New Jersey
ACCUTEST LABORATORIES

07/12/13

Technical Report for

Aquaterra Technologies, Inc.

Sun-Marcus Hook Refinery, Philadelphia, PA

AOI-5

Accutest Job Number: JB39590

Sampling Date: 06/13/13

Report to:

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ATTN: Tiffani Doerr

Total number of pages in report: **169**

ACCREDITED IN ACCORDANCE WITH nelac

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

Nancy T. Cole
Nancy Cole
Laboratory Director

Client Service contact: Kristin Beebe 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), PA, RI, SC, TN, VA, WV

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Sample Summary

Aquaterra Technologies, Inc.

Job No: JB39590

Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-5

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JB39590-1	06/13/13	11:20	ED	06/13/13	SO	Soil	AOI5_MW-481_0-1_061313
JB39590-2	06/13/13	12:00	ED	06/13/13	SO	Soil	AOI5_MW-481_5-6_061313

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

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Aquaterra Technologies, Inc.	**Job No:**	JB39590
Site:	Sun-Marcus Hook Refinery, Philadelphia, PA	**Report Date**	7/12/2013 1:43:28 PM

On 06/13/2013, 2 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 3 C. Samples were intact and chemically preserved, unless noted below. An Accutest Job Number of JB39590 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

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

Volatiles by GCMS By Method SW846 8260B

Matrix: SO **Batch ID:** VV5856

- All samples were analyzed within the recommended method holding time.
- Sample(s) JB39590-1MS, JB39590-2DUP were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- RPD(s) for Duplicate for Benzene are outside control limits for sample JB39590-2DUP. High RPD due to possible sample analyzed from different vials.

Extractables by GCMS By Method SW846 8270C

Matrix: SO **Batch ID:** M:OP33660

- The data for SW846 8270C meets quality control requirements.
- JB39590-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39590-1: Elevated RL due to dilution required for matrix interference. Analysis performed at Accutest Laboratories, Marlborough, MA.

Volatiles by GC By Method SW846 8011

Matrix: SO **Batch ID:** M:OP33671

- The data for SW846 8011 meets quality control requirements.
- JB39590-2: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39590-1: Analysis performed at Accutest Laboratories, Marlborough, MA.

Metals By Method SW846 6010C

Matrix: SO **Batch ID:** M:MP21196

- The data for SW846 6010C meets quality control requirements.
- JB39590-2 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39590-1 for Lead: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix: SO **Batch ID:** M:GN43301

- The data for SM21 2540 B MOD. meets quality control requirements.
- JB39590-1 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.
- JB39590-2 for Solids, Percent: Analysis performed at Accutest Laboratories, Marlborough, MA.

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client:	Accutest New Jersey	**Job No**	JB39590
Site:	AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA	**Report Date**	7/12/2013 10:31:59 AM

2 Sample(s) were collected on 06/13/2013 and were received at Accutest of NJ on 06/13/2013, at Accutest of NE on 06/15/2013 properly preserved, at 1.4 Deg. C and intact. These Samples received an Accutest job number of JB39590. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Extractables by GCMS By Method SW846 8270C

Matrix SO **Batch ID:** OP33660

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) MC21812-1MS, MC21812-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- JB39590-1: Elevated RL due to dilution required for matrix interference.

Volatiles by GC By Method SW846 8011

Matrix SO **Batch ID:** OP33671

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JB39439-1MS, JB39439-1MSD were used as the QC samples indicated.
- OP33671-MS/MSD for Bromofluorobenzene (S): Outside control limits due to possible matrix interference.
- JB39590-1,2 for Bromofluorobenzene (S): Outside control limits due to possible matrix interference.

Metals By Method SW846 6010C

Matrix SO **Batch ID:** MP21196

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC21810-5MS, MC21810-5MSD, MC21810-5SDL were used as the QC samples for metals.
- MP21196-SD1 for Lead: Serial dilution indicates possible matrix interference.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix SO **Batch ID:** GN43301

- Sample(s) MC21810-5DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety.The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(JB39590).

Summary of Hits

Job Number: JB39590
Account: Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Collected: 06/13/13

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JB39590-1	**AOI5_MW-481_0-1_061313**					
Benzene		0.00018 J	0.00082	0.000097	mg/kg	SW846 8260B
Ethylbenzene		0.00027 J	0.00082	0.00021	mg/kg	SW846 8260B
Xylene (total)		0.0011	0.00082	0.00011	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		0.00029 J	0.0041	0.00017	mg/kg	SW846 8260B
Benzo(a)pyrene [a]		0.157 J	0.56	0.060	mg/kg	SW846 8270C
Benzo(g,h,i)perylene [a]		0.262 J	0.56	0.056	mg/kg	SW846 8270C
Chrysene [a]		0.194 J	0.56	0.069	mg/kg	SW846 8270C
Phenanthrene [a]		0.230 J	0.56	0.076	mg/kg	SW846 8270C
Pyrene [a]		0.368 J	0.56	0.065	mg/kg	SW846 8270C
Lead [b]		90.1	0.91	0.15	mg/kg	SW846 6010C
JB39590-2	**AOI5_MW-481_5-6_061313**					
Benzene		0.00048 J	0.00085	0.00010	mg/kg	SW846 8260B
Methyl Tert Butyl Ether		0.0068	0.00085	0.00020	mg/kg	SW846 8260B
Chrysene [b]		0.0170 J	0.12	0.015	mg/kg	SW846 8270C
Pyrene [b]		0.0356 J	0.12	0.014	mg/kg	SW846 8270C
Lead [b]		8.3	0.89	0.15	mg/kg	SW846 6010C

(a) Elevated RL due to dilution required for matrix interference. Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Analysis performed at Accutest Laboratories, Marlborough, MA.

New Jersey

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Sample Results

Report of Analysis

Accutest Laboratories

Report of Analysis

Client Sample ID:	AOI5_MW-481_0-1_061313		
Lab Sample ID:	JB39590-1	**Date Sampled:**	06/13/13
Matrix:	SO - Soil	**Date Received:**	06/13/13
Method:	SW846 8260B	**Percent Solids:**	87.6
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V135697.D	1	06/17/13	DFT	n/a	n/a	VV5856
Run #2							

	Initial Weight
Run #1	7.0 g
Run #2	

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.00018	0.00082	0.000097	mg/kg	J
108-88-3	Toluene	ND	0.00082	0.000086	mg/kg	
100-41-4	Ethylbenzene	0.00027	0.00082	0.00021	mg/kg	J
1330-20-7	Xylene (total)	0.0011	0.00082	0.00011	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.00082	0.00019	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.00082	0.00011	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0041	0.000061	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.00029	0.0041	0.00017	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	ND	0.0041	0.00013	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		65-131%
17060-07-0	1,2-Dichloroethane-D4	86%		70-121%
2037-26-5	Toluene-D8	103%		80-128%
460-00-4	4-Bromofluorobenzene	92%		67-131%

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:	AOI5_MW-481_0-1_061313		
Lab Sample ID:	JB39590-1	**Date Sampled:**	06/13/13
Matrix:	SO - Soil	**Date Received:**	06/13/13
Method:	SW846 8270C SW846 3546	**Percent Solids:**	87.6
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	F65294.D	5	06/28/13	AMA	06/18/13	M:OP33660	M:MSF3028
Run #2							

	Initial Weight	Final Volume
Run #1	20.5 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.56	0.067	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.56	0.072	mg/kg	
50-32-8	Benzo(a)pyrene	0.157	0.56	0.060	mg/kg	J
205-99-2	Benzo(b)fluoranthene	ND	0.56	0.070	mg/kg	
191-24-2	Benzo(g,h,i)perylene	0.262	0.56	0.056	mg/kg	J
218-01-9	Chrysene	0.194	0.56	0.069	mg/kg	J
86-73-7	Fluorene	ND	0.56	0.074	mg/kg	
91-20-3	Naphthalene	ND	0.56	0.089	mg/kg	
85-01-8	Phenanthrene	0.230	0.56	0.076	mg/kg	J
129-00-0	Pyrene	0.368	0.56	0.065	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	57%		30-130%
321-60-8	2-Fluorobiphenyl	60%		30-130%
1718-51-0	Terphenyl-d14	78%		30-130%

(a) Elevated RL due to dilution required for matrix interference. Analysis performed at Accutest Laboratories, Marlborough, MA.

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:	AOI5_MW-481_0-1_061313		
Lab Sample ID:	JB39590-1	**Date Sampled:**	06/13/13
Matrix:	SO - Soil	**Date Received:**	06/13/13
Method:	SW846 8011 SW846 3550B	**Percent Solids:**	87.6
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB48736.D	1	06/19/13	AMA	06/18/13	M:OP33671	M:GBB2907
Run #2							

	Initial Weight	Final Volume
Run #1	30.5 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	191% [b]		61-167%
460-00-4	Bromofluorobenzene (S)	165%		61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Outside control limits due to possible 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

Report of Analysis

Client Sample ID:	AOI5_MW-481_0-1_061313		
Lab Sample ID:	JB39590-1	**Date Sampled:**	06/13/13
Matrix:	SO - Soil	**Date Received:**	06/13/13
		Percent Solids:	87.6
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Lead [a]	90.1	0.91	0.15	mg/kg	1	06/18/13	06/18/13	AMA	SW846 6010C [1]	SW846 3050B [2]

(1) Instrument QC Batch: M:MA15764
(2) Prep QC Batch: M:MP21196

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

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:	AOI5_MW-481_5-6_061313		
Lab Sample ID:	JB39590-2	**Date Sampled:**	06/13/13
Matrix:	SO - Soil	**Date Received:**	06/13/13
Method:	SW846 8260B	**Percent Solids:**	81.6
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V135701.D	1	06/17/13	DFT	n/a	n/a	VV5856
Run #2							

	Initial Weight
Run #1	7.2 g
Run #2	

Leaded Gasoline and Aviation Gas List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.00048	0.00085	0.00010	mg/kg	J
108-88-3	Toluene	ND	0.00085	0.000089	mg/kg	
100-41-4	Ethylbenzene	ND	0.00085	0.00022	mg/kg	
1330-20-7	Xylene (total)	ND	0.00085	0.00012	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	0.0068	0.00085	0.00020	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.00085	0.00011	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0043	0.000063	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0043	0.00018	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0043	0.00014	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		65-131%
17060-07-0	1,2-Dichloroethane-D4	83%		70-121%
2037-26-5	Toluene-D8	105%		80-128%
460-00-4	4-Bromofluorobenzene	96%		67-131%

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:	AOI5_MW-481_5-6_061313		
Lab Sample ID:	JB39590-2	**Date Sampled:**	06/13/13
Matrix:	SO - Soil	**Date Received:**	06/13/13
Method:	SW846 8270C SW846 3546	**Percent Solids:**	81.6
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	F65295.D	1	06/28/13	AMA	06/18/13	M:OP33660	M:MSF3028
Run #2							

	Initial Weight	Final Volume
Run #1	20.6 g	1.0 ml
Run #2		

BN Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	0.12	0.014	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.12	0.015	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.12	0.013	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.12	0.015	mg/kg	
191-24-2	Benzo(g,h,i)perylene	ND	0.12	0.012	mg/kg	
218-01-9	Chrysene	0.0170	0.12	0.015	mg/kg	J
86-73-7	Fluorene	ND	0.12	0.016	mg/kg	
91-20-3	Naphthalene	ND	0.12	0.019	mg/kg	
85-01-8	Phenanthrene	ND	0.12	0.016	mg/kg	
129-00-0	Pyrene	0.0356	0.12	0.014	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	70%		30-130%
321-60-8	2-Fluorobiphenyl	68%		30-130%
1718-51-0	Terphenyl-d14	80%		30-130%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

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:	AOI5_MW-481_5-6_061313		
Lab Sample ID:	JB39590-2	**Date Sampled:**	06/13/13
Matrix:	SO - Soil	**Date Received:**	06/13/13
Method:	SW846 8011 SW846 3550B	**Percent Solids:**	81.6
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	BB48737.D	1	06/19/13	AMA	06/18/13	M:OP33671	M:GBB2907
Run #2							

	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.0030	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	206% [b]		61-167%
460-00-4	Bromofluorobenzene (S)	171% [b]		61-167%

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.
(b) Outside control limits due to possible 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

Report of Analysis

Client Sample ID:	AOI5_MW-481_5-6_061313		
Lab Sample ID:	JB39590-2	**Date Sampled:**	06/13/13
Matrix:	SO - Soil	**Date Received:**	06/13/13
		Percent Solids:	81.6
Project:	Sun-Marcus Hook Refinery, Philadelphia, PA		

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Lead [a]	8.3	0.89	0.15	mg/kg	1	06/18/13	06/18/13	AMA	SW846 6010C [1]	SW846 3050B [2]

(1) Instrument QC Batch: M:MA15764
(2) Prep QC Batch: M:MP21196

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit
MDL = Method Detection Limit

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

New Jersey

ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

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

ACCUTEST LABORATORIES

SLL

CHAIN OF CUSTODY

PAGE 1 OF 1

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

FED-EX Tracking #:
Bottle Order Control #:
Accutest Quote #:
Accutest Job #: JB39590

Client / Reporting Information

Company Name: AQUATERRA
Street Address: 122 So Church St
City / State / Zip: Westchester PA 19382
Project Contact: Tiffany Doer
E-mail:
Phone #:
Fax #:
Sampler(s) Name(s): Eric Diech
Phone #:

Project Information

Project Name: Marcus Hook Refinery ADI-5
Street:
City / State:
Project #:
Client Purchase Order #:
Project Manager: Jim Oppenheim

Billing Information (if different from Report to)

Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

See attached list for analyses

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	Analysis	LAB USE ONLY
-1	A015_MW-48_0-1_061313	~~6401~~ 6496	6/13/13	1120	ED	SO	5					2	2	1		X	14B6
-2	A015_MW-48_5-6_061213	~~7445~~ 7446	6/13/13	1200	ED	SO	5					2	2	1		X	4968
																	SUB

D.I. slurry voc vials frozen storage
Date: 6-13-13 Time: 1750 Initials: MB

Turnaround Time (Business days)

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

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Data Deliverable Information

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

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

Comments / Special Instructions

Rec'd [illegible] Service Center

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	1550 6/13/13	1	2	6/13/13 1625	2
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
3	6/13/13 1820	3	4		4
Relinquished by:	Date Time:	Received By:	Custody Seal #	Intact / Not intact	Preserved where applicable	On Ice	Cooler Temp.
5		5					3.0

MB

5.1 5

JB39590: Chain of Custody
Page 1 of 2

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JB39590 **Client:** **Project:**

Date / Time Received: 6/13/2013 **Delivery Method:** **Airbill #'s:**

Cooler Temps (Initial/Adjusted): #1: (3/3); 0

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

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

Quality Control Preservatio	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

JB39590: Chain of Custody
Page 2 of 2

Internal Sample Tracking Chronicle

Aquaterra Technologies, Inc.

Job No: JB39590

Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JB39590-1 Collected: 13-JUN-13 11:20 By: ED Received: 13-JUN-13 By: AS AOI5_MW-481_0-1_061313						
JB39590-1	SW846 8260B	17-JUN-13 17:50	DFT			V8260SL
JB39590-1	SM21 2540 B MOD.	18-JUN-13	AMA			%SOL
JB39590-1	SW846 6010C	18-JUN-13 19:33	AMA	18-JUN-13	AMA	PB
JB39590-1	SW846 8011	19-JUN-13 18:15	AMA	18-JUN-13	AMA	V8011EDB
JB39590-1	SW846 8270C	28-JUN-13 03:46	AMA	18-JUN-13	AMA	B8270SL
JB39590-2 Collected: 13-JUN-13 12:00 By: ED Received: 13-JUN-13 By: AS AOI5_MW-481_5-6_061313						
JB39590-2	SW846 8260B	17-JUN-13 19:53	DFT			V8260SL
JB39590-2	SM21 2540 B MOD.	18-JUN-13	AMA			%SOL
JB39590-2	SW846 6010C	18-JUN-13 19:38	AMA	18-JUN-13	AMA	PB
JB39590-2	SW846 8011	19-JUN-13 18:42	AMA	18-JUN-13	AMA	V8011EDB
JB39590-2	SW846 8270C	28-JUN-13 04:09	AMA	18-JUN-13	AMA	B8270SL

Accutest Internal Chain of Custody

Job Number: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 06/13/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JB39590-1.1	Secured Storage	Robert Lofrano	06/14/13 11:45	Retrieve from Storage
JB39590-1.1	Robert Lofrano		06/14/13 11:45	Subcontract
JB39590-1.2	Secured Storage	Robert Lofrano	06/14/13 11:45	Retrieve from Storage
JB39590-1.2	Robert Lofrano		06/14/13 11:45	Subcontract
JB39590-1.4	Secured Storage	Thien Nguyen	06/17/13 17:09	Retrieve from Storage
JB39590-1.4	Thien Nguyen	GCMSV	06/17/13 17:09	Load on Instrument
JB39590-1.4	GCMSV	Thien Nguyen	06/19/13 11:34	Unload from Instrument
JB39590-1.4	Thien Nguyen	Secured Storage	06/19/13 11:34	Return to Storage
JB39590-1.5	Secured Storage	Thien Nguyen	06/17/13 17:09	Retrieve from Storage
JB39590-1.5	Thien Nguyen	GCMSV	06/17/13 17:09	Load on Instrument
JB39590-1.5	GCMSV	Thien Nguyen	06/19/13 11:34	Unload from Instrument
JB39590-1.5	Thien Nguyen	Secured Storage	06/19/13 11:34	Return to Storage
JB39590-2.1	Secured Storage	Robert Lofrano	06/14/13 11:45	Retrieve from Storage
JB39590-2.1	Robert Lofrano		06/14/13 11:45	Subcontract
JB39590-2.2	Secured Storage	Robert Lofrano	06/14/13 11:45	Retrieve from Storage
JB39590-2.2	Robert Lofrano		06/14/13 11:45	Subcontract
JB39590-2.4	Secured Storage	Thien Nguyen	06/17/13 17:09	Retrieve from Storage
JB39590-2.4	Thien Nguyen	GCMSV	06/17/13 17:09	Load on Instrument
JB39590-2.4	GCMSV	Thien Nguyen	06/19/13 11:34	Unload from Instrument
JB39590-2.4	Thien Nguyen	Secured Storage	06/19/13 11:34	Return to Storage
JB39590-2.5	Secured Storage	Thien Nguyen	06/17/13 17:09	Retrieve from Storage
JB39590-2.5	Thien Nguyen	GCMSV	06/17/13 17:09	Load on Instrument
JB39590-2.5	GCMSV	Thien Nguyen	06/19/13 11:34	Unload from Instrument
JB39590-2.5	Thien Nguyen	Secured Storage	06/19/13 11:34	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: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VV5856-MB	V135693.D	1	06/17/13	DFT	n/a	n/a	VV5856

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

JB39590-1, JB39590-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.12	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	0.14	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	0.26	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.074	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.24	ug/kg	
108-88-3	Toluene	ND	1.0	0.11	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.16	ug/kg	
1330-20-7	Xylene (total)	ND	1.0	0.14	ug/kg	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	101%	65-131%
17060-07-0	1,2-Dichloroethane-D4	84%	70-121%
2037-26-5	Toluene-D8	104%	80-128%
460-00-4	4-Bromofluorobenzene	96%	67-131%

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

Blank Spike Summary

Job Number: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VV5856-BS	V135694.D	1	06/17/13	DFT	n/a	n/a	VV5856

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

JB39590-1, JB39590-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	48.0	96	79-121
107-06-2	1,2-Dichloroethane	50	44.7	89	73-132
100-41-4	Ethylbenzene	50	46.3	93	78-119
98-82-8	Isopropylbenzene	50	44.3	89	75-122
1634-04-4	Methyl Tert Butyl Ether	100	94.9	95	73-122
108-88-3	Toluene	50	49.4	99	78-121
95-63-6	1,2,4-Trimethylbenzene	50	45.3	91	76-121
108-67-8	1,3,5-Trimethylbenzene	50	44.8	90	74-121
1330-20-7	Xylene (total)	150	144	96	79-120

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	104%	65-131%
17060-07-0	1,2-Dichloroethane-D4	88%	70-121%
2037-26-5	Toluene-D8	104%	80-128%
460-00-4	4-Bromofluorobenzene	103%	67-131%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB39590-1MS	V135698.D	1	06/17/13	DFT	n/a	n/a	VV5856
JB39590-1	V135697.D	1	06/17/13	DFT	n/a	n/a	VV5856

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

JB39590-1, JB39590-2

CAS No.	Compound	JB39590-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Limits
71-43-2	Benzene	0.18	J	36.6	32.3	88	47-130
107-06-2	1,2-Dichloroethane	ND		36.6	28.4	78	46-135
100-41-4	Ethylbenzene	0.27	J	36.6	26.4	71	30-139
98-82-8	Isopropylbenzene	ND		36.6	22.2	61	30-140
1634-04-4	Methyl Tert Butyl Ether	ND		36.6	28.8	79	50-127
108-88-3	Toluene	ND		36.6	30.6	84	38-136
95-63-6	1,2,4-Trimethylbenzene	0.29	J	36.6	20.5	55	20-145
108-67-8	1,3,5-Trimethylbenzene	ND		36.6	20.0	55	24-142
1330-20-7	Xylene (total)	1.1		110	80.3	72	31-140

CAS No.	Surrogate Recoveries	MS	JB39590-1	Limits
1868-53-7	Dibromofluoromethane	98%	103%	65-131%
17060-07-0	1,2-Dichloroethane-D4	77%	86%	70-121%
2037-26-5	Toluene-D8	102%	103%	80-128%
460-00-4	4-Bromofluorobenzene	98%	92%	67-131%

* = Outside of Control Limits.

Duplicate Summary

Job Number: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
JB39590-2DUP	V135700.D	1	06/17/13	DFT	n/a	n/a	VV5856
JB39590-2	V135701.D	1	06/17/13	DFT	n/a	n/a	VV5856

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

JB39590-1, JB39590-2

CAS No.	Compound	JB39590-2 ug/kg	Q	DUP ug/kg	Q	RPD	Limits
71-43-2	Benzene	0.48	J	0.39	J	21* [a]	20
107-06-2	1,2-Dichloroethane	ND		ND		nc	10
100-41-4	Ethylbenzene	ND		ND		nc	19
98-82-8	Isopropylbenzene	ND		ND		nc	15
1634-04-4	Methyl Tert Butyl Ether	6.8		5.9		14	16
108-88-3	Toluene	ND		ND		nc	24
95-63-6	1,2,4-Trimethylbenzene	ND		ND		nc	10
108-67-8	1,3,5-Trimethylbenzene	ND		ND		nc	10
1330-20-7	Xylene (total)	ND		ND		nc	24

CAS No.	Surrogate Recoveries	DUP	JB39590-2	Limits
1868-53-7	Dibromofluoromethane	103%	103%	65-131%
17060-07-0	1,2-Dichloroethane-D4	86%	83%	70-121%
2037-26-5	Toluene-D8	104%	105%	80-128%
460-00-4	4-Bromofluorobenzene	98%	96%	67-131%

(a) High RPD due to possible sample analyzed from different vials.

* = Outside of Control Limits.

Instrument Performance Check (BFB)

Job Number: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: VV5841-BFB
Lab File ID: V135310.D
Instrument ID: GCMSV
Injection Date: 06/04/13
Injection Time: 13:18

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	7557	17.9		Pass
75	30.0 - 60.0% of mass 95	19581	46.3		Pass
95	Base peak, 100% relative abundance	42285	100.0		Pass
96	5.0 - 9.0% of mass 95	3004	7.10		Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) [a]	Pass
174	50.0 - 120.0% of mass 95	36989	87.5		Pass
175	5.0 - 9.0% of mass 174	2797	6.61	(7.56) [a]	Pass
176	95.0 - 101.0% of mass 174	35674	84.4	(96.4) [a]	Pass
177	5.0 - 9.0% of mass 176	2285	5.40	(6.41) [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
VV5841-IC5841	V135312.D	06/04/13	14:49	01:31	Initial cal 1
VV5841-IC5841	V135313.D	06/04/13	15:20	02:02	Initial cal 2
VV5841-IC5841	V135314.D	06/04/13	15:51	02:33	Initial cal 5
VV5841-IC5841	V135315.D	06/04/13	16:22	03:04	Initial cal 10
VV5841-IC5841	V135316.D	06/04/13	16:53	03:35	Initial cal 20
VV5841-ICC5841	V135317.D	06/04/13	17:24	04:06	Initial cal 50
VV5841-IC5841	V135318.D	06/04/13	17:55	04:37	Initial cal 100
VV5841-IC5841	V135319.D	06/04/13	18:38	05:20	Initial cal 200
VV5841-ICV5841	V135322.D	06/04/13	20:14	06:56	Initial cal verification 50

Instrument Performance Check (BFB)

Job Number: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: VV5856-BFB
Lab File ID: V135690.D
Instrument ID: GCMSV
Injection Date: 06/17/13
Injection Time: 12:56

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	6844	16.1		Pass
75	30.0 - 60.0% of mass 95	19576	46.0		Pass
95	Base peak, 100% relative abundance	42561	100.0		Pass
96	5.0 - 9.0% of mass 95	3037	7.14		Pass
173	Less than 2.0% of mass 174	0	0.00	(0.00) [a]	Pass
174	50.0 - 120.0% of mass 95	41857	98.3		Pass
175	5.0 - 9.0% of mass 174	3081	7.24	(7.36) [a]	Pass
176	95.0 - 101.0% of mass 174	39806	93.5	(95.1) [a]	Pass
177	5.0 - 9.0% of mass 176	2786	6.55	(7.00) [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
VV5856-CC5841	V135691.D	06/17/13	14:22	01:26	Continuing cal 20
VV5856-MB	V135693.D	06/17/13	15:35	02:39	Method Blank
VV5856-BS	V135694.D	06/17/13	16:16	03:20	Blank Spike
ZZZZZZ	V135696.D	06/17/13	17:19	04:23	(unrelated sample)
JB39590-1	V135697.D	06/17/13	17:50	04:54	AOI5_MW-481_0-1_061313
JB39590-1MS	V135698.D	06/17/13	18:20	05:24	Matrix Spike
JB39590-2DUP	V135700.D	06/17/13	19:22	06:26	Duplicate
JB39590-2	V135701.D	06/17/13	19:53	06:57	AOI5_MW-481_5-6_061313
ZZZZZZ	V135702.D	06/17/13	20:23	07:27	(unrelated sample)
ZZZZZZ	V135703.D	06/17/13	20:54	07:58	(unrelated sample)
ZZZZZZ	V135704.D	06/17/13	21:25	08:29	(unrelated sample)
ZZZZZZ	V135705.D	06/17/13	21:56	09:00	(unrelated sample)
ZZZZZZ	V135706.D	06/17/13	22:27	09:31	(unrelated sample)
ZZZZZZ	V135707.D	06/17/13	22:57	10:01	(unrelated sample)
ZZZZZZ	V135708.D	06/17/13	23:28	10:32	(unrelated sample)
ZZZZZZ	V135709.D	06/17/13	23:59	11:03	(unrelated sample)
ZZZZZZ	V135710.D	06/18/13	00:30	11:34	(unrelated sample)

Volatile Internal Standard Area Summary

Job Number: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	VV5856-CC5841	**Injection Date:**	06/17/13
Lab File ID:	V135691.D	**Injection Time:**	14:22
Instrument ID:	GCMSV	**Method:**	SW846 8260B

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
Check Std	37949	7.43	203019	9.65	283544	10.60	238923	14.00	116217	16.61
Upper Limit [a]	75898	7.93	406038	10.15	567088	11.10	477846	14.50	232434	17.11
Lower Limit [b]	18975	6.93	101510	9.15	141772	10.10	119462	13.50	58109	16.11

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
VV5856-MB	30285	7.44	199429	9.66	277959	10.60	238735	14.00	108335	16.61
VV5856-BS	39718	7.44	213072	9.65	299905	10.60	256754	14.00	132589	16.61
ZZZZZZ	39582	7.44	217377	9.66	310467	10.60	266132	14.01	120356	16.61
JB39590-1	37562	7.45	229806	9.65	321755	10.60	267962	14.01	109154	16.61
JB39590-1MS	30442	7.44	232545	9.65	324628	10.60	264016	14.00	127492	16.61
JB39590-2DUP	44131	7.45	258133	9.66	365630	10.60	311752	14.01	145218	16.61
JB39590-2	36650	7.45	252343	9.66	355647	10.60	307265	14.01	142204	16.61
ZZZZZZ	37309	7.45	237576	9.66	332776	10.60	286978	14.01	132503	16.61
ZZZZZZ	37558	7.45	227560	9.66	324547	10.60	276235	14.01	123920	16.61
ZZZZZZ	36931	7.45	233707	9.66	328668	10.60	281246	14.01	126953	16.61
ZZZZZZ	27779	7.45	227141	9.65	317976	10.60	269343	14.01	117556	16.61
ZZZZZZ	37255	7.44	227060	9.65	324509	10.60	275127	14.00	123289	16.61
ZZZZZZ	39124	7.44	239646	9.65	341992	10.60	294894	14.00	130498	16.62
ZZZZZZ	41570	7.44	230306	9.66	332009	10.60	288630	14.00	127752	16.61
ZZZZZZ	36210	7.44	221173	9.66	311902	10.60	269030	14.01	119880	16.61
ZZZZZZ	41683	7.45	216084	9.65	313717	10.60	267889	14.01	118411	16.61

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: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

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

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4
JB39590-1	V135697.D	103.0	86.0	103.0	92.0
JB39590-2	V135701.D	103.0	83.0	105.0	96.0
JB39590-1MS	V135698.D	98.0	77.0	102.0	98.0
JB39590-2DUP	V135700.D	103.0	86.0	104.0	98.0
VV5856-BS	V135694.D	104.0	88.0	104.0	103.0
VV5856-MB	V135693.D	101.0	84.0	104.0	96.0

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	65-131%
S2 = 1,2-Dichloroethane-D4	70-121%
S3 = Toluene-D8	80-128%
S4 = 4-Bromofluorobenzene	67-131%

Initial Calibration Summary

Job Number: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: VV5841-ICC5841
Lab FileID: V135317.D

Response Factor Report MSV

```
Method       : C:\MSDCHEM\1\METHODS\MVS5841.M (RTE Integrator)
Title        : SW846 8260B, ZB624 60m x 0.25mm x 1.4um
Last Update  : Wed Jun 05 09:28:55 2013
Response via : Initial Calibration

Calibration Files
1   =v135312.D   10  =v135315.D   100 =v135318.D   50  =v135317.D
20  =v135316.D   200 =v135319.D   5   =v135314.D   2   =v135313.D
    =                =
```

Compound	1	10	100	50	20	200	5	2	Avg	%RSD
1) I Tert Butyl Alcohol-d9 ----------ISTD----------										
2) tertiary butyl alcohol	1.309	1.062	1.066	1.196	1.205	1.104	1.399		1.192	10.68
3) 1,4-dioxane	0.096	0.086	0.089	0.092	0.099	0.096			0.093	5.09
4) I pentafluorobenzene ----------ISTD----------										
5) chlorodifluoromethane	0.631	0.475	0.514	0.498	0.511	0.580	0.569	0.593	0.546	9.95
6) dichlorodifluoromethane	0.604	0.633	0.618	0.608	0.634	0.677	0.654	0.668	0.637	4.31
7) chloromethane	1.043	0.759	0.775	0.757	0.747	0.846	0.803	0.832	0.820	11.81
8) vinyl chloride	0.855	0.801	0.802	0.770	0.781	0.876	0.791	0.835	0.814	4.61
9) bromomethane	0.354	0.339	0.339	0.343	0.372	0.362	0.359		0.353	3.59
10) chloroethane	0.356	0.325	0.324	0.320	0.321	0.347	0.345	0.330	0.334	4.12
11) trichlorofluoromethane	0.770	0.699	0.701	0.695	0.713	0.736	0.732	0.727	0.722	3.48
12) ethyl ether	0.197	0.142	0.150	0.154	0.153	0.167	0.168	0.161	0.162	10.30
13) 2-chloropropane	1.018	0.671	0.748	0.785	0.811	0.817	0.905	0.906	0.833	12.93
14) acrolein	0.034	0.036	0.036	0.036	0.034	0.040	0.034	0.039	0.036	6.09
15) freon 113	0.288	0.256	0.277	0.275	0.269	0.297	0.296	0.291	0.281	5.09
16) 1,1-dichloroethene	0.492	0.314	0.355	0.371	0.396	0.390	0.439	0.435	0.399	13.90
17) acetone	0.055	0.044	0.050	0.056	0.051	0.066			0.054	13.47
18) iso-butyl alcohol	0.011	0.011	0.012	0.011	0.013	0.012	0.012		0.012	5.74
19) allyl chloride	0.259	0.195	0.247	0.260	0.257	0.278	0.270	0.255	0.253	9.92
20) acetonitrile	0.103	0.080	0.087	0.090	0.091	0.095	0.094	0.093	0.091	7.52
21) iodomethane	0.653	0.536	0.603	0.624	0.638	0.665	0.664	0.665	0.631	7.07
22) carbon disulfide	1.702	1.208	1.356	1.403	1.461	1.494	1.586	1.560	1.471	10.35
23) methylene chloride										

```
                  0.323 0.337 0.348 0.357 0.368 0.385 0.425          0.363    9.38
24)  1-chloropropane
            0.896 0.651 0.735 0.747 0.770 0.797 0.875 0.880          0.794   10.76
25)  methyl acetate
                  0.125 0.141 0.145 0.156 0.152 0.122 0.125          0.138   10.04
26)  methyl tert butyl ether
            0.752 0.655 0.730 0.749 0.744 0.810 0.748 0.788          0.747    6.06
27)  trans-1,2-dichloroethene
            0.467 0.352 0.388 0.397 0.413 0.422 0.447 0.467          0.419    9.61
28)  di-isopropyl ether
            1.310 1.143 1.230 1.236 1.192 1.319 1.249 1.253          1.242    4.63
29)  2-butanone
                  0.017 0.021 0.022 0.020 0.025                      0.021   13.99
30)  1,1-dichloroethane
            0.836 0.644 0.732 0.754 0.758 0.796 0.783 0.784          0.761    7.44
31)  chloroprene
            0.675 0.573 0.640 0.623 0.601 0.670 0.635 0.655          0.634    5.43
32)  acrylonitrile
            0.057 0.056 0.062 0.064 0.062 0.070 0.060 0.055          0.061    8.08
33)  vinyl acetate
                  0.027 0.037 0.035 0.034 0.041                      0.035   14.03
34)  ethyl tert-butyl ether
            1.039 0.950 1.039 1.040 1.001 1.127 1.020 0.997          1.027    4.92
35)  ethyl acetate
                  0.026 0.026 0.027 0.029 0.030 0.020                0.026   13.57
36)  2,2-dichloropropane
            0.707 0.498 0.575 0.597 0.613 0.626 0.662 0.662          0.618   10.33
37)  cis-1,2-dichloroethene
            0.482 0.346 0.389 0.394 0.405 0.422 0.435 0.423          0.412    9.59
38)  propionitrile
            0.016 0.021 0.023 0.024 0.023 0.027 0.021 0.019          0.022   14.66
39)  methyl acrylate
                  0.015 0.026 0.027 0.024 0.032 0.006                0.022   44.36
             ----- Linear regression -----  Coefficient =  0.9944
               Response Ratio = -0.00446 + 0.03214 *A

40)  methacrylonitrile
                  0.054 0.074 0.075 0.072 0.083 0.066                0.071   13.85
41)  bromochloromethane
            0.124 0.129 0.139 0.145 0.143 0.153 0.150 0.145          0.141    7.28
42)  tetrahydrofuran
                  0.060 0.065 0.067 0.063 0.072 0.060                0.065    7.22
43)  chloroform
            0.800 0.574 0.610 0.637 0.640 0.669 0.687 0.690          0.663   10.20
44)  tert-Butyl Formate
            0.189 0.197 0.211 0.207 0.189 0.235 0.198 0.204          0.204    7.30
45)  dibromofluoromethane (s)
            0.360 0.310 0.307 0.311 0.300 0.330 0.306 0.338          0.320    6.42
46)  1,2-dichloroethane-d4 (s)
            0.318 0.284 0.279 0.287 0.277 0.302 0.279 0.330          0.295    6.79
47)  1,1,1-trichloroethane
            0.684 0.503 0.579 0.598 0.617 0.634 0.666 0.645          0.616    9.27
48)  Cyclohexane
            0.771 0.528 0.639 0.657 0.694 0.693 0.750 0.743          0.684   11.41

49) I   1,4-difluorobenzene   ----------------ISTD---------------------
50)  methylcyclohexane
            0.539 0.477 0.522 0.512 0.513 0.550 0.557 0.563          0.529    5.46
51)  epichlorohydrin
                  0.011 0.012 0.011 0.011 0.013 0.011 0.010          0.011    8.18
```

Initial Calibration Summary

Job Number: JB39590 **Sample:** VV5841-ICC5841
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** V135317.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
52)  n-butyl alcohol
                0.004 0.004 0.004 0.004 0.005 0.003                0.004   12.62
53)  carbon tetrachloride
          0.424 0.318 0.376 0.379 0.395 0.409 0.435 0.425          0.395    9.66
54)  1,1-dichloropropene
          0.502 0.349 0.410 0.420 0.442 0.448 0.468 0.462          0.438   10.52
55)  hexane
          0.545 0.378 0.407 0.405 0.396 0.425 0.468 0.476          0.437   12.63
56)  2,2,4-Trimethylpentane
          1.352 1.147 1.231 1.217 1.189 1.342 1.345 1.316          1.267    6.36
57)  benzene
          1.387 1.011 1.125 1.155 1.148 1.233 1.244 1.279          1.198    9.48
58)  tert-amyl methyl ether
          0.720 0.581 0.630 0.629 0.605 0.688 0.624 0.655          0.642    6.97
59)  heptane
          0.313 0.229 0.243 0.245 0.246 0.267 0.270 0.262          0.259    9.88
60)  isopropyl acetate
          0.040 0.035 0.036 0.037 0.036 0.039 0.037                0.037    4.40
61)  1,2-dichloroethane
          0.272 0.223 0.247 0.254 0.246 0.268 0.249 0.256          0.252    6.04
62)  trichloroethene
          0.339 0.244 0.277 0.283 0.289 0.302 0.311 0.289          0.292    9.43
63)  2-chloroethyl vinyl ether
                0.036 0.048 0.045 0.041 0.060 0.036                0.044   20.16
           ----- Linear regression -----  Coefficient =  0.9901
             Response Ratio = -0.04608 + 0.06001 *A

64)  methyl methacrylate
                0.029 0.036 0.035 0.034 0.041                      0.035   12.85
65)  1,2-dichloropropane
          0.290 0.237 0.265 0.270 0.273 0.289 0.290 0.285          0.275    6.63
66)  dibromomethane
          0.117 0.094 0.102 0.103 0.103 0.112 0.104 0.113          0.106    6.92
67)  bromodichloromethane
          0.320 0.266 0.299 0.300 0.302 0.327 0.316 0.307          0.305    6.13
68)  2-nitropropane
                0.038 0.040 0.040 0.040 0.044 0.035 0.038          0.039    6.92
69)  cis-1,3-dichloropropene
          0.415 0.338 0.381 0.388 0.376 0.419 0.386 0.390          0.387    6.46
70)  toluene-d8 (s)
          1.300 0.956 0.986 1.004 0.986 1.074 1.019 1.169          1.062   11.04
71)  4-methyl-2-pentanone
                0.045 0.055 0.055 0.054 0.061 0.049 0.045          0.052   11.51
72)  toluene
          0.870 0.616 0.689 0.708 0.724 0.765 0.769 0.783          0.740   10.14
73)  isoamyl alcohol
          0.007 0.006 0.006 0.006 0.006 0.007 0.005 0.006          0.006    9.63
74)  trans-1,3-dichloropropene
          0.295 0.264 0.299 0.302 0.294 0.331 0.295 0.305          0.298    6.09
75)  ethyl methacrylate
          0.175 0.178 0.211 0.208 0.205 0.239 0.192 0.177          0.198   11.18
76)  1,1,2-trichloroethane
          0.136 0.119 0.131 0.133 0.130 0.144 0.138 0.127          0.132    5.60
77)  2-hexanone
                0.036 0.045 0.043 0.038 0.052 0.038                0.042   14.42

78) I   chlorobenzene-d5      ----------------ISTD---------------------
79)  tetrachloroethene
          0.472 0.331 0.377 0.399 0.409 0.420 0.445 0.442          0.412   10.70
80)  1,3-dichloropropane
```

Initial Calibration Summary

Job Number: JB39590 **Sample:** VV5841-ICC5841
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** V135317.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
            0.380 0.309 0.338 0.345 0.350 0.378 0.348 0.348         0.350    6.43
 81)  butyl acetate
                  0.058 0.047 0.043 0.046 0.053 0.063 0.046         0.051   14.69
 82)  3,3-Dimethyl-1-Butanol
            0.015 0.012 0.012 0.012 0.012 0.014 0.012 0.012         0.013    8.75
 83)  dibromochloromethane
            0.267 0.205 0.236 0.243 0.236 0.264 0.256 0.243         0.244    8.06
 84)  1,2-dibromoethane
            0.158 0.159 0.177 0.181 0.175 0.195 0.179 0.185         0.176    7.20
 85)  chlorobenzene
            1.001 0.813 0.877 0.909 0.925 0.974 0.993 0.946         0.930    6.82
 86)  1,1,1,2-tetrachloroethane
            0.315 0.278 0.302 0.306 0.312 0.334 0.322 0.304         0.309    5.24
 87)  ethylbenzene
            1.995 1.524 1.678 1.731 1.766 1.877 1.882 1.797         1.781    8.08
 88)  m,p-xylene
            0.727 0.575 0.639 0.662 0.672 0.722 0.722 0.682         0.675    7.63
 89)  o-xylene
            0.654 0.529 0.608 0.621 0.627 0.681 0.668 0.645         0.629    7.51
 90)  styrene
            0.931 0.805 0.966 0.977 0.972 1.095 0.974 0.915         0.954    8.45
 91)  bromoform
            0.122 0.122 0.142 0.142 0.140 0.161 0.140 0.121         0.136   10.09
 92)  cyclohexanone
            0.008 0.008 0.009 0.009 0.009 0.009 0.009 0.009         0.009    6.33
 93)  4-bromofluorobenzene (s)
                  0.412 0.399 0.413 0.394 0.440 0.481               0.423    7.66

 94) I   1,4-dichlorobenzene-d ----------------ISTD---------------------
 95)  isopropylbenzene
            4.346 3.162 3.417 3.505 3.729 3.761 4.078 4.097         3.762   10.54
 96)  1,1,2,2-tetrachloroethane
            0.581 0.459 0.466 0.473 0.477 0.509 0.508 0.518         0.499    7.99
 97)  trans-1,4-dichloro-2-butene
                  0.104 0.131 0.114 0.113 0.131 0.136 0.105         0.119   10.97
 98)  1,2,3-trichloropropane
                  0.107 0.107 0.110 0.118 0.121 0.123 0.122         0.115    6.25
 99)  bromobenzene
            0.891 0.649 0.673 0.700 0.724 0.773 0.782 0.788         0.747   10.38
100)  n-propylbenzene
            4.979 3.701 4.052 4.122 4.424 4.551 4.782 4.774         4.423    9.85
101)  2-chlorotoluene
            0.945 0.733 0.763 0.785 0.821 0.854 0.904 0.889         0.837    8.84
102)  4-chlorotoluene
            2.880 2.119 2.167 2.234 2.376 2.442 2.633 2.639         2.436   10.91
103)  1,3,5-trimethylbenzene
            3.404 2.538 2.760 2.827 2.977 3.090 3.234 3.160         2.999    9.38
104)  tert-butylbenzene
            3.165 2.320 2.536 2.559 2.751 2.792 3.011 2.998         2.767   10.31
105)  pentachloroethane
            0.599 0.451 0.455 0.478 0.487 0.496 0.522 0.501         0.499    9.41
106)  1,2,4-trimethylbenzene
            3.166 2.495 2.669 2.760 2.865 2.988 3.087 2.894         2.865    7.71
107)  sec-butylbenzene
            4.543 3.594 3.919 3.997 4.227 4.352 4.579 4.420         4.204    8.14
108)  p-isopropyltoluene
            3.551 2.789 3.077 3.148 3.319 3.464 3.524 3.309         3.273    7.90
109)  1,3-dichlorobenzene
            1.835 1.327 1.375 1.414 1.473 1.550 1.597 1.590         1.520   10.62
110)  1,4-dichlorobenzene
```

Initial Calibration Summary

Job Number: JB39590 **Sample:** VV5841-ICC5841
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** V135317.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

```
            1.789 1.314 1.340 1.382 1.483 1.541 1.549 1.624         1.503   10.59
111)  1,2-dichlorobenzene
            1.381 1.177 1.215 1.247 1.287 1.352 1.381 1.379         1.302    6.32
112)  Benzyl Chloride
            0.888 0.762 0.798 0.809 0.801 0.904 0.793 0.860         0.827    6.12
113)  n-butylbenzene
            1.687 1.402 1.637 1.648 1.744 1.877 1.771 1.615         1.673    8.32
114)  hexachloroethane
            0.572 0.504 0.544 0.548 0.589 0.581 0.598 0.599         0.567    5.83
115)  1,2-dibromo-3-chloropropane
                  0.078 0.081 0.083 0.076 0.083 0.079 0.076         0.079    3.79
116)  1,3,5-trichlorobenzene
            1.185 0.992 1.049 1.120 1.175 1.122 1.185 1.163         1.124    6.26
117)  1,2,4-trichlorobenzene
            0.780 0.641 0.747 0.787 0.780 0.783 0.710 0.663         0.736    7.92
118)  hexachlorobutadiene
            0.760 0.612 0.616 0.651 0.712 0.592 0.743 0.714         0.675    9.62
119)  naphthalene
                  0.898 1.136 1.152 1.068 1.117 0.891               1.044   11.41
120)  1,2,3-trichlorobenzene
            0.566 0.556 0.610 0.662 0.646 0.563 0.589 0.550         0.593    7.17
 ---------------------------------------------------------------------------
 (#) = Out of Range  ###  Number of calibration levels exceeded format  ###

          MVS5841.M         Wed Jun 05 09:31:12 2013   MSV
```

Initial Calibration Verification

Job Number: JB39590 **Sample:** VV5841-ICV5841
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** V135322.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\V135322.D Vial: 13
Acq On : 4 Jun 2013 8:14 pm Operator: danat
Sample : ICV5841-50 Inst : MSV
Misc : MS49281,VV5841,5.0,,,,1 Multiplr: 1.00
MS Integration Params: rteint1.p

Method : C:\MSDCHEM\1\METHODS\MVS5841.M (RTE Integrator)
Title : SW846 8260B, ZB624 60m x 0.25mm x 1.4um
Last Update : Wed Jun 05 09:28:55 2013
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	121	0.00	7.44
2	tertiary butyl alcohol	1.192	1.105	7.3	125	0.00	7.56
3	1,4-dioxane	0.093	0.087	6.5	119	0.00	11.36
4 I	pentafluorobenzene	1.000	1.000	0.0	111	0.00	9.66
5	chlorodifluoromethane	0.546	0.461	15.6	103	0.00	4.19
6	dichlorodifluoromethane	0.637	0.580	8.9	106	0.00	4.17
7	chloromethane	0.820	0.739	9.9	108	0.00	4.52
8	vinyl chloride	0.814	0.750	7.9	108	0.00	4.75
9	bromomethane	0.353	0.333	5.7	109	-0.01	5.39
10	chloroethane	0.334	0.312	6.6	108	0.00	5.56
11	trichlorofluoromethane	0.722	0.668	7.5	107	0.00	5.96
12	ethyl ether	0.162	0.162	0.0	116	0.00	6.36
13	2-chloropropane	0.833	0.777	6.7	110	0.00	6.57
14	acrolein	0.036	0.040	-11.1	123	0.00	6.64
15	freon 113	0.281	0.230	18.1	93	0.00	6.74
16	1,1-dichloroethene	0.399	0.361	9.5	108	0.00	6.79
17	acetone	0.054	0.049	9.3	110	0.00	6.86
18	iso-butyl alcohol	0.012	0.012	0.0	111	0.00	10.23
19	allyl chloride	0.253	0.247	2.4	105	0.00	7.31
20	acetonitrile	0.091	0.091	0.0	113	0.00	7.31
21	iodomethane	0.631	0.624	1.1	111	0.00	7.08
22	carbon disulfide	1.471	1.382	6.1	109	0.00	7.21
23	methylene chloride	0.363	0.357	1.7	114	0.00	7.50
24	1-chloropropane	0.794	0.754	5.0	112	0.00	7.53
25	methyl acetate	0.138	0.152	-10.1	117	0.00	7.29
26	methyl tert butyl ether	0.747	0.757	-1.3	112	0.00	7.80
27	trans-1,2-dichloroethene	0.419	0.398	5.0	111	0.00	7.86
28	di-isopropyl ether	1.242	1.206	2.9	108	0.00	8.37
29	2-butanone	0.021	0.023	-9.5	114	0.00	9.14
30	1,1-dichloroethane	0.761	0.759	0.3	112	0.00	8.43
31	chloroprene	0.634	0.569	10.3	101	0.00	8.53
32	acrylonitrile	0.061	0.071	-16.4	124	0.00	7.83
33	vinyl acetate	0.035	0.041	-17.1	130	0.00	8.39
34	ethyl tert-butyl ether	1.027	1.005	2.1	107	0.00	8.83
35	ethyl acetate	0.026	0.031	-19.2	130	0.00	9.13
36	2,2-dichloropropane	0.618	0.576	6.8	107	0.00	9.16
37	cis-1,2-dichloroethene	0.412	0.404	1.9	114	0.00	9.16
38	propionitrile	0.022	0.027	-22.7#	124	0.00	9.25
	----------	True	Calc.	% Drift	----------		
39	methyl acrylate	50.000	51.793	-3.6	118	0.00	9.21

Initial Calibration Verification

Job Number: JB39590 **Sample:** VV5841-ICV5841
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** V135322.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

			AvgRF	CCRF	% Dev			
40		methacrylonitrile	0.071	0.081	-14.1	121	0.00	9.42
41		bromochloromethane	0.141	0.147	-4.3	113	0.00	9.49
42		tetrahydrofuran	0.065	0.073	-12.3	119	-0.01	9.52
43		chloroform	0.663	0.645	2.7	112	0.00	9.53
44		tert-Butyl Formate	0.204	0.225	-10.3	121	0.00	9.55
45	S	dibromofluoromethane (s)	0.320	0.323	-0.9	115	0.00	9.73
46	S	1,2-dichloroethane-d4 (s)	0.295	0.297	-0.7	115	0.00	10.17
47		1,1,1-trichloroethane	0.616	0.584	5.2	109	0.00	9.78
48		Cyclohexane	0.684	0.645	5.7	109	0.00	9.85
49	I	1,4-difluorobenzene	1.000	1.000	0.0	111	0.00	10.60
50		methylcyclohexane	0.529	0.476	10.0	103	0.00	11.17
51		epichlorohydrin	0.011	0.012	-9.1	120	0.00	11.93
52		n-butyl alcohol	0.004	0.004	0.0	123	0.00	10.73
53		carbon tetrachloride	0.395	0.374	5.3	110	0.00	9.98
54		1,1-dichloropropene	0.438	0.412	5.9	109	0.00	9.96
55		hexane	0.437	0.331	24.3#	91	0.00	8.13
56		2,2,4-Trimethylpentane	1.267	1.059	16.4	97	0.00	10.20
57		benzene	1.198	1.160	3.2	112	0.00	10.23
58		tert-amyl methyl ether	0.642	0.636	0.9	113	0.00	10.24
59		heptane		----------NA----------				
60		isopropyl acetate	0.037	0.040	-8.1	120	0.00	10.25
61		1,2-dichloroethane	0.252	0.257	-2.0	113	0.00	10.26
62		trichloroethene	0.292	0.283	3.1	111	0.00	10.96
			True	Calc.	% Drift			
63		2-chloroethyl vinyl ether	250.000	251.868	-0.7	128	0.00	11.78
			AvgRF	CCRF	% Dev			
64		methyl methacrylate	0.035	0.039	-11.4	122	-0.01	11.22
65		1,2-dichloropropane	0.275	0.279	-1.5	115	0.00	11.23
66		dibromomethane	0.106	0.110	-3.8	119	0.00	11.41
67		bromodichloromethane	0.305	0.311	-2.0	115	0.00	11.54
68		2-nitropropane	0.039	0.044	-12.8	122	0.00	11.78
69		cis-1,3-dichloropropene	0.387	0.400	-3.4	115	0.00	12.02
70	S	toluene-d8 (s)	1.062	1.029	3.1	114	0.00	12.33
71		4-methyl-2-pentanone	0.052	0.061	-17.3	123	0.00	12.12
72		toluene	0.740	0.718	3.0	113	0.00	12.40
73		isoamyl alcohol	0.006	0.007	-16.7	130	0.00	12.14
74		trans-1,3-dichloropropene	0.298	0.314	-5.4	116	0.00	12.63
75		ethyl methacrylate	0.198	0.221	-11.6	119	0.00	12.60
76		1,1,2-trichloroethane	0.132	0.141	-6.8	119	0.00	12.87
77		2-hexanone	0.042	0.048	-14.3	122	0.00	13.05
78	I	chlorobenzene-d5	1.000	1.000	0.0	114	0.00	14.01
79		tetrachloroethene	0.412	0.375	9.0	107	0.00	13.05
80		1,3-dichloropropane	0.350	0.361	-3.1	119	0.00	13.07
81		butyl acetate	0.051	0.049	3.9	129	0.00	13.12
82		3,3-Dimethyl-1-Butanol	0.013	0.013	0.0	121	0.00	13.24
83		dibromochloromethane	0.244	0.245	-0.4	115	0.00	13.36
84		1,2-dibromoethane	0.176	0.189	-7.4	119	0.00	13.53
85		chlorobenzene	0.930	0.902	3.0	113	0.00	14.04
86		1,1,1,2-tetrachloroethane	0.309	0.309	0.0	115	0.00	14.10
87		ethylbenzene	1.781	1.711	3.9	112	0.00	14.09
88		m,p-xylene	0.675	0.649	3.9	111	0.00	14.20
89		o-xylene	0.629	0.622	1.1	114	0.00	14.68
90		styrene	0.954	0.974	-2.1	113	0.00	14.69
91		bromoform	0.136	0.148	-8.8	119	0.00	15.01

Initial Calibration Verification

Job Number: JB39590 **Sample:** VV5841-ICV5841
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** V135322.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

92		cyclohexanone	0.009	0.009	0.0	111	0.00	15.27
93	S	4-bromofluorobenzene (s)	0.423	0.416	1.7	114	0.00	15.30
94	I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	112	0.00	16.61
95		isopropylbenzene	3.762	3.444	8.5	110	0.00	15.06
96		1,1,2,2-tetrachloroethane	0.499	0.498	0.2	118	0.00	15.42
97		trans-1,4-dichloro-2-bute	0.119	0.116	2.5	114	0.00	15.46
98		1,2,3-trichloropropane	0.115	0.113	1.7	116	0.00	15.51
99		bromobenzene	0.747	0.702	6.0	113	0.00	15.53
100		n-propylbenzene	4.423	4.098	7.3	112	0.00	15.52
101		2-chlorotoluene	0.837	0.781	6.7	112	0.00	15.70
102		4-chlorotoluene	2.436	2.222	8.8	112	0.00	15.80
103		1,3,5-trimethylbenzene	2.999	2.763	7.9	110	0.00	15.68
104		tert-butylbenzene	2.767	2.543	8.1	112	0.00	16.08
105		pentachloroethane	0.499	0.476	4.6	112	0.00	16.19
106		1,2,4-trimethylbenzene	2.865	2.698	5.8	110	0.00	16.13
107		sec-butylbenzene	4.204	3.915	6.9	110	0.00	16.32
108		p-isopropyltoluene	3.273	3.074	6.1	110	0.00	16.45
109		1,3-dichlorobenzene	1.520	1.409	7.3	112	0.00	16.55
110		1,4-dichlorobenzene	1.503	1.392	7.4	113	0.00	16.64
111		1,2-dichlorobenzene	1.302	1.251	3.9	113	0.00	17.08
112		Benzyl Chloride	0.827	0.821	0.7	114	0.00	16.77
113		n-butylbenzene	1.673	1.597	4.5	109	0.00	16.91
114		hexachloroethane	0.567	0.549	3.2	113	0.00	17.36
115		1,2-dibromo-3-chloropropa	0.079	0.089	-12.7	120	0.00	17.95
116		1,3,5-trichlorobenzene	1.124	1.065	5.2	107	0.00	18.13
117		1,2,4-trichlorobenzene	0.736	0.779	-5.8	111	0.00	18.86
118		hexachlorobutadiene	0.675	0.646	4.3	111	0.00	18.97
119		naphthalene	1.044	1.206	-15.5	118	0.00	19.19
120		1,2,3-trichlorobenzene	0.593	0.658	-11.0	112	0.00	19.49

(#) = Out of Range SPCC's out = 0 CCC's out = 0
v135317.D MVS5841.M Thu Jun 06 11:21:49 2013 MSV

6.8.2

6

Continuing Calibration Summary

Job Number: JB39590 **Sample:** VV5856-CC5841
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** V135691.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\data\V\vv5856\v135691.D Vial: 2
Acq On : 17 Jun 2013 2:22 pm Operator: danat
Sample : cc5841-20 Inst : MSV
Misc : MS49948,VV5856,5.0,,,,1 Multiplr: 1.00
MS Integration Params: rteint1.p

Method : C:\MSDCHEM\1\METHODS\MVS5841.M (RTE Integrator)
Title : SW846 8260B, ZB624 60m x 0.25mm x 1.4um
Last Update : Wed Jun 05 09:28:55 2013
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	106	-0.01	7.43
2		tertiary butyl alcohol	1.192	1.064	10.7	95	0.00	7.56
3		1,4-dioxane	0.093	0.089	4.3	103	0.01	11.36
4	I	pentafluorobenzene	1.000	1.000	0.0	101	0.00	9.65
5		chlorodifluoromethane	0.546	0.416	23.8#	82	-0.01	4.18
6		dichlorodifluoromethane	0.637	0.601	5.7	95	0.00	4.17
7		chloromethane	0.820	0.622	24.1#	84	0.00	4.51
8		vinyl chloride	0.814	0.688	15.5	89	-0.01	4.75
9		bromomethane	0.353	0.339	4.0	99	-0.02	5.39
10		chloroethane	0.334	0.283	15.3	89	-0.01	5.55
11		trichlorofluoromethane	0.722	0.708	1.9	100	0.00	5.96
12		ethyl ether	0.162	0.136	16.0	89	0.00	6.36
13		2-chloropropane	0.833	0.619	25.7#	77	0.00	6.57
14		acrolein	0.036	0.032	11.1	94	0.00	6.64
15		freon 113	0.281	0.297	-5.7	111	-0.02	6.72
16		1,1-dichloroethene	0.399	0.379	5.0	96	-0.01	6.78
17		acetone	0.054	0.053	1.9	95	-0.01	6.86
18		iso-butyl alcohol	0.012	0.010	16.7	93	0.00	10.22
19		allyl chloride	0.253	0.228	9.9	89	0.00	7.31
20		acetonitrile	0.091	0.069	24.2#	77	0.00	7.30
21		iodomethane	0.631	0.656	-4.0	103	-0.01	7.08
22		carbon disulfide	1.471	1.345	8.6	93	-0.01	7.20
23		methylene chloride	0.363	0.354	2.5	100	-0.01	7.49
24		1-chloropropane	0.794	0.578	27.2#	76	0.00	7.53
25		methyl acetate	0.138	0.107	22.5#	69	0.00	7.29
26		methyl tert butyl ether	0.747	0.648	13.3	88	-0.01	7.79
27		trans-1,2-dichloroethene	0.419	0.411	1.9	100	0.00	7.86
28		di-isopropyl ether	1.242	0.956	23.0#	81	0.00	8.37
29		2-butanone	0.021	0.019	9.5	97	0.00	9.14
30		1,1-dichloroethane	0.761	0.645	15.2	86	0.00	8.42
31		chloroprene	0.634	0.541	14.7	91	-0.01	8.52
32		acrylonitrile	0.061	0.049	19.7	79	0.00	7.83
33		vinyl acetate	0.035	0.032	8.6	93	0.00	8.39
34		ethyl tert-butyl ether	1.027	0.890	13.3	89	0.00	8.83
35		ethyl acetate	0.026	0.019	26.9#	67	0.00	9.14
36		2,2-dichloropropane	0.618	0.598	3.2	98	-0.01	9.15
37		cis-1,2-dichloroethene	0.412	0.394	4.4	98	0.00	9.16
38		propionitrile	0.022	0.018	18.2	79	0.00	9.25
		----------	True	Calc.	% Drift	----------		
39		methyl acrylate	20.000	20.204	-1.0	89	0.00	9.21

Continuing Calibration Summary

Job Number: JB39590 **Sample:** VV5856-CC5841
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** V135691.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

			AvgRF	CCRF	% Dev			
40		methacrylonitrile	0.071	0.065	8.5	91	0.00	9.42
41		bromochloromethane	0.141	0.137	2.8	96	0.00	9.48
42		tetrahydrofuran	0.065	0.047	27.7#	75	0.00	9.53
43		chloroform	0.663	0.618	6.8	97	0.00	9.52
44		tert-Butyl Formate	0.204	0.178	12.7	95	0.00	9.55
45	S	dibromofluoromethane (s)	0.320	0.326	-1.9	109	0.00	9.73
46	S	1,2-dichloroethane-d4 (s)	0.295	0.254	13.9	92	-0.01	10.16
47		1,1,1-trichloroethane	0.616	0.594	3.6	97	-0.01	9.77
48		Cyclohexane	0.684	0.609	11.0	88	-0.02	9.84
49	I	1,4-difluorobenzene	1.000	1.000	0.0	100	0.00	10.60
50		methylcyclohexane	0.529	0.490	7.4	95	0.00	11.17
51		epichlorohydrin	0.011	0.009	18.2	81	0.00	11.93
52		n-butyl alcohol	0.004	0.003	25.0#	82	0.00	10.73
53		carbon tetrachloride	0.395	0.381	3.5	96	0.00	9.98
54		1,1-dichloropropene	0.438	0.397	9.4	90	0.00	9.95
55		hexane	0.437	0.349	20.1#	88	-0.01	8.12
56		2,2,4-Trimethylpentane	1.267	1.055	16.7	89	0.00	10.19
57		benzene	1.198	1.064	11.2	93	0.00	10.23
58		tert-amyl methyl ether	0.642	0.569	11.4	94	0.00	10.23
59		heptane	0.259	0.222	14.3	90	-0.01	10.36
60		isopropyl acetate	0.037	0.033	10.8	90	-0.01	10.24
61		1,2-dichloroethane	0.252	0.212	15.9	86	-0.01	10.25
62		trichloroethene	0.292	0.276	5.5	95	0.00	10.95

			True	Calc.	% Drift			
63		2-chloroethyl vinyl ether	100.000	78.477	21.5#	59	0.00	11.78

			AvgRF	CCRF	% Dev			
64		methyl methacrylate	0.035	0.029	17.1	84	0.00	11.22
65		1,2-dichloropropane	0.275	0.226	17.8	83	0.00	11.23
66		dibromomethane	0.106	0.095	10.4	92	0.00	11.41
67		bromodichloromethane	0.305	0.270	11.5	90	0.00	11.54
68		2-nitropropane	0.039	0.027	30.8#	69	0.00	11.77
69		cis-1,3-dichloropropene	0.387	0.342	11.6	91	0.00	12.02
70	S	toluene-d8 (s)	1.062	1.081	-1.8	110	0.00	12.32
71		4-methyl-2-pentanone	0.052	0.042	19.2	77	0.00	12.12
72		toluene	0.740	0.694	6.2	96	0.00	12.40
73		isoamyl alcohol	0.006	0.005	16.7	79	0.00	12.14
74		trans-1,3-dichloropropene	0.298	0.260	12.8	89	0.00	12.63
75		ethyl methacrylate	0.198	0.164	17.2	80	0.00	12.60
76		1,1,2-trichloroethane	0.132	0.120	9.1	93	-0.01	12.86
77		2-hexanone	0.042	0.043	-2.4	113	0.00	13.05
78	I	chlorobenzene-d5	1.000	1.000	0.0	108	0.00	14.00
79		tetrachloroethene	0.412	0.398	3.4	105	0.00	13.04
80		1,3-dichloropropane	0.350	0.285	18.6	88	0.00	13.07
81		butyl acetate	0.051	0.041	19.6	97	0.00	13.12
82		3,3-Dimethyl-1-Butanol	0.013	0.009	30.8#	80	0.00	13.23
83		dibromochloromethane	0.244	0.213	12.7	98	0.00	13.36
84		1,2-dibromoethane	0.176	0.156	11.4	96	0.00	13.53
85		chlorobenzene	0.930	0.813	12.6	95	0.00	14.03
86		1,1,1,2-tetrachloroethane	0.309	0.278	10.0	96	0.00	14.10
87		ethylbenzene	1.781	1.548	13.1	95	0.00	14.08
88		m,p-xylene	0.675	0.603	10.7	97	0.00	14.20
89		o-xylene	0.629	0.553	12.1	95	0.00	14.67
90		styrene	0.954	0.837	12.3	93	0.00	14.69
91		bromoform	0.136	0.125	8.1	97	0.00	15.01

Continuing Calibration Summary

Job Number: JB39590 **Sample:** VV5856-CC5841
Account: AQTPAW Aquaterra Technologies, Inc. **Lab FileID:** V135691.D
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

92		cyclohexanone	0.009	0.027	-200.0#	316#	0.00	15.28
93	S	4-bromofluorobenzene (s)	0.423	0.414	2.1	114	0.00	15.30
94	I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	108	0.00	16.61
95		isopropylbenzene	3.762	3.213	14.6	93	0.00	15.06
96		1,1,2,2-tetrachloroethane	0.499	0.401	19.6	90	0.00	15.42
97		trans-1,4-dichloro-2-bute	0.119	0.081	31.9#	77	0.00	15.46
98		1,2,3-trichloropropane	0.115	0.105	8.7	96	0.00	15.51
99		bromobenzene	0.747	0.659	11.8	98	0.00	15.52
100		n-propylbenzene	4.423	3.735	15.6	91	0.00	15.52
101		2-chlorotoluene	0.837	0.743	11.2	97	0.00	15.69
102		4-chlorotoluene	2.436	2.071	15.0	94	0.00	15.80
103		1,3,5-trimethylbenzene	2.999	2.557	14.7	92	0.00	15.68
104		tert-butylbenzene	2.767	2.309	16.6	90	0.00	16.08
105		pentachloroethane	0.499	0.417	16.4	92	0.00	16.19
106		1,2,4-trimethylbenzene	2.865	2.490	13.1	94	0.00	16.13
107		sec-butylbenzene	4.204	3.536	15.9	90	0.00	16.32
108		p-isopropyltoluene	3.273	2.724	16.8	88	0.00	16.45
109		1,3-dichlorobenzene	1.520	1.360	10.5	99	0.00	16.55
110		1,4-dichlorobenzene	1.503	1.309	12.9	95	0.00	16.64
111		1,2-dichlorobenzene	1.302	1.168	10.3	98	0.00	17.08
112		Benzyl Chloride	0.827	0.766	7.4	103	0.00	16.77
113		n-butylbenzene	1.673	1.380	17.5	85	0.00	16.91
114		hexachloroethane	0.567	0.495	12.7	91	0.00	17.36
115		1,2-dibromo-3-chloropropa	0.079	0.069	12.7	98	0.00	17.94
116		1,3,5-trichlorobenzene	1.124	1.002	10.9	92	0.00	18.13
117		1,2,4-trichlorobenzene	0.736	0.636	13.6	88	0.00	18.86
118		hexachlorobutadiene	0.675	0.573	15.1	87	0.00	18.97
119		naphthalene	1.044	0.838	19.7	84	0.00	19.19
120		1,2,3-trichlorobenzene	0.593	0.511	13.8	85	0.00	19.48

(#) = Out of Range SPCC's out = 0 CCC's out = 0
v135316.D MVS5841.M Tue Jun 18 09:29:19 2013 NJVOA08

6.8.3

6

New Jersey

ACCUTEST LABORATORIES

GC/MS Volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\V\vv5856\
Data File : v135697.D
Acq On : 17 Jun 2013 5:50 pm
Operator : danat
Sample : jb39590-1
Misc : MS50046,VV5856,7,,,,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jun 18 09:39:26 2013
Quant Method : C:\MSDCHEM\1\METHODS\MVS5841.M
Quant Title : SW846 8260B, ZB624 60m x 0.25mm x 1.4um
QLast Update : Wed Jun 05 09:28:55 2013
Response via : Initial Calibration

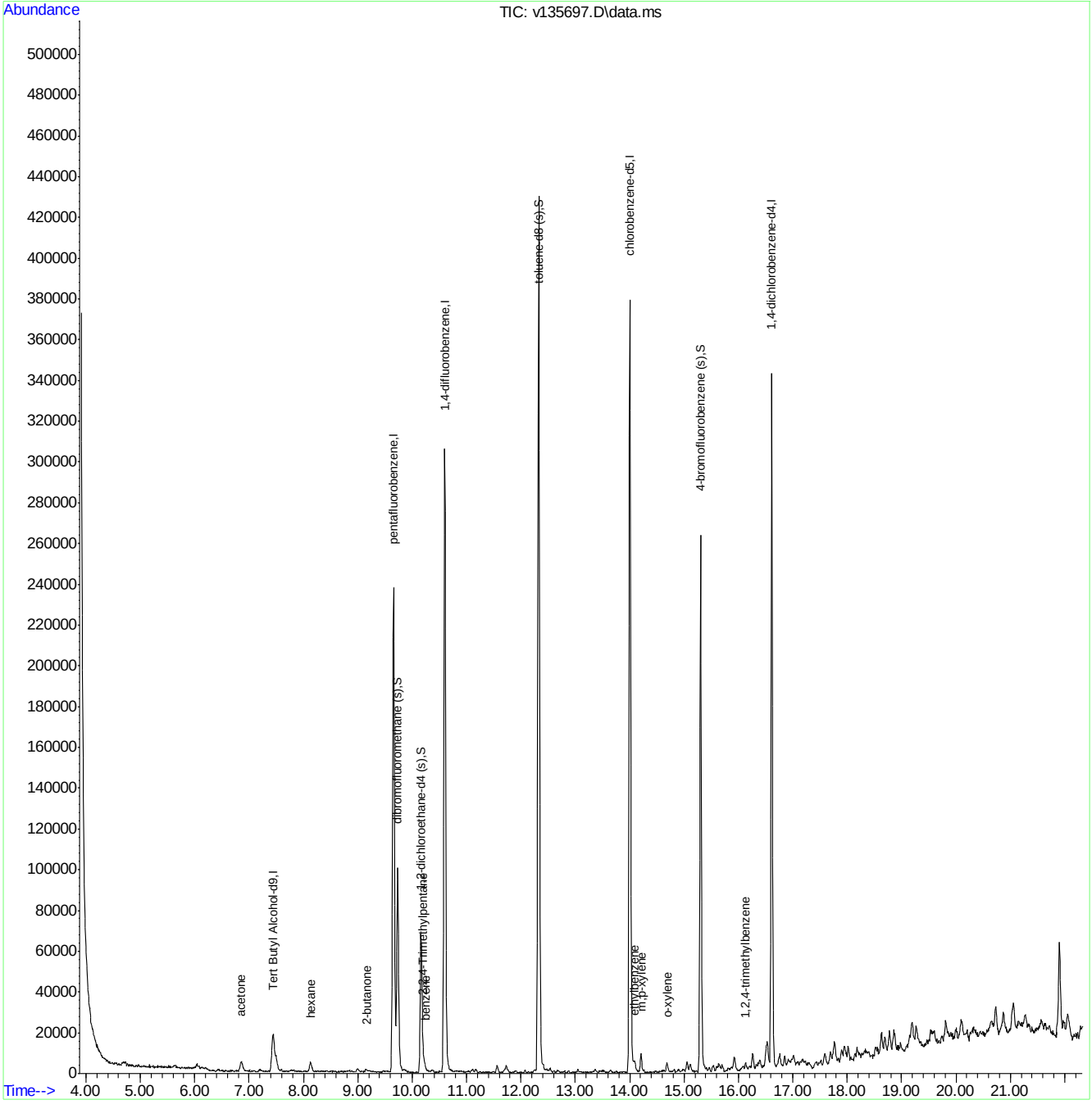
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	7.447	65	37562	500.00	ug/L	0.00
4) pentafluorobenzene	9.654	168	229806	50.00	ug/L	0.00
49) 1,4-difluorobenzene	10.600	114	321755	50.00	ug/L	0.00
78) chlorobenzene-d5	14.005	117	267962	50.00	ug/L	0.00
94) 1,4-dichlorobenzene-d4	16.610	152	109154	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.732	113	75899	51.54	ug/L	0.00
Spiked Amount 50.000	Range 65 - 131		Recovery = 103.08%			
46) 1,2-dichloroethane-d4 (s)	10.166	65	58442	43.14	ug/L	0.00
Spiked Amount 50.000	Range 70 - 121		Recovery = 86.28%			
70) toluene-d8 (s)	12.326	98	352086	51.54	ug/L	0.00
Spiked Amount 50.000	Range 80 - 128		Recovery = 103.08%			
93) 4-bromofluorobenzene (s)	15.302	95	104503	46.08	ug/L	0.00
Spiked Amount 50.000	Range 67 - 131		Recovery = 92.16%			
Target Compounds						Qvalue
17) acetone	6.856	43	10000	40.63	ug/L	97
29) 2-butanone	9.162	72	401	4.19	ug/L #	1
55) hexane	8.142	57	3566	1.27	ug/L	83
56) 2,2,4-Trimethylpentane	10.198	57	7059	0.87	ug/L	95
57) benzene	10.239	78	1660	0.22	ug/L	77
87) ethylbenzene	14.089	91	3187	0.33	ug/L	96
88) m,p-xylene	14.214	106	3142	0.87	ug/L	95
89) o-xylene	14.685	106	1697	0.50	ug/L	88
106) 1,2,4-trimethylbenzene	16.134	105	2231	0.36	ug/L	89

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

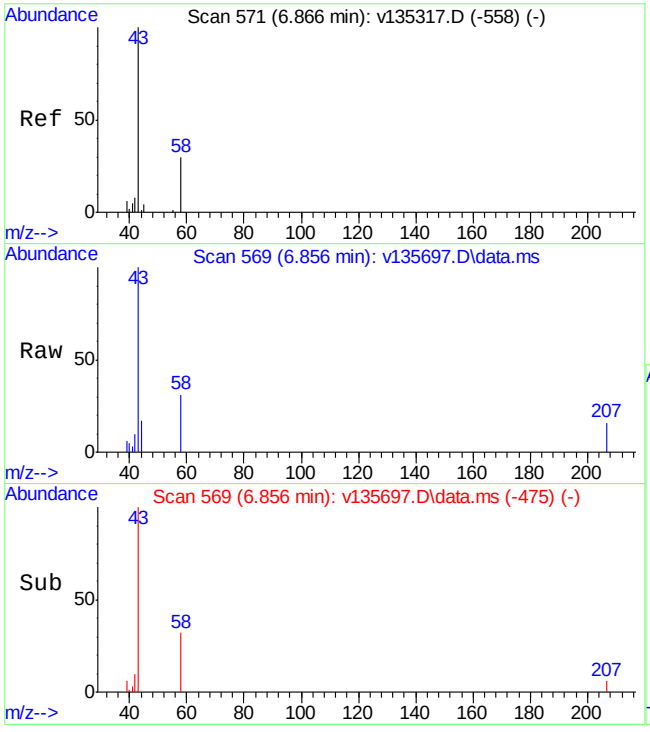
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\V\vv5856\
Data File : v135697.D
Acq On : 17 Jun 2013 5:50 pm
Operator : danat
Sample : jb39590-1
Misc : MS50046,VV5856,7,,,,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jun 18 09:39:26 2013
Quant Method : C:\MSDCHEM\1\METHODS\MVS5841.M
Quant Title : SW846 8260B, ZB624 60m x 0.25mm x 1.4um
QLast Update : Wed Jun 05 09:28:55 2013
Response via : Initial Calibration



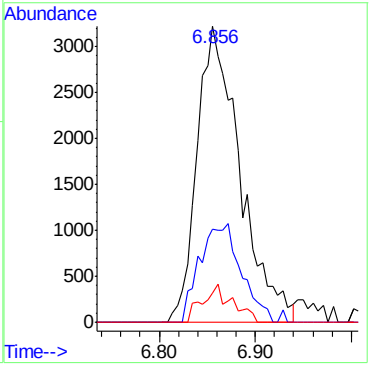
MVS5841.M Tue Jun 18 09:39:33 2013 NJVOA08 Page: 2

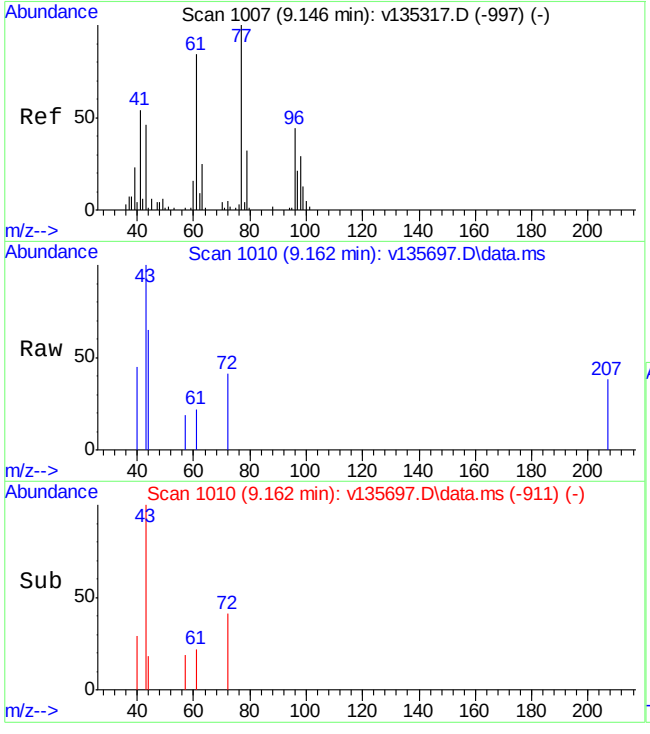


#17
acetone
Concen: 40.63 ug/L
RT: 6.856 min Scan# 569
Delta R.T. -0.011 min
Lab File: v135697.D
Acq: 17 Jun 2013 5:50 pm

Tgt Ion: 43 Resp: 10000

Ion	Ratio	Lower	Upper
43	100		
58	31.3	20.9	38.7
42	9.9	5.7	10.7

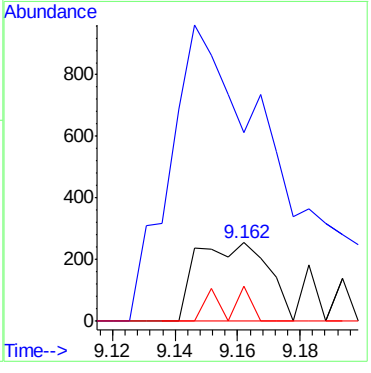


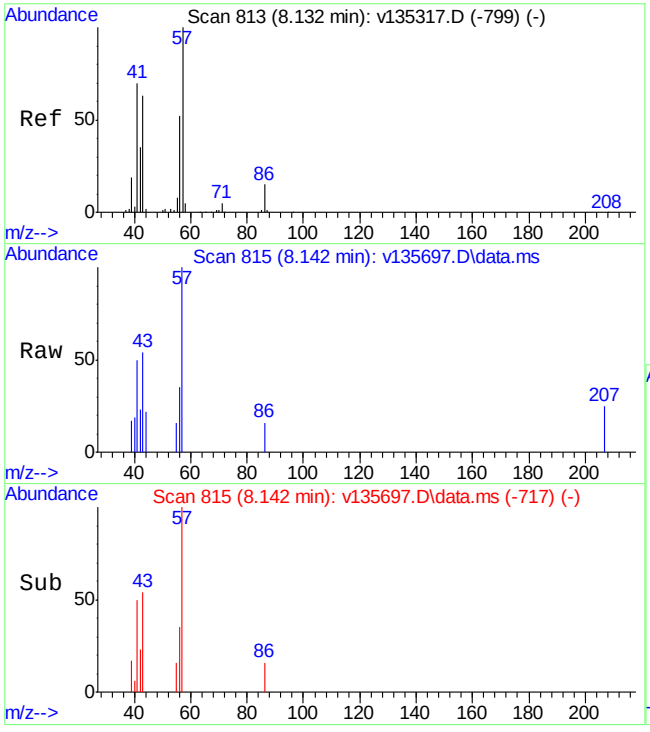


#29
2-butanone
Concen: 4.19 ug/L
RT: 9.162 min Scan# 1010
Delta R.T. 0.016 min
Lab File: v135697.D
Acq: 17 Jun 2013 5:50 pm

Tgt Ion: 72 Resp: 401

Ion	Ratio	Lower	Upper
72	100		
43	586.0	787.6	1462.8#
57	0.0	18.7	34.7#

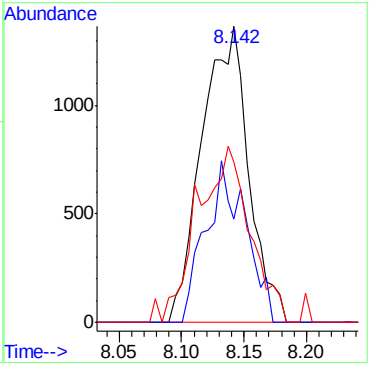


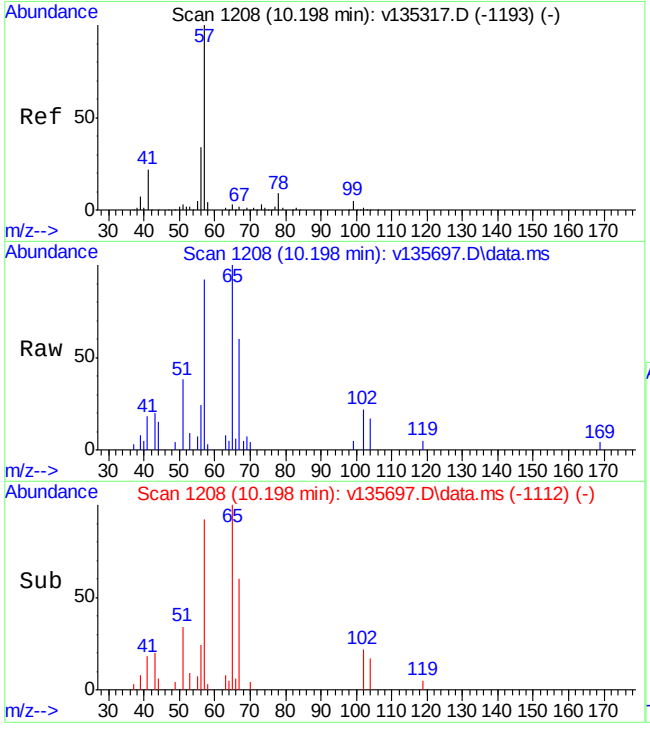


#55
hexane
Concen: 1.27 ug/L
RT: 8.142 min Scan# 815
Delta R.T. 0.010 min
Lab File: v135697.D
Acq: 17 Jun 2013 5:50 pm

Tgt Ion: 57 Resp: 3566

Ion	Ratio	Lower	Upper
57	100		
56	34.8	21.7	81.7
43	54.0	33.0	93.0

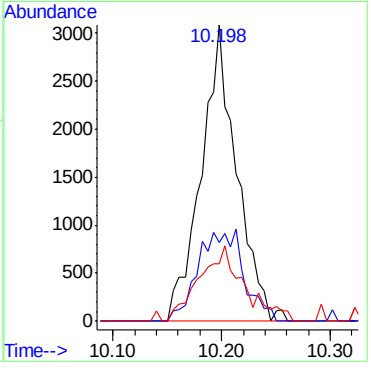




#56
2,2,4-Trimethylpentane
Concen: 0.87 ug/L
RT: 10.198 min Scan# 1208
Delta R.T. -0.000 min
Lab File: v135697.D
Acq: 17 Jun 2013 5:50 pm

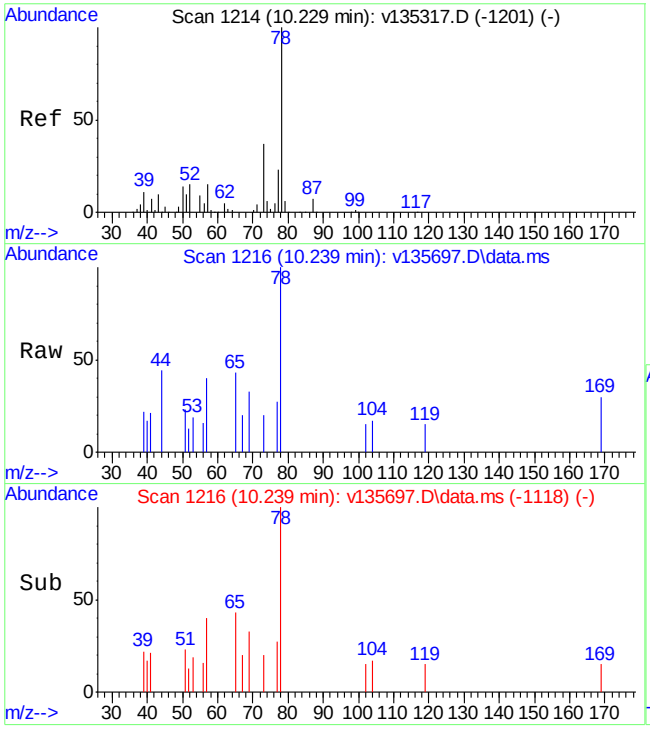
Tgt Ion: 57 Resp: 7059

Ion	Ratio	Lower	Upper
57	100		
56	39.3	24.2	45.0
41	31.5	21.3	39.6



7.1.1

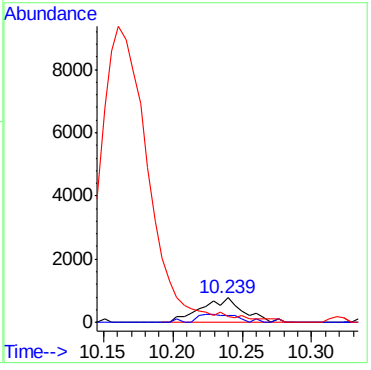
7

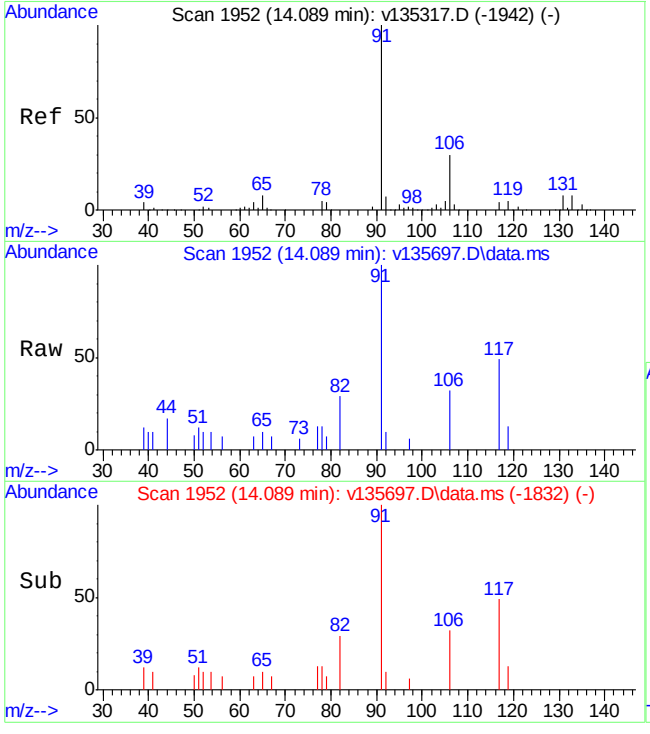


#57
benzene
Concen: 0.22 ug/L
RT: 10.239 min Scan# 1216
Delta R.T. 0.010 min
Lab File: v135697.D
Acq: 17 Jun 2013 5:50 pm

Tgt Ion: 78 Resp: 1660

Ion	Ratio	Lower	Upper
78	100		
77	26.7	0.0	53.2
51	36.1	0.0	47.0

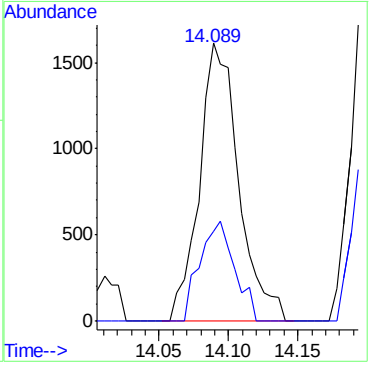


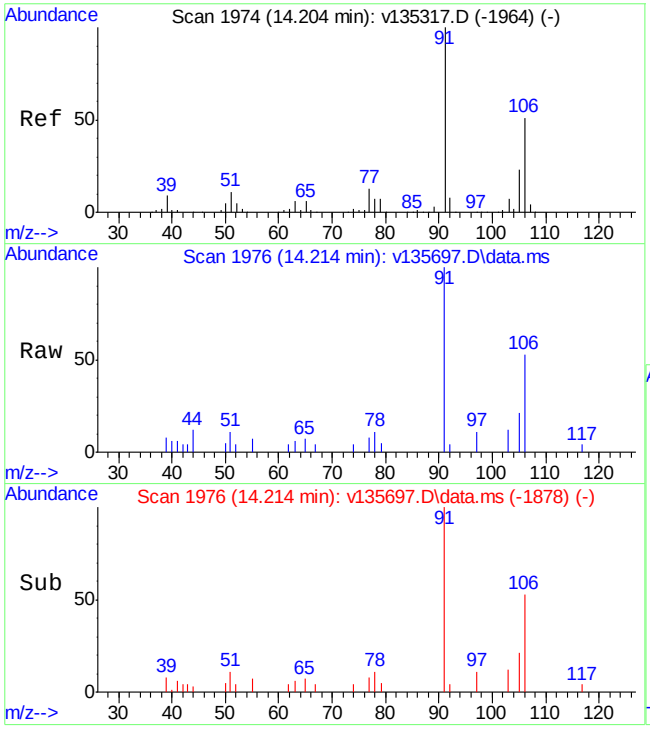


#87
ethylbenzene
Concen: 0.33 ug/L
RT: 14.089 min Scan# 1952
Delta R.T. -0.000 min
Lab File: v135697.D
Acq: 17 Jun 2013 5:50 pm

Tgt Ion: 91 Resp: 3187

Ion	Ratio	Lower	Upper
91	100		
106	32.5	0.2	60.2

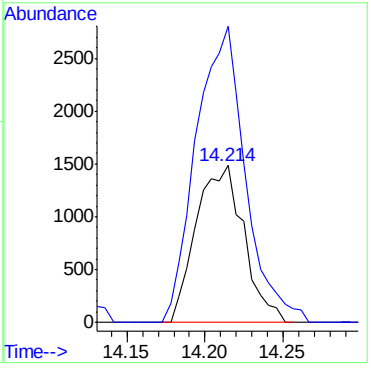


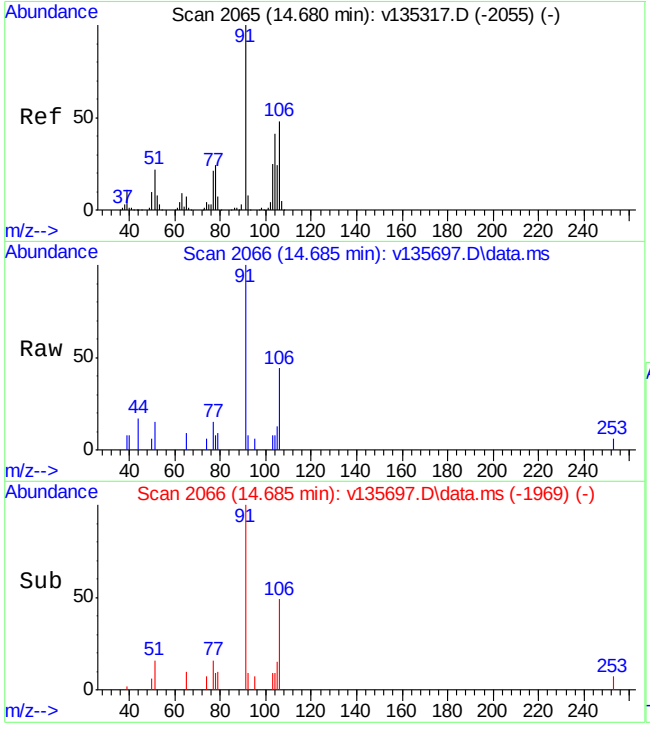


#88
m,p-xylene
Concen: 0.87 ug/L
RT: 14.214 min Scan# 1976
Delta R.T. 0.010 min
Lab File: v135697.D
Acq: 17 Jun 2013 5:50 pm

Tgt Ion:106 Resp: 3142

Ion	Ratio	Lower	Upper
106	100		
91	188.9	137.3	255.1

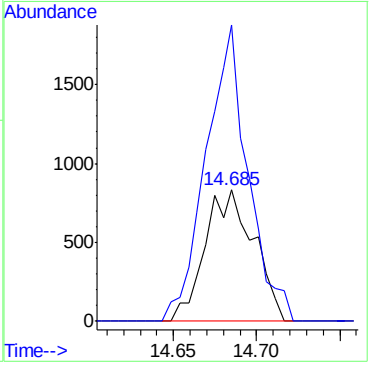


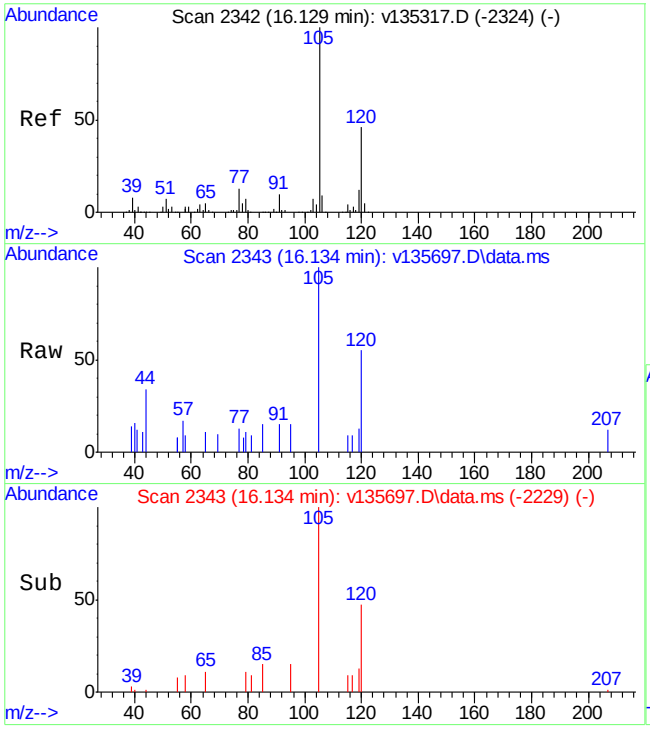


#89
o-xylene
Concen: 0.50 ug/L
RT: 14.685 min Scan# 2066
Delta R.T. 0.005 min
Lab File: v135697.D
Acq: 17 Jun 2013 5:50 pm

Tgt Ion:106 Resp: 1697

Ion	Ratio	Lower	Upper
106	100		
91	225.8	145.5	270.3

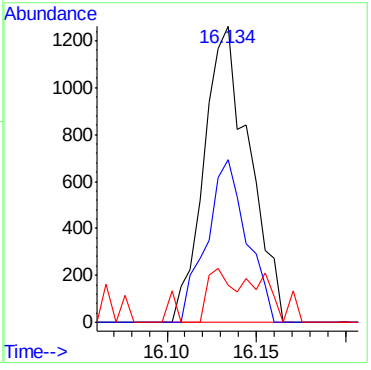




#106
1,2,4-trimethylbenzene
Concen: 0.36 ug/L
RT: 16.134 min Scan# 2343
Delta R.T. 0.005 min
Lab File: v135697.D
Acq: 17 Jun 2013 5:50 pm

Tgt Ion:105 Resp: 2231

Ion	Ratio	Lower	Upper
105	100		
120	54.9	16.1	76.1
77	12.5	0.0	42.8



Manual Integrations APPROVED (compounds with "m" flag)
Kanya Veerawat 06/18/13 16:23

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\V\vv5856\
Data File : v135701.D
Acq On : 17 Jun 2013 7:53 pm
Operator : danat
Sample : jb39590-2
Misc : MS50046,VV5856,7.2,,,,1
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Jun 18 09:43:10 2013
Quant Method : C:\MSDCHEM\1\METHODS\MVS5841.M
Quant Title : SW846 8260B, ZB624 60m x 0.25mm x 1.4um
QLast Update : Wed Jun 05 09:28:55 2013
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Tert Butyl Alcohol-d9	7.447	65	36650	500.00 ug/L	0.00
4) pentafluorobenzene	9.659	168	252343	50.00 ug/L	0.00
49) 1,4-difluorobenzene	10.600	114	355647	50.00 ug/L	0.00
78) chlorobenzene-d5	14.005	117	307265	50.00 ug/L	0.00
94) 1,4-dichlorobenzene-d4	16.610	152	142204	50.00 ug/L	0.00
System Monitoring Compounds					
45) dibromofluoromethane (s)	9.732	113	83341	51.54 ug/L	0.00
Spiked Amount 50.000	Range 65 - 131		Recovery = 103.08%		
46) 1,2-dichloroethane-d4 (s)	10.166	65	62035	41.70 ug/L	0.00
Spiked Amount 50.000	Range 70 - 121		Recovery = 83.40%		
70) toluene-d8 (s)	12.326	98	394716	52.27 ug/L	0.00
Spiked Amount 50.000	Range 80 - 128		Recovery = 104.54%		
93) 4-bromofluorobenzene (s)	15.302	95	125056	48.09 ug/L	0.00
Spiked Amount 50.000	Range 67 - 131		Recovery = 96.18%		
Target Compounds					Qvalue
2) tertiary butyl alcohol	7.556	59	2989	34.22 ug/L #	48
17) acetone	6.855	43	26794	99.15 ug/L	99
23) methylene chloride	7.499	84	22380	12.21 ug/L	98
26) methyl tert butyl ether	7.792	73	30153	8.00 ug/L	98
29) 2-butanone	9.141	72	1299m	12.35 ug/L	
55) hexane	8.137	57	13436	4.32 ug/L	99
56) 2,2,4-Trimethylpentane	10.192	57	11386	1.26 ug/L	96
57) benzene	10.234	78	4835	0.57 ug/L	97

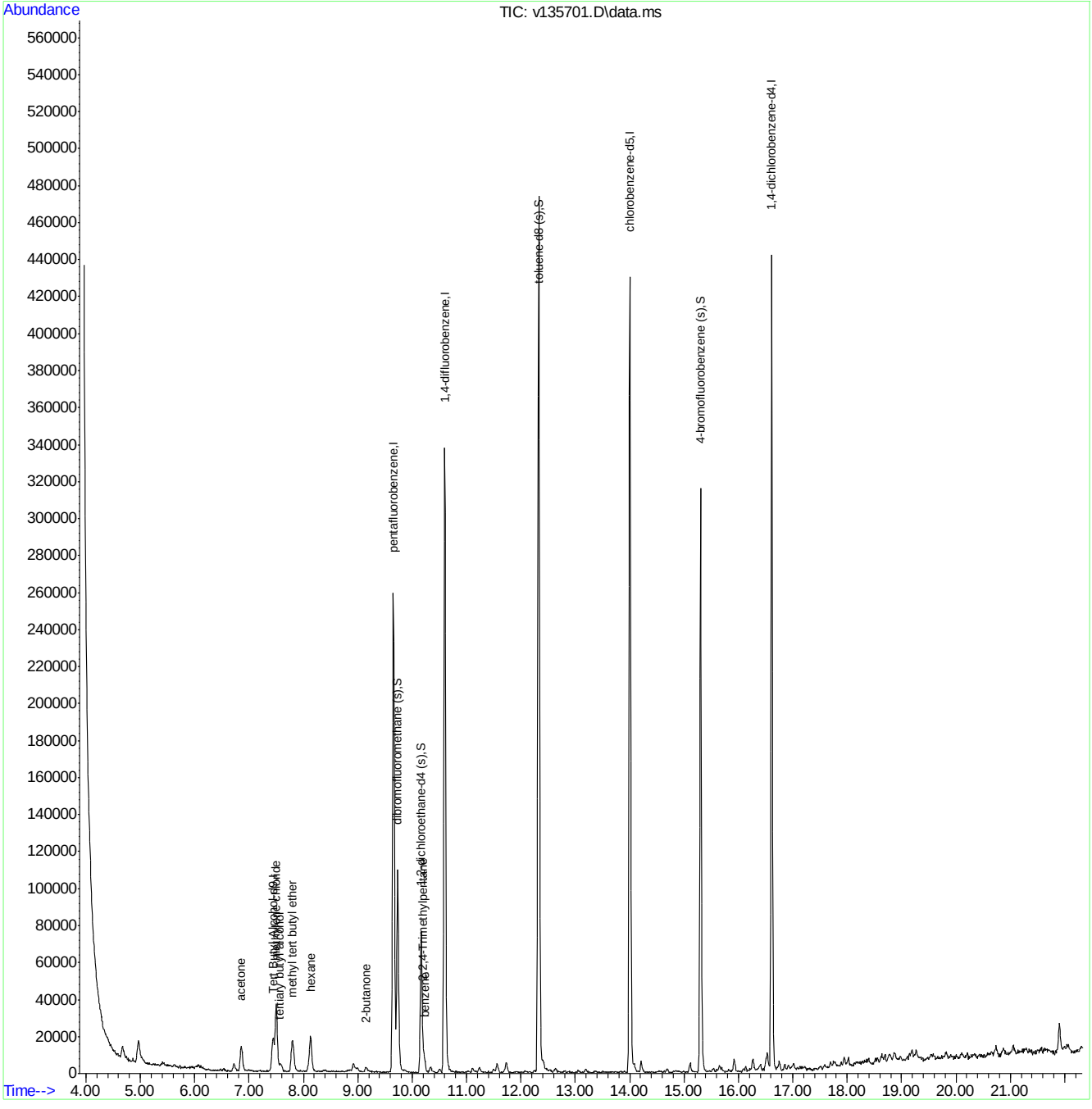
(#) = qualifier out of range (m) = manual integration (+) = signals summed

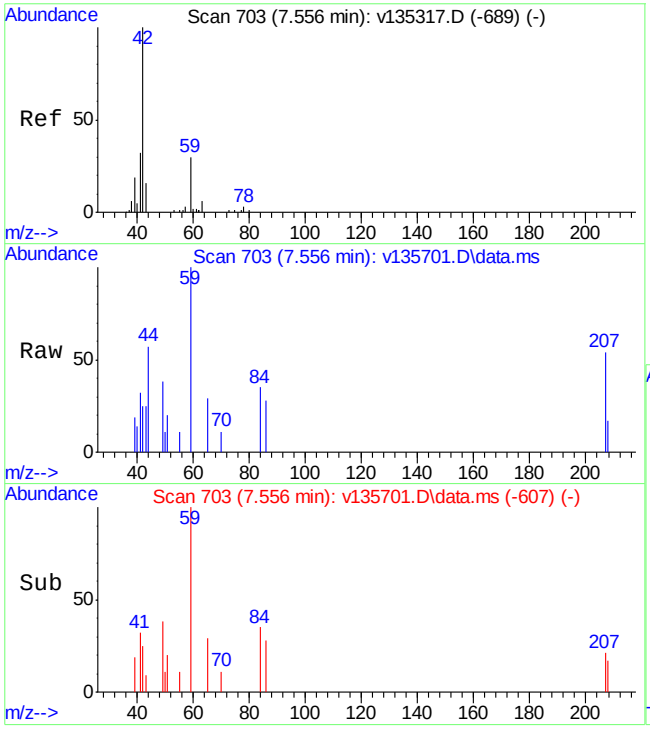
7.1.2
7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\V\vv5856\
Data File : v135701.D
Acq On : 17 Jun 2013 7:53 pm
Operator : danat
Sample : jb39590-2
Misc : MS50046,VV5856,7.2,,,,1
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Jun 18 09:43:10 2013
Quant Method : C:\MSDCHEM\1\METHODS\MVS5841.M
Quant Title : SW846 8260B, ZB624 60m x 0.25mm x 1.4um
QLast Update : Wed Jun 05 09:28:55 2013
Response via : Initial Calibration

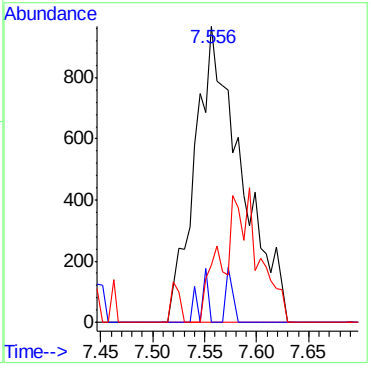


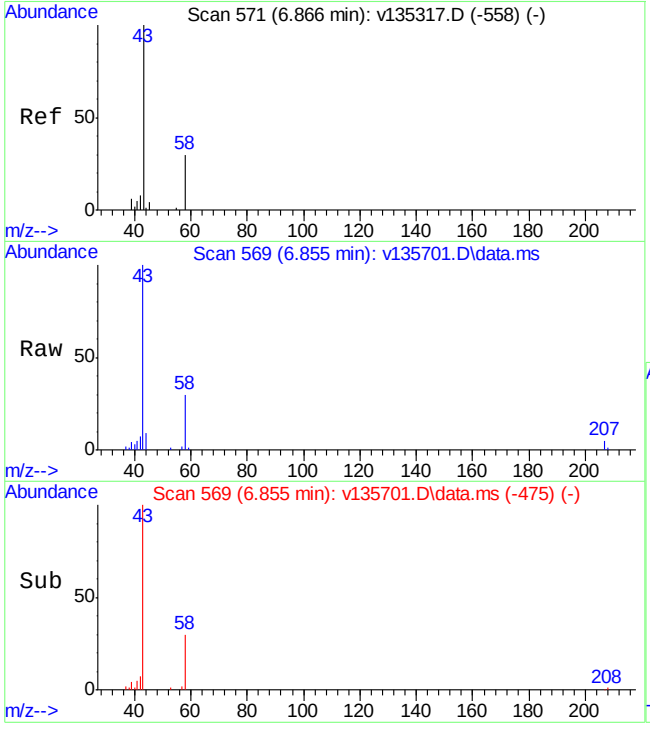


#2
tertiary butyl alcohol
Concen: 34.22 ug/L
RT: 7.556 min Scan# 703
Delta R.T. -0.000 min
Lab File: v135701.D
Acq: 17 Jun 2013 7:53 pm

Tgt Ion: 59 Resp: 2989

Ion	Ratio	Lower	Upper
59	100		
57	0.0	0.0	39.7
39	19.3	32.7	92.7#

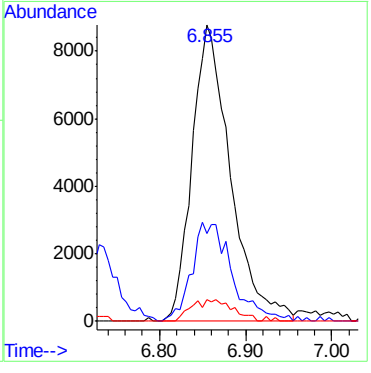


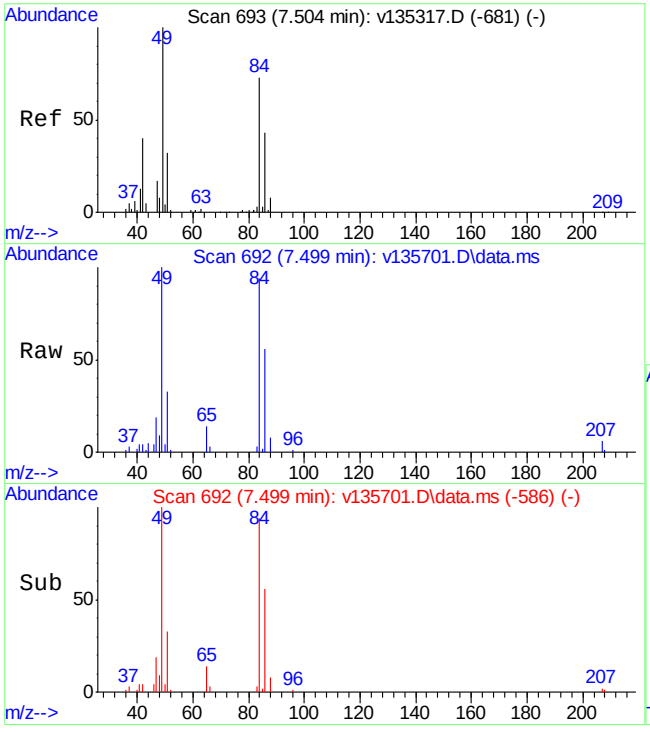


#17
acetone
Concen: 99.15 ug/L
RT: 6.855 min Scan# 569
Delta R.T. -0.011 min
Lab File: v135701.D
Acq: 17 Jun 2013 7:53 pm

Tgt Ion: 43 Resp: 26794

Ion	Ratio	Lower	Upper
43	100		
58	29.8	20.9	38.7
42	7.4	5.7	10.7

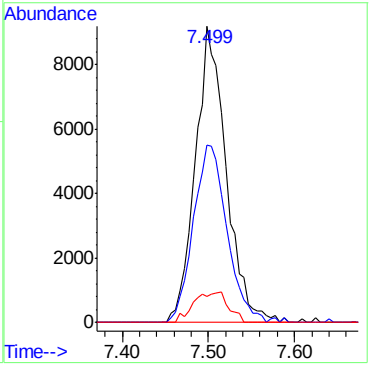


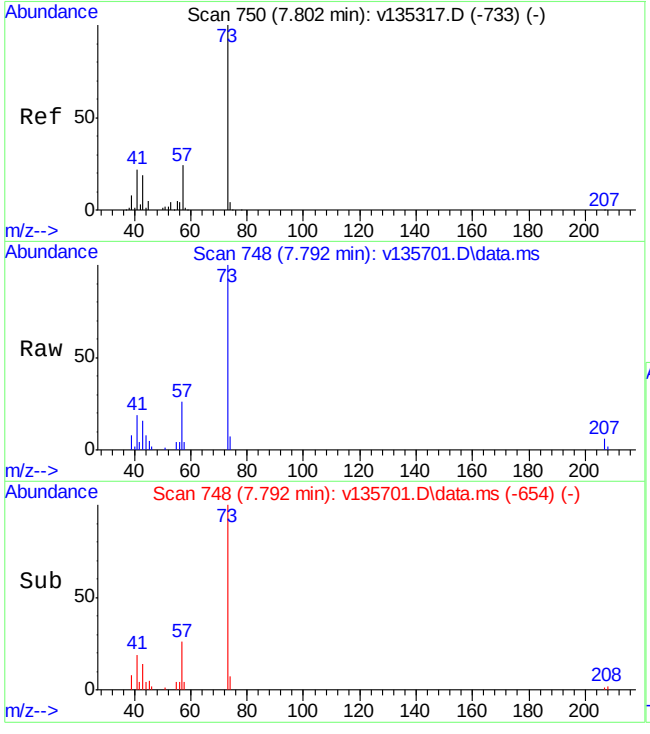


#23
methylene chloride
Concen: 12.21 ug/L
RT: 7.499 min Scan# 692
Delta R.T. -0.005 min
Lab File: v135701.D
Acq: 17 Jun 2013 7:53 pm

Tgt Ion: 84 Resp: 22380

Ion	Ratio	Lower	Upper
84	100		
86	60.0	41.2	76.4
88	8.6	7.5	13.9

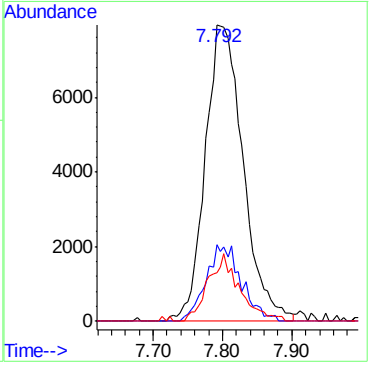


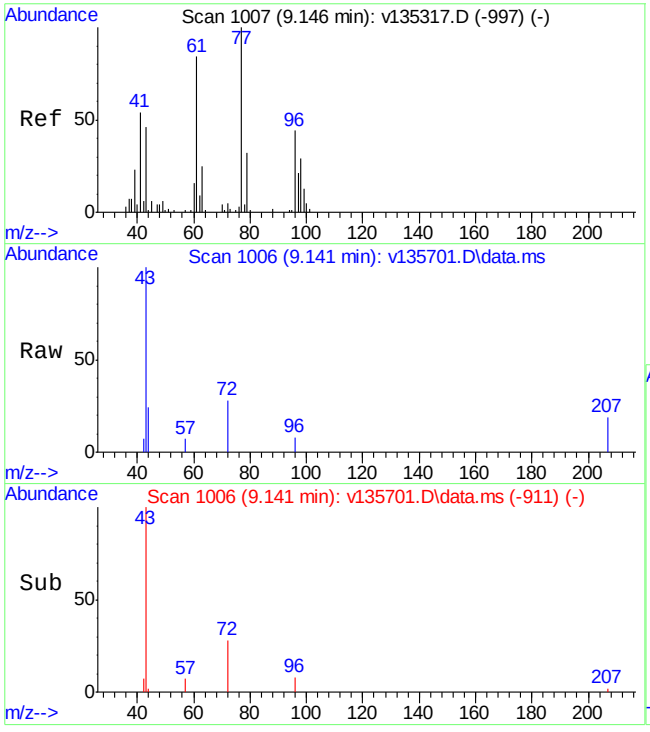


#26
methyl tert butyl ether
Concen: 8.00 ug/L
RT: 7.792 min Scan# 748
Delta R.T. -0.011 min
Lab File: v135701.D
Acq: 17 Jun 2013 7:53 pm

Tgt Ion: 73 Resp: 30153

Ion	Ratio	Lower	Upper
73	100		
57	23.9	0.0	53.6
43	18.8	0.0	50.2

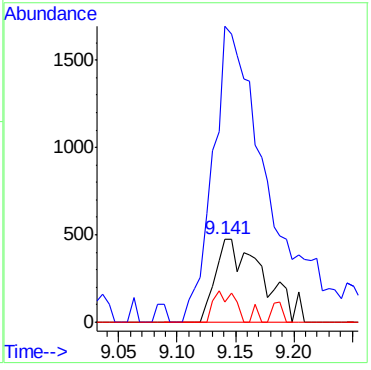


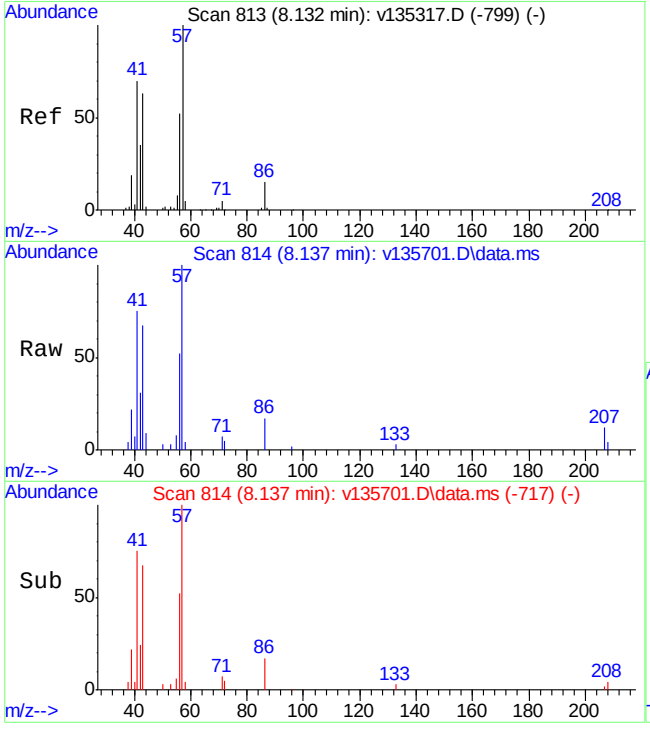


#29
2-butanone
Concen: 12.35 ug/L m
RT: 9.141 min Scan# 1006
Delta R.T. -0.005 min
Lab File: v135701.D
Acq: 17 Jun 2013 7:53 pm

Tgt Ion: 72 Resp: 1299

Ion	Ratio	Lower	Upper
72	100		
43	415.5	787.6	1462.8#
57	16.9	18.7	34.7#

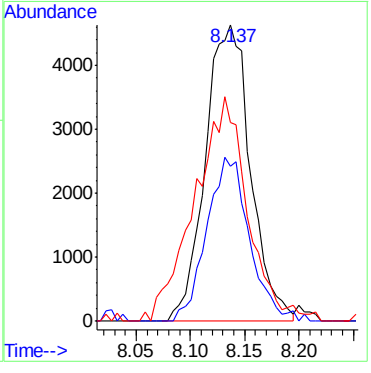




#55
hexane
Concen: 4.32 ug/L
RT: 8.137 min Scan# 814
Delta R.T. 0.005 min
Lab File: v135701.D
Acq: 17 Jun 2013 7:53 pm

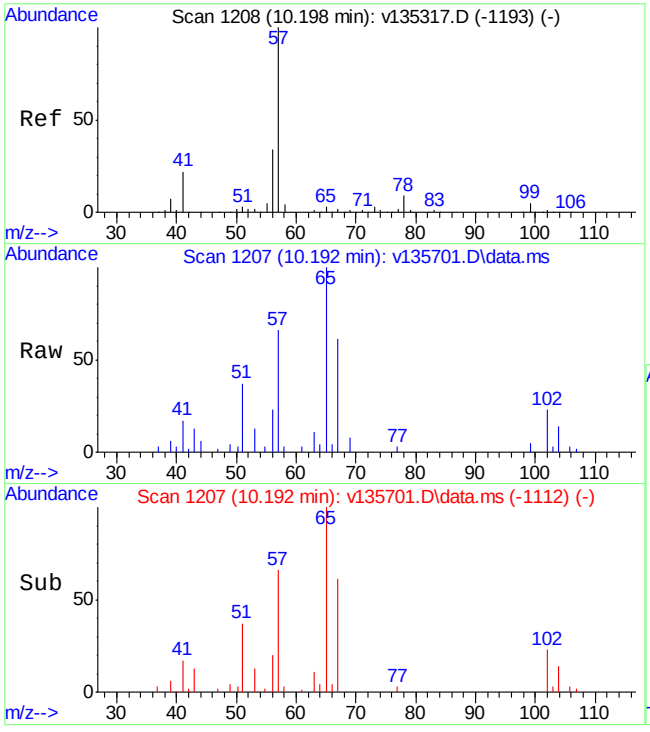
Tgt Ion: 57 Resp: 13436

Ion	Ratio	Lower	Upper
57	100		
56	52.3	21.7	81.7
43	61.7	33.0	93.0



7.1.2

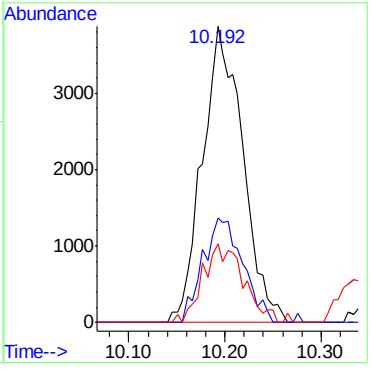
7

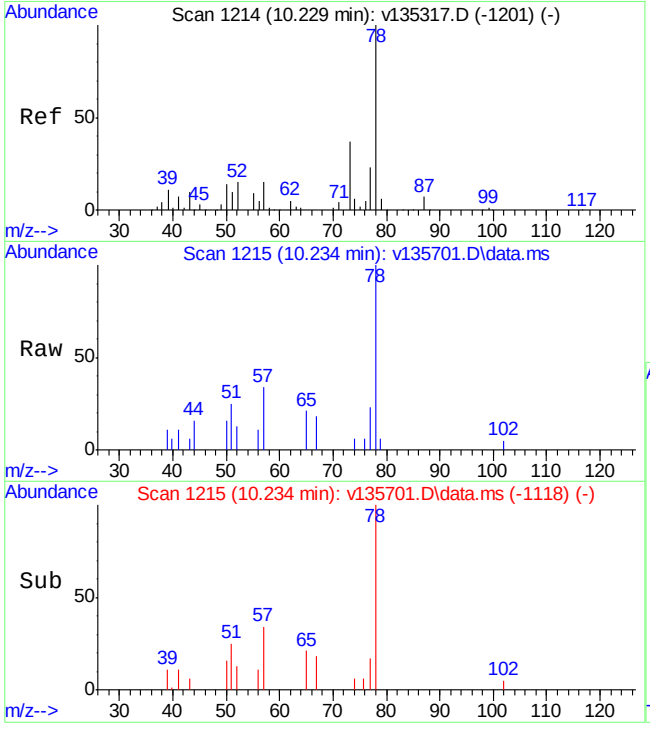


#56
2,2,4-Trimethylpentane
Concen: 1.26 ug/L
RT: 10.192 min Scan# 1207
Delta R.T. -0.005 min
Lab File: v135701.D
Acq: 17 Jun 2013 7:53 pm

Tgt Ion: 57 Resp: 11386

Ion	Ratio	Lower	Upper
57	100		
56	34.7	24.2	45.0
41	26.4	21.3	39.6

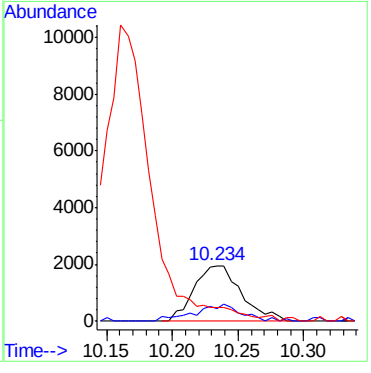




#57
benzene
Concen: 0.57 ug/L
RT: 10.234 min Scan# 1215
Delta R.T. 0.005 min
Lab File: v135701.D
Acq: 17 Jun 2013 7:53 pm

Tgt Ion: 78 Resp: 4835

Ion	Ratio	Lower	Upper
78	100		
77	22.6	0.0	53.2
51	19.4	0.0	47.0



7.1.2

7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\V\vv5856\
Data File : v135693.D
Acq On : 17 Jun 2013 3:35 pm
Operator : danat
Sample : mb
Misc : MS49948,VV5856,5.0,,,,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 18 09:30:18 2013
Quant Method : C:\MSDCHEM\1\METHODS\MVS5841.M
Quant Title : SW846 8260B, ZB624 60m x 0.25mm x 1.4um
QLast Update : Wed Jun 05 09:28:55 2013
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Tert Butyl Alcohol-d9	7.441	65	30285	500.00	ug/L	0.00
4) pentafluorobenzene	9.659	168	199429	50.00	ug/L	0.00
49) 1,4-difluorobenzene	10.600	114	277959	50.00	ug/L	0.00
78) chlorobenzene-d5	14.000	117	238735	50.00	ug/L	0.00
94) 1,4-dichlorobenzene-d4	16.610	152	108335	50.00	ug/L	0.00
System Monitoring Compounds						
45) dibromofluoromethane (s)	9.732	113	64844	50.74	ug/L	0.00
Spiked Amount 50.000	Range 65 - 131		Recovery = 101.48%			
46) 1,2-dichloroethane-d4 (s)	10.166	65	49425	42.04	ug/L	0.00
Spiked Amount 50.000	Range 70 - 121		Recovery = 84.08%			
70) toluene-d8 (s)	12.326	98	307511	52.10	ug/L	0.00
Spiked Amount 50.000	Range 80 - 128		Recovery = 104.20%			
93) 4-bromofluorobenzene (s)	15.302	95	97354	48.18	ug/L	0.00
Spiked Amount 50.000	Range 67 - 131		Recovery = 96.36%			

Target Compounds Qvalue

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

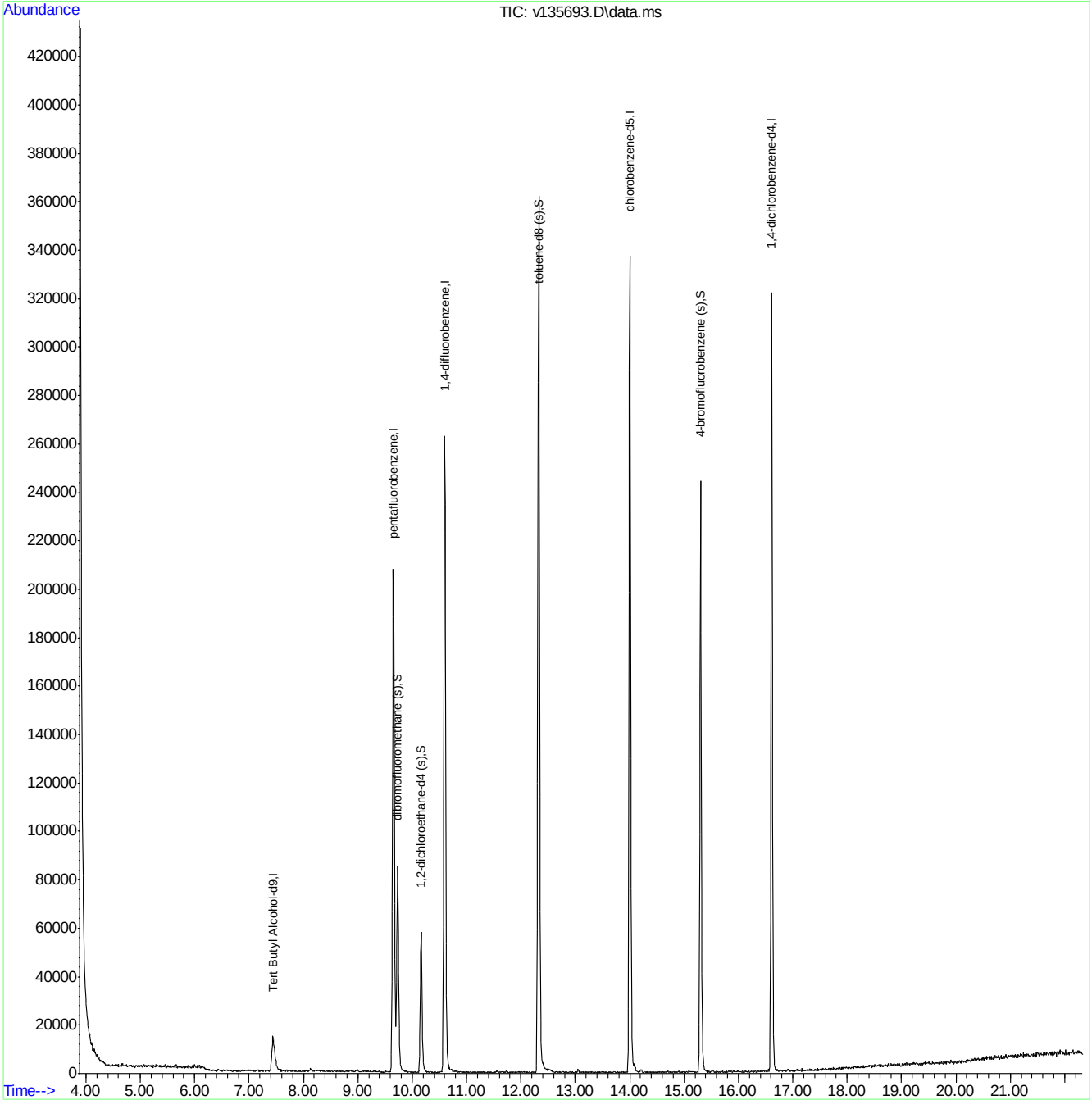
7.2.1

7

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\V\vv5856\
Data File : v135693.D
Acq On : 17 Jun 2013 3:35 pm
Operator : danat
Sample : mb
Misc : MS49948,VV5856,5.0,,,,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 18 09:30:18 2013
Quant Method : C:\MSDCHEM\1\METHODS\MVS5841.M
Quant Title : SW846 8260B, ZB624 60m x 0.25mm x 1.4um
QLast Update : Wed Jun 05 09:28:55 2013
Response via : Initial Calibration



New Jersey

ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

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

ACCUTEST LABORATORIES

CHAIN OF CUSTODY

PAGE ___ OF ___

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

FED-EX Tracking #:
Bottle Order Control #:
Accutest Quote #:
Accutest Job #: JB39590

Client / Reporting Information

Company Name: Accutest Laboratories
Street Address: 2235 Route 130
City / State / Zip: Dayton NJ 08810
Project Contact: Kristin Beebe
E-mail:
Phone #: 732-355-4559
Fax #:
Sampler(s) Name(s):
Phone:

Project Information

Project Name: Marcus Hook Refinery
Street:
City / State:
Project #:
Client Purchase Order #:
Project Manager:

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	%SOL	V8011EDB	B8270SL	PB	METDIG							LAB USE ONLY
1			6/13/2013	11:20		Soil	2					X				X	X	X	X	X							
2			6/13/2013	12:00		Soil	2					X				X	X	X	X	X							
																											13C

Turnaround Time (Business days)

Approved By (Accutest PM): / Date:

- [X] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY
- [ ] other

Emergency & Rush T/A data available VIA Lablink

Data Deliverable Information

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

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

Comments / Special Instructions

Please send 300ml jar and 60ml jar to ALNE only.

Methanol kits to remain here for analysis.

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	6-14-13 1700	1 FEDEX	2 FX	6-15-13 1100	2
3		3	4		4
5		5			

Custody Seal # 769 [ ] Intact [ ] Not Intact

Preserved where applicable [ ]

On Ice [X]

Cooler Temp. 1.6 C

8.1

8

JB39590: Chain of Custody
Page 1 of 2
Accutest Labs of New England, Inc.

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: JB39590 **Client:** ACNJ **Immediate Client Services Action Required:** No

Date / Time Received: 6/15/2013 **Delivery Method:** **Client Service Action Required at Login:** No

Project: MARCUS HOOK **No. Coolers:** 1 **Airbill #'s:**

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

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

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

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

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

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

Comments

Accutest Laboratories
V:508.481.6200

495 Technology Center West, Bldg One
F: 508.481.7753

Marlborough, MA
www/accutest.com

8.1

8

JB39590: Chain of Custody
Page 2 of 2

Internal Sample Tracking Chronicle

Accutest New Jersey

Job No: JB39590

AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA
Project No: AOI-5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
JB39590-1 Collected: 13-JUN-13 11:20 By: ED Received: 13-JUN-13 By: AOI5_MW-481_0-1_061313						
JB39590-1	SM21 2540 B MOD.	18-JUN-13	HS			%SOL
JB39590-1	SW846 6010C	18-JUN-13 19:33	EAL	18-JUN-13	DA	PB
JB39590-1	SW846 8011	19-JUN-13 18:15	AP	18-JUN-13	CC	V8011EDB
JB39590-1	SW846 8270C	28-JUN-13 03:46	KR	18-JUN-13	PA	B8270SL
JB39590-2 Collected: 13-JUN-13 12:00 By: ED Received: 13-JUN-13 By: AOI5_MW-481_5-6_061313						
JB39590-2	SM21 2540 B MOD.	18-JUN-13	HS			%SOL
JB39590-2	SW846 6010C	18-JUN-13 19:38	EAL	18-JUN-13	DA	PB
JB39590-2	SW846 8011	19-JUN-13 18:42	AP	18-JUN-13	CC	V8011EDB
JB39590-2	SW846 8270C	28-JUN-13 04:09	KR	18-JUN-13	PA	B8270SL

Accutest Internal Chain of Custody

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA
Received: 06/13/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
JB39590-1.1	Walk In Ref #9	Michael Rolo	06/18/13 10:37	Retrieve from Storage
JB39590-1.1	Michael Rolo	Walk In Ref #9	06/18/13 11:29	Return to Storage
JB39590-1.1	Walk In Ref #9	Chris Cataldo	06/18/13 18:38	Retrieve from Storage
JB39590-1.1	Chris Cataldo	Walk In Ref #9	06/18/13 18:38	Return to Storage
JB39590-1.2	Walk In Ref #9	Mehdi Abdolrahim	06/18/13 09:16	Retrieve from Storage
JB39590-1.2	Mehdi Abdolrahim	Walk In Ref #9	06/18/13 10:51	Return to Storage
JB39590-1.2	Walk In Ref #9	Dorina Antonovici	06/18/13 11:59	Retrieve from Storage
JB39590-1.2	Dorina Antonovici	Walk In Ref #9	06/18/13 13:18	Return to Storage
JB39590-2.1	Walk In Ref #9	Michael Rolo	06/18/13 10:37	Retrieve from Storage
JB39590-2.1	Michael Rolo	Walk In Ref #9	06/18/13 11:29	Return to Storage
JB39590-2.1	Walk In Ref #9	Chris Cataldo	06/18/13 18:38	Retrieve from Storage
JB39590-2.1	Chris Cataldo	Walk In Ref #9	06/18/13 18:38	Return to Storage
JB39590-2.2	Walk In Ref #9	Mehdi Abdolrahim	06/18/13 09:16	Retrieve from Storage
JB39590-2.2	Mehdi Abdolrahim	Walk In Ref #9	06/18/13 10:51	Return to Storage
JB39590-2.2	Walk In Ref #9	Dorina Antonovici	06/18/13 11:59	Retrieve from Storage
JB39590-2.2	Dorina Antonovici	Walk In Ref #9	06/18/13 13:18	Return to Storage

New Jersey
ACCUTEST LABORATORIES

GC/MS Semi-volatiles

QC Data Summaries

(Accutest Labs of New England, Inc.)

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: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33660-MB	F65269.D	1	06/27/13	KR	06/18/13	OP33660	MSF3028

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

JB39590-1, JB39590-2

CAS No.	Compound	Result	RL	MDL	Units	Q
120-12-7	Anthracene	ND	96	12	ug/kg	
56-55-3	Benzo(a)anthracene	ND	96	12	ug/kg	
50-32-8	Benzo(a)pyrene	ND	96	10	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	96	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	96	9.6	ug/kg	
218-01-9	Chrysene	ND	96	12	ug/kg	
86-73-7	Fluorene	ND	96	13	ug/kg	
91-20-3	Naphthalene	ND	96	15	ug/kg	
85-01-8	Phenanthrene	ND	96	13	ug/kg	
129-00-0	Pyrene	ND	96	11	ug/kg	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	64%	30-130%
4165-62-2	Phenol-d5	62%	30-130%
118-79-6	2,4,6-Tribromophenol	69%	30-130%
4165-60-0	Nitrobenzene-d5	69%	30-130%
321-60-8	2-Fluorobiphenyl	66%	30-130%
1718-51-0	Terphenyl-d14	81%	30-130%

Blank Spike Summary

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33660-BS	F65270.D	1	06/27/13	KR	06/18/13	OP33660	MSF3028

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

JB39590-1, JB39590-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
120-12-7	Anthracene	2460	1810	73	40-140
56-55-3	Benzo(a)anthracene	2460	2070	84	40-140
50-32-8	Benzo(a)pyrene	2460	1720	70	40-140
205-99-2	Benzo(b)fluoranthene	2460	2000	81	40-140
191-24-2	Benzo(g,h,i)perylene	2460	2050	83	40-140
218-01-9	Chrysene	2460	1900	77	40-140
86-73-7	Fluorene	2460	1830	74	40-140
91-20-3	Naphthalene	2460	1650	67	40-140
85-01-8	Phenanthrene	2460	1890	77	40-140
129-00-0	Pyrene	2460	2080	84	40-140

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	66%	30-130%
4165-62-2	Phenol-d5	63%	30-130%
118-79-6	2,4,6-Tribromophenol	74%	30-130%
4165-60-0	Nitrobenzene-d5	67%	30-130%
321-60-8	2-Fluorobiphenyl	66%	30-130%
1718-51-0	Terphenyl-d14	80%	30-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33660-MS	F65276.D	1	06/27/13	KR	06/18/13	OP33660	MSF3028
OP33660-MSD	F65277.D	1	06/27/13	KR	06/18/13	OP33660	MSF3028
MC21812-1	F65278.D	1	06/27/13	KR	06/18/13	OP33660	MSF3028

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

JB39590-1, JB39590-2

CAS No.	Compound	MC21812-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
120-12-7	Anthracene	ND		2960	2200	74	1980	69	11	40-140/30
56-55-3	Benzo(a)anthracene	ND		2960	2520	85	2250	78	11	40-140/30
50-32-8	Benzo(a)pyrene	ND		2960	2130	72	1860	64	14	40-140/30
205-99-2	Benzo(b)fluoranthene	ND		2960	2350	79	2060	71	13	40-140/30
191-24-2	Benzo(g,h,i)perylene	ND		2960	2570	87	2310	80	11	40-140/30
218-01-9	Chrysene	ND		2960	2360	80	2100	73	12	40-140/30
86-73-7	Fluorene	ND		2960	2300	78	2030	70	12	40-140/30
91-20-3	Naphthalene	163		2960	2280	71	1910	60	18	40-140/30
85-01-8	Phenanthrene	40.3	J	2960	2350	78	2110	72	11	40-140/30
129-00-0	Pyrene	16.0	J	2960	2520	84	2280	78	10	40-140/30

CAS No.	Surrogate Recoveries	MS	MSD	MC21812-1	Limits
367-12-4	2-Fluorophenol	67%	57%	66%	30-130%
4165-62-2	Phenol-d5	66%	57%	65%	30-130%
118-79-6	2,4,6-Tribromophenol	78%	69%	76%	30-130%
4165-60-0	Nitrobenzene-d5	70%	60%	68%	30-130%
321-60-8	2-Fluorobiphenyl	68%	58%	66%	30-130%
1718-51-0	Terphenyl-d14	79%	72%	79%	30-130%

* = Outside of Control Limits.

Instrument Performance Check (DFTPP)

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: MSF2937-DFTPP
Lab File ID: F62770.D
Instrument ID: GCMSF
Injection Date: 04/08/13
Injection Time: 08:39

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	5601	47.4		Pass
68	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
69	Mass 69 relative abundance	6603	55.9		Pass
70	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
127	40.0 - 60.0% of mass 198	5966	50.5		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	11811	100.0		Pass
199	5.0 - 9.0% of mass 198	800	6.77		Pass
275	10.0 - 30.0% of mass 198	2978	25.2		Pass
365	1.0 - 100.0% of mass 198	234	1.98		Pass
441	Present, but less than mass 443	860	7.28	(76.3) [b]	Pass
442	39.0 - 100.0% of mass 198	6440	54.5		Pass
443	17.0 - 23.0% of mass 442	1127	9.54	(17.5) [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
MSF2937-ICC2937	F62772.D	04/08/13	09:28	00:49	Initial cal 80
MSF2937-IC2937	F62773.D	04/08/13	09:52	01:13	Initial cal 1
MSF2937-IC2937	F62774.D	04/08/13	10:16	01:37	Initial cal 2
MSF2937-IC2937	F62775.D	04/08/13	10:40	02:01	Initial cal 5
MSF2937-IC2937	F62776.D	04/08/13	11:04	02:25	Initial cal 10
MSF2937-IC2937	F62777.D	04/08/13	11:28	02:49	Initial cal 20
MSF2937-IC2937	F62778.D	04/08/13	11:53	03:14	Initial cal 50
MSF2937-IC2937	F62779.D	04/08/13	12:17	03:38	Initial cal 120
MSF2937-ICV2937	F62780.D	04/08/13	12:42	04:03	Initial cal verification 20
MSF2937-ICV2937	F62781.D	04/08/13	13:07	04:28	Initial cal verification 50
MSF2937-ICV2937	F62782.D	04/08/13	13:32	04:53	Initial cal verification 20
MSF2937-ICV2937	F62783.D	04/08/13	13:57	05:18	Initial cal verification 20

Instrument Performance Check (DFTPP)

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: MSF3028-DFTPP
Lab File ID: F65267.D
Instrument ID: GCMSF
Injection Date: 06/27/13
Injection Time: 17:25

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	10905	38.4		Pass
68	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
69	Mass 69 relative abundance	13373	47.1		Pass
70	Less than 2.0% of mass 69	0	0.00	(0.00) [a]	Pass
127	40.0 - 60.0% of mass 198	13043	46.0		Pass
197	Less than 1.0% of mass 198	0	0.00		Pass
198	Base peak, 100% relative abundance	28368	100.0		Pass
199	5.0 - 9.0% of mass 198	2120	7.47		Pass
275	10.0 - 30.0% of mass 198	7742	27.3		Pass
365	1.0 - 100.0% of mass 198	749	2.64		Pass
441	Present, but less than mass 443	3368	11.9	(85.7) [b]	Pass
442	40.0 - 100.0% of mass 198	18864	66.5		Pass
443	17.0 - 23.0% of mass 442	3931	13.9	(20.8) [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
MSF3028-CC2937	F65268.D	06/27/13	17:48	00:23	Continuing cal 50
OP33660-MB	F65269.D	06/27/13	18:11	00:46	Method Blank
OP33660-BS	F65270.D	06/27/13	18:34	01:09	Blank Spike
ZZZZZZ	F65271.D	06/27/13	18:57	01:32	(unrelated sample)
ZZZZZZ	F65272.D	06/27/13	19:20	01:55	(unrelated sample)
ZZZZZZ	F65273.D	06/27/13	19:42	02:17	(unrelated sample)
ZZZZZZ	F65274.D	06/27/13	20:05	02:40	(unrelated sample)
ZZZZZZ	F65275.D	06/27/13	20:28	03:03	(unrelated sample)
OP33660-MS	F65276.D	06/27/13	20:51	03:26	Matrix Spike
OP33660-MSD	F65277.D	06/27/13	21:14	03:49	Matrix Spike Duplicate
MC21812-1	F65278.D	06/27/13	21:37	04:12	(used for QC only; not part of job JB39590)
ZZZZZZ	F65279.D	06/27/13	22:00	04:35	(unrelated sample)
ZZZZZZ	F65280.D	06/27/13	22:23	04:58	(unrelated sample)
ZZZZZZ	F65281.D	06/27/13	22:46	05:21	(unrelated sample)
ZZZZZZ	F65282.D	06/27/13	23:09	05:44	(unrelated sample)
ZZZZZZ	F65283.D	06/27/13	23:32	06:07	(unrelated sample)
ZZZZZZ	F65284.D	06/27/13	23:55	06:30	(unrelated sample)
ZZZZZZ	F65285.D	06/28/13	00:18	06:53	(unrelated sample)
ZZZZZZ	F65286.D	06/28/13	00:41	07:16	(unrelated sample)

Instrument Performance Check (DFTPP)

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: MSF3028-DFTPP
Lab File ID: F65267.D
Instrument ID: GCMSF
Injection Date: 06/27/13
Injection Time: 17:25

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	F65287.D	06/28/13	01:04	07:39	(unrelated sample)
ZZZZZZ	F65288.D	06/28/13	01:27	08:02	(unrelated sample)
ZZZZZZ	F65289.D	06/28/13	01:50	08:25	(unrelated sample)
ZZZZZZ	F65290.D	06/28/13	02:13	08:48	(unrelated sample)
ZZZZZZ	F65291.D	06/28/13	02:36	09:11	(unrelated sample)
ZZZZZZ	F65292.D	06/28/13	02:59	09:34	(unrelated sample)
ZZZZZZ	F65293.D	06/28/13	03:22	09:57	(unrelated sample)
JB39590-1	F65294.D	06/28/13	03:46	10:21	AOI5_MW-481_0-1_061313
JB39590-2	F65295.D	06/28/13	04:09	10:44	AOI5_MW-481_5-6_061313

Semivolatile Internal Standard Area Summary

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	MSF3028-CC2937	**Injection Date:**	06/27/13
Lab File ID:	F65268.D	**Injection Time:**	17:48
Instrument ID:	GCMSF	**Method:**	SW846 8270C

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT	IS 6 AREA	RT
Check Std	32527	3.37	120435	4.47	78278	6.08	148362	7.44	157794	10.22	147017	11.66
Upper Limit [a]	65054	3.87	240870	4.97	156556	6.58	296724	7.94	315588	10.72	294034	12.16
Lower Limit [b]	16264	2.87	60218	3.97	39139	5.58	74181	6.94	78897	9.72	73509	11.16

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
OP33660-MB	29118	3.37	106111	4.47	68102	6.08	127169	7.44	132086	10.21	124985	11.66
OP33660-BS	30454	3.37	113587	4.47	72537	6.08	134786	7.44	140372	10.22	133172	11.66
ZZZZZZ	27511	3.37	101627	4.47	65527	6.08	121664	7.44	126176	10.21	118378	11.66
ZZZZZZ	29787	3.37	110566	4.47	70956	6.08	129393	7.44	144494	10.21	146558	11.66
ZZZZZZ	28258	3.39	105734	4.48	69803	6.08	122448	7.44	134588	10.22	132570	11.66
ZZZZZZ	29087	3.37	109541	4.47	76784	6.08	88383	7.46	150464	10.25	150394	11.67
ZZZZZZ	25150	3.37	93539	4.47	60838	6.08	112544	7.44	120561	10.21	120103	11.66
OP33660-MS	28422	3.37	105882	4.47	68759	6.08	129553	7.44	137674	10.22	135810	11.66
OP33660-MSD	25414	3.37	94296	4.47	61473	6.07	114443	7.44	122959	10.22	121744	11.66
MC21812-1	28654	3.37	107067	4.47	69922	6.07	130903	7.44	140810	10.22	141525	11.66
ZZZZZZ	27470	3.37	104142	4.47	66622	6.07	128414	7.44	137542	10.22	136124	11.66
ZZZZZZ	26988	3.37	100797	4.47	65243	6.08	123775	7.44	131469	10.21	131663	11.66
ZZZZZZ	31706	3.37	126990	4.48	75471	6.10	135974	7.49	160730	10.22	158789	11.66
ZZZZZZ	29427	3.37	110861	4.47	72159	6.08	132086	7.44	142539	10.21	145121	11.66
ZZZZZZ	28277	3.37	104094	4.47	70089	6.07	131914	7.44	141233	10.22	141400	11.66
ZZZZZZ	26217	3.37	97860	4.47	64474	6.08	120405	7.43	130799	10.21	129985	11.66
ZZZZZZ	26200	3.37	98237	4.47	62476	6.08	118164	7.44	127606	10.21	130695	11.66
ZZZZZZ	27702	3.37	104726	4.47	71667	6.09	131067	7.46	134708	10.22	133412	11.66
ZZZZZZ	26368	3.37	95735	4.47	62482	6.08	116773	7.44	123767	10.21	127840	11.66
ZZZZZZ	29882	3.37	111384	4.47	76055	6.09	136089	7.45	142267	10.22	143096	11.66
ZZZZZZ	26098	3.37	98962	4.47	63047	6.08	116262	7.44	126697	10.21	128516	11.66
ZZZZZZ	31668	3.37	119452	4.47	80103	6.08	142596	7.44	149595	10.22	149989	11.66
ZZZZZZ	30683	3.37	113126	4.47	72637	6.08	133371	7.44	144491	10.23	155411	11.67
ZZZZZZ	34071	3.37	128436	4.47	85095	6.09	156686	7.45	161609	10.22	164300	11.66
ZZZZZZ	31599	3.37	118175	4.47	75870	6.08	140300	7.44	152232	10.22	155786	11.66
JB39590-1 [c]	27482	3.37	102182	4.47	68367	6.08	125823	7.44	142482	10.22	147927	11.67
JB39590-2	28960	3.37	106624	4.47	71257	6.08	129656	7.44	143746	10.22	150068	11.67

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

Semivolatile Internal Standard Area Summary

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	MSF3028-CC2937	**Injection Date:**	06/27/13
Lab File ID:	F65268.D	**Injection Time:**	17:48
Instrument ID:	GCMSF	**Method:**	SW846 8270C

Lab	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
Sample ID	**AREA**	**RT**	**AREA**	**RT**	**AREA**	**RT**	**AREA**	**RT**	**AREA**	**RT**	**AREA**	**RT**

(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) Elevated RL due to dilution required for matrix interference.

Semivolatile Surrogate Recovery Summary

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8270C **Matrix:** SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
JB39590-1	F65294.D	57.0	60.0	78.0
JB39590-2	F65295.D	70.0	68.0	80.0
OP33660-BS	F65270.D	67.0	66.0	80.0
OP33660-MB	F65269.D	69.0	66.0	81.0
OP33660-MS	F65276.D	70.0	68.0	79.0
OP33660-MSD	F65277.D	60.0	58.0	72.0

Surrogate Compounds	Recovery Limits
S1 = Nitrobenzene-d5	30-130%
S2 = 2-Fluorobiphenyl	30-130%
S3 = Terphenyl-d14	30-130%

Initial Calibration Summary

Job Number: JB39590 **Sample:** MSF2937-ICC2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62772.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Response Factor Report MSF

```
Method       : C:\msdchem\1\MET...\F130408_8270+.m (RTE Integrator)
Title        : SW-864 Method 8270
Last Update  : Wed Apr 10 10:06:30 2013
Response via : Initial Calibration

Calibration Files
120 =f62779.D    80  =f62772.D    20  =f62777.D    5   =f62775.D
2   =f62774.D    10  =f62776.D    50  =f62778.D    1   =f62773.D
    =                =
```

Compound	120	80	20	5	2	10	50	1	Avg	%RSD
1) I 1,4-Dichlorobenzene-d	----------ISTD----------									
2) N-nitrosodimethylamine	0.787	0.802	0.791	0.688		0.724	0.793		0.764	6.11
3) Pyridine	1.491	1.488	1.460	1.275	1.637	1.431	1.484		1.467	7.28
4) Methyl Methanesulfonate	0.692	0.685	0.655	0.636	0.566	0.648	0.694		0.654	6.87
5) Ethyl Methanesulfonate	0.945	0.943	0.933	0.872	0.984	0.888	0.925		0.927	4.03
6) Aniline	0.833	0.823	0.867	0.800	0.785	0.856	0.870		0.833	3.96
7) 2-Fluorophenol	1.213	1.242	1.177	1.111	0.982	1.128	1.244		1.157	8.05
8) bis(2-Chloroethyl)ether	0.850	0.862	0.854	0.805	0.928	0.838	0.873		0.858	4.36
9) Phenol-d5	1.528	1.561	1.501	1.390	1.323	1.487	1.529		1.474	5.82
10) Phenol	1.724	1.730	1.692	1.559	1.485	1.582	1.704	1.529	1.626	6.00
11) 2-Chlorophenol	1.308	1.329	1.296	1.218	1.170	1.257	1.316		1.271	4.62
12) 1,3-Dichlorobenzene	1.453	1.460	1.464	1.496	1.460	1.478	1.470	1.437	1.465	1.18
13) 1,4-Dichlorobenzene	1.585	1.594	1.592	1.584	1.594	1.573	1.547	1.519	1.574	1.72
14) 1,2-Dichlorobenzene	1.408	1.432	1.416	1.433	1.306	1.383	1.455	1.281	1.389	4.54
15) Benzyl alcohol	0.628	0.615	0.539	0.445		0.446	0.552		0.538	14.73
16) bis(2-chloroisopropyl)ether	1.108	1.142	1.147	1.090	1.148	1.124	1.133		1.127	1.93
17) o-cresol	1.242	1.287	1.313	1.186	1.111	1.186	1.284		1.230	5.87
18) Acetophenone	1.841	1.886	1.853	1.793	1.707	1.812	1.859		1.822	3.26
19) Hexachloroethane	0.547	0.553	0.533	0.548	0.577	0.537	0.550		0.549	2.61
20) N-Nitroso-di-n-propylamine	0.925	0.952	0.944	0.914	0.822	0.905	0.954		0.917	5.00
21) m+p-cresols	1.254	1.291	1.244	1.232	1.158	1.302	1.261		1.249	3.78
22) 4-methylphenol	1.254	1.291	1.244	1.232	1.158	1.302	1.261		1.249	3.78
23) Benzaldehyde										

```
            3.966 4.093 4.000 3.950       3.962 4.013 3.832         3.974    1.98

24) I   Naphthalene-d8        ----------------ISTD--------------------
25)  Nitrobenzene-d5
            0.390 0.393 0.379 0.335 0.290 0.372 0.384 0.313         0.357   10.95
26)  Nitrobenzene
            0.383 0.395 0.381 0.370 0.368 0.381 0.385               0.380    2.36
27)  Isophorone
            0.608 0.612 0.600 0.557 0.528 0.566 0.602               0.582    5.48
28)  2-Nitrophenol
            0.207 0.206 0.189 0.167       0.176 0.196               0.190    8.47
29)  2,4-Dimethylphenol
            0.379 0.388 0.377 0.366       0.360 0.378               0.375    2.68
30)  bis(2-Chloroethoxy)methane
            0.391 0.394 0.382 0.354       0.357 0.394               0.379    4.84
31)  Benzoic acid
            0.207 0.202 0.106 0.045       0.067 0.172               0.133   52.58
          ----- Quadratic regression -----                Coefficient =  0.9977
               Response Ratio = -0.03083 + 0.19101 *A + 0.00947 *A^2

32)  2,4-Dichlorophenol
            0.316 0.318 0.292 0.263       0.292 0.315               0.299    7.14
33)  1,2,4-Trichlorobenzene
            0.362 0.365 0.363 0.346 0.328 0.347 0.351               0.352    3.77
34)  Naphthalene
            1.014 1.021 0.999 0.988 0.976 0.983 1.004 0.999         0.998    1.53
35)  2,6-Dichlorophenol
            0.318 0.318 0.313 0.298       0.295 0.313               0.309    3.32
36)  4-Chloroaniline
            0.450 0.446 0.442 0.391       0.409 0.453               0.432    5.93
37)  Hexachlorobutadiene
            0.236 0.234 0.229 0.219 0.220 0.226 0.236               0.228    3.20
38)  4-Chloro-3-methylphenol
            0.333 0.324 0.315 0.292       0.304 0.323               0.315    4.74
39)  2-Methylnaphthalene
            0.720 0.717 0.706 0.680 0.671 0.697 0.695 0.640         0.691    3.85
40)  1-Methylnaphthalene
            0.675 0.671 0.690 0.653 0.663 0.655 0.674 0.644         0.666    2.24
41)  1,2,4,5-Tetrachlorobenzene
            0.428 0.429 0.427 0.410 0.386 0.409 0.417               0.415    3.69
42)  Caprolactam
            0.124 0.126 0.116 0.101       0.105 0.119               0.115    8.55

43) I   Acenaphthene-d10      ----------------ISTD--------------------
44)  Pentachloronitrobenzene
            0.182 0.180 0.175 0.151       0.167 0.181               0.173    6.93
45)  Hexachlorocyclopentadiene
            0.335 0.315 0.253 0.180       0.214 0.299               0.266   22.92
             ----- Linear regression -----  Coefficient =  0.9984
               Response Ratio = -0.07412 + 0.34179 *A

46)  2,4,6-Trichlorophenol
            0.408 0.395 0.378 0.338       0.367 0.399               0.381    6.77
47)  2,4,5-Trichlorophenol
            0.447 0.437 0.435 0.352       0.398 0.442               0.418    8.81
48)  2-Fluorobiphenyl
            1.385 1.332 1.365 1.349 1.205 1.355 1.350 1.294         1.329    4.27
49)  2-Chloronaphthalene
            1.082 1.072 1.061 1.026 1.014 1.063 1.082 0.945         1.043    4.49
50)  Acenaphthylene
```

Initial Calibration Summary

Job Number: JB39590 **Sample:** MSF2937-ICC2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62772.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

```
            1.796 1.769 1.754 1.717 1.615 1.743 1.788 1.656         1.730    3.71
51)  Dimethylphthalate
            1.316 1.297 1.312 1.273 1.268 1.284 1.289 1.263         1.288    1.54
52)  2,4-Dinitrotoluene
            0.308 0.301 0.285 0.245       0.278 0.301               0.287    8.08
53)  Acenaphthene
            1.132 1.098 1.117 1.087 1.035 1.114 1.118 1.114         1.102    2.74
54)  2,4-Dinitrophenol
            0.178 0.147 0.074 0.173       0.035 0.129               0.122   46.73
          ----- Quadratic regression -----                Coefficient =  0.9976
              Response Ratio = -0.00475 + 0.08858 *A + 0.03048 *A^2

55)  Dibenzofuran
            1.648 1.650 1.693 1.580 1.518 1.653 1.650 1.559         1.619    3.68
56)  2,6-Dinitrotoluene
            0.413 0.401 0.376 0.336       0.358 0.403               0.381    7.86
57)  4-Nitrophenol
            0.218 0.213 0.178             0.158 0.224               0.198   14.55
58)  2,3,4,6-Tetrachlorophenol
            0.386 0.374 0.341 0.291       0.313 0.360               0.344   10.71
59)  Fluorene
            1.299 1.301 1.279 1.262 1.196 1.303 1.293 1.166         1.262    4.17
60)  4-Chlorophenyl-phenylether
            0.724 0.715 0.708 0.664 0.695 0.703 0.714               0.703    2.78
61)  Diethylphthalate
            1.220 1.191 1.171 1.131 1.089 1.157 1.192 1.157         1.164    3.48
62)  2-nitroaniline
            0.382 0.365 0.337             0.323 0.361               0.354    6.57
63)  3-nitroaniline
            0.318 0.311 0.286 0.263       0.275 0.314               0.295    7.82
64)  4-nitroaniline
            0.321 0.319 0.291 0.257       0.265 0.317               0.295    9.71
65)  1,1'-Biphenyl
            1.370 1.339 1.335 1.305 1.206 1.331 1.361 1.187         1.304    5.33

66) I   Phenanthrene-d10      ----------------ISTD---------------------
67)  4,6-Dinitro-2-methylphenol
            0.150 0.137 0.098 0.044       0.063 0.130               0.104   41.52
             ----- Linear regression -----  Coefficient =  0.9974
              Response Ratio = -0.02441 + 0.15503 *A

68)  n-Nitrosodiphenylamine
            0.525 0.520 0.483 0.480 0.467 0.497 0.511               0.498    4.41
69)  1,2-Diphenylhydrazine
            0.652 0.636 0.596 0.590 0.558 0.609 0.644               0.612    5.50
70)  2,4,6-Tribromophenol
            0.125 0.122 0.110 0.086       0.107 0.117               0.111   12.73
71)  4-Bromophenyl-phenylether
            0.249 0.246 0.233 0.222 0.205 0.233 0.247               0.233    6.78
72)  Hexachlorobenzene
            0.271 0.266 0.254 0.249 0.252 0.259 0.265               0.259    3.15
73)  Pentachlorophenol
            0.123 0.114 0.082 0.046       0.067 0.106               0.090   33.27#
             ----- Linear regression -----  Coefficient =  0.9975
              Response Ratio = -0.01798 + 0.12678 *A

74)  Phenanthrene
            1.053 1.054 1.014 1.004 0.981 1.025 1.046 1.056         1.029    2.70
75)  Anthracene
            1.112 1.108 1.062 1.051 0.993 1.062 1.097 0.997         1.060    4.35
```

9.7.1

9

Initial Calibration Summary

Job Number: JB39590 **Sample:** MSF2937-ICC2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62772.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

```
76)  Carbazole
           0.965 0.970 0.934 0.903 0.891 0.933 0.969 0.859         0.928    4.39
77)  Di-n-butylphthalate
           1.133 1.119 1.053 0.987 0.924 1.000 1.128               1.049    7.78
78)  Fluoranthene
           1.256 1.261 1.211 1.177 1.096 1.200 1.257 1.069         1.191    6.19
79)  Atrazine
           0.211 0.208 0.199 0.187 0.180 0.196 0.212               0.199    6.19

80) I   Chrysene-d12          ----------------ISTD---------------------
81)  Benzidine
           0.345 0.523 0.442 0.384       0.451 0.425               0.428   14.26
82)  Pyrene
           1.164 1.165 1.157 1.127 1.079 1.137 1.180 1.134         1.143    2.75
83)  Terphenyl-d14
           0.903 0.919 0.886 0.830 0.846 0.872 0.914 0.814         0.873    4.53
84)  3,3-Dimethylbenzidine
                 0.520 0.452 0.496       0.519 0.389               0.475   11.70
85)  Butylbenzylphthalate
           0.409 0.405 0.388 0.329       0.364 0.397               0.382    8.04
86)  3,3'-Dichlorobenzidine
           0.391 0.419 0.380 0.351       0.371 0.404               0.386    6.25
87)  Benzo[a]anthracene
           1.039 1.034 1.020 0.971 0.977 1.003 1.044 1.006         1.012    2.72
88)  Chrysene
           1.023 1.031 1.030 0.982 1.004 1.019 1.033 0.972         1.012    2.31
89)  bis(2-Ethylhexyl)phthalate
           0.574 0.569 0.528 0.468       0.487 0.559               0.531    8.40

90) I   Perylene-d12          ----------------ISTD---------------------
91)  Di-n-octylphthalate
           1.023 1.015 0.897 0.781       0.837 0.980               0.922   10.85
92)  Benzo[b]fluoranthene
           1.280 1.280 1.271 1.074 1.106 1.212 1.255 1.110         1.199    7.32
93)  Benzo[k]fluoranthene
           1.108 1.092 1.035 1.156 1.049 1.068 1.098 1.096         1.088    3.45
94)  Benzo[a]pyrene
           1.139 1.136 1.117 1.036 1.025 1.068 1.134 0.999         1.082    5.26
95)  Indeno[1,2,3-cd]pyrene
           1.366 1.333 1.307 1.218 1.277 1.275 1.300 1.218         1.287    4.02
96)  Dibenz[a,h]anthracene
           1.139 1.112 1.058 1.030 1.050 1.059 1.074 1.076         1.075    3.27
97)  Benzo[g,h,i]perylene
           1.095 1.073 1.051 1.014 1.069 1.057 1.036 1.029         1.053    2.50
-------------------------------------------------------------------------------
(#) = Out of Range  ###  Number of calibration levels exceeded format  ###

          F130408_8270+.m        Wed Apr 10 10:07:34 2013   R1
```

9.7.1

9

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62780.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\F130408\f62780.D          Vial: 8
Acq On    :  8 Apr 2013  12:42 pm                   Operator: KRISTINR
Sample    : ICV2937-20                              Inst    : MSF
Misc      : op32443,msf2937,1000,,,1,1              Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\msdchem\1\MET...\F130408_8270+.m (RTE Integrator)
Title        : SW-864 Method 8270
Last Update  : Mon Apr 08 13:02:18 2013
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	102	0.00	4.16
2		N-nitrosodimethylamine	0.764	0.834	-9.2	108	0.00	2.37
3	T	Pyridine	1.467	1.596	-8.8	112	0.00	2.39
4	T	Methyl Methanesulfonate		----------NA----------				
5	T	Ethyl Methanesulfonate		----------NA----------				
6	T	Aniline		----------NA----------				
7	S	2-Fluorophenol		----------NA----------				
8	T	bis(2-Chloroethyl)ether	0.858	0.905	-5.5	108	0.00	3.97
9	S	Phenol-d5		----------NA----------				
10	C	Phenol		----------NA----------				
11	M	2-Chlorophenol		----------NA----------				
12	T	1,3-Dichlorobenzene	1.465	1.587	-8.3	111	0.00	4.13
13	C	1,4-Dichlorobenzene	1.574	1.693	-7.6	109	0.00	4.17
14	T	1,2-Dichlorobenzene	1.389	1.540	-10.9	111	0.00	4.31
15	T	Benzyl alcohol	0.538	0.610	-13.4	116	0.00	4.26
16	T	bis(2-chloroisopropyl)eth	1.127	1.421	-26.1#	126	0.00	4.38
17	T	o-cresol		----------NA----------				
18	T	Acetophenone	1.822	1.992	-9.3	106	0.00	4.48
19	T	Hexachloroethane	0.549	0.584	-6.4	112	0.00	4.55
20	P	N-Nitroso-di-n-propylamin	0.917	1.002	-9.3	108	0.00	4.48
21	T	m+p-cresols		----------NA----------				
22		4-methylphenol		----------NA----------				
23		Benzaldehyde		----------NA----------				
24	I	Naphthalene-d8	1.000	1.000	0.0	103	0.00	5.15
25	S	Nitrobenzene-d5	0.357	0.386	-8.1	105	0.00	4.60
26	T	Nitrobenzene	0.380	0.408	-7.4	110	0.00	4.61
27	T	Isophorone	0.582	0.656	-12.7	112	0.00	4.79
28	C	2-Nitrophenol		----------NA----------				
29	T	2,4-Dimethylphenol		----------NA----------				
30	T	bis(2-Chloroethoxy)methan	0.379	0.402	-6.1	108	0.00	4.95
		----------	True	Calc.	% Drift	----------		
31	T	Benzoic acid		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
32	C	2,4-Dichlorophenol		----------NA----------				
33	M	1,2,4-Trichlorobenzene	0.352	0.387	-9.9	109	0.00	5.12
34	T	Naphthalene	0.998	1.088	-9.0	112	0.00	5.17
35	T	2,6-Dichlorophenol		----------NA----------				
36	T	4-Chloroaniline		----------NA----------				
37	C	Hexachlorobutadiene	0.228	0.260	-14.0	116	0.00	5.30

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62780.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

38	C	4-Chloro-3-methylphenol		----------NA----------				
39	T	2-Methylnaphthalene	0.691	0.735	-6.4	107	0.00	5.72
40	T	1-Methylnaphthalene	0.666	0.729	-9.5	109	0.00	5.81
41	T	1,2,4,5-Tetrachlorobenzen	0.415	0.442	-6.5	107	0.00	5.89
42		Caprolactam		----------NA----------				
43	I	Acenaphthene-d10	1.000	1.000	0.0	101	0.00	6.60
44	T	Pentachloronitrobenzene	0.173	0.168	2.9	97	0.00	7.91
		----------	True	Calc.	% Drift	----------		
45	P	Hexachlorocyclopentadiene	40.000	39.322	1.7	76	0.00	5.90
		----------	AvgRF	CCRF	% Dev	----------		
46	C	2,4,6-Trichlorophenol		----------NA----------				
47	T	2,4,5-Trichlorophenol		----------NA----------				
48	S	2-Fluorobiphenyl	1.329	1.393	-4.8	103	0.00	6.03
49	T	2-Chloronaphthalene	1.043	1.158	-11.0	110	0.00	6.11
50	M	Acenaphthylene	1.730	1.562	9.7	90	0.00	6.47
51	T	Dimethylphthalate	1.288	1.355	-5.2	105	0.00	6.38
52	T	2,4-Dinitrotoluene	0.287	0.292	-1.7	104	0.00	6.44
53	C	Acenaphthene	1.102	1.226	-11.3	112	0.00	6.62
		----------	True	Calc.	% Drift	----------		
54	P	2,4-Dinitrophenol		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
55	T	Dibenzofuran	1.619	1.676	-3.5	100	0.00	6.76
56	M	2,6-Dinitrotoluene	0.381	0.384	-0.8	104	0.00	6.78
57	P	4-Nitrophenol		----------NA----------				
58	T	2,3,4,6-Tetrachlorophenol		----------NA----------				
59	T	Fluorene	1.262	1.408	-11.6	112	0.00	7.07
60	T	4-Chlorophenyl-phenylethe	0.703	0.769	-9.4	110	0.00	7.05
61	T	Diethylphthalate	1.164	1.255	-7.8	109	0.00	6.99
62	T	2-nitroaniline	0.354	0.365	-3.1	110	0.00	6.22
63	T	3-nitroaniline	0.295	0.264	10.5	94	0.00	6.57
64	T	4-nitroaniline	0.295	0.294	0.3	103	0.00	7.11
65		1,1'-Biphenyl	1.304	1.501	-15.1	114	0.00	6.10
66	I	Phenanthrene-d10	1.000	1.000	0.0	99	0.00	7.96
		----------	True	Calc.	% Drift	----------		
67	T	4,6-Dinitro-2-methylpheno		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
68	C	n-Nitrosodiphenylamine	0.498	0.494	0.8	101	0.00	7.17
69	T	1,2-Diphenylhydrazine	0.612	0.653	-6.7	108	0.00	7.20
70	S	2,4,6-Tribromophenol		----------NA----------				
71	T	4-Bromophenyl-phenylether	0.233	0.241	-3.4	102	0.00	7.51
72	T	Hexachlorobenzene	0.259	0.290	-12.0	112	0.00	7.67
		----------	True	Calc.	% Drift	----------		
73	C	Pentachlorophenol		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
74	T	Phenanthrene	1.029	1.108	-7.8	108	0.00	7.98
75	T	Anthracene	1.060	1.114	-5.1	104	0.00	8.03
76	T	Carbazole	0.928	0.986	-6.3	104	0.00	8.19
77	T	Di-n-butylphthalate	1.049	1.076	-2.6	101	0.00	8.60
78	C	Fluoranthene	1.191	1.332	-11.8	108	0.00	9.25
79		Atrazine		----------NA----------				

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62780.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

80	I	Chrysene-d12	1.000	1.000	0.0	99	0.00	10.74
81	T	Benzidine		----------NA----------				
82	M	Pyrene	1.143	1.232	-7.8	106	0.00	9.49
83	S	Terphenyl-d14	0.873	0.908	-4.0	102	0.00	9.66
84		3,3-Dimethylbenzidine		----------NA----------				
85	T	Butylbenzylphthalate	0.382	0.399	-4.5	102	0.00	10.20
86	T	3,3'-Dichlorobenzidine		----------NA----------				
87	T	Benzo[a]anthracene	1.012	1.132	-11.9	110	0.00	10.72
88	T	Chrysene	1.012	1.072	-6.0	104	0.00	10.76
89	T	bis(2-Ethylhexyl)phthalat	0.531	0.548	-3.2	103	0.00	10.82
90	I	Perylene-d12	1.000	1.000	0.0	97	0.00	12.22
91	C	Di-n-octylphthalate	0.922	1.051	-14.0	114	0.00	11.46
92	T	Benzo[b]fluoranthene	1.199	1.282	-7.0	98	0.00	11.84
93	T	Benzo[k]fluoranthene	1.088	1.232	-13.2	116	0.00	11.87
94	C	Benzo[a]pyrene	1.082	1.026	5.1	90	0.00	12.16
95	T	Indeno[1,2,3-cd]pyrene	1.287	1.372	-6.6	102	0.00	13.30
96	T	Dibenz[a,h]anthracene	1.075	1.160	-8.0	106	0.00	13.32
97	T	Benzo[g,h,i]perylene	1.053	1.184	-12.4	110	0.00	13.60

(47.5 %) 29 of 61 compounds'%D > 20

(#) = Out of Range SPCC's out = 1 CCC's out = 10
f62777.D F130408_8270+.m Mon Apr 08 13:07:10 2013 R1

9.7.2

9

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62781.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\F130408\f62781.D          Vial: 9
Acq On    :  8 Apr 2013   1:07 pm                   Operator: KRISTINR
Sample    : ICV2937-50                              Inst    : MSF
Misc      : op32443,msf2937,1000,,,1,1              Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\msdchem\1\MET...\F130408_8270+.m (RTE Integrator)
Title        : SW-864 Method 8270
Last Update  : Mon Apr 08 13:02:18 2013
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	159	0.00	4.16
2		N-nitrosodimethylamine		----------NA----------				
3	T	Pyridine		----------NA----------				
4	T	Methyl Methanesulfonate		----------NA----------				
5	T	Ethyl Methanesulfonate		----------NA----------				
6	T	Aniline		----------NA----------				
7	S	2-Fluorophenol	1.157	1.249	-8.0	160	0.00	3.27
8	T	bis(2-Chloroethyl)ether		----------NA----------				
9	S	Phenol-d5	1.474	1.519	-3.1	158	0.00	3.91
10	C	Phenol	1.626	1.666	-2.5	156	0.00	3.92
11	M	2-Chlorophenol	1.271	1.364	-7.3	165	0.00	4.03
12	T	1,3-Dichlorobenzene		----------NA----------				
13	C	1,4-Dichlorobenzene		----------NA----------				
14	T	1,2-Dichlorobenzene		----------NA----------				
15	T	Benzyl alcohol		----------NA----------				
16	T	bis(2-chloroisopropyl)eth		----------NA----------				
17	T	o-cresol	1.230	1.219	0.9	151	0.00	4.36
18	T	Acetophenone		----------NA----------				
19	T	Hexachloroethane		----------NA----------				
20	P	N-Nitroso-di-n-propylamin		----------NA----------				
21	T	m+p-cresols	1.249	1.311	-5.0	165	0.00	4.47
22		4-methylphenol	1.249	1.311	-5.0	165	0.00	4.47
23		Benzaldehyde		----------NA----------				
24	I	Naphthalene-d8	1.000	1.000	0.0	161	0.00	5.15
25	S	Nitrobenzene-d5		----------NA----------				
26	T	Nitrobenzene		----------NA----------				
27	T	Isophorone		----------NA----------				
28	C	2-Nitrophenol	0.190	0.207	-8.9	170	0.00	4.86
29	T	2,4-Dimethylphenol	0.375	0.313	16.5	133	0.00	4.88
30	T	bis(2-Chloroethoxy)methan		----------NA----------				
		----------	True	Calc.	% Drift	----------		
31	T	Benzoic acid	50.000	42.771	14.5	138	0.00	4.95
		----------	AvgRF	CCRF	% Dev	----------		
32	C	2,4-Dichlorophenol		----------NA----------				
33	M	1,2,4-Trichlorobenzene		----------NA----------				
34	T	Naphthalene		----------NA----------				
35	T	2,6-Dichlorophenol	0.309	0.317	-2.6	163	0.00	5.23
36	T	4-Chloroaniline		----------NA----------				
37	C	Hexachlorobutadiene		----------NA----------				

9.7.3

9

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62781.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

38	C	4-Chloro-3-methylphenol	0.315	0.339	-7.6	169	0.00	5.60
39	T	2-Methylnaphthalene		----------NA----------				
40	T	1-Methylnaphthalene		----------NA----------				
41	T	1,2,4,5-Tetrachlorobenzen		----------NA----------				
42		Caprolactam		----------NA----------				
43	I	Acenaphthene-d10	1.000	1.000	0.0	155	0.00	6.60
44	T	Pentachloronitrobenzene		----------NA----------				
		----------	True	Calc.	% Drift	----------		
45	P	Hexachlorocyclopentadiene		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
46	C	2,4,6-Trichlorophenol	0.381	0.432	-13.4	168	0.00	5.97
47	T	2,4,5-Trichlorophenol	0.418	0.488	-16.7	171	0.00	6.00
48	S	2-Fluorobiphenyl		----------NA----------				
49	T	2-Chloronaphthalene		----------NA----------				
50	M	Acenaphthylene		----------NA----------				
51	T	Dimethylphthalate		----------NA----------				
52	T	2,4-Dinitrotoluene		----------NA----------				
53	C	Acenaphthene		----------NA----------				
		----------	True	Calc.	% Drift	----------		
54	P	2,4-Dinitrophenol	50.000	54.450	-8.9	166	0.00	6.66
		----------	AvgRF	CCRF	% Dev	----------		
55	T	Dibenzofuran		----------NA----------				
56	M	2,6-Dinitrotoluene		----------NA----------				
57	P	4-Nitrophenol	0.198	0.230	-16.2	159	0.00	6.71
58	T	2,3,4,6-Tetrachlorophenol	0.344	0.398	-15.7	171	0.00	6.91
59	T	Fluorene		----------NA----------				
60	T	4-Chlorophenyl-phenylethe		----------NA----------				
61	T	Diethylphthalate		----------NA----------				
62	T	2-nitroaniline		----------NA----------				
63	T	3-nitroaniline		----------NA----------				
64	T	4-nitroaniline		----------NA----------				
65		1,1'-Biphenyl		----------NA----------				
66	I	Phenanthrene-d10	1.000	1.000	0.0	159	0.00	7.96
		----------	True	Calc.	% Drift	----------		
67	T	4,6-Dinitro-2-methylpheno	50.000	49.978	0.0	166	0.00	7.15
		----------	AvgRF	CCRF	% Dev	----------		
68	C	n-Nitrosodiphenylamine		----------NA----------				
69	T	1,2-Diphenylhydrazine		----------NA----------				
70	S	2,4,6-Tribromophenol	0.111	0.122	-9.9	166	0.00	7.31
71	T	4-Bromophenyl-phenylether		----------NA----------				
72	T	Hexachlorobenzene		----------NA----------				
		----------	True	Calc.	% Drift	----------		
73	C	Pentachlorophenol	50.000	58.880	-17.8	190	0.00	7.84
		----------	AvgRF	CCRF	% Dev	----------		
74	T	Phenanthrene		----------NA----------				
75	T	Anthracene		----------NA----------				
76	T	Carbazole		----------NA----------				
77	T	Di-n-butylphthalate		----------NA----------				
78	C	Fluoranthene		----------NA----------				
79		Atrazine		----------NA----------				

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62781.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

80	I	Chrysene-d12	1.000	1.000	0.0	156	0.00	10.74
81	T	Benzidine	----------NA----------					
82	M	Pyrene	----------NA----------					
83	S	Terphenyl-d14	----------NA----------					
84		3,3-Dimethylbenzidine	----------NA----------					
85	T	Butylbenzylphthalate	----------NA----------					
86	T	3,3'-Dichlorobenzidine	----------NA----------					
87	T	Benzo[a]anthracene	----------NA----------					
88	T	Chrysene	----------NA----------					
89	T	bis(2-Ethylhexyl)phthalat	----------NA----------					
90	I	Perylene-d12	1.000	1.000	0.0	157	0.00	12.22
91	C	Di-n-octylphthalate	----------NA----------					
92	T	Benzo[b]fluoranthene	----------NA----------					
93	T	Benzo[k]fluoranthene	----------NA----------					
94	C	Benzo[a]pyrene	----------NA----------					
95	T	Indeno[1,2,3-cd]pyrene	----------NA----------					
96	T	Dibenz[a,h]anthracene	----------NA----------					
97	T	Benzo[g,h,i]perylene	----------NA----------					

(0.0 %) 0 of 20 compounds'%D > 20

(#) = Out of Range SPCC's out = 1 CCC's out = 8
f62778.D F130408_8270+.m Tue Apr 09 10:19:42 2013 R1

9.7.3

9

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62782.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\F130408\f62782.D          Vial: 10
Acq On    :  8 Apr 2013   1:32 pm                   Operator: KRISTINR
Sample    : ICV2937-20                              Inst    : MSF
Misc      : op32443,msf2937,1000,,,1,1              Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\msdchem\1\MET...\F130408_8270+.m (RTE Integrator)
Title        : SW-864 Method 8270
Last Update  : Mon Apr 08 13:02:18 2013
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	86	0.00	4.16
2		N-nitrosodimethylamine		----------NA----------				
3	T	Pyridine		----------NA----------				
4	T	Methyl Methanesulfonate		----------NA----------				
5	T	Ethyl Methanesulfonate		----------NA----------				
6	T	Aniline	0.833	0.740	11.2	73	0.00	3.94
7	S	2-Fluorophenol		----------NA----------				
8	T	bis(2-Chloroethyl)ether		----------NA----------				
9	S	Phenol-d5		----------NA----------				
10	C	Phenol		----------NA----------				
11	M	2-Chlorophenol		----------NA----------				
12	T	1,3-Dichlorobenzene		----------NA----------				
13	C	1,4-Dichlorobenzene		----------NA----------				
14	T	1,2-Dichlorobenzene		----------NA----------				
15	T	Benzyl alcohol		----------NA----------				
16	T	bis(2-chloroisopropyl)eth		----------NA----------				
17	T	o-cresol		----------NA----------				
18	T	Acetophenone		----------NA----------				
19	T	Hexachloroethane		----------NA----------				
20	P	N-Nitroso-di-n-propylamin		----------NA----------				
21	T	m+p-cresols		----------NA----------				
22		4-methylphenol		----------NA----------				
23		Benzaldehyde		----------NA----------				
24	I	Naphthalene-d8	1.000	1.000	0.0	86	0.00	5.15
25	S	Nitrobenzene-d5		----------NA----------				
26	T	Nitrobenzene		----------NA----------				
27	T	Isophorone		----------NA----------				
28	C	2-Nitrophenol		----------NA----------				
29	T	2,4-Dimethylphenol		----------NA----------				
30	T	bis(2-Chloroethoxy)methan		----------NA----------				
		----------	True	Calc.	% Drift	----------		
31	T	Benzoic acid		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
32	C	2,4-Dichlorophenol		----------NA----------				
33	M	1,2,4-Trichlorobenzene		----------NA----------				
34	T	Naphthalene		----------NA----------				
35	T	2,6-Dichlorophenol		----------NA----------				
36	T	4-Chloroaniline	0.432	0.401	7.2	78	0.00	5.22
37	C	Hexachlorobutadiene		----------NA----------				

9.7.4

9

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62782.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

38	C	4-Chloro-3-methylphenol		----------NA----------				
39	T	2-Methylnaphthalene		----------NA----------				
40	T	1-Methylnaphthalene		----------NA----------				
41	T	1,2,4,5-Tetrachlorobenzen		----------NA----------				
42		Caprolactam		----------NA----------				
43	I	Acenaphthene-d10	1.000	1.000	0.0	84	0.00	6.60
44	T	Pentachloronitrobenzene		----------NA----------				
		----------	True	Calc.	% Drift	----------		
45	P	Hexachlorocyclopentadiene		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
46	C	2,4,6-Trichlorophenol		----------NA----------				
47	T	2,4,5-Trichlorophenol		----------NA----------				
48	S	2-Fluorobiphenyl		----------NA----------				
49	T	2-Chloronaphthalene		----------NA----------				
50	M	Acenaphthylene		----------NA----------				
51	T	Dimethylphthalate		----------NA----------				
52	T	2,4-Dinitrotoluene		----------NA----------				
53	C	Acenaphthene		----------NA----------				
		----------	True	Calc.	% Drift	----------		
54	P	2,4-Dinitrophenol		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
55	T	Dibenzofuran		----------NA----------				
56	M	2,6-Dinitrotoluene		----------NA----------				
57	P	4-Nitrophenol		----------NA----------				
58	T	2,3,4,6-Tetrachlorophenol		----------NA----------				
59	T	Fluorene		----------NA----------				
60	T	4-Chlorophenyl-phenylethe		----------NA----------				
61	T	Diethylphthalate		----------NA----------				
62	T	2-nitroaniline		----------NA----------				
63	T	3-nitroaniline		----------NA----------				
64	T	4-nitroaniline		----------NA----------				
65		1,1'-Biphenyl		----------NA----------				
66	I	Phenanthrene-d10	1.000	1.000	0.0	82	0.00	7.96
		----------	True	Calc.	% Drift	----------		
67	T	4,6-Dinitro-2-methylpheno		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
68	C	n-Nitrosodiphenylamine		----------NA----------				
69	T	1,2-Diphenylhydrazine		----------NA----------				
70	S	2,4,6-Tribromophenol		----------NA----------				
71	T	4-Bromophenyl-phenylether		----------NA----------				
72	T	Hexachlorobenzene		----------NA----------				
		----------	True	Calc.	% Drift	----------		
73	C	Pentachlorophenol		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
74	T	Phenanthrene		----------NA----------				
75	T	Anthracene		----------NA----------				
76	T	Carbazole		----------NA----------				
77	T	Di-n-butylphthalate		----------NA----------				
78	C	Fluoranthene		----------NA----------				
79		Atrazine		----------NA----------				

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62782.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

80	I	Chrysene-d12	1.000	1.000	0.0	85	0.00	10.74
81	T	Benzidine	0.428	0.583	-36.2#	112	0.00	9.39
82	M	Pyrene		----------NA----------				
83	S	Terphenyl-d14		----------NA----------				
84		3,3-Dimethylbenzidine		----------NA----------				
85	T	Butylbenzylphthalate		----------NA----------				
86	T	3,3'-Dichlorobenzidine	0.386	0.373	3.4	84	0.00	10.71
87	T	Benzo[a]anthracene		----------NA----------				
88	T	Chrysene		----------NA----------				
89	T	bis(2-Ethylhexyl)phthalat		----------NA----------				
90	I	Perylene-d12	1.000	1.000	0.0	88	0.00	12.22
91	C	Di-n-octylphthalate		----------NA----------				
92	T	Benzo[b]fluoranthene		----------NA----------				
93	T	Benzo[k]fluoranthene		----------NA----------				
94	C	Benzo[a]pyrene		----------NA----------				
95	T	Indeno[1,2,3-cd]pyrene		----------NA----------				
96	T	Dibenz[a,h]anthracene		----------NA----------				
97	T	Benzo[g,h,i]perylene		----------NA----------				

(25.0 %) 1 of 4 compounds'%D > 20

(#) = Out of Range SPCC's out = 2 CCC's out = 13
f62777.D F130408_8270+.m Tue Apr 09 10:21:25 2013 R1

9.7.4

9

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62783.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : C:\msdchem\1\DATA\F130408\f62783.D          Vial: 11
Acq On    :  8 Apr 2013   1:57 pm                   Operator: KRISTINR
Sample    : ICV2937-20                              Inst    : MSF
Misc      : op32443,msf2937,1000,,,1,1              Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : C:\msdchem\1\MET...\F130408_8270+.m (RTE Integrator)
Title        : SW-864 Method 8270
Last Update  : Mon Apr 08 13:02:18 2013
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	110	0.00	4.16
2		N-nitrosodimethylamine		----------NA----------				
3	T	Pyridine		----------NA----------				
4	T	Methyl Methanesulfonate		----------NA----------				
5	T	Ethyl Methanesulfonate		----------NA----------				
6	T	Aniline		----------NA----------				
7	S	2-Fluorophenol		----------NA----------				
8	T	bis(2-Chloroethyl)ether		----------NA----------				
9	S	Phenol-d5		----------NA----------				
10	C	Phenol		----------NA----------				
11	M	2-Chlorophenol		----------NA----------				
12	T	1,3-Dichlorobenzene		----------NA----------				
13	C	1,4-Dichlorobenzene		----------NA----------				
14	T	1,2-Dichlorobenzene		----------NA----------				
15	T	Benzyl alcohol		----------NA----------				
16	T	bis(2-chloroisopropyl)eth		----------NA----------				
17	T	o-cresol		----------NA----------				
18	T	Acetophenone		----------NA----------				
19	T	Hexachloroethane		----------NA----------				
20	P	N-Nitroso-di-n-propylamin		----------NA----------				
21	T	m+p-cresols		----------NA----------				
22		4-methylphenol		----------NA----------				
23		Benzaldehyde	3.974	2.854	28.2#	79	0.00	4.48
24	I	Naphthalene-d8	1.000	1.000	0.0	110	0.00	5.15
25	S	Nitrobenzene-d5		----------NA----------				
26	T	Nitrobenzene		----------NA----------				
27	T	Isophorone		----------NA----------				
28	C	2-Nitrophenol		----------NA----------				
29	T	2,4-Dimethylphenol		----------NA----------				
30	T	bis(2-Chloroethoxy)methan		----------NA----------				
		----------	True	Calc.	% Drift	----------		
31	T	Benzoic acid		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
32	C	2,4-Dichlorophenol		----------NA----------				
33	M	1,2,4-Trichlorobenzene		----------NA----------				
34	T	Naphthalene		----------NA----------				
35	T	2,6-Dichlorophenol		----------NA----------				
36	T	4-Chloroaniline		----------NA----------				
37	C	Hexachlorobutadiene		----------NA----------				

9.7.5

9

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62783.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

38	C	4-Chloro-3-methylphenol		----------NA----------				
39	T	2-Methylnaphthalene		----------NA----------				
40	T	1-Methylnaphthalene		----------NA----------				
41	T	1,2,4,5-Tetrachlorobenzen		----------NA----------				
42		Caprolactam	0.115	0.117	-1.7	111	0.00	5.45
43	I	Acenaphthene-d10	1.000	1.000	0.0	109	0.00	6.60
44	T	Pentachloronitrobenzene		----------NA----------				
		----------	True	Calc.	% Drift	----------		
45	P	Hexachlorocyclopentadiene		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
46	C	2,4,6-Trichlorophenol		----------NA----------				
47	T	2,4,5-Trichlorophenol		----------NA----------				
48	S	2-Fluorobiphenyl		----------NA----------				
49	T	2-Chloronaphthalene		----------NA----------				
50	M	Acenaphthylene		----------NA----------				
51	T	Dimethylphthalate		----------NA----------				
52	T	2,4-Dinitrotoluene		----------NA----------				
53	C	Acenaphthene		----------NA----------				
		----------	True	Calc.	% Drift	----------		
54	P	2,4-Dinitrophenol		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
55	T	Dibenzofuran		----------NA----------				
56	M	2,6-Dinitrotoluene		----------NA----------				
57	P	4-Nitrophenol		----------NA----------				
58	T	2,3,4,6-Tetrachlorophenol		----------NA----------				
59	T	Fluorene		----------NA----------				
60	T	4-Chlorophenyl-phenylethe		----------NA----------				
61	T	Diethylphthalate		----------NA----------				
62	T	2-nitroaniline		----------NA----------				
63	T	3-nitroaniline		----------NA----------				
64	T	4-nitroaniline		----------NA----------				
65		1,1'-Biphenyl	1.304	1.422	-9.0	116	0.00	6.10
66	I	Phenanthrene-d10	1.000	1.000	0.0	109	0.00	7.96
		----------	True	Calc.	% Drift	----------		
67	T	4,6-Dinitro-2-methylpheno		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
68	C	n-Nitrosodiphenylamine		----------NA----------				
69	T	1,2-Diphenylhydrazine		----------NA----------				
70	S	2,4,6-Tribromophenol		----------NA----------				
71	T	4-Bromophenyl-phenylether		----------NA----------				
72	T	Hexachlorobenzene		----------NA----------				
		----------	True	Calc.	% Drift	----------		
73	C	Pentachlorophenol		----------NA----------				
		----------	AvgRF	CCRF	% Dev	----------		
74	T	Phenanthrene		----------NA----------				
75	T	Anthracene		----------NA----------				
76	T	Carbazole		----------NA----------				
77	T	Di-n-butylphthalate		----------NA----------				
78	C	Fluoranthene		----------NA----------				
79		Atrazine	0.199	0.207	-4.0	114	0.00	7.69

Initial Calibration Verification

Job Number: JB39590 **Sample:** MSF2937-ICV2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F62783.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

80	I	Chrysene-d12	1.000	1.000	0.0	112	0.00	10.74
81	T	Benzidine	----------NA----------					
82	M	Pyrene	----------NA----------					
83	S	Terphenyl-d14	----------NA----------					
84		3,3-Dimethylbenzidine	----------NA----------					
85	T	Butylbenzylphthalate	----------NA----------					
86	T	3,3'-Dichlorobenzidine	----------NA----------					
87	T	Benzo[a]anthracene	----------NA----------					
88	T	Chrysene	----------NA----------					
89	T	bis(2-Ethylhexyl)phthalat	----------NA----------					
90	I	Perylene-d12	1.000	1.000	0.0	112	0.00	12.22
91	C	Di-n-octylphthalate	----------NA----------					
92	T	Benzo[b]fluoranthene	----------NA----------					
93	T	Benzo[k]fluoranthene	----------NA----------					
94	C	Benzo[a]pyrene	----------NA----------					
95	T	Indeno[1,2,3-cd]pyrene	----------NA----------					
96	T	Dibenz[a,h]anthracene	----------NA----------					
97	T	Benzo[g,h,i]perylene	----------NA----------					

(25.0 %) 1 of 4 compounds'%D > 20

(#) = Out of Range SPCC's out = 2 CCC's out = 13
f62777.D F130408_8270+.m Tue Apr 09 10:22:41 2013 R1

9.7.5

9

Continuing Calibration Summary

Job Number: JB39590 **Sample:** MSF3028-CC2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F65268.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Evaluate Continuing Calibration Report

```
Data File : F:\1\DATA\F130627\F65268.D                    Vial: 100
Acq On    : 27 Jun 2013   5:48 pm                    Operator: kristinr
Sample    : CC2937-50                                Inst    : MSF
Misc      : OP33659,MSF3028,,,,1,1                   Multiplr: 1.00
MS Integration Params: RTEINT.P

Method       : F:\1\METHODS\F13..._8270+.E.02.01.m (RTE Integrator)
Title        : SW-864 Method 8270
Last Update  : Tue Jul 02 11:27:47 2013
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	111	0.00	3.37
2		N-nitrosodimethylamine	0.764	0.732	4.2	102	0.02	1.43
3	T	Pyridine	1.467	1.399	4.6	104	-0.87#	1.43
4	T	Methyl Methanesulfonate	0.654	0.700	-7.0	111	0.00	2.30
5	T	Ethyl Methanesulfonate	0.927	0.944	-1.8	113	0.00	2.83
6	T	Aniline	0.833	0.758	9.0	96	0.00	3.14
7	S	2-Fluorophenol	1.157	1.174	-1.5	104	0.00	2.42
8	T	bis(2-Chloroethyl)ether	0.858	1.005	-17.1	127	0.00	3.20
9	S	Phenol-d5	1.474	1.483	-0.6	107	0.00	3.17
10	C	Phenol	1.626	1.592	2.1	103	0.00	3.17
11	M	2-Chlorophenol	1.271	1.235	2.8	104	0.00	3.24
12	T	1,3-Dichlorobenzene	1.465	1.468	-0.2	110	0.00	3.34
13	C	1,4-Dichlorobenzene	1.574	1.563	0.7	112	0.00	3.38
14	T	1,2-Dichlorobenzene	1.389	1.406	-1.2	107	0.00	3.54
15	T	Benzyl alcohol		----------NA----------				
16	T	bis(2-chloroisopropyl)eth	1.127	1.132	-0.4	110	0.00	3.65
17	T	o-cresol	1.230	1.428	-16.1	123	0.00	3.67
18	T	Acetophenone	1.822	1.874	-2.9	111	0.00	3.74
19	T	Hexachloroethane	0.549	0.569	-3.6	114	0.00	3.79
20	P	N-Nitroso-di-n-propylamin	0.917	0.966	-5.3	112	0.00	3.78
21	T	m+p-cresols	1.249	1.404	-12.4	123	0.00	3.80
22		4-methylphenol	1.249	1.391	-11.4	122	0.00	3.80
23		Benzaldehyde	3.974	3.303	16.9	91	0.72#	3.74
24	I	Naphthalene-d8	1.000	1.000	0.0	110	0.00	4.47
25	S	Nitrobenzene-d5	0.357	0.395	-10.6	113	0.00	3.87
26	T	Nitrobenzene	0.380	0.407	-7.1	116	0.00	3.89
27	T	Isophorone	0.582	0.620	-6.5	113	0.00	4.09
28	C	2-Nitrophenol	0.190	0.199	-4.7	112	0.00	4.17
29	T	2,4-Dimethylphenol	0.375	0.370	1.3	107	0.00	4.24
30	T	bis(2-Chloroethoxy)methan	0.379	0.381	-0.5	106	0.00	4.31
		----------	True	Calc.	% Drift	----------		
31	T	Benzoic acid	50.000	62.721	-25.4#	149	0.00	4.39
		----------	AvgRF	CCRF	% Dev	----------		
32	C	2,4-Dichlorophenol	0.299	0.314	-5.0	109	0.00	4.39
33	M	1,2,4-Trichlorobenzene	0.352	0.362	-2.8	113	0.00	4.44
34	T	Naphthalene	0.998	1.022	-2.4	112	0.00	4.49
35	T	2,6-Dichlorophenol	0.309	0.303	1.9	106	0.00	4.59
36	T	4-Chloroaniline	0.432	0.434	-0.5	105	0.00	4.58
37	C	Hexachlorobutadiene	0.228	0.243	-6.6	113	0.00	4.66

Continuing Calibration Summary

Job Number: JB39590 **Sample:** MSF3028-CC2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F65268.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

38	C	4-Chloro-3-methylphenol	0.315	0.325	-3.2	111	0.00	5.08
39	T	2-Methylnaphthalene	0.691	0.757	-9.6	119	0.00	5.12
40	T	1-Methylnaphthalene	0.666	0.677	-1.7	110	0.00	5.21
41	T	1,2,4,5-Tetrachlorobenzen	0.415	0.439	-5.8	115	0.00	5.31
42		Caprolactam	0.115	0.132	-14.8	122	0.01	4.88
43	I	Acenaphthene-d10	1.000	1.000	0.0	112	0.00	6.08
44	T	Pentachloronitrobenzene	0.173	0.196	-13.3	121	0.00	7.42
		----------	True	Calc.	% Drift	----------		
45	P	Hexachlorocyclopentadiene	100.000	79.268	20.7#	91	0.00	5.33
		----------	AvgRF	CCRF	% Dev	----------		
46	C	2,4,6-Trichlorophenol	0.381	0.371	2.6	105	0.00	5.42
47	T	2,4,5-Trichlorophenol	0.418	0.456	-9.1	116	0.00	5.47
48	S	2-Fluorobiphenyl	1.329	1.339	-0.8	111	0.00	5.48
49	T	2-Chloronaphthalene	1.043	1.082	-3.7	112	0.00	5.56
50	M	Acenaphthylene	1.730	1.785	-3.2	112	0.00	5.94
51	T	Dimethylphthalate	1.288	1.292	-0.3	113	0.00	5.91
52	T	2,4-Dinitrotoluene	0.377	0.409	-8.5	114	0.00	6.33
53	C	Acenaphthene	1.102	1.118	-1.5	112	0.00	6.11
		----------	True	Calc.	% Drift	----------		
54	P	2,4-Dinitrophenol	50.000	62.228	-24.5#	144	0.00	6.20
		----------	AvgRF	CCRF	% Dev	----------		
55	T	Dibenzofuran	1.619	1.623	-0.2	111	0.00	6.26
56	M	2,6-Dinitrotoluene	0.287	0.302	-5.2	112	0.00	5.97
57	P	4-Nitrophenol	0.198	0.237	-19.7	119	0.00	6.33
58	T	2,3,4,6-Tetrachlorophenol	0.344	0.365	-6.1	114	0.00	6.43
59	T	Fluorene	1.262	1.302	-3.2	113	0.00	6.58
60	T	4-Chlorophenyl-phenylethe	0.703	0.693	1.4	109	0.00	6.59
61	T	Diethylphthalate	1.164	1.225	-5.2	115	0.00	6.57
62	T	2-nitroaniline	0.354	0.366	-3.4	114	0.00	5.70
63	T	3-nitroaniline	0.295	0.311	-5.4	111	0.00	6.09
64	T	4-nitroaniline	0.295	0.306	-3.7	109	0.00	6.67
65		1,1'-Biphenyl	1.304	1.420	-8.9	117	0.00	5.56
66	I	Phenanthrene-d10	1.000	1.000	0.0	114	0.00	7.44
		----------	True	Calc.	% Drift	----------		
67	T	4,6-Dinitro-2-methylpheno	50.000	53.382	-6.8	128	0.00	6.71
		----------	AvgRF	CCRF	% Dev	----------		
68	C	n-Nitrosodiphenylamine	0.498	0.505	-1.4	113	0.00	6.71
69	T	1,2-Diphenylhydrazine	0.612	0.637	-4.1	113	0.00	6.73
70	S	2,4,6-Tribromophenol	0.111	0.119	-7.2	116	0.00	6.82
71	T	4-Bromophenyl-phenylether	0.233	0.239	-2.6	110	0.00	7.03
72	T	Hexachlorobenzene	0.259	0.268	-3.5	115	0.00	7.16
		----------	True	Calc.	% Drift	----------		
73	C	Pentachlorophenol	50.000	51.999	-4.0	118	0.00	7.36
		----------	AvgRF	CCRF	% Dev	----------		
74	T	Phenanthrene	1.029	1.026	0.3	112	0.00	7.47
75	T	Anthracene	1.060	1.067	-0.7	111	0.00	7.51
76	T	Carbazole	0.928	0.946	-1.9	111	0.00	7.70
77	T	Di-n-butylphthalate	1.049	1.115	-6.3	113	0.00	8.15
78	C	Fluoranthene	1.191	1.229	-3.2	112	0.00	8.69
79		Atrazine	0.199	0.187	6.0	100	0.00	7.27

Continuing Calibration Summary

Job Number: JB39590 **Sample:** MSF3028-CC2937
Account: ALNJ Accutest New Jersey **Lab FileID:** F65268.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

80	I	Chrysene-d12	1.000	1.000	0.0	110	0.00	10.22
81	T	Benzidine	0.428	0.329	23.1#	85	0.00	8.88
82	M	Pyrene	1.143	1.206	-5.5	113	0.00	8.93
83	S	Terphenyl-d14	0.873	0.935	-7.1	113	0.00	9.15
84		3,3-Dimethylbenzidine	0.475	0.322	32.2#	91	0.00	9.69
85	T	Butylbenzylphthalate	0.382	0.429	-12.3	119	0.00	9.75
86	T	3,3'-Dichlorobenzidine	0.386	0.411	-6.5	112	0.00	10.23
87	T	Benzo[a]anthracene	1.012	0.978	3.4	103	0.00	10.20
88	T	Chrysene	1.012	0.984	2.8	105	0.00	10.25
89	T	bis(2-Ethylhexyl)phthalat	0.531	0.592	-11.5	117	0.00	10.40
90	I	Perylene-d12	1.000	1.000	0.0	113	0.00	11.66
91	C	Di-n-octylphthalate	0.922	1.036	-12.4	120	0.00	11.03
92	T	Benzo[b]fluoranthene	1.199	1.142	4.8	103	0.00	11.30
93	T	Benzo[k]fluoranthene	1.088	1.109	-1.9	114	0.01	11.33
94	C	Benzo[a]pyrene	1.082	1.093	-1.0	109	0.00	11.61
95	T	Indeno[1,2,3-cd]pyrene	1.287	1.326	-3.0	116	0.00	12.64
96	T	Dibenz[a,h]anthracene	1.075	1.095	-1.9	116	0.00	12.65
97	T	Benzo[g,h,i]perylene	1.053	1.088	-3.3	119	0.00	12.85

(5.6 %) 5 of 90 compounds'%D > 20

(#) = Out of Range SPCC's out = 0 CCC's out = 0
F65313.D F130408_8270+.E.02.01.m Tue Jul 02 16:57:28 2013

9.7.6

New Jersey

ACCUTEST LABORATORIES

GC/MS Semi-volatiles

Raw Data

(Accutest Labs of New England, Inc.)

Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130627\
Data File : F65294.D
Acq On : 28 Jun 2013 3:46 am
Operator : kristinr
Sample : JB39590-1
Misc : OP33660,MSF3028,20.45,,,1,5
ALS Vial : 49 Sample Multiplier: 1

Quant Time: Jul 10 11:25:50 2013
Quant Method : F:\1\METHODS\F130408_8270-STAR.E.02.01.m
Quant Title : SW-864 Method 8270
QLast Update : Tue Jul 02 11:27:47 2013
Response via : Initial Calibration

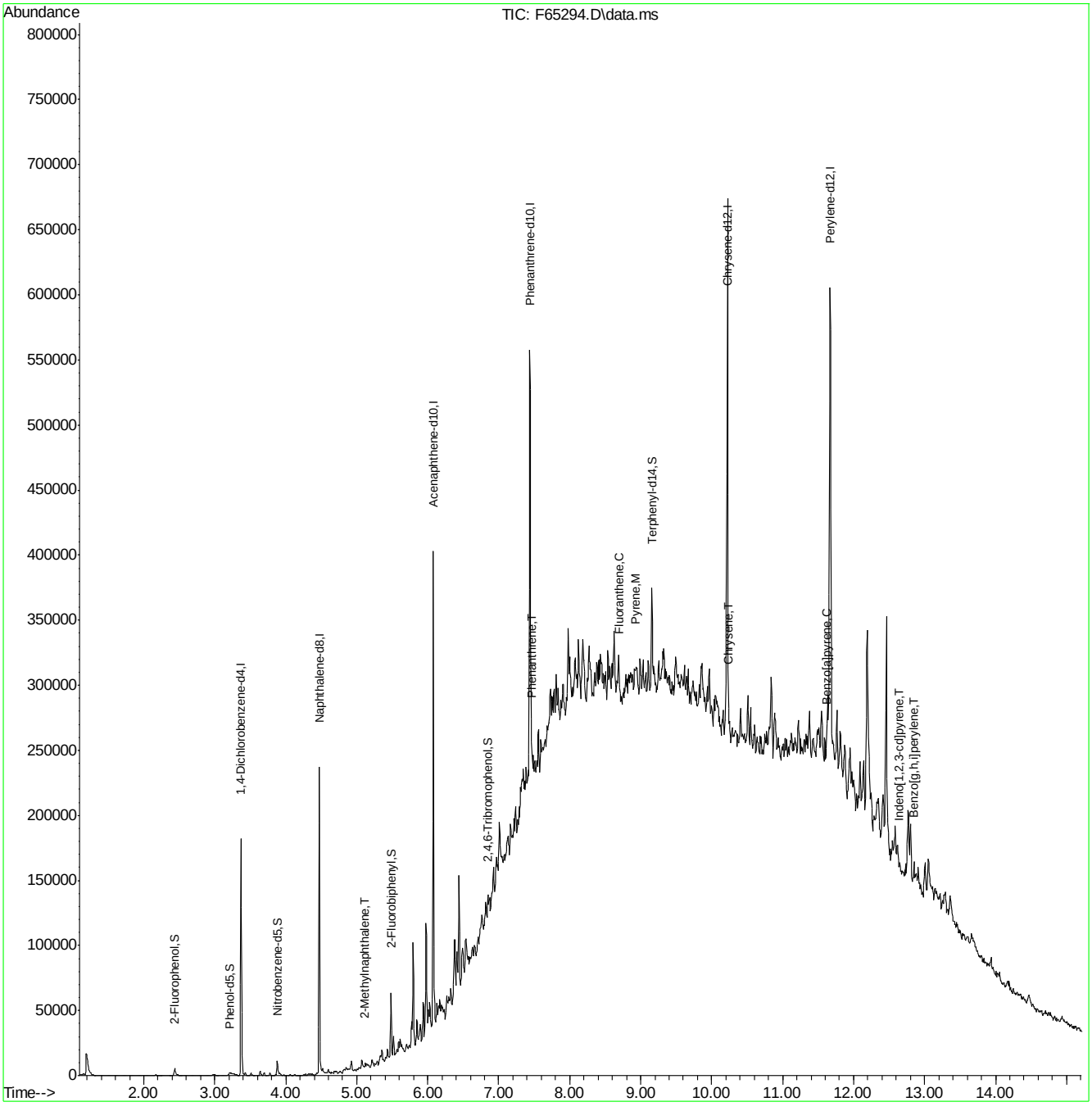
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) 1,4-Dichlorobenzene-d4	3.368	152	27482	40.00 ppm	-0.14
4) Naphthalene-d8	4.472	136	102182	40.00 ppm	-0.15
9) Acenaphthene-d10	6.076	164	68367	40.00 ppm	-0.16
14) Phenanthrene-d10	7.438	188	125823	40.00 ppm	-0.17
19) Chrysene-d12	10.223	240	142482	40.00 ppm	-0.18
24) Perylene-d12	11.668	264	147927	40.00 ppm	-0.19
System Monitoring Compounds					
2) 2-Fluorophenol	2.433	112	3698	4.65 ppm	-0.12
Spiked Amount 100.000	Range 30 - 130		Recovery	= 4.65%#	
3) Phenol-d5	3.209	99	4870	4.81 ppm	-0.09
Spiked Amount 100.000	Range 30 - 130		Recovery	= 4.81%#	
5) Nitrobenzene-d5	3.879	82	5197	5.70 ppm	-0.14
Spiked Amount 50.000	Range 30 - 130		Recovery	= 11.40%#	
10) 2-Fluorobiphenyl	5.482	172	13688	6.02 ppm	-0.15
Spiked Amount 50.000	Range 30 - 130		Recovery	= 12.04%#	
15) 2,4,6-Tribromophenol	6.839	330	1606	4.60 ppm	-0.14
Spiked Amount 100.000	Range 30 - 130		Recovery	= 4.60%#	
21) Terphenyl-d14	9.160	244	24225	7.79 ppm	-0.18
Spiked Amount 50.000	Range 30 - 130		Recovery	= 15.58%#	
Target Compounds					Qvalue
7) 2-Methylnaphthalene	5.118	142	1064	0.60 ppm	83
16) Phenanthrene	7.462	178	2666	0.82 ppm	75
18) Fluoranthene	8.696	202	1523	0.41 ppm	91
20) Pyrene	8.931	202	5372	1.32 ppm	97
23) Chrysene	10.241	228	2508	0.70 ppm	89
27) Benzo[a]pyrene	11.615	252	2247	0.56 ppm	91
28) Indeno[1,2,3-cd]pyrene	12.643	276	1807	0.38 ppm	100
30) Benzo[g,h,i]perylene	12.849	276	3652	0.94 ppm	94

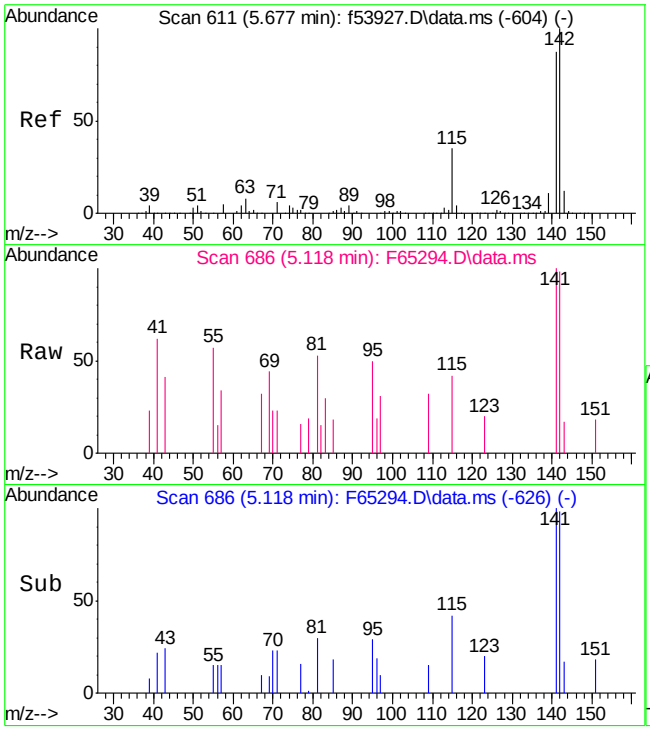
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130627\
Data File : F65294.D
Acq On : 28 Jun 2013 3:46 am
Operator : kristinr
Sample : JB39590-1
Misc : OP33660,MSF3028,20.45,,,1,5
ALS Vial : 49 Sample Multiplier: 1

Quant Time: Jul 10 11:25:50 2013
Quant Method : F:\1\METHODS\F130408_8270-STAR.E.02.01.m
Quant Title : SW-864 Method 8270
QLast Update : Tue Jul 02 11:27:47 2013
Response via : Initial Calibration

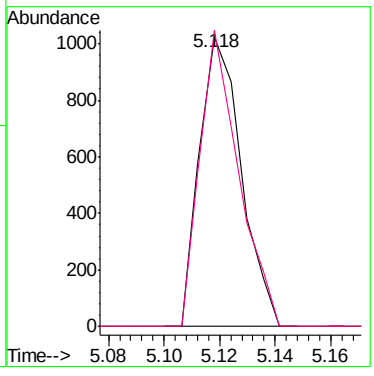


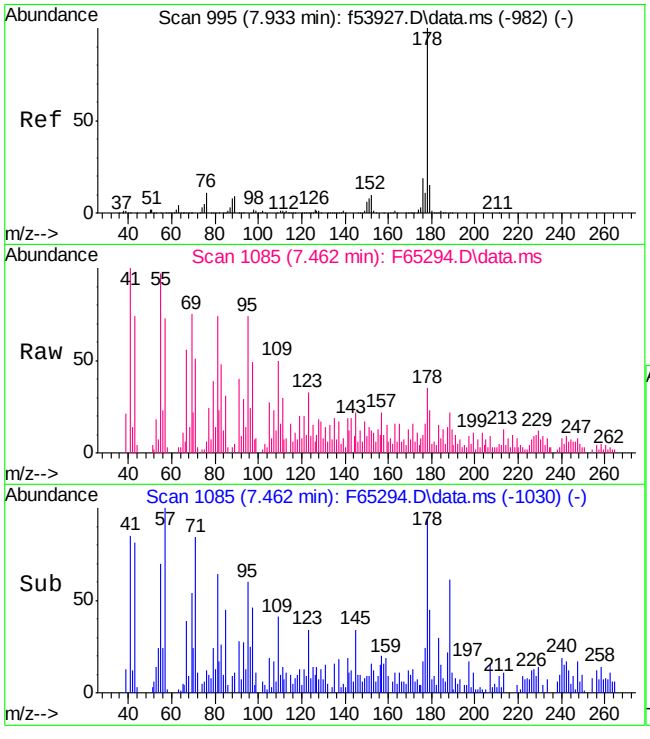


#7
2-Methylnaphthalene
Concen: 0.60 ppm
RT: 5.118 min Scan# 686
Delta R.T. -0.150 min
Lab File: F65294.D
Acq: 28 Jun 2013 3:46 am

Tgt Ion:142 Resp: 1064

Ion	Ratio	Lower	Upper
142	100		
141	102.2	56.7	116.7

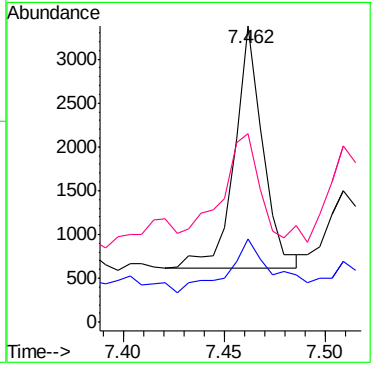




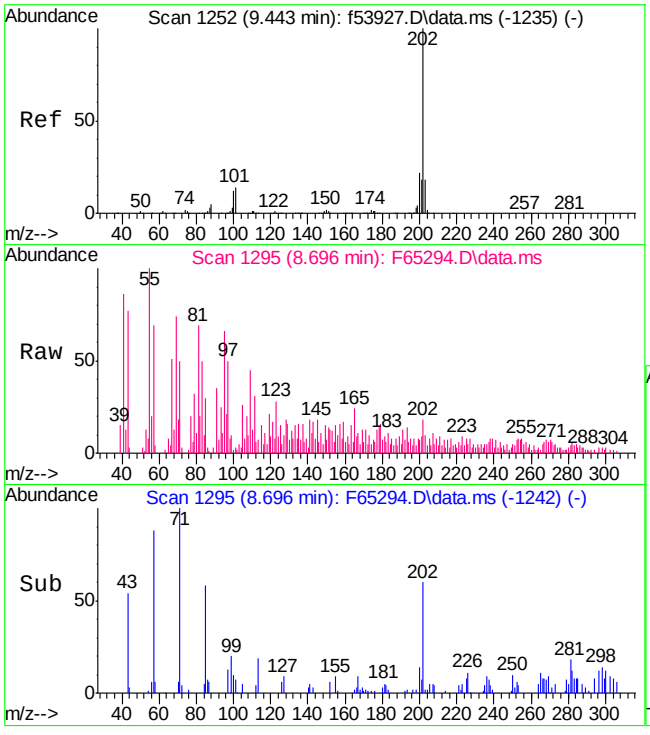
#16
Phenanthrene
Concen: 0.82 ppm
RT: 7.462 min Scan# 1085
Delta R.T. -0.179 min
Lab File: F65294.D
Acq: 28 Jun 2013 3:46 am

Tgt Ion:178 Resp: 2666

Ion	Ratio	Lower	Upper
178	100		
179	38.1	0.0	45.4
176	18.3	0.0	49.3



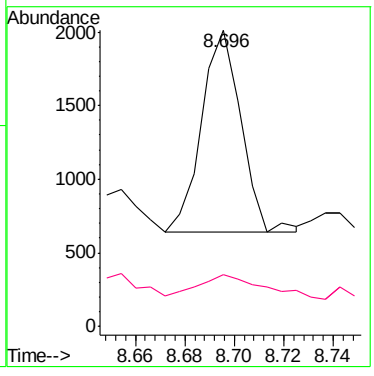
10.1.1
10

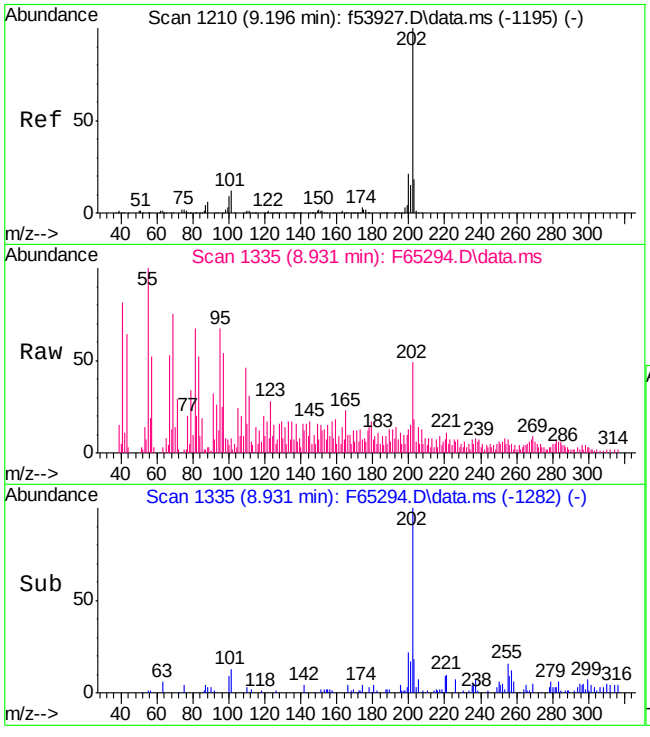


#18
Fluoranthene
Concen: 0.41 ppm
RT: 8.696 min Scan# 1295
Delta R.T. -0.190 min
Lab File: F65294.D
Acq: 28 Jun 2013 3:46 am

Tgt Ion:202 Resp: 1523

Ion	Ratio	Lower	Upper
202	100		
101	10.5	0.0	44.3

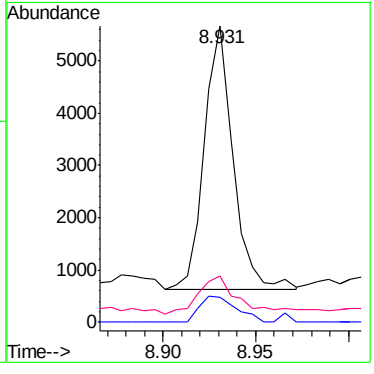


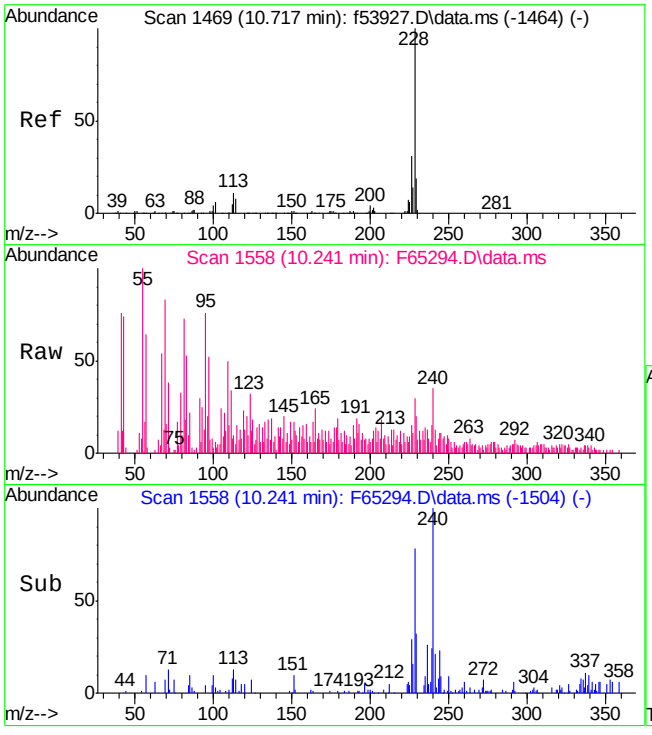


#20
Pyrene
Concen: 1.32 ppm
RT: 8.931 min Scan# 1335
Delta R.T. -0.190 min
Lab File: F65294.D
Acq: 28 Jun 2013 3:46 am

Tgt Ion:202 Resp: 5372

Ion	Ratio	Lower	Upper
202	100		
101	14.4	0.0	42.3
100	9.3	0.0	39.4

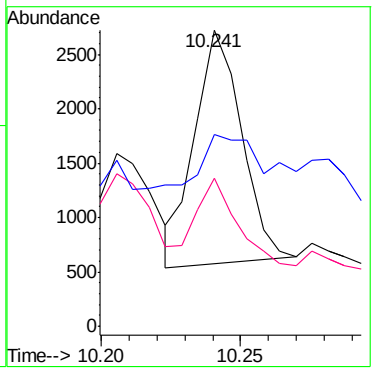


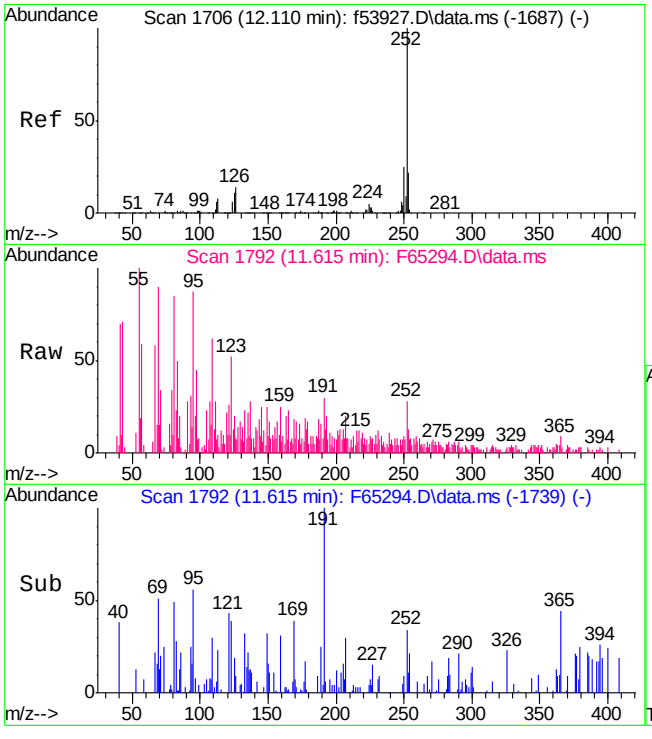


#23
Chrysene
Concen: 0.70 ppm
RT: 10.241 min Scan# 1558
Delta R.T. -0.185 min
Lab File: F65294.D
Acq: 28 Jun 2013 3:46 am

Tgt Ion:228 Resp: 2508

Ion	Ratio	Lower	Upper
228	100		
226	38.9	0.7	60.7
229	22.3	0.0	49.5

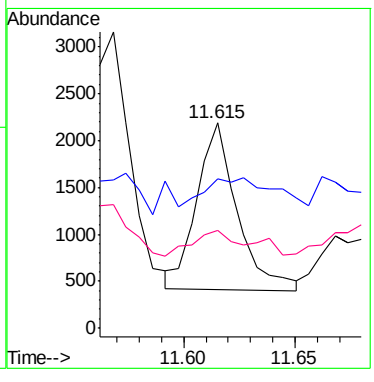


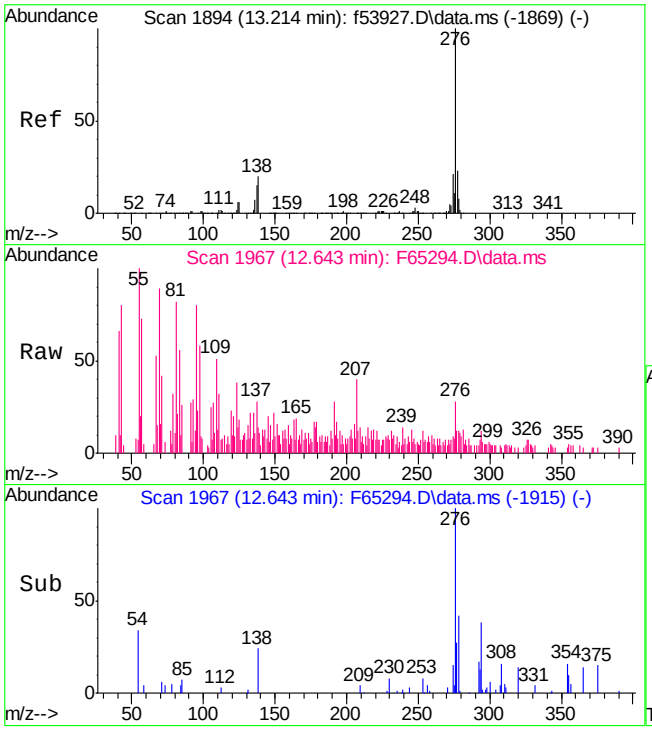


#27
Benzo[a]pyrene
Concen: 0.56 ppm
RT: 11.615 min Scan# 1792
Delta R.T. -0.191 min
Lab File: F65294.D
Acq: 28 Jun 2013 3:46 am

Tgt Ion:252 Resp: 2247

Ion	Ratio	Lower	Upper
252	100		
253	15.9	0.0	51.5
125	12.5	0.0	41.1

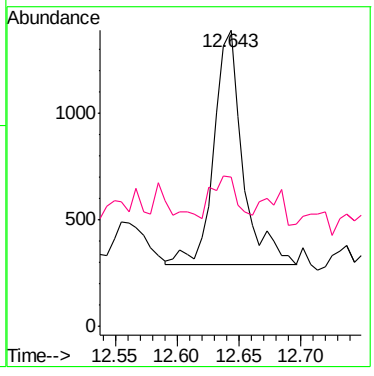


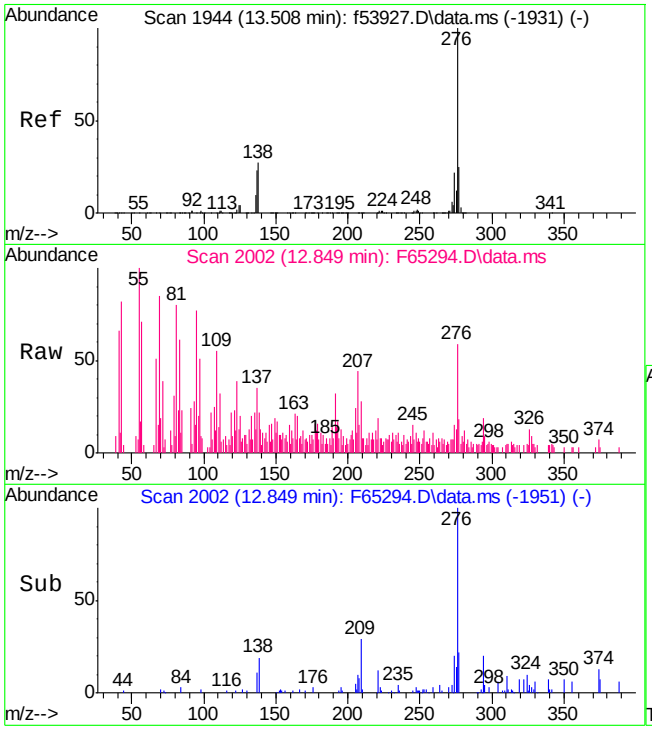


#28
Indeno[1,2,3-cd]pyrene
Concen: 0.38 ppm
RT: 12.643 min Scan# 1967
Delta R.T. -0.197 min
Lab File: F65294.D
Acq: 28 Jun 2013 3:46 am

Tgt Ion:276 Resp: 1807

Ion	Ratio	Lower	Upper
276	100		
138	20.1	0.0	50.2

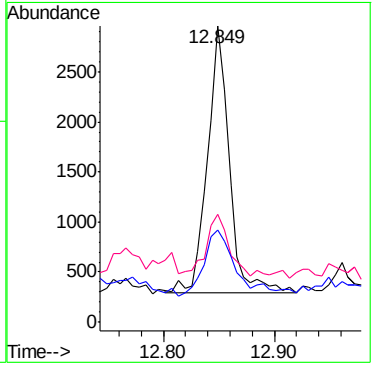




#30
Benzo[g,h,i]perylene
Concen: 0.94 ppm
RT: 12.849 min Scan# 2002
Delta R.T. -0.202 min
Lab File: F65294.D
Acq: 28 Jun 2013 3:46 am

Tgt Ion:276 Resp: 3652

Ion	Ratio	Lower	Upper
276	100		
138	22.0	0.0	56.7
277	23.6	0.0	54.5



Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130627\
Data File : F65295.D
Acq On : 28 Jun 2013 4:09 am
Operator : kristinr
Sample : JB39590-2
Misc : OP33660,MSF3028,20.64,,,1,1
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Jul 10 11:26:27 2013
Quant Method : F:\1\METHODS\F130408_8270-STAR.E.02.01.m
Quant Title : SW-864 Method 8270
QLast Update : Tue Jul 02 11:27:47 2013
Response via : Initial Calibration

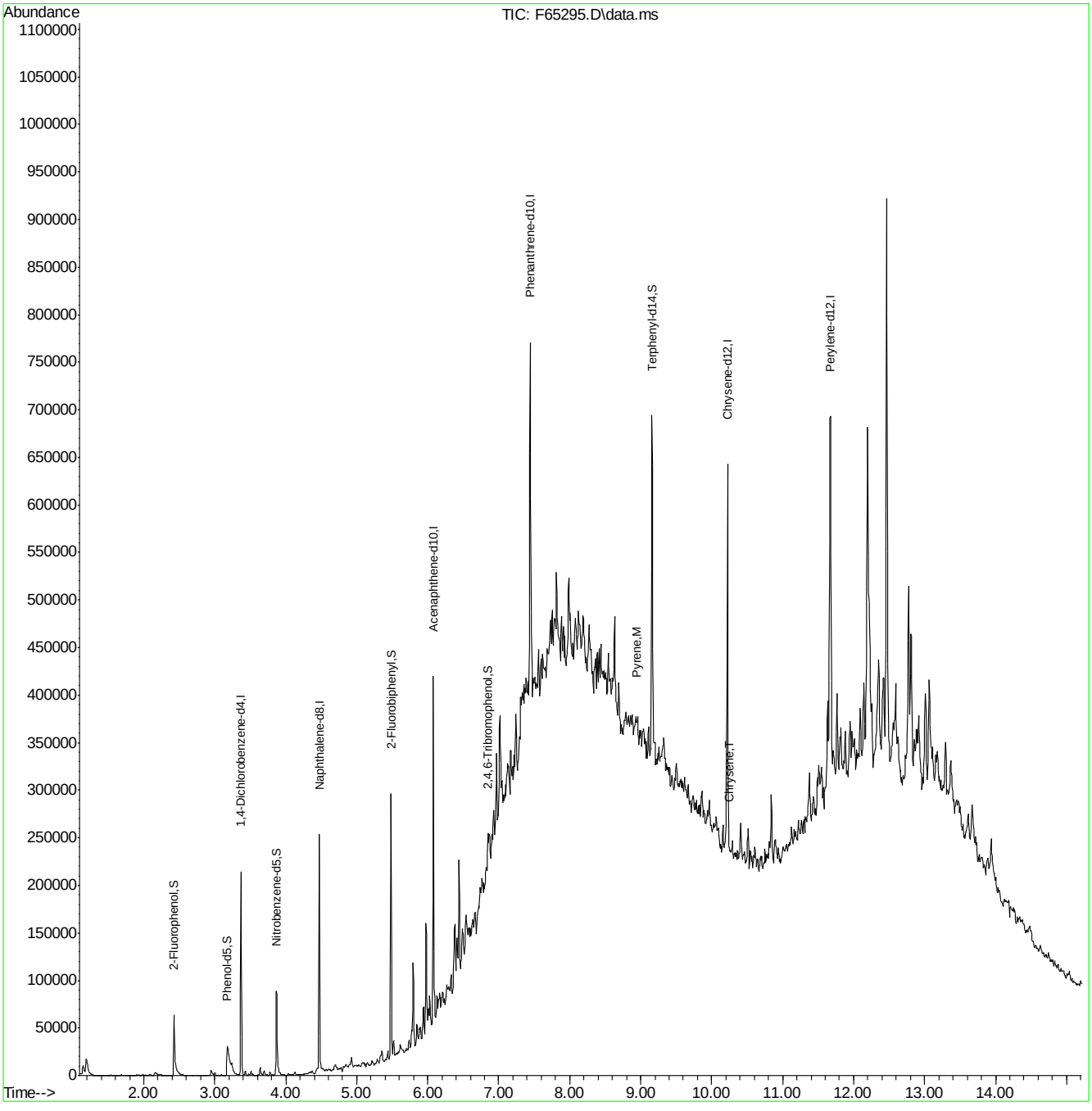
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) 1,4-Dichlorobenzene-d4	3.368	152	28960	40.00 ppm	-0.14
4) Naphthalene-d8	4.472	136	106624	40.00 ppm	-0.15
9) Acenaphthene-d10	6.076	164	71257	40.00 ppm	-0.16
14) Phenanthrene-d10	7.445	188	129656	40.00 ppm	-0.17
19) Chrysene-d12	10.223	240	143746	40.00 ppm	-0.18
24) Perylene-d12	11.674	264	150068	40.00 ppm	-0.18
System Monitoring Compounds					
2) 2-Fluorophenol	2.422	112	27282	32.58 ppm	-0.13
Spiked Amount 100.000	Range 30 - 130		Recovery = 32.58%		
3) Phenol-d5	3.174	99	34057	31.91 ppm	-0.13
Spiked Amount 100.000	Range 30 - 130		Recovery = 31.91%		
5) Nitrobenzene-d5	3.867	82	33517	35.22 ppm	-0.15
Spiked Amount 50.000	Range 30 - 130		Recovery = 70.44%		
10) 2-Fluorobiphenyl	5.482	172	80490	33.99 ppm	-0.15
Spiked Amount 50.000	Range 30 - 130		Recovery = 67.98%		
15) 2,4,6-Tribromophenol	6.851	330	13593	37.75 ppm	-0.13
Spiked Amount 100.000	Range 30 - 130		Recovery = 37.75%		
21) Terphenyl-d14	9.160	244	124918	39.83 ppm	-0.18
Spiked Amount 50.000	Range 30 - 130		Recovery = 79.66%		
Target Compounds					Qvalue
20) Pyrene	8.937	202	2464	0.60 ppm	84
23) Chrysene	10.247	228	1039	0.29 ppm	80

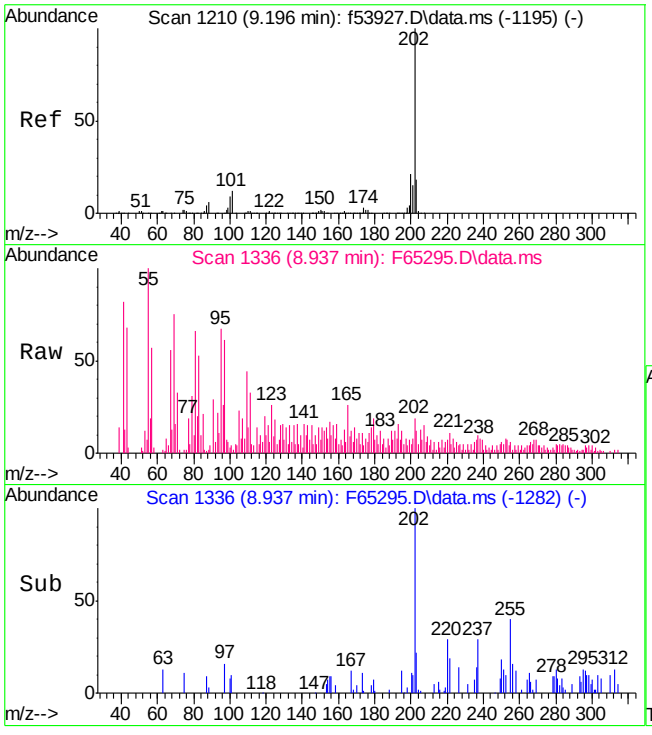
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130627\
Data File : F65295.D
Acq On : 28 Jun 2013 4:09 am
Operator : kristinr
Sample : JB39590-2
Misc : OP33660,MSF3028,20.64,,,1,1
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Jul 10 11:26:27 2013
Quant Method : F:\1\METHODS\F130408_8270-STAR.E.02.01.m
Quant Title : SW-864 Method 8270
QLast Update : Tue Jul 02 11:27:47 2013
Response via : Initial Calibration

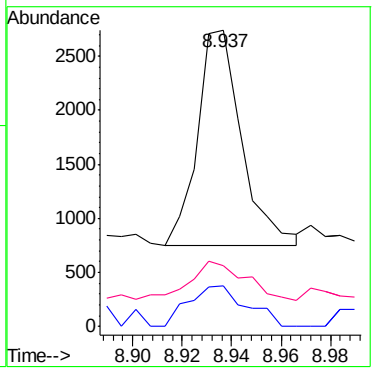


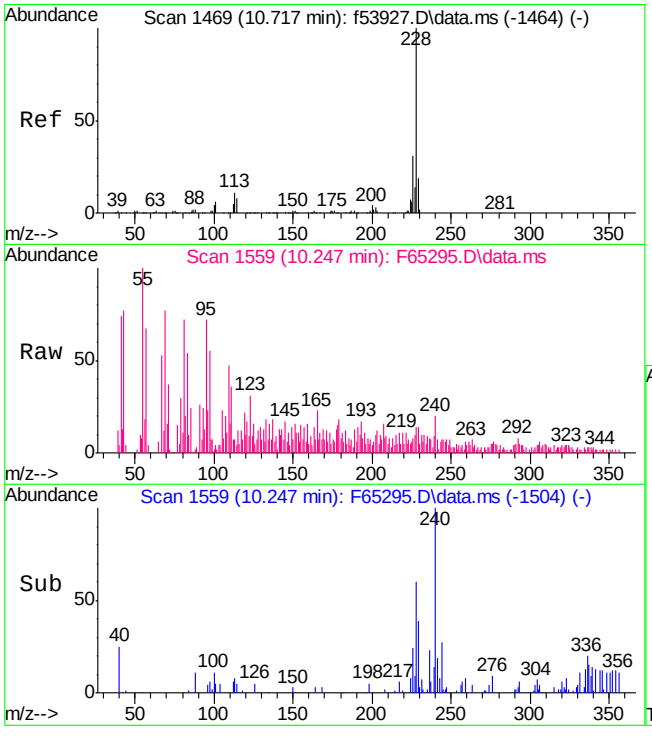


#20
Pyrene
Concen: 0.60 ppm
RT: 8.937 min Scan# 1336
Delta R.T. -0.184 min
Lab File: F65295.D
Acq: 28 Jun 2013 4:09 am

Tgt Ion:202 Resp: 2464

Ion	Ratio	Lower	Upper
202	100		
101	16.0	0.0	42.3
100	18.6	0.0	39.4

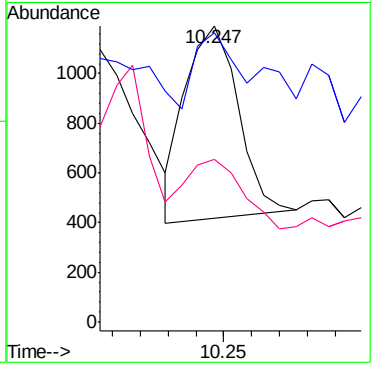




#23
Chrysene
Concen: 0.29 ppm
RT: 10.247 min Scan# 1559
Delta R.T. -0.179 min
Lab File: F65295.D
Acq: 28 Jun 2013 4:09 am

Tgt Ion:228 Resp: 1039

Ion	Ratio	Lower	Upper
228	100		
226	36.3	0.7	60.7
229	35.8	0.0	49.5



Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130627\
Data File : F65269.D
Acq On : 27 Jun 2013 6:11 pm
Operator : kristinr
Sample : OP33660-MB
Misc : OP33660,MSF3028,20.84,,,1,1
ALS Vial : 24 Sample Multiplier: 1

Quant Time: Jul 02 16:58:26 2013
Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
Quant Title : SW-864 Method 8270
QLast Update : Tue Jul 02 11:27:47 2013
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) 1,4-Dichlorobenzene-d4	3.370	152	29118	40.00	ppm	0.00
24) Naphthalene-d8	4.469	136	106111	40.00	ppm	0.00
43) Acenaphthene-d10	6.079	164	68102	40.00	ppm	0.00
66) Phenanthrene-d10	7.436	188	127169	40.00	ppm	0.00
80) Chrysene-d12	10.214	240	132086	40.00	ppm	0.00
90) Perylene-d12	11.659	264	124985	40.00	ppm	0.00
System Monitoring Compounds						
7) 2-Fluorophenol	2.425	112	26772	31.80	ppm	0.01
Spiked Amount 100.000	Range 30 - 130		Recovery = 31.80%			
9) Phenol-d5	3.171	99	33474	31.19	ppm	0.00
Spiked Amount 100.000	Range 30 - 130		Recovery = 31.19%			
25) Nitrobenzene-d5	3.870	82	32564	34.38	ppm	0.00
Spiked Amount 50.000	Range 30 - 130		Recovery = 68.76%			
48) 2-Fluorobiphenyl	5.479	172	74429	32.88	ppm	0.00
Spiked Amount 50.000	Range 30 - 130		Recovery = 65.76%			
70) 2,4,6-Tribromophenol	6.819	330	12155	34.42	ppm	0.00
Spiked Amount 100.000	Range 30 - 130		Recovery = 34.42%			
83) Terphenyl-d14	9.151	244	116501	40.42	ppm	0.00
Spiked Amount 50.000	Range 30 - 130		Recovery = 80.84%			

Target Compounds Qvalue

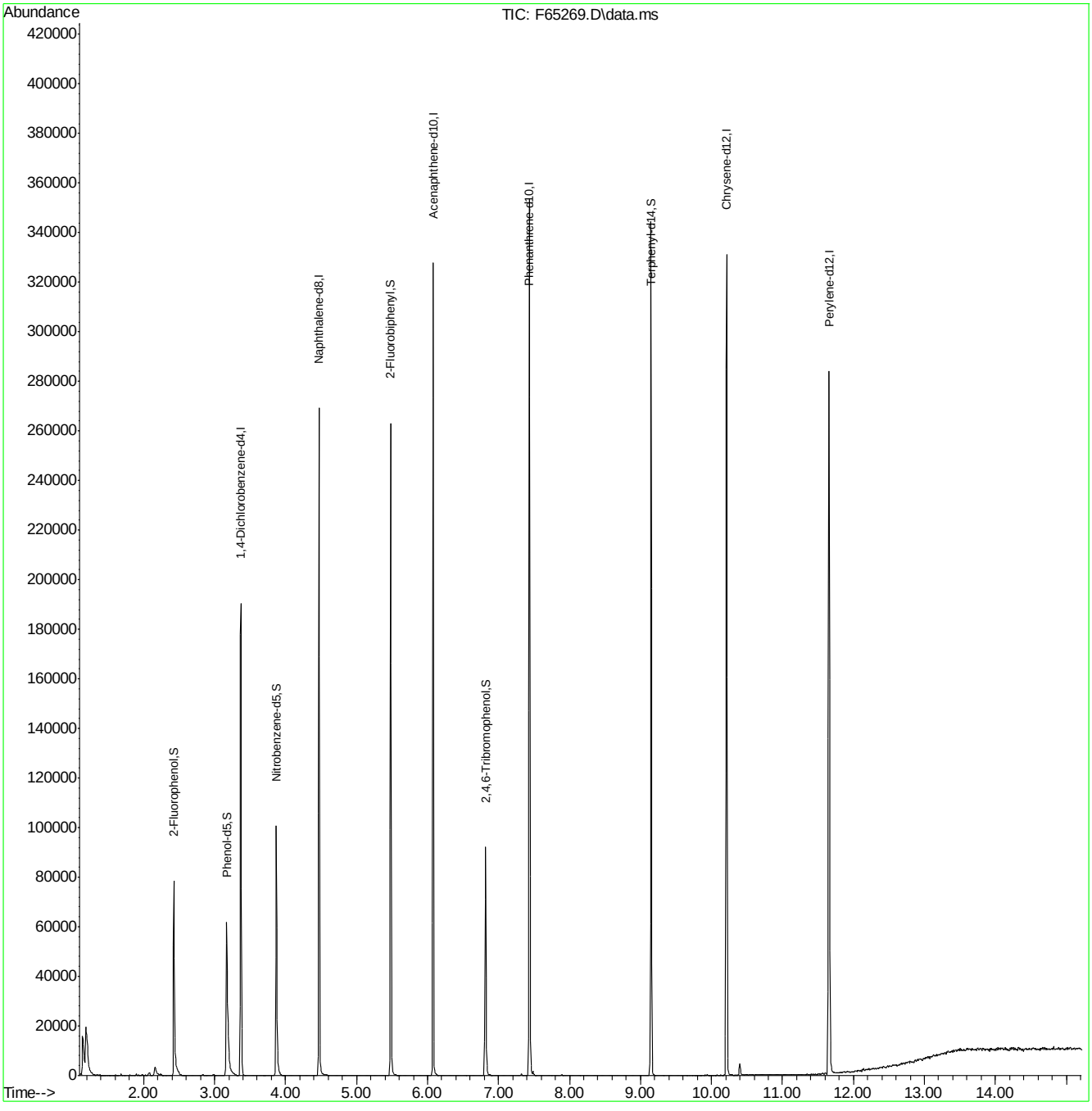
(#) = qualifier out of range (m) = manual integration (+) = signals summed

10.2.1 10

Quantitation Report (QT Reviewed)

Data Path : F:\1\DATA\F130627\
Data File : F65269.D
Acq On : 27 Jun 2013 6:11 pm
Operator : kristinr
Sample : OP33660-MB
Misc : OP33660,MSF3028,20.84,,,1,1
ALS Vial : 24 Sample Multiplier: 1

Quant Time: Jul 02 16:58:26 2013
Quant Method : F:\1\METHODS\F130408_8270+.E.02.01.m
Quant Title : SW-864 Method 8270
QLast Update : Tue Jul 02 11:27:47 2013
Response via : Initial Calibration



F130408_8270+.E.02.01.m Tue Jul 02 16:58:30 2013 Page: 2

New Jersey

ACCUTEST LABORATORIES

GC Volatiles

QC Data Summaries

(Accutest Labs of New England, Inc.)

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: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33671-MB	BB48728.D	1	06/19/13	AP	06/18/13	OP33671	GBB2907

The QC reported here applies to the following samples: **Method:** SW846 8011

JB39590-1, JB39590-2

CAS No.	Compound	Result	RL	MDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	2.5	0.95	ug/kg	

CAS No.	Surrogate Recoveries		Limits
460-00-4	Bromofluorobenzene (S)	104%	61-167%
460-00-4	Bromofluorobenzene (S)	159%	61-167%

Blank Spike Summary

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33671-BS	BB48729.D	1	06/19/13	AP	06/18/13	OP33671	GBB2907

The QC reported here applies to the following samples: **Method:** SW846 8011

JB39590-1, JB39590-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
106-93-4	1,2-Dibromoethane	3.30	4.0	121	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	124%	61-167%
460-00-4	Bromofluorobenzene (S)	148%	61-167%

11.2.1

11

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP33671-MS	BB48730.D	1	06/19/13	AP	06/18/13	OP33671	GBB2907
OP33671-MSD	BB48731.D	1	06/19/13	AP	06/18/13	OP33671	GBB2907
JB39439-1	BB48732.D	1	06/19/13	AP	06/18/13	OP33671	GBB2907

The QC reported here applies to the following samples: **Method:** SW846 8011

JB39590-1, JB39590-2

CAS No.	Compound	JB39439-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
106-93-4	1,2-Dibromoethane	ND		3.66	5.0	137	4.6	125	8	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	JB39439-1	Limits
460-00-4	Bromofluorobenzene (S)	146%	219%* [a]	99%	61-167%
460-00-4	Bromofluorobenzene (S)	172%* [a]	166%	140%	61-167%

(a) Outside control limits due to possible matrix interference.

11.3.1

11

* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Method: SW846 8011 **Matrix:** SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 [a]	S1 [b]
JB39590-1	BB48736.D	191.0* [c]	165.0
JB39590-2	BB48737.D	206.0* [c]	171.0* [c]
OP33671-BS	BB48729.D	124.0	148.0
OP33671-MB	BB48728.D	104.0	159.0
OP33671-MS	BB48730.D	146.0	172.0* [c]
OP33671-MSD	BB48731.D	219.0* [c]	166.0

Surrogate Compounds	Recovery Limits
S1 = Bromofluorobenzene (S)	61-167%

(a) Recovery from GC signal #2
(b) Recovery from GC signal #1
(c) Outside control limits due to possible matrix interference.

GC Surrogate Retention Time Summary

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Check Std:	GBB2907-ICC2907	**Injection Date:**	06/19/13
Lab File ID:	BB48722.D	**Injection Time:**	11:44
Instrument ID:	GCBB	**Method:**	SW846 8011

	S1 [a] RT	S1 [b] RT
Check Std	4.98	4.71

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 [a] RT	S1 [b] RT
OP33671-MB	BB48728.D	06/19/13	14:32	4.96	4.72
OP33671-BS	BB48729.D	06/19/13	14:59	4.96	4.71
OP33671-MS	BB48730.D	06/19/13	15:28	4.96	4.72
OP33671-MSD	BB48731.D	06/19/13	15:56	4.97	4.72
JB39439-1	BB48732.D	06/19/13	16:24	4.96	4.72
ZZZZZZ	BB48733.D	06/19/13	16:51	4.96	4.72
ZZZZZZ	BB48734.D	06/19/13	17:18	4.96	4.72
ZZZZZZ	BB48735.D	06/19/13	17:47	4.93	4.71
JB39590-1	BB48736.D	06/19/13	18:15	4.94	4.71
JB39590-2	BB48737.D	06/19/13	18:42	4.93	4.71

Surrogate Compounds

S1 = Bromofluorobenzene (S)

(a) Retention time from GC signal #2
(b) Retention time from GC signal #1

Initial Calibration Summary

Job Number: JB39590 **Sample:** GBB2907-ICC2907
Account: ALNJ Accutest New Jersey **Lab FileID:** BB48722.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

```
                         Response Factor Report  GCBB

  Method       : C:\msdchem\1\METHODS\ES130619.M (ChemStation Integrator)
  Title        : v8011edb soil
  Last Update  : Wed Jun 19 14:10:04 2013
  Response via : Initial Calibration

  Calibration Files
  1   =bb48721.d   2   =bb48722.d   3   =bb48723.d   4   =bb48724.d
  5      =bb48725.d    6      =bb48726.d

        Compound              1     2     3     4     5     6     Avg    %RSD
  ---------------------------------------------------------------------------
  1)     1,2-Dibromoethane   2.787 2.975 3.022 2.874 2.882 2.963 2.917 E5   2.93
  2) s   4-Bromofluorobenzen 1.442 1.430 1.406 1.431 1.446 1.393 1.425 E4   1.46
  3)     1,2-Dibromo-3-chlor 6.439 6.727 6.852 6.599 6.846 6.513 6.662 E5   2.60

Signal #2

  1)     1,2-Dibromoethane   3.694 3.982 4.120 3.936 3.944 3.959 3.939 E5   3.49
  2) s   4-Bromofluorobenzen 1.331 1.302 1.316 1.300 1.326 1.266 1.307 E4   1.80
  3)     1,2-Dibromo-3-chlor 7.079 7.154 7.382 6.988 7.240 6.991 7.139 E5   2.15
 ---------------------------------------------------------------------------
 (#) = Out of Range

           ES130619.M        Thu Jun 20 08:22:46 2013
```

11.6.1

11

Initial Calibration Verification

Job Number: JB39590 **Sample:** GBB2907-ICV2907
Account: ALNJ Accutest New Jersey **Lab FileID:** BB48727.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

```
                    Evaluate Continuing Calibration Report

 Signal #1 : C:\msdchem\1\DATA\Bb...19\bb48727.d\ECD1A.CH Vial: 82
 Signal #2 : C:\msdchem\1\DATA\Bb130619\bb48727.d\ECD2B.CH
 Acq On    : 19-Jun-13, 14:04:25                      Operator: andrip
 Sample    : icv2907-20,std-7                         Inst    : GCBB
 Misc      : op33671,gbb2907,30,,,50,,s               Multiplr: 1.00
 IntFile Signal #1: events.e     IntFile Signal #2: events2.e

 Method       : C:\msdchem\1\METHODS\ES130619.M (ChemStation Integrator)
 Title        : v8011edb soil
 Last Update  : Wed Jun 19 14:10:04 2013
 Response via : Multiple Level Calibration

 Min. RRF     :   0.000  Min. Rel. Area :  85%  Max. R.T. Dev  0.50min
 Max. RRF Dev :  15%     Max. Rel. Area : 115%

        Compound                AvgRF   CCRF      %Dev Area% Dev(min)RT Window
 ---------------------------------------------------------------------------
 1     1,2-Dibromoethane      291.715 316.033 E3  -8.3  106   0.00    3.68- 3.74
 2 s   4-Bromofluorobenzene    14.248  15.117 E3  -6.1  106   0.00    4.69- 4.75
 3     1,2-Dibromo-3-chloropr 666.243 695.478 E3  -4.4  103   0.00    6.35- 6.41

*****  Signal #2   *****

 1     1,2-Dibromoethane      393.905 426.505 E3  -8.3  107   0.00    3.76- 3.82
 2 s   4-Bromofluorobenzene    13.069  14.306 E3  -9.5  110  -0.03    4.91- 4.97
 3     1,2-Dibromo-3-chloropr 713.912 749.060 E3  -4.9  105   0.00    6.31- 6.37
---------------------------------------------------------------------------
---------------------------------------------------------------------------

   (#) = Out of Range              SPCC's out = 0  CCC's out = 0
    bb48722.d  ES130619.M       Thu Jun 20 08:22:41 2013
```

11.6.2

11

Continuing Calibration Summary

Job Number: JB39590 **Sample:** GBB2907-CC2907
Account: ALNJ Accutest New Jersey **Lab FileID:** BB48738.D
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

```
                    Evaluate Continuing Calibration Report

 Signal #1 : C:\msdchem\1\DATA\Bb...19\bb48738.d\ECD1A.CH Vial: 77
 Signal #2 : C:\msdchem\1\DATA\Bb130619\bb48738.d\ECD2B.CH
 Acq On    : 19-Jun-13, 19:10:29                       Operator: andrip
 Sample    : cc2907-20,std-2                           Inst    : GCBB
 Misc      : op33671,gbb2907,30,,,50,,s                Multiplr: 1.00
 IntFile Signal #1: events.e     IntFile Signal #2: events2.e

 Method       : C:\msdchem\1\METHODS\ES130619.M (ChemStation Integrator)
 Title        : v8011edb soil
 Last Update  : Wed Jun 19 14:10:04 2013
 Response via : Multiple Level Calibration

 Min. RRF     :   0.000  Min. Rel. Area :  85%  Max. R.T. Dev  0.50min
 Max. RRF Dev :  15%     Max. Rel. Area : 115%

        Compound                AvgRF   CCRF      %Dev Area% Dev(min)RT Window
 ---------------------------------------------------------------------------
 1     1,2-Dibromoethane      291.715 307.797 E3  -5.5  103   0.00    3.68- 3.74
 2 s   4-Bromofluorobenzene    14.248  16.237 E3 -14.0  114   0.00    4.68- 4.74
 3     1,2-Dibromo-3-chloropr 666.243 697.809 E3  -4.7  104   0.00    6.35- 6.41

*****  Signal #2   *****

 1     1,2-Dibromoethane      393.905 394.602 E3  -0.2   99  -0.01    3.75- 3.81
 2 s   4-Bromofluorobenzene    13.069  13.718 E3  -5.0  105  -0.05    4.90- 4.96
 3     1,2-Dibromo-3-chloropr 713.912 735.368 E3  -3.0  103   0.00    6.30- 6.36
---------------------------------------------------------------------------
---------------------------------------------------------------------------

   (#) = Out of Range              SPCC's out = 0  CCC's out = 0
    bb48722.d  ES130619.M       Thu Jun 20 08:32:40 2013
```

11.6.3

11

New Jersey

ACCUTEST LABORATORIES

GC Volatiles

Raw Data

(Accutest Labs of New England, Inc.)

Manual Integrations APPROVED (compounds with "m" flag)
Andri Piluri
06/20/13 08:28

Quantitation Report (QT Reviewed)

```
Data Path : C:\msdchem\1\DATA\Bb130619\
Data File : bb48736.d
Signal(s) : Signal #1: ECD1A.CH  Signal #2: ECD2B.CH
Acq On    : 19-Jun-13, 18:15:04
Operator  : andrip
Sample    : jb39590-1,op33671
Misc      : op33671,gbb2907,30.47,,,50,,s
ALS Vial  : 9 (Sig #1); 0 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jun 20 08:32:22 2013
Quant Method : C:\msdchem\1\METHODS\ES130619.M
Quant Title  : v8011edb soil
QLast Update : Wed Jun 19 14:10:04 2013
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Small noise peaks clipped

Volume Inj.     :
Signal #1 Phase :                    Signal #2 Phase:
Signal #1 Info  :                    Signal #2 Info :

      Compound         RT#1      RT#2    Resp#1   Resp#2   ug/L    ug/L
  ---------------------------------------------------------------------------

  System Monitoring Compounds
2) s   4-Bromofl...    4.715     4.940f  1175241  1250475   82.484m   95.680m
 Spiked Amount     50.000 Range  60 - 140  Recovery   =  164.97%#  191.36%#

  Target Compounds
1)     1,2-Dibro...    0.000     0.000         0        0    N.D. d    N.D. d
3)     1,2-Dibro...    0.000     0.000         0        0    N.D. d    N.D. d
  ---------------------------------------------------------------------------

 (f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25%  (m)=manual int.
```

12.1.1

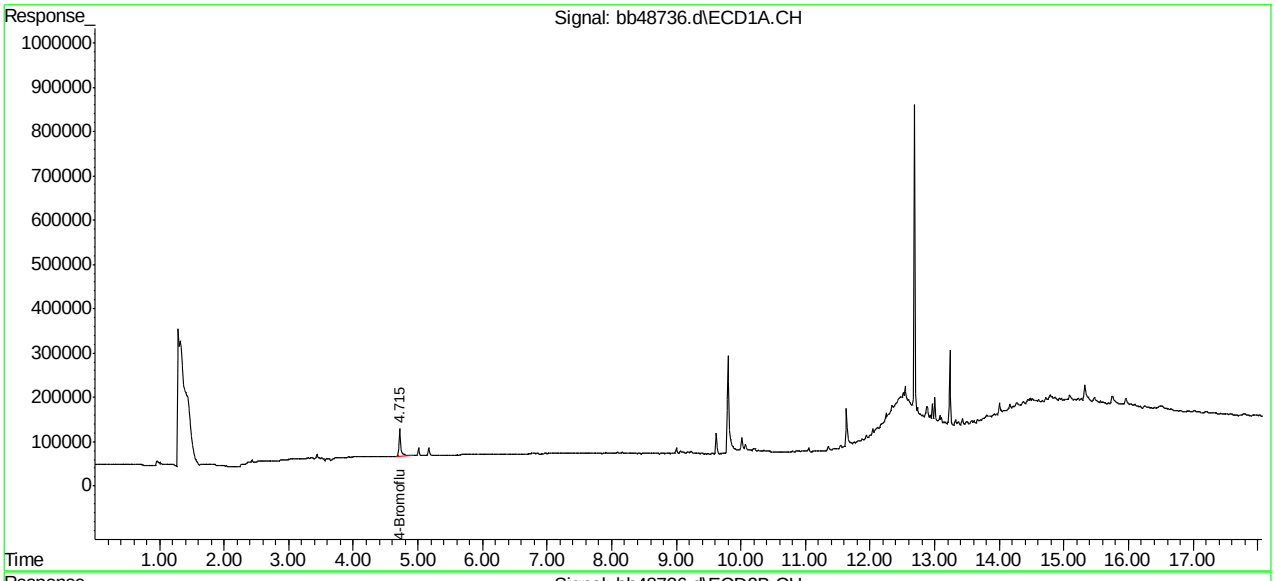
12

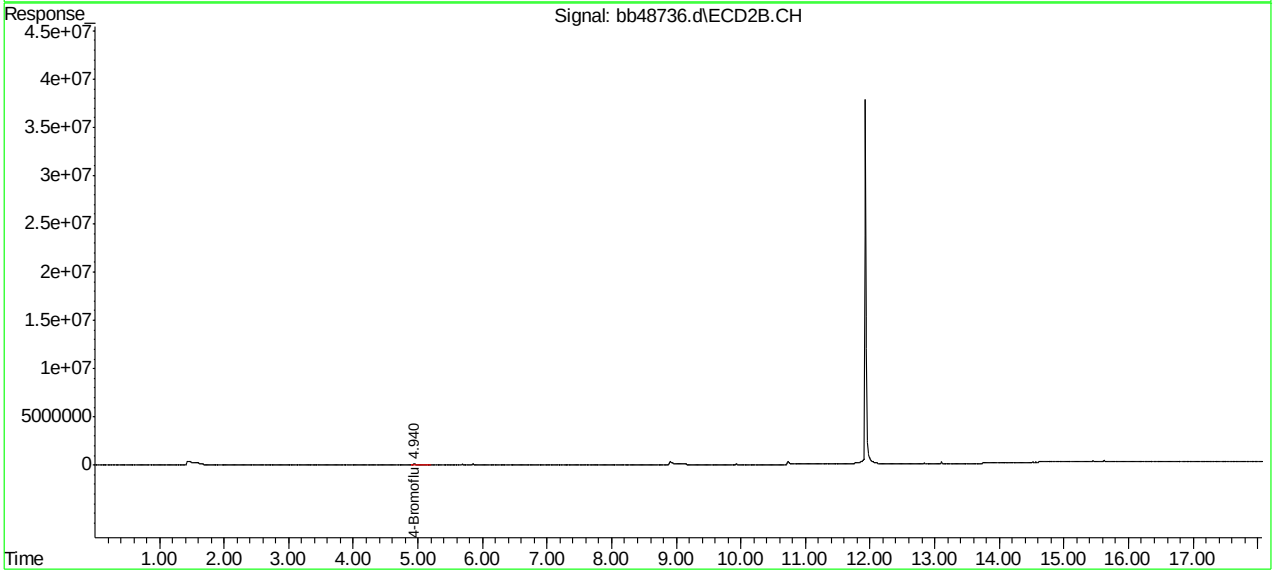
Quantitation Report (QT Reviewed)

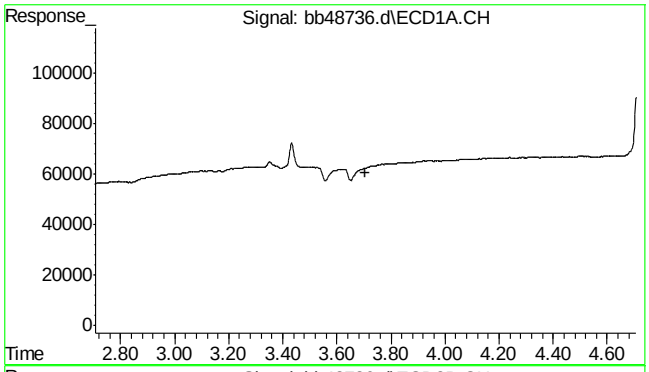
Data Path : C:\msdchem\1\DATA\Bb130619\
Data File : bb48736.d
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 19-Jun-13, 18:15:04
Operator : andrip
Sample : jb39590-1,op33671
Misc : op33671,gbb2907,30.47,,,50,,s
ALS Vial : 9 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jun 20 08:32:22 2013
Quant Method : C:\msdchem\1\METHODS\ES130619.M
Quant Title : v8011edb soil
QLast Update : Wed Jun 19 14:10:04 2013
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

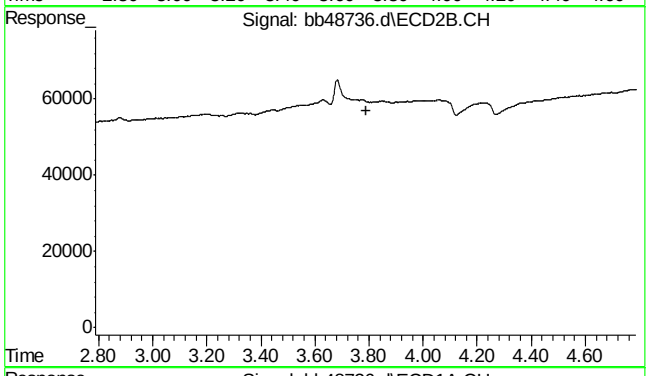






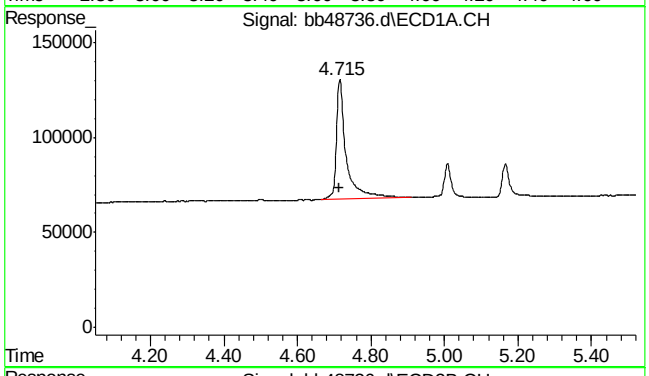
#1 1,2-Dibromoethane

R.T.: 0.000 min
Exp R.T. : 3.706 min
Response: 0
Conc: N.D.



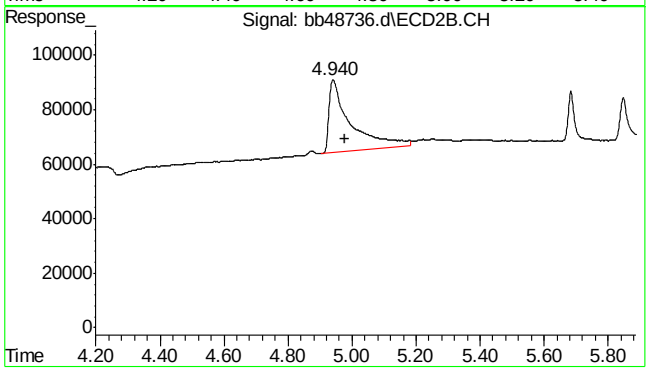
#1 1,2-Dibromoethane

R.T.: 0.000 min
Exp R.T. : 3.788 min
Response: 0
Conc: N.D.



#2 4-Bromofluorobenzene

R.T.: 4.715 min
Delta R.T.: 0.000 min
Response: 1175241
Conc: 82.48 ug/L m

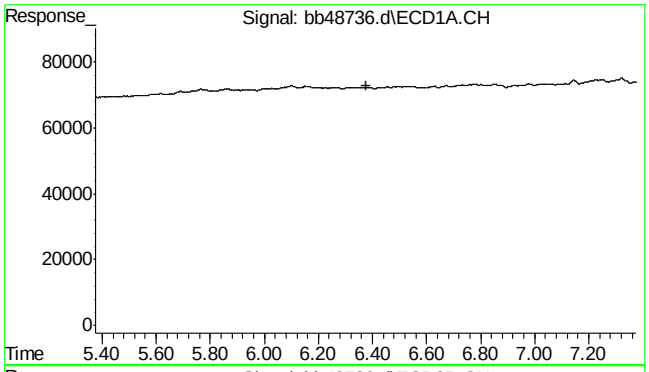


#2 4-Bromofluorobenzene

R.T.: 4.940 min
Delta R.T.: -0.038 min
Response: 1250475
Conc: 95.68 ug/L m

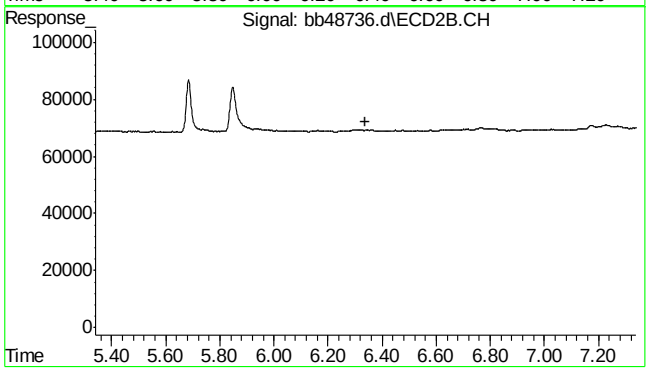
12.1.1

12



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min
Exp R.T. : 6.376 min
Response: 0
Conc: N.D.



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min
Exp R.T. : 6.339 min
Response: 0
Conc: N.D.

12.1.1

12

Manual Integrations
APPROVED
(compounds with "m" flag)
Andri Piluri
06/20/13 08:28

Quantitation Report (QT Reviewed)

```
Data Path : C:\msdchem\1\DATA\Bb130619\
Data File : bb48737.d
Signal(s) : Signal #1: ECD1A.CH  Signal #2: ECD2B.CH
Acq On    : 19-Jun-13, 18:42:37
Operator  : andrip
Sample    : jb39590-2,op33671
Misc      : op33671,gbb2907,30.43,,,50,,s
ALS Vial  : 10 (Sig #1); 0 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jun 20 08:32:36 2013
Quant Method : C:\msdchem\1\METHODS\ES130619.M
Quant Title  : v8011edb soil
QLast Update : Wed Jun 19 14:10:04 2013
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Small noise peaks clipped

Volume Inj.     :
Signal #1 Phase :                    Signal #2 Phase:
Signal #1 Info  :                    Signal #2 Info :

      Compound         RT#1      RT#2    Resp#1   Resp#2   ug/L    ug/L
  ---------------------------------------------------------------------------

  System Monitoring Compounds
2) s   4-Bromofl...    4.714     4.932f  1216557  1344583   85.384m  102.881m
 Spiked Amount     50.000 Range  60 - 140  Recovery   =  170.77%#  205.76%#

  Target Compounds
1)     1,2-Dibro...    0.000     0.000         0        0    N.D. d    N.D. d
3)     1,2-Dibro...    0.000     0.000         0        0    N.D. d    N.D. d
  ---------------------------------------------------------------------------

 (f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25%  (m)=manual int.
```

12.1.2

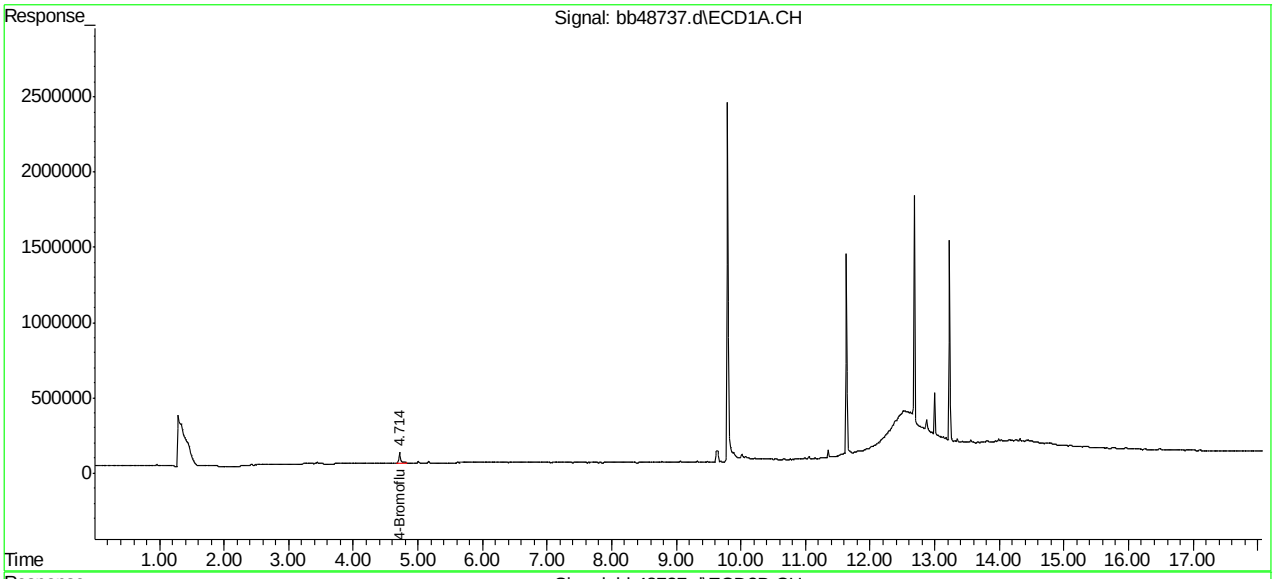
12

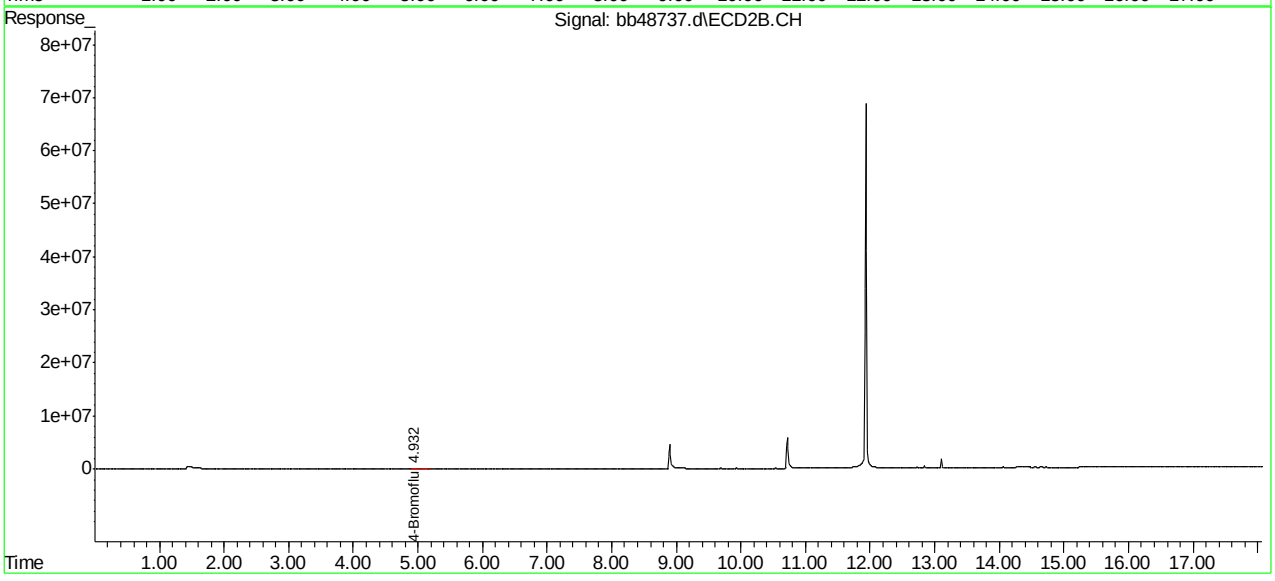
Quantitation Report (QT Reviewed)

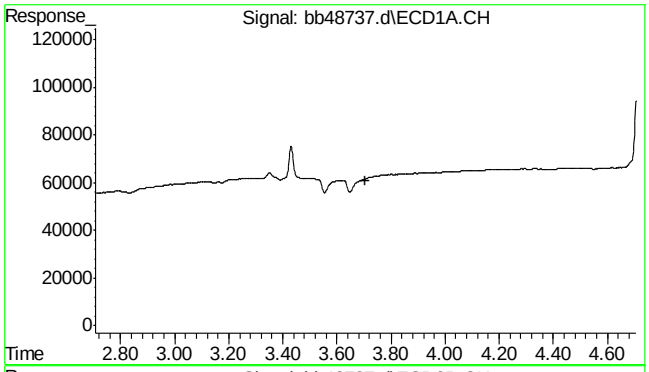
Data Path : C:\msdchem\1\DATA\Bb130619\
Data File : bb48737.d
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 19-Jun-13, 18:42:37
Operator : andrip
Sample : jb39590-2,op33671
Misc : op33671,gbb2907,30.43,,,50,,s
ALS Vial : 10 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jun 20 08:32:36 2013
Quant Method : C:\msdchem\1\METHODS\ES130619.M
Quant Title : v8011edb soil
QLast Update : Wed Jun 19 14:10:04 2013
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

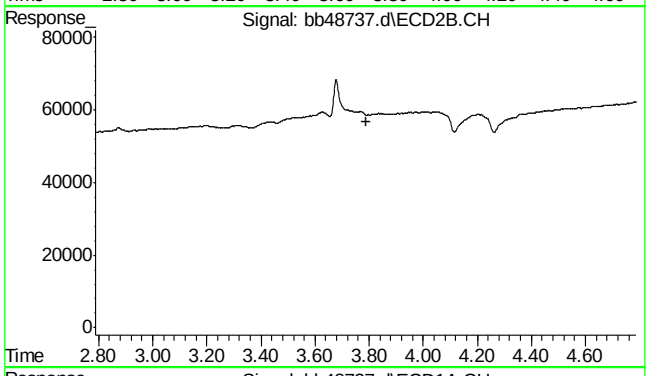






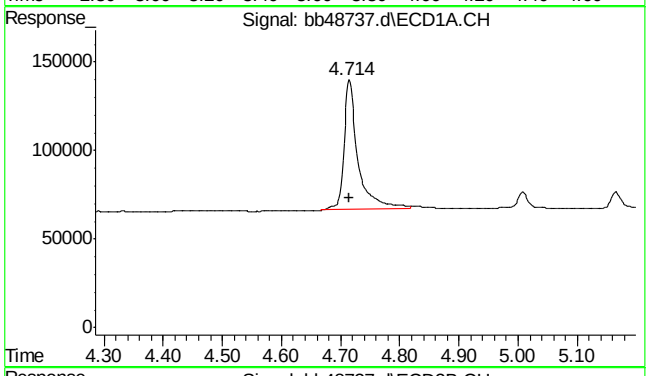
#1 1,2-Dibromoethane

R.T.: 0.000 min
Exp R.T. : 3.706 min
Response: 0
Conc: N.D.



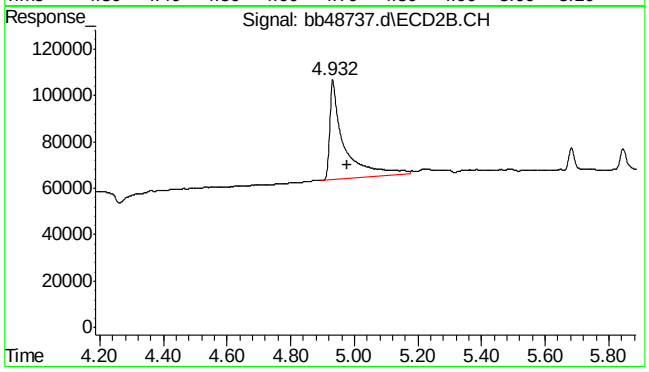
#1 1,2-Dibromoethane

R.T.: 0.000 min
Exp R.T. : 3.788 min
Response: 0
Conc: N.D.



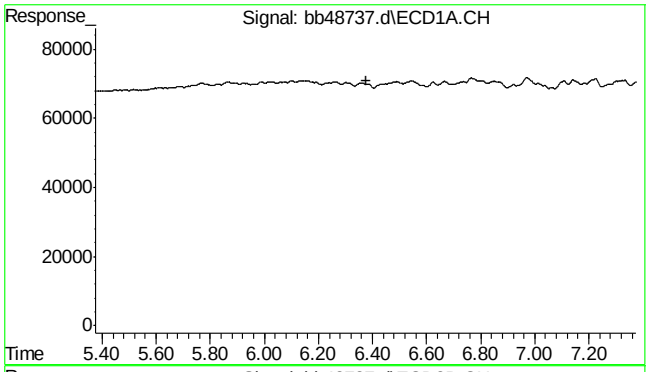
#2 4-Bromofluorobenzene

R.T.: 4.714 min
Delta R.T.: 0.000 min
Response: 1216557
Conc: 85.38 ug/L m



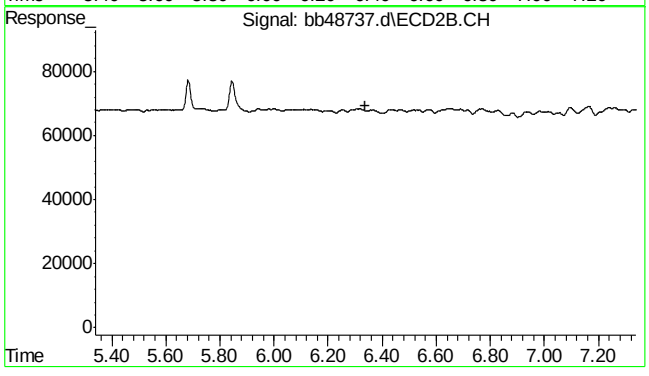
#2 4-Bromofluorobenzene

R.T.: 4.932 min
Delta R.T.: -0.046 min
Response: 1344583
Conc: 102.88 ug/L m



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min
Exp R.T. : 6.376 min
Response: 0
Conc: N.D.



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min
Exp R.T. : 6.339 min
Response: 0
Conc: N.D.

12.1.2

12

Manual Integrations APPROVED (compounds with "m" flag)
Andri Piluri
06/20/13 08:28

Quantitation Report (QT Reviewed)

```
Data Path : C:\msdchem\1\DATA\Bb130619\
Data File : bb48728.d
Signal(s) : Signal #1: ECD1A.CH  Signal #2: ECD2B.CH
Acq On    : 19-Jun-13, 14:32:09
Operator  : andrip
Sample    : op33671-mb
Misc      : op33671,gbb2907,30.33,,,50,,s
ALS Vial  : 1 (Sig #1); 0 (Sig #2)   Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jun 20 08:24:20 2013
Quant Method : C:\msdchem\1\METHODS\ES130619.M
Quant Title  : v8011edb soil
QLast Update : Wed Jun 19 14:10:04 2013
Response via : Initial Calibration
Integrator: ChemStation   6890 Scale Mode: Small noise peaks clipped

Volume Inj.     :
Signal #1 Phase :                    Signal #2 Phase:
Signal #1 Info  :                    Signal #2 Info :

      Compound         RT#1      RT#2    Resp#1   Resp#2   ug/L    ug/L
  ---------------------------------------------------------------------------

  System Monitoring Compounds
2) s   4-Bromofl...    4.715     4.961f  1136204   676778   79.744m   51.784m#
 Spiked Amount     50.000 Range  60 - 140  Recovery   =  159.49%#  103.57%

  Target Compounds
1)     1,2-Dibro...    0.000     0.000         0        0    N.D. d    N.D. d
3)     1,2-Dibro...    0.000     0.000         0        0    N.D. d    N.D. d
  ---------------------------------------------------------------------------

 (f)=RT Delta > 1/2 Window (#)=Amounts differ by > 25%  (m)=manual int.
```

12.2.1

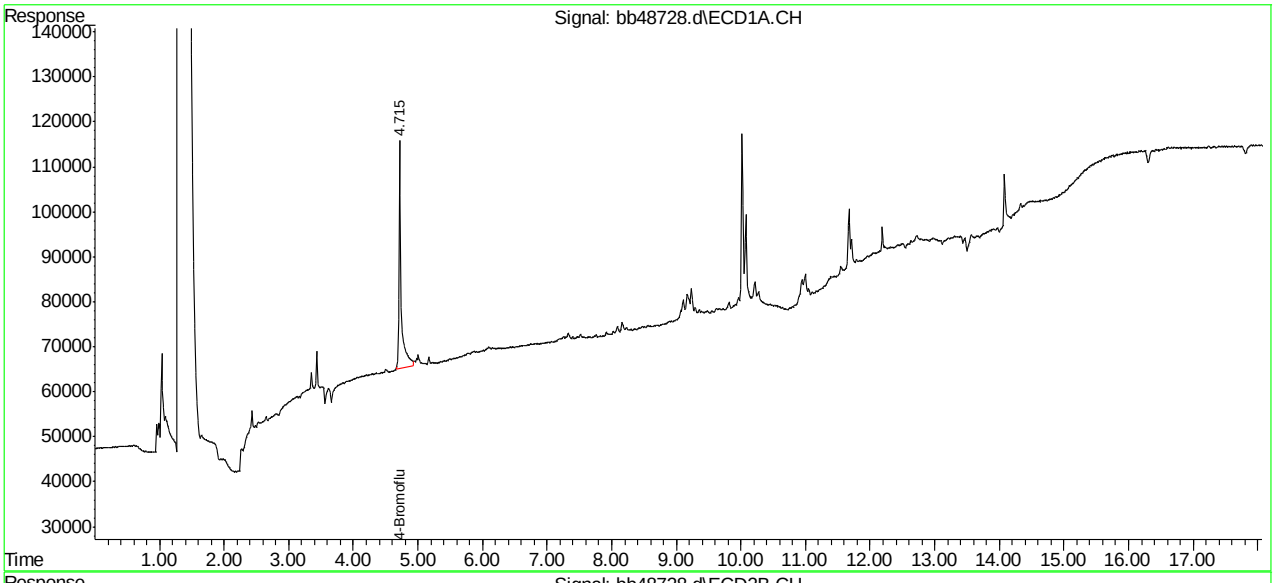
12

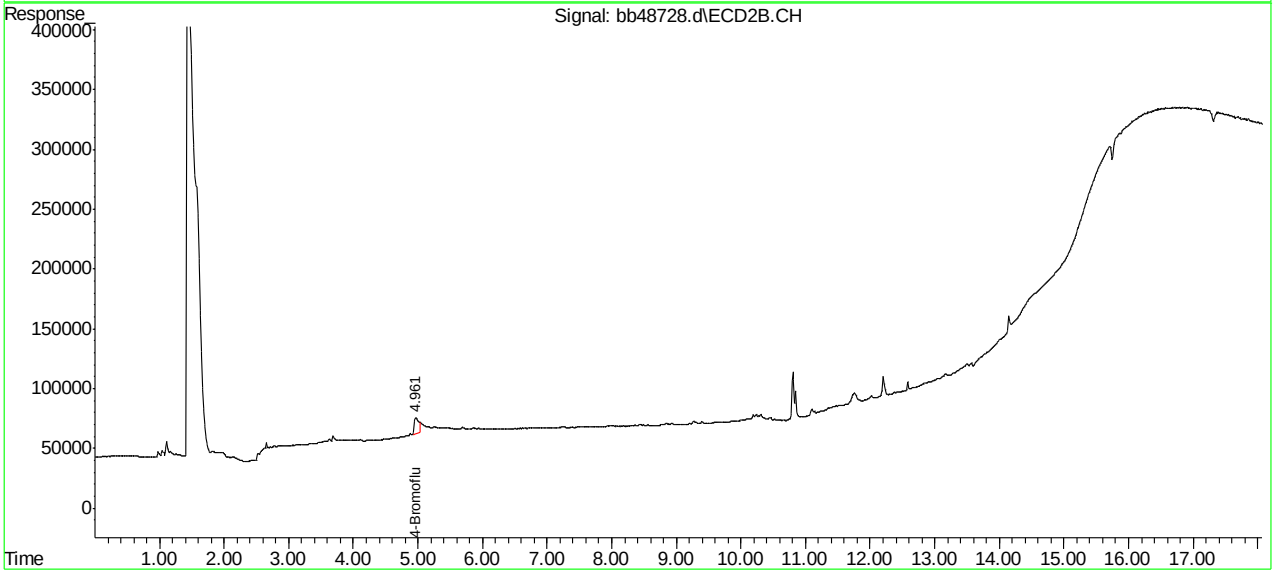
Quantitation Report (QT Reviewed)

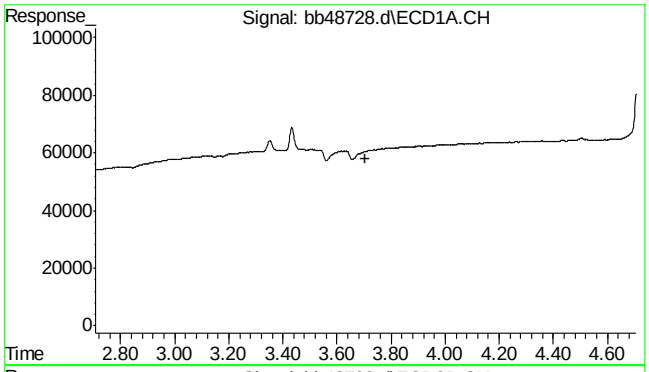
Data Path : C:\msdchem\1\DATA\Bb130619\
Data File : bb48728.d
Signal(s) : Signal #1: ECD1A.CH Signal #2: ECD2B.CH
Acq On : 19-Jun-13, 14:32:09
Operator : andrip
Sample : op33671-mb
Misc : op33671,gbb2907,30.33,,,50,,s
ALS Vial : 1 (Sig #1); 0 (Sig #2) Sample Multiplier: 1

Integration File signal 1: events.e
Integration File signal 2: events2.e
Quant Time: Jun 20 08:24:20 2013
Quant Method : C:\msdchem\1\METHODS\ES130619.M
Quant Title : v8011edb soil
QLast Update : Wed Jun 19 14:10:04 2013
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

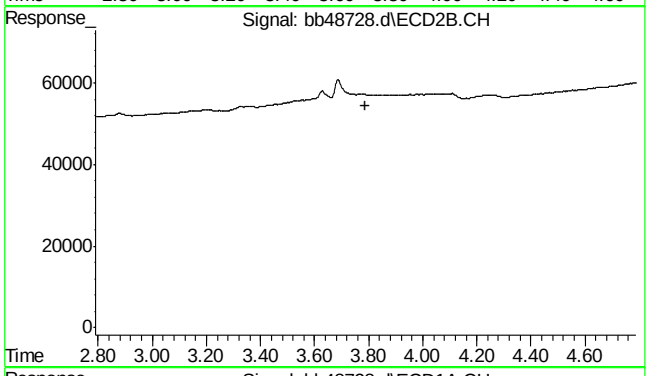






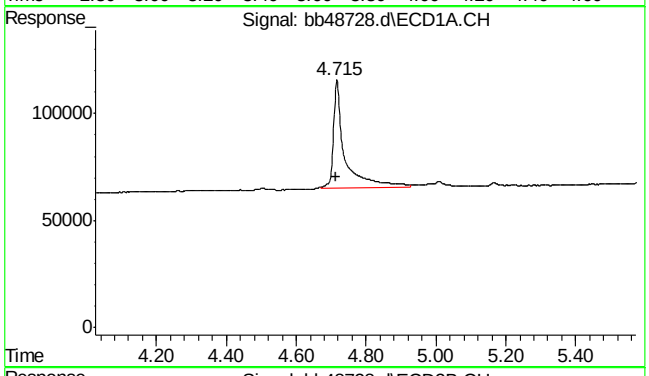
#1 1,2-Dibromoethane

R.T.: 0.000 min
Exp R.T. : 3.706 min
Response: 0
Conc: N.D.



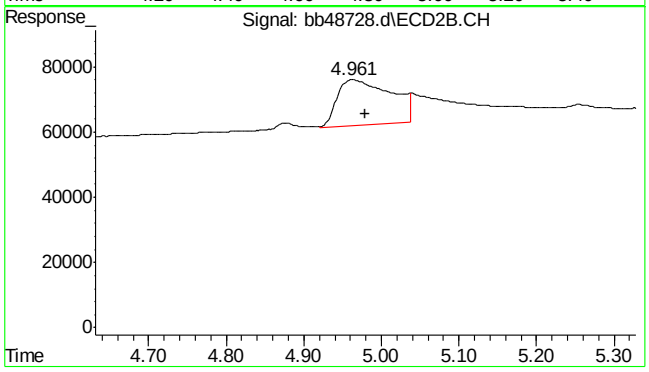
#1 1,2-Dibromoethane

R.T.: 0.000 min
Exp R.T. : 3.788 min
Response: 0
Conc: N.D.



#2 4-Bromofluorobenzene

R.T.: 4.715 min
Delta R.T.: 0.000 min
Response: 1136204
Conc: 79.74 ug/L m

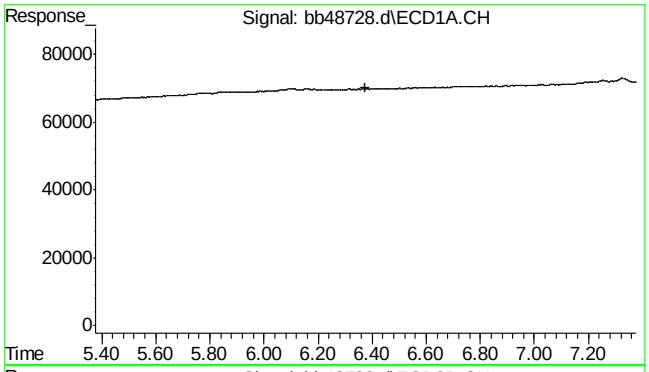


#2 4-Bromofluorobenzene

R.T.: 4.961 min
Delta R.T.: -0.017 min
Response: 676778
Conc: 51.78 ug/L m

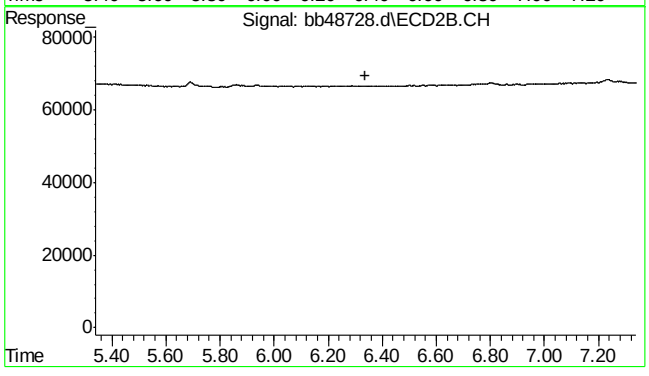
12.2.1

12



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min
Exp R.T. : 6.376 min
Response: 0
Conc: N.D.



#3 1,2-Dibromo-3-chloropropane

R.T.: 0.000 min
Exp R.T. : 6.339 min
Response: 0
Conc: N.D.

12.2.1

12

New Jersey

ACCUTEST LABORATORIES

Metals Analysis

QC Data Summaries

(Accutest Labs of New England, Inc.)

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: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
Analyst: EAL Run ID: MA15764
Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
17:40	MA15764-STD1	1		STD1
17:45	MA15764-STD2	1		STD2
17:50	MA15764-STD3	1		STD3
17:55	MA15764-STD4	1		STD4
18:00	MA15764-ICV1	1		
18:06	MA15764-ICB1	1		
18:12	MA15764-CCV1	1		
18:18	MA15764-CCB1	1		
18:26	MA15764-CRIA1	1		
18:30	MA15764-ICSA1	1		
18:35	MA15764-ICSAB1	1		
18:40	MP21196-B1	1		
18:45	MP21196-MB1	1		
18:50	MP21196-S1	1		
18:55	MP21196-S2	1		
19:00	MC21810-5	1		(sample used for QC only; not part of login JB39590)
19:04	MP21196-SD1	5		
19:09	MP21196-B2	1		
19:14	MA15764-CCV2	1		
19:19	MA15764-CCB2	1		
19:24	MP21196-LC1	1		
19:28	ZZZZZZ	1		
19:33	JB39590-1	1		
19:38	JB39590-2	1		
---------->	Last reportable sample/prep for job JB39590			
19:43	ZZZZZZ	1		
19:48	ZZZZZZ	1		
19:52	ZZZZZZ	1		
19:57	ZZZZZZ	1		
20:02	ZZZZZZ	1		
20:07	ZZZZZZ	1		
20:12	MA15764-CCV3	1		
20:17	MA15764-CCB3	1		
20:21	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
Analyst: EAL Run ID: MA15764
Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
20:26	ZZZZZZ	1		
20:31	ZZZZZZ	1		
20:36	ZZZZZZ	1		
20:41	ZZZZZZ	1		
20:46	ZZZZZZ	1		
20:50	ZZZZZZ	1		
20:55	ZZZZZZ	1		
21:00	ZZZZZZ	1		
21:05	ZZZZZZ	1		
21:10	MA15764-CCV4	1		
21:15	MA15764-CCB4	1		
21:20	MP21177-B1	1		
21:24	MP21177-MB1	1		
21:29	MP21177-S1	1		MS OUT FOR SB, BA, CA, MG, ZN, NEED PS.
21:34	MP21177-S2	1		
21:39	MC21503-7	1		(sample used for QC only; not part of login JB39590)
21:44	MP21177-SD1	5		
21:49	MP21177-LC1	1		
21:54	ZZZZZZ	1		
21:59	ZZZZZZ	1		
22:04	ZZZZZZ	1		
22:09	MA15764-CCV5	1		
22:13	MA15764-CCB5	1		
22:18	ZZZZZZ	1		
22:23	ZZZZZZ	1		
22:28	ZZZZZZ	1		
22:33	ZZZZZZ	1		
22:38	ZZZZZZ	1		
22:43	ZZZZZZ	1		
22:48	ZZZZZZ	1		
22:53	ZZZZZZ	1		
22:58	ZZZZZZ	1		
23:03	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
Analyst: EAL Run ID: MA15764
Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
23:08	MA15764-CCV6	1		
23:13	MA15764-CCB6	1		
23:18	ZZZZZZ	1		
23:23	ZZZZZZ	1		
23:28	ZZZZZZ	1		
23:33	ZZZZZZ	1		
23:38	ZZZZZZ	1		
23:43	ZZZZZZ	1		
23:47	MA15764-CCV7	1		
23:52	MA15764-CCB7	1		
23:57	MA15764-CRIA2	1		
00:02	MA15764-ICSA2	1		
00:07	MA15764-ICSAB2	1		
00:12	MA15764-CCV8	1		
00:17	MA15764-CCB8	1		
---------->	Last reportable CCB for job JB39590			
00:22	MP21182-B1	1		
00:26	MP21182-MB1	1		
00:31	MP21182-S1	1		
00:36	MP21182-S2	1		
00:41	MC21504-4	1		(sample used for QC only; not part of login JB39590)
00:46	MP21182-SD1	5		
00:51	MP21182-LC1	1		
00:56	ZZZZZZ	1		
01:01	ZZZZZZ	1		
01:05	ZZZZZZ	1		
01:10	MA15764-CCV9	1		
01:15	MA15764-CCB9	1		
01:20	ZZZZZZ	1		
01:25	ZZZZZZ	1		
01:30	ZZZZZZ	1		
01:35	ZZZZZZ	1		
01:40	ZZZZZZ	1		
01:45	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
Analyst: EAL Run ID: MA15764
Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
01:49	ZZZZZZ	1		
01:54	ZZZZZZ	1		
01:59	ZZZZZZ	1		
02:04	ZZZZZZ	1		
02:09	MA15764-CCV10	1		
02:14	MA15764-CCB10	1		
02:19	ZZZZZZ	1		
02:24	ZZZZZZ	1		
02:29	ZZZZZZ	1		
02:34	ZZZZZZ	1		
02:38	ZZZZZZ	1		
02:43	ZZZZZZ	1		
02:48	ZZZZZZ	2		
02:53	MP21183-PS1	1		
02:58	MP21187-PS1	1		
03:03	MP21183-S1	10		
03:08	MA15764-CCV11	1		
03:13	MA15764-CCB11	1		
03:17	MP21183-S2	10		
03:22	MC21539-9	10		(sample used for QC only; not part of login JB39590)
03:27	MP21183-SD1	50		
03:32	ZZZZZZ	1		RINSECONF.
03:37	MA15764-CRIA3	1		
03:42	MA15764-CRIB1	1		
03:47	MA15764-CCV12	1		
03:52	MA15764-CCB12	1		
03:57	ZZZZZZ	1		
04:02	ZZZZZZ	1		
04:07	ZZZZZZ	1		
04:12	ZZZZZZ	1		
04:17	ZZZZZZ	1		
04:22	ZZZZZZ	5		
04:27	MP21194-SD1	10		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
Analyst: EAL Run ID: MA15764
Parameters: Pb

Time	Sample Description	Dilution Factor	PS Recov	Comments
04:32	MA15764-CCV13	1		
04:37	MA15764-CCB13	1		
04:42	MA15764-CRIB2	1		
04:47	MA15764-CRI1	1		
04:52	ZZZZZZ	1		
04:57	MA15764-CRI2	1		
05:01	MA15764-ICSA3	1		
05:06	MA15764-ICSAB3	1		
05:11	MA15764-CCV14	1		
05:16	MA15764-CCB14	1		

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
Analyst: EAL Run ID: MA15764
Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
17:40	MA15764-STD1	4710 R	113470 R	10715 R
17:45	MA15764-STD2	4641	112130	10954
17:50	MA15764-STD3			10821
17:55	MA15764-STD4	4715	112400	10792
18:00	MA15764-ICV1	4651	110190	10815
18:06	MA15764-ICB1	4703	111510	10810
18:12	MA15764-CCV1	4762	112670	10860
18:18	MA15764-CCB1	4700	111820	10696
18:26	MA15764-CRIA1	4730	112150	10861
18:30	MA15764-ICSA1	4362	104260	10479
18:35	MA15764-ICSAB1	4335	106960	10240
18:40	MP21196-B1	4665	111740	10917
18:45	MP21196-MB1	4698	117450	10798
18:50	MP21196-S1	4930	121150	12309
18:55	MP21196-S2	4955	120240	11579
19:00	MC21810-5	5019	122990	11709
19:04	MP21196-SD1	4826	115010	11008
19:09	MP21196-B2	4680	111580	10653
19:14	MA15764-CCV2	4796	112960	10791
19:19	MA15764-CCB2	4750	111670	10823
19:24	MP21196-LC1	5020	123840	11502
19:28	ZZZZZZ	5131	121800	11577
19:33	JB39590-1	4972	124710	11755
19:38	JB39590-2	5143	123800	11719
19:43	ZZZZZZ	5097	119970	11609
19:48	ZZZZZZ	5038	119360	11376
19:52	ZZZZZZ	4974	116630	11338
19:57	ZZZZZZ	5011	118610	11242
20:02	ZZZZZZ	5067	119590	11255
20:07	ZZZZZZ	4853	115550	11028
20:12	MA15764-CCV3	4787	112780	10700
20:17	MA15764-CCB3	4776	112260	10688
20:21	ZZZZZZ	4886	114630	10945

INTERNAL STANDARD SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
Analyst: EAL Run ID: MA15764
Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
20:26	ZZZZZZ	4892	115490	10980
20:31	ZZZZZZ	5084	118960	11321
20:36	ZZZZZZ	5043	119580	11436
20:41	ZZZZZZ	4903	114790	10872
20:46	ZZZZZZ	5164	122520	11592
20:50	ZZZZZZ	4841	119510	11551
20:55	ZZZZZZ	5223	124730	11976
21:00	ZZZZZZ	5273	124800	12007
21:05	ZZZZZZ	4869	115510	10956
21:10	MA15764-CCV4	4802	113680	10836
21:15	MA15764-CCB4	4749	111740	10768
21:20	MP21177-B1	4727	110880	10547
21:24	MP21177-MB1	4765	109970	10908
21:29	MP21177-S1	4531	110920	10953
21:34	MP21177-S2	4713	115170	11114
21:39	MC21503-7	4749	112960	11206
21:44	MP21177-SD1	4836	114100	10863
21:49	MP21177-LC1	5133	123120	11650
21:54	ZZZZZZ	4969	121010	11662
21:59	ZZZZZZ	4624	112730	10913
22:04	ZZZZZZ	4206	109570	10597
22:09	MA15764-CCV5	4830	113300	10718
22:13	MA15764-CCB5	4783	111580	10581
22:18	ZZZZZZ	4566	111970	10887
22:23	ZZZZZZ	4718	115130	11141
22:28	ZZZZZZ	4819	114850	10879
22:33	ZZZZZZ	5172	123800	12392
22:38	ZZZZZZ	4712	112410	10885
22:43	ZZZZZZ	3434	102440	10186
22:48	ZZZZZZ	4712	114260	11195
22:53	ZZZZZZ	4513	110590	11006
22:58	ZZZZZZ	4925	116060	10733
23:03	ZZZZZZ	5022	122570	12071

INTERNAL STANDARD SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
Analyst: EAL Run ID: MA15764
Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
23:08	MA15764-CCV6	4872	112340	10550
23:13	MA15764-CCB6	4860	110290	10338
23:18	ZZZZZZ	4642	112400	10569
23:23	ZZZZZZ	4844	114860	11225
23:28	ZZZZZZ	4992	117390	11363
23:33	ZZZZZZ	4857	116060	11314
23:38	ZZZZZZ	4586	109860	11032
23:43	ZZZZZZ	5235	123590	11854
23:47	MA15764-CCV7	4860	112900	10589
23:52	MA15764-CCB7	4797	110380	10409
23:57	MA15764-CRIA2	4805	110720	10476
00:02	MA15764-ICSA2	4459	102540	10156
00:07	MA15764-ICSAB2	4526	100320	9679
00:12	MA15764-CCV8	4821	111390	10417
00:17	MA15764-CCB8	4789	111540	10498
00:22	MP21182-B1	4744	110650	10508
00:26	MP21182-MB1	4782	111160	10573
00:31	MP21182-S1	5061	120260	11678
00:36	MP21182-S2	4853	115530	11453
00:41	MC21504-4	5009	118760	11606
00:46	MP21182-SD1	4804	112900	10649
00:51	MP21182-LC1	5157	120030	11678
00:56	ZZZZZZ	4553	107940	11069
01:01	ZZZZZZ	5201	122970	12149
01:05	ZZZZZZ	4648	107270	10724
01:10	MA15764-CCV9	4848	112640	10428
01:15	MA15764-CCB9	4806	111660	10469
01:20	ZZZZZZ	4860	119030	10532
01:25	ZZZZZZ	5485	128620	12246
01:30	ZZZZZZ	5027	118270	11269
01:35	ZZZZZZ	5441	128330	12571
01:40	ZZZZZZ	5165	121630	11496
01:45	ZZZZZZ	5132	119020	11609

INTERNAL STANDARD SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
Analyst: EAL Run ID: MA15764
Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
01:49	ZZZZZZ	5493	128680	12242
01:54	ZZZZZZ	5522	130280	12478
01:59	ZZZZZZ	5152	122430	11775
02:04	ZZZZZZ	4837	114640	10892
02:09	MA15764-CCV10	4839	111140	10590
02:14	MA15764-CCB10	4775	107520	10895
02:19	ZZZZZZ	4886	114240	11060
02:24	ZZZZZZ	4829	113660	11138
02:29	ZZZZZZ	5573	129520	12220
02:34	ZZZZZZ	5047	118000	11330
02:38	ZZZZZZ	4946	117730	11276
02:43	ZZZZZZ	5013	119000	10868
02:48	ZZZZZZ	5550	127850	12002
02:53	MP21183-PS1	4854	114700	10934
02:58	MP21187-PS1	5250	123340	11696
03:03	MP21183-S1	4879	112870	10607
03:08	MA15764-CCV11	4836	111480	10494
03:13	MA15764-CCB11	4856	111120	10341
03:17	MP21183-S2	4920	112550	10522
03:22	MC21539-9	4898	112450	10571
03:27	MP21183-SD1	4863	113140	10572
03:32	ZZZZZZ	4846	110980	10394
03:37	MA15764-CRIA3	4794	112590	10597
03:42	MA15764-CRIB1	4851	111960	10494
03:47	MA15764-CCV12	4830	111460	10451
03:52	MA15764-CCB12	4839	111660	10477
03:57	ZZZZZZ	4286	100420	10539
04:02	ZZZZZZ	4379	101760	10506
04:07	ZZZZZZ	4427	103340	10667
04:12	ZZZZZZ	4110	97647	10146
04:17	ZZZZZZ	4174	98948	10381
04:22	ZZZZZZ	4346	99671	10352
04:27	MP21194-SD1	4750	111680	10848

INTERNAL STANDARD SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
Analyst: EAL Run ID: MA15764
Parameters: Pb

Time	Sample Description	Istd#1	Istd#2	Istd#3
04:32	MA15764-CCV13	4869	113240	10612
04:37	MA15764-CCB13	4820	110390	10255
04:42	MA15764-CRIB2	4805	110440	10412
04:47	MA15764-CRI1	4817	111190	10616
04:52	ZZZZZZ	4727	110150	10464
04:57	MA15764-CRI2	4830	113520	10689
05:01	MA15764-ICSA3	4465	104210	10205
05:06	MA15764-ICSAB3	4420	103030	10062
05:11	MA15764-CCV14	4852	112980	10633
05:16	MA15764-CCB14	4771	111170	10545

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 %

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: result < RL Run ID: MA15764 Units: ug/l

Time:			18:06		18:18		19:19		20:17	
Sample ID:			ICB1		CCB1		CCB2		CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.2	anr							
Arsenic	4.0	1.1	anr							
Barium	50	.43	anr							
Beryllium	4.0	.17	anr							
Boron	100	.47	anr							
Cadmium	4.0	.14	anr							
Calcium	5000	15	anr							
Chromium	10	.5	anr							
Cobalt	50	.15	anr							
Copper	25	.79	anr							
Gold	50	2.3								
Iron	100	4	anr							
Lead	5.0	.76	-0.20	<5.0	-0.10	<5.0	-0.40	<5.0	-0.20	<5.0
Magnesium	5000	53	anr							
Manganese	15	.16	anr							
Molybdenum	100	.25								
Nickel	40	.15	anr							
Palladium	50	2.3								
Platinum	50	5.2								
Potassium	5000	64	anr							
Selenium	10	1.7	anr							
Silicon	100	1.7								
Silver	5.0	.62	anr							
Sodium	5000	23	anr							
Strontium	10	.2								
Thallium	5.0	.67	anr							
Tin	100	.23	anr							
Titanium	50	1.9	anr							
Tungsten	100	7.3								
Vanadium	10	.95	anr							
Zinc	20	.13	anr							
Zirconium	50	2.3								

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: result < RL Run ID: MA15764 Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: result < RL Run ID: MA15764 Units: ug/l

Time:			21:15		22:13		23:13		23:52	
Sample ID:			CCB4		CCB5		CCB6		CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	17	anr							
Antimony	6.0	1.2	anr							
Arsenic	4.0	1.1	anr							
Barium	50	.43	anr							
Beryllium	4.0	.17	anr							
Boron	100	.47	anr							
Cadmium	4.0	.14	anr							
Calcium	5000	15	anr							
Chromium	10	.5	anr							
Cobalt	50	.15	anr							
Copper	25	.79	anr							
Gold	50	2.3								
Iron	100	4	anr							
Lead	5.0	.76	-1.0	<5.0	0.30	<5.0	-1.3	<5.0	-0.90	<5.0
Magnesium	5000	53	anr							
Manganese	15	.16	anr							
Molybdenum	100	.25								
Nickel	40	.15	anr							
Palladium	50	2.3								
Platinum	50	5.2								
Potassium	5000	64	anr							
Selenium	10	1.7	anr							
Silicon	100	1.7								
Silver	5.0	.62	anr							
Sodium	5000	23	anr							
Strontium	10	.2								
Thallium	5.0	.67	anr							
Tin	100	.23	anr							
Titanium	50	1.9	anr							
Tungsten	100	7.3								
Vanadium	10	.95	anr							
Zinc	20	.13	anr							
Zirconium	50	2.3								

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: result < RL Run ID: MA15764 Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: result < RL Run ID: MA15764 Units: ug/l

Time:			00:17	
Sample ID:			CCB8	
Metal	RL	IDL	raw	final
Aluminum	200	17	anr	
Antimony	6.0	1.2	anr	
Arsenic	4.0	1.1	anr	
Barium	50	.43	anr	
Beryllium	4.0	.17	anr	
Boron	100	.47	anr	
Cadmium	4.0	.14	anr	
Calcium	5000	15	anr	
Chromium	10	.5	anr	
Cobalt	50	.15	anr	
Copper	25	.79	anr	
Gold	50	2.3		
Iron	100	4	anr	
Lead	5.0	.76	-0.20	<5.0
Magnesium	5000	53	anr	
Manganese	15	.16	anr	
Molybdenum	100	.25		
Nickel	40	.15	anr	
Palladium	50	2.3		
Platinum	50	5.2		
Potassium	5000	64	anr	
Selenium	10	1.7	anr	
Silicon	100	1.7		
Silver	5.0	.62	anr	
Sodium	5000	23	anr	
Strontium	10	.2		
Thallium	5.0	.67	anr	
Tin	100	.23	anr	
Titanium	50	1.9	anr	
Tungsten	100	7.3		
Vanadium	10	.95	anr	
Zinc	20	.13	anr	
Zirconium	50	2.3		

(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: result < RL Run ID: MA15764 Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15764 Units: ug/l

Time:		18:00			18:12			19:14	
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								
Boron	anr								
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Gold									
Iron	anr								
Lead	3000	2900	96.7	2000	1890	94.5	2000	1880	94.0
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Palladium									
Platinum									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Thallium	anr								
Tin	anr								
Titanium	anr								
Tungsten									
Vanadium	anr								
Zinc	anr								
Zirconium									

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15764 Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

13.1.3

13

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15764 Units: ug/l

Time:		20:12			21:10			22:09	
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								
Boron	anr								
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Gold									
Iron	anr								
Lead	2000	1910	95.5	2000	1900	95.0	2000	1900	95.0
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Palladium									
Platinum									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Thallium	anr								
Tin	anr								
Titanium	anr								
Tungsten									
Vanadium	anr								
Zinc	anr								
Zirconium									

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15764 Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

13.1.3

13

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15764 Units: ug/l

Time:		23:08			23:47			00:12	
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								
Boron	anr								
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Gold									
Iron	anr								
Lead	2000	1900	95.0	2000	1890	94.5	2000	1910	95.5
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Palladium									
Platinum									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Thallium	anr								
Tin	anr								
Titanium	anr								
Tungsten									
Vanadium	anr								
Zinc	anr								
Zirconium									

(*) Outside of QC limits

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: 90 to 110 % Recovery Run ID: MA15764 Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

13.1.3

13

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: CRI 70-130% CRIA 70-130% Run ID: MA15764 Units: ug/l

Time:			18:26		23:57	
Sample ID:	CRI	CRIA	CRIA1		CRIA2	
Metal	True	True	Results	% Rec	Results	% Rec
Aluminum	200	200	anr			
Antimony	6.0	10	anr			
Arsenic	4.0	10	anr			
Barium	50	50	anr			
Beryllium	4.0	4.0	anr			
Boron	100	100	anr			
Cadmium	4.0	4.0	anr			
Calcium	5000	5000	anr			
Chromium	10	10	anr			
Cobalt	50	50	anr			
Copper	25	25	anr			
Gold	50	50				
Iron	100	100	anr			
Lead	5.0	10	9.2	92.0	9.7	97.0
Magnesium	5000	5000	anr			
Manganese	15	15	anr			
Molybdenum	100	100				
Nickel	40	40	anr			
Palladium	50	50				
Platinum	50	50				
Potassium	5000	5000	anr			
Selenium	10	10	anr			
Silicon	100	100				
Silver	5.0	5.0	anr			
Sodium	5000	5000	anr			
Strontium	10	10				
Thallium	5.0	10	anr			
Tin	100	100	anr			
Titanium	50	50	anr			
Tungsten	100	100				
Vanadium	10	10	anr			
Zinc	20	20	anr			
Zirconium	50	50				

(*) Outside of QC limits

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: CRI 70-130% CRIA 70-130% Run ID: MA15764 Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

13.1.4

13

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: 80 to 120 % Recovery Run ID: MA15764 Units: ug/l

Time:			18:30		18:35		00:02		00:07	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1		ICSA2		ICSAB2	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	508000	101.6	512000	102.4	522000	104.4	544000	108.8
Antimony		2000	-0.90		1970	98.5	-1.5		1860	93.0
Arsenic		2000	1.3		1960	98.0	0.60		1910	95.5
Barium		500	1.0		508	101.6	1.2		544	108.8
Beryllium		500	-0.50		473	94.6	-0.50		480	96.0
Boron		1000	-1.3		939	93.9	-1.4		914	91.4
Cadmium		1000	0.10		979	97.9	0.10		947	94.7
Calcium	500000	500000	452000	90.4	466000	93.2	453000	90.6	480000	96.0
Chromium		500	0.40		442	88.4	0.10		483	96.6
Cobalt		500	-0.40		452	90.4	-0.60		433	86.6
Copper		500	3.0		451	90.2	2.1		489	97.8
Gold		500	3.5		463	92.6	2.4		503	100.6
Iron	200000	200000	184000	92.0	189000	94.5	183000	91.5	194000	97.0
Lead		1000	-0.70		849	84.9	1.9		841	84.1
Magnesium	500000	500000	497000	99.4	512000	102.4	509000	101.8	540000	108.0
Manganese		500	1.0		450	90.0	0.90		482	96.4
Molybdenum		1000	-7.0		904	90.4	-7.3		867	86.7
Nickel		1000	-0.90		833	83.3	-1.1		814	81.4
Palladium		500	-0.90		480	96.0	-0.30		521	104.2
Platinum		500	-14		450	90.0	-15		490	98.0
Potassium			47.4		22.9		111		95.2	
Selenium		2000	-0.20		1940	97.0	-0.50		1860	93.0
Silicon		2000	30.2		2050	102.5	31.2		2000	100.0
Silver		1000	1.1		981	98.1	0.70		1060	106.0
Sodium			131		133		119		133	
Strontium		1000	1.1		1020	102.0	1.5		1080	108.0
Thallium		2000	1.5		1750	87.5	1.9		1720	86.0
Tin		1000	-1.3		914	91.4	-1.1		871	87.1
Titanium		500	7.2		466	93.2	6.9		503	100.6
Tungsten		2000	-15		1690	84.5	-18		1820	91.0
Vanadium		500	0.20		462	92.4	0.50		498	99.6
Zinc		1000	0.50		865	86.5	0.20		841	84.1
Zirconium		500	5.2		401	80.2	6.3		439	87.8

(*) Outside of QC limits

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

File ID: SA061813M2.ICP Date Analyzed: 06/18/13 Methods: SW846 6010C
QC Limits: 80 to 120 % Recovery Run ID: MA15764 Units: ug/l

Time:	
Sample ID:	
Metal	

(anr) Analyte not requested

13.1.5
13

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 06/18/13

Metal	RL	IDL	MDL	MB raw	final
Aluminum	20	1.7	3.6		
Antimony	1.0	.12	.15		
Arsenic	1.0	.11	.21		
Barium	5.0	.043	.073		
Beryllium	0.40	.017	.024		
Boron	10	.047	.11		
Cadmium	0.40	.014	.042		
Calcium	500	1.5	6.3		
Chromium	1.0	.05	.095		
Cobalt	5.0	.015	.047		
Copper	2.5	.079	.56		
Gold	5.0	.23	.43		
Iron	10	.4	.87		
Lead	1.0	.076	.17	-0.040	<1.0
Magnesium	500	5.3	5.1		
Manganese	1.5	.016	.04		
Molybdenum	10	.025	.07		
Nickel	4.0	.015	.044		
Palladium	5.0	.23	.64		
Platinum	5.0	.52	1.5		
Potassium	500	6.4	8.6		
Selenium	1.0	.17	.35		
Silicon	10	.17	3.3		
Silver	0.50	.062	.13		
Sodium	500	2.3	3.3		
Strontium	1.0	.02	.03		
Thallium	1.0	.067	.13		
Tin	10	.023	.14		
Titanium	5.0	.19	.14		
Tungsten	10	.73	.94		
Vanadium	1.0	.095	.13		
Zinc	2.0	.013	.16		
Zirconium	5.0	.23	.088		

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196 | Methods: SW846 6010C
Matrix Type: SOLID | Units: mg/kg

Prep Date:

Metal

Associated samples MP21196: JB39590-1, JB39590-2

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: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 06/18/13

Metal	MC21810-5 Original	MS	Spikelot MPICP	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	anr				
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Chromium	anr				
Cobalt					
Copper					
Gold					
Iron					
Lead	21.9	104	94.3	87.0	75-125
Magnesium					
Manganese					
Molybdenum					
Nickel					
Palladium					
Platinum					
Potassium					
Selenium	anr				
Silicon					
Silver	anr				
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Tungsten					
Vanadium					
Zinc					
Zirconium					

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196 | Methods: SW846 6010C
Matrix Type: SOLID | Units: mg/kg

Prep Date:

Metal

Associated samples MP21196: JB39590-1, JB39590-2

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: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 06/18/13

Metal	MC21810-5 Original	MSD	Spikelot MPICP	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	anr					
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt						
Copper						
Gold						
Iron						
Lead	21.9	94.3	94.3	76.8	9.8	20
Magnesium						
Manganese						
Molybdenum						
Nickel						
Palladium						
Platinum						
Potassium						
Selenium	anr					
Silicon						
Silver	anr					
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc						
Zirconium						

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196 Methods: SW846 6010C
Matrix Type: SOLID Units: mg/kg

Prep Date:

Metal

Associated samples MP21196: JB39590-1, JB39590-2

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: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:			06/18/13					06/18/13	
Metal	BSP Result	Spikelot MPICP	% Rec	QC Limits	BSD Result	Spikelot MPICP	% Rec	BSD RPD	QC Limit
Aluminum									
Antimony									
Arsenic	anr								
Barium	anr								
Beryllium									
Boron									
Cadmium	anr								
Calcium									
Chromium	anr								
Cobalt									
Copper									
Gold									
Iron									
Lead	92.7	100	92.7	80-120	93.0	100	93.0	0.3	20
Magnesium									
Manganese									
Molybdenum									
Nickel									
Palladium									
Platinum									
Potassium									
Selenium	anr								
Silicon									
Silver	anr								
Sodium									
Strontium									
Thallium									
Tin									
Titanium									
Tungsten									
Vanadium									
Zinc									
Zirconium									

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21196: JB39590-1, JB39590-2

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 06/18/13

Metal	LCS Result	Spikelot MPLCS80	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	anr			
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper				
Gold				
Iron				
Lead	107	115	93.0	82-119
Magnesium				
Manganese				
Molybdenum				
Nickel				
Palladium				
Platinum				
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				
Zinc				
Zirconium				

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:

Metal

Associated samples MP21196: JB39590-1, JB39590-2

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date: 06/18/13

Metal	MC21810-5 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	anr			
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper				
Gold				
Iron				
Lead	234	258	10.4 (a)	0-10
Magnesium				
Manganese				
Molybdenum				
Nickel				
Palladium				
Platinum				
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				
Zinc				
Zirconium				

SERIAL DILUTION RESULTS SUMMARY

Login Number: JB39590
Account: ALNJ - Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

QC Batch ID: MP21196 Methods: SW846 6010C
Matrix Type: SOLID Units: ug/l

Prep Date:

Metal

Associated samples MP21196: JB39590-1, JB39590-2

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Serial dilution indicates possible matrix interference.

New Jersey

ACCUTEST LABORATORIES

General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Job Number: JB39590
Account: ALNJ Accutest New Jersey
Project: AQTPAW: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: JB39590-1 **Analyzed:** 18-JUN-13 by HS **Method:** SM21 2540 B MOD.
ClientID: AOI5_MW-481_0-1_061313

Wet Weight (Total)	37.871	g
Tare Weight	26.889	g
Dry Weight (Total)	36.511	g
Solids, Percent	87.6	%

Sample: JB39590-2 **Analyzed:** 18-JUN-13 by HS **Method:** SM21 2540 B MOD.
ClientID: AOI5_MW-481_5-6_061313

Wet Weight (Total)	36.704	g
Tare Weight	26.2	g
Dry Weight (Total)	34.776	g
Solids, Percent	81.6	%

New Jersey

ACCUTEST LABORATORIES

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Job Number: JB39590
Account: AQTPAW Aquaterra Technologies, Inc.
Project: Sun-Marcus Hook Refinery, Philadelphia, PA

Sample: JB39590-1 **Analyzed:** 18-JUN-13 by AMA **Method:** SM21 2540 B MOD.
ClientID: AOI5_MW-481_0-1_061313

Wet Weight (Total)	37.871	g
Tare Weight	26.889	g
Dry Weight (Total)	36.511	g
Solids, Percent	87.6	%

Sample: JB39590-2 **Analyzed:** 18-JUN-13 by AMA **Method:** SM21 2540 B MOD.
ClientID: AOI5_MW-481_5-6_061313

Wet Weight (Total)	36.704	g
Tare Weight	26.2	g
Dry Weight (Total)	34.776	g
Solids, Percent	81.6	%