6	492000	98.4
Manganese		500	1.5		511	102.2	1.2		530	106.0
Molybdenum		500	0.10		490	98.0	-0.50		478	95.6
Nickel		1000	3.0		991	99.1	3.4		968	96.8
Palladium		500	30.9		568	113.6	31.0		584	116.8
Potassium			180		166		188		187	
Selenium		1000	-4.6		1040	104.0	-6.7		1020	102.0
Silicon			10.5		11.2		69.2		57.1	
Silver		1000	5.1		1100	110.0	3.7		1140	114.0
Sodium			7.4		14.8		82.8		78.6	
Sulfur		500	12.2		545	109.0	16.6		531	106.2
Strontium			4.5		4.6		4.6		4.6	
Thallium		1000	-2.2		978	97.8	-1.0		962	96.2
Tin			-3.0		-5.8		-4.2		-5.4	
Titanium			1.4		1.2		1.6		1.7	
Tungsten		500	2.5		529	105.8	8.3		516	103.2
Vanadium		500	0.80		503	100.6	0.20		525	105.0
Zinc		1000	-2.7		984	98.4	-2.7		966	96.6

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SE080515M2.ICP Date Analyzed: 08/05/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 80 to 120 % Recovery Run ID: MA37260 Units: ug/l

Time:			17:36		17:40		22:05		22:08	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1		ICSA2		ICSAB2	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Zirconium		500	-3.7		457	91.4	-3.8		471	94.2

(*) Outside of QC limits
(anr) Analyte not requested

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
Analyst: ND Run ID: MA37268
Parameters: V

Time	Sample Description	Dilution Factor	PS Recov	Comments
14:59	MA37268-STD1	1		STDA
15:05	MA37268-STD2	1		STDB
15:10	ZZZZZZ	1		
15:16	ZZZZZZ	1		
15:22	MA37268-ICV1	1		
15:28	MA37268-ICB1	1		
15:34	MA37268-CCV1	1		
15:40	MA37268-CCB1	1		
15:46	MA37268-CRI1	1		
15:51	MA37268-CRID1	1		See rerun
15:57	MA37268-CRIA1	1		
16:03	MA37268-ICSA1	1		
16:09	MA37268-ICSAB1	1		
16:15	ZZZZZZ	1		
16:21	ZZZZZZ	1		
16:26	ZZZZZZ	1		
16:32	MA37268-CCV2	1		
16:38	MA37268-CCB2	1		
16:44	MA37268-CRID2	1		
16:50	ZZZZZZ	1		
16:56	ZZZZZZ	1		
17:02	ZZZZZZ	1		
17:08	ZZZZZZ	1		
17:14	ZZZZZZ	1		
17:19	ZZZZZZ	1		
17:25	MP88121-MB2	5		
17:31	MA37268-CRID3	1		
17:37	MA37268-CCV3	1		
17:43	MA37268-CCB3	1		
17:49	MP88139-MB1	1		
17:55	MP88139-B1	1		
18:01	MP88139-B2	1		
18:06	MP88139-B3	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
Analyst: ND Run ID: MA37268
Parameters: V

Time	Sample Description	Dilution Factor	PS Recov	Comments
18:12	MP88139-B4	1		
18:18	MA37268-CCV4	1		
18:23	MA37268-CCB4	1		
18:29	MP88121-B2	5		
18:35	ZZZZZZ	5		
18:41	ZZZZZZ	5		
18:47	ZZZZZZ	5		
18:53	ZZZZZZ	5		
18:59	ZZZZZZ	5		
19:05	ZZZZZZ	5		
19:11	ZZZZZZ	5		
19:17	MP88107-MB1	1		
---------->	Last reportable sample/prep for job JC300			
19:23	MA37268-CCV5	1		
19:29	MA37268-CCB5	1		
19:34	ZZZZZZ	1		
19:40	MP88141-S1	2		
19:46	MP88141-S2	2		
19:52	JC372-3	2		(sample used for QC only; not part of login JC300)
19:58	MP88141-SD1	10		
20:04	MP88141-S1	10		
20:10	MP88141-S2	10		
20:15	JC372-3	10		(sample used for QC only; not part of login JC300)
20:21	MP88141-SD1	50		
20:27	MA37268-CCV6	1		
20:33	MA37268-CCB6	1		
20:39	ZZZZZZ	5		
20:45	MP88184-MB1	5		
20:51	MP88184-B1	5		
20:57	MP88184-S1	5		
21:02	MP88184-S2	5		
21:08	JC500-3T	5		(sample used for QC only; not part of login JC300)
21:14	MP88184-SD1	25		
21:20	ZZZZZZ	5		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
Analyst: ND Run ID: MA37268
Parameters: V

	Time	Sample Description	Dilution Factor	PS Recov	Comments
	21:26	ZZZZZZ	5		
	21:32	MA37268-CCV7	1		
	21:38	MA37268-CCB7	1		
	21:44	ZZZZZZ	1		
	21:50	MA37268-CRI2	1		
	21:55	MA37268-CRIA2	1		
	22:01	MA37268-CRID4	1		
	22:07	MA37268-ICSA2	1		
	22:13	MA37268-ICSAB2	1		
	22:19	MA37268-CCV8	1		
	22:25	MA37268-CCB8	1		
---------->	Last reportable CCB for job JC300				
	22:31	ZZZZZZ	1		
	22:37	ZZZZZZ	1		
	22:42	ZZZZZZ	1		
	22:48	ZZZZZZ	1		
	22:54	ZZZZZZ	1		
	22:59	ZZZZZZ	1		
	23:05	ZZZZZZ	1		
	23:11	ZZZZZZ	5		
	23:17	ZZZZZZ	1		
	23:23	ZZZZZZ	1		
	23:29	ZZZZZZ	1		
	23:35	MA37268-CCV9	1		
	23:41	MA37268-CCB9	1		
	23:47	ZZZZZZ	1		
	23:53	ZZZZZZ	1		
	23:59	ZZZZZZ	1		
	00:05	ZZZZZZ	1		
	00:11	ZZZZZZ	1		
	00:16	ZZZZZZ	1		
	00:22	ZZZZZZ	1		
	00:28	ZZZZZZ	1		
	00:34	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
Analyst: ND Run ID: MA37268
Parameters: V

Time	Sample Description	Dilution Factor	PS Recov	Comments
00:40	ZZZZZZ	1		
00:46	MA37268-CCV10	1		
00:52	MA37268-CCB10	1		
00:58	ZZZZZZ	1		
01:03	ZZZZZZ	1		
01:09	ZZZZZZ	1		
01:15	ZZZZZZ	1		
01:21	ZZZZZZ	1		
01:27	ZZZZZZ	1		
01:33	ZZZZZZ	1		
01:39	ZZZZZZ	1		
01:44	ZZZZZZ	1		
01:50	MP88144-S1	1		
01:56	MA37268-CCV11	1		
02:02	MA37268-CCB11	1		
02:07	MP88144-S2	1		
02:13	JC389-1	1		(sample used for QC only; not part of login JC300)
02:19	MP88144-SD1	1		No dilution factor.
02:25	ZZZZZZ	1		
02:31	ZZZZZZ	1		
02:37	ZZZZZZ	1		
02:43	MP88128-B2	1		
02:48	MP88128-MB2	1		
02:54	ZZZZZZ	1		
03:00	ZZZZZZ	1		
03:06	MA37268-CCV12	1		
03:12	MA37268-CCB12	1		
03:18	ZZZZZZ	1		
03:24	ZZZZZZ	1		
03:30	ZZZZZZ	1		
03:35	ZZZZZZ	1		
03:41	ZZZZZZ	1		
03:47	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
Analyst: ND Run ID: MA37268
Parameters: V

Time	Sample Description	Dilution Factor	PS Recov	Comments
03:53	ZZZZZZ	1		
03:59	ZZZZZZ	1		
04:05	ZZZZZZ	1		
04:11	ZZZZZZ	1		
04:16	MA37268-CCV13	1		
04:22	MA37268-CCB13	1		
04:28	ZZZZZZ	1		
04:34	ZZZZZZ	1		
04:40	ZZZZZZ	1		
04:46	ZZZZZZ	1		
04:52	MA37268-CCV14	1		
04:57	MA37268-CCB14	1		
05:03	MA37268-CRID5	1		
05:09	MA37268-CRI3	1		
05:15	MA37268-CCV15	1		
05:21	MA37268-CCB15	1		
05:27	ZZZZZZ	1		
05:33	ZZZZZZ	1		
05:39	ZZZZZZ	1		
05:45	ZZZZZZ	1		
05:51	ZZZZZZ	1		
05:57	ZZZZZZ	1		
06:02	ZZZZZZ	1		
06:08	ZZZZZZ	1		
06:14	ZZZZZZ	1		

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
Analyst: ND Run ID: MA37268
Parameters: V

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
14:59	MA37268-STD1	3715 R	77800 R	6667 R	4986 R
15:05	MA37268-STD2	3419	72000	6553	4562
15:10	ZZZZZZ	3537	73695	6591	4685
15:16	ZZZZZZ	3700	77452	6683	4965
15:22	MA37268-ICV1	3535	73786	6587	4680
15:28	MA37268-ICB1	3704	77842	6704	4959
15:34	MA37268-CCV1	3568	75026	6580	4707
15:40	MA37268-CCB1	3724	78523	6706	4982
15:46	MA37268-CRI1	3669	77067	6669	4931
15:51	MA37268-CRID1	No results reported for the elements associated with this internal standard.			
15:57	MA37268-CRIA1	3695	77118	6708	4959
16:03	MA37268-ICSA1	3202	65259	6138	4237
16:09	MA37268-ICSAB1	3226	65977	6180	4270
16:15	ZZZZZZ	3670	76828	6802	4954
16:21	ZZZZZZ	3618	77669	6792	4966
16:26	ZZZZZZ	3747	78869	6950	5037
16:32	MA37268-CCV2	3579	75454	6786	4719
16:38	MA37268-CCB2	3714	77706	6739	4969
16:44	MA37268-CRID2	3700	78158	6768	4966
16:50	ZZZZZZ	3619	76983	6735	4932
16:56	ZZZZZZ	3558	76072	6666	4966
17:02	ZZZZZZ	3337	68590	6358	4317
17:08	ZZZZZZ	3172	64695	6128	4166
17:14	ZZZZZZ	3727	78466	6871	4978
17:19	ZZZZZZ	3291	65498	6581	4045
17:25	MP88121-MB2	3582	73562	6655	4687
17:31	MA37268-CRID3	3690	77798	6793	4942
17:37	MA37268-CCV3	3547	74252	6688	4678
17:43	MA37268-CCB3	3677	77617	6699	4919
17:49	MP88139-MB1	3670	78463	6834	4956
17:55	MP88139-B1	3550	74967	6760	4749
18:01	MP88139-B2	3567	75490	6775	4761
18:06	MP88139-B3	3552	75251	6747	4742

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
Analyst: ND Run ID: MA37268
Parameters: V

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
18:12	MP88139-B4	3532	74819	6743	4713
18:18	MA37268-CCV4	3519	73055	6555	4645
18:23	MA37268-CCB4	3687	77172	6657	4929
18:29	MP88121-B2	3577	72753	6577	4675
18:35	ZZZZZZ	3474	70900	6440	4563
18:41	ZZZZZZ	3506	71370	6485	4608
18:47	ZZZZZZ	3555	72326	6564	4636
18:53	ZZZZZZ	3560	72569	6588	4663
18:59	ZZZZZZ	3489	71504	6597	4619
19:05	ZZZZZZ	3603	73664	6624	4729
19:11	ZZZZZZ	3484	71243	6472	4582
19:17	MP88107-MB1	3696	77595	6725	4925
19:23	MA37268-CCV5	3593	74016	6646	4712
19:29	MA37268-CCB5	3707	77492	6670	4934
19:34	ZZZZZZ	3736	79037	6847	4972
19:40	MP88141-S1	3812	78257	7139	4636
19:46	MP88141-S2	3821	78391	7245	4640
19:52	JC372-3	3888	79678	7270	4822
19:58	MP88141-SD1	3738	77861	6838	5028
20:04	MP88141-S1	3727	77411	6866	4839
20:10	MP88141-S2	3734	77437	6870	4849
20:15	JC372-3	3758	77854	6900	5056
20:21	MP88141-SD1	3754	78183	6866	5054
20:27	MA37268-CCV6	3525	71608	6577	4634
20:33	MA37268-CCB6	3745	77779	6791	4976
20:39	ZZZZZZ	3809	77915	7060	4831
20:45	MP88184-MB1	3621	73293	6656	4720
20:51	MP88184-B1	3627	73718	6711	4719
20:57	MP88184-S1	3618	73626	6758	4705
21:02	MP88184-S2	3610	73035	6649	4696
21:08	JC500-3T	3586	72757	6639	4669
21:14	MP88184-SD1	3676	75788	6653	4851
21:20	ZZZZZZ	3553	71905	6538	4628

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
Analyst: ND Run ID: MA37268
Parameters: V

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
21:26	ZZZZZZ	3587	72577	6692	4664
21:32	MA37268-CCV7	3605	74822	6726	4724
21:38	MA37268-CCB7	3747	77995	6814	4975
21:44	ZZZZZZ	3738	77461	6763	4978
21:50	MA37268-CRI2	3726	77461	6779	4970
21:55	MA37268-CRIA2	3725	77982	6810	4971
22:01	MA37268-CRID4	3742	77959	6857	4977
22:07	MA37268-ICSA2	3299	66891	6288	4320
22:13	MA37268-ICSAB2	3272	66152	6326	4298
22:19	MA37268-CCV8	3588	73833	6712	4702
22:25	MA37268-CCB8	3723	78033	6808	4944
22:31	ZZZZZZ	3775	78748	7017	5003
22:37	ZZZZZZ	3742	78479	6887	4960
22:42	ZZZZZZ	3664	76124	6861	4800
22:48	ZZZZZZ	3674	76474	6875	4812
22:54	ZZZZZZ	3641	75859	6921	4744
22:59	ZZZZZZ	3656	76108	7027	4757
23:05	ZZZZZZ	3683	76695	6953	4887
23:11	ZZZZZZ	3738	77575	6803	5004
23:17	ZZZZZZ	3722	77114	6820	4901
23:23	ZZZZZZ	3594	72423	6709	4668
23:29	ZZZZZZ	3597	72826	6654	4661
23:35	MA37268-CCV9	3596	73579	6552	4701
23:41	MA37268-CCB9	3713	76406	6600	4916
23:47	ZZZZZZ	3551	70689	6488	4608
23:53	ZZZZZZ	3565	71595	6484	4696
23:59	ZZZZZZ	3616	72944	6458	4898
00:05	ZZZZZZ	3652	74133	6516	4893
00:11	ZZZZZZ	3575	72695	6466	4736
00:16	ZZZZZZ	3576	72595	6432	4685
00:22	ZZZZZZ	3602	72817	6450	4810
00:28	ZZZZZZ	3602	72751	6321	4824
00:34	ZZZZZZ	3576	71768	6299	4779

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
Analyst: ND Run ID: MA37268
Parameters: V

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
00:40	ZZZZZZ	3545	71100	6317	4754
00:46	MA37268-CCV10	3508	70562	6224	4594
00:52	MA37268-CCB10	3636	73662	6321	4822
00:58	ZZZZZZ	3631	73081	6396	4852
01:03	ZZZZZZ	3541	69554	6330	4672
01:09	ZZZZZZ	3580	72246	6438	4774
01:15	ZZZZZZ	3644	73853	6501	4868
01:21	ZZZZZZ	3622	73129	6412	4688
01:27	ZZZZZZ	3685	74946	6461	4876
01:33	ZZZZZZ	3719	75925	6559	4920
01:39	ZZZZZZ	3592	72408	6382	4696
01:44	ZZZZZZ	3653	73753	6482	4756
01:50	MP88144-S1	3572	72172	6412	4634
01:56	MA37268-CCV11	3554	70757	6321	4632
02:02	MA37268-CCB11	3695	74948	6450	4873
02:07	MP88144-S2	3593	72572	6521	4654
02:13	JC389-1	3668	74369	6572	4829
02:19	MP88144-SD1	No results reported for the elements associated with this internal standard.			
02:25	ZZZZZZ	3751	76764	6703	4899
02:31	ZZZZZZ	3627	72523	6741	4674
02:37	ZZZZZZ	3632	72792	6747	4668
02:43	MP88128-B2	3695	75462	6756	4791
02:48	MP88128-MB2	3746	77147	6858	4946
02:54	ZZZZZZ	3796	78962	6932	4994
03:00	ZZZZZZ	3773	78245	6887	4974
03:06	MA37268-CCV12	3602	73274	6675	4685
03:12	MA37268-CCB12	3734	76755	6687	4918
03:18	ZZZZZZ	3756	78061	6890	4962
03:24	ZZZZZZ	3654	75138	6677	4743
03:30	ZZZZZZ	3596	74008	6730	4657
03:35	ZZZZZZ	3620	74882	6713	4685
03:41	ZZZZZZ	3613	74584	6682	4733
03:47	ZZZZZZ	3618	74966	6711	4722

INTERNAL STANDARD SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
Analyst: ND Run ID: MA37268
Parameters: V

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
03:53	ZZZZZZ	3637	75402	6698	4732
03:59	ZZZZZZ	3621	74622	6648	4699
04:05	ZZZZZZ	3593	74353	6667	4683
04:11	ZZZZZZ	3601	74471	6691	4696
04:16	MA37268-CCV13	3606	73488	6615	4704
04:22	MA37268-CCB13	3738	76875	6799	4939
04:28	ZZZZZZ	3640	74985	6803	4811
04:34	ZZZZZZ	3641	74863	6705	4853
04:40	ZZZZZZ	3641	75358	6768	4843
04:46	ZZZZZZ	3726	77195	6789	4929
04:52	MA37268-CCV14	3585	73409	6664	4679
04:57	MA37268-CCB14	3737	77023	6784	4939
05:03	MA37268-CRID5	3728	76914	6685	4937
05:09	MA37268-CRI3	3714	75993	6700	4927
05:15	MA37268-CCV15	3603	73250	6575	4692
05:21	MA37268-CCB15	3738	76636	6707	4928
05:27	ZZZZZZ	3780	72514	6799	4919
05:33	ZZZZZZ	3752	76896	6696	4912
05:39	ZZZZZZ	3745	76595	6745	4916
05:45	ZZZZZZ	3787	77893	6823	5037
05:51	ZZZZZZ	3733	76667	6753	4903
05:57	ZZZZZZ	3737	76694	6682	4936
06:02	ZZZZZZ	3485	70550	6447	4489
06:08	ZZZZZZ	3458	69911	6323	4377
06:14	ZZZZZZ	3741	77105	6739	5098

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: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37268 Units: ug/l

Time:			15:28		15:40		16:38		17:43	
Sample ID:			ICB1		CCB1		CCB2		CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	22	anr							
Antimony	6.0	2.2	anr							
Arsenic	3.0	1.1	anr							
Barium	200	.5	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.7	anr							
Boron	100	.8								
Cadmium	3.0	.3	anr							
Calcium	5000	28	anr							
Chromium	10	.5	anr							
Cobalt	50	.4	anr							
Copper	10	1.1	anr							
Iron	100	21	anr							
Lead	3.0	1.1	anr							
Lithium	20	2.9	anr							
Magnesium	5000	52	anr							
Manganese	15	.2	anr							
Molybdenum	20	.4								
Nickel	10	.5	anr							
Palladium	50	2.7								
Potassium	10000	57	anr							
Selenium	10	2.1	anr							
Silicon	200	9								
Silver	10	.8	anr							
Sodium	10000	28	anr							
Sulfur	50	4.4								
Strontium	10	.3								
Thallium	2.0	1.4	anr							
Tin	10	.9								
Titanium	10	.9								
Tungsten	50	1.1								
Vanadium	50	.5	0.20	<50	0.30	<50	0.10	<50	0.20	<50
Zinc	20	1.8	anr							

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37268 Units: ug/l

Time:			15:28		15:40		16:38		17:43	
Sample ID:			ICB1		CCB1		CCB2		CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zirconium	10	.5								

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37268 Units: ug/l

Time:			18:23		19:29		20:33		21:38	
Sample ID:			CCB4		CCB5		CCB6		CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	22	anr							
Antimony	6.0	2.2	anr							
Arsenic	3.0	1.1	anr							
Barium	200	.5	anr							
Beryllium	1.0	.2	anr							
Bismuth	20	2.7	anr							
Boron	100	.8								
Cadmium	3.0	.3	anr							
Calcium	5000	28	anr							
Chromium	10	.5	anr							
Cobalt	50	.4	anr							
Copper	10	1.1	anr							
Iron	100	21	anr							
Lead	3.0	1.1	anr							
Lithium	20	2.9	anr							
Magnesium	5000	52	anr							
Manganese	15	.2	anr							
Molybdenum	20	.4								
Nickel	10	.5	anr							
Palladium	50	2.7								
Potassium	10000	57	anr							
Selenium	10	2.1	anr							
Silicon	200	9								
Silver	10	.8	anr							
Sodium	10000	28	anr							
Sulfur	50	4.4								
Strontium	10	.3								
Thallium	2.0	1.4	anr							
Tin	10	.9								
Titanium	10	.9								
Tungsten	50	1.1								
Vanadium	50	.5	0.20	<50	0.20	<50	0.20	<50	0.10	<50
Zinc	20	1.8	anr							

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37268 Units: ug/l

Time:			18:23		19:29		20:33		21:38	
Sample ID:			CCB4		CCB5		CCB6		CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Zirconium	10	.5								

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37268 Units: ug/l

Time:			22:25	
Sample ID:			CCB8	
Metal	RL	IDL	raw	final
Aluminum	200	22	anr	
Antimony	6.0	2.2	anr	
Arsenic	3.0	1.1	anr	
Barium	200	.5	anr	
Beryllium	1.0	.2	anr	
Bismuth	20	2.7	anr	
Boron	100	.8		
Cadmium	3.0	.3	anr	
Calcium	5000	28	anr	
Chromium	10	.5	anr	
Cobalt	50	.4	anr	
Copper	10	1.1	anr	
Iron	100	21	anr	
Lead	3.0	1.1	anr	
Lithium	20	2.9	anr	
Magnesium	5000	52	anr	
Manganese	15	.2	anr	
Molybdenum	20	.4		
Nickel	10	.5	anr	
Palladium	50	2.7		
Potassium	10000	57	anr	
Selenium	10	2.1	anr	
Silicon	200	9		
Silver	10	.8	anr	
Sodium	10000	28	anr	
Sulfur	50	4.4		
Strontium	10	.3		
Thallium	2.0	1.4	anr	
Tin	10	.9		
Titanium	10	.9		
Tungsten	50	1.1		
Vanadium	50	.5	0.40	<50
Zinc	20	1.8	anr	

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: result < RL Run ID: MA37268 Units: ug/l

Time:			22:25	
Sample ID:			CCB8	
Metal	RL	IDL	raw	final
Zirconium	10	.5		

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery Run ID: MA37268 Units: ug/l

Time:		15:22			15:34			16:32	
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Bismuth	anr								
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	anr								
Lithium	anr								
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	2000	2010	100.5	2000	1970	98.5	2000	1960	98.0
Zinc	anr								

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery Run ID: MA37268 Units: ug/l

Time:		15:22			15:34			16:32	
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Zirconium									

(*) Outside of QC limits
(anr) Analyte not requested

12.2.3
12

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery Run ID: MA37268 Units: ug/l

Time:		17:37			18:18			19:23	
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Bismuth	anr								
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	anr								
Lithium	anr								
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	2000	1980	99.0	2000	1990	99.5	2000	1980	99.0
Zinc	anr								

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery Run ID: MA37268 Units: ug/l

Time:		17:37			18:18			19:23	
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Zirconium									

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery Run ID: MA37268 Units: ug/l

Time:		20:27			21:32			22:19	
Sample ID:	CCV	CCV6		CCV	CCV7		CCV	CCV8	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Bismuth	anr								
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	anr								
Lithium	anr								
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	2000	2080	104.0	2000	2000	100.0	2000	2030	101.5
Zinc	anr								

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 95 to 105 % Recovery Run ID: MA37268 Units: ug/l

Time:		20:27			21:32			22:19	
Sample ID:	CCV	CCV6		CCV	CCV7		CCV	CCV8	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Zirconium									

(*) Outside of QC limits
(anr) Analyte not requested

12.2.3
12

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery Run ID: MA37268 Units: ug/l

Time:				15:46		15:57		16:44	
Sample ID:	CRI	CRIA	CRID	CRI1		CRIA1		CRID2	
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			anr					
Boron	100		10						
Cadmium	3.0		1.0	anr					
Calcium	5000	2000	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	anr					
Lithium	20			anr					
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Palladium	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000	anr					
Sulfur	50								
Strontium	10								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	53.2	106.4			2.4	120.0
Zinc	20		10	anr					

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery Run ID: MA37268 Units: ug/l

Time:				15:46		15:57		16:44	
Sample ID:	CRI	CRIA	CRID	CRI1		CRIA1		CRID2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Zirconium	10								

(*) Outside of QC limits
(anr) Analyte not requested

12.2.4

12

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery Run ID: MA37268 Units: ug/l

Time:				17:31		21:50		21:55	
Sample ID:	CRI	CRIA	CRID	CRID3		CRI2		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	2000	1000	anr					
Chromium	10		2.0	anr					
Cobalt	50		3.0	anr					
Copper	10		2.0	anr					
Iron	100	500							
Lead	3.0	20	2.5	anr					
Lithium	20								
Magnesium	5000	2000	100	anr					
Manganese	15		3.0	anr					
Molybdenum	20								
Nickel	10		4.0	anr					
Palladium	50								
Potassium	5000		2000	anr					
Selenium	10	20	5.0	anr					
Silicon	200								
Silver	5.0		2.0	anr					
Sodium	5000		1000	anr					
Sulfur	50								
Strontium	10								
Thallium	10		2.0	anr					
Tin	10								
Titanium	10								
Tungsten	50								
Vanadium	50		2.0	2.3	115.0	53.7	107.4		
Zinc	20		10	anr					

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery Run ID: MA37268 Units: ug/l

Time:				17:31		21:50		21:55	
Sample ID:	CRI	CRIA	CRID	CRID3		CRI2		CRIA2	
Metal	True	True	True	Results	% Rec	Results	% Rec	Results	% Rec
Zirconium	10								

(*) Outside of QC limits
(anr) Analyte not requested

12.2.4

12

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery Run ID: MA37268 Units: ug/l

Time:				22:01	
Sample ID:	CRI	CRIA	CRID	CRID4	
Metal	True	True	True	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	2000	1000	anr	
Chromium	10		2.0	anr	
Cobalt	50		3.0	anr	
Copper	10		2.0	anr	
Iron	100	500			
Lead	3.0	20	2.5	anr	
Lithium	20				
Magnesium	5000	2000	100	anr	
Manganese	15		3.0	anr	
Molybdenum	20				
Nickel	10		4.0	anr	
Palladium	50				
Potassium	5000		2000	anr	
Selenium	10	20	5.0	anr	
Silicon	200				
Silver	5.0		2.0	anr	
Sodium	5000		1000	anr	
Sulfur	50				
Strontium	10				
Thallium	10		2.0	anr	
Tin	10				
Titanium	10				
Tungsten	50				
Vanadium	50		2.0	2.6	130.0
Zinc	20		10	anr	

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 70 to 130 % Recovery Run ID: MA37268 Units: ug/l

Time:				22:01	
Sample ID:	CRI	CRIA	CRID	CRID4	
Metal	True	True	True	Results	% Rec
Zirconium	10				

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 80 to 120 % Recovery Run ID: MA37268 Units: ug/l

Time:			16:03		16:09		22:07		22:13	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1		ICSA2		ICSAB2	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	501000	100.2	510000	102.0	491000	98.2	497000	99.4
Antimony		1000	8.3		1090	109.0	6.9		1080	108.0
Arsenic		1000	2.8		1050	105.0	5.1		1040	104.0
Barium		500	-0.70		510	102.0	-0.50		495	99.0
Beryllium		500	0.70		520	104.0	0.70		509	101.8
Bismuth		500	34.6		555	111.0	31.0		552	110.4
Boron			-0.20		-1.5		-0.50		-0.50	
Cadmium		1000	2.9		1030	103.0	2.8		1020	102.0
Calcium	400000	400000	380000	95.0	386000	96.5	373000	93.3	379000	94.8
Chromium		500	1.6		509	101.8	1.1		505	101.0
Cobalt		500	-2.7		484	96.8	-2.6		480	96.0
Copper		500	1.2		505	101.0	1.5		508	101.6
Iron	200000	200000	191000	95.5	197000	98.5	186000	93.0	192000	96.0
Lead		1000	-0.30		951	95.1	-0.90		950	95.0
Lithium		500	1.1		600	120.0	0.60		581	116.2
Magnesium	500000	500000	493000	98.6	490000	98.0	483000	96.6	480000	96.0
Manganese		500	1.5		516	103.2	0.90		520	104.0
Molybdenum		500	-0.80		487	97.4	-0.50		478	95.6
Nickel		1000	0.0		944	94.4	0.40		941	94.1
Palladium		500	30.7		560	112.0	32.0		555	111.0
Potassium			31.2		37.4		27.8		48.5	
Selenium		1000	5.0		1080	108.0	6.0		1070	107.0
Silicon			17.0		13.4		15.8		11.9	
Silver		1000	4.4		1070	107.0	2.4		1070	107.0
Sodium			-31		-22		198		279	
Sulfur		500	37.6		571	114.2	38.5		568	113.6
Strontium			5.4		5.6		5.3		5.4	
Thallium		1000	0.40		1000	100.0	2.4		983	98.3
Tin			-4.6		-4.8		-5.0		-4.5	
Titanium			2.4		3.0		2.4		2.8	
Tungsten		500	8.5		522	104.4	8.8		521	104.2
Vanadium		500	-5.3		504	100.8	-4.3		508	101.6
Zinc		1000	-2.9		969	96.9	-3.2		960	96.0

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SC080615M1.ICP Date Analyzed: 08/06/15 Methods: EPA 200.7, SW846 6010C
QC Limits: 80 to 120 % Recovery Run ID: MA37268 Units: ug/l

Time:			16:03		16:09		22:07		22:13	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1		ICSA2		ICSAB2	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Zirconium		500	2.8		506	101.2	2.3		510	102.0

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP88107
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:					08/04/15		08/04/15
Metal	RL	IDL	MDL	MB raw	final	MB raw	final
Aluminum	200	10	33				
Antimony	6.0	2.2	3				
Arsenic	3.0	1.1	2				
Barium	200	.2	.8				
Beryllium	1.0	.1	.35				
Bismuth	20	2.7	4.2				
Boron	100	.8	4.4				
Cadmium	3.0	.3	.28				
Calcium	5000	4.5	23				
Chromium	10	.5	.77				
Cobalt	50	.4	.54	-0.20	<50	0.0	<50
Copper	10	1.1	1.9				
Iron	100	1.7	21				
Lead	3.0	1.1	2.3	0.10	<3.0	0.70	<3.0
Lithium	20	1.5	3.8				
Magnesium	5000	21	49				
Manganese	15	.1	.18				
Molybdenum	20	.4	.85				
Nickel	10	.5	.79	-0.20	<10	0.20	<10
Palladium	50	2	4.5				
Potassium	10000	29	65				
Selenium	10	2.1	3.3				
Silicon	200	1.9	22				
Silver	10	.8	1.3				
Sodium	10000	9.4	35				
Sulfur	50	4.1	7.2				
Strontium	10	.1	.36				
Thallium	2.0	1.4	1.7				
Tin	10	.9	1.9				
Titanium	10	.9	.86				
Tungsten	50	1.1	5.6				
Vanadium	50	.5	.7	0.0	<50	0.0	<50
Zinc	20	.3	4.9	0.30	<20	0.80	<20

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP88107 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date:				08/04/15		08/04/15	
Metal	RL	IDL	MDL	MB raw	final	MB raw	final
Zirconium	10	.3	.71				

Associated samples MP88107: JC300-1F, JC300-2F, JC300-3F, JC300-4F, JC300-5F, JC300-6F

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: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP88107
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 08/04/15

Metal	JC472-5 Original	MS	Spikelot MPSPK1	% Rec	QC Limits
Aluminum	anr				
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Bismuth					
Boron					
Cadmium					
Calcium	anr				
Chromium	anr				
Cobalt	1.6	1760	2000	87.9	75-125
Copper					
Iron	anr				
Lead	2.3	1750	2000	87.4	75-125
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	4.3	1770	2000	88.3	75-125
Palladium					
Potassium	anr				
Selenium					
Silicon					
Silver					
Sodium	anr				
Sulfur					
Strontium					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium	6.7	1750	2000	87.2	75-125
Zinc	16.6	1780	2000	88.2	75-125

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP88107 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 08/04/15

Metal	JC472-5 Original MS	Spikelot MPSPK1	% Rec	QC Limits
Zirconium				

Associated samples MP88107: JC300-1F, JC300-2F, JC300-3F, JC300-4F, JC300-5F, JC300-6F

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: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP88107
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 08/04/15

Metal	JC472-5 Original	MSD	Spikelot MPSPK1	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony						
Arsenic	anr					
Barium						
Beryllium						
Bismuth						
Boron						
Cadmium						
Calcium	anr					
Chromium	anr					
Cobalt	1.6	1750	2000	87.4	0.6	20
Copper						
Iron	anr					
Lead	2.3	1750	2000	87.4	0.0	20
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	4.3	1760	2000	87.8	0.6	20
Palladium						
Potassium	anr					
Selenium						
Silicon						
Silver						
Sodium	anr					
Sulfur						
Strontium						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium	6.7	1740	2000	86.7	0.6	20
Zinc	16.6	1850	2000	91.7	3.9	20

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP88107 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 08/04/15

Metal	JC472-5 Original MSD	Spikelot MPSPK1	% Rec	MSD RPD	QC Limit
Zirconium					

Associated samples MP88107: JC300-1F, JC300-2F, JC300-3F, JC300-4F, JC300-5F, JC300-6F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP88107
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:			08/04/15				08/04/15	
Metal	BSP Result	Spikelot MPSPK1	% Rec	QC Limits	BSP Result	Spikelot MPSPK1	% Rec	QC Limits
Aluminum	anr							
Antimony								
Arsenic	anr							
Barium								
Beryllium								
Bismuth								
Boron								
Cadmium								
Calcium	anr							
Chromium	anr							
Cobalt	2060	2000	103.0	80-120	1890	2000	94.5	80-120
Copper								
Iron	anr							
Lead	2070	2000	103.5	80-120	1890	2000	94.5	80-120
Lithium								
Magnesium	anr							
Manganese	anr							
Molybdenum								
Nickel	2070	2000	103.5	80-120	1900	2000	95.0	80-120
Palladium								
Potassium	anr							
Selenium								
Silicon								
Silver								
Sodium	anr							
Sulfur								
Strontium								
Thallium								
Tin								
Titanium								
Tungsten								
Vanadium	2070	2000	103.5	80-120	1910	2000	95.5	80-120
Zinc	2090	2000	104.5	80-120	1920	2000	96.0	80-120

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP88107 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 08/04/15 08/04/15

Metal	BSP Result	Spikelot MPSPK1	% Rec	QC Limits	BSP Result	Spikelot MPSPK1	% Rec	QC Limits
Zirconium								

Associated samples MP88107: JC300-1F, JC300-2F, JC300-3F, JC300-4F, JC300-5F, JC300-6F

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP88107
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 08/04/15

Metal	JC472-5 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Bismuth				
Boron				
Cadmium				
Calcium	anr			
Chromium	anr			
Cobalt	1.60	0.00	100.0(a)	0-10
Copper				
Iron	anr			
Lead	2.30	0.00	100.0(a)	0-10
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	4.30	5.00	16.3 (a)	0-10
Palladium				
Potassium	anr			
Selenium				
Silicon				
Silver				
Sodium	anr			
Sulfur				
Strontium				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium	6.70	7.50	11.9 (a)	0-10
Zinc	16.6	17.7	6.6	0-10

SERIAL DILUTION RESULTS SUMMARY

Login Number: JC300
Account: AQTPAW - Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP88107 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 08/04/15

Metal	JC472-5 Original SDL 1:5	%DIF	QC Limits
Zirconium			

Associated samples MP88107: JC300-1F, JC300-2F, JC300-3F, JC300-4F, JC300-5F, JC300-6F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).