

**LONGHORN ARMY
AMMUNITION PLANT
KARNACK, TEXAS**

**ADMINISTRATIVE
RECORD**

Volume 15

2018

Bate Stamp Numbers

00856763 - 00858612

Prepared for

**Department of the Army
Longhorn Army Ammunition Plant**

1976 – 2018

***LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX***

VOLUME 15

2018

- A. Title: Report (cont'd) – Quarterly Evaluation Report, 2nd Quarter (April-July) 2017, Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas
- Author(s): AECOM Technical Services
- Recipient: U.S. Army Corps of Engineers
- Date: September 2017
- Bate Stamp: 00856763 – 00858612

2.2.2.1 Summary Data

Lab Report #: L17051391

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17051391-01	PrePrep Method: N/A	Instrument: HPMS15
Client ID: LH18/24-SP650-6442-GRAB	Prep Method: 3520C	Prep Date: 05/30/2017 16:02
Matrix: Water	Analytical Method: 8270D	Cal Date: 05/04/2017 16:11
Workgroup #: WG616244	Analyst: LJH	Run Date: 06/02/2017 15:08
Collect Date: 05/24/2017 15:00	Dilution: 5	File ID: 15M21272
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,4-Dioxane	123-91-1	18.1		11.1	5.56	2.78
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,4-Dioxane-d8	58.9	20	129			

2.2.2.2 QC Summary Data

Example 8270 Calculations

1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:

$$RF = [(Ax) (Cis)] / [(Ais) (Cx)]$$

where:

Ax = Area of the characteristic ion for the compound being measured:	1261197
Cis = Concentration of the specific internal standard (ug/mL)	40
Ais = Area of the characteristic ion of the specific internal standard	608044
Cx = Concentration of the compound in the standard being measured (ug/mL)	50
RF = Calculated Response Factor	1.65935

Example

2.0 Calculating the concentration (C) of a compound in water using the data from the prep log and quantitation report: *

$$Cx = [(Ax) (Cis) (Vf) (D)] / [(Ais) (RF) (Vi)]$$

where:

Ax = Area of the characteristic ion for the compound being measured	367250
Cis = Concentration of the specific internal standard (ug/mL)	40
Vf = Final volume of sample extract from prep log (mL)	1
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	511641
RF = Average RF from the ICAL	1.65935
Vi = Initial volume of sample extracted from prep log (mL)	1021
Cx = Concentration of the compound in the sample being measured (ug/mL)	0.016947
Cx = Concentration of the compound in the sample being measured (ug/L)	16.947

Example

3.0 Calculating the concentration (C) of a compound in soil using the data from the prep log and quantitation report: *

$$Cx = [(Ax) (Cis) (Vf) (D)] / [(Ais) (RF) (Wi)]$$

where:

Ax = Area of the characteristic ion for the compound being measured	367250
Cis = Concentration of the specific internal standard (ug/mL)	40
Vf = Final volume of sample extract from prep log (mL)	1
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	511641
RF = Average RF from the ICAL	1.65935
Wi = Initial weight of sample extracted (g) from prep log	30
Cx = Concentration of the compound in the sample being measured (ug/g)	0.576763
Cx = Concentration of the compound in the sample being measured (ug/kg)	576.7627

Example

Dry weight correction:

Percent solids (PCT_S)	50
Cd = (Cx) (100)/PCT_S	1153.525 ug/kg

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

4.0 Concentration from Linear Regression

Step 1: Retrieve Curve Data From Plot, $y = mx + b$

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve plot

b = intercept from curve plot

Step 2: Calculate y from Quantitation Report

y = 16790/784838 = 0.02139

Step 3: Solve for x

$$x = (y - b)/m = [(0.02139 - (-0.0435))/0.0783] = 0.829$$

Step 4: Solve for analyte concentration Cx

$$Cx = Cis (x) = (25.0)(0.829) = 20.72 \text{ ug/L}$$

Example Spreadsheet Calculation:

Slope from curve, m:	0.0783
Intercept from curve, b:	-0.0435
Area of analyte, Ax:	16790
Area of Internal Standard, Ais:	784484
Concentration of IS, Cis	25.00 ug/L
Response Ratio (y) :	0.021403
Amount Ratio:	0.828897
Concentration (Cx):	20.72241 ug/L

5.0 Concentration from Quadratic Regression**Step 1 - Retrieve Curve Data from Plot, $y = Ax^2 + Bx + C$**

Where:

$$Ax^2 + Bx + (C - y) = 0$$

A, B, C = constants from the ICAL quadratic regression

y = Response ratio = Area of analyte/Area of internal standard (IS)

x = Amount ratio = Concentration of analyte/concentration of IS

Step 2: Calculate y from Quantitation Report

$$y = Ax/Ais$$

Step 3: Solve for x using the quadratic formula

$$Ax^2 + Bx + C - y = 0$$

$$x = \frac{b \pm \sqrt{(b^2 - 4a(c - y))}}{2a} \quad (\text{Two possible solutions})$$

Step 4: Solve for analyte concentration Cx

$$Cx = (Cis)(\text{Amount ratio})$$

Example Spreadsheet Calculation:

Value of A from plot:	0.0259
Value of B from plot:	0.0596
Value of C from plot:	-0.0165
Area of analyte from quantitation report:	203233
Area of IS from quantitation report:	1425653
Response ratio, y:	0.142554
C - y:	-0.15905
Root 1 - Computed amount ratio, X1:	-3.88278
Root 2 - Computed amount ratio, X2:	1.581623 use this solution
Concentration of IS, Cis:	40.00
Concentration of analyte, Cx:	63.26 ug/L

Workgroup: WG615718 TIME ON: 16:10 OFF: 10:30 ON: 11:55 OFF: 08:10
 Analyst: CPD Methylene Chloride Lot #: COA19736
 Spike Analyst: CPD Na2SO4, Anhydrous, Granular Lot #: COA19759
 Method: 3520C 1:1 H2SO4 Lot #: RGT40290
 Run Date: 05/30/2017 16:02 10N NaOH Lot #: RGT40171
 SOP: EXB01 Revision 20
 Spike Witness: BNB
 Surr Solution: STD80323

	SAMPLE #	Type	Reference	Prod	pH	Init Amnt	Surr Amnt	Spike Amnt	Spike Sol	Final Vol	Color
1	L17051389-01	SAMP		827-DIOXANE<2>12		1000 mL	.05 mL			1 mL	Colored
2	L17051391-01	SAMP		827-DIOXANE<2>12		900 mL	.05 mL			1 mL	Colored
3	L17051403-01	SAMP		827-DIOXANE<2>12		1000 mL	.05 mL			1 mL	Colored
4	L17051403-02	SAMP		827-DIOXANE<2>12		980 mL	.05 mL			1 mL	Colored
5	L17051403-03	SAMP		827-DIOXANE<2>12		960 mL	.05 mL			1 mL	Colored
6	L17051403-04	SAMP		827-DIOXANE<2>12		950 mL	.05 mL			1 mL	Colored
7	L17051403-05	SAMP		827-DIOXANE<2>12		920 mL	.05 mL			1 mL	Colored
8	L17051403-06	SAMP		827-DIOXANE<2>12		940 mL	.05 mL			1 mL	Colored
9	L17051479-01	RS01		827-DIOXANE<2>12		940 mL	.05 mL			1 mL	Colored
10	L17051479-02	MS01	L17051479-01	827-DIOXANE<2>12		940 mL	.05 mL	.05 mL	STD77209	1 mL	Colored
11	L17051479-03	SD01	L17051479-01	827-DIOXANE<2>12		940 mL	.05 mL	.05 mL	STD77209	1 mL	Colored
12	WG615718-01	BLANK		827-DIOXANE<2>12		1000 mL	.05 mL			1 mL	Transparent
13	WG615718-02	LCS		827-DIOXANE<2>12		1000 mL	.05 mL	.05 mL	STD77209	1 mL	Colored
14	WG615718-03	REF	L17051479-01	827-DIOXANE<2>12		940 mL	.05 mL			1 mL	Colored
15	WG615718-04	MS	L17051479-01	827-DIOXANE<2>12		940 mL	.05 mL	.05 mL	STD77209	1 mL	Colored
16	WG615718-05	MSD	L17051479-01	827-DIOXANE<2>12		940 mL	.05 mL	.05 mL	STD77209	1 mL	Colored

pH 0-3 Lot#230515
 pH 10-12 Lot#213515
 TV1P5

L17051479-01	LEFT PINK RESIDUE ON ZYMARK
L17051479-02	LEFT PINK RESIDUE ON ZYMARK
L17051479-03	LEFT PINK RESIDUE ON ZYMARK
WG615718-03	LEFT PINK RESIDUE ON ZYMARK
WG615718-04	LEFT PINK RESIDUE ON ZYMARK
WG615718-05	LEFT PINK RESIDUE ON ZYMARK

Analyst: *Robert Davis*

Reviewer: *Jessica DeLong*



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 Dataset: 050417
 Analyst1: SCB Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 28

Maintenance Log ID: _____ Syringe Filter Lot#: _____

Eluent ID#: _____

Workgroups: _____ Column 1 ID: RXI-5MS Column 2 ID: NA
WG612906, WG611968

Internal STD: STD81022 Surrogate STD: NA Calibration STD: _____

CCV STD: STD80097 LCS STD: _____ MS/MSD STD: _____

Comments: _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15M21101	BAKE OUT	1	1		05/04/17 13:29
2	15M21102	WG612906-01 5PPM LL DFTPP	1	1	STD80383	05/04/17 14:00
3	15M21103	WG612906-02 5PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 14:18
4	15M21104	WG612906-03 10PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 14:40
5	15M21105	WG612906-04 7.5PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 15:03
6	15M21106	WG612906-05 2.5PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 15:26
7	15M21107	WG612906-06 1PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 15:48
8	15M21108	WG612906-07 0.4PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 16:11
9	15M21109	WG612906-08 5PPM ALT 1,4-DIOX STD	1	1	STD80098	05/04/17 16:48
10	15M21110	WG611678-01 BLANK 827-DIOXANE	7	1	SOIL	05/04/17 17:11
11	15M21111	L17040008-50 827-DIOXANE	7	1	SOIL	05/04/17 17:34
12	15M21112	L17040008-51 827-DIOXANE	7	1	SOIL	05/04/17 17:56
13	15M21113	L17040008-52 827-DIOXANE	7	1	SOIL	05/04/17 18:19
14	15M21114	L17040008-53 827-DIOXANE	7	1	SOIL	05/04/17 18:43
15	15M21115	BAKE OUT	1	1		05/04/17 19:05
16	15M21116	BAKE OUT	1	1		05/04/17 19:28
17	15M21117	BAKE OUT	1	1		05/04/17 19:51

Comments

Seq.	Rerun	Dil.	Reason	Analytes
12				
			L17040008-51 827-DIOXANE low recovery-remix and reanalyze.	

Page: 1

Approved: 05-MAY-17

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 Dataset: 060217
 Analyst1: LJH Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 28

Maintenance Log ID: _____ Syringe Filter Lot#: _____

Eluent ID#: _____

Workgroups: _____
 Column 1 ID: RXI-5MS Column 2 ID: NA
WG616244

Internal STD: STD81998 Surrogate STD: NA Calibration STD: _____

CCV STD: STD80097 LCS STD: _____ MS/MSD STD: _____

Comments: _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15M21257	BAKE OUT	1	1		06/02/17 08:56
2	15M21258	WG616311-01 5PPM LL DFTPP	1	1	STD80383	06/02/17 09:16
3	15M21259	WG616311-01 5PPM LL DFTPP	1	1	STD80383	06/02/17 09:44
4	15M21260	WG616311-01 5PPM LL DFTPP	1	1	STD80383	06/02/17 10:34
5	15M21261	WG616311-02 5PPM 1,4-DIOXANE STD	1	1	STD80097	06/02/17 10:52
6	15M21262	WG615718-01 BLANK 827-DIOXANE	1	1		06/02/17 11:15
7	15M21263	WG615718-02 LCS 827-DIOXANE	1	1		06/02/17 11:37
8	15M21264	WG615718-01 BLANK 827-DIOXANE	1	1		06/02/17 12:06
9	15M21265	L17051403-01 827-DIOXANE	1	1		06/02/17 12:29
10	15M21266	L17051403-02 827-DIOXANE	1	1		06/02/17 12:51
11	15M21267	L17051403-03 827-DIOXANE	1	1		06/02/17 13:14
12	15M21268	L17051403-04 827-DIOXANE	1	1		06/02/17 13:37
13	15M21269	L17051403-05 827-DIOXANE	1	1		06/02/17 14:00
14	15M21270	L17051403-06 827-DIOXANE	1	1		06/02/17 14:23
15	15M21271	L17051389-01 5X 827-DIOXANE	1	5		06/02/17 14:45
16	15M21272	L17051391-01 5X 827-DIOXANE	1	5		06/02/17 15:08
17	15M21273	L17051479-01 REF 10X 827-DIOXANE	1	10		06/02/17 15:31
18	15M21274	L17051479-02 MS 10X 827-DIOXANE	1	10		06/02/17 15:54
19	15M21275	L17051479-03 MSD 10X 827-DIOXANE	1	10		06/02/17 16:17
20	15M21276	L17051403-02 20X 827-DIOXANE	1	20		06/02/17 16:39
21	15M21277	L17051403-03 20X 827-DIOXANE	1	20		06/02/17 17:02
22	15M21278	L17051403-04 20X 827-DIOXANE	1	20		06/02/17 17:25
23	15M21279	L17051403-05 20X 827-DIOXANE	1	20		06/02/17 17:48
24	15M21280	L17051403-06 20X 827-DIOXANE	1	20		06/02/17 18:10
25	15M21281	L17051479-01 REF 20X 827-DIOXANE	1	20		06/02/17 18:33
26	15M21282	BAKE OUT	1	1		06/02/17 18:56
27	15M21283	BAKE OUT	1	1		06/02/17 19:18
28	15M21284	BAKE OUT	1	1		06/02/17 19:41

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2				
			WG616311-01 5PPM LL DFTPP had an ion failure, RR, NR.	

Page: 1

Approved: 05-JUN-17

Eri C. Zimm



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 _____ Dataset: 060217 _____
 Analyst1: LJH _____ Analyst2: NA _____
 Method: 8270C/D _____ SOP: MSS01 _____ Rev: 28 _____

Maintenance Log ID: _____ Syringe Filter Lot#: _____
 Eluent ID#: _____

Workgroups: _____ Column 1 ID: RXI-5MS _____ Column 2 ID: NA _____
 WG616244 _____
 Internal STD: STD81998 _____ Surrogate STD: NA _____
 CCV STD: STD80097 _____ LCS STD: _____

Comments

Seq.	Rerun	Dil.	Reason	Analytes
3				
			WG616311-01 5PPM LL DFTPP Pentachlorophenol was high. Maintenance was performed by cutting the column ~10 cm. RR, NR.	
8				
			WG615718-01 BLANK 827-DIOXANE unnecessary RR, NR.	
10	X	20	Over Calibration Range	1,4 Dioxane
			L17051403-02 827-DIOXANE	
11	X	20	Over Calibration Range	1,4 Dioxane
			L17051403-03 827-DIOXANE	
12	X	20	Over Calibration Range	1,4 Dioxane
			L17051403-04 827-DIOXANE	
13	X	20	Over Calibration Range	1,4 Dioxane
			L17051403-05 827-DIOXANE	
14	X	20	Over Calibration Range	1,4 Dioxane
			L17051403-06 827-DIOXANE	
15			Surrogate standard failure	1,4-Dioxane-d8
			L17051389-01 5X 827-DIOXANE was ran at an initial dilution based on sample history. Surrogate failed high and sample had a hit. Re-extraction is necessary.	
16				
			L17051391-01 5X 827-DIOXANE was an at an initial dilution based on sample history.	
17	X	20	Over Calibration Range	1,4 Dioxane
			L17051479-01 REF 10X 827-DIOXANE was ran at an initial dilution due to the sample matrix being pink.	
18				
			L17051479-02 MS 10X 827-DIOXANE was ran at an initial dilution due to the sample matrix being pink. 1,4-dioxane failed low due to the presence of this analyte in the reference sample.	
19				
			L17051479-03 MSD 10X 827-DIOXANE was ran at an initial dilution due to the sample matrix being pink. 1,4-dioxane failed low due to the presence of this analyte in the reference sample.	

Page: 2

Approved: 05-JUN-17



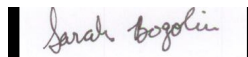

Microbac Laboratories Inc.

Data Checklist

Date: 04-MAY-2017
 Analyst: SCB
 Analyst: NA
 Method: 827-DIOX
 Instrument: HPMS15
 Curve Workgroup: NA
 Runlog ID: 81976
 Analytical Workgroups: WG612906, L17040008

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	X
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	X
TCL hits	X
Surrogate recoveries	X
LCS/LCSD (Laboratory Control Sample)	NA
Recoveries	NA
Surrogate recoveries	NA
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	SCB
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	MES

Primary Reviewer:
05-MAY-2017



Secondary Reviewer:
05-MAY-2017



CHECKLIST1 - Modified 03/05/2008

Generated: MAY-05-2017 17:10:06



Microbac Laboratories Inc.

Data Checklist

Date: 02-JUN-2017
 Analyst: LJH
 Analyst: NA
 Method: 827-DIOX
 Instrument: HPMS15
 Curve Workgroup: NA
 Runlog ID: 82551
 Analytical Workgroups: L17051389, L17051391, L17051403, L17051479

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	X
TCL hits	X
Surrogate recoveries	X
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	X
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	
Check for completeness	X
Primary Reviewer	LJH
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
05-JUN-2017

Racey J. Bendorshot

Secondary Reviewer:
05-JUN-2017

Eri C. Zimm



Analytical Method:8270D
Login Number:L17051391

AAB#:WG616244

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6442-GRAB	01	05/24/17					05/30/2017	6	7		06/02/17	3	40	

* = SEE PROJECT QAPP REQUIREMENTS



Login Number:L17051391
Instrument Id:HPMS15
Workgroup (AAB#):WG616244

Method:827-DIOXANE
CAL ID: HPMS15 - 04-MAY-17
Matrix:Water

Sample Number	Dilution	Tag	1
L17051391-01	5.00	DL01	58.9
WG615718-01	1.00	01	51.6
WG615718-02	1.00	01	48.6

Surrogates	Surrogate Limits
1 - 1,4-Dioxane-d8	20 - 129

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



METHOD BLANK SUMMARY

Login Number: L17051391 Work Group: WG616244
Blank File ID: 15M21262 Blank Sample ID: WG615718-01
Prep Date: 05/30/17 16:02 Instrument ID: HPMS15
Analyzed Date: 06/02/17 11:15 Method: 8270D
Analyst: LJH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG615718-02	15M21263	06/02/17 11:37	01
LH18/24-SP650-6442-GRAB	L17051391-01	15M21272	06/02/17 15:08	DL01

Report Name: BLANK_SUMMARY
PDF File ID: 5321180
Report generated 06/05/2017 11:19



Login Number: L17051391 Prep Date: 05/30/17 16:02 Sample ID: WG615718-01
 Instrument ID: HPMS15 Run Date: 06/02/17 11:15 Prep Method: 3520C
 File ID: 15M21262 Analyst: LJH Method: 8270D
 Workgroup (AAB#): WG616244 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS15-04-MAY-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
1,4-Dioxane	0.500	2.00	0.500	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,4-Dioxane-d8	51.6	20 - 129	PASS

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5321181
 05-JUN-2017 11:19



Login Number: L17051391 Run Date: 06/02/2017 Sample ID: WG615718-02
 Instrument ID: HPMS15 Run Time: 11:37 Prep Method: 3520C
 File ID: 15M21263 Analyst: LJH Method: 8270D
 Workgroup (AAB#): WG616244 Matrix: Water Units: ug/L
 QC Key: DOD4 Lot#: STD77209 Cal ID: HPMS15-04-MAY-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
1,4-Dioxane	5.00	2.73	54.7	30 - 104	

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,4-Dioxane-d8	48.6	20 - 129	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
 PDF File ID: 5321182
 Report generated: 06/05/2017 11:19



DFTPP

Login Number: L17051391 Tune ID: WG612906-01
 Instrument: HPMS15 Run Date: 05/04/2017
 Analyst: SCB Run Time: 14:00
 Workgroup: WG612906 File ID: 15M21102
 Cal ID: HPMS15-04-MAY-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	39.8	100763	PASS
68.0	69.0	0	2.00	1.94	2347	PASS
69.0	198	0	100	47.6	120729	PASS
70.0	69.0	0	2.00	0.764	922	PASS
127	198	40.0	60.0	52.2	132295	PASS
197	198	0	1.00	0.399	1011	PASS
198	198	100	100	100	253422	PASS
199	198	5.00	9.00	6.86	17396	PASS
275	198	10.0	30.0	24.4	61731	PASS
365	198	1.00	100	2.74	6948	PASS
441	443	0.0100	100	72.9	21184	PASS
442	198	40.0	100	55.7	141072	PASS
443	442	17.0	23.0	20.6	29074	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG612906-02	STD-CCV	01	05/04/2017 14:18	
WG612906-03	STD	01	05/04/2017 14:40	
WG612906-04	STD	01	05/04/2017 15:03	
WG612906-05	STD	01	05/04/2017 15:26	
WG612906-06	STD	01	05/04/2017 15:48	
WG612906-07	STD	01	05/04/2017 16:11	
WG612906-08	SSCV	01	05/04/2017 16:48	

* Sample past 12 hour tune limit



DFTPP

Login Number: L17051391 Tune ID: WG616311-01
 Instrument: HPMS15 Run Date: 06/02/2017
 Analyst: LJH Run Time: 10:34
 Workgroup: WG616311 File ID: 15M21260
 Cal ID: HPMS15-04-MAY-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	39.4	74447	PASS
68.0	69.0	0	2.00	1.90	1638	PASS
69.0	198	0	100	45.7	86307	PASS
70.0	69.0	0	2.00	0.651	562	PASS
127	198	40.0	60.0	51.2	96616	PASS
197	198	0	1.00	0.755	1426	PASS
198	198	100	100	100	188815	PASS
199	198	5.00	9.00	7.30	13778	PASS
275	198	10.0	30.0	24.8	46787	PASS
365	198	1.00	100	3.59	6771	PASS
441	443	0.0100	100	78.3	16773	PASS
442	198	40.0	100	58.3	110131	PASS
443	442	17.0	23.0	19.4	21408	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG616311-02	CCV	01	06/02/2017 10:52	
WG615718-01	BLANK	01	06/02/2017 11:15	
WG615718-02	LCS	01	06/02/2017 11:37	
L17051391-01	LH18/24-SP650-6442-GRAB	DL01	06/02/2017 15:08	

* Sample past 12 hour tune limit



Login Number: L17051391
Analytical Method: 8270D
ICAL Workgroup: WG612906

Instrument ID: HPMS15
Initial Calibration Date: 04-MAY-17 16:11
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
1,4-Dioxane	0.3110	1.82		

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 5321183
Report generated 06/05/2017 11:19



Login Number: L17051391
Analytical Method: 8270D

Instrument ID: HPMS15
Initial Calibration Date: 04-MAY-17 16:11
Column ID: F

Analyte	WG612906-02			WG612906-03			WG612906-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,4-Dioxane	5.00	126741.000	0.3085	10.0	226922.000	0.3188	7.50	171013.000	0.3132

INT_CAL - Modified 03/06/2008
PDF File ID: 5321183
Report generated 06/05/2017 11:19



Login Number: L17051391
 Analytical Method: 8270D

Instrument ID: HPMS15
 Initial Calibration Date: 04-MAY-17 16:11
 Column ID: F

Analyte	WG612906-05			WG612906-06			WG612906-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,4-Dioxane	2.50	53891.0000	0.3099	1.00	21636.0000	0.3135	0.400	8746.00000	0.3020

INT_CAL - Modified 03/06/2008
 PDF File ID: 5321183
 Report generated 06/05/2017 11:19



Login Number: L17051391 Run Date: 05/04/2017 Sample ID: WG612906-08
 Instrument ID: HPMS15 Run Time: 16:48 Method: 8270D
 File ID: 15M21109 Analyst: SCB/LJH QC Key: DOD4
 ICal Workgroup: WG612906 Cal ID: HPMS15 - 04-MAY-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
1,4-Dioxane	5000	4430	ug/L	0.274	11.4	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17051391 Run Date: 06/02/2017 Sample ID: WG616311-02
 Instrument ID: HPMS15 Run Time: 10:52 Method: 8270D
 File ID: 15M21261 Analyst: LJH QC Key: DOD4
 Workgroup (AAB#): WG616244 Cal ID: HPMS15 - 04-MAY-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
1,4-Dioxane	5000	4850	ug/L	0.302	2.91	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17051391
Instrument ID: HPMS15
Workgroup (AAB#): WG616244

ICAL CCV Number: WG612906-02
CAL ID: HPMS15-04-MAY-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG612906-02	NA	NA	82158
Upper Limit	NA	NA	164316
Lower Limit	NA	NA	41079
<u>L17051391-01</u>	5.00	DL01	87178
WG615718-01	1.00	01	81982
WG615718-02	1.00	01	71184

IS-1 - 1,4-Dichlorobenzene-d4

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO MIDPOINT OF ICAL)

00856787

Login Number: L17051391
Instrument ID: HPMS15
Workgroup (AAB#): WG616244

ICAL CCV Number: WG612906-02
CAL ID: HPMS15-04-MAY-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG612906-02	NA	NA	7.2
Upper Limit	NA	NA	7.7
Lower Limit	NA	NA	6.7
<u>L17051391-01</u>	5.00	DL01	7.179
WG615718-01	1.00	01	7.176
WG615718-02	1.00	01	7.176

IS-1 - 1,4-Dichlorobenzene-d4

Underline = Response outside limits



2.3 Metals Data

2.3.1 Metals I C P Data

2.3.1.1 Summary Data

Lab Report #: L17051391

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17051391-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: LH18/24-SP650-6442-GRAB	Prep Method: 3015A	Prep Date: 05/30/2017 09:42
Matrix: Water	Analytical Method: 6010C	Cal Date: 06/01/2017 11:29
Workgroup #: WG616048	Analyst: KKB	Run Date: 06/01/2017 16:56
Collect Date: 05/24/2017 15:00	Dilution: 1	File ID: T4.060117.165621
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Aluminum, Total	7429-90-5	0.123	J	0.200	0.200	0.100
Iron, Total	7439-89-6	0.868		0.100	0.100	0.0500
Selenium, Total	7782-49-2	0.0200	U	0.0200	0.0200	0.0100
J	Estimated value ; the analyte concentration was less than the LOQ.					
U	Analyte was not detected. The concentration is below the reported LOD.					

2.3.1.2 QC Summary Data

Example 6010 Calculations

Thermo Scientific iCAP

1.0 Initial Calibration (ICAL) Parameters

For a multi-point calibration, the system performs linear regression from data consisting of a blank and four standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system in ug/mL (ppm)

Vf = Final volume (mL)

Vi = Initial volume (mL)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/mL (mg/L)

Example:

0.1

50

50

1

0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (mg/L) (ppm)

Vf = Final volume (mL)

Vi = Initial weight (g)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/g (mg/kg)

Example:

0.1

50

1

1

5

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

$Cdry$ = Concentration calculated as dry weight (mg/kg)

Example:

5

80

6.25

Example 6010 Calculations

Thermo Scientific iCAP

1.0 Initial Calibration (ICAL) Parameters

For a multi-point calibration, the system performs linear regression from data consisting of a blank and four standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system in ug/mL (ppm)

Vf = Final volume (mL)

Vi = Initial volume (mL)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/mL (mg/L)

Example:

0.1

50

50

1

0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (mg/L) (ppm)

Vf = Final volume (mL)

Vi = Initial weight (g)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/g (mg/kg)

Example:

0.1

50

1

1

5

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

$Cdry$ = Concentration calculated as dry weight (mg/kg)

Example:

5

80

6.25

Workgroup: WG615868
 Analyst: ERP
 Spike Analyst: ERP
 Run Date: 05/30/2017 09:42
 Method: 3015A
 Balance: BAL019
 Instrument: MW-1
 Instrument Start: 05/30/2017 09:58

SOP: ME407 Revision 19
 Spike Solution: STD81778
 Spike Witness: VC
 HNO3 Lot #: COA19718
 HCL Lot #: COA19685
 40 & 50 ML. DIGESTION TUCOA19487
 ICP FILTERS LOT#R6sa4256RGT40011

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG615868-02	BLANK	1	40 mL	50 mL	206.735 g	206.717 g	
2	WG615868-03	LCS	1	40 mL	50 mL	212.379 g	212.351 g	5 mL
3	L17051380-26	SAMP	1	40 mL	50 mL	205.622 g	205.596 g	
4	L17051380-27	SAMP	1	40 mL	50 mL	206.151 g	206.126 g	06/05/17
5	L17051380-28	SAMP	1	40 mL	50 mL	204.84 g	204.816 g	06/05/17
6	L17051389-01	SAMP	1	40 mL	50 mL	203.928 g	203.907 g	06/05/17
7	L17051391-01	SAMP	1	40 mL	50 mL	206.157 g	206.139 g	06/05/17
8	WG615868-01	REF	1	40 mL	50 mL	206.164 g	206.14 g	
9	L17051398-04	RSO2	1	40 mL	50 mL	206.164 g	206.14 g	06/08/17
10	WG615868-04	MS	1	40 mL	50 mL	209.461 g	209.431 g	5 mL
11	L17051398-05	MSO2	1	40 mL	50 mL	209.461 g	209.431 g	5 mL
12	WG615868-05	MSD	1	40 mL	50 mL	211.213 g	211.185 g	5 mL
13	L17051398-06	SDO2	1	40 mL	50 mL	211.213 g	211.185 g	5 mL
14	L17051398-11	SAMP	1	40 mL	50 mL	205.551 g	205.531 g	06/08/17
15	L17051398-14	SAMP	1	40 mL	50 mL	207.409 g	207.38 g	06/08/17
16	L17051398-17	SAMP	1	40 mL	50 mL	206.961 g	206.943 g	06/08/17
17	L17051398-20	SAMP	1	40 mL	50 mL	203.605 g	203.573 g	06/08/17
18	L17051398-23	SAMP	1	40 mL	50 mL	208.305 g	208.283 g	06/08/17
19	L17051398-26	SAMP	1	40 mL	50 mL	207.554 g	207.534 g	06/08/17
20	L17051398-29	SAMP	1	40 mL	50 mL	206.132 g	206.09 g	06/08/17
21	L17051403-01	SAMP	1	40 mL	50 mL	204.995 g	204.961 g	06/05/17
22	L17051403-02	SAMP	1	40 mL	50 mL	208.594 g	208.567 g	06/05/17
23	L17051403-03	SAMP	1	40 mL	50 mL	205.211 g	205.191 g	06/05/17
24	L17051403-04	SAMP	1	40 mL	50 mL	205.057 g	205.023 g	06/05/17
25	L17051403-05	SAMP	1	40 mL	50 mL	207.806 g	207.768 g	06/05/17
26	L17051403-06	SAMP	1	40 mL	50 mL	206.509 g	206.49 g	06/05/17
27	L17051497-01	SAMP	1	40 mL	50 mL	205.001 g	204.967 g	06/09/17

L17051398-17 filtered digestate

Analyst: Evan Poston

Reviewer: Vicki Collier



Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 060117T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD81939 Int. Std: RGT39282
 CCV: STD81717 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 615862,616020,616025,616048,616173

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.060117.111435	WG616329-01	Calibration Point		1		06/01/17 11:14
2	T4.060117.111818	WG616329-02	Calibration Point		1		06/01/17 11:18
3	T4.060117.112201	WG616329-03	Calibration Point		1		06/01/17 11:22
4	T4.060117.112544	WG616329-04	Calibration Point		1		06/01/17 11:25
5	T4.060117.112912	WG616329-05	Calibration Point		1		06/01/17 11:29
6	T4.060117.113238	WG616329-06	Initial Calibration Verification		1		06/01/17 11:32
7	T4.060117.114028	WG616329-07	Initial Calib Blank		1		06/01/17 11:40
8	T4.060117.114412	WG616329-08	Low Level Initial Calibration V		1		06/01/17 11:44
9	T4.060117.115008	WG616329-09	LLICV		1		06/01/17 11:50
10	T4.060117.115346	WG616329-10	LLICV		1		06/01/17 11:53
11	T4.060117.115726	WG616329-11	Interference Check		1		06/01/17 11:57
12	T4.060117.120111	WG616329-12	Interference Check		1		06/01/17 12:01
13	T4.060117.122813	WG616329-13	CCV		1		06/01/17 12:28
14	T4.060117.123142	WG616329-14	CCB		1		06/01/17 12:31
15	T4.060117.123527	WG615670-02	Method/Prep Blank	40/50	1		06/01/17 12:35
16	T4.060117.123911	WG615670-03	Laboratory Control S	40/50	1		06/01/17 12:39
17	T4.060117.124239	L17051380-01	AAA3178	40/50	1		06/01/17 12:42
18	T4.060117.124618	L17051380-02	AAA3178	40/50	1		06/01/17 12:46
19	T4.060117.124958	L17051380-03	AAA3179	40/50	1		06/01/17 12:49
20	T4.060117.125338	L17051380-04	AAA3179	40/50	1		06/01/17 12:53
21	T4.060117.125716	L17051380-05	AAA3180	40/50	1		06/01/17 12:57
22	T4.060117.130053	L17051380-06	AAA3180	40/50	1		06/01/17 13:00
23	T4.060117.130430	WG615862-03	Post Digestion Spike		1	L17051380-06	06/01/17 13:04
24	T4.060117.130757	WG615862-04	Serial Dilution		5	L17051380-06	06/01/17 13:07
25	T4.060117.131137	WG616329-15	CCV		1		06/01/17 13:11
26	T4.060117.131504	WG616329-16	CCB		1		06/01/17 13:15
27	T4.060117.131851	L17051380-07	AAA3181	40/50	1		06/01/17 13:18
28	T4.060117.132227	L17051380-08	AAA3181	40/50	1		06/01/17 13:22
29	T4.060117.132605	L17051380-09	AAA3182	40/50	1		06/01/17 13:26
30	T4.060117.132944	L17051380-10	AAA3182	40/50	1		06/01/17 13:29
31	T4.060117.133323	WG615670-01	Reference Sample		1	L17051380-17	06/01/17 13:33
32	T4.060117.133701	WG615670-04	Matrix Spike	40/50	1	L17051380-17	06/01/17 13:37
33	T4.060117.134029	WG615670-05	Matrix Spike Duplica	40/50	1	L17051380-17	06/01/17 13:40
34	T4.060117.134357	WG616329-17	CCV		1		06/01/17 13:43

Page: 1 Approved: June 02, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 060117T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD81939 Int. Std: RGT39282
 CCV: STD81717 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 615862,616020,616025,616048,616173

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.060117.134725	WG616329-18	CCB		1		06/01/17 13:47
36	T4.060117.135111	WG615827-02	Method/Prep Blank	40/50	1		06/01/17 13:51
37	T4.060117.135455	WG615827-03	Laboratory Control S	40/50	1		06/01/17 13:54
38	T4.060117.135822	L17051380-11	AAA3183	40/50	1		06/01/17 13:58
39	T4.060117.140200	L17051380-12	AAA3183	40/50	1		06/01/17 14:02
40	T4.060117.140539	L17051380-13	EB0300	40/50	1		06/01/17 14:05
41	T4.060117.140923	L17051380-14	EB0300	40/50	1		06/01/17 14:09
42	T4.060117.141305	L17051380-15	AAB3209	40/50	1		06/01/17 14:13
43	T4.060117.141644	L17051380-16	AAB3209	40/50	1		06/01/17 14:16
44	T4.060117.142024	WG616020-03	Post Digestion Spike		1	L17051380-16	06/01/17 14:20
45	T4.060117.142352	WG616020-04	Serial Dilution		5	L17051380-16	06/01/17 14:23
46	T4.060117.142735	WG616329-19	CCV		1		06/01/17 14:27
47	T4.060117.143103	WG616329-20	CCB		1		06/01/17 14:31
48	T4.060117.143447	WG615827-01	Reference Sample		1	L17051380-18	06/01/17 14:34
49	T4.060117.143825	WG615827-04	Matrix Spike	40/50	1	L17051380-18	06/01/17 14:38
50	T4.060117.144153	WG615827-05	Matrix Spike Duplica	40/50	1	L17051380-18	06/01/17 14:41
51	T4.060117.144521	L17051380-23	AAB3211	40/50	1		06/01/17 14:45
52	T4.060117.144900	L17051380-24	AAB3211	40/50	1		06/01/17 14:49
53	T4.060117.145237	L17051380-25	AAB3212	40/50	1		06/01/17 14:52
54	T4.060117.145617	WG616329-21	CCV		1		06/01/17 14:56
55	T4.060117.145946	WG616329-22	CCB		1		06/01/17 14:59
56	T4.060117.150330	WG615901-03	Method/Prep Blank	40/50	1		06/01/17 15:03
57	T4.060117.150713	WG615901-04	Laboratory Control S	40/50	1		06/01/17 15:07
58	T4.060117.151042	WG615901-01	Reference Sample		100	L17051479-01	06/01/17 15:10
59	T4.060117.151423	WG615901-05	Matrix Spike	40/50	100	L17051479-01	06/01/17 15:14
60	T4.060117.151805	WG615901-06	Matrix Spike Duplica	40/50	100	L17051479-01	06/01/17 15:18
61	T4.060117.152147	WG615901-02	Reference Sample		1	L17051497-22	06/01/17 15:21
62	T4.060117.152525	WG615901-07	Matrix Spike	40/50	1	L17051497-22	06/01/17 15:25
63	T4.060117.152853	WG615901-08	Matrix Spike Duplica	40/50	1	L17051497-22	06/01/17 15:28
64	T4.060117.153221	L17051497-27	AAC3262	40/50	1		06/01/17 15:32
65	T4.060117.153600	L17051497-28	AAC3262	40/50	1		06/01/17 15:36
66	T4.060117.153939	WG616329-23	CCV		1		06/01/17 15:39
67	T4.060117.154307	WG616329-24	CCB		1		06/01/17 15:43
68	T4.060117.154650	L17051497-29	EB0303	40/50	1		06/01/17 15:46

Page: 2 Approved: June 02, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 060117T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8

Maintenance Log ID: _____

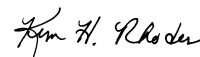
Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD81939 Int. Std: RGT39282
 CCV: STD81717 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 615862,616020,616025,616048,616173

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.060117.155034	L17051497-30	EB0303	40/50	1		06/01/17 15:50
70	T4.060117.155418	WG616025-03	Post Digestion Spike		1	L17051497-30	06/01/17 15:54
71	T4.060117.155746	WG616025-04	Serial Dilution		5	L17051497-30	06/01/17 15:57
72	T4.060117.160130	WG616329-25	CCV		1		06/01/17 16:01
73	T4.060117.160459	WG616329-26	CCB		1		06/01/17 16:04
74	T4.060117.160842	WG616329-27	Low Level Continuing Calibra		1		06/01/17 16:08
75	T4.060117.161222	WG616329-28	LLCCV		1		06/01/17 16:12
76	T4.060117.161600	WG616329-29	Low Level Continuing Calibra		1		06/01/17 16:16
77	T4.060117.161938	WG616329-30	Interference Check		1		06/01/17 16:19
78	T4.060117.162324	WG616329-31	Interference Check		1		06/01/17 16:23
79	T4.060117.162706	WG616329-32	CCV		1		06/01/17 16:27
80	T4.060117.163040	WG616329-33	CCB		1		06/01/17 16:30
81	T4.060117.163423	WG615868-02	Method/Prep Blank	40/50	1		06/01/17 16:34
82	T4.060117.163806	WG615868-03	Laboratory Control S	40/50	1		06/01/17 16:38
83	T4.060117.164135	L17051380-26	AAB3212	40/50	1		06/01/17 16:41
84	T4.060117.164514	L17051380-27	EB0301	40/50	1		06/01/17 16:45
85	T4.060117.164859	L17051380-28	EB0301	40/50	1		06/01/17 16:48
86	T4.060117.165241	L17051389-01	LH18/24-SP140-7442-GRAB	40/50	1		06/01/17 16:52
87	T4.060117.165621	L17051391-01	LH18/24-SP650-6442-GRAB	40/50	1		06/01/17 16:56
88	T4.060117.170000	WG615868-01	Reference Sample		1	L17051398-04	06/01/17 17:00
89	T4.060117.170342	WG615868-04	Matrix Spike	40/50	1	L17051398-04	06/01/17 17:03
90	T4.060117.170711	WG615868-05	Matrix Spike Duplica	40/50	1	L17051398-04	06/01/17 17:07
91	T4.060117.171042	WG616329-34	CCV		1		06/01/17 17:10
92	T4.060117.171410	WG616329-35	CCB		1		06/01/17 17:14
93	T4.060117.171754	L17051398-11	MW2E-333-14	40/50	1		06/01/17 17:17
94	T4.060117.172137	L17051398-14	MW4B-333-14	40/50	1		06/01/17 17:21
95	T4.060117.172518	L17051398-17	MW4B2-333-14	40/50	1		06/01/17 17:25
96	T4.060117.172857	L17051398-20	MW5A-333-14	40/50	1		06/01/17 17:28
97	T4.060117.173239	L17051398-23	OW1B-333-14	40/50	1		06/01/17 17:32
98	T4.060117.173620	L17051398-26	OW2A-333-14	40/50	1		06/01/17 17:36
99	T4.060117.174004	L17051398-29	OW3A-333-14	40/50	1		06/01/17 17:40
100	T4.060117.174347	L17051403-01	TCF-EB01-052317	40/50	1		06/01/17 17:43
101	T4.060117.174730	L17051403-02	MW26-GW-052317	40/50	1		06/01/17 17:47
102	T4.060117.175140	L17051403-03	MW23-GW-052417	40/50	1		06/01/17 17:51

Page: 3 Approved: June 02, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 060117T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD81939 Int. Std: RGT39282
 CCV: STD81717 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 615862,616020,616025,616048,616173Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T4.060117.175552	WG616329-36	CCV		1		06/01/17 17:55
104	T4.060117.175920	WG616329-37	CCB		1		06/01/17 17:59
105	T4.060117.180304	L17051403-04	MW21-GW-052417	40/50	1		06/01/17 18:03
106	T4.060117.180714	L17051403-05	MW35-GW-052417	40/50	1		06/01/17 18:07
107	T4.060117.181123	L17051403-06	MW35-GW-052417D	40/50	1		06/01/17 18:11
108	T4.060117.181534	L17051497-01	AAB3213	40/50	1		06/01/17 18:15
109	T4.060117.181912	WG616048-01	Post Digestion Spike		1	L17051497-01	06/01/17 18:19
110	T4.060117.182240	WG616048-02	Serial Dilution		5	L17051497-01	06/01/17 18:22
111	T4.060117.182620	WG616329-38	CCV		1		06/01/17 18:26
112	T4.060117.182947	WG616329-39	CCB		1		06/01/17 18:29
113	T4.060117.183330	WG615875-02	Method/Prep Blank	40/50	1		06/01/17 18:33
114	T4.060117.183712	WG615875-03	Laboratory Control S	40/50	1		06/01/17 18:37
115	T4.060117.184041	L17051497-02	AAB3213	40/50	1		06/01/17 18:40
116	T4.060117.184420	L17051497-03	AAB3214	40/50	1		06/01/17 18:44
117	T4.060117.184759	L17051497-04	AAB3214	40/50	1		06/01/17 18:47
118	T4.060117.185137	L17051497-05	AAB3215	40/50	1		06/01/17 18:51
119	T4.060117.185516	L17051497-06	AAB3215	40/50	1		06/01/17 18:55
120	T4.060117.185854	L17051497-07	AAB3216	40/50	1		06/01/17 18:58
121	T4.060117.190234	WG616173-01	Post Digestion Spike		1	L17051497-07	06/01/17 19:02
122	T4.060117.190602	WG616173-02	Serial Dilution		5	L17051497-07	06/01/17 19:06
123	T4.060117.190944	WG616329-40	CCV		1		06/01/17 19:09
124	T4.060117.191312	WG616329-41	CCB		1		06/01/17 19:13
125	T4.060117.191657	L17051497-08	AAB3216	40/50	1		06/01/17 19:16
126	T4.060117.192037	L17051497-09	AAC3256	40/50	1		06/01/17 19:20
127	T4.060117.192417	L17051497-10	AAC3256	40/50	1		06/01/17 19:24
128	T4.060117.192756	L17051497-11	AAC3257	40/50	1		06/01/17 19:27
129	T4.060117.193136	L17051497-12	AAC3257	40/50	1		06/01/17 19:31
130	T4.060117.193515	L17051497-13	AAC3258	40/50	1		06/01/17 19:35
131	T4.060117.193854	L17051497-14	AAC3258	40/50	1		06/01/17 19:38
132	T4.060117.194234	L17051497-15	AAC3259	40/50	1		06/01/17 19:42
133	T4.060117.194612	L17051497-16	AAC3259	40/50	1		06/01/17 19:46
134	T4.060117.194952	L17051497-17	AAC3260	40/50	1		06/01/17 19:49
135	T4.060117.195332	WG616329-42	CCV		1		06/01/17 19:53
136	T4.060117.195659	WG616329-43	CCB		1		06/01/17 19:56

Page: 4 Approved: June 02, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 060117T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD81939 Int. Std: RG739282
 CCV: STD81717 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 615862,616020,616025,616048,616173

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
137	T4.060117.200044	L17051497-18	AAC3260	40/50	1		06/01/17 20:00
138	T4.060117.200422	L17051497-19	EB0302	40/50	1		06/01/17 20:04
139	T4.060117.200806	L17051497-20	EB0302	40/50	1		06/01/17 20:08
140	T4.060117.201149	WG615875-01	Reference Sample		1	L17051497-21	06/01/17 20:11
141	T4.060117.201528	WG615875-04	Matrix Spike	40/50	1	L17051497-21	06/01/17 20:15
142	T4.060117.201855	WG615875-05	Matrix Spike Duplica	40/50	1	L17051497-21	06/01/17 20:18
143	T4.060117.202223	WG616329-44	CCV		1		06/01/17 20:22
144	T4.060117.202551	WG616329-45	CCB		1		06/01/17 20:25
145	T4.060117.202935	WG616329-46	LLCCV		1		06/01/17 20:29
146	T4.060117.203314	WG616329-47	LLCCV		1		06/01/17 20:33
147	T4.060117.203653	WG616329-48	Low Level Continuing Calibra		1		06/01/17 20:36
148	T4.060117.204031	WG616329-49	Interference Check		1		06/01/17 20:40
149	T4.060117.204416	WG616329-50	Interference Check		1		06/01/17 20:44
150	T4.060117.204756	WG616329-51	CCV		1		06/01/17 20:47
151	T4.060117.205123	WG616329-52	CCB		1		06/01/17 20:51

Page: 5 Approved: June 02, 2017

Kim H. Rhodes



Microbac Laboratories Inc.

Data Checklist

Date: 01-JUN-2017
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 616329
 Runlog ID: 82520
 Analytical Workgroups: 615862,616020,616025,616048,616173

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	X
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	
Level 4	1479,1403
Check for compliance with method and project specific requirements	1380,1497,1389,1391
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KKB
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
02-JUN-2017

Secondary Reviewer:
02-JUN-2017

Ki K Beck

Lyn H. Rhodes



Analytical Method:6010C
Login Number:L17051391

AAB#:WG616048

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6442-GRAB	01	05/24/17					05/30/2017	5.8	180		06/01/17	8.1	180	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17051391 Work Group: WG616048
 Blank File ID: T4.060117.163423 Blank Sample ID: WG615868-02
 Prep Date: 05/30/17 09:42 Instrument ID: ICP-THERMO4
 Analyzed Date: 06/01/17 16:34 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG615868-03	T4.060117.163806	06/01/17 16:38	01
LH18/24-SP650-6442-GRAB	L17051391-01	T4.060117.165621	06/01/17 16:56	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5319908
 Report generated 06/02/2017 10:35



Login Number: L17051391 Prep Date: 05/30/17 09:42 Sample ID: WG615868-02
Instrument ID: ICP-THERMO4 Run Date: 06/01/17 16:34 Prep Method: 3015A
File ID: T4.060117.163423 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG616048 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-TH-01-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Aluminum, Total	0.100	0.200	0.100	1	U
Iron, Total	0.0500	0.100	0.0500	1	U
Selenium, Total	0.0100	0.0200	0.0100	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5319909
02-JUN-2017 10:35



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG615868-03
 Instrument ID: ICP-THERMO4 Run Time: 16:38 Prep Method: 3015A
 File ID: T4.060117.163806 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG616048 Matrix: Water Units: mg/L
 QC Key: DOD4 Lot#: STD81778 Cal ID: ICP-TH-01-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Total	6.25	6.28	101	80 - 120	
Iron, Total	2.50	2.48	99.2	80 - 120	
Selenium, Total	0.250	0.234	93.5	80 - 120	

LCS - Modified 03/06/2008
 PDF File ID: 5319910
 Report generated: 06/02/2017 10:35



Loginnum: L17051391 Cal ID: ICP-THERMO4- Worknum: WG616048
 Instrument ID: ICP-THERMO4 Contract #: _____ Method: 6010C
 Parent ID: WG615868-01 File ID: T4.060117.170000 Dil: 1 Matrix: WATER
 Sample ID: WG615868-04 MS File ID: T4.060117.170342 Dil: 1 Units: mg/L
 Sample ID: WG615868-05 MSD File ID: T4.060117.170711 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum	0.336	6.25	6.39	96.9	6.25	6.36	96.4	0.418	80 - 120	20	
Iron	0.835	2.50	2.71	74.8	2.50	2.66	73.1	1.57	80 - 120	20	*
Selenium	ND	0.250	0.231	92.5	0.250	0.226	90.3	2.36	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L17051391 **Worknum:** WG616048
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG616048-02 **File ID:** T4.060117.182240 **Dil:** 5 **Units:** ug/L
Sample: L17051497-01 **File ID:** T4.060117.181534 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	11.3		0.750	F	93.40	E
Iron	2760		2780		0.60	
Selenium	2.82		41.9		1390.00	E

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 25 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 25 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5319905

06/02/2017 10:34



Sample Login ID: L17051391

Worknum: WG616048

Instrument ID: ICP-THERMO4

Method: 6010C

Post Spike ID: WG616048-01

File ID: T4.060117.181912

Dil: 1

Units: ug/L

Sample ID: L17051497-01

File ID: T4.060117.181534

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4930		0	U	5000	98.6	75 - 125	
IRON	4450		2760		2000	98.2	75 - 125	
SELENIUM	189		0	U	200	94.3	75 - 125	

N = % Recovery exceeds control limits

F = Result is between MDL and RL

U = Sample result is below MDL. A value of zero is used in the calculation



Microbac Laboratories Inc.
Initial Calibration Summary

00856810

Login: L17051391 Workgroup (AAB#): WG616048
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG616329 Initial Calibration Date: 01-JUN-2017 11:29

	WG616329-01		WG616329-02		WG616329-03		WG616329-04		WG616329-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ALUMINUM	0	0.00203	.1	0.00326	.2	0.00406	10	0.113	20	0.219	.999633	
IRON	0	-0.0000300	.04	0.000850	.08	0.00118	4	0.0692	8	0.138	.999538	
SELENIUM	0	-0.0000600	NA	NA	.008	0.0000800	.4	0.00621	.8	0.0124	.999631	

INT = Instrument intensity
 R = Coefficient of correlation
 Q = Data Qualifier
 * = Out of Compliance; R < 0.995

INT_CAL_ICP - Modified 03/06/2008
 PDF File ID: 5319914
 Report generated: 02-JUN-2017 10:35



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-07
Instrument ID: ICP-THERMO4 Run Time: 11:40 Method: 6010C
File ID: T4.060117.114028 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG616048 Cal ID: ICP-THERM - 01-JUN-17
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
IRON	.04	.08	.04	U
SELENIUM	.008	.016	.008	U

U = Result is less than 2 x MDL
F = Result is between MDL and 2 x MDL
* = Result is above 2 x MDL



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-14
 Instrument ID: ICP-THERMO4 Run Time: 12:31 Method: 6010C
 File ID: T4.060117.123142 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Iron	0.0400	0.0800	0.0400	U
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-26
Instrument ID: ICP-THERMO4 Run Time: 16:04 Method: 6010C
File ID: T4.060117.160459 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Iron	0.0400	0.0800	0.0400	U
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-33
 Instrument ID: ICP-THERMO4 Run Time: 16:30 Method: 6010C
 File ID: T4.060117.163040 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Iron	0.0400	0.0800	0.0400	U
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-35
 Instrument ID: ICP-THERMO4 Run Time: 17:14 Method: 6010C
 File ID: T4.060117.171410 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Iron	0.0400	0.0800	0.0400	U
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-37
 Instrument ID: ICP-THERMO4 Run Time: 17:59 Method: 6010C
 File ID: T4.060117.175920 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Iron	0.0400	0.0800	0.0400	U
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-39
 Instrument ID: ICP-THERMO4 Run Time: 18:29 Method: 6010C
 File ID: T4.060117.182947 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Iron	0.0400	0.0800	0.0400	U
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-45
 Instrument ID: ICP-THERMO4 Run Time: 20:25 Method: 6010C
 File ID: T4.060117.202551 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Iron	0.0400	0.0800	0.0400	U
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5319919
 Report generated 06/02/2017 10:35



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-52
 Instrument ID: ICP-THERMO4 Run Time: 20:51 Method: 6010C
 File ID: T4.060117.205123 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Iron	0.0400	0.0800	0.0400	U
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-06
Instrument ID: ICP-THERMO4 Run Time: 11:32 Method: 6010C
File ID: T4.060117.113238 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Aluminum	10	10.1	101	90 - 110	
Iron	4	4.00	100	90 - 110	
Selenium	.4	0.412	103	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-13
Instrument ID: ICP-THERMO4 Run Time: 12:28 Method: 6010C
File ID: T4.060117.122813 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.2	mg/L	102	90 - 110	
Iron	4.00	4.01	mg/L	100	90 - 110	
Selenium	0.400	0.402	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-25
Instrument ID: ICP-THERMO4 Run Time: 16:01 Method: 6010C
File ID: T4.060117.160130 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.3	mg/L	103	90 - 110	
Iron	4.00	4.04	mg/L	101	90 - 110	
Selenium	0.400	0.399	mg/L	99.6	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-32
 Instrument ID: ICP-THERMO4 Run Time: 16:27 Method: 6010C
 File ID: T4.060117.162706 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.2	mg/L	102	90 - 110	
Iron	4.00	4.01	mg/L	100	90 - 110	
Selenium	0.400	0.399	mg/L	99.8	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-34
 Instrument ID: ICP-THERMO4 Run Time: 17:10 Method: 6010C
 File ID: T4.060117.171042 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.2	mg/L	102	90 - 110	
Iron	4.00	3.98	mg/L	99.6	90 - 110	
Selenium	0.400	0.395	mg/L	98.7	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5319918
 Report generated 06/02/2017 10:35



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-36
 Instrument ID: ICP-THERMO4 Run Time: 17:55 Method: 6010C
 File ID: T4.060117.175552 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.3	mg/L	103	90 - 110	
Iron	4.00	4.01	mg/L	100	90 - 110	
Selenium	0.400	0.396	mg/L	99.0	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-38
Instrument ID: ICP-THERMO4 Run Time: 18:26 Method: 6010C
File ID: T4.060117.182620 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.3	mg/L	103	90 - 110	
Iron	4.00	4.06	mg/L	102	90 - 110	
Selenium	0.400	0.398	mg/L	99.6	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-44
Instrument ID: ICP-THERMO4 Run Time: 20:22 Method: 6010C
File ID: T4.060117.202223 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.4	mg/L	104	90 - 110	
Iron	4.00	4.04	mg/L	101	90 - 110	
Selenium	0.400	0.402	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-51
 Instrument ID: ICP-THERMO4 Run Time: 20:47 Method: 6010C
 File ID: T4.060117.204756 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.4	mg/L	104	90 - 110	
Iron	4.00	4.05	mg/L	101	90 - 110	
Selenium	0.400	0.409	mg/L	102	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-08
 Instrument ID: ICP-THERMO4 Run Time: 11:44 Method: 6010C
 File ID: T4.060117.114412 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.175	mg/L	110	70 - 130	
Iron	0.0800	0.0672	mg/L	84.0	70 - 130	
Selenium	0.0160	0.0194	mg/L	121	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-27
 Instrument ID: ICP-THERMO4 Run Time: 16:08 Method: 6010C
 File ID: T4.060117.160842 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.176	mg/L	110	70 - 130	
Iron	0.0800	0.0706	mg/L	88.3	70 - 130	
Selenium	0.0160	0.0167	mg/L	104	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616329-48
 Instrument ID: ICP-THERMO4 Run Time: 20:36 Method: 6010C
 File ID: T4.060117.203653 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG616048 Cal ID: ICP-TH - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.180	mg/L	113	70 - 130	
Iron	0.0800	0.0973	mg/L	122	70 - 130	
Selenium	0.0160	0.0169	mg/L	106	70 - 130	

* Exceeds LIMITS Criteria



Login number: L17051391
 Instrument ID: ICP-THERMO4
 Sol. A : WG616329-11
 Sol. AB : WG616329-12

File ID: T4.060117.115726
 File ID: T4.060117.120111

Workgroup (AAB#): WG616048
 Method: 6010C
 Units: mg/L
 Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	242	96.8	250	241	96.4	
Iron	100	97.6	97.6	100	96.9	96.9	
Selenium	NS	0.00355	NS	0.250	0.245	98.0	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login number: L17051391
 Instrument ID: ICP-THERMO4
 Sol. A: WG616329-30
 Sol. AB: WG616329-31

File ID: T4.060117.161938
 File ID: T4.060117.162324

Workgroup (AAB#): WG616048
 Method: 6010C
 Units: mg/L
 Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	248	99.2	250	242	96.8	
Iron	100	96.8	96.8	100	95.7	95.7	
Selenium	NS	0.000440	NS	0.250	0.243	97.2	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login number: L17051391
Instrument ID: ICP-THERMO4
Sol. A: WG616329-49
Sol. AB: WG616329-50

File ID: T4.060117.204031
File ID: T4.060117.204416

Workgroup (AAB#): WG616048
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	245	98.0	250	244	97.6	
Iron	100	97.0	97.0	100	96.4	96.4	
Selenium	NS	0.00138	NS	0.250	0.241	96.4	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login Number: L17051391
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	AG	AL	AS	B	BA
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0.0000410	0	0	0
ARSENIC	189.00	0	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0.0145	0	-0.0000800
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0	0	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0.000378	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	-0.000289	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0.0000140	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	-0.0000120	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	0
ZINC	206.20	0	0.0000320	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5319913
 Report generated: 06/02/2017 10:35



Login Number: L17051391

Date: 01/04/2017

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	BE	CA	CD	CO	CR
ALUMINUM	308.20	0	0	0	-0.000820	0
ANTIMONY	206.80	0	0	0	0	0.0260
ARSENIC	189.00	0	0	0	0	-0.00730
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0.00343	0
CADMIUM	228.80	0	0	0	-0.00390	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	-0.000200
COPPER	224.70	0	0	0	0.0000770	-0.00100
IRON	261.10	0	0	0	0	-0.00100
LEAD	220.30	0	0	0	-0.0000130	-0.000132
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0.0000500
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	-0.000860	0
PHOSPHORUS	214.90	0	0	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0.00000500	0	0	0
THALLIUM	190.80	0	0	0	0.00240	0.000276
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	-0.00350
ZINC	206.20	0	0	0	0	-0.00180
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5319913
 Report generated: 06/02/2017 10:35



Login Number: L17051391

Date: 01/04/2017

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	CU	FE	K	LI	MG
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0.0000560	0	0	0
ARSENIC	189.00	0	-0.0000490	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0.000648	0	0	0
CADMIUM	228.80	0	-0.00000500	0	0	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0.0000400	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0	0.00139	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0.000609	0	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0.0000220
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0.0000420	0	0	0
PHOSPHORUS	214.90	0.0390	0.000900	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	-0.000118	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	-0.000200	0	0	0
VANADIUM	292.40	0	0.0000700	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5319913
 Report generated: 06/02/2017 10:35



Login Number: L17051391

Date: 01/04/2017

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	MN	MO	NA	NI	P
ALUMINUM	308.20	0	0.0163	0	0	0
ANTIMONY	206.80	0	0.000910	0	-0.00190	0
ARSENIC	189.00	0	0.000139	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	-0.00190	0	0	0
CADMIUM	228.80	0	0.0000320	0	-0.000770	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0.000360	0	0	0	0
COBALT	228.60	0	-0.00200	0	0.000100	0
COPPER	224.70	0	0.00160	0	-0.0123	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	-0.000610	0	0.000110	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	-0.00290	-0.0230	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0.0000300	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0.00710	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0.000600	0.000580	0	0	0
SILICON	212.40	0	-0.354	0	0	0
SILVER	328.10	0	-0.0000100	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0.00100	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	-0.000153	0	0	0
VANADIUM	292.40	-0.000200	-0.00160	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5319913
 Report generated: 06/02/2017 10:35



Login Number: L17051391
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	PB	SB	SE	SI	SN
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0	0	0	-0.0320
ARSENIC	189.00	0	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0	0	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0.00440	0	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5319913
 Report generated: 06/02/2017 10:35



Login Number: L17051391
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	SR	TI	TL	V	ZN
ALUMINUM	308.20	0	0	0	0.0720	0
ANTIMONY	206.80	0	0.000500	0	-0.00360	0
ARSENIC	189.00	0	0	0	0.000107	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	-0.00000700	0	0.000990	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0	0.000102	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0.0000550	0	0	0
COBALT	228.60	0	0.00170	0	0.0000200	0
COPPER	224.70	0	0.000269	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0	0	-0.000126	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	-0.00290	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	-0.000110	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0	0	-0.00100	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	-0.000720	0	-0.000260	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	-0.00100	0	-0.0420	0
TIN	189.90	0	-0.00190	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0.000820	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5319913
 Report generated: 06/02/2017 10:35



Login Number: L17051391
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	ZR
ALUMINUM	308.20	0
ANTIMONY	206.80	0
ARSENIC	189.00	0
BARIUM	455.40	0
BERYLLIUM	313.10	0
BORON	249.60	0
CADMIUM	228.80	0
CALCIUM	422.60	0
CHROMIUM	267.70	0
COBALT	228.60	0
COPPER	224.70	0
IRON	261.10	0
LEAD	220.30	0
LITHIUM	670.70	0
MAGNESIUM	279.10	0
MANGANESE	257.60	0
MOLYBDENUM	202.00	0
NICKEL	231.60	0
PHOSPHORUS	214.90	0
POTASSIUM	766.40	0
SELENIUM	196.10	0
SILICON	212.40	0
SILVER	328.10	0
SODIUM	589.50	0
STRONTIUM	407.70	0
THALLIUM	190.80	0
TIN	189.90	0
TITANIUM	337.20	0
VANADIUM	292.40	0
ZINC	206.20	0
ZIRCONIUM	339.10	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5319913
 Report generated: 06/02/2017 10:35



Login Number: L17051391 Date: 04/05/2017
 Instrument ID: ICP-THERMO4 Method: 6010C

Analyte	Integration Time (Sec.)	Concentration (ug/L)
Aluminum	10.00	900.0
Antimony	20.00	45.0
Arsenic	10.00	45.0
Barium	10.00	45.0
Beryllium	10.00	1.8
Boron	20.00	45.0
Cadmium	20.00	4.5
Calcium	8.00	270.0
Chromium	20.00	36.0
Cobalt	20.00	45.0
Copper	20.00	180.0
Iron	8.00	720.0
Lead	20.00	225.0
Lithium	8.00	36.0
Magnesium	8.00	900.0
Manganese	10.00	36.0
Molybdenum	20.00	18.0
Nickel	20.00	90.0
Phosphorus	20.00	180.0
Potassium	8.00	360.0
Selenium	20.00	90.0
Silicon	20.00	36.0
Silver	10.00	4.5
Sodium	8.00	270.0
Strontium	8.00	9.0
Thallium	20.00	18.0
Tin	20.00	45.0
Titanium	8.00	45.0
Vanadium	20.00	27.0
Zinc	20.00	45.0
Zirconium	10.00	45.0

Comments:

All analytes passed acceptance criteria at the specified concentration.



2.3 Metals Data

2.3.2 Metals ICP-MS Data

2.3.2.1 Summary Data

Lab Report #: L17051391

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17051391-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP650-6442-GRAB	Prep Method: 3015A	Prep Date: 05/30/2017 07:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/01/2017 16:12
Workgroup #: WG615899	Analyst: JYH	Run Date: 06/01/2017 16:55
Collect Date: 05/24/2017 15:00	Dilution: 1	File ID: NI.060117.165545
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chromium, Total	7440-47-3	0.00207	J	0.00400	0.00200	0.00100
Vanadium, Total	7440-62-2	0.00100	U	0.00200	0.00100	0.000500
J	Estimated value ; the analyte concentration was less than the LOQ.					
J	Estimated value ; the analyte concentration was greater than the highest standard					
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17051391

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17051391-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP650-6442-GRAB	Prep Method: 3015A	Prep Date: 05/30/2017 07:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/01/2017 12:20
Workgroup #: WG615899	Analyst: JYH	Run Date: 06/01/2017 14:07
Collect Date: 05/24/2017 15:00	Dilution: 1	File ID: NI.060117.140712
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Antimony, Total	7440-36-0	0.00100	U	0.00200	0.00100	0.000500
Arsenic, Total	7440-38-2	0.00211		0.00200	0.00100	0.000500
Cadmium, Total	7440-43-9	0.000600	U	0.00120	0.000600	0.000300
Cobalt, Total	7440-48-4	0.0110		0.00200	0.00100	0.000500
Lead, Total	7439-92-1	0.00100	U	0.00200	0.00100	0.000500
Nickel, Total	7440-02-0	0.0132		0.00800	0.00400	0.00200
Silver, Total	7440-22-4	0.00100	U	0.00200	0.00100	0.000500
Thallium, Total	7440-28-0	0.000200	U	0.000400	0.000200	0.000100
Zinc, Total	7440-66-6	0.0286	J	0.0500	0.0250	0.0125
J	Estimated value ; the analyte concentration was less than the LOQ.					
J	Estimated value ; the analyte concentration was greater than the highest standard					
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17051391

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17051391-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP650-6442-GRAB	Prep Method: 3015A	Prep Date: 05/30/2017 07:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/01/2017 12:20
Workgroup #: WG615899	Analyst: JYH	Run Date: 06/01/2017 15:25
Collect Date: 05/24/2017 15:00	Dilution: 50	File ID: NI.060117.152548
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Barium, Total	7440-39-3	0.686		0.300	0.150	0.0750
Manganese, Total	7439-96-5	0.605		0.200	0.100	0.0500
U	Analyte was not detected. The concentration is below the reported LOD.					

2.3.2.2 QC Summary Data

Example 6020 Calculations
Perkin Elmer ELAN 6100

1.0 Initial Calibration (ICAL) Parameters

The system performs linear regression from data consisting of a blank and three standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (ug/L)

Vf = Final volume

Vi = Initial volume

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in (ug/L)

Example:

0.1

100

40

1

0.25

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (ug/L)

Vf = Final volume

Vi = Initial volume

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in (ug/kg)

Example:

0.1

200

0.5

1

40

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

$Cdry$ = Concentration calculated as dry weight (ug/kg)

Example:

40

80

50

50 ug/kg = 0.050 mg/kg

Perkin Elmer ELAN ICP/MS

STANDARDS KEY

QC Std 1 - ICV

QC Std 2 - ICB

QC Std 3 - LLICV

QC Std 4 - ICSA

QC Std 5 - ICSAB

QC Std 6 - CCV

QC Std 7 - CCB

QC Std 8 - LLCCV

Calibration Solutions

Analyte	Stock Conc. (mg/L)	S1 (mg/L)	S2 (mg/L)	S3 (mg/L)	S4 (mg/L)
Al	10	0	0.0004	0.05	0.1
Sb	10	0	0.0004	0.05	0.1
As	10	0	0.0004	0.05	0.1
Ba	10	0	0.0004	0.05	0.1
Be	10	0	0.0004	0.05	0.1
Ca	1000	0	0.04	5	10
Cd	10	0	0.0004	0.05	0.1
Cr	10	0	0.0004	0.05	0.1
Co	10	0	0.0004	0.05	0.1
Cu	10	0	0.0004	0.05	0.1
Fe	1000	0	0.04	5	10
Pb	10	0	0.0004	0.05	0.1
Mg	1000	0	0.04	5	10
Mn	10	0	0.0004	0.05	0.1
Ni	10	0	0.0004	0.05	0.1
K	1000	0	0.04	5	10
Se	10	0	0.0004	0.05	0.1
Ag	10	0	0.0004	0.05	0.1
Na	1000	0	0.04	5	10
Tl	10	0	0.0004	0.05	0.1
V	10	0	0.0004	0.05	0.1
U	1000	0	0.0004	0.05	0.1
Zn	10	0	0.0004	0.05	0.1

Workgroup: WG615832
 Analyst: VC
 Spike Analyst: VC
 Run Date: 05/30/2017 07:36
 Method: 3015A
 Balance: BAL016
 Instrument: MW-3
 Instrument Start: 05/30/2017 07:48

SOP: ME407 Revision 19
 Spike Solution: STD80296
 Spike Witness: ERP
 HNO3 Lot #: COA19718
 40 & 50 ML. DIGESTION TU COA19487
 MS Filters- fisher-Lot# rRGT40013

	SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG615832-02	BLANK	1	20 mL	50 mL	183.14 g	183.134 g		
2	WG615832-04	FLT_BLK	1	20 mL	50 mL	182.746 g	182.723 g		
3	WG615832-03	LCS	1	20 mL	50 mL	185.688 g	185.679 g	.25 mL	
4	L17051380-23	SAMP	1	20 mL	50 mL	181.783 g	181.76 g		06/05/17
5	L17051380-24	SAMP	1	20 mL	50 mL	185.225 g	185.244 g		06/05/17
6	L17051380-25	SAMP	1	20 mL	50 mL	182.751 g	182.734 g		06/05/17
7	L17051380-26	SAMP	1	20 mL	50 mL	181.473 g	181.45 g		06/05/17
8	L17051380-27	SAMP	1	20 mL	50 mL	181.733 g	181.712 g		06/05/17
9	L17051380-28	SAMP	1	20 mL	50 mL	181.681 g	181.642 g		06/05/17
10	L17051389-01	SAMP	1	20 mL	50 mL	182.843 g	182.843 g		06/05/17
11	L17051391-01	SAMP	1	20 mL	50 mL	184.014 g	184 g		06/05/17
12	L17051403-01	SAMP	1	20 mL	50 mL	182.906 g	182.919 g		06/05/17
13	L17051403-02	SAMP	1	20 mL	50 mL	184.058 g	184.073 g		06/05/17
14	L17051403-03	SAMP	1	20 mL	50 mL	181.61 g	181.63 g		06/05/17
15	L17051403-04	SAMP	1	20 mL	50 mL	182.048 g	182.053 g		06/05/17
16	L17051403-05	SAMP	1	20 mL	50 mL	182.766 g	182.757 g		06/05/17
17	L17051403-06	SAMP	1	20 mL	50 mL	182.921 g	182.929 g		06/05/17
18	L17051419-01	SAMP	1	20 mL	50 mL	185.047 g	185.035 g		06/01/17
19	WG615832-01	REF	1	20 mL	50 mL	183.003 g	183.01 g		
20	L17051479-01	RS01	1	20 mL	50 mL	183.003 g	183.01 g		06/06/17
21	WG615832-05	MS	1	20 mL	50 mL	184.869 g	184.876 g	.25 mL	
22	L17051479-02	MS01	1	20 mL	50 mL	184.869 g	184.876 g	.25 mL	06/06/17
23	WG615832-06	MSD	1	20 mL	50 mL	183.474 g	183.472 g	.25 mL	
24	L17051479-03	SD01	1	20 mL	50 mL	183.474 g	183.472 g	.25 mL	06/06/17

L17051403-04 FILTERED DIGESTATE

Analyst: Veech Collier

Reviewer: Erin Poston



Microbac Laboratories Inc.

Instrument Run Log

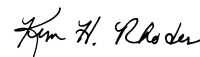
Instrument: ICP-MS2 Dataset: 060117A.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD81946 ICV Std: STD81801 Post Spike: STD79415
 ICSA: STD81802 ICSAB: STD81803 Int. Std: RGT39300
 CCV: STD81947 LLCCV: STD81819 Tuning Sol : STD81373
 Stannous : _____ Hydroxylamine : _____

Workgroups: 615899,616234

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.060117.120743	Blank	Blank		1		06/01/17 12:07
2	NI.060117.121049	WG616242-01	Calibration Point		1		06/01/17 12:10
3	NI.060117.121354	WG616242-02	Calibration Point		1		06/01/17 12:13
4	NI.060117.121659	WG616242-03	Calibration Point		1		06/01/17 12:16
5	NI.060117.122005	WG616242-04	Calibration Point		1		06/01/17 12:20
6	NI.060117.122312	WG616242-05	Initial Calibration Verification		1		06/01/17 12:23
7	NI.060117.122619	WG616242-06	Initial Calib Blank		1		06/01/17 12:26
8	NI.060117.122926	WG616242-07	Low Level Initial Calibration V		1		06/01/17 12:29
9	NI.060117.123231	WG616242-08	Interference Check		1		06/01/17 12:32
10	NI.060117.123537	WG616242-09	Interference Check		1		06/01/17 12:35
11	NI.060117.123844	WG616242-10	CCV		1		06/01/17 12:38
12	NI.060117.124149	WG616242-11	CCB		1		06/01/17 12:41
13	NI.060117.124457	WG615832-02	Method/Prep Blank	20/50	1		06/01/17 12:44
14	NI.060117.124802	WG615832-03	Laboratory Control S	20/50	1		06/01/17 12:48
15	NI.060117.125221	WG615832-04	Filter Blank		1		06/01/17 12:52
16	NI.060117.125526	WG615832-01	Reference Sample		5	L17051479-01	06/01/17 12:55
17	NI.060117.125832	WG615832-05	Matrix Spike	20/50	5	L17051479-01	06/01/17 12:58
18	NI.060117.130137	WG615832-06	Matrix Spike Duplica	20/50	5	L17051479-01	06/01/17 13:01
19	NI.060117.130443	L17051380-23	AAB3211	20/50	1		06/01/17 13:04
20	NI.060117.130748	L17051380-24	AAB3211	20/50	1		06/01/17 13:07
21	NI.060117.131054	WG615899-01	Post Digestion Spike		1	L17051380-24	06/01/17 13:10
22	NI.060117.131359	WG615899-02	Serial Dilution		5	L17051380-24	06/01/17 13:13
23	NI.060117.131707	WG616242-12	CCV		1		06/01/17 13:17
24	NI.060117.132013	WG616242-13	CCB		1		06/01/17 13:20
25	NI.060117.132320	L17051403-01	TCF-EB01-052317	20/50	1		06/01/17 13:23
26	NI.060117.132625	L17051403-02	MW26-GW-052317	20/50	5		06/01/17 13:26
27	NI.060117.132931	L17051403-03	MW23-GW-052417	20/50	5		06/01/17 13:29
28	NI.060117.133237	L17051403-04	MW21-GW-052417	20/50	5		06/01/17 13:32
29	NI.060117.133542	L17051403-05	MW35-GW-052417	20/50	5		06/01/17 13:35
30	NI.060117.133847	L17051403-06	MW35-GW-052417D	20/50	5		06/01/17 13:38
31	NI.060117.134153	L17051419-01	T7E1247-01	20/50	1		06/01/17 13:41
32	NI.060117.134458	L17051380-25	AAB3212	20/50	1		06/01/17 13:44
33	NI.060117.134804	L17051380-26	AAB3212	20/50	1		06/01/17 13:48
34	NI.060117.135109	L17051380-27	EB0301	20/50	1		06/01/17 13:51

Page: 1 Approved: June 02, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 060117A.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD81946 ICV Std: STD81801 Post Spike: STD79415
 ICSA: STD81802 ICSAB: STD81803 Int. Std: RGT39300
 CCV: STD81947 LLCCV: STD81819 Tuning Sol : STD81373
 Stannous : _____ Hydroxylamine : _____

Workgroups: 615899,616234

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.060117.135416	WG616242-14	CCV		1		06/01/17 13:54
36	NI.060117.135721	WG616242-15	CCB		1		06/01/17 13:57
37	NI.060117.140028	L17051380-28	EB0301	20/50	1		06/01/17 14:00
38	NI.060117.140407	L17051389-01	LH18/24-SP140-7442-GRAB	20/50	1		06/01/17 14:04
39	NI.060117.140712	L17051391-01	LH18/24-SP650-6442-GRAB	20/50	1		06/01/17 14:07
40	NI.060117.141019	WG616242-16	CCV		1		06/01/17 14:10
41	NI.060117.141325	WG616242-17	CCB		1		06/01/17 14:13
42	NI.060117.141632	WG616242-18	Interference Check		1		06/01/17 14:16
43	NI.060117.141937	WG616242-19	Interference Check		1		06/01/17 14:19
44	NI.060117.142308	WG616242-20	CCV		1		06/01/17 14:23
45	NI.060117.142614	WG616242-21	CCB		1		06/01/17 14:26
46	NI.060117.142921	WG616242-22	Low Level Continuing Calibra		1		06/01/17 14:29
47	NI.060117.143249	WG616135-02	Method/Prep Blank	20/50	1		06/01/17 14:32
48	NI.060117.143555	WG616135-03	Laboratory Control S	20/50	1		06/01/17 14:35
49	NI.060117.143900	L17051497-20	EB0302	20/50	1		06/01/17 14:39
50	NI.060117.144206	WG616135-01	Reference Sample		1	L17051497-22	06/01/17 14:42
51	NI.060117.144511	WG616135-04	Matrix Spike	20/50	1	L17051497-22	06/01/17 14:45
52	NI.060117.144817	WG616135-05	Matrix Spike Duplica	20/50	1	L17051497-22	06/01/17 14:48
53	NI.060117.145123	L17051497-27	AAC3262	20/50	1		06/01/17 14:51
54	NI.060117.145429	WG616234-01	Post Digestion Spike		1	L17051497-27	06/01/17 14:54
55	NI.060117.145734	WG616234-02	Serial Dilution		5	L17051497-27	06/01/17 14:57
56	NI.060117.150040	WG616234-02	Serial Dilution		25	L17051497-27	06/01/17 15:00
57	NI.060117.150347	WG616242-23	CCV		1		06/01/17 15:03
58	NI.060117.150652	WG616242-24	CCB		1		06/01/17 15:06
59	NI.060117.150959	L17051497-28	AAC3262	20/50	1		06/01/17 15:09
60	NI.060117.151326	L17051497-29	EB0303	20/50	1		06/01/17 15:13
61	NI.060117.151631	L17051497-30	EB0303	20/50	1		06/01/17 15:16
62	NI.060117.151937	L17051554-02	AO9-MW11-Y2S2	20/50	1		06/01/17 15:19
63	NI.060117.152243	L17051554-03	AO9-MW12-Y2S2	20/50	1		06/01/17 15:22
64	NI.060117.152548	L17051391-01	LH18/24-SP650-6442-GRAB	20/50	50		06/01/17 15:25
65	NI.060117.152855	WG616242-25	Interference Check		1		06/01/17 15:28
66	NI.060117.153200	WG616242-26	Interference Check		1		06/01/17 15:32
67	NI.060117.153508	WG616242-27	CCV		1		06/01/17 15:35
68	NI.060117.153814	WG616242-28	CCB		1		06/01/17 15:38

Page: 2 Approved: June 02, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 060117A.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD81946 ICV Std: STD81801 Post Spike: STD79415
 ICSA: STD81802 ICSAB: STD81803 Int. Std: RGT39300
 CCV: STD81947 LLCCV: STD81819 Tuning Sol: STD81373
 Stannous: _____ Hydroxylamine: _____

Workgroups: 615899,616234

Comments:

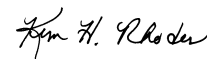
--

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	NI.060117.154120	WG616242-29	Low Level Continuing Calibra		1		06/01/17 15:41

Comments

Seq.	Rerun	Dil.	Reason	Analytes
32			Seq. 32-34: Wrong sample labels. JYH	
37			Wrong sample label. JYH	

Page: 3 Approved: June 02, 2017




Microbac Laboratories Inc.

Instrument Run Log

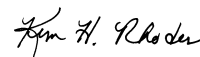
Instrument: ICP-MS2 Dataset: 060117B.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD81946 ICV Std: STD81801 Post Spike: STD79415
 ICSA: STD81802 ICSAB: STD81803 Int. Std: RG739300
 CCV: STD81947 LLCCV: STD81819 Tuning Sol : STD81373
 Stannous : _____ Hydroxylamine : _____

Workgroups: 615899

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.060117.160023	Blank	Blank		1		06/01/17 16:00
2	NI.060117.160329	WG616294-01	Calibration Point		1		06/01/17 16:03
3	NI.060117.160635	WG616294-02	Calibration Point		1		06/01/17 16:06
4	NI.060117.160940	WG616294-03	Calibration Point		1		06/01/17 16:09
5	NI.060117.161246	WG616294-04	Calibration Point		1		06/01/17 16:12
6	NI.060117.161554	WG616294-05	Initial Calibration Verification		1		06/01/17 16:15
7	NI.060117.161901	WG616294-06	Initial Calib Blank		1		06/01/17 16:19
8	NI.060117.162208	WG616294-07	Low Level Initial Calibration V		1		06/01/17 16:22
9	NI.060117.162513	WG616294-08	Interference Check		1		06/01/17 16:25
10	NI.060117.162819	WG616294-09	Interference Check		1		06/01/17 16:28
11	NI.060117.163126	WG616294-10	CCV		1		06/01/17 16:31
12	NI.060117.163431	WG616294-11	CCB		1		06/01/17 16:34
13	NI.060117.163738	WG615832-02	Method/Prep Blank	20/50	1		06/01/17 16:37
14	NI.060117.164044	WG615832-03	Laboratory Control S	20/50	1		06/01/17 16:40
15	NI.060117.164444	L17051479-01	MW01-GW-052517		5	WG615832-01	06/01/17 16:44
16	NI.060117.164934	L17051479-02	MW01-GW-052517 MS	20/50	5	WG615832-05	06/01/17 16:49
17	NI.060117.165240	L17051479-03	MW01-GW-052517 MSD	20/50	5	WG615832-06	06/01/17 16:52
18	NI.060117.165545	L17051391-01	LH18/24-SP650-6442-GRAB	20/50	1		06/01/17 16:55
19	NI.060117.165851	L17051389-01	LH18/24-SP140-7442-GRAB	20/50	1		06/01/17 16:58
20	NI.060117.170156	WG615899-03	Post Digestion Spike		1	L17051389-01	06/01/17 17:01
21	NI.060117.170502	WG615899-04	Serial Dilution		5	L17051389-01	06/01/17 17:05
22	NI.060117.170808	WG616294-12	CCV		1		06/01/17 17:08
23	NI.060117.171114	WG616294-13	CCB		1		06/01/17 17:11
24	NI.060117.171421	WG616294-14	Low Level Continuing Calibra		1		06/01/17 17:14
25	NI.060117.171727	40 PPB SE	40 PPB SE		10		06/01/17 17:17

Page: 1 Approved: June 02, 2017




Microbac Laboratories Inc.

Data Checklist

Date: 01-JUN-2017
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A/200.8
 Instrument: ICP-MS
 Curve Workgroup: 616242
 Runlog ID: 82517
 Analytical Workgroups: 615899,616234

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	1380,1389,1391,1403,1479,1497
	1554
Client Forms	X
Level X	
Level 3	1403,1479
Level 4	1380,1389,1391,1497,1554
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JYH
Secondary Reviewer	KHR
Comments	

Primary Reviewer:

Secondary Reviewer:
02-JUN-2017



Microbac Laboratories Inc.

Data Checklist

Date: 01-JUN-2017
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A/200.8
 Instrument: ICP-MS
 Curve Workgroup: 616294
 Runlog ID: 82524
 Analytical Workgroups: 615899

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	
Client Forms	X
Level X	
Level 3	
Level 4	1389,1391
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JYH
Secondary Reviewer	KHR
Comments	

Primary Reviewer:

Secondary Reviewer:
02-JUN-2017



Analytical Method:6020A
Login Number:L17051391

AAB#:WG615899

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6442-GRAB	01	05/24/17					05/30/2017	5.7	180		06/01/17	8.1	180	
LH18/24-SP650-6442-GRAB	01	05/24/17					05/30/2017	5.7	180		06/01/17	8	180	
LH18/24-SP650-6442-GRAB	01	05/24/17					05/30/2017	5.7	180		06/01/17	8	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5318871
Report generated 06/02/2017 08:18



METHOD BLANK SUMMARY

Login Number: L17051391 Work Group: WG615899
 Blank File ID: NI.060117.124457 Blank Sample ID: WG615832-02
 Prep Date: 05/30/17 07:36 Instrument ID: ICP-MS2
 Analyzed Date: 06/01/17 12:44 Method: 6020A
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG615832-03	NI.060117.124802	06/01/17 12:48	01
FLT_BLK	WG615832-04	NI.060117.125221	06/01/17 12:52	01
LH18/24-SP650-6442-GRAB	L17051391-01	NI.060117.140712	06/01/17 14:07	01
LH18/24-SP650-6442-GRAB	L17051391-01	NI.060117.152548	06/01/17 15:25	DL01
LCS	WG615832-03	NI.060117.164044	06/01/17 16:40	02
LH18/24-SP650-6442-GRAB	L17051391-01	NI.060117.165545	06/01/17 16:55	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5318872
 Report generated 06/02/2017 08:24



METHOD BLANK SUMMARY

Login Number: L17051391
 Blank File ID: NI.060117.163738
 Prep Date: 05/30/17 07:36
 Analyzed Date: 06/01/17 16:37
 Analyst: JYH

Work Group: WG615899
 Blank Sample ID: WG615832-02
 Instrument ID: ICP-MS2
 Method: 6020A

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG615832-03	NI.060117.124802	06/01/17 12:48	01
FLT_BLK	WG615832-04	NI.060117.125221	06/01/17 12:52	01
LH18/24-SP650-6442-GRAB	L17051391-01	NI.060117.140712	06/01/17 14:07	01
LH18/24-SP650-6442-GRAB	L17051391-01	NI.060117.152548	06/01/17 15:25	DL01
LCS	WG615832-03	NI.060117.164044	06/01/17 16:40	02
LH18/24-SP650-6442-GRAB	L17051391-01	NI.060117.165545	06/01/17 16:55	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5318872
 Report generated 06/02/2017 08:24



Login Number: L17051391 Prep Date: 05/30/17 07:36 Sample ID: WG615832-02
 Instrument ID: ICP-MS2 Run Date: 06/01/17 12:44 Prep Method: 3015A
 File ID: NI.060117.124457 Analyst: JYH Method: 6020A
 Workgroup (AAB#): WG615899 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-MS - 01-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Antimony, Total	0.000500	0.00200	0.000500	1	U
Arsenic, Total	0.000500	0.00200	0.000500	1	U
Barium, Total	0.00150	0.00600	0.00150	1	U
Cadmium, Total	0.000300	0.00120	0.000300	1	U
Chromium, Total	0.00100	0.00400	0.00100	1	U
Cobalt, Total	0.000500	0.00200	0.000500	1	U
Lead, Total	0.000500	0.00200	0.000500	1	U
Manganese, Total	0.00100	0.00400	0.00100	1	U
Nickel, Total	0.00200	0.00800	0.00200	1	U
Silver, Total	0.000500	0.00200	0.000500	1	U
Thallium, Total	0.000100	0.000400	0.000100	1	U
Vanadium, Total	0.000500	0.00200	0.000500	1	U
Zinc, Total	0.0125	0.0500	0.0125	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5318873
 02-JUN-2017 08:24



Login Number: L17051391 Prep Date: 05/30/17 07:36 Sample ID: WG615832-02
Instrument ID: ICP-MS2 Run Date: 06/01/17 16:37 Prep Method: 3015A
File ID: NI.060117.163738 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG615899 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-MS - 01-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Chromium, Total	0.00100	0.00400	0.00100	1	U
Vanadium, Total	0.000500	0.00200	0.000500	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5318873
02-JUN-2017 08:24



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG615832-03
 Instrument ID: ICP-MS2 Run Time: 12:48 Prep Method: 3015A
 File ID: NI.060117.124802 Analyst: JYH Method: 6020A
 Workgroup (AAB#): WG615899 Matrix: Water Units: mg/L
 QC Key: DOD4 Lot#: STD80296 Cal ID: ICP-MS - 01-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Antimony, Total	0.125	0.117	93.7	80 - 120	
Arsenic, Total	0.125	0.119	94.9	80 - 120	
Barium, Total	0.125	0.119	95.2	80 - 120	
Cadmium, Total	0.125	0.122	97.5	80 - 120	
Chromium, Total	0.125	0.121	96.9	80 - 120	
Cobalt, Total	0.125	0.120	96.0	80 - 120	
Lead, Total	0.125	0.120	96.2	80 - 120	
Manganese, Total	0.125	0.122	97.5	80 - 120	
Nickel, Total	0.125	0.123	98.2	80 - 120	
Silver, Total	0.125	0.124	99.6	80 - 120	
Thallium, Total	0.125	0.124	99.3	80 - 120	
Vanadium, Total	0.125	0.121	96.7	80 - 120	
Zinc, Total	0.125	0.124	99.1	80 - 120	

LCS - Modified 03/06/2008
 PDF File ID: 5318874
 Report generated: 06/02/2017 08:24



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG615832-03
Instrument ID: ICP-MS2 Run Time: 16:40 Prep Method: 3015A
File ID: NI.060117.164044 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG615899 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD80296 Cal ID: ICP-MS - 01-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Chromium, Total	0.125	0.119	95.4	80 - 120	
Vanadium, Total	0.125	0.118	94.8	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5318874
Report generated: 06/02/2017 08:24



Loginnum: L17051391 Cal ID: ICP-MS2- Worknum: WG615899
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG615832-01 File ID: NI.060117.125526 Dil: 5 Matrix: WATER
 Sample ID: WG615832-05 MS File ID: NI.060117.125832 Dil: 5 Units: mg/L
 Sample ID: WG615832-06 MSD File ID: NI.060117.130137 Dil: 5

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Antimony	0.00114	0.125	0.116	92.0	0.125	0.118	93.2	1.28	80 - 120	20	
Arsenic	ND	0.125	0.119	95.2	0.125	0.127	102	6.72	80 - 120	20	
Cadmium	0.000544	0.125	0.112	89.4	0.125	0.113	90.2	0.857	80 - 120	20	
Chromium	0.0119	0.125	0.126	91.5	0.125	0.127	92.3	0.824	80 - 120	20	
Cobalt	0.0119	0.125	0.126	91.6	0.125	0.130	94.9	3.20	80 - 120	20	
Lead	0.000989	0.125	0.127	100	0.125	0.128	102	1.55	80 - 120	20	
Nickel	0.171	0.125	0.251	63.5	0.125	0.254	66.1	1.26	80 - 120	20	*
Silver	ND	0.125	0.107	85.2	0.125	0.109	87.5	2.66	80 - 120	20	
Thallium	0.000725	0.125	0.125	99.4	0.125	0.128	101	2.01	80 - 120	20	
Vanadium	ND	0.125	0.119	95.2	0.125	0.122	97.3	2.14	80 - 120	20	
Zinc	0.0268	0.125	0.143	92.7	0.125	0.150	98.2	4.68	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Loginnum: L17051391 Cal ID: ICP-MS2- Worknum: WG615899
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG615832-01 File ID: NI.060117.164444 Dil: 5 Matrix: WATER
 Sample ID: WG615832-05 MS File ID: NI.060117.164934 Dil: 5 Units: mg/L
 Sample ID: WG615832-06 MSD File ID: NI.060117.165240 Dil: 5

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Chromium	0.0165	0.125	0.133	93.1	0.125	0.128	89.3	3.64	80 - 120	20	
Vanadium	ND	0.125	0.127	101	0.125	0.124	99.1	2.28	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L17051391 **Worknum:** WG615899
Instrument: ICP-MS2 **Method:** 6020A
Serial Dil: WG615899-02 **File ID:** NI.060117.131359 **Dil:** 5 **Units:** ug/L
Sample: L17051380-24 **File ID:** NI.060117.130748 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Antimony	ND	U	1.90	F	3920.00	
Arsenic	3.12	X	3.48	F	11.60	
Barium	35.2	X	35.7	X	1.50	
Cadmium	ND	U	ND	U		
Chromium	ND	U	ND	U		
Cobalt	0.977	X	ND	U		
Lead	ND	U	ND	U		
Manganese	80.9		82.8		2.36	
Nickel	2.85	F	ND	U		
Silver	ND	U	ND	U		
Thallium	0.0464	F	ND	U		
Vanadium	ND	U	ND	U		
Zinc	ND	U	ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 100 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 100 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5318869

06/02/2017 08:24



Microbac Laboratories Inc.
Serial Dilution Report

Login: L17051391 **Worknum:** WG615899
Instrument: ICP-MS2 **Method:** 6020A
Serial Dil: WG615899-04 **File ID:** NI.060117.170502 **Dil:** 5 **Units:** ug/L
Sample: L17051389-01 **File ID:** NI.060117.165851 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Antimony	ND	U	1.60	F	736.00	
Arsenic	ND	U	ND	U		
Barium	78.4		77.8		0.75	
Cadmium	ND	U	ND	U		
Chromium	1.04	F	2.39	F	129.00	
Cobalt	ND	U	ND	U		
Lead	ND	U	ND	U		
Manganese	33.1	X	32.7	X	1.34	
Nickel	ND	U	ND	U		
Silver	ND	U	ND	U		
Thallium	ND	U	ND	U		
Vanadium	ND	U	ND	U		
Zinc	ND	U	ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 100 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 100 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5318869

06/02/2017 08:24



Sample Login ID: L17051391

Worknum: WG615899

Instrument ID: ICP-MS2

Method: 6020A

Post Spike ID: WG615899-01

File ID: NI.060117.131054

Dil: 1

Units: ug/L

Sample ID: L17051380-24

File ID: NI.060117.130748

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ANTIMONY	51.0		0	U	50	102.0	75 - 125	
ARSENIC	56.2		3.12		50	106.1	75 - 125	
BARIUM	86.3		35.2		50	102.1	75 - 125	
CADMIUM	50.8		0	U	50	101.6	75 - 125	
CHROMIUM	51.2		0	U	50	102.4	75 - 125	
COBALT	50.3		0.977		50	98.7	75 - 125	
LEAD	51.0		0	U	50	102.0	75 - 125	
MANGANESE	133		80.9		50	104.1	75 - 125	
NICKEL	51.7		2.85	F	50	97.8	75 - 125	
SILVER	48.2		0	U	50	96.4	75 - 125	
THALLIUM	51.1		0.0464	F	50	102.2	75 - 125	
VANADIUM	50.6		0	U	50	101.3	75 - 125	
ZINC	52.6		0	U	50	105.3	75 - 125	

N = % Recovery exceeds control limits

F = Result is between MDL and RL

U = Sample result is below MDL. A value of zero is used in the calculation



Sample Login ID: L17051391

Worknum: WG615899

Instrument ID: ICP-MS2

Method: 6020A

Post Spike ID: WG615899-03

File ID: NI.060117.170156

Dil: 1

Units: ug/L

Sample ID: L17051389-01

File ID: NI.060117.165851

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ANTIMONY	49.0		0	U	50	97.9	75 - 125	
ARSENIC	52.3		0	U	50	104.5	75 - 125	
BARIUM	127		78.4		50	97.8	75 - 125	
CADMIUM	48.1		0	U	50	96.2	75 - 125	
CHROMIUM	52.9		1.04	F	50	103.8	75 - 125	
COBALT	51.0		0	U	50	102.0	75 - 125	
LEAD	51.2		0	U	50	102.5	75 - 125	
MANGANESE	84.4		33.1		50	102.5	75 - 125	
NICKEL	50.7		0	U	50	101.4	75 - 125	
SILVER	38.5		0	U	50	77.0	75 - 125	
THALLIUM	51.2		0	U	50	102.3	75 - 125	
VANADIUM	52.4		0	U	50	104.8	75 - 125	
ZINC	53.6		0	U	50	107.2	75 - 125	

N = % Recovery exceeds control limits

F = Result is between MDL and RL

U = Sample result is below MDL. A value of zero is used in the calculation



Microbac Laboratories Inc.
Initial Calibration Summary

00856873

Login:	<u>L17051391</u>	Workgroup (AAB#):	<u>WG615899</u>
Analytical Method:	<u>6020A</u>	Instrument ID:	<u>ICP-MS2</u>
ICAL Worknum:	<u>WG616242</u>	Initial Calibration Date:	<u>01-JUN-2017 12:20</u>

	WG616242-01		WG616242-02		WG616242-03		WG616242-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ANTIMONY	0	237	.4	441	50	244000	100	476000	1	
ARSENIC	0	-18.8	.4	33.2	50	56000	100	107000	.999873	
BARIUM	0	31.7	.4	107	50	75300	100	145000	.999957	
CADMIUM	0	5.30	.4	83.6	50	82600	100	160000	.999989	
CHROMIUM	0	8270	.4	8550	50	355000	100	672000	.999884	
COBALT	0	329	.4	746	50	455000	100	865000	.999842	
LEAD	0	476	.4	793	50	292000	100	558000	.999956	
MANGANESE	0	2740	.4	3270	50	591000	100	1130000	.999894	
NICKEL	0	291	.4	415	50	98000	100	186000	.999815	
SILVER	0	111	.4	381	50	272000	100	515000	.999878	
THALLIUM	0	97.7	.4	432	50	349000	100	668000	.999971	
VANADIUM	0	1970	.4	2310	50	387000	100	743000	.999925	
ZINC	0	413	.4	494	50	55800	100	108000	.999981	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

INT_CAL_ICP - Modified 03/06/2008
PDF File ID: 5318878
Report generated: 02-JUN-2017 08:18



Microbac Laboratories Inc.
Initial Calibration Summary

00856874

Login: L17051391 Workgroup (AAB#): WG615899
 Analytical Method: 6020A Instrument ID: ICP-MS2
 ICAL Worknum: WG616294 Initial Calibration Date: 01-JUN-2017 16:12

	WG616294-01		WG616294-02		WG616294-03		WG616294-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ANTIMONY	0	253	.4	410	50	227000	100	461000	.999936	
ARSENIC	0	-15.1	.4	48.3	50	51900	100	106000	.999916	
BARIIUM	0	30.3	.4	102	50	70200	100	141000	.999986	
CADMIUM	0	4.00	.4	82.3	50	77400	100	156000	.999968	
CHROMIUM	0	5490	.4	5900	50	320000	100	639000	.999968	
COBALT	0	216	.4	590	50	408000	100	819000	.999998	
LEAD	0	428	.4	701	50	278000	100	557000	.999962	
MANGANESE	0	2000	.4	2450	50	534000	100	1060000	.999995	
NICKEL	0	232	.4	299	50	88000	100	176000	.999999	
SILVER	0	112	.4	348	50	253000	100	510000	.999972	
THALLIUM	0	13.0	.4	308	50	328000	100	657000	.999962	
VANADIUM	0	1190	.4	1610	50	350000	100	707000	.999943	
ZINC	0	410	.4	476	50	51800	100	104000	.999996	

INT = Instrument intensity
 R = Coefficient of correlation
 Q = Data Qualifier
 * = Out of Compliance; R < 0.995



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-06
 Instrument ID: ICP-MS2 Run Time: 12:26 Method: 6020A
 File ID: NI.060117.122619 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS2 - 01-JUN-17
 Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
SILVER	.2	.8	.2	U
ARSENIC	.2	.8	.2	U
BARIIUM	.6	2.4	.6	U
CADMIUM	.12	.48	.12	U
COBALT	.2	.8	.2	U
CHROMIUM	.4	1.6	.4	U
MANGANESE	.4	1.6	.4	U
NICKEL	.8	3.2	.8	U
LEAD	.2	.8	.2	U
ANTIMONY	.2	.8	.2	U
THALLIUM	.04	.16	.04	U
VANADIUM	.2	.8	.2	U
ZINC	5	20	5	U

U = Result is less than 2 x MDL
 F = Result is between MDL and 2 x MDL
 * = Result is above 2 x MDL



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616294-06
 Instrument ID: ICP-MS2 Run Time: 16:19 Method: 6020A
 File ID: NI.060117.161901 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS2 - 01-JUN-17
 Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
SILVER	.2	.8	.2	U
ARSENIC	.2	.8	.2	U
BARIIUM	.6	2.4	.6	U
CADMIUM	.12	.48	.12	U
COBALT	.2	.8	.2	U
CHROMIUM	.4	1.6	.4	U
MANGANESE	.4	1.6	.4	U
NICKEL	.8	3.2	.8	U
LEAD	.2	.8	.2	U
ANTIMONY	.2	.8	.2	U
THALLIUM	.04	.16	.04	U
VANADIUM	.2	.8	.2	U
ZINC	5	20	5	U

U = Result is less than 2 x MDL
 F = Result is between MDL and 2 x MDL
 * = Result is above 2 x MDL



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-11
 Instrument ID: ICP-MS2 Run Time: 12:41 Method: 6020A
 File ID: NI.060117.124149 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.200	U
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-13
 Instrument ID: ICP-MS2 Run Time: 13:20 Method: 6020A
 File ID: NI.060117.132013 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.207	F
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-15
 Instrument ID: ICP-MS2 Run Time: 13:57 Method: 6020A
 File ID: NI.060117.135721 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.200	U
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-17
 Instrument ID: ICP-MS2 Run Time: 14:13 Method: 6020A
 File ID: NI.060117.141325 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.200	U
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	-0.458	F
Cobalt	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-21
 Instrument ID: ICP-MS2 Run Time: 14:26 Method: 6020A
 File ID: NI.060117.142614 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.331	F
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	-0.453	F
Cobalt	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-24
 Instrument ID: ICP-MS2 Run Time: 15:06 Method: 6020A
 File ID: NI.060117.150652 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.219	F
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-28
 Instrument ID: ICP-MS2 Run Time: 15:38 Method: 6020A
 File ID: NI.060117.153814 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.284	F
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	-0.422	F
Cobalt	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616294-11
 Instrument ID: ICP-MS2 Run Time: 16:34 Method: 6020A
 File ID: NI.060117.163431 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.200	U
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616294-13
 Instrument ID: ICP-MS2 Run Time: 17:11 Method: 6020A
 File ID: NI.060117.171114 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.200	U
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-05
 Instrument ID: ICP-MS2 Run Time: 12:23 Method: 6020A
 File ID: NI.060117.122312 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Antimony	50	49.9	99.8	90 - 110	
Arsenic	50	49.8	99.6	90 - 110	
Barium	50	49.7	99.4	90 - 110	
Cadmium	50	50.0	99.9	90 - 110	
Chromium	50	49.6	99.3	90 - 110	
Cobalt	50	49.7	99.3	90 - 110	
Lead	50	49.8	99.6	90 - 110	
Manganese	50	49.9	99.9	90 - 110	
Nickel	50	49.7	99.5	90 - 110	
Silver	50	50.3	101	90 - 110	
Thallium	50	49.7	99.4	90 - 110	
Vanadium	50	49.4	98.9	90 - 110	
Zinc	50	49.6	99.2	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616294-05
 Instrument ID: ICP-MS2 Run Time: 16:15 Method: 6020A
 File ID: NI.060117.161554 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Antimony	50	48.6	97.2	90 - 110	
Arsenic	50	48.5	97.0	90 - 110	
Barium	50	48.5	97.0	90 - 110	
Cadmium	50	48.5	97.1	90 - 110	
Chromium	50	48.8	97.6	90 - 110	
Cobalt	50	48.6	97.2	90 - 110	
Lead	50	48.4	96.9	90 - 110	
Manganese	50	49.0	98.1	90 - 110	
Nickel	50	48.7	97.3	90 - 110	
Silver	50	48.8	97.5	90 - 110	
Thallium	50	48.5	97.1	90 - 110	
Vanadium	50	48.2	96.3	90 - 110	
Zinc	50	48.9	97.8	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-10
Instrument ID: ICP-MS2 Run Time: 12:38 Method: 6020A
File ID: NI.060117.123844 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.0500	0.0504	mg/L	101	90 - 110	
Arsenic	0.0500	0.0488	mg/L	97.7	90 - 110	
Barium	0.0500	0.0483	mg/L	96.5	90 - 110	
Cadmium	0.0500	0.0495	mg/L	99.0	90 - 110	
Chromium	0.0500	0.0488	mg/L	97.5	90 - 110	
Cobalt	0.0500	0.0488	mg/L	97.7	90 - 110	
Lead	0.0500	0.0489	mg/L	97.8	90 - 110	
Manganese	0.0500	0.0487	mg/L	97.5	90 - 110	
Nickel	0.0500	0.0486	mg/L	97.3	90 - 110	
Silver	0.0500	0.0499	mg/L	99.8	90 - 110	
Thallium	0.0500	0.0487	mg/L	97.4	90 - 110	
Vanadium	0.0500	0.0484	mg/L	96.8	90 - 110	
Zinc	0.0500	0.0489	mg/L	97.7	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5318882
Report generated 06/02/2017 08:18



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-12
Instrument ID: ICP-MS2 Run Time: 13:17 Method: 6020A
File ID: NI.060117.131707 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.0500	0.0491	mg/L	98.2	90 - 110	
Arsenic	0.0500	0.0484	mg/L	96.9	90 - 110	
Barium	0.0500	0.0492	mg/L	98.3	90 - 110	
Cadmium	0.0500	0.0490	mg/L	98.1	90 - 110	
Chromium	0.0500	0.0478	mg/L	95.7	90 - 110	
Cobalt	0.0500	0.0475	mg/L	95.1	90 - 110	
Lead	0.0500	0.0493	mg/L	98.6	90 - 110	
Manganese	0.0500	0.0478	mg/L	95.7	90 - 110	
Nickel	0.0500	0.0477	mg/L	95.3	90 - 110	
Silver	0.0500	0.0496	mg/L	99.2	90 - 110	
Thallium	0.0500	0.0491	mg/L	98.1	90 - 110	
Vanadium	0.0500	0.0477	mg/L	95.4	90 - 110	
Zinc	0.0500	0.0483	mg/L	96.6	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5318882
Report generated 06/02/2017 08:18



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-14
 Instrument ID: ICP-MS2 Run Time: 13:54 Method: 6020A
 File ID: NI.060117.135416 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.0500	0.0494	mg/L	98.9	90 - 110	
Arsenic	0.0500	0.0496	mg/L	99.1	90 - 110	
Barium	0.0500	0.0502	mg/L	100	90 - 110	
Cadmium	0.0500	0.0499	mg/L	99.8	90 - 110	
Chromium	0.0500	0.0478	mg/L	95.6	90 - 110	
Cobalt	0.0500	0.0477	mg/L	95.5	90 - 110	
Lead	0.0500	0.0500	mg/L	100	90 - 110	
Manganese	0.0500	0.0476	mg/L	95.3	90 - 110	
Nickel	0.0500	0.0482	mg/L	96.3	90 - 110	
Silver	0.0500	0.0502	mg/L	100	90 - 110	
Thallium	0.0500	0.0496	mg/L	99.2	90 - 110	
Vanadium	0.0500	0.0477	mg/L	95.4	90 - 110	
Zinc	0.0500	0.0486	mg/L	97.2	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5318882
 Report generated 06/02/2017 08:18



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-16
Instrument ID: ICP-MS2 Run Time: 14:10 Method: 6020A
File ID: NI.060117.141019 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.0500	0.0500	mg/L	100	90 - 110	
Arsenic	0.0500	0.0500	mg/L	99.9	90 - 110	
Barium	0.0500	0.0510	mg/L	102	90 - 110	
Cadmium	0.0500	0.0505	mg/L	101	90 - 110	
Chromium	0.0500	0.0493	mg/L	98.5	90 - 110	
Cobalt	0.0500	0.0490	mg/L	98.0	90 - 110	
Lead	0.0500	0.0509	mg/L	102	90 - 110	
Manganese	0.0500	0.0493	mg/L	98.6	90 - 110	
Nickel	0.0500	0.0489	mg/L	97.8	90 - 110	
Silver	0.0500	0.0511	mg/L	102	90 - 110	
Thallium	0.0500	0.0503	mg/L	101	90 - 110	
Vanadium	0.0500	0.0492	mg/L	98.3	90 - 110	
Zinc	0.0500	0.0494	mg/L	98.8	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5318882
Report generated 06/02/2017 08:18



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-20
Instrument ID: ICP-MS2 Run Time: 14:23 Method: 6020A
File ID: NI.060117.142308 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.0500	0.0499	mg/L	99.8	90 - 110	
Arsenic	0.0500	0.0492	mg/L	98.5	90 - 110	
Barium	0.0500	0.0498	mg/L	99.7	90 - 110	
Cadmium	0.0500	0.0491	mg/L	98.3	90 - 110	
Chromium	0.0500	0.0481	mg/L	96.2	90 - 110	
Cobalt	0.0500	0.0475	mg/L	95.0	90 - 110	
Lead	0.0500	0.0491	mg/L	98.2	90 - 110	
Manganese	0.0500	0.0481	mg/L	96.2	90 - 110	
Nickel	0.0500	0.0478	mg/L	95.6	90 - 110	
Silver	0.0500	0.0494	mg/L	98.8	90 - 110	
Thallium	0.0500	0.0485	mg/L	97.0	90 - 110	
Vanadium	0.0500	0.0479	mg/L	95.9	90 - 110	
Zinc	0.0500	0.0484	mg/L	96.8	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5318882
Report generated 06/02/2017 08:18



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-23
 Instrument ID: ICP-MS2 Run Time: 15:03 Method: 6020A
 File ID: NI.060117.150347 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.0500	0.0509	mg/L	102	90 - 110	
Arsenic	0.0500	0.0495	mg/L	99.0	90 - 110	
Barium	0.0500	0.0500	mg/L	100	90 - 110	
Cadmium	0.0500	0.0510	mg/L	102	90 - 110	
Chromium	0.0500	0.0486	mg/L	97.2	90 - 110	
Cobalt	0.0500	0.0479	mg/L	95.7	90 - 110	
Lead	0.0500	0.0504	mg/L	101	90 - 110	
Manganese	0.0500	0.0484	mg/L	96.8	90 - 110	
Nickel	0.0500	0.0481	mg/L	96.2	90 - 110	
Silver	0.0500	0.0515	mg/L	103	90 - 110	
Thallium	0.0500	0.0498	mg/L	99.7	90 - 110	
Vanadium	0.0500	0.0485	mg/L	97.0	90 - 110	
Zinc	0.0500	0.0491	mg/L	98.2	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5318882
 Report generated 06/02/2017 08:18



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-27
Instrument ID: ICP-MS2 Run Time: 15:35 Method: 6020A
File ID: NI.060117.153508 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.0500	0.0514	mg/L	103	90 - 110	
Arsenic	0.0500	0.0490	mg/L	98.0	90 - 110	
Barium	0.0500	0.0495	mg/L	98.9	90 - 110	
Cadmium	0.0500	0.0504	mg/L	101	90 - 110	
Chromium	0.0500	0.0479	mg/L	95.8	90 - 110	
Cobalt	0.0500	0.0478	mg/L	95.6	90 - 110	
Lead	0.0500	0.0495	mg/L	99.0	90 - 110	
Manganese	0.0500	0.0482	mg/L	96.3	90 - 110	
Nickel	0.0500	0.0479	mg/L	95.7	90 - 110	
Silver	0.0500	0.0514	mg/L	103	90 - 110	
Thallium	0.0500	0.0493	mg/L	98.6	90 - 110	
Vanadium	0.0500	0.0479	mg/L	95.8	90 - 110	
Zinc	0.0500	0.0486	mg/L	97.1	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5318882
Report generated 06/02/2017 08:18



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616294-10
Instrument ID: ICP-MS2 Run Time: 16:31 Method: 6020A
File ID: NI.060117.163126 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.0500	0.0503	mg/L	101	90 - 110	
Arsenic	0.0500	0.0498	mg/L	99.7	90 - 110	
Barium	0.0500	0.0494	mg/L	98.7	90 - 110	
Cadmium	0.0500	0.0500	mg/L	100	90 - 110	
Chromium	0.0500	0.0502	mg/L	100	90 - 110	
Cobalt	0.0500	0.0499	mg/L	99.8	90 - 110	
Lead	0.0500	0.0497	mg/L	99.4	90 - 110	
Manganese	0.0500	0.0506	mg/L	101	90 - 110	
Nickel	0.0500	0.0502	mg/L	100	90 - 110	
Silver	0.0500	0.0507	mg/L	101	90 - 110	
Thallium	0.0500	0.0496	mg/L	99.2	90 - 110	
Vanadium	0.0500	0.0500	mg/L	99.9	90 - 110	
Zinc	0.0500	0.0499	mg/L	99.7	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5318882
Report generated 06/02/2017 08:18



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616294-12
Instrument ID: ICP-MS2 Run Time: 17:08 Method: 6020A
File ID: NI.060117.170808 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.0500	0.0502	mg/L	100	90 - 110	
Arsenic	0.0500	0.0506	mg/L	101	90 - 110	
Barium	0.0500	0.0505	mg/L	101	90 - 110	
Cadmium	0.0500	0.0498	mg/L	99.5	90 - 110	
Chromium	0.0500	0.0509	mg/L	102	90 - 110	
Cobalt	0.0500	0.0504	mg/L	101	90 - 110	
Lead	0.0500	0.0509	mg/L	102	90 - 110	
Manganese	0.0500	0.0510	mg/L	102	90 - 110	
Nickel	0.0500	0.0504	mg/L	101	90 - 110	
Silver	0.0500	0.0481	mg/L	96.1	90 - 110	
Thallium	0.0500	0.0502	mg/L	100	90 - 110	
Vanadium	0.0500	0.0507	mg/L	101	90 - 110	
Zinc	0.0500	0.0501	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5318882
Report generated 06/02/2017 08:18



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-07
 Instrument ID: ICP-MS2 Run Time: 12:29 Method: 6020A
 File ID: NI.060117.122926 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.400	0.439	ug/L	110	70 - 130	
Arsenic	0.400	0.414	ug/L	103	70 - 130	
Barium	0.750	0.708	ug/L	94.4	70 - 130	
Cadmium	0.240	0.243	ug/L	101	70 - 130	
Chromium	0.800	0.629	ug/L	78.6	70 - 130	
Cobalt	0.400	0.386	ug/L	96.5	70 - 130	
Lead	0.200	0.201	ug/L	100	70 - 130	
Manganese	0.500	0.450	ug/L	90.0	70 - 130	
Nickel	1.60	1.47	ug/L	91.8	70 - 130	
Silver	0.400	0.425	ug/L	106	70 - 130	
Thallium	0.0800	0.0914	ug/L	114	70 - 130	
Vanadium	0.400	0.296	ug/L	74.0	70 - 130	
Zinc	6.25	6.19	ug/L	99.0	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-22
 Instrument ID: ICP-MS2 Run Time: 14:29 Method: 6020A
 File ID: NI.060117.142921 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.400	0.512	ug/L	128	70 - 130	
Arsenic	0.400	0.399	ug/L	99.8	70 - 130	
Barium	0.750	0.761	ug/L	101	70 - 130	
Cadmium	0.240	0.231	ug/L	96.2	70 - 130	
Chromium	0.800	0.474	ug/L	59.3	70 - 130	*
Cobalt	0.400	0.372	ug/L	93.1	70 - 130	
Lead	0.200	0.200	ug/L	100	70 - 130	
Manganese	0.500	0.437	ug/L	87.5	70 - 130	
Nickel	1.60	1.44	ug/L	89.8	70 - 130	
Silver	0.400	0.464	ug/L	116	70 - 130	
Thallium	0.0800	0.0795	ug/L	99.4	70 - 130	
Vanadium	0.400	0.263	ug/L	65.6	70 - 130	*
Zinc	6.25	6.10	ug/L	97.6	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616242-29
 Instrument ID: ICP-MS2 Run Time: 15:41 Method: 6020A
 File ID: NI.060117.154120 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.400	0.454	ug/L	113	70 - 130	
Arsenic	0.400	0.383	ug/L	95.8	70 - 130	
Barium	0.750	0.692	ug/L	92.3	70 - 130	
Cadmium	0.240	0.228	ug/L	94.9	70 - 130	
Chromium	0.800	0.455	ug/L	56.8	70 - 130	*
Cobalt	0.400	0.347	ug/L	86.7	70 - 130	
Lead	0.200	0.176	ug/L	88.2	70 - 130	
Manganese	0.500	0.408	ug/L	81.6	70 - 130	
Nickel	1.60	1.39	ug/L	87.1	70 - 130	
Silver	0.400	0.424	ug/L	106	70 - 130	
Thallium	0.0800	0.0686	ug/L	85.8	70 - 130	
Vanadium	0.400	0.235	ug/L	58.9	70 - 130	*
Zinc	6.25	5.91	ug/L	94.6	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616294-07
 Instrument ID: ICP-MS2 Run Time: 16:22 Method: 6020A
 File ID: NI.060117.162208 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.400	0.378	ug/L	94.4	70 - 130	
Arsenic	0.400	0.380	ug/L	94.9	70 - 130	
Barium	0.750	0.704	ug/L	93.9	70 - 130	
Cadmium	0.240	0.229	ug/L	95.5	70 - 130	
Chromium	0.800	0.808	ug/L	101	70 - 130	
Cobalt	0.400	0.381	ug/L	95.2	70 - 130	
Lead	0.200	0.187	ug/L	93.4	70 - 130	
Manganese	0.500	0.456	ug/L	91.3	70 - 130	
Nickel	1.60	1.51	ug/L	94.1	70 - 130	
Silver	0.400	0.375	ug/L	93.9	70 - 130	
Thallium	0.0800	0.0867	ug/L	108	70 - 130	
Vanadium	0.400	0.343	ug/L	85.7	70 - 130	
Zinc	6.25	5.91	ug/L	94.5	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17051391 Run Date: 06/01/2017 Sample ID: WG616294-14
 Instrument ID: ICP-MS2 Run Time: 17:14 Method: 6020A
 File ID: NI.060117.171421 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG615899 Cal ID: ICP-MS - 01-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Antimony	0.400	0.419	ug/L	105	70 - 130	
Arsenic	0.400	0.365	ug/L	91.3	70 - 130	
Barium	0.750	0.713	ug/L	95.1	70 - 130	
Cadmium	0.240	0.225	ug/L	93.5	70 - 130	
Chromium	0.800	0.865	ug/L	108	70 - 130	
Cobalt	0.400	0.380	ug/L	95.0	70 - 130	
Lead	0.200	0.194	ug/L	96.8	70 - 130	
Manganese	0.500	0.484	ug/L	96.7	70 - 130	
Nickel	1.60	1.51	ug/L	94.2	70 - 130	
Silver	0.400	0.459	ug/L	115	70 - 130	
Thallium	0.0800	0.0847	ug/L	106	70 - 130	
Vanadium	0.400	0.372	ug/L	93.0	70 - 130	
Zinc	6.25	6.05	ug/L	96.7	70 - 130	

* Exceeds LIMITS Criteria



Login number: L17051391
Instrument ID: ICP-MS2
Sol. A: WG616242-08
Sol. AB: WG616242-09

File ID: NI.060117.123231
File ID: NI.060117.123537

Workgroup (AAB#): WG615899
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Antimony	NS	0.0223	NS	100	100	100	
Arsenic	NS	0.0388	NS	100	102	102	
Barium	NS	0.0416	NS	100	100	100	
Cadmium	NS	-0.0288	NS	100	99.9	99.9	
Chromium	NS	-0.274	NS	100	100	100	
Cobalt	NS	0.0406	NS	100	99.0	99.0	
Lead	NS	0.0130	NS	100	101	101	
Manganese	NS	0.285	NS	100	100	100	
Nickel	NS	0.326	NS	100	98.5	98.5	
Silver	NS	0.00450	NS	100	92.2	92.2	
Thallium	NS	0.00500	NS	100	100	100	
Vanadium	NS	-0.0634	NS	100	99.4	99.4	
Zinc	NS	1.37	NS	100	102	102	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login number: L17051391
Instrument ID: ICP-MS2
Sol. A: WG616242-18
Sol. AB: WG616242-19

File ID: NI.060117.141632
File ID: NI.060117.141937

Workgroup (AAB#): WG615899
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Antimony	NS	0.0272	NS	100	99.4	99.4	
Arsenic	NS	0.0199	NS	100	99.9	99.9	
Barium	NS	0.0468	NS	100	101	101	
Cadmium	NS	0.00890	NS	100	98.9	98.9	
Chromium	NS	-0.337	NS	100	96.5	96.5	
Cobalt	NS	0.0404	NS	100	96.1	96.1	
Lead	NS	0.00990	NS	100	100	100	
Manganese	NS	0.198	NS	100	96.1	96.1	
Nickel	NS	0.314	NS	100	96.3	96.3	
Silver	NS	0.00430	NS	100	93.8	93.8	
Thallium	NS	0.00250	NS	100	98.9	98.9	
Vanadium	NS	-0.0810	NS	100	96.6	96.6	
Zinc	NS	1.89	NS	100	99.9	99.9	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login number: L17051391
Instrument ID: ICP-MS2
Sol. A: WG616242-25
Sol. AB: WG616242-26

File ID: NI.060117.152855
File ID: NI.060117.153200

Workgroup (AAB#): WG615899
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Antimony	NS	0.0191	NS	100	101	101	
Arsenic	NS	0.00820	NS	100	101	101	
Barium	NS	0.0574	NS	100	99.7	99.7	
Cadmium	NS	0.0179	NS	100	100	100	
Chromium	NS	-0.339	NS	100	96.7	96.7	
Cobalt	NS	0.0443	NS	100	95.5	95.5	
Lead	NS	0.0153	NS	100	100	100	
Manganese	NS	0.172	NS	100	96.4	96.4	
Nickel	NS	0.321	NS	100	95.2	95.2	
Silver	NS	0.00530	NS	100	60.4	60.4	*
Thallium	NS	-0.00250	NS	100	99.6	99.6	
Vanadium	NS	-0.0877	NS	100	96.7	96.7	
Zinc	NS	1.61	NS	100	100	100	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login number: L17051391
Instrument ID: ICP-MS2
Sol. A: WG616294-08
Sol. AB: WG616294-09

File ID: NI.060117.162513
File ID: NI.060117.162819

Workgroup (AAB#): WG615899
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Antimony	NS	0.0214	NS	100	98.6	98.6	
Arsenic	NS	0.00550	NS	100	100	100	
Barium	NS	0.0355	NS	100	97.8	97.8	
Cadmium	NS	-0.00380	NS	100	95.8	95.8	
Chromium	NS	-0.110	NS	100	99.5	99.5	
Cobalt	NS	0.0505	NS	100	100	100	
Lead	NS	0.0227	NS	100	98.7	98.7	
Manganese	NS	0.184	NS	100	100	100	
Nickel	NS	0.323	NS	100	99.4	99.4	
Silver	NS	0.00970	NS	100	38.1	38.1	*
Thallium	NS	0.00660	NS	100	98.2	98.2	
Vanadium	NS	-0.0253	NS	100	99.4	99.4	
Zinc	NS	1.15	NS	100	102	102	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



INTERNAL STANDARD REPORT

Login: L17051391 Analytical Method: 6020
 Analytical Workgroup: WG615899 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 01-JUN-2017 12:10

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L17051380-24	SAMP	01-JUN-2017 13:07	93.208	98.697	95.404
L17051389-01	SAMP	01-JUN-2017 14:04	88.798	94.076	91.855
L17051391-01	SAMP	01-JUN-2017 14:07	92.206	97.005	96.322
L17051391-01	SAMP	01-JUN-2017 15:25	88.977	88.943	88.467
WG615832-02	BLANK	01-JUN-2017 12:44	98.166	102.456	101.363
WG615832-03	LCS	01-JUN-2017 12:48	98.404	102.466	100.72
WG615832-04	FLT_BLK	01-JUN-2017 12:52	97.678	102.09	99.646
WG615899-01	PSPK	01-JUN-2017 13:10	93.886	98.888	96.468
WG615899-02	SERIAL	01-JUN-2017 13:13	94.518	95.3	94.898
WG616242-05	ICV	01-JUN-2017 12:23	96.559	99.636	99.124
WG616242-06	ICB	01-JUN-2017 12:26	89.35	90.125	90.498
WG616242-07	LLICV	01-JUN-2017 12:29	96.571	98.586	97.72
WG616242-08	ICS	01-JUN-2017 12:32	92.29	95.479	94.69
WG616242-09	ICS	01-JUN-2017 12:35	97.185	102.955	100.479
WG616242-10	CCV	01-JUN-2017 12:38	96.314	100.644	99.217
WG616242-11	CCB	01-JUN-2017 12:41	93.265	92.871	94.169
WG616242-12	CCV	01-JUN-2017 13:17	96.903	100.627	98.165
WG616242-13	CCB	01-JUN-2017 13:20	95.424	97.482	95.401
WG616242-14	CCV	01-JUN-2017 13:54	92.72	93.463	92.276
WG616242-15	CCB	01-JUN-2017 13:57	93.098	92.756	90.717
WG616242-16	CCV	01-JUN-2017 14:10	93.707	96.572	95.075
WG616242-17	CCB	01-JUN-2017 14:13	86.644	84.446	84.334
WG616242-18	ICS	01-JUN-2017 14:16	89.034	89.803	88.464
WG616242-19	ICS	01-JUN-2017 14:19	94.682	97.551	95.288
WG616242-20	CCV	01-JUN-2017 14:23	95.326	95.937	95.914
WG616242-21	CCB	01-JUN-2017 14:26	93.053	92.968	92.612
WG616242-22	LLCCV	01-JUN-2017 14:29	93.645	93.39	92.483
WG616242-23	CCV	01-JUN-2017 15:03	92.115	95.792	93.566
WG616242-24	CCB	01-JUN-2017 15:06	92.478	92.982	92.816
WG616242-25	ICS	01-JUN-2017 15:28	86.578	89.711	87.701
WG616242-26	ICS	01-JUN-2017 15:32	92.627	98.219	95.394
WG616242-27	CCV	01-JUN-2017 15:35	92.215	95.953	93.465
WG616242-28	CCB	01-JUN-2017 15:38	92.153	93.964	92.823
WG616242-29	LLCCV	01-JUN-2017 15:41	92.715	94.288	92.77

Acceptance criteria: 30% - 120% Underlined recoveries are out of range
 Acceptance criteria for CCVs and CCBs for method SW846-6020: 80% - 120%

INT_STD_ICPMS - Modified 07/28/2010
 PDF File ID: 5318877
 Report generated: 06/02/2017 08:24



INTERNAL STANDARD REPORT

Login: L17051391 Analytical Method: 6020
 Analytical Workgroup: WG615899 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 01-JUN-2017 16:03

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L17051389-01	SAMP	01-JUN-2017 16:58	95.809	103.374	101.88
L17051391-01	SAMP	01-JUN-2017 16:55	96.294	101.548	99.108
WG615832-02	BLANK	01-JUN-2017 16:37	100.281	101.53	102.293
WG615832-03	LCS	01-JUN-2017 16:40	102.647	103.326	103.549
WG615899-03	PSPK	01-JUN-2017 17:01	96.373	104.734	104.188
WG615899-04	SERIAL	01-JUN-2017 17:05	95.924	98.994	98.606
WG616294-05	ICV	01-JUN-2017 16:15	100.326	102.975	102.191
WG616294-06	ICB	01-JUN-2017 16:19	99.658	100.024	100.531
WG616294-07	LLICV	01-JUN-2017 16:22	97.255	97.751	98.195
WG616294-08	ICS	01-JUN-2017 16:25	95.058	96.941	96.244
WG616294-09	ICS	01-JUN-2017 16:28	101.21	104.372	104.745
WG616294-10	CCV	01-JUN-2017 16:31	101.546	104.751	104.031
WG616294-11	CCB	01-JUN-2017 16:34	99.65	102.086	101.124
WG616294-12	CCV	01-JUN-2017 17:08	99.286	102.771	102.472
WG616294-13	CCB	01-JUN-2017 17:11	99.945	100.469	100.599
WG616294-14	LLCCV	01-JUN-2017 17:14	98.957	99.621	98.494

Acceptance criteria: 30% - 120% Underlined recoveries are out of range
 Acceptance criteria for CCVs and CCBs for method SW846-6020: 80% - 120%

INT_STD_ICPMS - Modified 07/28/2010
 PDF File ID: 5318877
 Report generated: 06/02/2017 08:24



Login Number: L17051391 Date: 04/12/2017
Instrument ID: ICP-MS2 Method: 6020A

Analyte	Integration Time (Sec.)	Concentration (ug/L)
Antimony	1.00	100.0
Arsenic	1.00	100.0
Barium	1.00	100.0
Cadmium	1.00	100.0
Chromium	1.00	100.0
Cobalt	1.00	100.0
Copper	1.00	100.0
Lead	1.00	100.0
Manganese	1.00	100.0
Nickel	1.00	100.0
Selenium	1.00	100.0
Silver	1.00	100.0
Thallium	1.00	100.0
Uranium	1.00	100.0
Vanadium	1.00	100.0
Zinc	1.00	100.0

Comments:

All analytes passed acceptance criteria at the specified concentration.



2.4 General Chemistry Data

2.4.1 Method 9056

2.4.1.1 Summary Data

Lab Report #: L17051391

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17051391-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6442-GRAB	Prep Method: 9056	Prep Date: 05/25/2017 16:04
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG615591	Analyst: CAS	Run Date: 05/26/2017 02:00
Collect Date: 05/24/2017 15:00	Dilution: 5	File ID: I2_052517-34
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Sulfate	14808-79-8	51.0		10.0	5.00	2.50
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17051391

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17051391-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6442-GRAB	Prep Method: 9056	Prep Date: 05/25/2017 16:04
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG615591	Analyst: CAS	Run Date: 05/26/2017 02:19
Collect Date: 05/24/2017 15:00	Dilution: 50	File ID: I2_052517-35
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chloride	16887-00-6	433		20.0	10.0	5.00
J	Estimated value ; the analyte concentration was less than the LOQ.					

2.4.1.2 QC Summary Data

The concentrations (ppm) of the calibration standards and the resulting area counts are used to determine the equation of a linear or quadratic plot.

The slope and y-intercept of that line are used to calculate the quantity of the analyzed unknown samples.

Amount(ppm) = [(slope)(area count of unknown) + y-intercept](dilution)

(The slope is the amt/area also identified as the CF or calibration factor)

Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC2 Dataset: 041117 IC2 ICAL.SEQ
 Analyst1: CAS Analyst2: NA
 Method: IC01 SOP: 300/9056 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 160804254
 Eluent ID#: RGT39823

Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM

Internal STD: NA Surrogate STD: NA Calibration STD STD81395 (04-11-2017)
 CCV STD: STD81395 LCS STD: STD81396 MS/MSD STD: NA

Comments: ICAL WG609755: Alternate Source STD81396
 Guard Column: Ionpac AG14A (4x50mm)
 Dionex S/N 012640
 Analytical Column: Ionpac AS14A (4x250mm)
 Dionex S/N 010066
 Cond Suppressor: AERS 500 (4mm)
 Dionex S/N 140122040
 System Backpressure: 1836 psi

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I2_041117-01	ELUENT	1	1		04/11/17 16:16
2	I2_041117-02	DI WATER	1	1		04/11/17 16:35
3	I2_041117-03	WG609755-01 STD	1	1		04/11/17 16:55
4	I2_041117-04	WG609755-02 STD	1	1		04/11/17 17:14
5	I2_041117-05	WG609755-03 STD	1	1		04/11/17 17:33
6	I2_041117-06	WG609755-04 STD	1	1		04/11/17 17:52
7	I2_041117-07	WG609755-05 STD	1	1		04/11/17 18:11
8	I2_041117-08	WG609755-06 STD	1	1		04/11/17 18:31
9	I2_041117-09	WG609755-07 SSCV	1	1		04/11/17 18:50
10	I2_041117-10	LCRV @Level-6	1	1		04/11/17 19:09
11	I2_041117-11	LCRV @Level-4	1	1		04/11/17 19:28
12	I2_041117-12	LCRV @Level-2	1	1		04/11/17 19:48
13	I2_041117-13	LCRV @Level-0	1	1		04/11/17 20:07
14	I2_041117-14	END	1	1		04/11/17 20:26

Comments

Seq.	Rerun	Dil.	Reason	Analytes
------	-------	------	--------	----------

Page: 1

Approved: 12-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC2 Dataset: 052517 IC2.SEQ
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 161205254
 Eluent ID#: RGT40258

Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM
 Analytical WG615591 (Waters)
 Internal STD: NA Surrogate STD: NA Calibration STD STD81395 (04-11-2017)
 CCV STD: STD81395 LCS STD: STD81396 MS/MSD STD: STD81396

Comments: System Backpressure: 1809 psi

Samples L17051318 (-03,05,07,09,11,13,15) were analyzed at dilutions only due to their pre-run screen results for sulfate, which were greater than the calibration maximum.

Samples L17051347-03 and L17051348-03 were analyzed at dilutions only due to their pre-run screen results for sulfate, which were greater than 200 ppm.

Samples L17051389-01 and L17051391-01 were analyzed at dilutions only due to their pre-run screen results for chloride, which were greater than 200 ppm.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I2_052517-01	ELUENT	1	1		05/25/17 15:25
2	I2_052517-02	DI WATER	1	1		05/25/17 15:45
3	I2_052517-03	WG615593-01 ANION CCV	1	1	STD81395	05/25/17 16:04
4	I2_052517-04	WG615593-02 ANION CCB	1	1		05/25/17 16:23
5	I2_052517-05	WG615591-01 ANION BLANK	1	1		05/25/17 16:42
6	I2_052517-06	WG615591-02 ANION LCS	1	1	STD81396	05/25/17 17:02
7	I2_052517-07	L17051318-01 (SO4) REF	1	1		05/25/17 17:21
8	I2_052517-08	WG615591-04 DUP 1318-01	2	1		05/25/17 17:40
9	I2_052517-09	WG615591-05 MS 1318-01	2	1	STD81396	05/25/17 17:59
10	I2_052517-10	WG615591-06 MSD 1318-01	2	1	STD81396	05/25/17 18:19
11	I2_052517-11	L17051318-03 (SO4) 20x (NR)	2	20		05/25/17 18:38
12	I2_052517-12	L17051318-05 (SO4) 50x	2	50		05/25/17 18:57
13	I2_052517-13	L17051318-07 (SO4) 50x	2	50		05/25/17 19:16
14	I2_052517-14	L17051318-09 (SO4) 10x	2	10		05/25/17 19:35
15	I2_052517-15	WG615593-03 ANION CCV	1	1	STD81395	05/25/17 19:55
16	I2_052517-16	WG615593-04 ANION CCB	1	1		05/25/17 20:14
17	I2_052517-17	L17051318-11 (SO4) 10x	2	10		05/25/17 20:33
18	I2_052517-18	L17051318-13 (SO4) 50x	2	50		05/25/17 20:52
19	I2_052517-19	L17051318-15 (SO4) 50x	2	50		05/25/17 21:12
20	I2_052517-20	L17051318-17 (SO4)	2	1		05/25/17 21:31
21	I2_052517-21	L17051318-19 (SO4)	2	1		05/25/17 21:50
22	I2_052517-22	L17051343-01 (F,CL,BR,SO4) REF	1	1		05/25/17 22:09
23	I2_052517-23	WG615591-08 DUP 1343-01	1	1		05/25/17 22:29
24	I2_052517-24	L17051347-03 (CL,SO4) 5x	2	5		05/25/17 22:48
25	I2_052517-25	L17051347-03 RR SO4 10x (NR)	2	10		05/25/17 23:07
26	I2_052517-26	WG615593-05 ANION CCV	1	1	STD81395	05/25/17 23:26
27	I2_052517-27	WG615593-06 ANION CCB	1	1		05/25/17 23:46
28	I2_052517-28	L17051348-03 (CL,SO4) 5x	2	5		05/26/17 00:05

Page: 1

Approved: 26-MAY-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC2 Dataset: 052517 IC2.SEQ
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 161205254
 Eluent ID#: RGT40258

Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM
 Analytical WG615591 (Waters)
 Internal STD: NA Surrogate STD: NA STD81395 (04-11-2017)
 CCV STD: STD81395 LCS STD: STD81396 STD81396

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
29	I2_052517-29	L17051348-03 RR SO4 10x	2	10		05/26/17 00:24
30	I2_052517-30	L17051383-01 (SO4)	1	1		05/26/17 00:43
31	I2_052517-31	L17051383-02 (SO4)	1	1		05/26/17 01:03
32	I2_052517-32	L17051389-01 (CL,SO4) 5x	1	5		05/26/17 01:22
33	I2_052517-33	L17051389-01 RR CL 50x	1	50		05/26/17 01:41
34	I2_052517-34	L17051391-01 (CL,SO4) 5x	1	5		05/26/17 02:00
35	I2_052517-35	L17051391-01 RR CL 50x	1	50		05/26/17 02:19
36	I2_052517-36	WG615593-07 ANION CCV	1	1	STD81395	05/26/17 02:39
37	I2_052517-37	WG615593-08 ANION CCB	1	1		05/26/17 02:58
38	I2_052517-38	WG615593-09 ANION CCV	1	1	STD81395	05/26/17 08:29
39	I2_052517-39	WG615593-10 ANION CCB	1	1		05/26/17 08:48
40	I2_052517-40	L17051318-03 (SO4) 50x	2	50		05/26/17 09:08
41	I2_052517-41	WG615593-11 ANION CCV	1	1	STD81395	05/26/17 09:27
42	I2_052517-42	WG615593-12 ANION CCB	1	1		05/26/17 09:46
43	I2_052517-43	END	1	1		05/26/17 10:05

Comments

Seq.	Rerun	Dil.	Reason	Analytes

Eri C. Zimm



Microbac Laboratories Inc.

Data Checklist

Date: 11-APR-2017
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC2
 Curve Workgroup: WG609755
 Runlog ID: 81498
 Analytical Workgroups: ICAL ONLY

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	NA
Endrin/DDT breakdown (8081/MS)	NA
Pentachlorophenol/benzidine tailing (MS)	NA
Eluent check (IC)/system pressure (HPLC)	1836PSI
Window standard (FID)	NA
Initial Calibration	X
Average RF	NA
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	NA
% D/% Drift	NA
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	NA
TCL hits	NA
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	NA
Recoveries	NA
Surrogate recoveries	NA
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	NA
TCL hits	NA
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	NA
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	X
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	CAS
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
12-APR-2017



Secondary Reviewer:
12-APR-2017




Microbac Laboratories Inc.

Data Checklist


Date: 25-MAY-2017
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC2
 Curve Workgroup: NA
 Runlog ID: 82427
 Analytical Workgroups: L17051318, L17051343, 1347, 1348, 1383, 1389, 1391

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	NA
Endrin/DDT breakdown (8081/MS)	NA
Pentachlorophenol/benzidine tailing (MS)	NA
Eluent check (IC)/system pressure (HPLC)	1809 PSI
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	NA
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	X
Check for completeness	X
Primary Reviewer	CAS
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
26-MAY-2017



Secondary Reviewer:
26-MAY-2017




Analytical Method:9056
Login Number:L17051391

AAB#:WG615591

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6442-GRAB	01	05/24/17					05/25/2017	1	2		05/26/17	1.5	2	
LH18/24-SP650-6442-GRAB	01	05/24/17					05/25/2017	1	2		05/26/17	1.5	2	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5314577
Report generated 05/30/2017 10:45



METHOD BLANK SUMMARY

Login Number: L17051391 Work Group: WG615591
 Blank File ID: I2_052517-05 Blank Sample ID: WG615591-01
 Prep Date: 05/25/17 16:04 Instrument ID: IC2
 Analyzed Date: 05/25/17 16:42 Method: 9056
 Analyst: CAS

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG615591-02	I2_052517-06	05/25/17 17:02	01
DUP	WG615591-04	I2_052517-08	05/25/17 17:40	01
DUP	WG615591-08	I2_052517-23	05/25/17 22:29	01
LH18/24-SP650-6442-GRAB	L17051391-01	I2_052517-34	05/26/17 02:00	DL01
LH18/24-SP650-6442-GRAB	L17051391-01	I2_052517-35	05/26/17 02:19	DL02

Report Name: BLANK_SUMMARY
 PDF File ID: 5314578
 Report generated 05/30/2017 10:45



Login Number: L17051391 Prep Date: 05/25/17 16:04 Sample ID: WG615591-01
 Instrument ID: IC2 Run Date: 05/25/17 16:42 Prep Method: 9056
 File ID: I2_052517-05 Analyst: CAS Method: 9056
 Workgroup (AAB#): WG615591 Matrix: Water Units: mg/L
 Contract #: Cal ID: IC2-11-APR-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Chloride	0.100	0.400	0.100	1	U
Sulfate	0.500	2.00	0.500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5314579
 30-MAY-2017 10:45



Login Number: L17051391 Run Date: 05/25/2017 Sample ID: WG615591-02
Instrument ID: IC2 Run Time: 17:02 Prep Method: 9056
File ID: I2_052517-06 Analyst: CAS Method: 9056
Workgroup (AAB#): WG615591 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD81396 Cal ID: IC2-11-APR-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Chloride	8.00	8.25	103	90 - 110	
Sulfate	40.0	41.6	104	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5314580
Report generated: 05/30/2017 10:45



Login Number: L17051391 Instrument ID: IC2
Analytical Method: 9056 Initial Calibration Date: 11-APR-17 18:31
ICAL Workgroup: WG609755 Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Chloride	4.765	8.91		0.99700
Sulfate	6.254	13.0		0.99600

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 5314581
Report generated 05/30/2017 10:45



Login Number: L17051391
 Analytical Method: 9056

Instrument ID: IC2
 Initial Calibration Date: 11-APR-17 18:31
 Column ID: F

Analyte	WG609755-01			WG609755-02			WG609755-03		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloride	0.200	0.039000000 0	5.128	1.00	0.194000000	5.155	4.00	0.805000000	4.969
Sulfate	1.00	0.136000000	7.353	5.00	0.730000000	6.849	20.0	3.096000000	6.460

INT_CAL - Modified 03/06/2008
 PDF File ID: 5314581
 Report generated 05/30/2017 10:45



Login Number: L17051391
 Analytical Method: 9056

Instrument ID: IC2
 Initial Calibration Date: 11-APR-17 18:31
 Column ID: F

Analyte	WG609755-04			WG609755-05			WG609755-06		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloride	8.00	1.70500000	4.692	12.0	2.64500000	4.537	24.0	5.83700000	4.112
Sulfate	40.0	6.67400000	5.993	60.0	10.46500000	5.733	120	23.36900000	5.135

INT_CAL - Modified 03/06/2008
 PDF File ID: 5314581
 Report generated 05/30/2017 10:45



Login Number: L17051391 Run Date: 04/11/2017 Sample ID: WG609755-07
 Instrument ID: IC2 Run Time: 18:50 Method: 9056
 File ID: I2 041117-09 Analyst: CAS QC Key: DOD4
 ICal Workgroup: WG609755 Cal ID: IC2 - 11-APR-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Chloride	8.00	8.03	mg/L	4.73	0.400	10	
Sulfate	40.0	40.5	mg/L	6.04	1.20	10	

* Exceeds %D Limit



Login Number: L17051391 Run Date: 05/25/2017 Sample ID: WG615593-02
 Instrument ID: IC2 Run Time: 16:23 Method: 9056
 File ID: I2 052517-04 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG615591 Cal ID: IC2 - 11-APR-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.400	0.100	U
Sulfate	0.500	2.00	0.500	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 05/25/2017 Sample ID: WG615593-04
 Instrument ID: IC2 Run Time: 20:14 Method: 9056
 File ID: I2 052517-16 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG615591 Cal ID: IC2 - 11-APR-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.400	0.100	U
Sulfate	0.500	2.00	0.500	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 05/25/2017 Sample ID: WG615593-06
 Instrument ID: IC2 Run Time: 23:46 Method: 9056
 File ID: I2 052517-27 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG615591 Cal ID: IC2 - 11-APR-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.400	0.100	U
Sulfate	0.500	2.00	0.500	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 05/26/2017 Sample ID: WG615593-08
 Instrument ID: IC2 Run Time: 02:58 Method: 9056
 File ID: I2 052517-37 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG615591 Cal ID: IC2 - 11-APR-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.400	0.100	U
Sulfate	0.500	2.00	0.500	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17051391 Run Date: 05/25/2017 Sample ID: WG615593-01
 Instrument ID: IC2 Run Time: 16:04 Method: 9056
 File ID: I2 052517-03 Analyst: CAS QC Key: DOD4
 Workgroup (AAB#): WG615591 Cal ID: IC2 - 11-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	7.79	mg/L	4.89	2.59	10	
Sulfate	40.0	38.9	mg/L	6.31	2.67	10	

* Exceeds %D Criteria



Login Number: L17051391 Run Date: 05/25/2017 Sample ID: WG615593-03
Instrument ID: IC2 Run Time: 19:55 Method: 9056
File ID: I2 052517-15 Analyst: CAS QC Key: DOD4
Workgroup (AAB#): WG615591 Cal ID: IC2 - 11-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.26	mg/L	4.59	3.24	10	
Sulfate	40.0	41.6	mg/L	5.86	4.02	10	

* Exceeds %D Criteria



Login Number: L17051391 Run Date: 05/25/2017 Sample ID: WG615593-05
 Instrument ID: IC2 Run Time: 23:26 Method: 9056
 File ID: I2 052517-26 Analyst: CAS QC Key: DOD4
 Workgroup (AAB#): WG615591 Cal ID: IC2 - 11-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.30	mg/L	4.57	3.69	10	
Sulfate	40.0	41.6	mg/L	5.87	3.88	10	

* Exceeds %D Criteria



Login Number: L17051391 Run Date: 05/26/2017 Sample ID: WG615593-07
Instrument ID: IC2 Run Time: 02:39 Method: 9056
File ID: I2 052517-36 Analyst: CAS QC Key: DOD4
Workgroup (AAB#): WG615591 Cal ID: IC2 - 11-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.30	mg/L	4.56	3.80	10	
Sulfate	40.0	41.6	mg/L	5.86	4.02	10	

* Exceeds %D Criteria



2.4 General Chemistry Data

2.4.2 COD Data

2.4.2.1 Summary Data

Lab Report #: L17051391

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17051391-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6442-GRAB	Prep Method: METHOD	Prep Date: N/A
Matrix: Water	Analytical Method: 410.4 MOD	Cal Date: 02/27/2017 11:47
Workgroup #: WG615777	Analyst: TMM	Run Date: 05/26/2017 08:30
Collect Date: 05/24/2017 15:00	Dilution: 1	File ID: 00.1705260830-13
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chemical Oxygen Demand	COD	16.7	J	40.0	20.0	10.0
J	Estimated value ; the analyte concentration was less than the LOQ.					

2.4.2.2 QC Summary Data

Example Calculations for Visible Spectrophotometric Methods

Linear Calibration Model

Step 1 - Retrieve Curve Data from ICAL

m = slope of the linear equation
 b = intercept from the linear equation
 y = instrument response as absorbance or OD
 x = concentration of analyte (mg/L)
 $y = mx + b$

Step 2: Calculate the instrument concentration, x

Where:

$$x = (y - b)/m$$

Step 3: Solve for analyte concentration in sample, Cx

$$C_x = (x) (D)$$

Example Calculation (LCS):

Value of m from plot:	7.809
Value of b from plot:	0.0004135
Absorbance of unknown from quantitation report (y):	0.31
Calculated concentration (x):	0.03964483
Dilution factor (D):	1.00
Concentration of analyte in sample, C _y :	0.0396 mg/L

SmartChem Autoanalyzer - Quadratic Calibration for Chloride and Sulfate

Step 1 - Retrieve Curve Data from Smartchem ICAL

A, B, C = constants from the ICAL quadratic regression

x = instrument response as absorbance or OD

y = concentration of analyte (mg/L)

Step 2: Calculate the instrument concentration, y

Where:

$$y = Ax^2 + Bx + C$$

Step 3: Solve for analyte concentration in sample, C_y

$$C_y = (y) (D)$$

Example Calculation (LCS):

Value of A from plot:	101.2796
Value of B from plot:	318.9056
Value of C from plot:	-2.2712
Absorbance of unknown from quantitation report (x):	0.1583
Calculated concentration (y):	50.7495108
Dilution factor (D):	1.00
Concentration of analyte in sample, C _y :	50.75 mg/L

Microbac Laboratories Inc.

Data Checklist

Date: 26-MAY-2017
 Analyst: TMM
 Analyst: NA
 Method: COD-LOW
 Instrument: V-1200
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG615777

Calibration/Linearity	2/27/17
Second Source Check	
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	TMM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
26-MAY-2017

Jammy Morris

Secondary Reviewer:
30-MAY-2017

Dennis Johnson



Analytical Method: 410.4 MOD
Login Number: L17051391

AAB#: WG615777

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6442-GRAB	01	05/24/17					05/26/2017	1.7	28		05/26/17	1.7	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17051391 Work Group: WG615777
 Blank File ID: 00.1705260830-03 Blank Sample ID: WG615777-01
 Prep Date: 05/26/17 08:30 Instrument ID: V-1200
 Analyzed Date: 05/26/17 08:30 Method: 410.4 MOD
 Analyst: TMM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG615777-02	00.1705260830-04	05/26/17 08:30	
LCS2	WG615777-03	00.1705260830-05	05/26/17 08:30	
LH18/24-SP650-6442-GRAB	L17051391-01	00.1705260830-13	05/26/17 08:30	
DUP	WG615777-05	00.1705260830-15	05/26/17 08:30	

Report Name: BLANK_SUMMARY
 PDF File ID: 5313724
 Report generated 05/30/2017 08:28



Login Number: L17051391 Prep Date: 05/26/17 08:30 Sample ID: WG615777-01
Instrument ID: V-1200 Run Date: 05/26/17 08:30 Prep Method: METHOD
File ID: 00.1705260830-03 Analyst: TMM Method: 410.4 MOD
Workgroup (AAB#): WG615777 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: V-1200-12-APR-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Chemical Oxygen Demand	10.0	40.0	10.0	1	J

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5313725
30-MAY-2017 08:28



Login Number: L17051391 Analyst: TMM Prep Method: METHOD
 Instrument ID: V-1200 Matrix: Water Method: 410.4 MOD
 Workgroup (AAB#): WG615777 Units: mg/L
 QC Key: DOD4 Lot #: STD77863
 Sample ID: WG615777-02 LCS File ID: 00.1705260830-04 Run Date: 05/26/2017 08:30
 Sample ID: WG615777-03 LCS2 File ID: 00.1705260830-05 Run Date: 05/26/2017 08:30

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Chemical Oxygen Demand	100	104	104	100	106	106	1.27	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5313726
 Report generated: 05/30/2017 08:28



2.4.2.3 Raw Data

W9604321

Curves - low

Parameter: COD - low

Spectrophotometer: V-1200

Calibration (Curve) standard stock: STJ 80541

Concentration: 10,000mg/L

Recipe for preparation of curve standards found in:
 SOP: 6405 Revision: 17 Page: 10

Second Source Stock: 77863 (concentration: 100mg/L)

Daily Preparation: 5(100)/50

concentration = 100

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance	
5 (150)	2 mL	1cm	420nm	0.205	0.197
6 (100)	↓	↓	↓	0.326	0.316
7 (50)	↓	↓	↓	0.437	0.442
8 (30)	↓	↓	↓	0.482	0.495
9 (20)	↓	↓	↓	0.505	0.507
Blank	↓	↓	↓	0.541	0.561
2nd source (100)	↓	↓	↓	0.338	0.328

Analyst: Shaelyn Carley

Date/Time: 2-27-17 1145

DCN#124219



Microbac Laboratories Inc.
INITIAL CALIBRATION

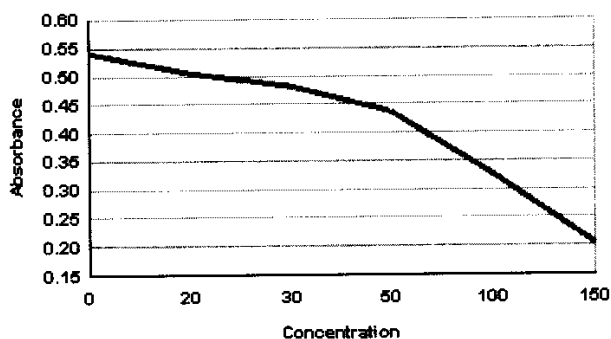
Workgroup: WG604321
Analytical Method: 400
Instrument ID: V-1200

Analyst: SDC
Initial Calibration Date: 02/27/2017

Analyte: CHEMICAL OXYGEN DEMAND
Number of Points: 6
Slope: -0.00225645
Y-Intercept: 0.547626
Coef. Of Correlation (R^2): 0.998855
Coef. Of Correlation (R): 0.999427

Concentration X	Absorbance Y	X^2	$X * Y$	Y-Fitted (mX^2+B)
0.00	0.541	0.00	0.00	0.547626
20.0	0.505	400	10.1	0.502497
30.0	0.482	900	14.5	0.479933
50.0	0.437	2500	21.9	0.434804
100	0.326	10000	32.6	0.321981
150	0.205	22500	30.8	0.209158

Curve Fit



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 02/28/2017 14:28



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

00856953

Workgroup #: WG604321

Instrument ID: V-1200

File ID: 00.1702271147-07

Run Date: 02/27/2017

CCV ID: WG604321-07

Run Time: 11:47

Units: mg/L

Analyst: SDC

Analyte: CHEMICAL OXYGEN DEMAND Cal ID: V-1200 - 27-FEB-17 11:47:06

Analyte	Expected	Found	RF	%D	Q
Chemical Oxygen Demand	100	92.9	0.00338	7.1	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 02/28/2017 14:29



WORKGROUP: WG615777

COD-Jow

EPA 410.4/SMS220D/HACH 8000
 SOP K4105 Revision #: 18
 Curve ID: 2/27/17
 Wavelength (nm): 420
 All samples use 2ml

CCV: 80541
 Daily dilution: $3(10000)/50$
 Daily dilution: $5(1000)/50$
 Daily dilution: = 60
 Hot Block ID: COD#2

LCS: 17863
 Daily dilution: $5(1000)/50$
 Daily dilution: = 1000
 COD vial Lot # A7003C

Spike: 17863
 Daily dilution: $0.1(1000)/2$
 Daily dilution: = 50
 Spectrophotometer: V-1200

SAMPLE	DILUTION	ABSORBANCE 1	ABSORBANCE 2
CCV: 60 mg/L		0.408	
BLANK:		0.525	
LCS: 1000 mg/L		0.312	
LCS DUP: 1000 mg/L		0.309	
05-1428-01		0.520	
02		0.544	
03		0.555	
04		0.484	
05		0.535	
06		0.545	
05-1389-01		0.273	
05-1391-01		0.510	
05-1410-14		0.531	
05-1424-02		0.189	
DUP: 05-1410-14		0.524	
MS: (50) ↓		0.404	
MDS: (50) ↓		0.389	
CCV: 60 mg/L		0.407	

RRR on right

ANALYST: Jimmy Jones
 DATE/TIME: (on) 5/26/17 08:30
 DATE/TIME: (off) 10:30

DCN#126103



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG615777Analyst: TMMAnalyte: CHEMICAL OXYGEN DEMANDDate: 05/26/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG615777-01	2	2	0.525	-0.002256	0.5476	10.027	10.027	1	mg/L
WG615777-02	2	2	0.312	-0.002256	0.5476	104.42	104.42	1	mg/L
WG615777-03	2	2	0.309	-0.002256	0.5476	105.75	105.75	1	mg/L
L17051428-01	2	2	0.520	-0.002256	0.5476	12.243	12.243 F	1	mg/L
L17051428-02	2	2	0.544	-0.002256	0.5476	1.6071	ND	1	mg/L
L17051428-03	2	2	0.555	-0.002256	0.5476	-3.2678	ND	1	mg/L
L17051428-04	2	2	0.484	-0.002256	0.5476	28.198	28.198	1	mg/L
L17051428-05	2	2	0.535	-0.002256	0.5476	5.5957	ND	1	mg/L
L17051428-06	2	2	0.545	-0.002256	0.5476	1.1640	ND	1	mg/L
L17051389-01	2	2	0.273	-0.002256	0.5476	121.71	121.71	1	mg/L
L17051391-01	2	2	0.510	-0.002256	0.5476	16.675	16.675 F	1	mg/L
WG615777-04	2	2	0.531	-0.002256	0.5476	7.3684	7.3684	1	mg/L
L17051410-14	2	2	0.531	-0.002256	0.5476	7.3684	ND	1	mg/L
WG615777-05	2	2	0.524	-0.002256	0.5476	10.471	10.471	1	mg/L
WG615777-06	2	2	0.404	-0.002256	0.5476	63.651	63.651	1	mg/L
WG615777-07	2	2	0.389	-0.002256	0.5476	70.299	70.299	1	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 05/26/2017 14:35

Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00856956

Workgroup #: WG615801 Instrument ID: V-1200
File ID: 00.1705260830-01 Run Date: 05/26/2017
CCV ID: WG615801-01 Run Time: 08:30
Units: mg/L Analyst: TMM
Analyte: CHEMICAL OXYGEN DEMAND Cal ID: V-1200 - 12-APR-17

Analyte	Expected	Found	RF	%D	Q
Chemical Oxygen Demand	60	61.9	0.00680	3.2	

* Exceeds %D Limit
CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 05/26/2017 14:36



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00856957

Workgroup #: WG615801 Instrument ID: V-1200
File ID: 00.1705260830-18 Run Date: 05/26/2017
CCV ID: WG615801-03 Run Time: 08:30
Units: mg/L Analyst: TMM
Analyte: CHEMICAL OXYGEN DEMAND Cal ID: V-1200 - 12-APR-17

Analyte	Expected	Found	RF	%D	Q
Chemical Oxygen Demand	60	62.3	0.00678	3.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 05/26/2017 14:36



2.4 General Chemistry Data

2.4.3 Oil and Grease Data

2.4.3.1 Summary Data

Lab Report #: L17051391

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17051391-01	PrePrep Method: N/A	Instrument: HORIZON
Client ID: LH18/24-SP650-6442-GRAB	Prep Method: 1664A	Prep Date: N/A
Matrix: Water	Analytical Method: 1664A	Cal Date:
Workgroup #: WG615965	Analyst: AWE	Run Date: 05/31/2017 08:46
Collect Date: 05/24/2017 15:00	Dilution: 1	File ID: ON.1705310846-09
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
n-Hexane Extractable Material (HEM)	OILGREASE	2.80	U	5.60	2.80	1.40
U	Analyte was not detected. The concentration is below the reported LOD.					

2.4.3.2 QC Summary Data

Example Oil and Grease - HEM Calculations

$$[(WT2 - WT1) * 1000000]/\text{volume} = \text{mg/L}$$

where:

WT1 = weight (grams) of empty container.

WT2 = weight (grams) of dried sample and container.

1000000 = factor to get to mg/L.

volume = mL of sample used.

The samples are not blank corrected.

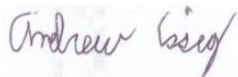
Microbac Laboratories Inc.

Data Checklist

Date: 31-MAY-2017
 Analyst: AWE
 Analyst: NA
 Method: HEM
 Instrument: HORIZON
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG615965

Calibration/Linearity	05/31/17
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	X
LCS/LCS Dup	X
MS/MSD	
Duplicate	
Upload Results	X
Client Forms	X
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	AWE
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
01-JUN-2017



Secondary Reviewer:
01-JUN-2017




Analytical Method:1664A
Login Number:L17051391

AAB#:WG615965

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6442-GRAB	01	05/24/17					05/31/2017	6.7	28		05/31/17	6.7	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17051391 Work Group: WG615965
 Blank File ID: ON.1705310846-01 Blank Sample ID: WG615965-01
 Prep Date: 05/31/17 08:46 Instrument ID: HORIZON
 Analyzed Date: 05/31/17 08:46 Method: 1664A
 Analyst: AWE

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG615965-02	ON.1705310846-02	05/31/17 08:46	
LCS2	WG615965-03	ON.1705310846-03	05/31/17 08:46	
LH18/24-SP650-6442-GRAB	L17051391-01	ON.1705310846-09	05/31/17 08:46	

Report Name: BLANK_SUMMARY
 PDF File ID: 5317602
 Report generated 06/01/2017 09:47



Login Number: L17051391 Prep Date: 05/31/17 08:46 Sample ID: WG615965-01
Instrument ID: HORIZON Run Date: 05/31/17 08:46 Prep Method: 1664A
File ID: ON.1705310846-01 Analyst: AWE Method: 1664A
Workgroup (AAB#): WG615965 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: HORIZO - _____

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
n-Hexane Extractable Material (HEM)	1.40	5.60	1.40	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5317603
01-JUN-2017 09:47



Login Number: L17051391 Analyst: AWE Prep Method: 1664A
 Instrument ID: HORIZON Matrix: Water Method: 1664A
 Workgroup (AAB#): WG615965 Units: mg/L
 QC Key: DOD4 Lot #: STD82076
 Sample ID: WG615965-02 LCS File ID: ON.1705310846-02 Run Date: 05/31/2017 08:46
 Sample ID: WG615965-03 LCS2 File ID: ON.1705310846-03 Run Date: 05/31/2017 08:46

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
n-Hexane Extractable Material (HEM)	40.0	33.1	82.8	40.0	31.9	79.8	3.69	78 - 114	18	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5317604
 Report generated: 06/01/2017 09:47



2.4.3.3 Raw Data

Microbac Laboratories Inc.
GRAVIMETRIC REPORT

00856972

Workgroup (AAB#): WG615965
Analyst: AWE
Analyte: OIL & GREASE
Balance: BAL004

Method: 1664A
SOP: K1664 Revision 12
Spike Solution: STD82076
Daily Dilution: _____

SAMPLE ID	Instrument	HORIZONTAL VOL	INITIAL WT	DRY WT A	DRY WT B	DRY WT C	Anal. Conc	Rep. Conc.	Units
WG615965-01	B	1000	2.2935	2.2939	2.2938			0.3000	mg/L
WG615965-02	L	1000	2.3115	2.3448	2.3446			33.10	mg/L
WG615965-03	L2	1000	2.2789	2.3107	2.3108			31.90	mg/L
L17051367-02	1	1000	2.2603	2.2603	2.2604			ND	mg/L
L17051367-04	2	1000	2.289	2.2892	2.2892			ND	mg/L
L17051367-06	3	980	2.3307	2.3306	2.3308			ND	mg/L
L17051369-01	4	360	2.3505	2.3582	2.3581			21.11	mg/L
L17051389-01	5	1000	2.2887	2.2887	2.2891			ND	mg/L
L17051391-01	6	1000	2.3896	2.3904	2.3908			ND	mg/L
L17051417-05	7	1000	2.2919	2.2926	2.2925			ND	mg/L
L17051441-01	8	1000	2.2922	2.2929	2.2929			ND	mg/L
L17051441-02	9	1000	2.2618	2.2626	2.2627			ND	mg/L
L17051550-01	10	1000	2.3522	2.3673	2.3676			15.40	mg/L
L17051550-02	11	1000	2.3147	2.3167	2.3167			ND	mg/L
L17051550-03	12	1000	2.3369	2.34	2.3401			ND	mg/L
L17051550-04	13	1000	2.3652	2.3763	2.3764			11.20	mg/L
L17051559-01	14	950	2.3305	2.3306	2.3307			ND	mg/L
L17051574-01	15	430	2.3383	2.5444	2.5422	2.5419	473.5	473.5	mg/L

L17051550-01	Has yellow layer in bottom of pan.
L17051550-04	Has yellow layer in bottom of pan.
L17051574-01	Yellow layer of oil in bottom of pan.

Analyst: Andrew Casey

Date/Time (on) : 05/31/2017 08:46
Date/Time (off) : 05/31/2017 10:28
Date/Time (off) : 05/31/2017 10:58
Date/Time (off) : 05/31/2017 11:28

*Duplicate required on 10% of samples



Workgroup (AAB#): WG615965

Method: 1664A

Analyst: AWE

SOP: K1664 Revision 12

Analyte: OIL & GREASE

Spike Solution: STD82076

Balance: BAL004

Daily Dilution: _____

SAMPLE NUMBER	Instrument#	HORIZONTAL VOL	INITIAL WT	DRY WT A	DRY WT B	DRY WT C	Anal. Conc	Rep. Conc.	Units
WG615965-01	B	1000	2.2935	2.2939	2.2938			0.3000	mg/L
WG615965-02	L	1000	2.3115	2.3448	2.3446			33.10	mg/L
WG615965-03	L2	1000	2.2789	2.3107	2.3108			31.90	mg/L
L17051367-02	1	1000	2.2603	2.2603	2.2604			ND	mg/L
L17051367-04	2	1000	2.289	2.2892	2.2892			ND	mg/L
L17051367-06	3	980	2.3307	2.3306	2.3308			ND	mg/L
L17051369-01	4	360	2.3505	2.3582	2.3581			21.11	mg/L
L17051389-01	5	1000	2.2887	2.2887	2.2891			ND	mg/L
L17051391-01	6	1000	2.3896	2.3904	2.3908			ND	mg/L
L17051417-05	7	1000	2.2919	2.2926	2.2925			ND	mg/L
L17051441-01	8	1000	2.2922	2.2929	2.2929			ND	mg/L
L17051441-02	9	1000	2.2618	2.2626	2.2627			ND	mg/L
L17051550-01	10	1000	2.3522	2.3673	2.3676			15.40	mg/L
L17051550-02	11	1000	2.3147	2.3167	2.3167			ND	mg/L
L17051550-03	12	1000	2.3369	2.34	2.3401			ND	mg/L
L17051550-04	13	1000	2.3652	2.3763	2.3764			11.20	mg/L
L17051559-01	14	950	2.3305	2.3306	2.3307			ND	mg/L
L17051574-01	15	430	2.3383	2.5444	2.5422	2.5419	473.5	473.5	mg/L

L17051550-01 Has yellow layer in bottom of pan.

L17051550-04 Has yellow layer in bottom of pan.

L17051574-01 Yellow layer of oil in bottom of pan.

Analyst: Andrew Giesig

Date/Time (on) : 05/31/2017 08:46
 Date/Time (off) : 05/31/2017 10:28
 Date/Time (off) : 05/31/2017 10:58
 Date/Time (off) : 05/31/2017 11:28

*Duplicate required on 10% of samples



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
June 6, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
ALS - ADRIANE L. STEED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BLG - BRENDA L. GREENWALT	BNB - Brandi N. Bentley
BRG - BRENDA R. GREGORY	CAS - Craig A. Smith
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL	CV - Carl Volkman
DAK - DEAN A. KETELSEN	DCM - DAVID C. MERCKLE
DEV - DAVID E. VANDENBERG	DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER	DLP - DOROTHY L. PAYNE
DSM - DAVID S. MOSSOR	DTG - DOMINIC T. GEHRET
ECL - ERIC C. LAWSON	EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER	FJB - FRANCES J. BOLDEN
HRF - HEATHER R. FAIRCHILD	JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH	JKP - JACQUELINE K. PARSONS
JLD - JESSICA L. DELONG	JST - JOSHUA S. TAYLOR
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KDD - Katelyn D. Daley
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRP - KATHY R. PARSONS	LJH - Lacey J. Hendershot
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
OJE - OMOYEMWEN J. ENGLISH	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCA - SUEELLEN C. ADAMS
SCB - SARAH C. BOGOLIN	SCJ - SUE ELLEN C. JOHNSON
SDC - SHALYN D. CONLEY	TB - TODD BOYLE
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	ZTB - ZACH T. BARNES

List of Valid Qualifiers

June 06, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample receipt exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentatively identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound



List of Valid Qualifiers

June 06, 2017

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below



CHAIN OF CUSTODY

Name Of Lab Shipping To: MICROBAC (740) 373-4071 ATTN: STEPHANIE MOSSBURG

Project: AECOM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS		Project No.: 60256135.GWTPT HRUMAR16
Job: GROUNDWATER TREATMENT PLANT QUARTERLY EFFLUENT SAMPLES		
Prepared By: Scott Beesinger		
P. O. Number		
Field Sample I.D.	Sample Matrix	Date / Time
LH18/24-SP650-6442-GRAB	Water	05/24/17 / 15:00
LH18/24-SP650-6442-GRAB	Water	05/24/17 / 15:00
LH18/24-SP650-6442-GRAB	Water	05/24/17 / 15:00
LH18/24-SP650-6442-GRAB	Water	05/24/17 / 15:00
Trip Blank	Water	05/24/17
MS / MSD		
NO. OF CONTAINERS		
ROD Volatiles		
Total Metals		
Oil & Grease		
Chemical Oxygen Demand		
Chloride & Sulfate		
1,4 - DIOXANE		
Perchlorate		
Remarks (Preservatives, etc.)		
Lab I.D.#		

STANDARD TURN AROUND TIME

Additional Remarks:	
Relinquished By: <i>Scott Beesinger</i>	Received By:
Date: 05/24/17 Time: 15:45	Date: _____ Time: _____
Relinquished By: _____	Received By: _____
Date: _____ Time: _____	Date: _____ Time: _____

For Lab Use Only					
Received At Lab By: _____	Date: _____	Time: _____	Airbill No. _____	Date: _____	Time: _____
Remarks: _____	Date: _____	Time: _____	Seal No. _____	Date: _____	Condition _____

Microbac OVD
 Received: 05/25/2017 09:42
 By: CARRA STRICKLER
 221000101300
Anna Strickler

Cooler ID 1300

COOLER TEMP >6° C LOG

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C

DJO 5/25/17

pH Lot # HC601354

pH Exceptions

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6

PRESERVATIVE EXCEPTIONS
 NONE
 AS NOTED
DJO 5/25/17

Document Control # 1957
 Last 10-07-2016

Issued to: Document Master File

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17051391

Account: 2551

Project: 2551.096

Samples: 2

Due Date: 05-JUN-2017

Samplenum **Container ID** **Products**
L17051391-01 913147 826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	25-MAY-2017 14:32	BRG		
2	ANALYZ	V1	ORG4	25-MAY-2017 14:47	HRF	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	25-MAY-2017 14:32	BRG		
2	ANALYZ	V1	ORG4	25-MAY-2017 14:47	HRF	CLS	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	25-MAY-2017 14:32	BRG		
2	ANALYZ	V1	ORG4	25-MAY-2017 14:47	HRF	CLS	

Samplenum **Container ID** **Products**
L17051391-01 913148 827-DIOXANE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	25-MAY-2017 14:32	BRG		
2	PREP	W1	EXT	30-MAY-2017 14:57	CPD	CLS	
3	ANALYZ*	EXT	SEMI	01-JUN-2017 15:12	SCB	CPD	

***Sample extract/digestate/leachate**

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	25-MAY-2017 14:32	BRG		
2	STORE	W1	A1	26-MAY-2017 09:02	CLS	CLS	

***Sample extract/digestate/leachate**

Samplenum **Container ID** **Products**
L17051391-01 913149 9056

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	25-MAY-2017 14:32	BRG		
2	PREP	W1	SEM	25-MAY-2017 15:13	CAS	BRG	
3	STORE	SEM	A1	26-MAY-2017 15:17	CLS	CAS	
4	ANALYZ*	SEM	SEMI	01-JUN-2017 15:12	SCB	CAS	

***Sample extract/digestate/leachate**

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17051391

Account: 2551

Project: 2551.096

Samples: 2

Due Date: 05-JUN-2017

Samplenum **Container ID** **Products**
L17051391-01 913150 COD-HIGH COD-LOW

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	WET	25-MAY-2017 14:32	BRG		
2	STORE	WET	A1	30-MAY-2017 14:51	TMM	CLS	

Samplenum **Container ID** **Products**
L17051391-01 913151 OG-HEM

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	25-MAY-2017 14:32	BRG		<2
2	ANALYZ	W1	WET	31-MAY-2017 07:34	AWE	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER		25-MAY-2017 14:32	BRG		<2

Samplenum **Container ID** **Products**
L17051391-01 913152 AG-MS AL AS-MS BA-MS CD-MS CO-MS CR-MS FE MN-N

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	25-MAY-2017 14:32	BRG		
2	PREP	W1	DIG	25-MAY-2017 14:56	ERP	BRG	
3	ANALYZ*	DIG	METALS	30-MAY-2017 12:33	JYH	ERP	
4	STORE	DIG	A1	30-MAY-2017 13:56	BRG	ERP	

*Sample extract/digestate/leachate

Samplenum **Container ID** **Products**
L17051391-01 913154 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	25-MAY-2017 14:33	BRG		
2	ANALYZ	W1	SEM	26-MAY-2017 08:19	JWR	CLS	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17051391

Account: 2551

Project: 2551.096

Samples: 2

Due Date: 05-JUN-2017

<u>Samplenum</u>	<u>Container ID</u>	<u>Products</u>
L17051391-02	913153	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	25-MAY-2017 14:32	BRG		
2	ANALYZ	V1	ORG4	25-MAY-2017 14:47	HRF	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	25-MAY-2017 14:32	BRG		
2	ANALYZ	V1	ORG4	25-MAY-2017 14:47	HRF	CLS	

A1 - Sample Archive (COLD)
 A2 - Sample Archive (AMBIENT)
 F1 - Volatiles Freezer in Login
 V1 - Volatiles Refrigerator in Login
 W1 - Walkin Cooler in Login



NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
 Total Halide by Bomb Combustion (TX)
 Particle Sizing - 200 Mesh (PS200)
 Specific Gravity/Density (SPGRAV)
 Total Residual Chlorine (CL-TRL)
 Total Volatile Solids (all forms) (TVS)
 Total Coliform Bacteria (all methods)
 Fecal Coliform Bacteria (all methods)
 Sulfite (SO₃)
 Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS

Nitrogen, Ammonia by Method 350.1
 Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
 Phenolics, Total by Method 420.1
 ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
 Acetic acid
 Butyric acid
 Lactic acid
 Propionic acid
 Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
 1-Methylnaphthalene
 1,4-Dioxane
 Atrazine
 Benzaldehyde
 Biphenyl
 Caprolactam
 Hexamethylphosphoramide (HMPA)
 Pentachlorobenzene
 Pentachloroethane

NELAP Accreditation by Laboratory SOP**NONPOTABLE WATER**OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALSOVD MSS01/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP**SOLID AND HAZARDOUS CHEMICALS**OVD MSV01/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)



Laboratory Report Number: L17060105

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on June 13 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Microbac Laboratories * Ohio Valley Division
158 Starlite Drive, Marietta, OH 45750 * T: (740) 373-4071 F: (740) 373-4835 * www.microbac.com

Lab Report #: L17060105

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

The following discrepancies were noted:

Discrepancy	Resolution
The temperature was out of the acceptable range for the following samples. BRG	Please proceed. MRT
The ice was melted. BRG	Please proceed. MRT

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
00110490	I	8.0		J4616881677	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	No
4	Was ice present?	No
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	NA

**Lab Report #:** L17060105**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP650-6445-GRAB	L17060105-01	05/31/2017 15:00	06/02/2017 09:34



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	NH3
Prep Batch Number(s):	WG616848	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-13 19:22:07



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	NH3
Prep Batch Number(s):	WG616848	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	NH3
Prep Batch Number(s):	WG616848	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	NH3
Prep Batch Number(s):	WG616848	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	NH3
Prep Batch Number(s):	WG616848	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	NH3
Prep Batch Number(s):	WG616848	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	PO4
Prep Batch Number(s):	WG616359	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-13 19:21:31



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	PO4
Prep Batch Number(s):	WG616359	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	PO4
Prep Batch Number(s):	WG616359	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	PO4
Prep Batch Number(s):	WG616359	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	PO4
Prep Batch Number(s):	WG616359	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	PO4
Prep Batch Number(s):	WG616359	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	TOC
Prep Batch Number(s):	WG616847	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-13 19:22:37



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	TOC
Prep Batch Number(s):	WG616847	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	TOC
Prep Batch Number(s):	WG616847	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	TOC
Prep Batch Number(s):	WG616847	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	TOC
Prep Batch Number(s):	WG616847	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060105
Project Name:		Method:	TOC
Prep Batch Number(s):	WG616847	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-13 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

Lab Report #: L17060105
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060105-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6445-GRAB	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 06/07/2017 08:02
Workgroup #: WG616848	Analyst: DCM	Run Date: 06/07/2017 08:18
Collect Date: 05/31/2017 15:00	Dilution: 5	File ID: S2170607001.025
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	5.01	CT1	1.00	0.500	0.250
CT1	Cooler temperature at sample receipt exceeded regulatory limit.					

Lab Report #: L17060105
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060105-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6445-GRAB	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 03/09/2017 11:26
Workgroup #: WG616359	Analyst: DLP	Run Date: 06/02/2017 11:20
Collect Date: 05/31/2017 15:00	Dilution: 2	File ID: 00.1706021120-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	1.17	CT1	0.200	0.100	0.0500
CT1	Cooler temperature at sample receipt exceeded regulatory limit.					

Lab Report #: L17060105
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060105-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6445-GRAB	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG616847	Analyst: ADG	Run Date: 06/07/2017 09:22
Collect Date: 05/31/2017 15:00	Dilution: 5	File ID: TC06072017.007
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	57.6		10.0	5.00	2.50

2.1 General Chemistry Data

2.1.1 Ammonia Data

2.1.1.1 Summary Data

Lab Report #: L17060105

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060105-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6445-GRAB	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 06/07/2017 08:02
Workgroup #: WG616848	Analyst: DCM	Run Date: 06/07/2017 08:18
Collect Date: 05/31/2017 15:00	Dilution: 5	File ID: S2170607001.025
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	5.01	CT1	1.00	0.500	0.250
CT1	Cooler temperature at sample receipt exceeded regulatory limit.					

Lab Report #: L17060105

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

2.1.1.2 QC Summary Data

Example Ammonia Calculations

$$(\text{absorbance} - \text{intercept}) / (\text{slope} * \text{dilution}) = \text{mg/L}$$

where:

absorbance = reading from the spectrophotometer

intercept = calculated from calibration standard absorbencies

slope = calculated from calibration standard absorbencies

dilution = dilution of the distillate in decimal form (ex. 1/5 dilution = 0.2)

Microbac Laboratories Inc.

Data Checklist

Date: 07-JUN-2017
 Analyst: DCM
 Analyst: NA
 Method: NH3
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG616848 WG616849 WG616850 WG616852

Calibration/Linearity	06-07-2017
Second Source Check	X
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	X
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	DCM
Secondary Reviewer	SAV
Comments	

Primary Reviewer:
07-JUN-2017



Secondary Reviewer:
08-JUN-2017




Analytical Method: 350.1
Login Number: L17060105

AAB#: WG616848

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6445-GRAB	01	05/31/17					06/07/2017	6.7	28		06/07/17	6.7	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060105 Work Group: WG616848
 Blank File ID: S2170607001.011 Blank Sample ID: WG616848-01
 Prep Date: 06/07/17 08:06 Instrument ID: SMARTCHEM2
 Analyzed Date: 06/07/17 08:06 Method: 350.1
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG616848-02	S2170607001.012	06/07/17 08:07	01
LH18/24-SP650-6445-GRAB	L17060105-01	S2170607001.025	06/07/17 08:18	DL01
DUP	WG616848-04	S2170607001.027	06/07/17 08:21	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5328516
 Report generated 06/08/2017 11:32



Login Number: L17060105 Prep Date: 06/07/17 08:06 Sample ID: WG616848-01
 Instrument ID: SMARTCHEM2 Run Date: 06/07/17 08:06 Prep Method: 350.1
 File ID: S2170607001.011 Analyst: DCM Method: 350.1
 Workgroup (AAB#): WG616848 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: SMARTC-07-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Nitrogen, Ammonia	0.0500	0.200	0.0500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5328517
 08-JUN-2017 11:32



Login Number: L17060105 Run Date: 06/07/2017 Sample ID: WG616848-02
Instrument ID: SMARTCHEM2 Run Time: 08:07 Prep Method: 350.1
File ID: S2170607001.012 Analyst: DCM Method: 350.1
Workgroup (AAB#): WG616848 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD80299 Cal ID: SMARTC-07-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Ammonia	2.00	2.06	103	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5328518
Report generated: 06/08/2017 11:32



2.1 General Chemistry Data

2.1.2 Orthophosphate Data

2.1.2.1 Summary Data

Lab Report #: L17060105
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060105-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6445-GRAB	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 03/09/2017 11:26
Workgroup #: WG616359	Analyst: DLP	Run Date: 06/02/2017 11:20
Collect Date: 05/31/2017 15:00	Dilution: 2	File ID: 00.1706021120-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	1.17	CT1	0.200	0.100	0.0500
CT1	Cooler temperature at sample receipt exceeded regulatory limit.					

2.1.2.2 QC Summary Data

Example Calculations for Visible Spectrophotometric Methods

Linear Calibration Model

Step 1 - Retrieve Curve Data from ICAL

m = slope of the linear equation
 b = intercept from the linear equation
 y = instrument response as absorbance or OD
 x = concentration of analyte (mg/L)
 $y = mx + b$

Step 2: Calculate the instrument concentration, x

Where:

$$x = (y - b)/m$$

Step 3: Solve for analyte concentration in sample, Cx

$$Cx = (x) (D)$$

Example Calculation (LCS):

Value of m from plot:	7.809
Value of b from plot:	0.0004135
Absorbance of unknown from quantitation report (y):	0.31
Calculated concentration (x):	0.03964483
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	0.0396 mg/L

SmartChem Autoanalyzer - Quadratic Calibration for Chloride and Sulfate

Step 1 - Retrieve Curve Data from Smartchem ICAL

A, B, C = constants from the ICAL quadratic regression

x = instrument response as absorbance or OD

y = concentration of analyte (mg/L)

Step 2: Calculate the instrument concentration, y

Where:

$$y = Ax^2 + Bx + C$$

Step 3: Solve for analyte concentration in sample, Cy

$$Cy = (y) (D)$$

Example Calculation (LCS):

Value of A from plot:	101.2796
Value of B from plot:	318.9056
Value of C from plot:	-2.2712
Absorbance of unknown from quantitation report (x):	0.1583
Calculated concentration (y):	50.7495108
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	50.75 mg/L

Microbac Laboratories Inc.

Data Checklist

Date: 02-JUN-2017
 Analyst: DLP
 Analyst: NA
 Method: PO4
 Instrument: V-1200
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG616359

Calibration/Linearity	
Second Source Check	03-09-17
ICV/CCV (std)	
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Primary Reviewer	DLP
Secondary Reviewer	SAV
Comments	

Primary Reviewer:
02-JUN-2017

Secondary Reviewer:
06-JUN-2017

Dwight Payne

Sarah Vandenberg



Analytical Method: 365.2
Login Number: L17060105

AAB#: WG616359

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6445-GRAB	01	05/31/17					06/02/2017	1.8	2		06/02/17	1.8	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060105 Work Group: WG616359
 Blank File ID: 00.1706021120-03 Blank Sample ID: WG616359-01
 Prep Date: 06/02/17 11:20 Instrument ID: V-1200
 Analyzed Date: 06/02/17 11:20 Method: 365.2
 Analyst: DLP

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG616359-02	00.1706021120-04	06/02/17 11:20	
LCS2	WG616359-03	00.1706021120-05	06/02/17 11:20	
LH18/24-SP650-6445-GRAB	L17060105-01	00.1706021120-06	06/02/17 11:20	
DUP	WG616359-05	00.1706021120-07	06/02/17 11:20	

Report Name: BLANK_SUMMARY
 PDF File ID: 5324422
 Report generated 06/06/2017 12:35



Login Number: L17060105 Prep Date: 06/02/17 11:20 Sample ID: WG616359-01
Instrument ID: V-1200 Run Date: 06/02/17 11:20 Prep Method: 365.2
File ID: 00.1706021120-03 Analyst: DLP Method: 365.2
Workgroup (AAB#): WG616359 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: V-1200-01-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Orthophosphate	0.0250	0.100	0.0250	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5324423
06-JUN-2017 12:35



Login Number: L17060105 Analyst: DLP Prep Method: 365.2
 Instrument ID: V-1200 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG616359 Units: mg/L
 QC Key: DOD4 Lot #: STD82182

Sample ID: WG616359-02 LCS File ID: 00.1706021120-04 Run Date: 06/02/2017 11:20
 Sample ID: WG616359-03 LCS2 File ID: 00.1706021120-05 Run Date: 06/02/2017 11:20

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	1.00	100	1.00	0.999	99.9	0.478	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5324424
 Report generated: 06/06/2017 12:35



2.1.2.3 Raw Data

Std 605653

Curves

Parameter: PO4

Spectrophotometer: V-1200

Calibration (Curve) standard stock: 79640

Concentration: 1000 mg/L

Recipe for preparation of curve standards found in:
SOP: 3653 Revision: 11 Page: 9

Second Source Stock: Std 605657 (concentration: 10)

Daily Preparation: 10(10)/100

concentration = 1.0

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
1.0	50	1cm	9540	0.635
0.7	↓	↓	↓	0.440
0.5				0.318
0.2				0.129
0.1				0.067
0.05				0.038
0				0.007
2nd Source 1.0				0.631

Analyst: April Greene

Date/Time: 3/9/12 @ 0125

DCN#124439



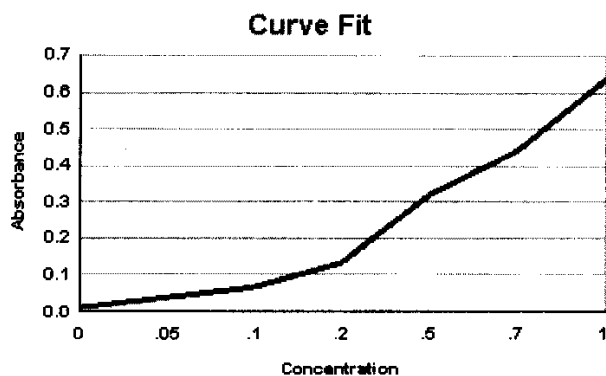
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG605653
Analytical Method: 300
Instrument ID: V-1200

Analyst: ADG
Initial Calibration Date: 03/09/2017

Analyte: **ORTHOPHOSPHATE**
Number of Points: 7
Slope: 0.626650
Y-Intercept: 0.00514888
Coef. Of Correlation (R^2): 0.999901
Coef. Of Correlation (R): 0.999951

Concentration X	Absorbance Y	X ²	X * Y	Y-Fitted (mX ² +B)
0.00	0.00700	0.00	0.00	0.00514888
0.0500	0.0380	0.00250	0.00190	0.0364814
0.100	0.0670	0.0100	0.00670	0.0678139
0.200	0.129	0.0400	0.0258	0.130479
0.500	0.318	0.250	0.159	0.318474
0.700	0.440	0.490	0.308	0.443804
1.00	0.635	1.00	0.635	0.631799



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 03/09/2017 12:03



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

Workgroup #: WG605653
File ID: 00.1703091126-08
CCV ID: WG605653-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 03/09/2017
Run Time: 11:26
Analyst: ADG
Cal ID: V-1200 - 09-MAR-17 11:26:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	0.999	0.631	0.1	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 03/09/2017 12:06



Orthophosphate
(orthophosphate1)

EPA 365.2 / SM4500-P E

SOP K3653 Rev 17

Color Reagent Chemicals

RGT 40282

RGT 38726

RGT 374 39475

COA 18278

CCV: 5.5 mg/L

Daily Dilution: 5(5)/50

Daily Dilution: 0.5

Spectrophotometer: V-1200

LCS: 5.0 mg/L

Daily Dilution: 10(10)/100

Daily Dilution: 1.0

Curve ID: WG 605653

Spike: 5.0 mg/L

Daily Dilution: 2(10)/50

Daily Dilution: 0.4

3-09-17

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: 5.5 mg/L	50	✓		0.315
BLK/CCB:	50	✓		0.020
LCS: 1.0 ppm	50	✓		0.634
LCS D: 1.0 ppm	50	✓		0.631
CT1 26-105-01	50	✓	1/5 / 1/2	0.189 0.371
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
DUP 26-105-01	50	✓	1/2	0.373
MS: () 1/25-01	50	✓	1/2	0.998 0.498
MSD: ()	50			
CCV: () 0.5	50			0.325
CCB: 0.5 mg/L	50	✓	DUP 26-02-17	0.325 0.000

Analyst: Quinty Payne Date/Time: 6-02-17 11:20

DCN#126210



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG616359Analyst: DLPAnalyte: ORTHOPHOSPHATEDate: 06/02/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG616359-01	50	50	0	0.6267	0.005149	-0.0082165	-0.0082165	1	mg/L
WG616359-02	50	50	0.634	0.6267	0.005149	1.0035	1.0035	1	mg/L
WG616359-03	50	50	0.631	0.6267	0.005149	0.99872	0.99872	1	mg/L
L17060105-01	50	50	0.371	0.6267	0.005149	0.58382	1.1676	2	mg/L
WG616359-04	50	50	0.371	0.6267	0.005149	0.58382	1.1676	2	mg/L
WG616359-05	50	50	0.373	0.6267	0.005149	0.58701	1.1740	2	mg/L
WG616359-06	50	50	0.498	0.6267	0.005149	0.78649	1.5730	2	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 06/02/2017 18:00

Workgroup #: WG616463 Instrument ID: V-1200
File ID: 00.1706021120-09 Run Date: 06/02/2017
CCV ID: WG616463-03 Run Time: 11:20
Units: mg/L Analyst: DLP
Analyte: ORTHOPOSPHATE Cal ID: V-1200 - 01-JUN-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.510	0.650	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/02/2017 17:59



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00857041

Workgroup #: WG616463 Instrument ID: V-1200
File ID: 00.1706021120-01 Run Date: 06/02/2017
CCV ID: WG616463-01 Run Time: 11:20
Units: mg/L Analyst: DLP
Analyte: ORTHOPHOSPHATE Cal ID: V-1200 - 01-JUN-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.494	0.630	1.2	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/02/2017 17:59



2.1 General Chemistry Data

2.1.3 Total Organic Carbon Data

2.1.3.1 Summary Data

Lab Report #: L17060105

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060105-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6445-GRAB	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG616847	Analyst: ADG	Run Date: 06/07/2017 09:22
Collect Date: 05/31/2017 15:00	Dilution: 5	File ID: TC06072017.007
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	57.6		10.0	5.00	2.50

2.1.3.2 QC Summary Data

**Total Organic Carbon Example Calculations
(Direct Readout Parameter)**

$$(\text{Readout})/(\text{dilution}) = \text{mg/L}$$

where:

Readout = direct readout from the instrument

dilution = dilution in decimal form (ex. 1/5 dilution = 0.2)

Microbac Laboratories Inc.

Data Checklist

Date: 07-JUN-2017
 Analyst: ADG
 Analyst: NA
 Method: TOC
 Instrument: TOVVWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG616847

Calibration/Linearity	02/10/17
Second Source Check	
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	X
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	ADG
Secondary Reviewer	SAV
Comments	

Primary Reviewer:
08-JUN-2017

April Greene

Secondary Reviewer:
09-JUN-2017

Sarah Vandenberg



Analytical Method: 415.1
Login Number: L17060105

AAB#: WG616847

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6445-GRAB	01	05/31/17					06/07/2017	6.8	28		06/07/17	6.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060105 Work Group: WG616847
 Blank File ID: TC06072017.004 Blank Sample ID: WG616847-01
 Prep Date: 06/07/17 08:11 Instrument ID: TOC-VWP
 Analyzed Date: 06/07/17 08:11 Method: 415.1
 Analyst: ADG

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG616847-02	TC06072017.005	06/07/17 08:30	01
LCS2	WG616847-03	TC06072017.006	06/07/17 08:51	01
LH18/24-SP650-6445-GRAB	L17060105-01	TC06072017.007	06/07/17 09:22	DL01
DUP	WG616847-05	TC06072017.031	06/07/17 17:58	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5330976
 Report generated 06/09/2017 13:08



Login Number: L17060105 Prep Date: 06/07/17 08:11 Sample ID: WG616847-01
 Instrument ID: TOC-VWP Run Date: 06/07/17 08:11 Prep Method: 415.1
 File ID: TC06072017.004 Analyst: ADG Method: 415.1
 Workgroup (AAB#): WG616847 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: TOC-VW-10-FEB-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Total Organic Carbon	0.500	2.00	0.500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5330977
 09-JUN-2017 13:08



Login Number: L17060105 Analyst: ADG Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG616847 Units: mg/L
 QC Key: DOD4 Lot #: STD80787
 Sample ID: WG616847-02 LCS File ID: TC06072017.005 Run Date: 06/07/2017 08:30
 Sample ID: WG616847-03 LCS2 File ID: TC06072017.006 Run Date: 06/07/2017 08:51

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	26.2	105	25.0	26.1	104	0.574	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5330978
 Report generated: 06/09/2017 13:08



2.1.3.3 Raw Data

Curve

~~WG 602411~~
~~WG 602476~~ *dm/11/13/17*
 WG 602481

Total Organic Carbon

MAKE DAILY

CCV (TOC): _____ LCS (TOC): _____
 (5/200)(1000) = 25mg/L (5/200)(1000) = 25mg/L

CCV (TIC): _____ MS (TOC): _____
 (5/200)(1000) = 25mg/L _____

Calibration Curve Date: _____ Reagent: RET 35944
RET 37673

SM5310-C : Matrix 2 WG _____
 EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K 4151 Rev. 18 *dm/11/13/17*
 Instrument: Shimadza TOC-VWP/ASI

- | | | |
|----------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------|
| <input checked="" type="checkbox"/> drain reservoir filled | <input checked="" type="checkbox"/> DAILY CHECK | <input checked="" type="checkbox"/> sufficient acid waste container |
| <input checked="" type="checkbox"/> ASI water bottle full | <input checked="" type="checkbox"/> 3 rd bottle full | |
| <input checked="" type="checkbox"/> dilution water bottle full | <input checked="" type="checkbox"/> sufficient gas | |
| | <input checked="" type="checkbox"/> sufficient persulfate | |

Position	Sample ID	Dilution	Position	Sample ID	Dilution	Position	Sample ID	Dilution
1	TC Curve		26	TC Curve		51		
2	TC ICV		27	Std 79318		52	See SOP	
3	TIC Curve		28			53	for point	
4	TIC ICV		29	TIC Curve		54	preparation	
5			30	Std 80415		55		
6			31			56		
7			32			57		
8			33	TOC (TC)		58		
9			34	ICV		59		
10			35	Std 77870		60	5/200 (1000) = 25	
11			36			61		
12			37	TIC ICV		62		
13			38	Std 80416		63		
14			39			64		
15			40			65		
16			41			66		
17			42			67		
18			43			68		
19	all points		44	analyzed in duplicate		69		
20			45			70		
21			46			71		
22			47			72		
23			48			73		
24			49			74		
25			50			75		

Analyst: David Merckli Date/Time: 2/10/17

DCN#123915



C:\TOC3201\Data\CURVES-02-10-2017.t32

	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TC	TCCURVE		Complete	2/10/2017 10:29:51 A	0, 1, 2, 3, 4, 5
2	TC	TOC ICV	TC:23.90mg/L	Complete	2/10/2017 10:47:48 A	6
3	IC	TICCURVE		Complete	2/10/2017 3:55:41 PM	0, 1, 2, 3, 4, 5
4	IC	TIC CURVE	IC:24.27mg/L	Complete	2/10/2017 4:12:07 PM	6
5	TC		TC:0.000mg/L	Complete	2/10/2017 4:31:41 PM	7
6	IC	TOC/TIC	IC:8.571mg/L	Complete	2/10/2017 4:42:05 PM	7
7	TC	TOC/TIC	TC:32.10mg/L	Complete	2/10/2017 5:01:02 PM	7

2/13/2017 7:01:58 AM

1/1

2/12/2017 11:18:36 AM

CURVES-02-10-2017.i32

Instr. Information

System
DetectorTOCVW ASI
Wet Chemical

Cal. Curve

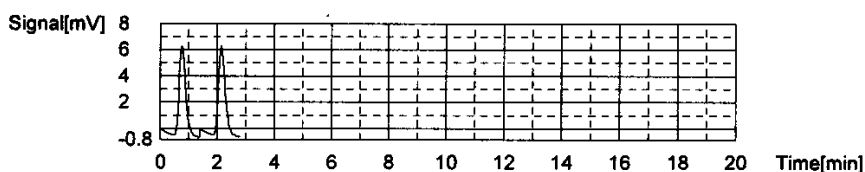
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

Type	Anal.
Standard	TC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.83	500uL	1	*****		2/10/2017 9:36:31 AM
2	10.82	500uL	1	*****		2/10/2017 9:40:05 AM

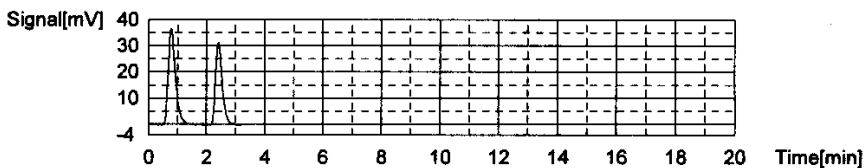
Acid Add. 0.000%
 Mean Area 10.82



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	64.31	500uL	1	*****		2/10/2017 9:45:28 AM
2	51.52	500uL	1	*****		2/10/2017 9:49:19 AM

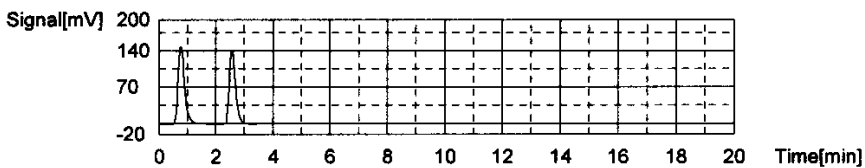
Acid Add. 0.000%
 Mean Area 57.92



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	238.4	500uL	1	*****		2/10/2017 9:55:04 AM
2	216.3	500uL	1	*****		2/10/2017 9:58:58 AM

Acid Add. 0.000%
 Mean Area 227.4

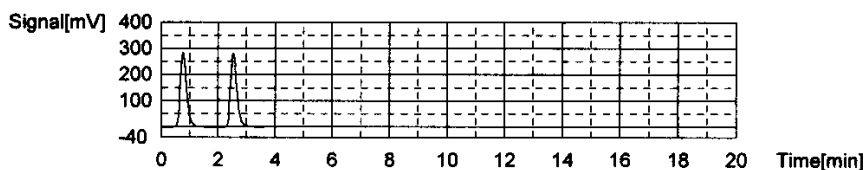


Conc: 10.00mg/L

1/6

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	442.5	500uL	1	*****		2/10/2017 10:04:41 AM
2	437.9	500uL	1	*****		2/10/2017 10:08:48 AM

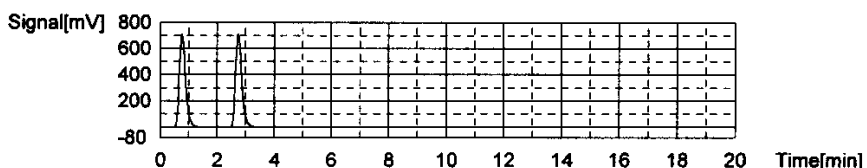
Acid Add. 0.000%
 Mean Area 440.2



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1091	500uL	1	*****		2/10/2017 10:14:47 AM
2	1092	500uL	1	*****		2/10/2017 10:19:05 AM

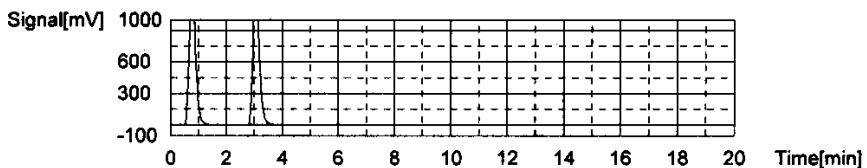
Acid Add. 0.000%
 Mean Area 1092



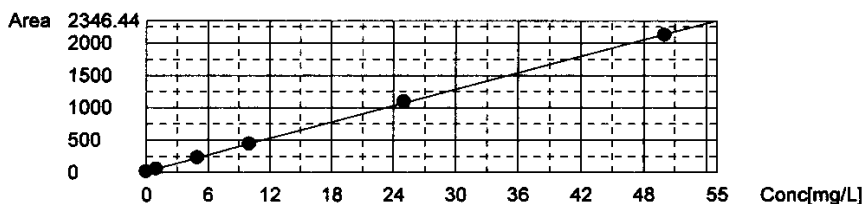
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	2132	500uL	1	*H*****		2/10/2017 10:25:19 AM
2	2118	500uL	1	*H*****		2/10/2017 10:29:51 AM

Acid Add. 0.000%
 Mean Area 2125



Slope: 42.33
 Intercept 16.87
 r^2 0.999887
 Zero Shift No



Sample

Sample Name: TOC ICV
 Sample ID: Untitled
 Origin: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:23.90mg/L

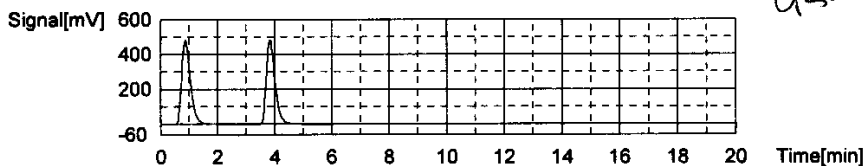
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1029	23.91mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 10:42:11 AM
2	1028	23.89mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 10:47:48 AM

95.6%

Mean Area 1029
Mean Conc. 23.90mg/L



Cal. Curve

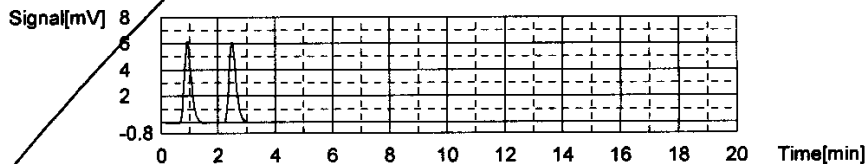
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

Type	Anal.
Standard	TC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.59	500uL	1	*****		2/10/2017 2:49:09 PM
2	10.43	500uL	1	*****		2/10/2017 2:53:06 PM

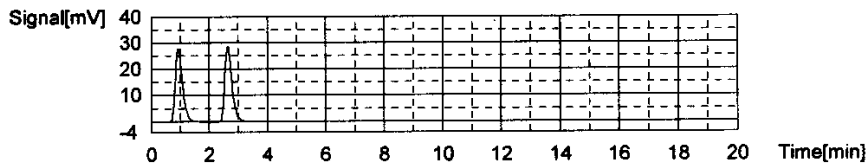
Acid Add. 3.000%
Mean Area 10.51



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	48.13	500uL	1	*****		2/10/2017 3:00:24 PM
2	49.13	500uL	1	*****		2/10/2017 3:04:41 PM

Acid Add. 3.000%
Mean Area 48.63

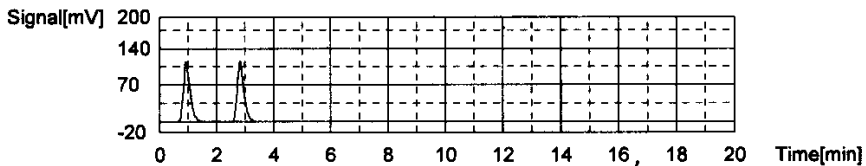


Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	189.0	500uL	1	*****		2/10/2017 3:12:24 PM
2	190.1	500uL	1	*****		2/10/2017 3:16:55 PM

dcn
3/23/17

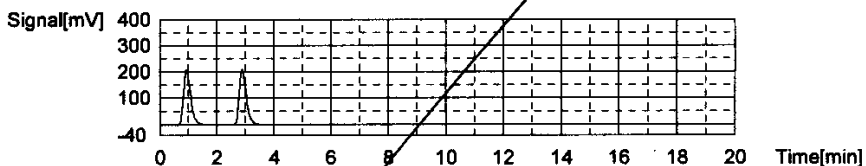
Acid Add. 3.000%
Mean Area 189.6



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	360.6	500uL	1	*****		2/10/2017 3:24:47 PM
2	362.2	500uL	1	*****		2/10/2017 3:29:24 PM

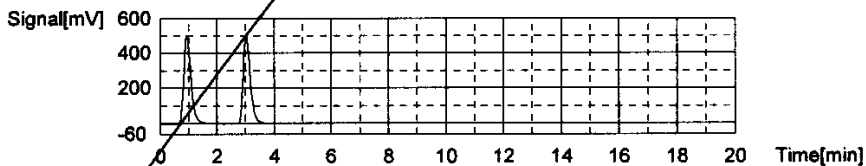
Acid Add. 3.000%
Mean Area 361.4



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	859.3	500uL	1	*****		2/10/2017 3:37:23 PM
2	856.9	500uL	1	*****		2/10/2017 3:42:16 PM

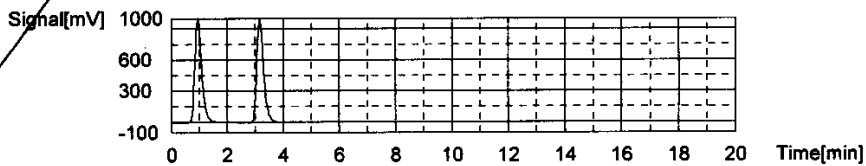
Acid Add. 3.000%
Mean Area 858.1



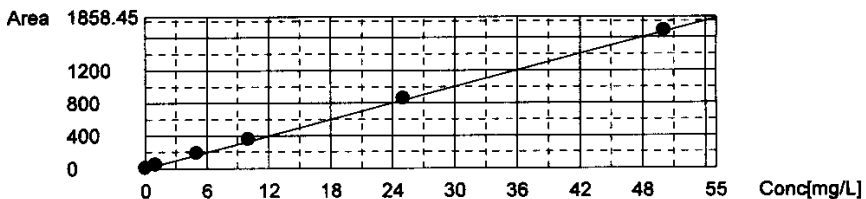
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1690	500uL	1	*****		2/10/2017 3:50:31 PM
2	1689	500uL	1	*****		2/10/2017 3:55:41 PM

Acid Add. 3.000%
Mean Area 1690



Slope: 33.49
 Intercept: 0.000
 r^2: 0.999919
 Zero Shift: Yes



Sample

dcn

See following pages for curve, slope, intercept
 and zero shift unchecked

TOC-V Cal Curve Information
TICCURVE-02-10-2017.2017_02_10_14_45_10.cal

Date of Creation 2:10:17 PM 2/10/2017
User
System TOCVW ASI

Cal. Curve

Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status Completed
Comment:

Type	Anal.
Standard	IC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.59	500uL	1	*****		2/10/2017 2:49:09 PM
2	10.43	500uL	1	*****		2/10/2017 2:53:06 PM

Acid Add. 3.000%
Mean Area 10.51
SD Area 0.1131
CV Area 1.08%
Vial 0

Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	48.13	500uL	1	*****		2/10/2017 3:00:24 PM
2	49.13	500uL	1	*****		2/10/2017 3:04:41 PM

Acid Add. 3.000%
Mean Area 48.63
SD Area 0.7071
CV Area 1.45%
Vial 1

Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	189.0	500uL	1	*****		2/10/2017 3:12:24 PM
2	190.1	500uL	1	*****		2/10/2017 3:16:55 PM

Acid Add. 3.000%
Mean Area 189.6
SD Area 0.7778
CV Area 0.41%
Vial 2

Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	360.6	500uL	1	*****		2/10/2017 3:24:47 PM
2	362.2	500uL	1	*****		2/10/2017 3:29:24 PM

Acid Add. 3.000%
 Mean Area 361.4
 SD Area 1.131
 CV Area 0.31%
 Vial 3

Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	859.3	500uL	1	*****		2/10/2017 3:37:23 PM
2	856.9	500uL	1	*****		2/10/2017 3:42:16 PM

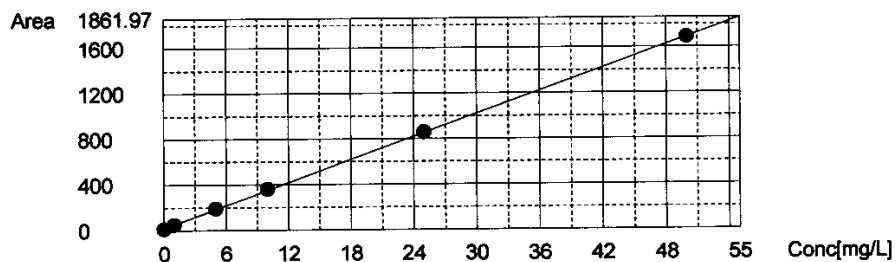
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1690	500uL	1	*****		2/10/2017 3:50:31 PM
2	1689	500uL	1	*****		2/10/2017 3:55:41 PM

Acid Add. 3.000%
 Mean Area 1690
 SD Area 0.7071
 CV Area 0.04%
 Vial 5

Slope: 33.49
 Intercept 18.41
 r^2 0.999919
 Zero Shift No



Sample Name: TIC CURVE
 Sample ID: Untitled
 Origin: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed
 Chk. Result:

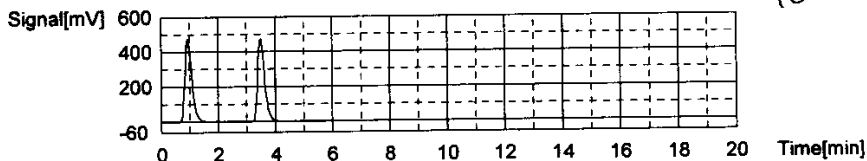
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

1. Det

Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	810.5	24.20mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 4:08:15 PM
2	814.6	24.33mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 4:12:07 PM

Mean Area 812.5
 Mean Conc. 24.27mg/L



Sample

Sample Name: Untitled
 Sample ID: TCCURVE-02-10-2017.2017_02_10_14_14_25.cal
 Origin: Completed
 Status: Completed
 Chk. Result:

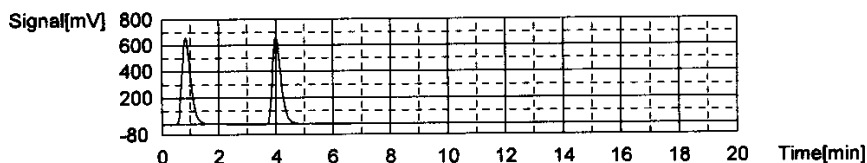
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1406	0.000mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_14_14	2/10/2017 4:25:42 PM
2	1411	0.000mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_14_14	2/10/2017 4:31:41 PM

Mean Area 1409
 Mean Conc. 0.000mg/L



Sample

Sample Name: TOC/TIC
 Sample ID: Untitled
 Origin: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed
 Chk. Result:

2/12/2017 11:18:36 AM

CURVES-02-10-2017.i32

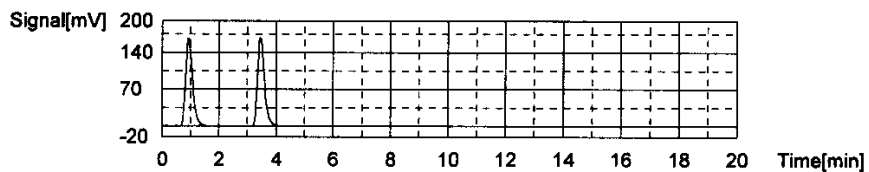
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

1. Det

Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	286.8	8.565mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	12/10/2017 4:37:09 PM
2	287.2	8.577mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	12/10/2017 4:42:05 PM

Mean Area 287.0
Mean Conc. 8.571mg/L



Sample

Sample Name: TOC/TIC
Sample ID: Untitled
Origin: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
Status: Completed
Chk. Result

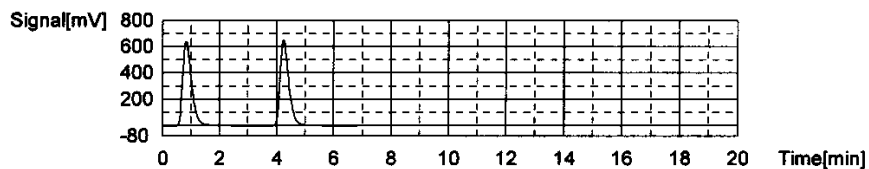
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1378	32.16mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	12/10/2017 4:55:07 PM
2	1373	32.04mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	12/10/2017 5:01:02 PM

Mean Area 1376
Mean Conc. 32.10mg/L



WORKGROUP: WG616847

Total Organic Carbon

MAKE DAILY

CCV (TOC): 79381
(5/200)(1000) = 25mg/L

LCS (TOC): Std 80787
(5/200)(1000) = 25mg/L

CCV (TIC): 80416
(5/200)(1000) = 25mg/L

MS (TOC): Std 80787 80787

Calibration Curve Date: 2-10-17

Reagent: 0.4(1000)/40-400/p
402-70
39260

SM5310-C: Matrix 2 WG 6016847

EPA 415.1/9060A(mod): Matrix 1 WG _____

SW846 9060A (4 rep) WG _____

SOP: K 1491 Rev. 19

Instrument: Shimadza TOC-VWP/ASI

- drain reservoir filled
- ASI water bottle full
- dilution water bottle full

- DAILY CHECK
- 3rd bottle full
 - sufficient gas
 - sufficient persulfate

- sufficient acid waste container

CT1

Position	Sample ID	Dilution
1	TIC	
2	TIC/TIC	
3	CCV	
4	BTK	
5	LCS	
6	LCS	
7	105-01	1/5
8	119-11	
9	13	
10	15	
11	128-01	1/25
12	02	
13	04	
14	CCV	
15	CCB	
16	232-01	
17	03	
18	05	
19	07	
20	09	
21	11	
22	247-01	1/1000
23	MS 269-01	
24	MS 03	
25	MS 05	

Position	Sample ID	Dilution
26	CCV	
27	CCB	
28	289-07	
29	09	
30	292-01	
31	292-01 Dup	
32	0232-01	1/3
33	09	1/3
34	6/11/17 BTK 289-01	1/5
35	MS LCS	03 MS
36	MS LCS	05 MS
37	CCV	
38	CCB	
39	6/11/17 FCB MS	
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		

Position	Sample ID	Dilution
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		

Analyst: And Greene

Date/Time: 6/11/17 @ 0730

DCN#126290



	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:1.632mg/L TC:28.28mg/L IC:26.63mg/L	Complete	6/7/2017 7:41:04 AM	1
2	TOC	TOC/TIC	TOC:26.75mg/L TC:35.66mg/L IC:8.908mg/L	Complete	6/7/2017 7:54:01 AM	2
3	TOC	CCV	!!Error!! TOC:23.17mg/L TC:22.84mg/L IC:-0.3374mg/L	Complete	6/7/2017 8:06:11 AM	3
4	TOC	WG616847-01 BLK	!!Error!! TOC:0.1335mg/L TC:-0.1483mg/L IC:-0.2818mg/L	Complete	6/7/2017 8:22:38 AM	0
5	TOC	WG616847-02 LCS	!!Error!! TOC:26.20mg/L TC:25.84mg/L IC:-0.3579mg/L	Complete	6/7/2017 8:43:31 AM	5
6	TOC	WG616847-03 LCSD	!!Error!! TOC:26.05mg/L TC:25.71mg/L IC:-0.3370mg/L	Complete	6/7/2017 9:04:17 AM	6
7	TOC	L17060105-01 (5)	TOC:11.52mg/L TC:16.32mg/L IC:4.794mg/L	Complete	6/7/2017 9:35:56 AM	7
8	TOC	L17060119-11	TOC:6.204mg/L TC:40.82mg/L IC:34.61mg/L	Complete	6/7/2017 9:58:31 AM	8
9	TOC	L17060119-13	!!Error!! TOC:0.4444mg/L TC:0.3301mg/L IC:-0.1144mg/L	Complete	6/7/2017 10:17:55 AM	9
10	TOC	L17060119-15	TOC:1.334mg/L TC:5.970mg/L IC:4.636mg/L	Complete	6/7/2017 10:38:27 AM	10
11	TOC	L17060128-01 (25)	TOC:23.87mg/L TC:24.65mg/L IC:0.7774mg/L	Complete	6/7/2017 11:20:52 AM	11
12	TOC	L17060128-02	TOC:3.877mg/L TC:15.81mg/L IC:11.94mg/L	Complete	6/7/2017 11:42:41 AM	12
13	TOC	L17060128-04	TOC:3.503mg/L TC:11.84mg/L IC:8.336mg/L	Complete	6/7/2017 12:03:48 PM	13
14	TOC	CCV	!!Error!! TOC:23.94mg/L TC:23.68mg/L IC:-0.2615mg/L	Complete	6/7/2017 12:15:54 PM	14
15	TOC	CCB	!!Error!! TOC:0.1378mg/L TC:-0.1516mg/L IC:-0.2894mg/L	Complete	6/7/2017 12:25:03 PM	0
16	TOC	<Untitled>	!!Error!! TOC:3.476mg/L TC:58.82mg/L IC:62.30mg/L	Complete	6/7/2017 12:50:26 PM	16
17	TOC	L17060232-03	TOC:3.710mg/L TC:36.86mg/L IC:33.15mg/L	Complete	6/7/2017 1:14:38 PM	17
18	TOC	L17060232-05	TOC:2.986mg/L TC:31.86mg/L IC:28.88mg/L	Complete	6/7/2017 1:38:19 PM	18
19	TOC	L17060232-07	TOC:3.084mg/L TC:36.46mg/L IC:33.37mg/L	Complete	6/7/2017 2:02:23 PM	19
20	TOC	<Untitled>	!!Error!! TOC:-10.61mg/L TC:64.08mg/L IC:74.69mg/L	Complete	6/7/2017 2:28:59 PM	20
21	TOC	L17060232-11	!!Error!! TOC:0.4659mg/L TC:0.4262mg/L IC:-0.03970mg/L	Complete	6/7/2017 2:48:31 PM	21
22	TOC	L17060247-01 (10000)	TOC:10.19mg/L TC:10.25mg/L IC:0.05795mg/L	Complete	6/7/2017 3:08:51 PM	22
23	TOC	L17060289-01	TOC:4.284mg/L TC:46.68mg/L IC:42.39mg/L	Complete	6/7/2017 3:32:50 PM	23
24	TOC	L17060289-03	TOC:23.83mg/L TC:40.14mg/L IC:16.32mg/L	Complete	6/7/2017 3:56:06 PM	24
25	TOC	L17060289-05	TOC:23.34mg/L TC:38.18mg/L IC:14.84mg/L	Complete	6/7/2017 4:18:31 PM	25
26	TOC	CCV	!!Error!! TOC:23.59mg/L TC:23.39mg/L IC:-0.1966mg/L	Complete	6/7/2017 4:30:45 PM	26
27	TOC	CCB	!!Error!! TOC:0.1238mg/L TC:-0.1575mg/L IC:-0.2812mg/L	Complete	6/7/2017 4:47:01 PM	0
28	TOC	L17060289-07	TOC:2.860mg/L TC:32.73mg/L IC:29.87mg/L	Complete	6/7/2017 5:09:38 PM	28
29	TOC	L17060289-09	TOC:2.579mg/L TC:27.66mg/L IC:25.08mg/L	Complete	6/7/2017 5:32:17 PM	29
30	TOC	L17060292-01	!!Error!! TOC:0.3358mg/L TC:0.1108mg/L IC:-0.2250mg/L	Complete	6/7/2017 5:51:27 PM	30
31	TOC	WG616847-05 DUP	!!Error!! TOC:0.2956mg/L TC:0.01417mg/L IC:-0.2814mg/L	Complete	6/7/2017 6:10:35 PM	31
32	TOC	L17060232-01 (3)	TOC:1.052mg/L TC:21.95mg/L IC:20.90mg/L	Complete	6/7/2017 6:32:39 PM	32
33	TOC	L17060232-09 (3)	TOC:2.264mg/L TC:32.32mg/L IC:30.06mg/L	Complete	6/7/2017 6:55:46 PM	33
34	TOC	<Untitled>	!!Error!! TOC:-0.2097mg/L TC:52.73mg/L IC:52.94mg/L	Complete	6/7/2017 7:21:03 PM	34
35	TOC	<Untitled>	TOC:25.59mg/L TC:47.88mg/L IC:22.29mg/L	Complete	6/7/2017 7:43:48 PM	35
36	TOC	<Untitled>	TOC:25.98mg/L TC:44.07mg/L IC:18.08mg/L	Complete	6/7/2017 8:06:28 PM	36
37	TOC	CCV	!!Error!! TOC:26.55mg/L TC:26.35mg/L IC:-0.2068mg/L	Complete	6/7/2017 8:18:47 PM	37
38	TOC	CCB	!!Error!! TOC:0.1214mg/L TC:-0.1480mg/L IC:-0.2694mg/L	Complete	6/7/2017 8:27:46 PM	0

Instr. Information

System
Detector

TOCVW ASI
Wet Chemical

Sample

Sample Name: TIC
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

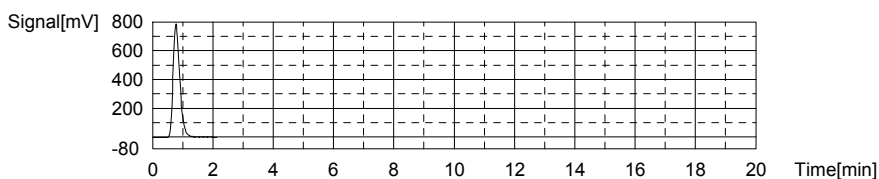
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.632mg/L TC:28.26mg/L IC:26.63mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1213	28.26mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_56	7/2017 7:35:59 AM

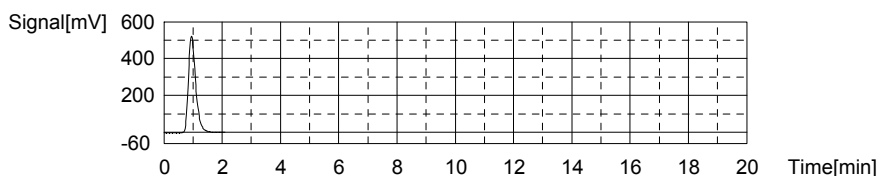
Mean Area 1213
Mean Conc. 28.26mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	910.1	26.63mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	7/2017 7:41:04 AM

Mean Area 910.1
Mean Conc. 26.63mg/L



Sample

Sample Name: TOC/TIC
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.75mg/L TC:35.66mg/L IC:8.908mg/L

1. Det

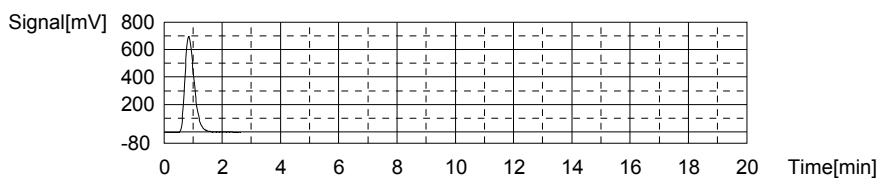
Anal.: TC

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1526	35.66mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	7/2017 7:49:07 AM

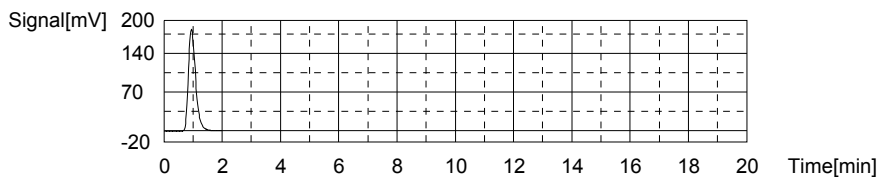
Mean Area 1526
Mean Conc. 35.66mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	316.7	8.908mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	7/2017 7:54:01 AM

Mean Area 316.7
Mean Conc. 8.908mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

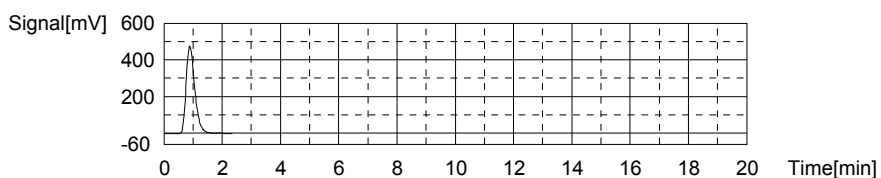
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.17mg/L TC:22.84mg/L IC:-0.3374mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	983.4	22.84mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	7/2017 8:01:48 AM

Mean Area 983.4
Mean Conc. 22.84mg/L



Anal.: IC

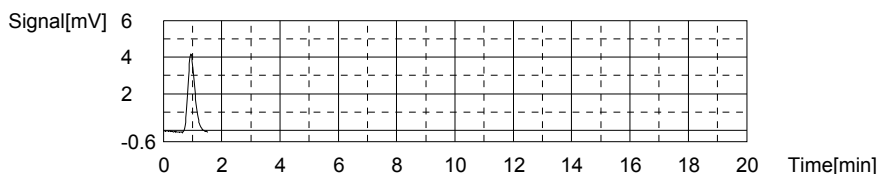
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.115	-0.3374mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	7/2017 8:06:11 AM

2/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

Mean Area 7.115
Mean Conc. -0.3374mg/L



Sample

Sample Name: WG616847-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

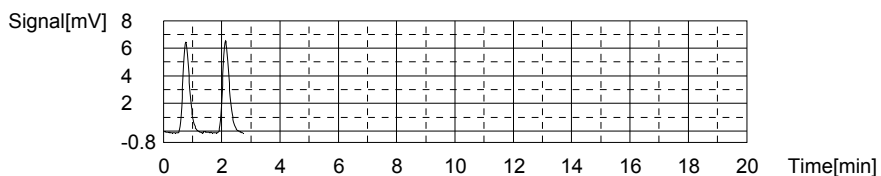
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1335mg/L TC:-0.1483mg/L IC:-0.2818mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.53	-0.1497mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	7/2017 8:11:11 AM
2	10.65	-0.1468mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	7/2017 8:14:42 AM

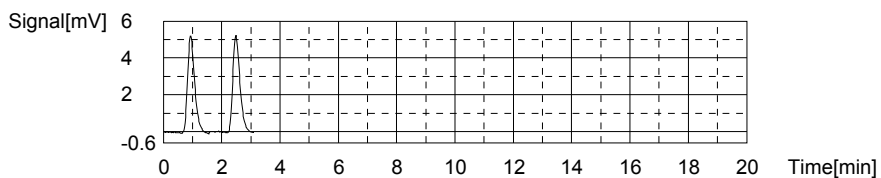
Mean Area 10.59
Mean Conc. -0.1483mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.010	-0.2809mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	7/2017 8:18:41 AM
2	8.948	-0.2827mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	7/2017 8:22:38 AM

Mean Area 8.979
Mean Conc. -0.2818mg/L



Sample

Sample Name: WG616847-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

3/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

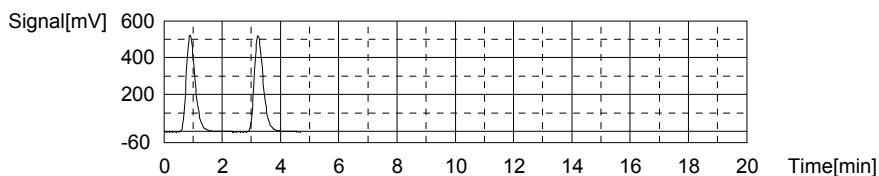
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.20mg/L TC:25.84mg/L IC:-0.3579mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1110	25.83mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 8:30:25 AM	
2	1111	25.85mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 8:35:02 AM	

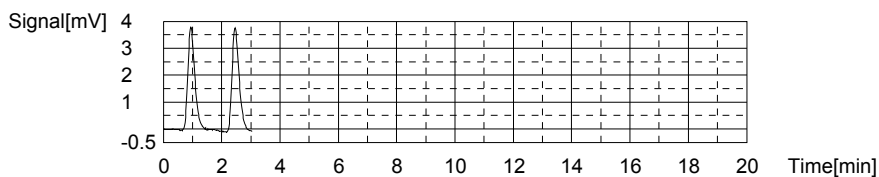
Mean Area 1111
Mean Conc. 25.84mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.366	-0.3598mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 8:39:24 AM	
2	6.494	-0.3560mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 8:43:31 AM	

Mean Area 6.430
Mean Conc. -0.3579mg/L



Sample

Sample Name: WG616847-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

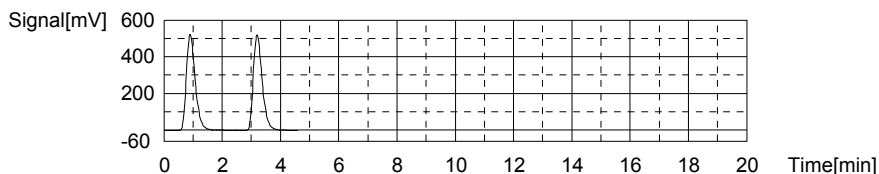
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.05mg/L TC:25.71mg/L IC:-0.3370mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1107	25.76mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 8:51:15 AM	
2	1103	25.66mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 8:55:48 AM	

Mean Area 1105
Mean Conc. 25.71mg/L



Anal.: IC

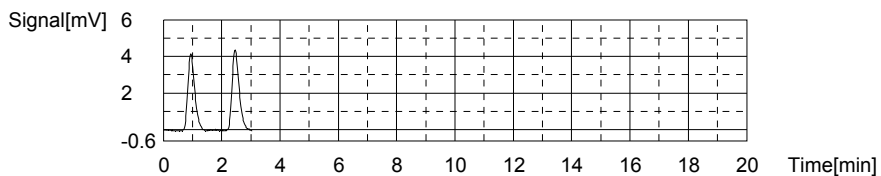
4/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.938	-0.3427mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 9:00:08 AM
2	7.321	-0.3313mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 9:04:17 AM

Mean Area 7.130
Mean Conc. -0.3370mg/L



Sample

Sample Name: L17060105-01 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

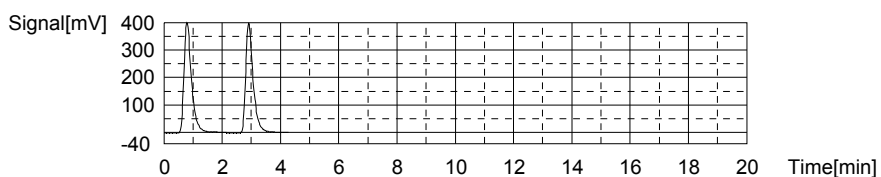
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.52mg/L TC:16.32mg/L IC:4.794mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	710.2	16.38mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 9:22:21 AM
2	704.9	16.26mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 9:26:47 AM

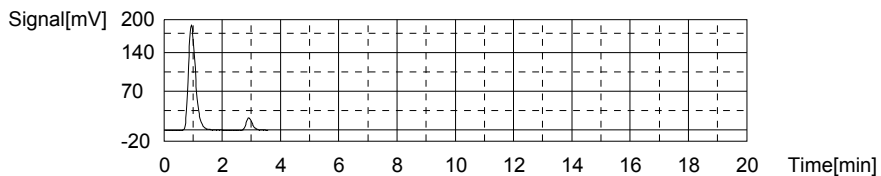
Mean Area 707.5
Mean Conc. 16.32mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	324.7	9.147mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 9:31:42 AM
2	33.22	0.4421mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 9:35:56 AM

Mean Area 179.0
Mean Conc. 4.794mg/L



Sample

5/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

Sample Name: L17060119-11
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

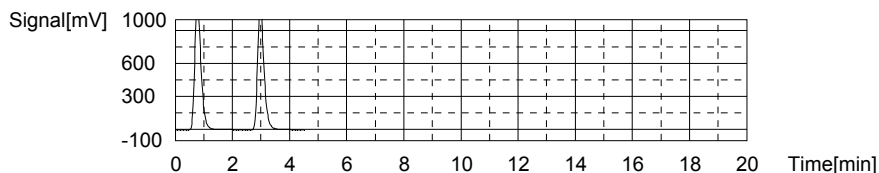
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:6.204mg/L TC:40.82mg/L IC:34.61mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1751	40.97mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 9:43:35 AM	
2	1738	40.66mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 9:48:15 AM	

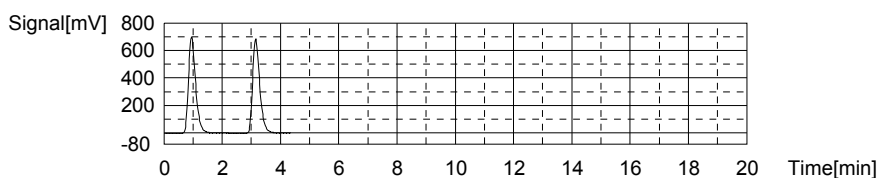
Mean Area 1745
 Mean Conc. 40.82mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1188	34.93mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 9:53:29 AM	
2	1167	34.30mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 9:58:31 AM	

Mean Area 1178
 Mean Conc. 34.61mg/L



Sample

Sample Name: L17060119-13
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.4444mg/L TC:0.3301mg/L IC:-0.1144mg/L

1. Det

Anal.: TC

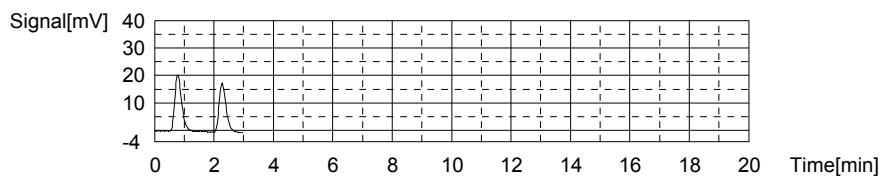
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	32.83	0.3772mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 10:05:27 AM	
2	28.84	0.2829mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 10:09:12 AM	

6/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

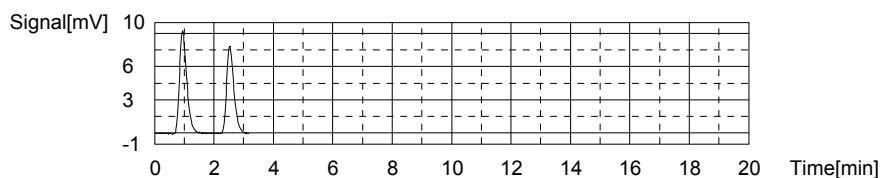
Mean Area 30.84
Mean Conc. 0.3301mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	15.73	-0.08017mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 10:13:45 AM
2	13.44	-0.1486mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 10:17:55 AM

Mean Area 14.59
Mean Conc. -0.1144mg/L



Sample

Sample Name: L17060119-15
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

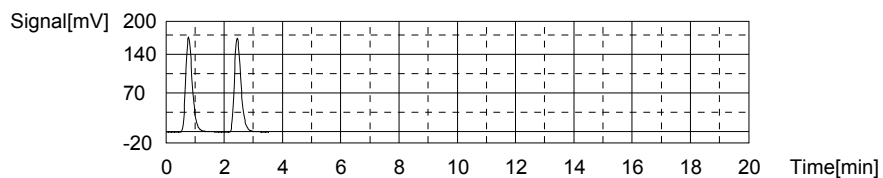
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.334mg/L TC:5.970mg/L IC:4.636mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	269.1	5.959mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	56/7/2017 10:25:01 AM
2	270.0	5.981mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	56/7/2017 10:29:13 AM

Mean Area 269.6
Mean Conc. 5.970mg/L

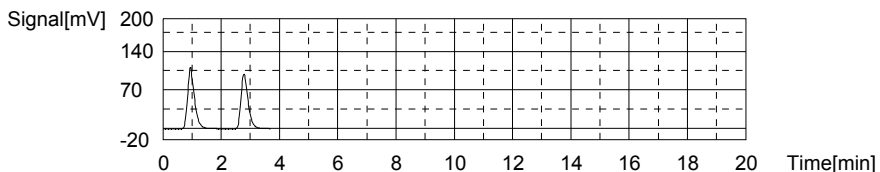


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	178.3	4.775mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 10:33:56 AM
2	169.0	4.497mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 10:38:27 AM

7/27

Mean Area 173.7
Mean Conc. 4.636mg/L



Sample

Sample Name: L17060128-01 (25)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

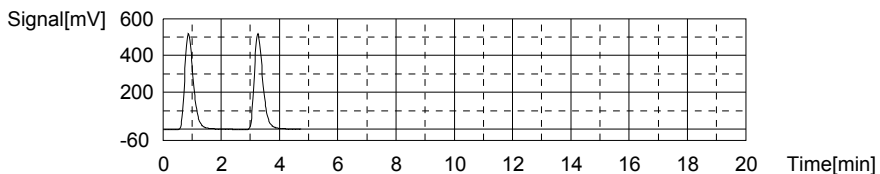
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:23.87mg/L TC:24.65mg/L IC:0.7774mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1061	24.67mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/7/2017 11:07:19 AM
2	1059	24.62mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/7/2017 11:11:56 AM

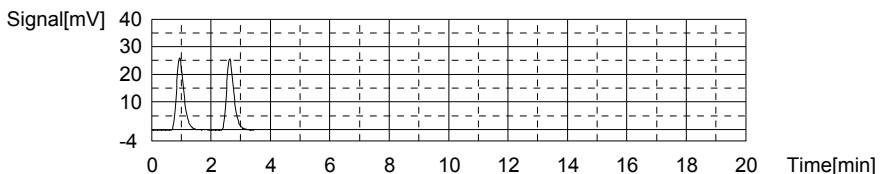
Mean Area 1060
Mean Conc. 24.65mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	44.63	0.7829mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/7/2017 11:16:29 AM
2	44.26	0.7718mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/7/2017 11:20:52 AM

Mean Area 44.45
Mean Conc. 0.7774mg/L



Sample

Sample Name: L17060128-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

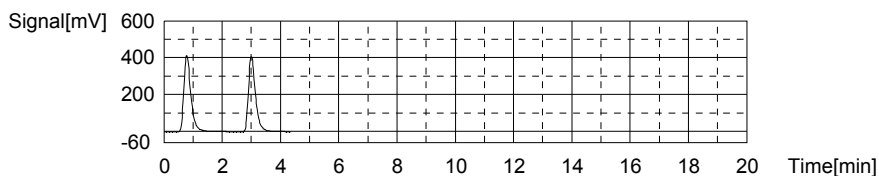
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.877mg/L TC:15.81mg/L IC:11.94mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	688.8	15.88mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 11:28:32 AM	
2	683.6	15.75mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 11:32:56 AM	

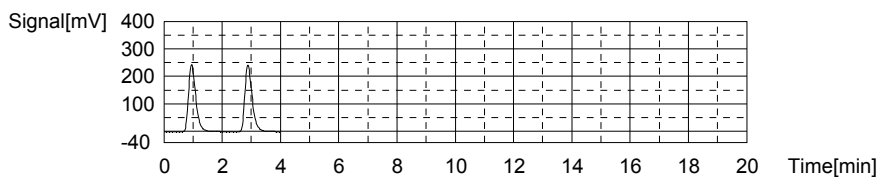
Mean Area 686.2
Mean Conc. 15.81mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	418.1	11.94mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 11:37:51 AM	
2	418.2	11.94mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 11:42:41 AM	

Mean Area 418.2
Mean Conc. 11.94mg/L



Sample

Sample Name: L17060128-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

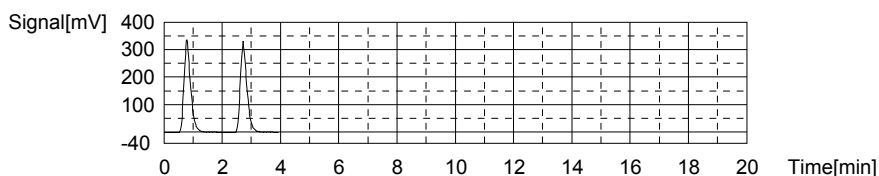
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.503mg/L TC:11.84mg/L IC:8.336mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	519.7	11.88mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 11:50:04 AM	
2	516.2	11.80mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 11:54:19 AM	

Mean Area 518.0
Mean Conc. 11.84mg/L



Anal.: IC

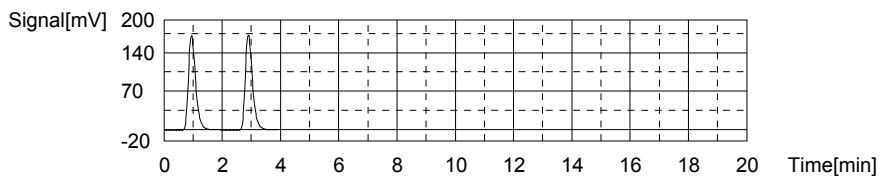
9/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	295.6	8.278mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 11:59:10 AM
2	299.5	8.394mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 12:03:48 PM

Mean Area 297.6
Mean Conc. 8.336mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

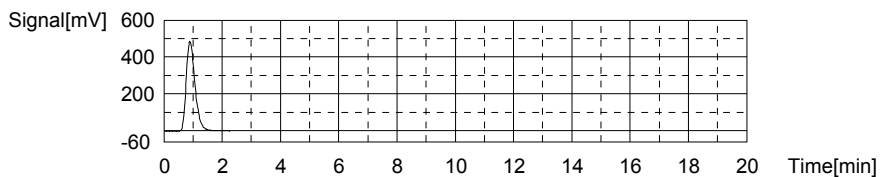
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.94mg/L TC:23.68mg/L IC:-0.2615mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1019	23.68mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 12:11:31 PM

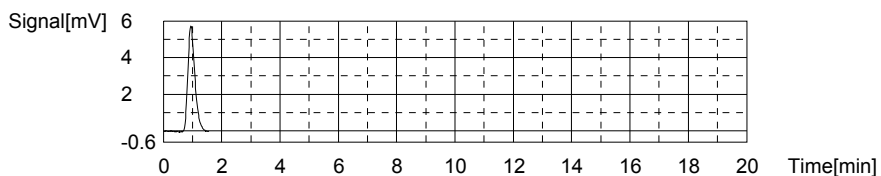
Mean Area 1019
Mean Conc. 23.68mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.657	-0.2615mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 12:15:54 PM

Mean Area 9.657
Mean Conc. -0.2615mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

10/27

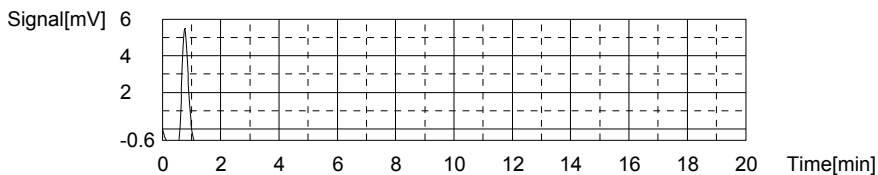
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1378mg/L TC:-0.1516mg/L IC:-0.2894mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.45	-0.1516mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 12:21:05 PM	

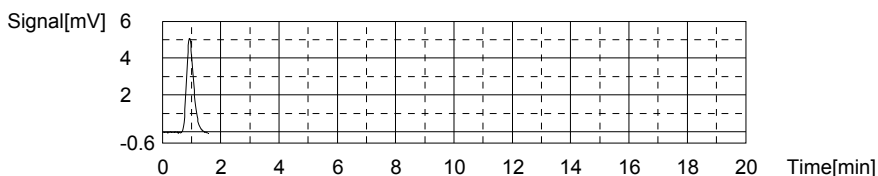
Mean Area 10.45
Mean Conc. -0.1516mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.724	-0.2894mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16/7/2017 12:25:03 PM	

Mean Area 8.724
Mean Conc. -0.2894mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

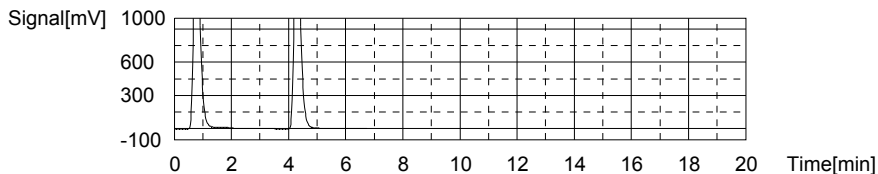
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-3.476mg/L TC:58.82mg/L IC:62.30mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2527	59.31mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 12:34:01 PM	
2	2486	58.34mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 12:39:39 PM	

Mean Area 2507
Mean Conc. 58.82mg/L



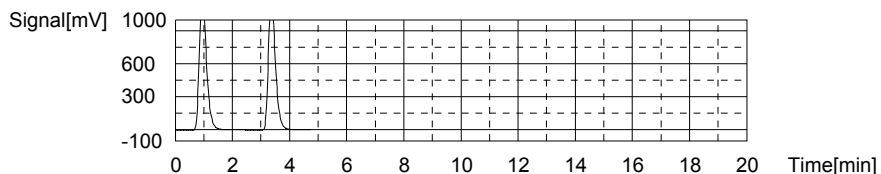
Anal.: IC

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2169	64.22mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 12:45:13 PM
2	2040	60.37mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 12:50:26 PM

Mean Area 2105
Mean Conc. 62.30mg/L



Sample

Sample Name: L17060232-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

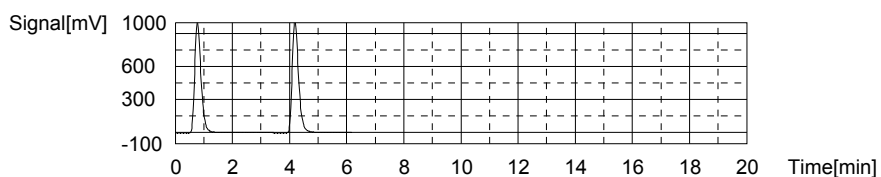
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.710mg/L TC:36.86mg/L IC:33.15mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1565	36.58mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 12:59:17 PM
2	1589	37.14mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 1:04:22 PM

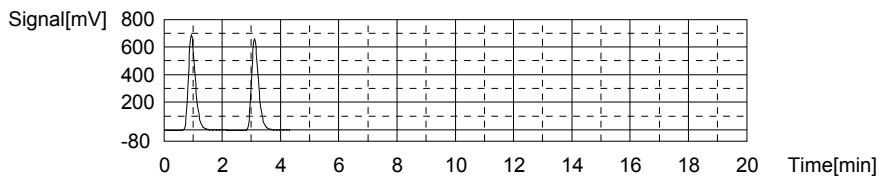
Mean Area 1577
Mean Conc. 36.86mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1148	33.73mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 1:09:38 PM
2	1109	32.57mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 1:14:38 PM

Mean Area 1129
Mean Conc. 33.15mg/L



Sample

12/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

Sample Name: L17060232-05
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

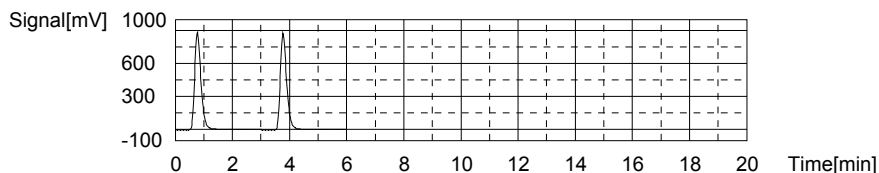
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.986mg/L TC:31.86mg/L IC:28.88mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1375	32.09mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017	1:23:05 PM
2	1356	31.64mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017	1:28:21 PM

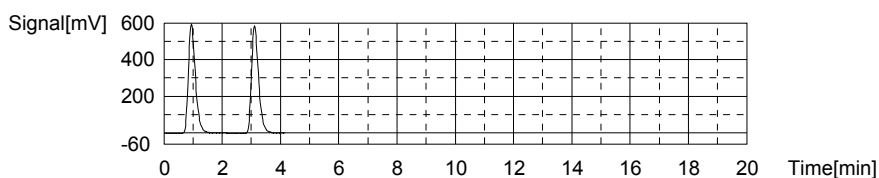
Mean Area 1366
 Mean Conc. 31.86mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	991.5	29.06mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017	1:33:32 PM
2	979.3	28.70mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017	1:38:19 PM

Mean Area 985.4
 Mean Conc. 28.88mg/L



Sample

Sample Name: L17060232-07
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.084mg/L TC:36.46mg/L IC:33.37mg/L

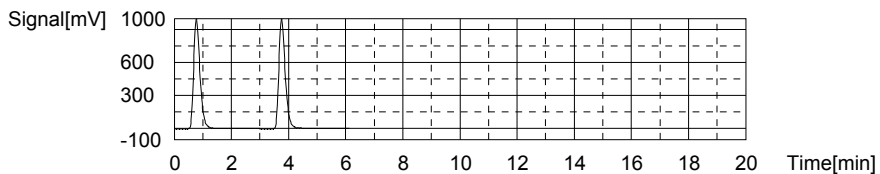
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1551	36.25mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017	1:46:44 PM
2	1569	36.67mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017	1:52:16 PM

13/27

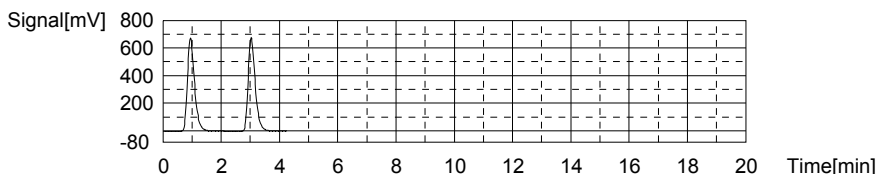
Mean Area 1560
Mean Conc. 36.46mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1134	33.32mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 1:57:24 PM
2	1138	33.43mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 2:02:23 PM

Mean Area 1136
Mean Conc. 33.37mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

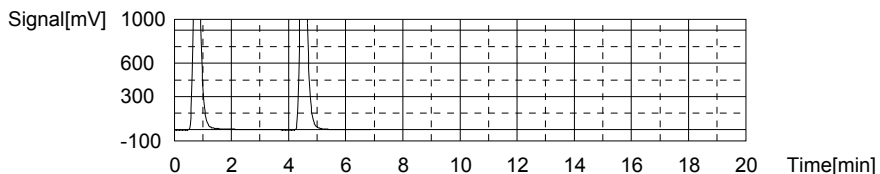
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-10.61mg/L TC:64.08mg/L IC:74.69mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2732	64.15mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/6/7/2017 2:11:34 PM
2	2726	64.01mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/6/7/2017 2:17:45 PM

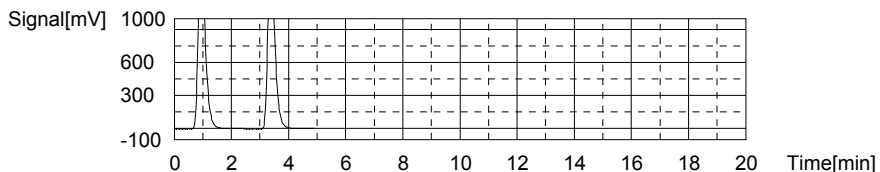
Mean Area 2729
Mean Conc. 64.08mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2542	75.36mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 2:23:27 PM
2	2497	74.02mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 2:28:59 PM

Mean Area 2520
Mean Conc. 74.69mg/L



Sample

Sample Name: L17060232-11
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

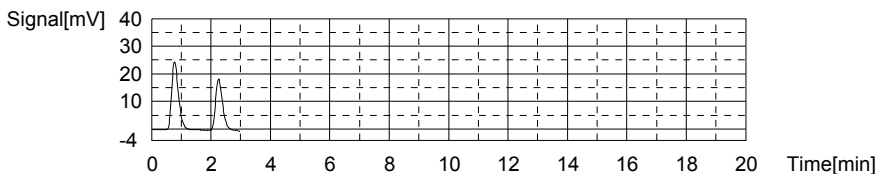
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.4659mg/L TC:0.4262mg/L IC:-0.03970mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	39.34	0.5310mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 2:35:54 PM
2	30.47	0.3214mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 2:39:39 PM

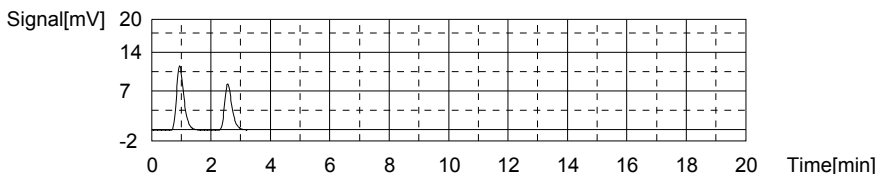
Mean Area 34.91
Mean Conc. 0.4262mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	19.83	0.04227mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/7/2017 2:44:16 PM
2	14.34	-0.1217mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/7/2017 2:48:31 PM

Mean Area 17.09
Mean Conc. -0.03970mg/L



Sample

Sample Name: L17060247-01 (10000)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

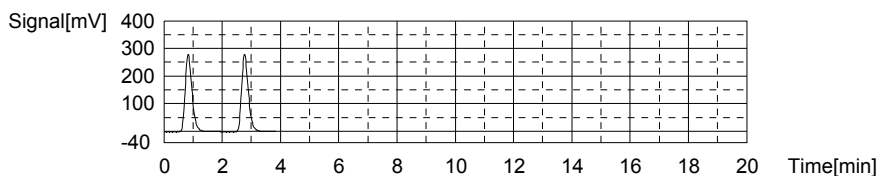
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:10.19mg/L TC:10.25mg/L IC:0.05795mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	450.0	10.23mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 2:55:53 PM	
2	451.3	10.26mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 3:00:03 PM	

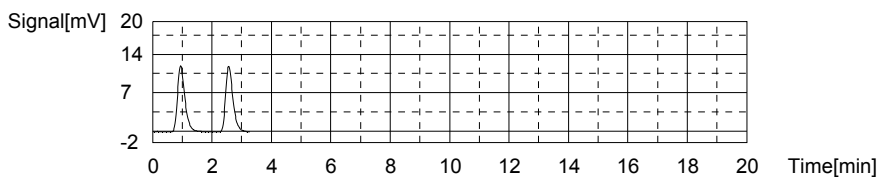
Mean Area 450.6
Mean Conc. 10.25mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	20.31	0.05661mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 3:04:32 PM	
2	20.40	0.05929mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 3:08:51 PM	

Mean Area 20.36
Mean Conc. 0.05795mg/L



Sample

Sample Name: L17060289-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

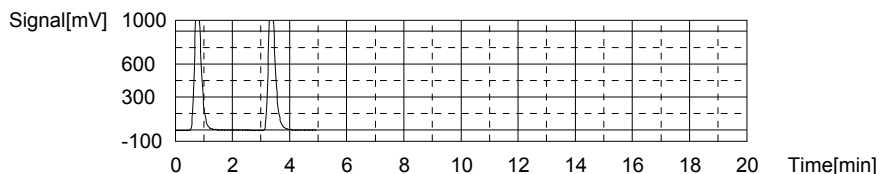
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.284mg/L TC:46.68mg/L IC:42.39mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1967	46.07mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 3:16:51 PM	
2	2018	47.28mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 3:22:25 PM	

Mean Area 1993
Mean Conc. 46.68mg/L



Anal.: IC

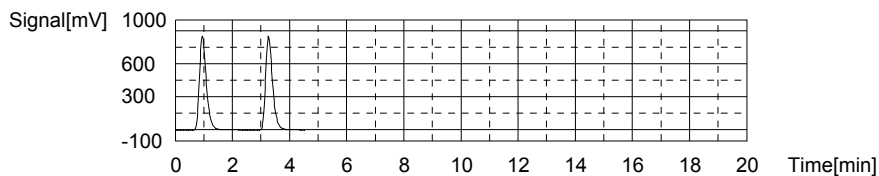
16/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1442	42.51mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 3:27:46 PM
2	1434	42.27mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 3:32:50 PM

Mean Area 1438
Mean Conc. 42.39mg/L



Sample

Sample Name: L17060289-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

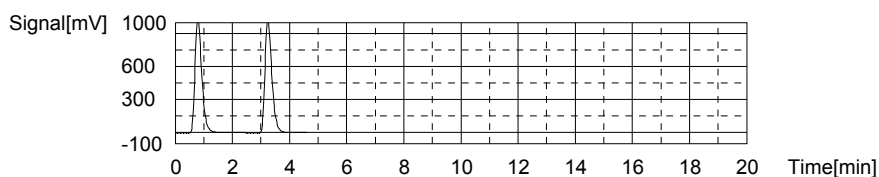
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:23.83mg/L TC:40.14mg/L IC:16.32mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1725	40.36mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 3:40:44 PM
2	1707	39.93mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 3:46:00 PM

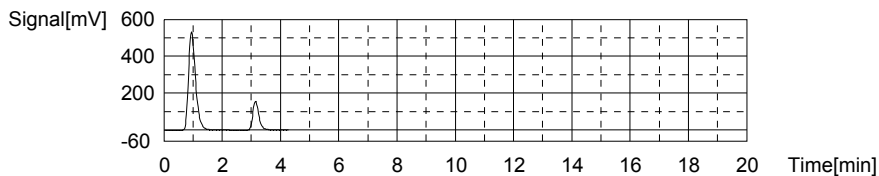
Mean Area 1716
Mean Conc. 40.14mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	899.6	26.32mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 3:51:21 PM
2	230.0	6.319mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 3:56:06 PM

Mean Area 564.8
Mean Conc. 16.32mg/L



Sample

17/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

Sample Name: L17060289-05
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

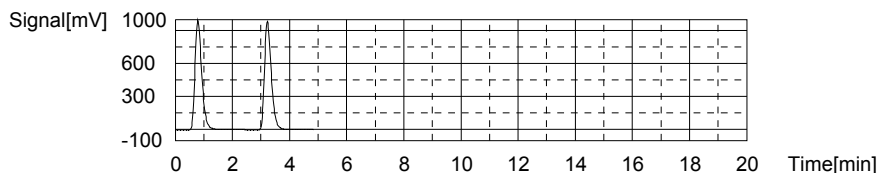
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:23.34mg/L TC:38.18mg/L IC:14.84mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1645	38.47mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017	4:03:59 PM
2	1621	37.90mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017	4:08:47 PM

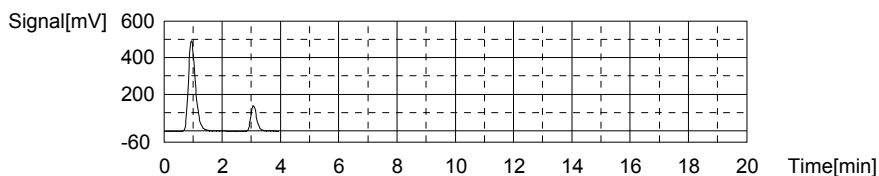
Mean Area 1633
 Mean Conc. 38.18mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	834.6	24.37mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017	4:14:00 PM
2	196.4	5.315mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017	4:18:31 PM

Mean Area 515.5
 Mean Conc. 14.84mg/L



Sample

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.59mg/L TC:23.39mg/L IC:-0.1966mg/L

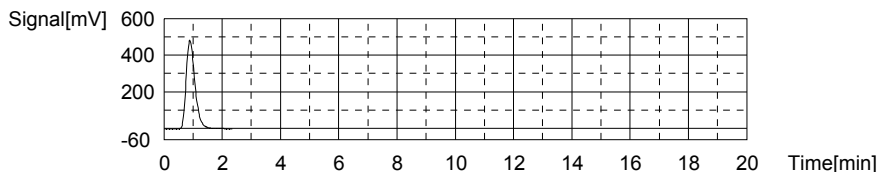
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1007	23.39mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017	4:26:18 PM

18/27

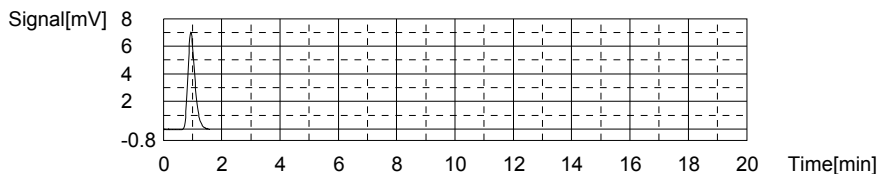
Mean Area 1007
Mean Conc. 23.39mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.83	-0.1966mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	7/2017 4:30:45 PM

Mean Area 11.83
Mean Conc. -0.1966mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

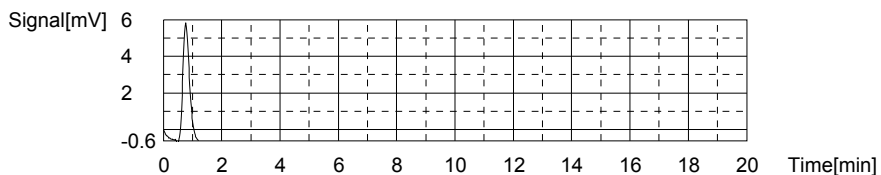
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1238mg/L TC:-0.1575mg/L IC:-0.2812mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.20	-0.1575mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	7/2017 4:43:03 PM

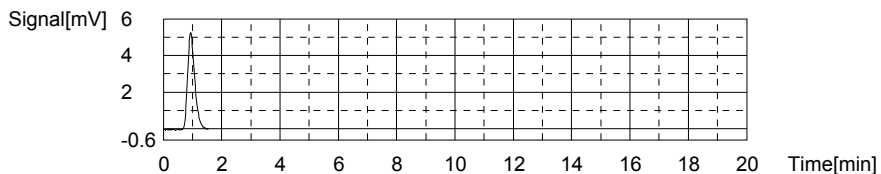
Mean Area 10.20
Mean Conc. -0.1575mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.997	-0.2812mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	7/2017 4:47:01 PM

Mean Area 8.997
Mean Conc. -0.2812mg/L



Sample

Sample Name: L17060289-07
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

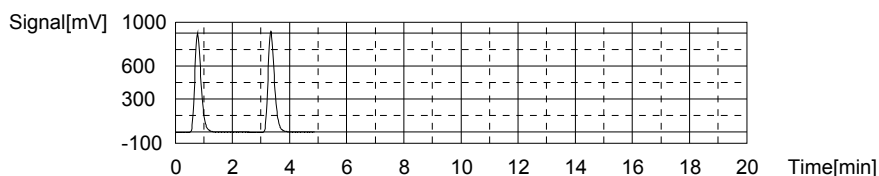
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.860mg/L TC:32.73mg/L IC:29.87mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1385	32.32mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 4:54:49 PM	
2	1419	33.13mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 4:59:23 PM	

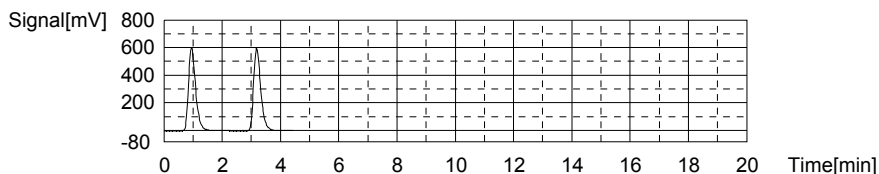
Mean Area 1402
 Mean Conc. 32.73mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1018	29.85mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16/7/2017 5:04:41 PM	
2	1019	29.88mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16/7/2017 5:09:38 PM	

Mean Area 1019
 Mean Conc. 29.87mg/L



Sample

Sample Name: L17060289-09
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.579mg/L TC:27.66mg/L IC:25.08mg/L

1. Det

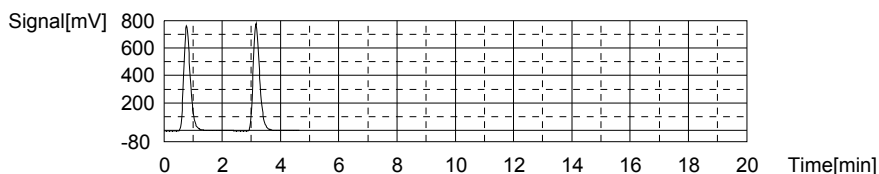
Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1176	27.39mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 5:17:29 PM	
2	1199	27.93mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 5:22:12 PM	

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

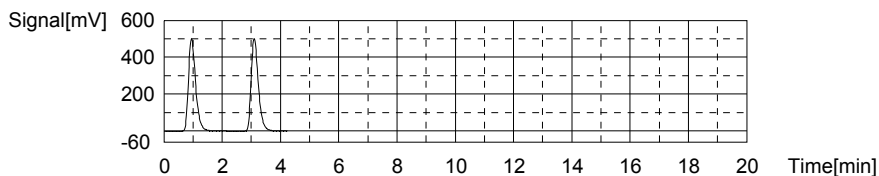
Mean Area 1188
Mean Conc. 27.66mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	857.1	25.05mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 5:27:23 PM
2	859.3	25.11mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 5:32:17 PM

Mean Area 858.2
Mean Conc. 25.08mg/L



Sample

Sample Name: L17060292-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

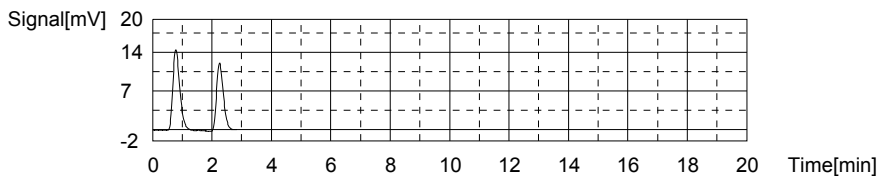
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.3358mg/L TC:0.1108mg/L IC:-0.2250mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	23.80	0.1638mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	56/7/2017 5:39:12 PM
2	19.31	0.05776mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	56/7/2017 5:42:50 PM

Mean Area 21.56
Mean Conc. 0.1108mg/L



Anal.: IC

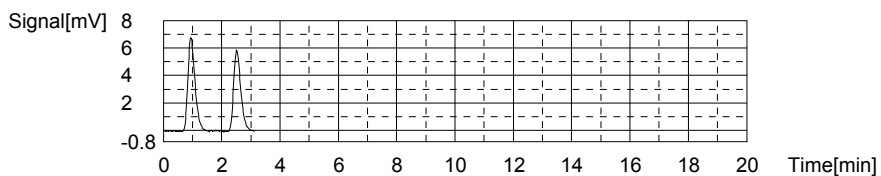
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.64	-0.2023mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 5:47:18 PM
2	10.12	-0.2477mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 5:51:27 PM

21/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

Mean Area 10.88
Mean Conc. -0.2250mg/L



Sample

Sample Name: WG616847-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

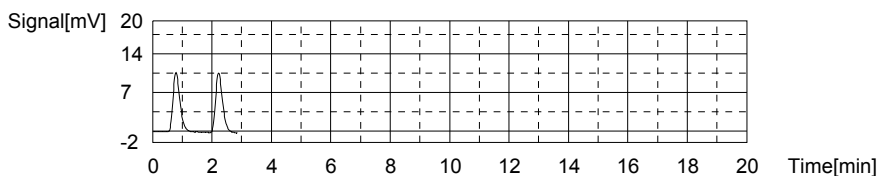
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.2956mg/L TC:0.01417mg/L IC:-0.2814mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	17.39	0.01240mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 5:58:21 PM	
2	17.54	0.01594mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 6:02:02 PM	

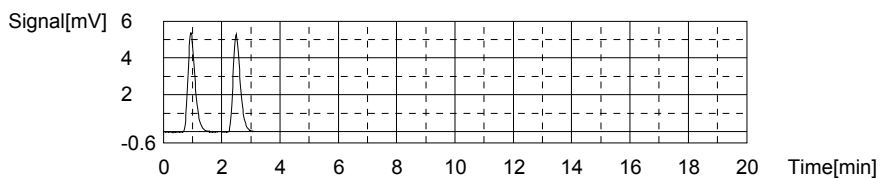
Mean Area 17.47
Mean Conc. 0.01417mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.085	-0.2786mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 6:06:25 PM	
2	8.895	-0.2843mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 6:10:35 PM	

Mean Area 8.990
Mean Conc. -0.2814mg/L



Sample

Sample Name: L17060232-01 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

22/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

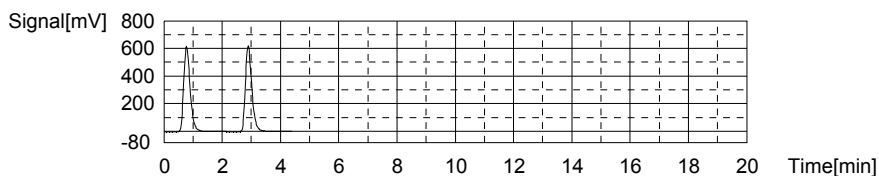
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.052mg/L TC:21.95mg/L IC:20.90mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	939.0	21.79mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 6:18:09 PM	
2	953.1	22.12mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 6:22:41 PM	

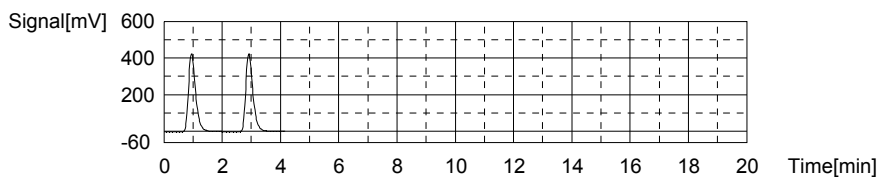
Mean Area 946.0
Mean Conc. 21.95mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	716.3	20.84mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 6:27:39 PM	
2	720.3	20.96mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 6:32:39 PM	

Mean Area 718.3
Mean Conc. 20.90mg/L



Sample

Sample Name: L17060232-09 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

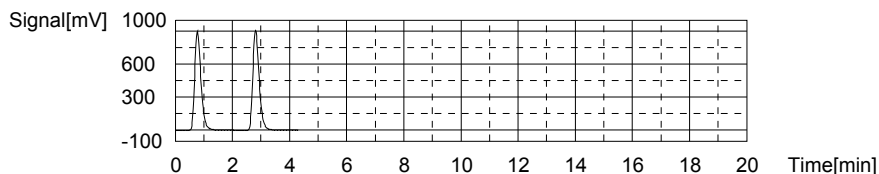
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.264mg/L TC:32.32mg/L IC:30.06mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1379	32.18mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 6:40:08 PM	
2	1391	32.47mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 6:45:34 PM	

Mean Area 1385
Mean Conc. 32.32mg/L



Anal.: IC

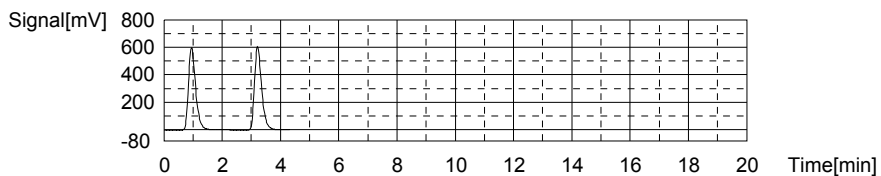
23/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1021	29.94mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 6:50:54 PM
2	1029	30.18mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 6:55:46 PM

Mean Area 1025
Mean Conc. 30.06mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

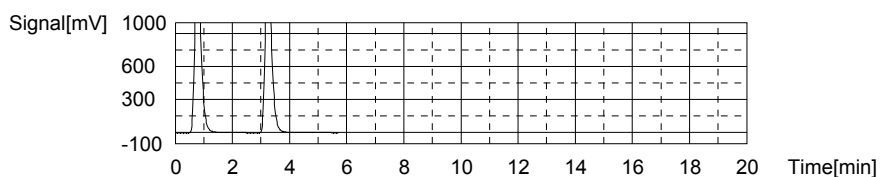
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-0.2097mg/L TC:52.73mg/L IC:52.94mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2239	52.50mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 7:03:41 PM
2	2258	52.95mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/7/2017 7:10:05 PM

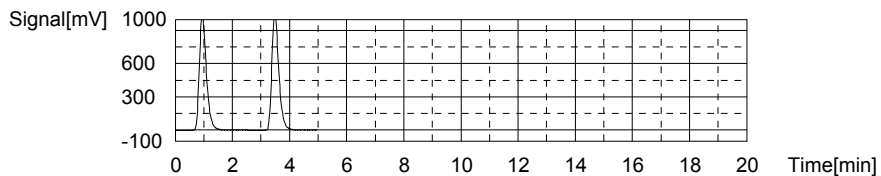
Mean Area 2249
Mean Conc. 52.73mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1787	52.82mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 7:15:44 PM
2	1795	53.05mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 7:21:03 PM

Mean Area 1791
Mean Conc. 52.94mg/L



Sample

24/27

6/8/2017 7:27:39 AM

06-07-2017-ADG-TOC.i32

Sample Name: <Untitled>
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

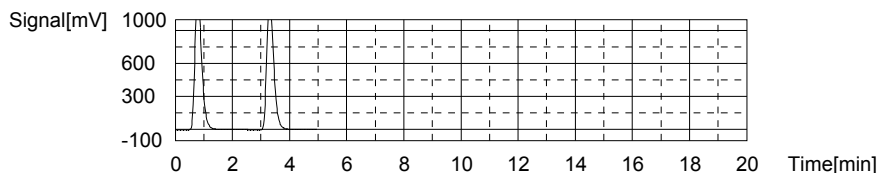
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:25.59mg/L TC:47.88mg/L IC:22.29mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2049	48.01mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 7:29:02 PM	
2	2038	47.75mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 7:33:44 PM	

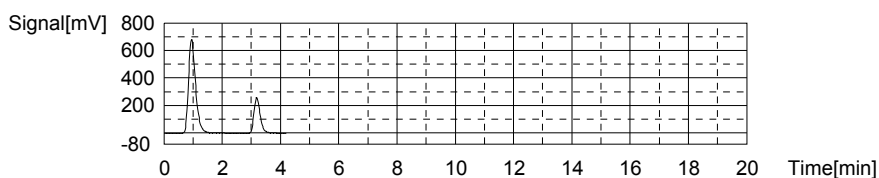
Mean Area 2044
 Mean Conc. 47.88mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1147	33.70mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 7:39:08 PM	
2	382.5	10.87mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/7/2017 7:43:48 PM	

Mean Area 764.8
 Mean Conc. 22.29mg/L



Sample

Sample Name: <Untitled>
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:25.98mg/L TC:44.07mg/L IC:18.08mg/L

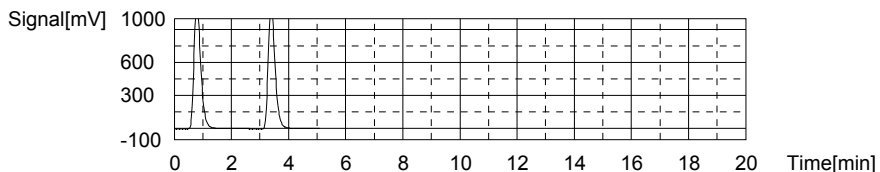
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1898	44.44mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 7:51:51 PM	
2	1866	43.69mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/7/2017 7:56:49 PM	

25/27

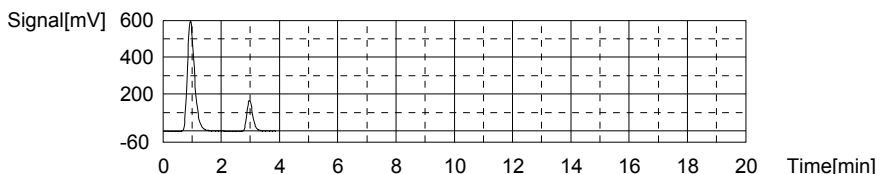
Mean Area 1882
Mean Conc. 44.07mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1011	29.64mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 8:01:56 PM
2	236.9	6.525mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 8:06:28 PM

Mean Area 624.0
Mean Conc. 18.08mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

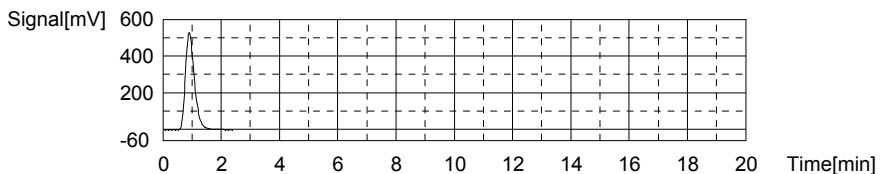
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.55mg/L TC:26.35mg/L IC:-0.2068mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1132	26.35mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/6/7/2017 8:14:19 PM

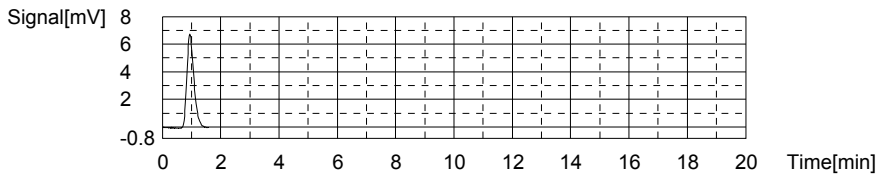
Mean Area 1132
Mean Conc. 26.35mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.49	-0.2068mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/7/2017 8:18:47 PM

Mean Area 11.49
Mean Conc. -0.2068mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

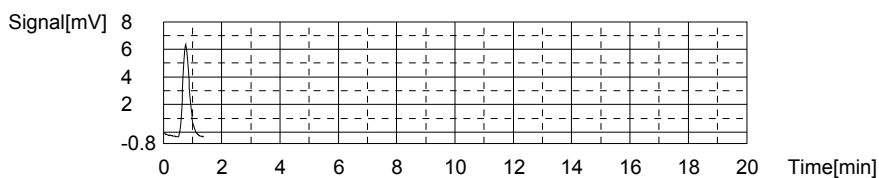
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1214mg/L TC:-0.1480mg/L IC:-0.2694mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.60	-0.1480mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_56	7/2017 8:23:49 PM

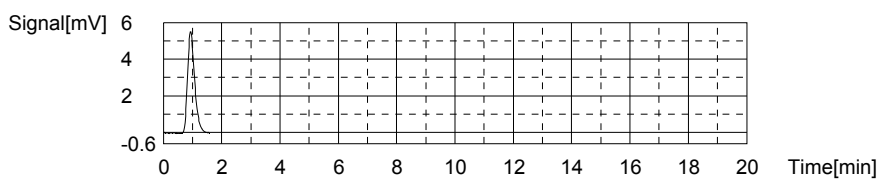
Mean Area 10.60
 Mean Conc. -0.1480mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.392	-0.2694mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	7/2017 8:27:46 PM

Mean Area 9.392
 Mean Conc. -0.2694mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
June 13, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
ALS - ADRIANE L. STEED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BLG - BRENDA L. GREENWALT	BNB - Brandi N. Bentley
BRG - BRENDA R. GREGORY	CAS - Craig A. Smith
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL	CV - Carl Volkman
DAK - DEAN A. KETELSEN	DCM - DAVID C. MERCKLE
DEV - DAVID E. VANDENBERG	DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER	DLP - DOROTHY L. PAYNE
DSM - DAVID S. MOSSOR	DTG - DOMINIC T. GEHRET
ECL - ERIC C. LAWSON	EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER	FJB - FRANCES J. BOLDEN
HRF - HEATHER R. FAIRCHILD	JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH	JKP - JACQUELINE K. PARSONS
JLD - JESSICA L. DELONG	JST - JOSHUA S. TAYLOR
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KDD - Katelyn D. Daley
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRP - KATHY R. PARSONS	LJH - Lacey J. Hendershot
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
OJE - OMOYEMWEN J. ENGLISH	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCA - SUEELLEN C. ADAMS
SCB - SARAH C. BOGOLIN	SCJ - SUE ELLEN C. JOHNSON
SDC - SHALYN D. CONLEY	TB - TODD BOYLE
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	ZTB - ZACH T. BARNES

List of Valid Qualifiers

June 13, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample receipt exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentatively identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound



List of Valid Qualifiers

June 13, 2017


Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below



CHAIN OF CUSTODY

Name Of Lab Shipping To: MICROBAC (740) 373-4071 ATTN: STEPHANIE MOSSBURG

Project: AECOM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES Prepared By: Scott Beesinger		Project No.: 60256135.GWTP HRUMAR16		Analyses		Remarks (Preservatives, etc.) Lab I.D.#	
MS / MSD No. OF CONTAINERS		AMMONIA-N ORTHO-PHOSPHATE TOTAL ORGANIC CARBON		H2SO4 NONE			
Field Sample I.D.	Sample Matrix	Date / Time					
LH18/24-SP650-6445-Grab	Water	05/31/17 / 15:00	X				
LH18/24-SP650-6445-Grab	Water	05/31/17 / 15:00	X				
Microbac OVD Received: 06/02/2017 09:34 By: BRENDA GREGORY 221000101558 							

Additional Remarks: Standard TAT on all parameters Send results to Linda Raabe at linda.raabe@aecom.com or call at 210-253-7518

Relinquished By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	05/31/17	15:30			

For Lab Use Only Received At Lab By:		Date	Time	Airfill No.	Temp of Container	Seal No.	Condition
Remarks:							



COOLER TEMP >6° C LOG

Cooler ID 1558

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C
LH 18/24-SP650-6445	8					
BY <u>6/2/17</u>						

pH Exceptions

pH Lot # HL601354

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6
BY <u>6/2/17</u> PRESERVATIVE EXCEPTIONS NONE <u>AS NOTED</u> <u>BY 6/2/17</u>						

Document Control # 1957
Last 10-07-2016

Issued to: Document Master File

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17060105

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 13-JUN-2017

Samplenum **Container ID** **Products**
L17060105-01 916330 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	02-JUN-2017 10:01	CLS		
2	ANALYZ	W1	WET	02-JUN-2017 10:36	DLP	CLS	
3	STORE	WET	A1	06-JUN-2017 07:59	CLS	DLP	

Samplenum **Container ID** **Products**
L17060105-01 916331 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	02-JUN-2017 10:01	CLS		<2
2	ANALYZ	W1	DIG	05-JUN-2017 07:21	ADG	AZH	
3	STORE	WET	A1	08-JUN-2017 09:42	CLS	ADG	

Samplenum **Container ID** **Products**
L17060105-01 916332 NH3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	02-JUN-2017 10:01	CLS		
2	ANALYZ	W1	WET	06-JUN-2017 08:17	EPT	CLS	
3	STORE	WET	A1	08-JUN-2017 16:46	CLS	EPT	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
 Total Halide by Bomb Combustion (TX)
 Particle Sizing - 200 Mesh (PS200)
 Specific Gravity/Density (SPGRAV)
 Total Residual Chlorine (CL-TRL)
 Total Volatile Solids (all forms) (TVS)
 Total Coliform Bacteria (all methods)
 Fecal Coliform Bacteria (all methods)
 Sulfite (SO₃)
 Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS

Nitrogen, Ammonia by Method 350.1
 Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
 Phenolics, Total by Method 420.1
 ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
 Acetic acid
 Butyric acid
 Lactic acid
 Propionic acid
 Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
 1-Methylnaphthalene
 1,4-Dioxane
 Atrazine
 Benzaldehyde
 Biphenyl
 Caprolactam
 Hexamethylphosphoramide (HMPA)
 Pentachlorobenzene
 Pentachloroethane

NELAP Accreditation by Laboratory SOP**NONPOTABLE WATER**OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALSOVD MSS01/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP**SOLID AND HAZARDOUS CHEMICALS**OVD MSV01/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)



Laboratory Report Number: L17060106

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on June 16 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Microbac Laboratories * Ohio Valley Division
158 Starlite Drive, Marietta, OH 45750 * T: (740) 373-4071 F: (740) 373-4835 * www.microbac.com

Lab Report #: L17060106

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

The following discrepancies were noted:

Discrepancy	Resolution
The temperature was out of the acceptable range for the following samples. BRG	Please proceed. MRT
The ice was melted. BRG	Please proceed. MRT

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
00110490	I	8.0		J4616881677	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	No
4	Was ice present?	No
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	Yes

**Lab Report #:** L17060106**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP650-6444	L17060106-01	05/31/2017 15:00	06/02/2017 09:34
TRIP BLANK	L17060106-02	05/31/2017 00:01	06/02/2017 09:34



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-07 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Mary Schilling		Anaylst III	2017-06-07 12:20:45



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-07 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?		X			1
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?	X				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-07 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-07 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-07 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-07 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

- 1) The temperature at receipt was 8 C, exceeding the regulatory guidelines for testing. The ice in the cooler had melted.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	6850
Prep Batch Number(s):	WG616603	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Eric Lawson		Chemist III	2017-06-06 19:39:51



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	6850
Prep Batch Number(s):	WG616603	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?		X			1
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	6850
Prep Batch Number(s):	WG616603	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	6850
Prep Batch Number(s):	WG616603	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	6850
Prep Batch Number(s):	WG616603	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	6850
Prep Batch Number(s):	WG616603	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

1. The temperature at receipt was 8 degrees C, exceeding the regulatory guidelines for testing.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	9056
Prep Batch Number(s):	WG616628	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Eric Lawson		Chemist III	2017-06-06 18:50:22



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	9056
Prep Batch Number(s):	WG616628	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?		X			1
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	9056
Prep Batch Number(s):	WG616628	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	9056
Prep Batch Number(s):	WG616628	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	9056
Prep Batch Number(s):	WG616628	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060106
Project Name:		Method:	9056
Prep Batch Number(s):	WG616628	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-06 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

1. The temperature at receipt was 8 degrees C, exceeding the regulatory guidelines for testing.

Certificate of Analysis

Sample #: L17060106-01	PrePrep Method: N/A	Instrument: HPMS6
Client ID: LH18/24-SP650-6444	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 05/25/2017 15:51
Workgroup #: WG616419	Analyst: TMB	Run Date: 06/03/2017 00:47
Collect Date: 05/31/2017 15:00	Dilution: 1	File ID: 6M147762
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U,CT1	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U,CT1	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U,CT1	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U,CT1	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U,CT1	1.00	0.500	0.250
Acetone	67-64-1	9.27	J,CT1	10.0	5.00	2.50
Benzene	71-43-2	0.250	U,CT1	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U,CT1	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U,CT1	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U,CT1	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U,CT1	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U,CT1	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U,CT1	1.00	0.500	0.250
Styrene	100-42-5	0.250	U,CT1	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U,CT1	1.00	0.500	0.250
Trichloroethene	79-01-6	2.87	CT1	1.00	0.500	0.250
Toluene	108-88-3	0.500	U,CT1	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U,CT1	1.00	0.500	0.250
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,2-Dichloroethane-d4	103	70	120			
4-Bromofluorobenzene	99.3	75	120			
Dibromofluoromethane	105	85	115			
Toluene-d8	102	85	120			
CT1	Cooler temperature at sample receipt exceeded regulatory limit.					
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regulatory limit.					
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded regulatory limit.					

Lab Report #: L17060106
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060106-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6444	Prep Method: 6850	Prep Date: 06/05/2017 15:49
Matrix: Water	Analytical Method: 6850	Cal Date: 04/24/2017 15:40
Workgroup #: WG616603	Analyst: WTD	Run Date: 06/05/2017 21:12
Collect Date: 05/31/2017 15:00	Dilution: 1	File ID: 1LM.LM39742
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.384	J,CT1	0.400	0.200	0.100
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regulatory limit.					

Lab Report #: L17060106
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060106-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6444	Prep Method: 9056	Prep Date: 06/05/2017 17:15
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG616628	Analyst: CAS	Run Date: 06/05/2017 18:51
Collect Date: 05/31/2017 15:00	Dilution: 5	File ID: I2_060517-08
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Sulfate	14808-79-8	33.6	CT1	10.0	5.00	2.50
CT1	Cooler temperature at sample receipt exceeded regulatory limit.					
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17060106
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060106-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6444	Prep Method: 9056	Prep Date: 06/05/2017 17:15
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG616628	Analyst: CAS	Run Date: 06/05/2017 19:10
Collect Date: 05/31/2017 15:00	Dilution: 50	File ID: I2_060517-09
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chloride	16887-00-6	462	CT1	20.0	10.0	5.00
CT1	Cooler temperature at sample receipt exceeded regulatory limit.					
J	Estimated value ; the analyte concentration was less than the LOQ.					

Certificate of Analysis

Sample #: L17060106-02	PrePrep Method: N/A	Instrument: HPMS6
Client ID: TRIP BLANK	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 05/25/2017 15:51
Workgroup #: WG616419	Analyst: TMB	Run Date: 06/02/2017 20:48
Collect Date: 05/31/2017 00:01	Dilution: 1	File ID: 6M147754
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U,CT1	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U,CT1	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U,CT1	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U,CT1	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U,CT1	1.00	0.500	0.250
Acetone	67-64-1	4.36	J,CT1	10.0	5.00	2.50
Benzene	71-43-2	0.250	U,CT1	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U,CT1	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U,CT1	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U,CT1	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U,CT1	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U,CT1	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U,CT1	1.00	0.500	0.250
Styrene	100-42-5	0.250	U,CT1	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U,CT1	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U,CT1	1.00	0.500	0.250
Toluene	108-88-3	0.500	U,CT1	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U,CT1	1.00	0.500	0.250
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,2-Dichloroethane-d4	103	70	120			
4-Bromofluorobenzene	99.7	75	120			
Dibromofluoromethane	104	85	115			
Toluene-d8	101	85	120			
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regulatory limit.					
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded regulatory limit.					

Certificate of Analysis

2.1 Volatiles Data

2.1.1 Volatiles GCMS Data (8260)

2.1.1.1 Summary Data

Certificate of Analysis

Sample #: L17060106-01	PrePrep Method: N/A	Instrument: HPMS6
Client ID: LH18/24-SP650-6444	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 05/25/2017 15:51
Workgroup #: WG616419	Analyst: TMB	Run Date: 06/03/2017 00:47
Collect Date: 05/31/2017 15:00	Dilution: 1	File ID: 6M147762
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U,CT1	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U,CT1	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U,CT1	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U,CT1	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U,CT1	1.00	0.500	0.250
Acetone	67-64-1	9.27	J,CT1	10.0	5.00	2.50
Benzene	71-43-2	0.250	U,CT1	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U,CT1	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U,CT1	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U,CT1	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U,CT1	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U,CT1	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U,CT1	1.00	0.500	0.250
Styrene	100-42-5	0.250	U,CT1	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U,CT1	1.00	0.500	0.250
Trichloroethene	79-01-6	2.87	CT1	1.00	0.500	0.250
Toluene	108-88-3	0.500	U,CT1	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U,CT1	1.00	0.500	0.250
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,2-Dichloroethane-d4	103	70	120			
4-Bromofluorobenzene	99.3	75	120			
Dibromofluoromethane	105	85	115			
Toluene-d8	102	85	120			
CT1	Cooler temperature at sample receipt exceeded regulatory limit.					
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regulatory limit.					
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded regulatory limit.					

Certificate of Analysis

Sample #: L17060106-02

PrePrep Method: N/A

Instrument: HPMS6

Client ID: TRIP BLANK

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 05/25/2017 15:51

Workgroup #: WG616419

Analyst: TMB

Run Date: 06/02/2017 20:48

Collect Date: 05/31/2017 00:01

Dilution: 1

File ID: 6M147754

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U,CT1	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U,CT1	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U,CT1	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U,CT1	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U,CT1	1.00	0.500	0.250
Acetone	67-64-1	4.36	J,CT1	10.0	5.00	2.50
Benzene	71-43-2	0.250	U,CT1	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U,CT1	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U,CT1	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U,CT1	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U,CT1	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U,CT1	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U,CT1	1.00	0.500	0.250
Styrene	100-42-5	0.250	U,CT1	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U,CT1	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U,CT1	1.00	0.500	0.250
Toluene	108-88-3	0.500	U,CT1	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U,CT1	1.00	0.500	0.250
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,2-Dichloroethane-d4	103	70	120			
4-Bromofluorobenzene	99.7	75	120			
Dibromofluoromethane	104	85	115			
Toluene-d8	101	85	120			
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regulatory limit.					
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded regulatory limit.					

Certificate of Analysis

2.1.1.2 QC Summary Data

Example 8260 Calculations

1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:

$$RF = [(Ax) (Cis)] / [(Ais) (Cx)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured:	3399156
Cis = Concentration of the specific internal standard (ug/mL)	25
Ais = Area of the characteristic ion of the specific internal standard	846471
Cx = Concentration of the compound in the standard being measured (ug/mL)	100

RF = Calculated Response Factor **1.0039**

2.0 Calculating the concentration (C) of a compound in water using the average RF: *

$$Cx = [(Ax) (Cis) (Vn)(D)] / [(Ais) (RF) (Vs)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured	3122498
Cis = Concentration of the specific internal standard (ug/L)	25
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	611048
RF = Average RF from the ICAL	1.004
Vs = Purge volume of sample (mL)	10
Vn = Nominal purge volume of sample (mL) (10.0 mL)	10
Cx = Concentration of the compound in the sample being measured (ug/L)	127.2428

3.0 Calculating the concentration (C) of a compound in soil using the average RF: *

$$Cx = [(Ax) (Cis) (Wn)(D)] / [(Ais) (RF) (Ws)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured	3122498
Cis = Concentration of the specific internal standard (ug/L)	25
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	611048
RF = Average RF from the ICAL	1.004
Ws = Weight of sample purged (g)	5
Wn = Nominal purge weight (g) (5.0 g)	5
Cx = Concentration of the compound in the sample being measured (ug/L)	127.2428

Dry weight correction:

Percent solids (PCT_S)	50
Cd = (Cx) (100)/PCT_S	254.4856

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

4.0 Concentration from Linear Regression

Step 1: Retrieve Curve Data From Plot, $y = mx + b$

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve = 0.213

b = intercept from curve = - 0.00642

Step 2: Calculate y from Quantitation Report

$$y = 86550/593147 = 0.1459$$

Step 3: Solve for x

$$x = (y - b)/m = [(0.1459 - (-0.00642))/0.213] = 0.7152$$

Step 4: Solve for analyte concentration Cx

$$Cx = Cis (x) = (25.0)(0.7152) = 17.88$$

Example Spreadsheet Calculation:

Slope from curve, m:	0.213
Intercept from curve, b:	-0.00642
Area of analyte, Ax:	86550
Area of Internal Standard, Ais:	593147
Concentration of IS, Cis	25.00
Response Ratio:	0.145917
Amount Ratio:	0.715195
Concentration:	17.87988
Units of Internal Standard:	ug/L

5.0 Concentration from Quadratic Regression**Step 1 - Retrieve Curve Data from Plot, $y = Ax^2 + Bx + C$**

Where:

$$Ax^2 + Bx + (C - y) = 0$$

A, B, C = constants from the ICAL quadratic regression

y = Response ratio = Area of analyte/Area of internal standard (IS)

x = Amount ratio = Concentration of analyte/concentration of IS

Step 2: Calculate y from Quantitation Report

$$y = Ax/Ais$$

Step 3: Solve for x using the quadratic formula

$$Ax^2 + Bx + C - y = 0$$

$$x = \frac{b \pm \sqrt{(b^2 - 4a(c - y))}}{2a} \quad (\text{Two possible solutions})$$

Step 4: Solve for analyte concentration Cx

$$Cx = (Cis)(\text{Amount ratio})$$

Example Spreadsheet Calculation:

Value of A from plot:	-0.00629
Value of B from plot:	0.511
Value of C from plot:	-0.0276
Area of unknown from quantitation report:	293821
Area of IS from quantitation report:	784848
Response ratio, y:	0.374367
C - y:	-0.40197
Root 1 - Computed amount ratio, X1:	80.44567
Root 2 - Computed amount ratio, X2:	0.794396 use this solution
Concentration of IS, Cis:	25.00
Concentration of analyte, Cx:	19.86 ug/L

Analyst(s): BUB
 Date: 5-31-17
 Filter Lot #: 9803210
 Agitator Speed 30 ± 2 rpm

Balance ID: BAL020
 pH Probe ID: T5
 Temp probe ID: 1025 1023

Analyst / Date		Analyst / Date	
<u>BUB</u>	<u>5-31-17</u>	<u>BUB</u>	<u>6-1-17</u>
Time On	Temp On °C	Time Off	Temp Off °C
<u>1456</u>	<u>23.2</u>	<u>803</u>	<u>22.3</u>

ZHE	Sample #	Pressure ✓	PSI ON	PSI OFF	Method	Fluid #	Matrix*	%Solid	Size Reduction		Int. Wt. (g)	Fluid Vol. (mL)
									Yes	No		
A												
B												
C												
D												
E												
F	<u>05-15105-01</u>	<u>✓</u>	<u>10</u>	<u>10</u>	<u>1311</u>	<u>F1-242</u>	<u>S</u>	<u>100</u>	<u>✓</u>	<u>25.00</u>	<u>500</u>	
G	<u>05-15105-02</u>	<u>✓</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>✓</u>	<u>25.01</u>	<u>500</u>	
H												
I												
J												
K												
L												
M												
N												
O												
P												
Q												
R												
S												
NA	<u>EBIK-1</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>1311</u>	<u>F1-242</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>40</u>	<u>40</u>

*Matrix Code = (S-solid) (SS-sand, soil or sludge) (P-paint) (O-organic) (W-water or waste)

Comments: NA

Peer Review By: [Signature]

Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 011217
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01 Rev: 24
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01 Rev: 18
 Maintenance Log ID: 54037

Internal Standard: STD79772 Surrogate Standard: STD79772
 CCV: STD79829; STD79571 LCS: STD79908; STD79496 MS/MSD: STD79909
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG598323; WG598431

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M144707	WG598323-01 50ng BFB STD 8260	NA	1	1	STD79474	01/12/17 08:36
6M144708	WG598323-02 5ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 09:02
6M144709	WG598323-03 20ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 09:37
6M144710	WG598323-04 50ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 10:10
6M144711	WG598323-05 100ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 10:42
6M144712	WG598323-06 200ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 11:14
6M144713	WG598323-07 300ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 11:47
6M144714	WG598323-08 400ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 12:19
6M144715	WG598323-09 500ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 12:52
6M144716	rinse	NA	1	1		01/12/17 13:25
6M144717	WG598323-10 100ug/L ALT SRC STD A9/F	NA	1	1	STD79496	01/12/17 13:56
6M144718	WG598430-01 50ng BFB STD 8260	NA	1	1	STD79474	01/12/17 14:27
6M144719	WG598430-02 50ug/L CCV STD 8260	NA	1	1	STD79829	01/12/17 14:52
6M144720	WG598452-01 100ug/L A9 CCV STD 8260	NA	1	1	STD79571	01/12/17 15:27
6M144721	WG598431-01 VBLK0112 BLANK STD 826	NA	1	1		01/12/17 15:59
6M144722	WG598431-02 20ug/L LCS STD 8260	NA	1	1	STD79908	01/12/17 16:32
6M144723	L16120615-05 B MS 826-A9-SPE	7	1	1	STD79909	01/12/17 17:04
6M144724	L16120615-06 B MSD 826-A9-SPE	7	1	1	STD79909	01/12/17 17:37
6M144725	WG598431-03 100ug/L A9/FOO LCS	NA	1	1	STD79496	01/12/17 18:09
6M144726	L16120718-01 B TB 826-AP-SPE	<2	1	1		01/12/17 18:42
6M144727	L16120973-01 B TB 826-AP-SPE	<2	1	1		01/12/17 19:14
6M144728	L16120615-01 B 826-AP-SPE	7	1	1		01/12/17 19:46
6M144729	L16120615-02 B 826-AP-SPE	7	1	1		01/12/17 20:19
6M144730	L16120615-03 B EB 826-AP-SPE	4	1	1		01/12/17 20:51
6M144731	L16120615-04 B RS 826-AP-SPE	7	1	1		01/12/17 21:23
6M144732	L16120615-07 B 826-AP-SPE	4	1	1		01/12/17 21:55
6M144733	L16120615-08 B 826-AP-SPE	7	1	1		01/12/17 22:27
6M144734	L16120615-09 B 826-AP-SPE	7	1	1		01/12/17 22:59
6M144735	L16120718-02 B 826-AP-SPE	7	1	1		01/12/17 23:31
6M144736	L16120718-03 B 826-AP-SPE	7	1	1		01/13/17 00:03
6M144737	L16120718-04 B 826-AP-SPE	4	1	1		01/13/17 00:36
6M144738	L16120718-05 B 826-AP-SPE	4	1	1		01/13/17 01:08
6M144739	L16120718-06 B 826-AP-SPE	7	1	1		01/13/17 01:40
6M144740	L16120718-07 B 826-AP-SPE	7	1	1		01/13/17 02:12

Approved: January 13, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 011217
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01 Rev: 24
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01 Rev: 18
 Maintenance Log ID: 54037

Internal Standard: STD79772 Surrogate Standard: STD79772
 CCV: STD79829; STD79571 LCS: STD79908; STD79496 MS/MSD: STD79909
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG598323; WG598431

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M144741	RINSE	NA	1	1		01/13/17 02:44
6M144742	WG598431-07 VBLK0112 BLANK STD 624	NA	2	1		01/13/17 03:16
6M144743	L17010300-04 A 624	7	2	1		01/13/17 03:47
6M144744	L17010466-03 A 624-SPE	7	2	1		01/13/17 04:20
6M144745	L17010446-02 A 624-SPE1	7	2	1		01/13/17 04:52
6M144746	CCV	NA	1	1		01/13/17 05:24
6M144747	RINSE	NA	1	1		01/13/17 05:56
6M144748	RINSE	NA	1	1		01/13/17 06:28

Approved: January 13, 2017

Page: 2

Sarah Vandenberg



Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 052517
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01/OVAP MSV01 Rev: 24/0
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01/OVAP PAT01 Rev: 18/1
 Maintenance Log ID: _____

Internal Standard: STD81995 Surrogate Standard: STD81995
 CCV: STD82074 LCS: STD82078 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG615531

Comments:

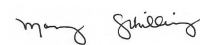
File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M147585	WG615531-01 50ng BFB STD 8260	NA	1	1	STD81972	05/25/17 09:59
6M147586	RINSE	NA	1	1		05/25/17 10:24
6M147587	WG615531-02 0.3ug/L STD 8260	NA	1	1	STD82074	05/25/17 10:54
6M147588	WG615531-03 0.4ug/L STD 8260	NA	1	1	STD82074	05/25/17 11:24
6M147589	WG615531-04 1ug/L STD 8260	NA	1	1	STD82074	05/25/17 11:54
6M147590	WG615531-05 2ug/L STD 8260	NA	1	1	STD82074	05/25/17 12:24
6M147591	WG615531-06 5ug/L STD 8260	NA	1	1	STD82074	05/25/17 12:54
6M147592	WG615531-04 1ug/L STD 8260	NA	1	1	STD82074	05/25/17 13:23
6M147593	WG615531-07 20ug/L STD 8260	NA	1	1	STD82074	05/25/17 13:53
6M147594	WG615531-08 50ug/L STD 8260	NA	1	1	STD82074	05/25/17 14:23
6M147595	WG615531-09 100ug/L STD 8260	NA	1	1	STD82074	05/25/17 14:53
6M147596	WG615531-10 200ug/L STD 8260	NA	1	1	STD82074	05/25/17 15:22
6M147597	WG615531-11 300ug/L STD 8260	NA	1	1	STD82074	05/25/17 15:51
6M147598	RINSE	NA	1	1		05/25/17 16:42
6M147599	RINSE	NA	1	1		05/25/17 17:13
6M147600	WG615531-12 20ug/L ALT SRC STD 8260	NA	1	1	STD82078	05/25/17 17:43
6M147601	RINSE	NA	1	1		05/25/17 18:13

Comments

Seq.	Rerun	Dil.	Reason	Analytes
5	X			
File ID: 6M147589				
Iodomethane didn't have a secondary. DNR.				

Approved: May 31, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 060217
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01/OVAP MSV01 Rev: 24/0
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01/OVAP PAT01 Rev: 18/1
 Maintenance Log ID: 54199

Internal Standard: STD81995 Surrogate Standard: STD81995
 CCV: STD82162 LCS: STD82132 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG616419

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M147741	WG616418-01 50ng BFB STD 8260	NA	1	1	STD81972	06/02/17 14:20
6M147742	WG616418-02 50ug/L CCV STD 8260	NA	1	1	STD82162	06/02/17 14:47
6M147743	WG616418-02 50ug/L CCV STD 8260	NA	1	1	STD82162	06/02/17 15:18
6M147744	WG000000-01 100ug/L A9 CCV STD 8260	NA	1	1	STD81708	06/02/17 15:48
6M147745	WG616419-01 VBLK0602 BLANK STD 826	NA	1	1		06/02/17 16:18
6M147746	L17051100-01 A 826-REF-BLK	<2	1	1		06/02/17 16:48
6M147747	WG616419-02 20ug/L LCS STD 8260	NA	1	1	STD82132	06/02/17 17:19
6M147748	WG616419-03 20ug/L LCS2 STD 8260	NA	1	1	STD82132	06/02/17 17:49
6M147749	L17051565-01 A 10X 826-TC	NA	17	10		06/02/17 18:18
6M147750	L17051565-02 A 10X 826-TC	NA	17	10		06/02/17 18:48
6M147751	L17060076-04 A TB 826-SPE	<2	1	1		06/02/17 19:18
6M147752	L17060076-01 A EB 826-SPE	<2	1	1		06/02/17 19:48
6M147753	L17060132-03 A TB 826-SPE	<2	1	1		06/02/17 20:18
6M147754	L17060106-02 A TB 826-LOW CT1	<2	1	1		06/02/17 20:48
6M147755	L17060100-03 A TB 826-BETX	<2	1	1		06/02/17 21:18
6M147756	L17051554-01 A TB 826-SPE	<2	1	1		06/02/17 21:48
6M147757	L17060076-02 A 826-SPE	<2	1	1		06/02/17 22:19
6M147758	L17060076-03 A 826-SPE	<2	1	1		06/02/17 22:49
6M147759	L17060132-01 A 826-SPE	<2	1	1		06/02/17 23:18
6M147760	L17060132-02 A 826-SPE	<2	1	1		06/02/17 23:48
6M147761	L17060100-01 A 826-BETX	<2	1	1		06/03/17 00:18
6M147762	L17060106-01 A 826-LOW CT1	<2	1	1		06/03/17 00:47
6M147763	L17051554-03 A 826-SPE	<2	1	1		06/03/17 01:17
6M147764	L17051554-02 A 826-SPE	<2	1	1		06/03/17 01:46
6M147765	RINSE	NA	1	1		06/03/17 02:16
6M147766	WG616419-04 VBLK0602 BLANK STD 624	NA	2	1		06/03/17 02:46
6M147767	L17060040-02 B 10X 624-SPE D1	5	2	10		06/03/17 03:15
6M147768	CCV	NA	1	1		06/03/17 03:45
6M147769	RINSE	NA	1	1		06/03/17 04:15
6M147770	WG616073-01 A FBLK 10X 826-TC	NA	17	10		06/03/17 04:45
6M147771	RINSE	NA	1	1		06/03/17 05:16

Comments

Approved: June 05, 2017

Page: 1

Sarah Vandenberg

Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 060217
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01/OVAP MSV01 Rev: 24/0
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01/OVAP PAT01 Rev: 18/1
 Maintenance Log ID: 54199

Internal Standard: STD81995 Surrogate Standard: STD81995
 CCV: STD82162 LCS: STD82132 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG616419

Comments:

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2	X			
File ID: 6M147742				
Chloromethane was low, DNR.				
4				
File ID: 6M147744				
Not needed. DNR.				

Approved: June 05, 2017

Page: 2




Microbac Laboratories Inc.

Data Checklist

Date: 12-JAN-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 79799
 Analytical Workgroups: WG598323; WG598431

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	NA
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	SAV
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
13-JAN-2017

Tiffany Bailey

Secondary Reviewer:
13-JAN-2017

Sarah Vandenberg



Microbac Laboratories Inc.

Data Checklist

Date: 25-MAY-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 82462
 Analytical Workgroups: WG615531

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	MES
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
30-MAY-2017

Tiffany Bailey

Secondary Reviewer:
31-MAY-2017

Mary Sheehy



Microbac Laboratories Inc.

Data Checklist

Date: 02-JUN-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 82550
 Analytical Workgroups: WG616419

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	SAV
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
05-JUN-2017

Tiffany Bailey

Secondary Reviewer:
05-JUN-2017

Sarah Vandenberg



Analytical Method: 8260B
 Login Number: L17060106

AAB#: WG616419

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6444	01	05/31/17					06/03/2017	2.4	14		06/03/17	2.4	14	
TRIP BLANK	02	05/31/17					06/02/2017	2.9	14		06/02/17	2.9	14	

* = SEE PROJECT QAPP REQUIREMENTS



Login Number: L17060106
 Instrument Id: HPMS6
 Workgroup (AAB#): WG616419

Method: 8260
 CAL ID: HPMS6 - 25-MAY-17
 Matrix: Water

Sample Number	Dilution	Tag	1	2	3	4
L17060106-01	1.00	01	103	105	99.3	102
L17060106-02	1.00	01	103	104	99.7	101
WG616419-01	1.00	01	102	103	101	103
WG616419-02	1.00	01	101	104	99.7	102
WG616419-03	1.00	01	102	104	99.7	101
WG616419-04	1.00	01	104	104	99.4	102

Surrogates	Surrogate Limits		
1 - 1,2-Dichloroethane-d4	70	-	120
2 - Dibromofluoromethane	85	-	115
3 - 4-Bromofluorobenzene	75	-	120
4 - Toluene-d8	85	-	120

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



METHOD BLANK SUMMARY

Login Number: L17060106 Work Group: WG616419
Blank File ID: 6M147745 Blank Sample ID: WG616419-01
Prep Date: 06/02/17 16:18 Instrument ID: HPMS6
Analyzed Date: 06/02/17 16:18 Method: 8260B
Analyst: TMB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG616419-02	6M147747	06/02/17 17:19	01
LCS2	WG616419-03	6M147748	06/02/17 17:49	01
TRIP BLANK	L17060106-02	6M147754	06/02/17 20:48	01
LH18/24-SP650-6444	L17060106-01	6M147762	06/03/17 00:47	01

Report Name: BLANK_SUMMARY
PDF File ID: 5322475
Report generated 06/07/2017 08:23



Login Number: L17060106 Prep Date: 06/02/17 16:18 Sample ID: WG616419-01
 Instrument ID: HPMS6 Run Date: 06/02/17 16:18 Prep Method: 5030B/5030C/503
 File ID: 6M147745 Analyst: TMB Method: 8260B
 Workgroup (AAB#): WG616419 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS6-25-MAY-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
1,1,1-Trichloroethane	0.250	1.00	0.250	1	U
1,1,2-Trichloroethane	0.250	1.00	0.250	1	U
1,1-Dichloroethane	0.125	0.500	0.125	1	U
1,1-Dichloroethene	0.500	2.00	0.500	1	U
1,2-Dichloroethane	0.250	1.00	0.250	1	U
Acetone	2.50	10.0	2.50	1	U
Benzene	0.125	0.500	0.125	1	U
Carbon tetrachloride	0.250	1.00	0.250	1	U
Chloroform	0.125	0.500	0.125	1	U
Ethylbenzene	0.250	1.00	0.250	1	U
Methylene chloride	0.250	1.00	0.250	1	U
m,p-Xylene	0.500	2.00	0.500	1	U
o-Xylene	0.250	1.00	0.250	1	U
Styrene	0.125	0.500	0.125	1	U
Tetrachloroethene	0.250	1.00	0.250	1	U
Trichloroethene	0.250	1.00	0.250	1	U
Toluene	0.250	1.00	0.250	1	U
Vinyl chloride	0.250	1.00	0.250	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	102	70 - 120	PASS
4-Bromofluorobenzene	101	75 - 120	PASS
Dibromofluoromethane	103	85 - 115	PASS
Toluene-d8	103	85 - 120	PASS

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5321228
 07-JUN-2017 08:23



Login Number: L17060106 Analyst: TMB Prep Method: 5030B/5030C/503
 Instrument ID: HPMS6 Matrix: Water Method: 8260B
 Workgroup (AAB#): WG616419 Units: ug/L
 QC Key: DOD4 Lot #: STD82132

Sample ID: WG616419-02 LCS File ID: 6M147747 Run Date: 06/02/2017 17:19
 Sample ID: WG616419-03 LCS2 File ID: 6M147748 Run Date: 06/02/2017 17:49

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
1,1,1-Trichloroethane	20.0	21.2	106	20.0	20.8	104	2.04	65 - 130	30	
1,1,2-Trichloroethane	20.0	20.6	103	20.0	21.1	106	2.30	75 - 125	30	
1,1-Dichloroethane	20.0	19.9	99.3	20.0	20.2	101	1.54	70 - 135	30	
1,1-Dichloroethene	20.0	20.8	104	20.0	21.0	105	1.16	70 - 130	30	
1,2-Dichloroethane	20.0	21.1	106	20.0	21.1	106	0.0294	70 - 130	30	
Acetone	20.0	19.6	98.0	20.0	21.5	107	9.00	40 - 140	30	
Benzene	20.0	19.7	98.7	20.0	19.9	99.4	0.700	80 - 120	30	
Carbon tetrachloride	20.0	23.2	116	20.0	22.7	114	1.90	65 - 140	30	
Chloroform	20.0	19.2	95.8	20.0	19.1	95.4	0.423	65 - 135	30	
Ethylbenzene	20.0	20.5	102	20.0	20.6	103	0.861	75 - 125	30	
m,p-Xylene	40.0	40.2	100	40.0	40.4	101	0.713	75 - 130	30	
Methylene chloride	20.0	19.9	99.3	20.0	20.2	101	1.44	55 - 140	30	
o-Xylene	20.0	20.9	104	20.0	20.9	104	0.0397	80 - 120	30	
Styrene	20.0	20.8	104	20.0	20.7	104	0.367	65 - 135	30	
Tetrachloroethene	20.0	20.6	103	20.0	20.6	103	0.221	45 - 150	30	
Toluene	20.0	19.9	99.3	20.0	19.9	99.3	0.0614	75 - 120	30	
Trichloroethene	20.0	21.1	106	20.0	20.8	104	1.54	70 - 125	30	
Vinyl chloride	20.0	22.5	112	20.0	21.5	108	4.39	50 - 145	30	

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
1,2-Dichloroethane-d4	101	102	70 - 120	PASS
Dibromofluoromethane	104	104	85 - 115	PASS
4-Bromofluorobenzene	99.7	99.7	75 - 120	PASS
Toluene-d8	102	101	85 - 120	PASS

* EXCEEDS %REC LIMIT
 # EXCEEDS RPD LIMIT



BFB

Login Number: L17060106 Tune ID: WG598323-01
 Instrument: HPMS6 Run Date: 01/12/2017
 Analyst: TMB Run Time: 08:36
 Workgroup: WG598323 File ID: 6M144707
 Cal ID: HPMS6-12-JAN-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	19.2	7923	PASS
75.0	95.0	30.0	60.0	54.8	22651	PASS
95.0	95.0	100	100	100	41304	PASS
96.0	95.0	5.00	9.00	7.28	3007	PASS
173	174	0	2.00	0.352	116	PASS
174	95.0	50.0	100	79.8	32963	PASS
175	174	5.00	9.00	8.22	2709	PASS
176	174	95.0	101	97.3	32071	PASS
177	176	5.00	9.00	6.69	2147	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG598323-02	STD	01	01/12/2017 09:02	
WG598323-03	STD	01	01/12/2017 09:37	
WG598323-04	STD	01	01/12/2017 10:10	
WG598323-05	STD-CCV	01	01/12/2017 10:42	
WG598323-06	STD	01	01/12/2017 11:14	
WG598323-07	STD	01	01/12/2017 11:47	
WG598323-08	STD	01	01/12/2017 12:19	
WG598323-09	STD	01	01/12/2017 12:52	
WG598323-10	SSCV	01	01/12/2017 13:56	

* Sample past 12 hour tune limit



BFB

Login Number: L17060106 Tune ID: WG615531-01
 Instrument: HPMS6 Run Date: 05/25/2017
 Analyst: TMB Run Time: 09:59
 Workgroup: WG615531 File ID: 6M147585
 Cal ID: HPMS6-25-MAY-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	18.3	5863	PASS
75.0	95.0	30.0	60.0	48.2	15474	PASS
95.0	95.0	100	100	100	32082	PASS
96.0	95.0	5.00	9.00	6.88	2208	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	68.1	21858	PASS
175	174	5.00	9.00	7.28	1592	PASS
176	174	95.0	101	96.6	21117	PASS
177	176	5.00	9.00	6.63	1400	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG615531-02	STD	01	05/25/2017 10:54	
WG615531-03	STD	01	05/25/2017 11:24	
WG615531-05	STD	01	05/25/2017 12:24	
WG615531-06	STD	01	05/25/2017 12:54	
WG615531-04	STD	01	05/25/2017 13:23	
WG615531-07	STD	01	05/25/2017 13:53	
WG615531-08	STD-CCV	01	05/25/2017 14:23	
WG615531-09	STD	01	05/25/2017 14:53	
WG615531-10	STD	01	05/25/2017 15:22	
WG615531-11	STD	01	05/25/2017 15:51	
WG615531-12	SSCV	01	05/25/2017 17:43	

* Sample past 12 hour tune limit



BFB

Login Number: L17060106 Tune ID: WG616418-01
 Instrument: HPMS6 Run Date: 06/02/2017
 Analyst: TMB Run Time: 14:20
 Workgroup: WG616418 File ID: 6M147741
 Cal ID: HPMS6-25-MAY-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	20.1	4940	PASS
75.0	95.0	30.0	60.0	50.1	12293	PASS
95.0	95.0	100	100	100	24536	PASS
96.0	95.0	5.00	9.00	6.60	1619	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	68.2	16742	PASS
175	174	5.00	9.00	7.73	1294	PASS
176	174	95.0	101	99.9	16732	PASS
177	176	5.00	9.00	7.23	1210	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG616418-02	CCV	01	06/02/2017 15:18	
WG616419-01	BLANK	01	06/02/2017 16:18	
WG616419-02	LCS	01	06/02/2017 17:19	
WG616419-03	LCS2	01	06/02/2017 17:49	
L17060106-02	TRIP BLANK	01	06/02/2017 20:48	
L17060106-01	LH18/24-SP650-6444	01	06/03/2017 00:47	
WG616419-04	BLANK2	01	06/03/2017 02:46	*
WG616073-01	FBLK1	DL01	06/03/2017 04:45	*

* Sample past 12 hour tune limit



Calibration Table Report
 Method: A9FOOWT.M
 Title: A9-FOO Water - IC: 011217 - HPMS6
 Last Calibration: Thu Jan 12 13:53:06 2017
 Curve: WG598323
 Calibration Files

Compound										Avg	%RSD
	5	20	50	100	200	300	400	500			
	6M144708.D	6M144709.D	6M144710.D	6M144711.D	6M144712.D	6M144713.D	6M144714.D	6M144715.D			
I Fluorobenzene	ISTD										
T Acetonitrile	0.021	0.019	0.018	0.017	0.018	0.016	0.017	0.017	0.018	8.729	
T 3-Chloro-1-propene	0.301	0.305	0.307	0.308	0.306	0.295	0.287	0.289	0.300	2.763	
T 2-Chloro-1,3-butadiene	0.348	0.368	0.380	0.385	0.382	0.371	0.361	0.364	0.370	3.335	
T Ethyl Acetate	0.144	0.163	0.169	0.166	0.171	0.152	0.159	0.159	0.160	5.700	
T Methacrylonitrile	0.076	0.087	0.089	0.088	0.089	0.080	0.083	0.083	0.084	5.535	
T Isobutyl Alcohol	0.004	0.006	0.006	0.005	0.005	0.004	0.005	0.006	0.005	13.176	
T 1-Butanol									0.000	0.000	
T Methyl methacrylate	0.146	0.173	0.185	0.185	0.188	0.171	0.177	0.178	0.175	7.640	
T 2-Nitropropane		0.063	0.071	0.071	0.076	0.070	0.075	0.074	0.071	6.228	
I Chlorobenzene-d5	ISTD										
I 1,4-Dichlorobenzene-d4	ISTD										
T Cyclohexanone		0.008	0.009	0.008	0.010	0.009	0.011	0.012	0.009	14.808	

Fri Jan 13 10:37:15 2017

T	1,2,3-Trichloropropane		0.159	0.184	0.214	0.219	0.207	0.203	0.203		0.1983	10.286	
T	trans-1,4-Dichloro-2-Butene		0.158	0.186	0.206	0.226	0.216	0.216	0.222	0.216	0.2057	11.014	
T	n-Propylbenzene	4.512	4.368	4.202	4.141	4.29	4.092	3.904	3.715		4.1531	6.1343	
T	Bromobenzene	0.731	0.746	0.865	0.838	0.838	0.841	0.795	0.766	0.751	0.7971	6.2596	
T	1,3,5-Trimethylbenzene		2.971	2.915	2.816	2.751	2.892	2.79	2.694	2.616	2.8057	4.226	
T	2-Chlorotoluene		3.148	3.108	2.942	2.882	3.046	2.675	2.588	2.548	2.8671	8.2441	
T	4-Chlorotoluene		2.827	2.515	2.528	2.44	2.358	2.492	2.39	2.276	2.4782	6.6453	
T	a-Methylstyrene					1.423	1.572	1.527	1.499	1.446	1.327	1.4656	5.9171
T	tert-Butylbenzene		0.527	0.521	0.518	0.542	0.524	0.508	0.495		0.5192	2.8616	
T	1,2,4-Trimethylbenzene		2.963	2.948	2.903	3.022	2.892	2.79	2.689		2.8866	3.9156	
T	sec-Butylbenzene		3.579	3.497	3.312	3.468	3.333	3.189	3.067		3.3494	5.39	
T	p-Isopropyltoluene			2.93	2.761	2.705	2.82	2.744	2.633	2.552	2.7352	4.5004	
T	1,3-Dichlorobenzene	1.768	1.634	1.586	1.576	1.591	1.552	1.482	1.43		1.5772	6.4005	
T	1,4-Dichlorobenzene	1.708	1.642	1.622	1.62	1.599	1.6	1.546	1.483	1.426	1.583	5.4062	
T	n-Butylbenzene			2.894	2.749	2.675	2.775	2.73	2.613	2.529	2.7091	4.3506	
T	1,2-Dichlorobenzene	1.468	1.534	1.524	1.504	1.501	1.505	1.469	1.398	1.342	1.4717	4.2873	
T	1,2-Dibromo-3-Chloropropane				0.12	0.144	0.146	0.15	0.147	0.147	0.1424	7.7877	
T	1,2,4-Trichlorobenzene		1.195	1.131	1.102	1.04	1.053	1.042	0.984	0.945	1.0615	7.5424	
T	Hexachlorobutadiene		0.394	0.37	0.365	0.336	0.355	0.337	0.322	0.313	0.3491	7.7311	
T	Naphthalene		2.574	2.48	2.443	2.43	2.428	2.392	2.268	2.152	2.396	5.4371	
T	1,2,3-Trichlorobenzene	1.012	1.188	1.009	0.987	0.983	0.979	0.947	0.896	0.858	0.9844	9.3675	

Tue May 30 12:32:10 2017

Login Number: L17060106 Run Date: 05/25/2017 Sample ID: WG615531-12
 Instrument ID: HPMS6 Run Time: 17:43 Method: 8260B
 File ID: 6M147600 Analyst: TMB QC Key: DOD4
 ICal Workgroup: WG615531 Cal ID: HPMS6 - 25-MAY-17

Analyte		Expected	Found	Units	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	20.0	20.7	ug/L	0.437	3.40	20	
Chloroform	CCC	20.0	18.4	ug/L	0.494	7.80	20	
Ethylbenzene	CCC	20.0	20.4	ug/L	0.553	2.00	20	
Toluene	CCC	20.0	19.8	ug/L	1.61	1.20	20	
Vinyl Chloride	CCC	20.0	21.8	ug/L	0.300	8.90	20	
1,1,2,2-Tetrachloroethane	SPCC	20.0	20.0	ug/L	0.766	0.100	20	
Chloromethane	SPCC	20.0	21.0	ug/L	0.429	5.10	20	
Bromoform	SPCC	20.0	18.9	ug/L	0.192	5.70	20	
Chlorobenzene	SPCC	20.0	20.1	ug/L	1.02	0.500	20	
1,1-Dichloroethene	SPCC	20.0	19.8	ug/L	0.529	0.800	20	
1,1,1-Trichloroethane		20.0	20.3	ug/L	0.419	1.30	20	
1,1,2-Trichloroethane		20.0	20.5	ug/L	0.300	2.40	20	
1,2-Dichloroethane		20.0	20.0	ug/L	0.355	0	20	
Acetone		20.0	18.6	ug/L	0.0555	6.80	20	
Benzene		20.0	19.7	ug/L	1.14	1.40	20	
Carbon Tetrachloride		20.0	21.3	ug/L	0.337	6.50	20	
Methylene Chloride		20.0	19.8	ug/L	0.291	1.20	20	
m-,p-Xylene		40.0	40.2	ug/L	0.670	0.400	20	
o-Xylene		20.0	20.7	ug/L	0.678	3.50	20	
Styrene		20.0	20.9	ug/L	1.16	4.50	20	
Tetrachloroethene		20.0	19.9	ug/L	0.337	0.600	20	
Trichloroethene		20.0	20.4	ug/L	0.256	2.20	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17060106 Run Date: 06/02/2017 Sample ID: WG616418-02
Instrument ID: HPMS6 Run Time: 15:18 Method: 8260B
File ID: 6M147743 Analyst: TMB QC Key: DOD4
Workgroup (AAB#): WG616419 Cal ID: HPMS6 - 25-MAY-17
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,2-Dichloropropane	CCC	50.0	50.7	ug/L	0.309	1.36	20	
1,1-Dichloroethene	CCC	50.0	50.9	ug/L	0.430	1.80	20	
Chloroform	CCC	50.0	46.0	ug/L	0.493	7.99	20	
Ethylbenzene	CCC	50.0	50.6	ug/L	0.548	1.11	20	
Toluene	CCC	50.0	48.4	ug/L	1.58	3.18	20	
Vinyl Chloride	CCC	50.0	43.0	ug/L	0.237	14.0	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	52.6	ug/L	0.804	5.15	20	
Bromoform	SPCC	50.0	55.2	ug/L	0.225	10.4	20	
Chlorobenzene	SPCC	50.0	48.9	ug/L	0.996	2.13	20	
Chloromethane	SPCC	50.0	38.3	ug/L	0.313	23.4	20	*
1,1-Dichloroethane	SPCC	50.0	49.8	ug/L	0.531	0.398	20	
Xylenes		150	148	ug/L	0.656	1.28	20	
1,1,1-Trichloroethane		50.0	50.6	ug/L	0.419	1.30	20	
1,1,2-Trichloroethane		50.0	52.6	ug/L	0.308	5.12	20	
1,2-Dichloroethane		50.0	51.7	ug/L	0.367	3.35	20	
Acetone		50.0	54.5	ug/L	0.0650	9.10	20	
Benzene		50.0	47.5	ug/L	1.10	4.98	20	
Carbon Tetrachloride		50.0	56.1	ug/L	0.354	12.2	20	
Methylene Chloride		50.0	48.5	ug/L	0.286	3.04	20	
m-,p-Xylene		100	97.8	ug/L	0.653	2.18	20	
o-Xylene		50.0	50.3	ug/L	0.659	0.529	20	
Styrene		50.0	51.5	ug/L	1.14	3.02	20	
Tetrachloroethene		50.0	49.7	ug/L	0.337	0.684	20	
Trichloroethene		50.0	49.8	ug/L	0.249	0.459	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

CCV - Modified 03/05/2008

PDF File ID: 5321232

Report generated 06/07/2017 08:23



Login Number: L17060106
Instrument ID: HPMS6
Workgroup (AAB#): WG616419

ICAL CCV Number: WG615531-08
CAL ID: HPMS6-25-MAY-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG615531-08	NA	NA	167733	318587	459042
Upper Limit	NA	NA	335466	637174	918084
Lower Limit	NA	NA	83867	159294	229521
<u>L17060106-01</u>	1.00	01	140317	281902	416035
<u>L17060106-02</u>	1.00	01	144860	292407	433307
WG616419-01	1.00	01	155171	308000	460394
WG616419-02	1.00	01	152958	294503	421977
WG616419-03	1.00	01	161047	314504	456607

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO MIDPOINT OF ICAL)

00857164

Login Number: L17060106
Instrument ID: HPMS6
Workgroup (AAB#): WG616419

ICAL CCV Number: WG615531-08
CAL ID: HPMS6-25-MAY-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG615531-08	NA	NA	18.16	15.13	11.25
Upper Limit	NA	NA	18.66	15.63	11.75
Lower Limit	NA	NA	17.66	14.63	10.75
<u>L17060106-01</u>	1.00	01	18.16	15.12	11.25
<u>L17060106-02</u>	1.00	01	18.16	15.12	11.25
WG616419-01	1.00	01	18.15	15.12	11.25
WG616419-02	1.00	01	18.16	15.13	11.25
WG616419-03	1.00	01	18.15	15.12	11.25

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



2.2 General Chromatography Data

2.2.1 LC/MS Data (6850)

2.2.1.1 Summary Data

Lab Report #: L17060106

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060106-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6444	Prep Method: 6850	Prep Date: 06/05/2017 15:49
Matrix: Water	Analytical Method: 6850	Cal Date: 04/24/2017 15:40
Workgroup #: WG616603	Analyst: WTD	Run Date: 06/05/2017 21:12
Collect Date: 05/31/2017 15:00	Dilution: 1	File ID: 1LM.LM39742
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.384	J,CT1	0.400	0.200	0.100
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regulatory limit.					

2.2.1.2 QC Summary Data

Example Calculation 6850 - Perchlorate**Concentration from Linear Regression****Step 1: Retrieve Curve Data From Plot, $y = mx + b$**

y = response ratio = response of analyte / response of internal standard (IS) = R_x/R_{istd}

x = amount ratio = concentration analyte/concentration internal standard (IS) = C_x / C_{istd}

m = slope from curve (1.45)

b = intercept from curve (-0.00242)

$y = 1.45x + -0.00242$

Step 2: Substitute the value for y

where $y = 12600/226000 = 0.055752$

Step 3: Solve for x

$x = (y - b)/m = 0.0040119$

Step 4: Solve for analyte concentration C_x

$C_x = (C_{is})(x) = (5 \text{ ug/L})(0.0040119) = 0.200594 \text{ ug/L}$

Example Calculation - Water:

Slope from curve, m :	1.45
Intercept from curve, b :	-0.00242
Response of analyte, R_x :	12600
Response of Internal Standard, R_{istd} :	226000
Concentration of IS, C_{istd} (ug/L):	5.00
Response Ratio:	0.05575
Amount Ratio:	0.04012
Analyte Concentration, C_x (ug/L) :	0.200594

Example Calculation - Soil:

Analyte Concentration, C_x (ug/L):	0.20059
Amount of soil extracted (g):	5.00
Final volume of extract (mL):	50.00
Percent solids (Pct wt.)	100
Concentration in soil (ug/kg):	2.005938

Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 042417_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG611327 (waters) Analytical WG611328 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: STD80234

Comments: ICAL WG611288 : Alternate Source STD80234
 Analytical Column : RPPX 5um (250x4.6mm)
 K'Prime S/N RPPX250-02115

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM39494	WG611288-01 CCB	1	1		04/24/17 13:27
2	1LM.LM39495	WG611288-02 STD (0.1 ug/L)	1	1	STD80232	04/24/17 13:46
3	1LM.LM39496	WG611288-03 STD (0.2 ug/L)	1	1	STD80232	04/24/17 14:05
4	1LM.LM39497	WG611288-04 STD (0.5 ug/L)	1	1	STD80232	04/24/17 14:24
5	1LM.LM39498	WG611288-05 STD (1.0 ug/L)	1	1	STD80232	04/24/17 14:43
6	1LM.LM39499	WG611288-06 STD (2.0 ug/L)	1	1	STD80232	04/24/17 15:02
7	1LM.LM39500	WG611288-07 STD (5.0 ug/L)	1	1	STD80232	04/24/17 15:21
8	1LM.LM39501	WG611288-08 STD (10 ug/L)	1	1	STD80232	04/24/17 15:40
9	1LM.LM39502	WG611288-09 SSCV (1.0 ug/L)	1	1	STD80234	04/24/17 15:59
10	1LM.LM39503	WG611330-01 CCB	1	1		04/24/17 16:18
11	1LM.LM39504	WG611330-02 CCV (1.0ug/L)	1	1	STD80232	04/24/17 16:37
12	1LM.LM39505	WG611327-07 MRL (0.2ug/L)	1	1	STD80232	04/24/17 16:56
13	1LM.LM39506	WG611327-01 MCT (0.2ug/L)	1	1	STD80234	04/24/17 17:14
14	1LM.LM39507	WG611327-02 BLANK	1	1		04/24/17 17:34
15	1LM.LM39508	WG611327-03 LCS (0.2ug/L)	1	1	STD80234	04/24/17 17:52
16	1LM.LM39509	L17040713-06 RS	1	1		04/24/17 18:11
17	1LM.LM39510	L17040713-07 MS	1	1	STD80234	04/24/17 18:30
18	1LM.LM39511	L17040713-08 MSD	1	1	STD80234	04/24/17 18:49
19	1LM.LM39512	L17040713-01	1	1		04/24/17 19:08
20	1LM.LM39513	L17040713-02	1	1		04/24/17 19:27
21	1LM.LM39514	L17040713-03	1	1		04/24/17 19:46
22	1LM.LM39515	L17040713-04	1	1		04/24/17 20:05
23	1LM.LM39516	WG611330-03 CCV (1.0ug/L)	1	1	STD80232	04/24/17 20:24
24	1LM.LM39517	WG611327-08 MRL (0.2ug/L)	1	1	STD80232	04/24/17 20:43
25	1LM.LM39518	WG611330-04 CCB	1	1		04/24/17 21:02
26	1LM.LM39519	L17040713-05	1	1		04/24/17 21:21
27	1LM.LM39520	L17040713-09	1	1		04/24/17 21:40
28	1LM.LM39521	L17040713-10	1	1		04/24/17 21:59
29	1LM.LM39522	L17040713-11	1	1		04/24/17 22:17
30	1LM.LM39523	L17040713-12	1	1		04/24/17 22:36
31	1LM.LM39524	L17040713-13	1	1		04/24/17 22:55
32	1LM.LM39525	WG611330-05 CCV (1.0ug/L)	1	1	STD80232	04/24/17 23:14
33	1LM.LM39526	WG611327-09 MRL (0.2ug/L)	1	1	STD80232	04/24/17 23:33

Page: 1

Approved: 25-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 042417_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG611327 (waters) Analytical WG611328 (waters)
 Internal STD: COA19471 Surrogate STD: NA STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 STD80234

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM39527	WG611328-07 MRL (0.2ug/L)	1	1	STD80232	04/24/17 23:52
35	1LM.LM39528	WG611330-06 CCB	1	1		04/25/17 00:11
36	1LM.LM39529	WG611328-01 MCT (0.2ug/L)	1	1	STD80234	04/25/17 00:30
37	1LM.LM39530	WG611328-02 BLANK	1	1		04/25/17 00:49
38	1LM.LM39531	WG611328-03 LCS (0.2ug/L)	1	1	STD80234	04/25/17 01:08
39	1LM.LM39532	L17040841-08 RS	1	1		04/25/17 01:27
40	1LM.LM39533	L17040841-09 MS	1	1	STD80234	04/25/17 01:46
41	1LM.LM39534	L17040841-10 MSD	1	1	STD80234	04/25/17 02:05
42	1LM.LM39535	L17040841-01	1	1		04/25/17 02:23
43	1LM.LM39536	L17040841-02	1	1		04/25/17 02:42
44	1LM.LM39537	L17040841-03	1	1		04/25/17 03:01
45	1LM.LM39538	L17040841-04	1	1		04/25/17 03:20
46	1LM.LM39539	WG611330-07 CCV (1.0ug/L)	1	1	STD80232	04/25/17 03:39
47	1LM.LM39540	WG611328-08 MRL (0.2ug/L)	1	1	STD80232	04/25/17 03:58
48	1LM.LM39541	WG611330-08 CCB	1	1		04/25/17 04:17
49	1LM.LM39542	L17040841-05	1	1		04/25/17 04:36
50	1LM.LM39543	L17040841-06	1	1		04/25/17 04:55
51	1LM.LM39544	L17040841-07	1	1		04/25/17 05:14
52	1LM.LM39545	L17040841-11	1	1		04/25/17 05:33
53	1LM.LM39546	L17040841-12	1	1		04/25/17 05:52
54	1LM.LM39547	L17040841-13	1	1		04/25/17 06:11
55	1LM.LM39548	WG611330-09 CCV (1.0ug/L)	1	1	STD80232	04/25/17 06:30
56	1LM.LM39549	WG611328-09 MRL (0.2ug/L)	1	1	STD80232	04/25/17 06:49
57	1LM.LM39550	WG611330-10 CCB	1	1		04/25/17 07:07

Comments

Seq.	Rerun	Dil.	Reason	Analytes
------	-------	------	--------	----------

Page: 2

Approved: 25-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 060517_WTD.TXT
 Analyst1: WTD Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: _____ Column 1 ID: KP-RPPX250 Column 2 ID: NA
L17051588, L17060106
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM39725	WG616602-01 CCB	1	1		06/05/17 15:49
2	1LM.LM39726	WG616602-02 CCV (1.0ug/L)	1	1	STD80232	06/05/17 16:08
3	1LM.LM39727	WG616603-07 MRL (0.2ug/L)	1	1	STD80232	06/05/17 16:27
4	1LM.LM39728	WG616603-01 MCT (0.2ug/L)	1	1	STD80234	06/05/17 16:46
5	1LM.LM39729	WG616603-02 BLANK	1	1		06/05/17 17:05
6	1LM.LM39730	WG616603-03 LCS (0.2ug/L)	1	1	STD80234	06/05/17 17:24
7	1LM.LM39731	L17051588-01 REF	1	1	STD80234	06/05/17 17:43
8	1LM.LM39732	L17051588-02 MS	1	1	STD80234	06/05/17 18:02
9	1LM.LM39733	L17051588-03 MSD	1	1	STD80234	06/05/17 18:21
10	1LM.LM39734	L17051588-04	1	1	STD80234	06/05/17 18:40
11	1LM.LM39735	L17051588-05	1	1	STD80234	06/05/17 18:59
12	1LM.LM39736	L17051588-06	1	1	STD80234	06/05/17 19:18
13	1LM.LM39737	L17051588-07	1	1	STD80234	06/05/17 19:37
14	1LM.LM39738	WG616602-03 CCV (1.0ug/L)	1	1	STD80232	06/05/17 19:56
15	1LM.LM39739	WG616603-08 MRL (0.2ug/L)	1	1	STD80232	06/05/17 20:15
16	1LM.LM39740	WG616602-04 CCB	1	1		06/05/17 20:34
17	1LM.LM39741	L17051588-08	1	1		06/05/17 20:53
18	1LM.LM39742	L17060106-01 (CT1)	1	1		06/05/17 21:12
19	1LM.LM39743	WG616602-05 CCV (1.0ug/L)	1	1	STD80232	06/05/17 21:31
20	1LM.LM39744	WG616603-09 MRL (0.2ug/L)	1	1	STD80232	06/05/17 21:49
21	1LM.LM39745	WG616602-06 CCB	1	1		06/05/17 22:08
22	1LM.LM39746	WG616602-07 CCB	1	1		06/06/17 08:31
23	1LM.LM39747	WG616602-08 CCV (1.0ug/L)	1	1	STD80232	06/06/17 08:50
24	1LM.LM39748	WG616603-10 MRL (0.2ug/L)	1	1	STD80232	06/06/17 09:09
25	1LM.LM39749	L17051588-02 MS	1	1	STD80234	06/06/17 09:28
26	1LM.LM39750	WG616602-09 CCV (1.0ug/L)	1	1	STD80232	06/06/17 09:47
27	1LM.LM39751	WG616603-11 QCMRL 0.2ug/L	1	1	STD80234	06/06/17 11:07
28	1LM.LM39752	WG616602-10 CCB	1	1		06/06/17 11:26

Comments

Seq.	Rerun	Dil.	Reason	Analytes
8				
L17051588-02 MS was inadvertently double spiked with internal standard. Re-prep and re-analysis performed.				

Page: 1

Approved: 06-JUN-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 060517_WTD.TXT
 Analyst1: WTD Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: _____ Column 1 ID: KP-RPPX250 Column 2 ID: NA
L17051588, L17060106
 Internal STD: COA19471 Surrogate STD: NA STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 NA

Comments

Seq.	Rerun	Dil.	Reason	Analytes
18				
			L17060106-01 - CT1 - Cooler temperature out of regulatory guidance specification for chemical testing.	
27				
			WG616603-11 - The nitrogen generator failed during analysis. Re started and re-ran.	

Page: 2

Approved: 06-JUN-17




Microbac Laboratories Inc.

Data Checklist

Date: 24-APR-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: WG611288
 Runlog ID: 81726
 Analytical Workgroups: L17040713, L17040841

ANALYTICAL	
System Performance Check	NA
DFTPP (GCMS)	NA
Endrin/DDT breakdown (8081/GCMS)	NA
Pentachlorophenol/benzidine tailing (GCMS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	NA
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (GCMS)	X
Continuing calibration blank (CCB) (IC/LCMS)	X
Limit of quantitation verification (LOQV) (LCMS)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	X
Library searches (GCMS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	JWR
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
25-APR-2017

John Richards

Secondary Reviewer:
25-APR-2017

Eri C. Zimm

CHECKLIST1 - Modified 03/05/2008

Generated: APR-25-2017 14:21:32



Microbac Laboratories Inc.

Data Checklist

Date: 05-JUN-2017
 Analyst: WTD
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 82593
 Analytical Workgroups: L17051588, L17060106

ANALYTICAL	
System Performance Check	X
DFTPP (GCMS)	NA
Endrin/DDT breakdown (8081/GCMS)	NA
Pentachlorophenol/benzidine tailing (GCMS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (GCMS)	X
Continuing calibration blank (CCB) (IC/LCMS)	X
Limit of quantitation verification (LOQV) (LCMS)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	NA
Internal standard areas (MS)	X
Library searches (GCMS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	WTD
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
06-JUN-2017



Secondary Reviewer:
06-JUN-2017




Analytical Method:6850
Login Number:L17060106

AAB#:WG616603

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6444	01	05/31/17					06/05/2017	5	28		06/05/17	.2	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060106 Work Group: WG616603
 Blank File ID: 1LM.LM39729 Blank Sample ID: WG616603-02
 Prep Date: 06/05/17 15:49 Instrument ID: LCMS1
 Analyzed Date: 06/05/17 17:05 Method: 6850
 Analyst: WTD

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG616603-07	1LM.LM39727	06/05/17 16:27	01
MCT	WG616603-01	1LM.LM39728	06/05/17 16:46	01
LCS	WG616603-03	1LM.LM39730	06/05/17 17:24	01
QCMRL	WG616603-08	1LM.LM39739	06/05/17 20:15	01
LH18/24-SP650-6444	L17060106-01	1LM.LM39742	06/05/17 21:12	01
QCMRL	WG616603-09	1LM.LM39744	06/05/17 21:49	01
QCMRL	WG616603-10	1LM.LM39748	06/06/17 09:09	01
QCMRL	WG616603-11	1LM.LM39751	06/06/17 11:07	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5324529
 Report generated 06/06/2017 15:43



Login Number: L17060106 Prep Date: 06/05/17 15:49 Sample ID: WG616603-02
Instrument ID: LCMS1 Run Date: 06/05/17 17:05 Prep Method: 6850
File ID: 1LM.LM39729 Analyst: WTD Method: 6850
Workgroup (AAB#): WG616603 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Perchlorate	0.100	0.400	0.100	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5324530
06-JUN-2017 15:43



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616603-03
Instrument ID: LCMS1 Run Time: 17:24 Prep Method: 6850
File ID: 1LM.LM39730 Analyst: WTD Method: 6850
Workgroup (AAB#): WG616603 Matrix: Water Units: ug/L
QC Key: DOD4 Lot#: STD80234 Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Perchlorate	0.200	0.226	113	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5324531
Report generated: 06/06/2017 15:43



Login Number: L17060106
Analytical Method: 6850
ICAL Workgroup: WG611288

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.286	4.98	1.00000	

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 5324533
Report generated 06/06/2017 15:43



Login Number: L17060106
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-02			WG611288-03			WG611288-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	21000.0000	1.332	0.200	38200.0000	1.222	0.500	104000.000	1.335

INT_CAL - Modified 03/06/2008
PDF File ID: 5324533
Report generated 06/06/2017 15:43



Login Number: L17060106
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-05			WG611288-06			WG611288-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	206000.000	1.288	2.00	412000.000	1.312	5.00	955000.000	1.270

INT_CAL - Modified 03/06/2008
PDF File ID: 5324533
Report generated 06/06/2017 15:43



Login Number: L17060106
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-08		
	CONC	RESP	RF
Perchlorate	10.0	1860000.00	1.244

INT_CAL - Modified 03/06/2008
PDF File ID: 5324533
Report generated 06/06/2017 15:43



Login Number: L17060106 Run Date: 04/24/2017 Sample ID: WG611288-09
Instrument ID: LCMS1 Run Time: 15:59 Method: 6850
File ID: 1LM.LM39502 Analyst: JWR QC Key: DOD4
ICal Workgroup: WG611288 Cal ID: LCMS1 - 24-APR-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	0.977	ug/L	1.24	2.30	15	

* Exceeds %D Limit



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616602-01
Instrument ID: LCMS1 Run Time: 15:49 Method: 6850
File ID: LLM.LM39725 Analyst: WTD Units: ug/L
Workgroup (AAB#): WG616603 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616602-04
Instrument ID: LCMS1 Run Time: 20:34 Method: 6850
File ID: LLM.LM39740 Analyst: WTD Units: ug/L
Workgroup (AAB#): WG616603 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616602-06
Instrument ID: LCMS1 Run Time: 22:08 Method: 6850
File ID: LLM.LM39745 Analyst: WTD Units: ug/L
Workgroup (AAB#): WG616603 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060106 Run Date: 06/06/2017 Sample ID: WG616602-07
Instrument ID: LCMS1 Run Time: 08:31 Method: 6850
File ID: LLM.LM39746 Analyst: WTD Units: ug/L
Workgroup (AAB#): WG616603 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060106 Run Date: 06/06/2017 Sample ID: WG616602-10
Instrument ID: LCMS1 Run Time: 11:26 Method: 6850
File ID: LLM.LM39752 Analyst: WTD Units: ug/L
Workgroup (AAB#): WG616603 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616602-02
Instrument ID: LCMS1 Run Time: 16:08 Method: 6850
File ID: 1LM.LM39726 Analyst: WTD QC Key: DOD4
Workgroup (AAB#): WG616603 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.05	ug/L	1.33	5.00	15	

* Exceeds %D Criteria



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616602-03
 Instrument ID: LCMS1 Run Time: 19:56 Method: 6850
 File ID: 1LM.LM39738 Analyst: WTD QC Key: DOD4
 Workgroup (AAB#): WG616603 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.05	ug/L	1.34	5.00	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5324535
 Report generated 06/06/2017 15:43



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616602-05
 Instrument ID: LCMS1 Run Time: 21:31 Method: 6850
 File ID: 1LM.LM39743 Analyst: WTD QC Key: DOD4
 Workgroup (AAB#): WG616603 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.08	ug/L	1.37	8.00	15	

* Exceeds %D Criteria



Login Number: L17060106 Run Date: 06/06/2017 Sample ID: WG616602-08
Instrument ID: LCMS1 Run Time: 08:50 Method: 6850
File ID: 1LM.LM39747 Analyst: WTD QC Key: DOD4
Workgroup (AAB#): WG616603 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.09	ug/L	1.38	9.00	15	

* Exceeds %D Criteria



Login Number: L17060106 Run Date: 06/06/2017 Sample ID: WG616602-09
 Instrument ID: LCMS1 Run Time: 09:47 Method: 6850
 File ID: 1LM.LM39750 Analyst: WTD QC Key: DOD4
 Workgroup (AAB#): WG616603 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.08	ug/L	1.37	8.00	15	

* Exceeds %D Criteria



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616603-07
 Instrument ID: LCMS1 Run Time: 16:27 Prep Method: 6850
 File ID: 1LM.LM39727 Analyst: WTD Method: 6850
 Workgroup (AAB#): WG616603 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.206	103	70 - 130	



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616603-08
 Instrument ID: LCMS1 Run Time: 20:15 Prep Method: 6850
 File ID: 1LM.LM39739 Analyst: WTD Method: 6850
 Workgroup (AAB#): WG616603 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.210	105	70 - 130	



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616603-09
 Instrument ID: LCMS1 Run Time: 21:49 Prep Method: 6850
 File ID: 1LM.LM39744 Analyst: WTD Method: 6850
 Workgroup (AAB#): WG616603 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.210	105	70 - 130	



Login Number: L17060106 Run Date: 06/06/2017 Sample ID: WG616603-10
Instrument ID: LCMS1 Run Time: 09:09 Prep Method: 6850
File ID: 1LM.LM39748 Analyst: WTD Method: 6850
Workgroup (AAB#): WG616603 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.209	105	70 - 130	



Login Number: L17060106 Run Date: 06/06/2017 Sample ID: WG616603-11
Instrument ID: LCMS1 Run Time: 11:07 Prep Method: 6850
File ID: 1LM.LM39751 Analyst: WTD Method: 6850
Workgroup (AAB#): WG616603 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.206	103	70 - 130	



Login Number: L17060106
Instrument ID: LCMS1
Workgroup (AAB#): WG616603

ICAL CCV Number: WG611288-05
CAL ID: LCMS1-24-APR-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG611288	NA	NA	777000
Upper Limit	NA	NA	1165500
Lower Limit	NA	NA	388500
<u>L17060106-01</u>	1.00	01	571000
WG616603-02	1.00	01	601000
WG616603-03	1.00	01	621000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: 6850	Samplenum: L17060106-01
Instrument: LCMS1	Prep Date: 06/05/2017 15:49	File ID: 1LM.LM39742
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 21:12	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	56300	18500	3.04	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG611288-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39495
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 04/24/2017 13:46	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	21000	6820	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG611288-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39496
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 04/24/2017 14:05	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	38200	13500	2.83	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG611288-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39497
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 04/24/2017 14:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	104000	33400	3.11	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG611288-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39498
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 04/24/2017 14:43	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	206000	65300	3.15	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG611288-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39499
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 04/24/2017 15:02	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	412000	130000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106
Instrument: LCMS1
Analyst: JWR
Worknum: WG616603

Prep Method: _____
Prep Date: _____
Anal Method: 6850
Analysis Date: 04/24/2017 15:21

Samplenum: WG611288-07
File ID: 1LM.LM39500
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	955000	298000	3.20	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG611288-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39501
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 04/24/2017 15:40	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1860000	603000	3.08	2.3	3.8	

Perchlorate Ion Ratios
 Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG611288-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39502
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 04/24/2017 15:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	197000	65000	3.03	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG616602-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39725
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 15:49	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1250	584	2.14	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG616602-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39726
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 16:08	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	166000	52000	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG616602-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39738
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 19:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	215000	67300	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG616602-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39740
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 20:34	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	1330	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG616602-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39743
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 21:31	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	225000	69400	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG616602-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39745
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 22:08	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2080	1070	1.94	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG616602-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39746
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/06/2017 08:31	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG616602-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39747
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/06/2017 08:50	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	199000	62300	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG616602-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39750
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/06/2017 09:47	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	221000	69700	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: _____	Samplenum: WG616602-10
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39752
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/06/2017 11:26	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: 6850	Samplenum: WG616603-01
Instrument: LCMS1	Prep Date: 06/05/2017 15:49	File ID: 1LM.LM39728
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 16:46	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	35200	12400	2.84	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: 6850	Samplenum: WG616603-02
Instrument: LCMS1	Prep Date: 06/05/2017 15:49	File ID: 1LM.LM39729
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 17:05	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2200	853	2.58	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: 6850	Samplenum: WG616603-03
Instrument: LCMS1	Prep Date: 06/05/2017 15:49	File ID: 1LM.LM39730
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 17:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	36600	10800	3.39	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: 6850	Samplenum: WG616603-07
Instrument: LCMS1	Prep Date: 06/05/2017 15:49	File ID: 1LM.LM39727
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 16:27	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	33300	11200	2.97	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: 6850	Samplenum: WG616603-08
Instrument: LCMS1	Prep Date: 06/05/2017 15:49	File ID: 1LM.LM39739
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 20:15	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	44600	14100	3.16	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: 6850	Samplenum: WG616603-09
Instrument: LCMS1	Prep Date: 06/05/2017 15:49	File ID: 1LM.LM39744
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/05/2017 21:49	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	45500	13900	3.27	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: 6850	Samplenum: WG616603-10
Instrument: LCMS1	Prep Date: 06/05/2017 15:49	File ID: 1LM.LM39748
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/06/2017 09:09	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	39900	12500	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060106	Prep Method: 6850	Samplenum: WG616603-11
Instrument: LCMS1	Prep Date: 06/05/2017 15:49	File ID: 1LM.LM39751
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG616603	Analysis Date: 06/06/2017 11:07	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	45700	14100	3.24	2.3	3.8	

2.3 General Chemistry Data

2.3.1 Method 9056

2.3.1.1 Summary Data

Lab Report #: L17060106

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060106-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6444	Prep Method: 9056	Prep Date: 06/05/2017 17:15
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG616628	Analyst: CAS	Run Date: 06/05/2017 18:51
Collect Date: 05/31/2017 15:00	Dilution: 5	File ID: I2_060517-08
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Sulfate	14808-79-8	33.6	CT1	10.0	5.00	2.50
CT1	Cooler temperature at sample receipt exceeded regulatory limit.					
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17060106

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060106-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6444	Prep Method: 9056	Prep Date: 06/05/2017 17:15
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG616628	Analyst: CAS	Run Date: 06/05/2017 19:10
Collect Date: 05/31/2017 15:00	Dilution: 50	File ID: I2_060517-09
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chloride	16887-00-6	462	CT1	20.0	10.0	5.00
CT1	Cooler temperature at sample receipt exceeded regulatory limit.					
J	Estimated value ; the analyte concentration was less than the LOQ.					

2.3.1.2 QC Summary Data

The concentrations (ppm) of the calibration standards and the resulting area counts are used to determine the equation of a linear or quadratic plot.

The slope and y-intercept of that line are used to calculate the quantity of the analyzed unknown samples.

Amount(ppm) = [(slope)(area count of unknown) + y-intercept](dilution)

(The slope is the amt/area also identified as the CF or calibration factor)

Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC2 Dataset: 041117 IC2 ICAL.SEQ
 Analyst1: CAS Analyst2: NA
 Method: IC01 SOP: 300/9056 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 160804254
 Eluent ID#: RGT39823

Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM

Internal STD: NA Surrogate STD: NA Calibration STD STD81395 (04-11-2017)
 CCV STD: STD81395 LCS STD: STD81396 MS/MSD STD: NA

Comments: ICAL WG609755: Alternate Source STD81396
 Guard Column: Ionpac AG14A (4x50mm)
 Dionex S/N 012640
 Analytical Column: Ionpac AS14A (4x250mm)
 Dionex S/N 010066
 Cond Suppressor: AERS 500 (4mm)
 Dionex S/N 140122040
 System Backpressure: 1836 psi

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I2_041117-01	ELUENT	1	1		04/11/17 16:16
2	I2_041117-02	DI WATER	1	1		04/11/17 16:35
3	I2_041117-03	WG609755-01 STD	1	1		04/11/17 16:55
4	I2_041117-04	WG609755-02 STD	1	1		04/11/17 17:14
5	I2_041117-05	WG609755-03 STD	1	1		04/11/17 17:33
6	I2_041117-06	WG609755-04 STD	1	1		04/11/17 17:52
7	I2_041117-07	WG609755-05 STD	1	1		04/11/17 18:11
8	I2_041117-08	WG609755-06 STD	1	1		04/11/17 18:31
9	I2_041117-09	WG609755-07 SSCV	1	1		04/11/17 18:50
10	I2_041117-10	LCRV @Level-6	1	1		04/11/17 19:09
11	I2_041117-11	LCRV @Level-4	1	1		04/11/17 19:28
12	I2_041117-12	LCRV @Level-2	1	1		04/11/17 19:48
13	I2_041117-13	LCRV @Level-0	1	1		04/11/17 20:07
14	I2_041117-14	END	1	1		04/11/17 20:26

Comments

Seq.	Rerun	Dil.	Reason	Analytes
------	-------	------	--------	----------

Page: 1

Approved: 12-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC2 Dataset: 060517 IC2.SEQ
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 161205254
 Eluent ID#: RGT40348

Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM
 Analytical WG616628 (Waters)
 Internal STD: NA Surrogate STD: NA Calibration STD STD81395 (04-11-2017)
 CCV STD: STD81395 LCS STD: STD81396 MS/MSD STD: STD81396

Comments: System Backpressure: 1744 psi

Sample L17060106-01 was analyzed at dilutions only due to its pre-run screen result for chloride, which was greater than 200 ppm.

Sample L17060149-01 was analyzed at a dilution only due to its pre-run screen result for chloride, which was greater than the calibration maximum.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I2_060517-01	ELUENT	1	1		06/05/17 16:36
2	I2_060517-02	DI WATER	1	1		06/05/17 16:56
3	I2_060517-03	WG616629-01 ANION CCV	1	1	STD81395	06/05/17 17:15
4	I2_060517-04	WG616629-02 ANION CCB	1	1		06/05/17 17:34
5	I2_060517-05	WG616628-01 ANION BLANK	1	1		06/05/17 17:53
6	I2_060517-06	WG616628-02 ANION LCS	1	1	STD81396	06/05/17 18:13
7	I2_060517-07	L17060046-01 (CL,SO4)	2	1		06/05/17 18:32
8	I2_060517-08	L17060106-01 (CL,SO4) 5x	1	5		06/05/17 18:51
9	I2_060517-09	L17060106-01 RR CL 50x	1	50		06/05/17 19:10
10	I2_060517-10	L17060124-01 (CL,SO4)	2	1		06/05/17 19:29
11	I2_060517-11	L17060126-01 (CL,SO4) REF	1	1		06/05/17 19:49
12	I2_060517-12	WG616628-04 DUP 0126-01	2	1		06/05/17 20:08
13	I2_060517-13	WG616628-05 MS 0126-01	2	1	STD81396	06/05/17 20:27
14	I2_060517-14	WG616628-06 MSD 0126-01	2	1	STD81396	06/05/17 20:46
15	I2_060517-15	WG616629-03 ANION CCV	1	1	STD81395	06/05/17 21:06
16	I2_060517-16	WG616629-04 ANION CCB	1	1		06/05/17 21:25
17	I2_060517-17	L17060149-01 (CL) 50x	2	50		06/05/17 21:44
18	I2_060517-18	L17060179-01 (CL,SO4)	1	1		06/05/17 22:03
19	I2_060517-19	L17060179-02 (CL,SO4)	1	1		06/05/17 22:23
20	I2_060517-20	L17060179-03 (CL,SO4)	1	1		06/05/17 22:42
21	I2_060517-21	L17060179-04 (CL,SO4)	1	1		06/05/17 23:01
22	I2_060517-22	L17060180-01 (CL,SO4)	1	1		06/05/17 23:20
23	I2_060517-23	L17060180-01 RR CL 5x	1	5		06/05/17 23:40
24	I2_060517-24	L17060180-02 (CL,SO4)	1	1		06/05/17 23:59
25	I2_060517-25	L17060180-02 RR CL 5x	1	5		06/06/17 00:18
26	I2_060517-26	L17060180-03 (CL,SO4)	1	1		06/06/17 00:37
27	I2_060517-27	WG616629-05 ANION CCV	1	1	STD81395	06/06/17 00:57
28	I2_060517-28	WG616629-06 ANION CCB	1	1		06/06/17 01:16
29	I2_060517-29	L17060180-04 (CL,SO4) REF	1	1		06/06/17 01:35
30	I2_060517-30	WG616628-08 DUP 0180-04	1	1		06/06/17 01:54

Page: 1

Approved: 06-JUN-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC2 Dataset: 060517 IC2.SEQ
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 161205254
 Eluent ID#: RGT40348

Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM
 Analytical WG616628 (Waters)
 Internal STD: NA Surrogate STD: NA STD81395 (04-11-2017)
 CCV STD: STD81395 LCS STD: STD81396 STD81396

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
31	I2_060517-31	L17060180-05 (CL,SO4)	1	1		06/06/17 02:14
32	I2_060517-32	L17060189-01 (CL,SO4)	2	1		06/06/17 02:33
33	I2_060517-33	L17060189-03 (CL,SO4)	2	1		06/06/17 02:52
34	I2_060517-34	L17060189-03 RR CL 5x	2	5		06/06/17 03:11
35	I2_060517-35	L17060189-05 (CL,SO4)	2	1		06/06/17 03:31
36	I2_060517-36	L17060189-05 RR CL 5x	2	5		06/06/17 03:50
37	I2_060517-37	L17060189-07 (CL,SO4)	2	1		06/06/17 04:09
38	I2_060517-38	WG616629-07 ANION CCV	1	1	STD81395	06/06/17 04:28
39	I2_060517-39	WG616629-08 ANION CCB	1	1		06/06/17 04:48
40	I2_060517-40	END	1	1		06/06/17 05:07

Comments

Seq.	Rerun	Dil.	Reason	Analytes

Page: 2

Approved: 06-JUN-17




Microbac Laboratories Inc.

Data Checklist

Date: 11-APR-2017
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC2
 Curve Workgroup: WG609755
 Runlog ID: 81498
 Analytical Workgroups: ICAL ONLY

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	NA
Endrin/DDT breakdown (8081/MS)	NA
Pentachlorophenol/benzidine tailing (MS)	NA
Eluent check (IC)/system pressure (HPLC)	1836PSI
Window standard (FID)	NA
Initial Calibration	X
Average RF	NA
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	NA
% D/% Drift	NA
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	NA
TCL hits	NA
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	NA
Recoveries	NA
Surrogate recoveries	NA
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	NA
TCL hits	NA
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	NA
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	X
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	CAS
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
12-APR-2017



Secondary Reviewer:
12-APR-2017




Microbac Laboratories Inc.

Data Checklist

Date: 05-JUN-2017
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC2
 Curve Workgroup: NA
 Runlog ID: 82582
 Analytical Workgroups: L17060046, 06-106, 06-124, 06-126, 06-149, 06-179, 06-180, 0189

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	NA
Endrin/DDT breakdown (8081/MS)	NA
Pentachlorophenol/benzidine tailing (MS)	NA
Eluent check (IC)/system pressure (HPLC)	1744 PSI
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	NA
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	X
Check for completeness	X
Primary Reviewer	CAS
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
06-JUN-2017



Secondary Reviewer:
06-JUN-2017




Analytical Method:9056
Login Number:L17060106

AAB#:WG616628

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6444	01	05/31/17					06/05/2017	5.1	2	*	06/05/17	5.2	2	*
LH18/24-SP650-6444	01	05/31/17					06/05/2017	5.1	2	*	06/05/17	5.2	2	*

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060106 Work Group: WG616628
 Blank File ID: I2_060517-05 Blank Sample ID: WG616628-01
 Prep Date: 06/05/17 17:15 Instrument ID: IC2
 Analyzed Date: 06/05/17 17:53 Method: 9056
 Analyst: CAS

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG616628-02	I2_060517-06	06/05/17 18:13	01
LH18/24-SP650-6444	L17060106-01	I2_060517-08	06/05/17 18:51	DL01
LH18/24-SP650-6444	L17060106-01	I2_060517-09	06/05/17 19:10	DL02
DUP	WG616628-04	I2_060517-12	06/05/17 20:08	01
DUP	WG616628-08	I2_060517-30	06/06/17 01:54	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5323717
 Report generated 06/06/2017 15:26



Login Number: L17060106 Prep Date: 06/05/17 17:15 Sample ID: WG616628-01
 Instrument ID: IC2 Run Date: 06/05/17 17:53 Prep Method: 9056
 File ID: I2_060517-05 Analyst: CAS Method: 9056
 Workgroup (AAB#): WG616628 Matrix: Water Units: mg/L
 Contract #: Cal ID: IC2-11-APR-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Chloride	0.100	0.400	0.100	1	U
Sulfate	0.500	2.00	0.500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5323718
 06-JUN-2017 15:26



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616628-02
Instrument ID: IC2 Run Time: 18:13 Prep Method: 9056
File ID: I2 060517-06 Analyst: CAS Method: 9056
Workgroup (AAB#): WG616628 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD81396 Cal ID: IC2-11-APR-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Chloride	8.00	8.24	103	90 - 110	
Sulfate	40.0	41.1	103	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5323719
Report generated: 06/06/2017 15:26



Login Number: L17060106
Analytical Method: 9056
ICAL Workgroup: WG609755

Instrument ID: IC2
Initial Calibration Date: 11-APR-17 18:31
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Chloride	4.765	8.91		0.99700
Sulfate	6.254	13.0		0.99600

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum



Login Number: L17060106
 Analytical Method: 9056

Instrument ID: IC2
 Initial Calibration Date: 11-APR-17 18:31
 Column ID: F

Analyte	WG609755-01			WG609755-02			WG609755-03		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloride	0.200	0.039000000 0	5.128	1.00	0.194000000	5.155	4.00	0.805000000	4.969
Sulfate	1.00	0.136000000	7.353	5.00	0.730000000	6.849	20.0	3.096000000	6.460

INT_CAL - Modified 03/06/2008
 PDF File ID: 5324848
 Report generated 06/06/2017 15:26



Login Number: L17060106
 Analytical Method: 9056

Instrument ID: IC2
 Initial Calibration Date: 11-APR-17 18:31
 Column ID: F

Analyte	WG609755-04			WG609755-05			WG609755-06		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloride	8.00	1.70500000	4.692	12.0	2.64500000	4.537	24.0	5.83700000	4.112
Sulfate	40.0	6.67400000	5.993	60.0	10.46500000	5.733	120	23.36900000	5.135

INT_CAL - Modified 03/06/2008
 PDF File ID: 5324848
 Report generated 06/06/2017 15:26



Login Number: L17060106 Run Date: 04/11/2017 Sample ID: WG609755-07
 Instrument ID: IC2 Run Time: 18:50 Method: 9056
 File ID: I2 041117-09 Analyst: CAS QC Key: DOD4
 ICal Workgroup: WG609755 Cal ID: IC2 - 11-APR-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Chloride	8.00	8.03	mg/L	4.73	0.400	10	
Sulfate	40.0	40.5	mg/L	6.04	1.20	10	

* Exceeds %D Limit



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616629-02
 Instrument ID: IC2 Run Time: 17:34 Method: 9056
 File ID: I2 060517-04 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG616628 Cal ID: IC2 - 11-APR-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.400	0.100	U
Sulfate	0.500	2.00	0.500	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616629-04
 Instrument ID: IC2 Run Time: 21:25 Method: 9056
 File ID: I2 060517-16 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG616628 Cal ID: IC2 - 11-APR-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.400	0.100	U
Sulfate	0.500	2.00	0.500	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616629-01
Instrument ID: IC2 Run Time: 17:15 Method: 9056
File ID: I2 060517-03 Analyst: CAS QC Key: DOD4
Workgroup (AAB#): WG616628 Cal ID: IC2 - 11-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.21	mg/L	4.62	2.58	10	
Sulfate	40.0	41.3	mg/L	5.92	3.13	10	

* Exceeds %D Criteria



Login Number: L17060106 Run Date: 06/05/2017 Sample ID: WG616629-03
 Instrument ID: IC2 Run Time: 21:06 Method: 9056
 File ID: I2 060517-15 Analyst: CAS QC Key: DOD4
 Workgroup (AAB#): WG616628 Cal ID: IC2 - 11-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.23	mg/L	4.61	2.84	10	
Sulfate	40.0	41.6	mg/L	5.86	4.08	10	

* Exceeds %D Criteria



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
June 16, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
ALS - ADRIANE L. STEED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BLG - BRENDA L. GREENWALT	BNB - Brandi N. Bentley
BRG - BRENDA R. GREGORY	CAS - Craig A. Smith
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL	CV - Carl Volkman
DAK - DEAN A. KETELSEN	DCM - DAVID C. MERCKLE
DEV - DAVID E. VANDENBERG	DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER	DLP - DOROTHY L. PAYNE
DSM - DAVID S. MOSSOR	DTG - DOMINIC T. GEHRET
ECL - ERIC C. LAWSON	EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER	FJB - FRANCES J. BOLDEN
HRF - HEATHER R. FAIRCHILD	JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH	JKP - JACQUELINE K. PARSONS
JLD - JESSICA L. DELONG	JST - JOSHUA S. TAYLOR
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KDD - Katelyn D. Daley
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRP - KATHY R. PARSONS	LJH - Lacey J. Hendershot
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
OJE - OMOYEMWEN J. ENGLISH	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCA - SUEELLEN C. ADAMS
SCB - SARAH C. BOGOLIN	SCJ - SUE ELLEN C. JOHNSON
SDC - SHALYN D. CONLEY	TB - TODD BOYLE
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	ZTB - ZACH T. BARNES

List of Valid Qualifiers

June 16, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample receipt exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentatively identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound



List of Valid Qualifiers

June 16, 2017

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below



CHAIN OF CUSTODY

Name Of Lab Shipping To: MICROBAC (740) 373-4071 ATTN: STEPHANIE MOSSBURG

Project: AECOM LONGHORN ARMY AMMIN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS		Project No.: 60256135.GWTPT HRUMAR16	
Job: GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES			
Prepared By: Scott Beesinger		P.O Number	
Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD
LH18/24-SP650-6444	Water	05/31/17 / 15:00	3
LH18/24-SP650-6444	Water	05/31/17 / 15:00	2
Trip Blank	Water	05/31/17	2

Analyses		Remarks (Preservatives, etc.)	Lab I.D.#
VOG	CHLORIDE, SULFATE		
3	1	HCL	
3	1	NONE	
2	1	HCL	

Microbac OVD
 Received: 06/02/2017 09:34
 By: BRENDA GREGORY
 221000101556

Stephanie Mossburg

Additional Remarks: STANDARD TAT ON ALL PARAMETERS. EMAIL RESULTS TO info@microbac.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	05/31/17	15:30									

9 For Lab Use Only Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly



COOLER TEMP >6° C LOG

Cooler ID 1556

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C
LH18/24-SP650-6444	8					
Trip Blank	8					
<p><i>Blg 6/2/17</i></p>						

pH Exceptions

pH Lot # HC601354

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6
<p>PRESERVATIVE EXCEPTIONS</p> <p>NONE</p> <p><input checked="" type="checkbox"/> AS NOTED</p>						

Document Control # 1957
Last 10-07-2016

Issued to: Document Master File

Blg 6/2/17

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17060106

Account: 2551

Project: 2551.096

Samples: 2

Due Date: 13-JUN-2017

Samplenum Container ID Products

L17060106-01 916333

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	L1	02-JUN-2017 10:11	CLS		
2	ANALYZ	L1	ORG4	02-JUN-2017 13:14	JST	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	L1	02-JUN-2017 10:11	CLS		
2	ANALYZ	L1	ORG4	02-JUN-2017 13:14	JST	CLS	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	L1	02-JUN-2017 10:11	CLS		
2	ANALYZ	L1	ORG4	02-JUN-2017 13:14	JST	CLS	

Samplenum Container ID Products

L17060106-01 916334 9056 826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER		02-JUN-2017 10:11	CLS		

Samplenum Container ID Products

L17060106-01 916335 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	02-JUN-2017 10:11	CLS		
2	ANALYZ	W1	SEM	05-JUN-2017 14:04	WTD	CLS	
3	ANALYZ	SEM	A1	08-JUN-2017 08:59	CLS	WTD	

Samplenum Container ID Products

L17060106-02 916336

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	L1	02-JUN-2017 10:11	CLS		
2	ANALYZ	L1	ORG4	02-JUN-2017 13:14	JST	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	L1	02-JUN-2017 10:11	CLS		
2	ANALYZ	L1	ORG4	02-JUN-2017 13:14	JST	CLS	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
 Total Halide by Bomb Combustion (TX)
 Particle Sizing - 200 Mesh (PS200)
 Specific Gravity/Density (SPGRAV)
 Total Residual Chlorine (CL-TRL)
 Total Volatile Solids (all forms) (TVS)
 Total Coliform Bacteria (all methods)
 Fecal Coliform Bacteria (all methods)
 Sulfite (SO₃)
 Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS

Nitrogen, Ammonia by Method 350.1
 Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
 Phenolics, Total by Method 420.1
 ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
 Acetic acid
 Butyric acid
 Lactic acid
 Propionic acid
 Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
 1-Methylnaphthalene
 1,4-Dioxane
 Atrazine
 Benzaldehyde
 Biphenyl
 Caprolactam
 Hexamethylphosphoramide (HMPA)
 Pentachlorobenzene
 Pentachloroethane

NELAP Accreditation by Laboratory SOP**NONPOTABLE WATER**OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALSOVD MSS01/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP**SOLID AND HAZARDOUS CHEMICALS**OVD MSV01/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)



Laboratory Report Number: L17060482

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on June 22 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Microbac Laboratories * Ohio Valley Division
158 Starlite Drive, Marietta, OH 45750 * T: (740) 373-4071 F: (740) 373-4835 * www.microbac.com

Lab Report #: L17060482

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

The following discrepancies were noted:

Discrepancy	Resolution
LH18/24-SP140-7447-Grab : the CR-6 was received out of hold. CLS	Client notified, please proceed. ALS

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0011846	H	1.0		1Z4984890169489494	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	No
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	NA

**Lab Report #:** L17060482**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP140-7447-GRAB	L17060482-01	06/07/2017 15:00	06/09/2017 10:09



Login Number: L17060482
Department: Conventionals
Analyst: Dorothy Payne

METHOD

Analysis SM3500Cr-D/7196A (Hexavalent Chromium)

HOLDING TIMES

Sample Analysis: The samples were received past the recommended hold time. The analysis was performed out of hold per client's request.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 126502

Approved By: Sarah Vandenberg

A handwritten signature in cursive script that reads "Sarah Vandenberg".



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Eric Lawson		Chemist III	2017-06-14 20:18:39



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

There are no exceptions.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Kim Rhodes		Analyst III	2017-06-22 18:54:47



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports	X				
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?					
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?	X				
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Kim Rhodes		Analyst III	2017-06-22 18:53:34



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports	X				
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?					
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?	X				
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-22 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-16 16:48:46



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?		X			
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060482
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

The sample was received past the 24 hour holding time.

Lab Report #: L17060482
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060482-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP140-7447-GRAB	Prep Method: 6850	Prep Date: 06/13/2017 14:30
Matrix: Water	Analytical Method: 6850	Cal Date: 04/24/2017 15:40
Workgroup #: WG617701	Analyst: JWR	Run Date: 06/13/2017 17:32
Collect Date: 06/07/2017 15:00	Dilution: 10000	File ID: 1LM.LM39826
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	10900		4000	2000	1000

Certificate of Analysis

Sample #: L17060482-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: LH18/24-SP140-7447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 11:40
Matrix: Water	Analytical Method: 6010C	Cal Date: 06/14/2017 13:33
Workgroup #: WG617838	Analyst: KKB	Run Date: 06/14/2017 18:46
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: T4.061417.184600
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Selenium, Total	7782-49-2	0.0800	U	0.0800	0.0800	0.0400
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060482
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060482-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP140-7447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 08:11
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/14/2017 09:42
Workgroup #: WG617731	Analyst: JYH	Run Date: 06/14/2017 11:36
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: NI.061417.113607
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Silver, Total	7440-22-4	0.00100	U	0.00200	0.00100	0.000500
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060482
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060482-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP140-7447-GRAB	Prep Method: 7196A	Prep Date: N/A
Matrix: Water	Analytical Method: 7196A	Cal Date: 06/05/2017 10:10
Workgroup #: WG617322	Analyst: DLP	Run Date: 06/09/2017 15:00
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: 00.1706091500-05
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chromium, Hexavalent	18540-29-9	0.0100	U,H1	0.0200	0.0100	0.00500
U,H1	Not detected; Sample analysis performed past holding time.					

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17060482

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060482-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP140-7447-GRAB	Prep Method: 6850	Prep Date: 06/13/2017 14:30
Matrix: Water	Analytical Method: 6850	Cal Date: 04/24/2017 15:40
Workgroup #: WG617701	Analyst: JWR	Run Date: 06/13/2017 17:32
Collect Date: 06/07/2017 15:00	Dilution: 10000	File ID: 1LM.LM39826
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	10900		4000	2000	1000

2.1.1.2 QC Summary Data

Example Calculation 6850 - Perchlorate**Concentration from Linear Regression****Step 1: Retrieve Curve Data From Plot, $y = mx + b$**

y = response ratio = response of analyte / response of internal standard (IS) = R_x/R_{istd}

x = amount ratio = concentration analyte/concentration internal standard (IS) = C_x / C_{istd}

m = slope from curve (1.45)

b = intercept from curve (-0.00242)

$y = 1.45x + -0.00242$

Step 2: Substitute the value for y

where $y = 12600/226000 = 0.055752$

Step 3: Solve for x

$x = (y - b)/m = 0.0040119$

Step 4: Solve for analyte concentration C_x

$C_x = (C_{is})(x) = (5 \text{ ug/L})(0.0040119) = 0.200594 \text{ ug/L}$

Example Calculation - Water:

Slope from curve, m :	1.45
Intercept from curve, b :	-0.00242
Response of analyte, R_x :	12600
Response of Internal Standard, R_{istd} :	226000
Concentration of IS, C_{istd} (ug/L):	5.00
Response Ratio:	0.05575
Amount Ratio:	0.04012
Analyte Concentration, C_x (ug/L) :	0.200594

Example Calculation - Soil:

Analyte Concentration, C_x (ug/L):	0.20059
Amount of soil extracted (g):	5.00
Final volume of extract (mL):	50.00
Percent solids (Pct wt.)	100
Concentration in soil (ug/kg):	2.005938

Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 042417_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG611327 (waters) Analytical WG611328 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: STD80234

Comments: ICAL WG611288 : Alternate Source STD80234
 Analytical Column : RPPX 5um (250x4.6mm)
 K'Prime S/N RPPX250-02115

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM39494	WG611288-01 CCB	1	1		04/24/17 13:27
2	1LM.LM39495	WG611288-02 STD (0.1 ug/L)	1	1	STD80232	04/24/17 13:46
3	1LM.LM39496	WG611288-03 STD (0.2 ug/L)	1	1	STD80232	04/24/17 14:05
4	1LM.LM39497	WG611288-04 STD (0.5 ug/L)	1	1	STD80232	04/24/17 14:24
5	1LM.LM39498	WG611288-05 STD (1.0 ug/L)	1	1	STD80232	04/24/17 14:43
6	1LM.LM39499	WG611288-06 STD (2.0 ug/L)	1	1	STD80232	04/24/17 15:02
7	1LM.LM39500	WG611288-07 STD (5.0 ug/L)	1	1	STD80232	04/24/17 15:21
8	1LM.LM39501	WG611288-08 STD (10 ug/L)	1	1	STD80232	04/24/17 15:40
9	1LM.LM39502	WG611288-09 SSCV (1.0 ug/L)	1	1	STD80234	04/24/17 15:59
10	1LM.LM39503	WG611330-01 CCB	1	1		04/24/17 16:18
11	1LM.LM39504	WG611330-02 CCV (1.0ug/L)	1	1	STD80232	04/24/17 16:37
12	1LM.LM39505	WG611327-07 MRL (0.2ug/L)	1	1	STD80232	04/24/17 16:56
13	1LM.LM39506	WG611327-01 MCT (0.2ug/L)	1	1	STD80234	04/24/17 17:14
14	1LM.LM39507	WG611327-02 BLANK	1	1		04/24/17 17:34
15	1LM.LM39508	WG611327-03 LCS (0.2ug/L)	1	1	STD80234	04/24/17 17:52
16	1LM.LM39509	L17040713-06 RS	1	1		04/24/17 18:11
17	1LM.LM39510	L17040713-07 MS	1	1	STD80234	04/24/17 18:30
18	1LM.LM39511	L17040713-08 MSD	1	1	STD80234	04/24/17 18:49
19	1LM.LM39512	L17040713-01	1	1		04/24/17 19:08
20	1LM.LM39513	L17040713-02	1	1		04/24/17 19:27
21	1LM.LM39514	L17040713-03	1	1		04/24/17 19:46
22	1LM.LM39515	L17040713-04	1	1		04/24/17 20:05
23	1LM.LM39516	WG611330-03 CCV (1.0ug/L)	1	1	STD80232	04/24/17 20:24
24	1LM.LM39517	WG611327-08 MRL (0.2ug/L)	1	1	STD80232	04/24/17 20:43
25	1LM.LM39518	WG611330-04 CCB	1	1		04/24/17 21:02
26	1LM.LM39519	L17040713-05	1	1		04/24/17 21:21
27	1LM.LM39520	L17040713-09	1	1		04/24/17 21:40
28	1LM.LM39521	L17040713-10	1	1		04/24/17 21:59
29	1LM.LM39522	L17040713-11	1	1		04/24/17 22:17
30	1LM.LM39523	L17040713-12	1	1		04/24/17 22:36
31	1LM.LM39524	L17040713-13	1	1		04/24/17 22:55
32	1LM.LM39525	WG611330-05 CCV (1.0ug/L)	1	1	STD80232	04/24/17 23:14
33	1LM.LM39526	WG611327-09 MRL (0.2ug/L)	1	1	STD80232	04/24/17 23:33

Page: 1

Approved: 25-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 042417_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG611327 (waters) Analytical WG611328 (waters)
 Internal STD: COA19471 Surrogate STD: NA STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 STD80234

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM39527	WG611328-07 MRL (0.2ug/L)	1	1	STD80232	04/24/17 23:52
35	1LM.LM39528	WG611330-06 CCB	1	1		04/25/17 00:11
36	1LM.LM39529	WG611328-01 MCT (0.2ug/L)	1	1	STD80234	04/25/17 00:30
37	1LM.LM39530	WG611328-02 BLANK	1	1		04/25/17 00:49
38	1LM.LM39531	WG611328-03 LCS (0.2ug/L)	1	1	STD80234	04/25/17 01:08
39	1LM.LM39532	L17040841-08 RS	1	1		04/25/17 01:27
40	1LM.LM39533	L17040841-09 MS	1	1	STD80234	04/25/17 01:46
41	1LM.LM39534	L17040841-10 MSD	1	1	STD80234	04/25/17 02:05
42	1LM.LM39535	L17040841-01	1	1		04/25/17 02:23
43	1LM.LM39536	L17040841-02	1	1		04/25/17 02:42
44	1LM.LM39537	L17040841-03	1	1		04/25/17 03:01
45	1LM.LM39538	L17040841-04	1	1		04/25/17 03:20
46	1LM.LM39539	WG611330-07 CCV (1.0ug/L)	1	1	STD80232	04/25/17 03:39
47	1LM.LM39540	WG611328-08 MRL (0.2ug/L)	1	1	STD80232	04/25/17 03:58
48	1LM.LM39541	WG611330-08 CCB	1	1		04/25/17 04:17
49	1LM.LM39542	L17040841-05	1	1		04/25/17 04:36
50	1LM.LM39543	L17040841-06	1	1		04/25/17 04:55
51	1LM.LM39544	L17040841-07	1	1		04/25/17 05:14
52	1LM.LM39545	L17040841-11	1	1		04/25/17 05:33
53	1LM.LM39546	L17040841-12	1	1		04/25/17 05:52
54	1LM.LM39547	L17040841-13	1	1		04/25/17 06:11
55	1LM.LM39548	WG611330-09 CCV (1.0ug/L)	1	1	STD80232	04/25/17 06:30
56	1LM.LM39549	WG611328-09 MRL (0.2ug/L)	1	1	STD80232	04/25/17 06:49
57	1LM.LM39550	WG611330-10 CCB	1	1		04/25/17 07:07

Comments

Seq.	Rerun	Dil.	Reason	Analytes
------	-------	------	--------	----------

Page: 2

Approved: 25-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 061317_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG617701 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: Samples L17060482-01 and L17060570(-01,-02,-03,-05,-06,-08,-09,-14) were analyzed at dilutions based on their historical results.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM39818	WG617708-01 CCB	1	1		06/13/17 15:01
2	1LM.LM39819	WG617708-02 CCV (1.0ug/L)	1	1	STD80232	06/13/17 15:19
3	1LM.LM39820	WG617701-05 MRL (0.2ug/L)	1	1	STD80232	06/13/17 15:38
4	1LM.LM39821	WG617701-01 MCT (0.2ug/L)	1	1	STD80234	06/13/17 15:57
5	1LM.LM39822	WG617701-02 BLANK	1	1		06/13/17 16:16
6	1LM.LM39823	WG617701-03 LCS (0.2ug/L)	1	1	STD80234	06/13/17 16:35
7	1LM.LM39824	WG617701-04 LCS2 (0.2ug/L)	1	1	STD80234	06/13/17 16:54
8	1LM.LM39825	L17060311-01	1	1		06/13/17 17:13
9	1LM.LM39826	L17060482-01 (10,000x)	1	10000		06/13/17 17:32
10	1LM.LM39827	L17060484-01	1	1		06/13/17 17:51
11	1LM.LM39828	L17060570-01 (100x)	1	100		06/13/17 18:10
12	1LM.LM39829	L17060570-02 (10,000x)(NR)	1	10000		06/13/17 18:29
13	1LM.LM39830	L17060570-03 (10,000x)	1	10000		06/13/17 18:48
14	1LM.LM39831	WG617708-03 CCV (1.0ug/L)	1	1	STD80232	06/13/17 19:07
15	1LM.LM39832	WG617701-06 MRL (0.2ug/L)	1	1	STD80232	06/13/17 19:26
16	1LM.LM39833	WG617708-04 CCB	1	1		06/13/17 19:45
17	1LM.LM39834	L17060570-05 (100x)(NR)	1	100		06/13/17 20:04
18	1LM.LM39835	L17060570-06 (1,000x)	1	1000		06/13/17 20:23
19	1LM.LM39836	L17060570-08 (10,000x)(NR)	1	10000		06/13/17 20:42
20	1LM.LM39837	L17060570-09 (50x)	1	50		06/13/17 21:01
21	1LM.LM39838	L17060570-10	1	1		06/13/17 21:20
22	1LM.LM39839	L17060570-11	1	1		06/13/17 21:39
23	1LM.LM39840	L17060570-12	1	1		06/13/17 21:58
24	1LM.LM39841	L17060570-14 (50,000x)	1	50000		06/13/17 22:17
25	1LM.LM39842	WG617708-05 CCV (1.0ug/L)	1	1	STD80232	06/13/17 22:36
26	1LM.LM39843	WG617701-07 MRL (0.2ug/L)	1	1	STD80232	06/13/17 22:55
27	1LM.LM39844	WG617708-06 CCB	1	1		06/13/17 23:14
28	1LM.LM39845	WG617708-07 CCV (1.0ug/L)	1	1	STD80232	06/14/17 11:24
29	1LM.LM39846	WG617701-08 MRL (0.2ug/L)	1	1	STD80232	06/14/17 11:43
30	1LM.LM39847	WG617708-08 CCB	1	1		06/14/17 12:02
31	1LM.LM39848	L17060570-02 (RR 1,000x)	1	1000		06/14/17 12:21
32	1LM.LM39849	L17060570-05 (RR Neat)	1	1		06/14/17 12:40
33	1LM.LM39850	L17060570-08 (RR 100x)	1	100		06/14/17 12:59

Page: 1

Approved: 14-JUN-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 061317_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG617701 (waters)
 Internal STD: COA19471 Surrogate STD: NA STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM39851	WG617708-09 CCV (1.0ug/L)	1	1	STD80232	06/14/17 13:18
35	1LM.LM39852	WG617701-09 MRL (0.2ug/L)	1	1	STD80232	06/14/17 13:37
36	1LM.LM39853	WG617708-10 CCB	1	1		06/14/17 13:56

Comments

Seq.	Rerun	Dil.	Reason	Analytes
12	X	1000	Analyzed too dilute	
			L17060570-02 (10,000x)(NR) : This sample was reanalyzed at a 1,000x dilution on the end of this run.	
17	X	1	Analyzed too dilute	
			L17060570-05 (100x)(NR) : This sample was reanalyzed as neat on the end of this run.	
19	X	100	Analyzed too dilute	
			L17060570-08 (10,000x)(NR) : This sample was reanalyzed at a 100x dilution on the end of this run.	

Eri C. Zimm



Microbac Laboratories Inc.

Data Checklist

Date: 24-APR-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: WG611288
 Runlog ID: 81726
 Analytical Workgroups: L17040713, L17040841

ANALYTICAL	
System Performance Check	NA
DFTPP (GCMS)	NA
Endrin/DDT breakdown (8081/GCMS)	NA
Pentachlorophenol/benzidine tailing (GCMS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	NA
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (GCMS)	X
Continuing calibration blank (CCB) (IC/LCMS)	X
Limit of quantitation verification (LOQV) (LCMS)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	X
Library searches (GCMS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	JWR
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
25-APR-2017

John Richards

Secondary Reviewer:
25-APR-2017

Eri C. Zimm

CHECKLIST1 - Modified 03/05/2008

Generated: APR-25-2017 14:21:32



Microbac Laboratories Inc.

Data Checklist

Date: 13-JUN-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 82758
 Analytical Workgroups: L17060311, L17060482, L17060484, L17060570

ANALYTICAL	
System Performance Check	NA
DFTPP (GCMS)	NA
Endrin/DDT breakdown (8081/GCMS)	NA
Pentachlorophenol/benzidine tailing (GCMS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (GCMS)	X
Continuing calibration blank (CCB) (IC/LCMS)	X
Limit of quantitation verification (LOQV) (LCMS)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	X
Library searches (GCMS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	
Check for completeness	X
Primary Reviewer	JWR
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
14-JUN-2017



Secondary Reviewer:
14-JUN-2017




Analytical Method:6850
Login Number:L17060482

AAB#:WG617701

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP140-7447-GRAB	01	06/07/17					06/13/2017	6	28		06/13/17	.1	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060482 Work Group: WG617701
 Blank File ID: 1LM.LM39822 Blank Sample ID: WG617701-02
 Prep Date: 06/13/17 14:30 Instrument ID: LCMS1
 Analyzed Date: 06/13/17 16:16 Method: 6850
 Analyst: JWR

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG617701-05	1LM.LM39820	06/13/17 15:38	01
MCT	WG617701-01	1LM.LM39821	06/13/17 15:57	01
LCS	WG617701-03	1LM.LM39823	06/13/17 16:35	01
LCS2	WG617701-04	1LM.LM39824	06/13/17 16:54	01
LH18/24-SP140-7447-GRAB	L17060482-01	1LM.LM39826	06/13/17 17:32	DL01
QCMRL	WG617701-06	1LM.LM39832	06/13/17 19:26	01
QCMRL	WG617701-07	1LM.LM39843	06/13/17 22:55	01
QCMRL	WG617701-08	1LM.LM39846	06/14/17 11:43	01
QCMRL	WG617701-09	1LM.LM39852	06/14/17 13:37	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5337222
 Report generated 06/14/2017 16:37



Login Number: L17060482 Prep Date: 06/13/17 14:30 Sample ID: WG617701-02
 Instrument ID: LCMS1 Run Date: 06/13/17 16:16 Prep Method: 6850
 File ID: 1LM.LM39822 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Perchlorate	0.100	0.400	0.100	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5337223
 14-JUN-2017 16:37



Login Number: L17060482 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG617701 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG617701-03 LCS File ID: 1LM.LM39823 Run Date: 06/13/2017 16:35
 Sample ID: WG617701-04 LCS2 File ID: 1LM.LM39824 Run Date: 06/13/2017 16:54

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.206	103	0.200	0.207	104	0.484	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5337224
 Report generated: 06/14/2017 16:37



Login Number: L17060482
Analytical Method: 6850
ICAL Workgroup: WG611288

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.286	4.98	1.00000	

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 5337554
Report generated 06/14/2017 16:37



Login Number: L17060482
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-02			WG611288-03			WG611288-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	21000.0000	1.332	0.200	38200.0000	1.222	0.500	104000.000	1.335

INT_CAL - Modified 03/06/2008
PDF File ID: 5337554
Report generated 06/14/2017 16:37



Login Number: L17060482
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-05			WG611288-06			WG611288-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	206000.000	1.288	2.00	412000.000	1.312	5.00	955000.000	1.270

INT_CAL - Modified 03/06/2008
PDF File ID: 5337554
Report generated 06/14/2017 16:37



Login Number: L17060482
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-08		
	CONC	RESP	RF
Perchlorate	10.0	1860000.00	1.244

INT_CAL - Modified 03/06/2008
PDF File ID: 5337554
Report generated 06/14/2017 16:37



Login Number: L17060482 Run Date: 04/24/2017 Sample ID: WG611288-09
 Instrument ID: LCMS1 Run Time: 15:59 Method: 6850
 File ID: 1LM.LM39502 Analyst: JWR QC Key: DOD4
 ICal Workgroup: WG611288 Cal ID: LCMS1 - 24-APR-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	0.977	ug/L	1.24	2.30	15	

* Exceeds %D Limit



Login Number: L17060482 Run Date: 06/13/2017 Sample ID: WG617708-01
Instrument ID: LCMS1 Run Time: 15:01 Method: 6850
File ID: 1LM.LM39818 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060482 Run Date: 06/13/2017 Sample ID: WG617708-04
 Instrument ID: LCMS1 Run Time: 19:45 Method: 6850
 File ID: LLM.LM39833 Analyst: JWR Units: ug/L
 Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5337227
 Report generated 06/14/2017 16:37



Login Number: L17060482 Run Date: 06/13/2017 Sample ID: WG617708-06
Instrument ID: LCMS1 Run Time: 23:14 Method: 6850
File ID: LLM.LM39844 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 5337227
Report generated 06/14/2017 16:37



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617708-08
Instrument ID: LCMS1 Run Time: 12:02 Method: 6850
File ID: LLM.LM39847 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617708-10
Instrument ID: LCMS1 Run Time: 13:56 Method: 6850
File ID: LLM.LM39853 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 5337227
Report generated 06/14/2017 16:37



Login Number: L17060482 Run Date: 06/13/2017 Sample ID: WG617708-02
Instrument ID: LCMS1 Run Time: 15:19 Method: 6850
File ID: 1LM.LM39819 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.08	ug/L	1.37	8.00	15	

* Exceeds %D Criteria



Login Number: L17060482 Run Date: 06/13/2017 Sample ID: WG617708-03
 Instrument ID: LCMS1 Run Time: 19:07 Method: 6850
 File ID: 1LM.LM39831 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.08	ug/L	1.37	8.00	15	

* Exceeds %D Criteria



Login Number: L17060482 Run Date: 06/13/2017 Sample ID: WG617708-05
 Instrument ID: LCMS1 Run Time: 22:36 Method: 6850
 File ID: 1LM.LM39842 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.09	ug/L	1.38	9.00	15	

* Exceeds %D Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617708-07
Instrument ID: LCMS1 Run Time: 11:24 Method: 6850
File ID: 1LM.LM39845 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.08	ug/L	1.37	8.00	15	

* Exceeds %D Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617708-09
 Instrument ID: LCMS1 Run Time: 13:18 Method: 6850
 File ID: 1LM.LM39851 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.10	ug/L	1.40	10.0	15	

* Exceeds %D Criteria



Login Number: L17060482 Run Date: 06/13/2017 Sample ID: WG617701-05
Instrument ID: LCMS1 Run Time: 15:38 Prep Method: 6850
File ID: 1LM.LM39820 Analyst: JWR Method: 6850
Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.212	106	70 - 130	



Login Number: L17060482 Run Date: 06/13/2017 Sample ID: WG617701-06
Instrument ID: LCMS1 Run Time: 19:26 Prep Method: 6850
File ID: 1LM.LM39832 Analyst: JWR Method: 6850
Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.200	100	70 - 130	



Login Number: L17060482 Run Date: 06/13/2017 Sample ID: WG617701-07
Instrument ID: LCMS1 Run Time: 22:55 Prep Method: 6850
File ID: 1LM.LM39843 Analyst: JWR Method: 6850
Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.216	108	70 - 130	



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617701-08
Instrument ID: LCMS1 Run Time: 11:43 Prep Method: 6850
File ID: 1LM.LM39846 Analyst: JWR Method: 6850
Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.211	106	70 - 130	



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617701-09
Instrument ID: LCMS1 Run Time: 13:37 Prep Method: 6850
File ID: 1LM.LM39852 Analyst: JWR Method: 6850
Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.220	110	70 - 130	



Login Number: L17060482
Instrument ID: LCMS1
Workgroup (AAB#): WG617701

ICAL CCV Number: WG611288-05
CAL ID: LCMS1-24-APR-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG611288	NA	NA	777000
Upper Limit	NA	NA	1165500
Lower Limit	NA	NA	388500
<u>L17060482-01</u>	10000	DL01	619000
WG617701-02	1.00	01	615000
WG617701-03	1.00	01	613000
WG617701-04	1.00	01	625000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
 Microbac Laboratories Inc.



Login #: L17060482	Prep Method: 6850	Samplenum: L17060482-01
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39826
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 17:32	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	171000	55300	3.09	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG611288-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39495
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 13:46	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	21000	6820	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG611288-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39496
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 14:05	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	38200	13500	2.83	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG611288-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39497
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 14:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	104000	33400	3.11	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG611288-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39498
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 14:43	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	206000	65300	3.15	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG611288-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39499
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 15:02	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	412000	130000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG611288-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39500
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 15:21	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	955000	298000	3.20	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG611288-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39501
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 15:40	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1860000	603000	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG611288-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39502
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 15:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	197000	65000	3.03	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: 6850	Samplenum: WG617701-01
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39821
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 15:57	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	34800	11600	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: 6850	Samplenum: WG617701-02
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39822
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 16:16	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: 6850	Samplenum: WG617701-03
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39823
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 16:35	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	33000	10300	3.20	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482
Instrument: LCMS1
Analyst: JWR
Worknum: WG617701

Prep Method: 6850
Prep Date: 06/13/2017 14:30
Anal Method: 6850
Analysis Date: 06/13/2017 16:54

Samplenum: WG617701-04
File ID: 1LM.LM39824
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	33800	10800	3.13	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: 6850	Samplenum: WG617701-05
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39820
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 15:38	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	33800	11500	2.94	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: 6850	Samplenum: WG617701-06
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39832
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 19:26	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	36600	12900	2.84	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: 6850	Samplenum: WG617701-07
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39843
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 22:55	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	41000	13400	3.06	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: 6850	Samplenum: WG617701-08
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39846
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 11:43	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	34800	10100	3.45	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: 6850	Samplenum: WG617701-09
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39852
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 13:37	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	40100	13200	3.04	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG617708-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39818
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 15:01	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	959	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG617708-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39819
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 15:19	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	171000	52500	3.26	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG617708-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39831
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 19:07	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	200000	63000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG617708-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39833
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 19:45	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	744	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG617708-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39842
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 22:36	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	201000	64100	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG617708-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39844
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 23:14	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	534	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG617708-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39845
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 11:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	169000	53000	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG617708-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39847
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 12:02	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG617708-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39851
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 13:18	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	195000	61100	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060482	Prep Method: _____	Samplenum: WG617708-10
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39853
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 13:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

2.2 Metals Data

2.2.1 Metals I C P Data

2.2.1.1 Summary Data

Lab Report #: L17060482

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060482-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: LH18/24-SP140-7447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 11:40
Matrix: Water	Analytical Method: 6010C	Cal Date: 06/14/2017 13:33
Workgroup #: WG617838	Analyst: KKB	Run Date: 06/14/2017 18:46
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: T4.061417.184600
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Selenium, Total	7782-49-2	0.0800	U	0.0800	0.0800	0.0400
U	Analyte was not detected. The concentration is below the reported LOD.					

2.2.1.2 QC Summary Data

Example 6010 Calculations

Thermo Scientific iCAP

1.0 Initial Calibration (ICAL) Parameters

For a multi-point calibration, the system performs linear regression from data consisting of a blank and four standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system in ug/mL (ppm)

Vf = Final volume (mL)

Vi = Initial volume (mL)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/mL (mg/L)

Example:

0.1

50

50

1

0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (mg/L) (ppm)

Vf = Final volume (mL)

Vi = Initial weight (g)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/g (mg/kg)

Example:

0.1

50

1

1

5

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

$Cdry$ = Concentration calculated as dry weight (mg/kg)

Example:

5

80

6.25

Example 6010 Calculations
Thermo Scientific iCAP

1.0 Initial Calibration (ICAL) Parameters

For a multi-point calibration, the system performs linear regression from data consisting of a blank and four standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system in ug/mL (ppm)

Vf = Final volume (mL)

Vi = Initial volume (mL)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/mL (mg/L)

Example:

0.1

50

50

1

0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (mg/L) (ppm)

Vf = Final volume (mL)

Vi = Initial weight (g)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/g (mg/kg)

Example:

0.1

50

1

1

5

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

$Cdry$ = Concentration calculated as dry weight (mg/kg)

Example:

5

80

6.25

Workgroup: WG617642
 Analyst: VC
 Spike Analyst: VC
 Run Date: 06/13/2017 11:40
 Method: 3015A
 Balance: BAL016
 Instrument: MW-3
 Instrument Start: 06/13/2017 11:44

SOP: ME407 Revision 19
 Spike Solution: STD82091
 Spike Witness: REK
 HNO3 Lot #: COA19718
 HCL Lot #: COA19685
 40 & 50 ML. DIGESTION TU COA19764
 ICP FILTERS LOT# R6sa4256RGT40011

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG617642-02	BLANK	1	40 mL	50 mL	206.939 g	206.938 g	
2	WG617411-01	FBLK1	17	5 mL	50 mL	211.601 g	211.613 g	
3	WG617642-03	LCS	1	40 mL	50 mL	211.909 g	211.913 g	5 mL
4	L17060421-01	SAMP	17	5 mL	50 mL	209.218 g	209.208 g	06/16/17
5	L17060421-02	SAMP	17	5 mL	50 mL	212.442 g	212.438 g	06/16/17
6	L17060468-01	SAMP	1	20 mL	50 mL	206.805 g	206.753 g	06/16/17
7	L17060468-02	SAMP	1	40 mL	50 mL	204.168 g	204.149 g	06/16/17
8	L17060482-01	SAMP	1	40 mL	50 mL	207.754 g	207.733 g	06/20/17
9	L17060484-01	SAMP	1	40 mL	50 mL	205.805 g	205.782 g	06/20/17
10	WG617642-01	REF	17	5 mL	50 mL	209.586 g	209.582 g	
11	L17060488-01	SAMP	17	5 mL	50 mL	209.586 g	209.582 g	06/14/17
12	L17060488-02	SAMP	17	5 mL	50 mL	211.162 g	211.151 g	06/14/17
13	L17060506-01	SAMP	1	40 mL	50 mL	204.361 g	204.347 g	06/20/17
14	L17060538-01	SAMP	1	40 mL	50 mL	206.624 g	206.613 g	06/19/17
15	L17060539-01	SAMP	1	40 mL	50 mL	207.288 g	207.27 g	06/19/17
16	L17060540-01	SAMP	1	40 mL	50 mL	207.085 g	207.072 g	06/19/17
17	L17060540-02	SAMP	1	40 mL	50 mL	204.768 g	204.76 g	06/19/17
18	L17060541-01	SAMP	1	40 mL	50 mL	205.978 g	205.962 g	06/19/17
19	L17060542-01	SAMP	1	40 mL	50 mL	206.674 g	206.65 g	06/19/17
20	WG617642-04	MS	1	5 mL	50 mL	209.761 g	209.742 g	5 mL
21	WG617642-05	MSD	1	5 mL	50 mL	208.454 g	208.449 g	5 mL

L17060468-01 PH ADJ, FILTERED DIGESTATE

Analyst: Vesha Collier

Reviewer: [Signature]



Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061417T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8

Maintenance Log ID: _____

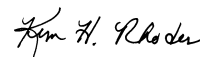
Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RGT39282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617841,617843,617838

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.061417.131910	WG617982-01	Calibration Point		1		06/14/17 13:19
2	T4.061417.132255	WG617982-02	Calibration Point		1		06/14/17 13:22
3	T4.061417.132640	WG617982-03	Calibration Point		1		06/14/17 13:26
4	T4.061417.133024	WG617982-04	Calibration Point		1		06/14/17 13:30
5	T4.061417.133352	WG617982-05	Calibration Point		1		06/14/17 13:33
6	T4.061417.133719	WG617982-06	Initial Calibration Verification		1		06/14/17 13:37
7	T4.061417.134107	WG617982-07	Initial Calib Blank		1		06/14/17 13:41
8	T4.061417.134450	WG617982-08	Low Level Initial Calibration V		1		06/14/17 13:44
9	T4.061417.135450	WG617982-09	LLICV		1		06/14/17 13:54
10	T4.061417.135832	WG617982-10	Low Level Initial Calibration V		1		06/14/17 13:58
11	T4.061417.140214	WG617982-11	Interference Check		1		06/14/17 14:02
12	T4.061417.140600	WG617982-12	Interference Check		1		06/14/17 14:06
13	T4.061417.140942	WG617982-13	CCV		1		06/14/17 14:09
14	T4.061417.141309	WG617982-14	CCB		1		06/14/17 14:13
15	T4.061417.143339	WG617808-02	Method/Prep Blank	40/50	1		06/14/17 14:33
16	T4.061417.143724	WG617808-03	Laboratory Control S	40/50	1		06/14/17 14:37
17	T4.061417.144052	WG617661-01	Fluid Blank 1		1		06/14/17 14:40
18	T4.061417.144437	WG617808-01	Reference Sample		1	L17060577-02	06/14/17 14:44
19	T4.061417.144819	WG617808-04	Matrix Spike	5/50	1	L17060577-02	06/14/17 14:48
20	T4.061417.145148	WG617808-05	Matrix Spike Duplica	5/50	1	L17060577-02	06/14/17 14:51
21	T4.061417.145516	L17060580-02	J7F0755-02	5/50	1		06/14/17 14:55
22	T4.061417.145857	L17060608-01	2212-154-A W1	40/50	1		06/14/17 14:58
23	T4.061417.150239	WG617841-01	Post Digestion Spike		1	L17060608-01	06/14/17 15:02
24	T4.061417.150608	WG617841-02	Serial Dilution		5	L17060608-01	06/14/17 15:06
25	T4.061417.150949	WG617982-15	CCV		1		06/14/17 15:09
26	T4.061417.151317	WG617982-16	CCB		1		06/14/17 15:13
27	T4.061417.151703	L17060609-01	15-12-17 ES-1	40/50	1		06/14/17 15:17
28	T4.061417.152046	L17060611-01	MEANS\ 28-012-100.04\ PR	40/50	1		06/14/17 15:20
29	T4.061417.152428	L17060611-02	MEANS\ 28-012-100.04\ PR	40/50	1		06/14/17 15:24
30	T4.061417.152809	L17060612-01	YOUNG\ 28-011-138\ PR\	40/50	1		06/14/17 15:28
31	T4.061417.153149	L17060612-02	YOUNG\ 28-011-138\ PR\	40/50	1		06/14/17 15:31
32	T4.061417.153528	L17060638-01	41702-B01-WQ-W0003	40/50	1		06/14/17 15:35
33	T4.061417.153913	L17060638-02	50608-B01-WQ-W0002	40/50	1		06/14/17 15:39
34	T4.061417.154257	L17060638-03	50608-D01-WQ-W0008	40/50	1		06/14/17 15:42

Page: 1 Approved: June 15, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061417T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RGT39282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol: _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617841,617843,617838

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.061417.154641	L17060638-04	51105-F01-WQ-W0002	40/50	1		06/14/17 15:46
36	T4.061417.155026	L17060669-01	2017PRE-16780SWEATRD	40/50	1		06/14/17 15:50
37	T4.061417.155407	WG617982-17	CCV		1		06/14/17 15:54
38	T4.061417.155734	WG617982-18	CCB		1		06/14/17 15:57
39	T4.061417.160121	L17060682-01	FRAC TANK PRE	40/50	1		06/14/17 16:01
40	T4.061417.160502	L17060682-02	FRAC TANK PRE	40/50	1		06/14/17 16:05
41	T4.061417.160840	L17060682-03	FRAC TANK MID	40/50	1		06/14/17 16:08
42	T4.061417.161220	L17060682-04	FRAC TANK POST	40/50	1		06/14/17 16:12
43	T4.061417.161559	WG617982-19	CCV		1		06/14/17 16:15
44	T4.061417.161927	WG617982-20	CCB		1		06/14/17 16:19
45	T4.061417.162315	WG617982-21	Low Level Continuing Calibra		1		06/14/17 16:23
46	T4.061417.162655	WG617982-22	Low Level Continuing Calibra		1		06/14/17 16:26
47	T4.061417.163036	WG617982-23	LLCCV		1		06/14/17 16:30
48	T4.061417.163418	WG617665-02	Method/Prep Blank	40/50	1		06/14/17 16:34
49	T4.061417.163803	WG617665-03	Laboratory Control S	40/50	1		06/14/17 16:38
50	T4.061417.164131	L17060570-01	102-060917	40/50	1		06/14/17 16:41
51	T4.061417.164511	L17060570-02	129-060917	40/50	1		06/14/17 16:45
52	T4.061417.164854	L17060570-04	120F-060917	40/50	1		06/14/17 16:48
53	T4.061417.165235	L17060570-05	123-060917	40/50	1		06/14/17 16:52
54	T4.061417.165616	L17060570-07	125F-060917	40/50	1		06/14/17 16:56
55	T4.061417.165959	L17060570-08	109-060917	40/50	1		06/14/17 16:59
56	T4.061417.170342	WG617843-01	Post Digestion Spike		1	L17060570-08	06/14/17 17:03
57	T4.061417.170710	WG617843-02	Serial Dilution		5	L17060570-08	06/14/17 17:07
58	T4.061417.171056	WG617982-24	CCV		1		06/14/17 17:10
59	T4.061417.171424	WG617982-25	CCB		1		06/14/17 17:14
60	T4.061417.171809	L17060570-09	18CPTMW24-060917	40/50	1		06/14/17 17:18
61	T4.061417.172158	L17060570-10	18WW03-060917	40/50	1		06/14/17 17:21
62	T4.061417.172538	L17060570-11	18WW03FD-060917	40/50	1		06/14/17 17:25
63	T4.061417.172920	L17060570-13	18WW18F-060917	40/50	1		06/14/17 17:29
64	T4.061417.173258	L17060570-14	18WW17-060917	40/50	1		06/14/17 17:32
65	T4.061417.173644	L17060607-01	6-8-17 W1	40/50	1		06/14/17 17:36
66	T4.061417.174025	L17060607-02	6-10-5 W1	40/50	1		06/14/17 17:40
67	T4.061417.174406	L17060607-03	6-8-18 P1	40/50	1		06/14/17 17:44
68	T4.061417.174748	L17060607-04	6-8-18 W2	40/50	1		06/14/17 17:47

Page: 2 Approved: June 15, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061417T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RGT39282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 617841,617843,617838

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.061417.175129	L17060607-05	6-8-18 W1	40/50	1		06/14/17 17:51
70	T4.061417.175511	WG617982-26	CCV		1		06/14/17 17:55
71	T4.061417.175839	WG617982-27	CCB		1		06/14/17 17:58
72	T4.061417.180224	L17060607-06	6-10-10 S1	40/50	1		06/14/17 18:02
73	T4.061417.180605	L17060607-07	59-11-10.32 W1	40/50	1		06/14/17 18:06
74	T4.061417.180945	L17060610-01	LEMMON_28-011-121	40/50	1		06/14/17 18:09
75	T4.061417.181325	WG617665-01	Reference Sample		1	L17060610-02	06/14/17 18:13
76	T4.061417.181705	WG617665-04	Matrix Spike	40/50	1	L17060610-02	06/14/17 18:17
77	T4.061417.182033	WG617665-05	Matrix Spike Duplica	40/50	1	L17060610-02	06/14/17 18:20
78	T4.061417.182402	WG617982-28	CCV		1		06/14/17 18:24
79	T4.061417.182730	WG617982-29	CCB		1		06/14/17 18:27
80	T4.061417.183115	WG617642-02	Method/Prep Blank	40/50	1		06/14/17 18:31
81	T4.061417.183500	WG617642-03	Laboratory Control S	40/50	1		06/14/17 18:35
82	T4.061417.183828	L17060468-01	H7F0329-01 (SAMPLE 1)	20/50	1		06/14/17 18:38
83	T4.061417.184212	L17060468-02	H7F0329-02 (SAMPLE 2)	40/50	1		06/14/17 18:42
84	T4.061417.184600	L17060482-01	LH18/24-SP140-7447-GRAB	40/50	1		06/14/17 18:46
85	T4.061417.184941	L17060484-01	LH18/24-SP650-6447-GRAB	40/50	1		06/14/17 18:49
86	T4.061417.185320	L17060488-01	13837-SSP0567		1	WG617642-01	06/14/17 18:53
87	T4.061417.185701	WG617642-04	Matrix Spike	5/50	1	L17060488-01	06/14/17 18:57
88	T4.061417.190030	WG617642-05	Matrix Spike Duplica	5/50	1	L17060488-01	06/14/17 19:00
89	T4.061417.190358	L17060506-01	AAB9029	40/50	1		06/14/17 19:03
90	T4.061417.190737	WG617982-30	CCV		1		06/14/17 19:07
91	T4.061417.191105	WG617982-31	CCB		1		06/14/17 19:11
92	T4.061417.191449	L17060538-01	1001-220 W1	40/50	1		06/14/17 19:14
93	T4.061417.191830	L17060539-01	1001-145-C W1	40/50	1		06/14/17 19:18
94	T4.061417.192209	L17060540-01	1001-213 W1	40/50	1		06/14/17 19:22
95	T4.061417.192548	L17060540-02	1001-213 W2	40/50	1		06/14/17 19:25
96	T4.061417.192928	L17060541-01	1001-212 W1	40/50	1		06/14/17 19:29
97	T4.061417.193303	L17060542-01	1001-145-H P1	40/50	1		06/14/17 19:33
98	T4.061417.193645	WG617838-03	Post Digestion Spike		1	L17060542-01	06/14/17 19:36
99	T4.061417.194013	WG617838-04	Serial Dilution		5	L17060542-01	06/14/17 19:40
100	T4.061417.194358	WG617982-32	CCV		1		06/14/17 19:43
101	T4.061417.194725	WG617982-33	CCB		1		06/14/17 19:47
102	T4.061417.195111	WG617982-34	Low Level Continuing Calibra		1		06/14/17 19:51

Page: 3 Approved: June 15, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061417T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RG739282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

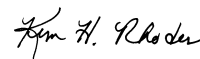
Workgroups: 617841,617843,617838

Comments:

--

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T4.061417.195451	WG617982-35	Low Level Continuing Calibra		1		06/14/17 19:54
104	T4.061417.195832	WG617982-36	LLCCV		1		06/14/17 19:58

Page: 4 Approved: June 15, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061517T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RGT39282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 617838,617843,618070

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.061517.112842	WG618082-01	Calibration Point		1		06/15/17 11:28
2	T4.061517.113226	WG618082-02	Calibration Point		1		06/15/17 11:32
3	T4.061517.113610	WG618082-03	Calibration Point		1		06/15/17 11:36
4	T4.061517.113956	WG618082-04	Calibration Point		1		06/15/17 11:39
5	T4.061517.114323	WG618082-05	Calibration Point		1		06/15/17 11:43
6	T4.061517.114650	WG618082-06	Initial Calibration Verification		1		06/15/17 11:46
7	T4.061517.115218	WG618082-07	Initial Calib Blank		1		06/15/17 11:52
8	T4.061517.115601	WG618082-08	Low Level Initial Calibration V		1		06/15/17 11:56
9	T4.061517.115942	WG618082-09	LLICV		1		06/15/17 11:59
10	T4.061517.120323	WG618082-10	LLICV		1		06/15/17 12:03
11	T4.061517.120705	WG618082-11	Interference Check		1		06/15/17 12:07
12	T4.061517.121052	WG618082-12	Interference Check		1		06/15/17 12:10
13	T4.061517.121433	WG618082-13	CCV		1		06/15/17 12:14
14	T4.061517.121801	WG618082-14	CCB		1		06/15/17 12:18
15	T4.061517.123858	WG617642-02	Method/Prep Blank	40/50	1		06/15/17 12:38
16	T4.061517.124244	WG617642-03	Laboratory Control S	40/50	1		06/15/17 12:42
17	T4.061517.124612	L17060468-01	H7F0329-01 (SAMPLE 1)	20/50	10		06/15/17 12:46
18	T4.061517.124955	L17060468-02	H7F0329-02 (SAMPLE 2)	40/50	5		06/15/17 12:49
19	T4.061517.125337	WG617642-01	Reference Sample		1	L17060488-01	06/15/17 12:53
20	T4.061517.125717	WG617642-04	Matrix Spike	5/50	1	L17060488-01	06/15/17 12:57
21	T4.061517.130045	WG617642-05	Matrix Spike Duplica	5/50	1	L17060488-01	06/15/17 13:00
22	T4.061517.130415	WG618082-15	CCV		1		06/15/17 13:04
23	T4.061517.130743	WG618082-16	CCB		1		06/15/17 13:07
24	T4.061517.131128	L17060506-01	AAB9029	40/50	1		06/15/17 13:11
25	T4.061517.131505	WG617838-03	Post Digestion Spike		1	L17060542-01	06/15/17 13:15
26	T4.061517.131833	WG617838-04	Serial Dilution		5	L17060542-01	06/15/17 13:18
27	T4.061517.132214	L17060506-01	AAB9029	40/50	5		06/15/17 13:22
28	T4.061517.132558	WG618082-17	CCV		1		06/15/17 13:25
29	T4.061517.132926	WG618082-18	CCB		1		06/15/17 13:29
30	T4.061517.133312	WG617665-02	Method/Prep Blank	40/50	1		06/15/17 13:33
31	T4.061517.133656	WG617665-03	Laboratory Control S	40/50	1		06/15/17 13:36
32	T4.061517.134024	L17060570-01	102-060917	40/50	1		06/15/17 13:40
33	T4.061517.134406	L17060570-02	129-060917	40/50	1		06/15/17 13:44
34	T4.061517.134748	L17060570-04	120F-060917	40/50	1		06/15/17 13:47

Page: 1 Approved: June 16, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061517T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RGT39282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617838,617843,618070

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.061517.135130	L17060570-05	123-060917	40/50	1		06/15/17 13:51
36	T4.061517.135512	L17060570-07	125F-060917	40/50	1		06/15/17 13:55
37	T4.061517.135856	WG617843-03	Post Digestion Spike		1	L17060570-07	06/15/17 13:58
38	T4.061517.140223	WG617843-04	Serial Dilution		5	L17060570-07	06/15/17 14:02
39	T4.061517.140608	L17060570-08	109-060917	40/50	1		06/15/17 14:06
40	T4.061517.140952	WG618082-19	CCV		1		06/15/17 14:09
41	T4.061517.141320	WG618082-20	CCB		1		06/15/17 14:13
42	T4.061517.141707	L17060570-09	18CPTMW24-060917	40/50	25		06/15/17 14:17
43	T4.061517.142049	L17060570-10	18WW03-060917	40/50	1		06/15/17 14:20
44	T4.061517.142431	L17060570-11	18WW03FD-060917	40/50	1		06/15/17 14:24
45	T4.061517.142812	L17060570-13	18WW18F-060917		10		06/15/17 14:28
46	T4.061517.143154	L17060570-14	18WW17-060917	40/50	1		06/15/17 14:31
47	T4.061517.143540	L17060570-14	18WW17-060917	40/50	25		06/15/17 14:35
48	T4.061517.143923	L17060570-13	18WW18F-060917	40/50	25		06/15/17 14:39
49	T4.061517.144342	WG617665-01	Reference Sample		1	L17060610-02	06/15/17 14:43
50	T4.061517.144722	WG617665-04	Matrix Spike	40/50	1	L17060610-02	06/15/17 14:47
51	T4.061517.145051	WG617665-05	Matrix Spike Duplica	40/50	1	L17060610-02	06/15/17 14:50
52	T4.061517.145420	WG618082-21	CCV		1		06/15/17 14:54
53	T4.061517.145749	WG618082-22	CCB		1		06/15/17 14:57
54	T4.061517.150136	WG618082-23	Low Level Continuing Calibra		1		06/15/17 15:01
55	T4.061517.150517	WG618082-24	LLCCV		1		06/15/17 15:05
56	T4.061517.150859	WG618082-25	LLCCV		1		06/15/17 15:08
57	T4.061517.160235	WG618082-26	CCV		1		06/15/17 16:02
58	T4.061517.160605	WG618082-27	CCB		1		06/15/17 16:06
59	T4.061517.160950	WG618025-02	Method/Prep Blank	40/50	1		06/15/17 16:09
60	T4.061517.161333	WG618025-03	Laboratory Control S	40/50	1		06/15/17 16:13
61	T4.061517.161701	WG617820-01	Fluid Blank 1		1		06/15/17 16:17
62	T4.061517.162046	L17060648-01	17F1236-01		1	WG618025-01	06/15/17 16:20
63	T4.061517.162431	WG618025-04	Matrix Spike	5/50	1	L17060648-01	06/15/17 16:24
64	T4.061517.162759	WG618025-05	Matrix Spike Duplica	5/50	1	L17060648-01	06/15/17 16:27
65	T4.061517.163128	L17060722-02	PERMEATE	1/50	1		06/15/17 16:31
66	T4.061517.163508	L17060722-04	BLEED	1/50	1		06/15/17 16:35
67	T4.061517.163852	WG618082-28	CCV		1		06/15/17 16:38
68	T4.061517.164219	WG618082-29	CCB		1		06/15/17 16:42

Page: 2 Approved: June 16, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

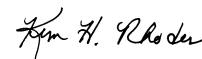
Instrument: ICP-THERMO4 Dataset: 061517T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RGT39282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 617838,617843,618070

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.061517.164605	L17060722-06	N. DOCK FLUME	1/50	1		06/15/17 16:46
70	T4.061517.164950	L17060741-01	45-2-9 W1 (PRE)	40/50	1		06/15/17 16:49
71	T4.061517.165334	L17060741-02	45-2-9 W1 (POST)	40/50	1		06/15/17 16:53
72	T4.061517.165717	L17060742-01	45-2-3 W1 (PRE)	40/50	1		06/15/17 16:57
73	T4.061517.170059	L17060742-02	45-2-3 W1 (POST)	40/50	1		06/15/17 17:00
74	T4.061517.170441	L17060760-01	17F1527-01	5/50	1		06/15/17 17:04
75	T4.061517.170825	L17060760-02	17F1527-02	5/50	1		06/15/17 17:08
76	T4.061517.171206	L17060760-03	17F1527-03	5/50	1		06/15/17 17:12
77	T4.061517.171547	L17060760-04	17F1527-04	5/50	1		06/15/17 17:15
78	T4.061517.171930	L17060760-05	17F1527-05	5/50	1		06/15/17 17:19
79	T4.061517.172314	WG618082-30	CCV		1		06/15/17 17:23
80	T4.061517.172643	WG618082-31	CCB		1		06/15/17 17:26
81	T4.061517.173028	L17060769-01	39121-01-21466-PD1	40/50	1		06/15/17 17:30
82	T4.061517.173408	L17060769-02	39121-01-21466-PD1	40/50	1		06/15/17 17:34
83	T4.061517.173748	WG618070-01	Post Digestion Spike		1	L17060769-02	06/15/17 17:37
84	T4.061517.174117	WG618070-02	Serial Dilution		5	L17060769-02	06/15/17 17:41
85	T4.061517.174501	WG618082-32	CCV		1		06/15/17 17:45
86	T4.061517.174829	WG618082-33	CCB		1		06/15/17 17:48

Page: 3 Approved: June 16, 2017




Microbac Laboratories Inc.

Data Checklist

Date: 14-JUN-2017
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 617982
 Runlog ID: 82755
 Analytical Workgroups: 617841,617843,617838

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	669
Level 4	638,570,482,484,506
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KKB
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
15-JUN-2017

Secondary Reviewer:
15-JUN-2017

Ki K Buck

Tom H. Rhodes



Microbac Laboratories Inc.

Data Checklist

Date: 15-JUN-2017
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 618082
 Runlog ID: 82785
 Analytical Workgroups: 617838,617843,618070

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	
Level 4	506,570
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KKB
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
16-JUN-2017

Secondary Reviewer:
16-JUN-2017

Ki K Beck

Tom H. Rhodes



Analytical Method:6010C
Login Number:L17060482

AAB#:WG617838

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP140-7447-GRAB	01	06/07/17					06/13/2017	5.9	180		06/14/17	7.2	180	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060482 Work Group: WG617838
 Blank File ID: T4.061417.183115 Blank Sample ID: WG617642-02
 Prep Date: 06/13/17 11:40 Instrument ID: ICP-THERMO4
 Analyzed Date: 06/14/17 18:31 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617642-03	T4.061417.183500	06/14/17 18:35	01
LH18/24-SP140-7447-GRAB	L17060482-01	T4.061417.184600	06/14/17 18:46	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5338605
 Report generated 06/15/2017 10:43



Login Number: L17060482 Prep Date: 06/13/17 11:40 Sample ID: WG617642-02
 Instrument ID: ICP-THERMO4 Run Date: 06/14/17 18:31 Prep Method: 3015A
 File ID: T4.061417.183115 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG617838 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-TH-14-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Selenium, Total	0.0400	0.0800	0.0400	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5338606
 15-JUN-2017 10:35



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617642-03
Instrument ID: ICP-THERMO4 Run Time: 18:35 Prep Method: 3015A
File ID: T4.061417.183500 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG617838 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD82091 Cal ID: ICP-TH-14-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Selenium, Total	0.250	0.230	92.2	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5338607
Report generated: 06/15/2017 10:35



Loginnum: L17060482 Cal ID: ICP-THERMO4- Worknum: WG617838
 Instrument ID: ICP-THERMO4 Contract #: _____ Method: 6010C
 Parent ID: WG617642-01 File ID: T4.061417.185320 Dil: 1 Matrix: WATER
 Sample ID: WG617642-04 MS File ID: T4.061417.185701 Dil: 1 Units: mg/L
 Sample ID: WG617642-05 MSD File ID: T4.061417.190030 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Selenium	ND	2.00	1.91	95.3	2.00	1.90	95.2	0.121	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L17060482 **Worknum:** WG617838
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG617838-04 **File ID:** T4.061417.194013 **Dil:** 5 **Units:** ug/L
Sample: L17060542-01 **File ID:** T4.061417.193303 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Selenium	ND	U	ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 25 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 25 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5338602

06/15/2017 10:35



Sample Login ID: L17060482 Worknum: WG617838
 Instrument ID: ICP-THERMO4 Method: 6010C
 Post Spike ID: WG617838-03 File ID: T4.061417.193645 Dil: 1 Units: ug/L
 Sample ID: L17060542-01 File ID: T4.061417.193303 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
SELENIUM	182		0	U	200	90.9	75 - 125	

N = % Recovery exceeds control limits

F = Result is between MDL and RL

U = Sample result is below MDL. A value of zero is used in the calculation



Login: L17060482 Workgroup (AAB#): WG617838
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG617982 Initial Calibration Date: 14-JUN-2017 13:33

	WG617982-01		WG617982-02		WG617982-03		WG617982-04		WG617982-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
SELENIUM	0	-0.0000100	NA	NA	.008	0.0000600	.4	0.00631	.8	0.0125	.999721	

INT = Instrument intensity
 R = Coefficient of correlation
 Q = Data Qualifier
 * = Out of Compliance; R < 0.995



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-07
Instrument ID: ICP-THERMO4 Run Time: 13:41 Method: 6010C
File ID: T4.061417.134107 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG617838 Cal ID: ICP-THERI - 14-JUN-17
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
SELENIUM	.032	.064	.032	U

U = Result is less than 2 x MDL
F = Result is between MDL and 2 x MDL
* = Result is above 2 x MDL



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-14
Instrument ID: ICP-THERMO4 Run Time: 14:13 Method: 6010C
File ID: T4.061417.141309 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-29
Instrument ID: ICP-THERMO4 Run Time: 18:27 Method: 6010C
File ID: T4.061417.182730 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-31
 Instrument ID: ICP-THERMO4 Run Time: 19:11 Method: 6010C
 File ID: T4.061417.191105 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5338616
 Report generated 06/15/2017 10:36



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-33
 Instrument ID: ICP-THERMO4 Run Time: 19:47 Method: 6010C
 File ID: T4.061417.194725 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.0320	0.0640	0.0320	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-06
 Instrument ID: ICP-THERMO4 Run Time: 13:37 Method: 6010C
 File ID: T4.061417.133719 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Selenium	.4	0.410	102	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-13
Instrument ID: ICP-THERMO4 Run Time: 14:09 Method: 6010C
File ID: T4.061417.140942 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.406	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-28
 Instrument ID: ICP-THERMO4 Run Time: 18:24 Method: 6010C
 File ID: T4.061417.182402 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.400	mg/L	99.9	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-30
 Instrument ID: ICP-THERMO4 Run Time: 19:07 Method: 6010C
 File ID: T4.061417.190737 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.401	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-32
Instrument ID: ICP-THERMO4 Run Time: 19:43 Method: 6010C
File ID: T4.061417.194358 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.400	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-08
 Instrument ID: ICP-THERMO4 Run Time: 13:44 Method: 6010C
 File ID: T4.061417.134450 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0139	mg/L	86.7	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-21
 Instrument ID: ICP-THERMO4 Run Time: 16:23 Method: 6010C
 File ID: T4.061417.162315 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0168	mg/L	105	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617982-34
 Instrument ID: ICP-THERMO4 Run Time: 19:51 Method: 6010C
 File ID: T4.061417.195111 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0154	mg/L	96.3	70 - 130	

* Exceeds LIMITS Criteria



Login number: L17060482
Instrument ID: ICP-THERMO4
Sol. A: WG617982-11
Sol. AB: WG617982-12

File ID: T4.061417.140214
File ID: T4.061417.140600

Workgroup (AAB#): WG617838
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Selenium	NS	-0.0000100	NS	0.250	0.250	100	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login Number: L17060482
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	AG	AL	AS	B	BA
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0.0000410	0	0	0
ARSENIC	189.00	0	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0.0145	0	-0.0000800
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0	0	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0.000378	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	-0.000289	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0.0000140	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	-0.0000120	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	0
ZINC	206.20	0	0.0000320	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338610
 Report generated: 06/15/2017 10:35



Login Number: L17060482
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	BE	CA	CD	CO	CR
ALUMINUM	308.20	0	0	0	-0.000820	0
ANTIMONY	206.80	0	0	0	0	0.0260
ARSENIC	189.00	0	0	0	0	-0.00730
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0.00343	0
CADMIUM	228.80	0	0	0	-0.00390	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	-0.000200
COPPER	224.70	0	0	0	0.0000770	-0.00100
IRON	261.10	0	0	0	0	-0.00100
LEAD	220.30	0	0	0	-0.0000130	-0.000132
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0.0000500
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	-0.000860	0
PHOSPHORUS	214.90	0	0	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0.00000500	0	0	0
THALLIUM	190.80	0	0	0	0.00240	0.000276
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	-0.00350
ZINC	206.20	0	0	0	0	-0.00180
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338610
 Report generated: 06/15/2017 10:35



Login Number: L17060482
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	CU	FE	K	LI	MG
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0.0000560	0	0	0
ARSENIC	189.00	0	-0.0000490	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0.000648	0	0	0
CADMIUM	228.80	0	-0.00000500	0	0	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0.0000400	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0	0.00139	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0.000609	0	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0.0000220
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0.0000420	0	0	0
PHOSPHORUS	214.90	0.0390	0.000900	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	-0.000118	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	-0.000200	0	0	0
VANADIUM	292.40	0	0.0000700	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338610
 Report generated: 06/15/2017 10:35



Login Number: L17060482
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	MN	MO	NA	NI	P
ALUMINUM	308.20	0	0.0163	0	0	0
ANTIMONY	206.80	0	0.000910	0	-0.00190	0
ARSENIC	189.00	0	0.000139	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	-0.00190	0	0	0
CADMIUM	228.80	0	0.0000320	0	-0.000770	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0.000360	0	0	0	0
COBALT	228.60	0	-0.00200	0	0.000100	0
COPPER	224.70	0	0.00160	0	-0.0123	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	-0.000610	0	0.000110	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	-0.00290	-0.0230	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0.0000300	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0.00710	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0.000600	0.000580	0	0	0
SILICON	212.40	0	-0.354	0	0	0
SILVER	328.10	0	-0.0000100	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0.00100	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	-0.000153	0	0	0
VANADIUM	292.40	-0.000200	-0.00160	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338610
 Report generated: 06/15/2017 10:35



Login Number: L17060482

Date: 01/04/2017

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	PB	SB	SE	SI	SN
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0	0	0	-0.0320
ARSENIC	189.00	0	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0	0	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0.00440	0	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338610
 Report generated: 06/15/2017 10:35



Login Number: L17060482
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	SR	TI	TL	V	ZN
ALUMINUM	308.20	0	0	0	0.0720	0
ANTIMONY	206.80	0	0.000500	0	-0.00360	0
ARSENIC	189.00	0	0	0	0.000107	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	-0.00000700	0	0.000990	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0	0.000102	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0.0000550	0	0	0
COBALT	228.60	0	0.00170	0	0.0000200	0
COPPER	224.70	0	0.000269	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0	0	-0.000126	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	-0.00290	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	-0.000110	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0	0	-0.00100	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	-0.000720	0	-0.000260	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	-0.00100	0	-0.0420	0
TIN	189.90	0	-0.00190	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0.000820	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338610
 Report generated: 06/15/2017 10:35



Login Number: L17060482

Date: 01/04/2017

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	ZR
ALUMINUM	308.20	0
ANTIMONY	206.80	0
ARSENIC	189.00	0
BARIUM	455.40	0
BERYLLIUM	313.10	0
BORON	249.60	0
CADMIUM	228.80	0
CALCIUM	422.60	0
CHROMIUM	267.70	0
COBALT	228.60	0
COPPER	224.70	0
IRON	261.10	0
LEAD	220.30	0
LITHIUM	670.70	0
MAGNESIUM	279.10	0
MANGANESE	257.60	0
MOLYBDENUM	202.00	0
NICKEL	231.60	0
PHOSPHORUS	214.90	0
POTASSIUM	766.40	0
SELENIUM	196.10	0
SILICON	212.40	0
SILVER	328.10	0
SODIUM	589.50	0
STRONTIUM	407.70	0
THALLIUM	190.80	0
TIN	189.90	0
TITANIUM	337.20	0
VANADIUM	292.40	0
ZINC	206.20	0
ZIRCONIUM	339.10	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338610
 Report generated: 06/15/2017 10:35



Login Number: L17060482 Date: 04/05/2017
 Instrument ID: ICP-THERMO4 Method: 6010C

Analyte	Integration Time (Sec.)	Concentration (ug/L)
Aluminum	10.00	900.0
Antimony	20.00	45.0
Arsenic	10.00	45.0
Barium	10.00	45.0
Beryllium	10.00	1.8
Boron	20.00	45.0
Cadmium	20.00	4.5
Calcium	8.00	270.0
Chromium	20.00	36.0
Cobalt	20.00	45.0
Copper	20.00	180.0
Iron	8.00	720.0
Lead	20.00	225.0
Lithium	8.00	36.0
Magnesium	8.00	900.0
Manganese	10.00	36.0
Molybdenum	20.00	18.0
Nickel	20.00	90.0
Phosphorus	20.00	180.0
Potassium	8.00	360.0
Selenium	20.00	90.0
Silicon	20.00	36.0
Silver	10.00	4.5
Sodium	8.00	270.0
Strontium	8.00	9.0
Thallium	20.00	18.0
Tin	20.00	45.0
Titanium	8.00	45.0
Vanadium	20.00	27.0
Zinc	20.00	45.0
Zirconium	10.00	45.0

Comments:

All analytes passed acceptance criteria at the specified concentration.



2.2 Metals Data

2.2.2 Metals ICP-MS Data

2.2.2.1 Summary Data

Lab Report #: L17060482

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060482-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP140-7447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 08:11
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/14/2017 09:42
Workgroup #: WG617731	Analyst: JYH	Run Date: 06/14/2017 11:36
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: NI.061417.113607
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Silver, Total	7440-22-4	0.00100	U	0.00200	0.00100	0.000500
U	Analyte was not detected. The concentration is below the reported LOD.					

2.2.2.2 QC Summary Data

Example 6020 Calculations
Perkin Elmer ELAN 6100

1.0 Initial Calibration (ICAL) Parameters

The system performs linear regression from data consisting of a blank and three standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (ug/L)

Vf = Final volume

Vi = Initial volume

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in (ug/L)

Example:

0.1

100

40

1

0.25

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (ug/L)

Vf = Final volume

Vi = Initial volume

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in (ug/kg)

Example:

0.1

200

0.5

1

40

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

$Cdry$ = Concentration calculated as dry weight (ug/kg)

Example:

40

80

50

50 ug/kg = 0.050 mg/kg

Perkin Elmer ELAN ICP/MS

STANDARDS KEY

QC Std 1 - ICV

QC Std 2 - ICB

QC Std 3 - LLICV

QC Std 4 - ICSA

QC Std 5 - ICSAB

QC Std 6 - CCV

QC Std 7 - CCB

QC Std 8 - LLCCV

Calibration Solutions

Analyte	Stock Conc. (mg/L)	S1 (mg/L)	S2 (mg/L)	S3 (mg/L)	S4 (mg/L)
Al	10	0	0.0004	0.05	0.1
Sb	10	0	0.0004	0.05	0.1
As	10	0	0.0004	0.05	0.1
Ba	10	0	0.0004	0.05	0.1
Be	10	0	0.0004	0.05	0.1
Ca	1000	0	0.04	5	10
Cd	10	0	0.0004	0.05	0.1
Cr	10	0	0.0004	0.05	0.1
Co	10	0	0.0004	0.05	0.1
Cu	10	0	0.0004	0.05	0.1
Fe	1000	0	0.04	5	10
Pb	10	0	0.0004	0.05	0.1
Mg	1000	0	0.04	5	10
Mn	10	0	0.0004	0.05	0.1
Ni	10	0	0.0004	0.05	0.1
K	1000	0	0.04	5	10
Se	10	0	0.0004	0.05	0.1
Ag	10	0	0.0004	0.05	0.1
Na	1000	0	0.04	5	10
Tl	10	0	0.0004	0.05	0.1
V	10	0	0.0004	0.05	0.1
U	1000	0	0.0004	0.05	0.1
Zn	10	0	0.0004	0.05	0.1

Workgroup: WG617566
 Analyst: VC
 Spike Analyst: VC
 Run Date: 06/13/2017 08:11
 Method: 3015A
 Balance: BAL016
 Instrument: MW-4
 Instrument Start: 06/13/2017 08:16

SOP: ME407 Revision 19
 Spike Solution: STD80296
 Spike Witness: REK
 40 & 50 ML. DIGESTION TU COA19764
 HNO3 Lot #: COA19650
 MS Filters- fisher-Lot#rRGT40013

	SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG617566-02	BLANK	1	20 mL	50 mL	182.948 g	182.943 g		
2	WG617566-03	LCS	1	20 mL	50 mL	183.209 g	183.203 g	.25 mL	
3	L17060482-01	SAMP	1	20 mL	50 mL	182.359 g	182.339 g		06/20/17
4	L17060484-01	SAMP	1	20 mL	50 mL	182.47 g	182.46 g		06/20/17
5	L17060570-01	SAMP	1	20 mL	50 mL	182.258 g	182.256 g		06/23/17
6	L17060570-02	SAMP	1	20 mL	50 mL	183.162 g	183.13 g		06/23/17
7	L17060570-04	SAMP	1	20 mL	50 mL	182.017 g	182.004 g		06/23/17
8	L17060570-05	SAMP	1	20 mL	50 mL	183.483 g	183.463 g		06/23/17
9	L17060570-07	SAMP	1	20 mL	50 mL	184.275 g	184.267 g		06/23/17
10	L17060570-08	SAMP	1	20 mL	50 mL	182.98 g	182.991 g		06/23/17
11	L17060570-09	SAMP	1	20 mL	50 mL	183.35 g	183.347 g		06/23/17
12	L17060574-01	SAMP	1	20 mL	50 mL	184.409 g	184.391 g		06/19/17
13	L17060574-02	SAMP	1	20 mL	50 mL	181.413 g	181.417 g		06/19/17
14	L17060574-03	SAMP	1	20 mL	50 mL	184.652 g	184.64 g		06/19/17
15	L17060574-04	SAMP	1	20 mL	50 mL	182.495 g	182.477 g		06/19/17
16	L17060574-05	SAMP	1	20 mL	50 mL	184.41 g	184.386 g		06/19/17
17	L17060575-01	SAMP	1	20 mL	50 mL	183.69 g	183.69 g		06/19/17
18	L17060575-02	SAMP	1	20 mL	50 mL	185.997 g	185.99 g		06/19/17
19	L17060575-03	SAMP	1	20 mL	50 mL	183.663 g	183.655 g		06/19/17
20	L17060575-04	SAMP	1	20 mL	50 mL	180.481 g	180.48 g		06/19/17
21	L17060575-05	SAMP	1	20 mL	50 mL	185.389 g	185.375 g		06/19/17
22	WG617566-01	REF	1	20 mL	50 mL	181.359 g	181.356 g		
23	L17060575-06	SAMP	1	20 mL	50 mL	181.359 g	181.356 g		06/19/17
24	WG617566-04	MS	1	20 mL	50 mL	183.938 g	183.924 g	.25 mL	
25	WG617566-05	MSD	1	20 mL	50 mL	181.776 g	181.763 g	.25 mL	

L17060570-01	FILTERED DIGESTATE
L17060570-04	FILTERED DIGESTATE

Analyst: Veeha Collier

Reviewer: [Signature]



Microbac Laboratories Inc.

Instrument Run Log

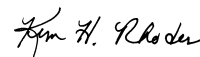
Instrument: ICP-MS2 Dataset: 061417B.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD81946 ICV Std: STD82261 Post Spike: STD79415
 ICSA: STD82264 ICSAB: STD82265 Int. Std: RGT39300
 CCV: STD81947 LLCCV: STD82263 Tuning Sol : STD82266
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617719,617731

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.061417.092938	Blank	Blank		1		06/14/17 09:29
2	NI.061417.093244	WG617829-01	Calibration Point		1		06/14/17 09:32
3	NI.061417.093549	WG617829-02	Calibration Point		1		06/14/17 09:35
4	NI.061417.093855	WG617829-03	Calibration Point		1		06/14/17 09:38
5	NI.061417.094201	WG617829-04	Calibration Point		1		06/14/17 09:42
6	NI.061417.094508	WG617829-05	Initial Calibration Verification		1		06/14/17 09:45
7	NI.061417.094815	WG617829-06	Initial Calib Blank		1		06/14/17 09:48
8	NI.061417.095122	WG617829-07	Low Level Initial Calibration V		1		06/14/17 09:51
9	NI.061417.095427	WG617829-08	Interference Check		1		06/14/17 09:54
10	NI.061417.095733	WG617829-09	Interference Check		1		06/14/17 09:57
11	NI.061417.100041	WG617829-10	CCV		1		06/14/17 10:00
12	NI.061417.100346	WG617829-11	CCB		1		06/14/17 10:03
13	NI.061417.100707	WG617383-02	Method/Prep Blank	.25/100	1		06/14/17 10:07
14	NI.061417.101013	WG617383-03	Laboratory Control S	.25/100	1		06/14/17 10:10
15	NI.061417.101318	WG617383-01	Reference Sample		200	L17060509-01	06/14/17 10:13
16	NI.061417.101623	WG617383-04	Matrix Spike	.254/100	200	L17060509-01	06/14/17 10:16
17	NI.061417.101928	WG617383-05	Matrix Spike Duplica	.251/100	200	L17060509-01	06/14/17 10:19
18	NI.061417.102234	L17060490-01	GS203QGSS060717S	.25/100	1		06/14/17 10:22
19	NI.061417.102539	WG617719-01	Post Digestion Spike		1	L17060490-01	06/14/17 10:25
20	NI.061417.102844	WG617719-02	Serial Dilution		5	L17060490-01	06/14/17 10:28
21	NI.061417.103150	WG617719-02	Serial Dilution		25	L17060490-01	06/14/17 10:31
22	NI.061417.103456	WG617719-02	Serial Dilution		125	L17060490-01	06/14/17 10:34
23	NI.061417.103803	WG617829-12	CCV		1		06/14/17 10:38
24	NI.061417.104108	WG617829-13	CCB		1		06/14/17 10:41
25	NI.061417.104415	WG617391-02	Method/Prep Blank		1		06/14/17 10:44
26	NI.061417.104721	WG617391-03	Laboratory Control S		1		06/14/17 10:47
27	NI.061417.105025	WG617391-01	Reference Sample		1	L17060490-01	06/14/17 10:50
28	NI.061417.105331	WG617391-04	Matrix Spike		1	L17060490-01	06/14/17 10:53
29	NI.061417.105636	WG617391-05	Matrix Spike Duplica		1	L17060490-01	06/14/17 10:56
30	NI.061417.105942	WG617720-01	Post Digestion Spike		1	L17060490-01	06/14/17 10:59
31	NI.061417.110549	WG617829-14	CCV		1		06/14/17 11:05
32	NI.061417.110854	WG617829-15	CCB		1		06/14/17 11:08
33	NI.061417.112040	WG617566-02	Method/Prep Blank	20/50	1		06/14/17 11:20
34	NI.061417.112345	WG617566-03	Laboratory Control S	20/50	1		06/14/17 11:23

Page: 1 Approved: June 16, 2017




Microbac Laboratories Inc.

Instrument Run Log

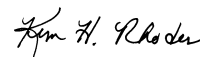
Instrument: ICP-MS2 Dataset: 061417B.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD81946 ICV Std: STD82261 Post Spike: STD79415
 ICSA: STD82264 ICSAB: STD82265 Int. Std: RGT39300
 CCV: STD81947 LLCCV: STD82263 Tuning Sol : STD82266
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617719,617731

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.061417.112651	WG617566-01	Reference Sample		1	L17060575-06	06/14/17 11:26
36	NI.061417.112956	WG617566-04	WG617566-01	20/50	1	L17060575-06	06/14/17 11:29
37	NI.061417.113302	WG617566-05	Matrix Spike Duplica	20/50	1	L17060575-06	06/14/17 11:33
38	NI.061417.113607	L17060482-01	LH18/24-SP140-7447-GRAB	20/50	1		06/14/17 11:36
39	NI.061417.113913	L17060484-01	LH18/24-SP650-6447-GRAB	20/50	1		06/14/17 11:39
40	NI.061417.114219	WG617731-01	Post Digestion Spike		1	L17060484-01	06/14/17 11:42
41	NI.061417.114524	L17060484-01	LH18/24-SP650-6447-GRAB		5		06/14/17 11:45
42	NI.061417.114829	WG617731-02	Serial Dilution		25	L17060484-01	06/14/17 11:48
43	NI.061417.115137	WG617829-16	CCV		1		06/14/17 11:51
44	NI.061417.115442	WG617829-17	CCB		1		06/14/17 11:54
45	NI.061417.115749	L17060570-01	102-060917	20/50	1		06/14/17 11:57
46	NI.061417.120054	L17060570-02	129-060917	20/50	1		06/14/17 12:00
47	NI.061417.120400	L17060570-04	120F-060917	20/50	1		06/14/17 12:04
48	NI.061417.120706	L17060570-05	123-060917	20/50	1		06/14/17 12:07
49	NI.061417.121010	L17060570-07	125F-060917	20/50	1		06/14/17 12:10
50	NI.061417.121316	L17060570-08	109-060917	20/50	1		06/14/17 12:13
51	NI.061417.121621	L17060570-09	18CPTMW24-060917	20/50	1		06/14/17 12:16
52	NI.061417.121927	L17060574-01	7060394-01	20/50	1		06/14/17 12:19
53	NI.061417.122232	L17060574-02	7060394-02	20/50	1		06/14/17 12:22
54	NI.061417.122537	L17060574-03	7060394-03	20/50	1		06/14/17 12:25
55	NI.061417.122844	WG617829-18	CCV		1		06/14/17 12:28
56	NI.061417.123150	WG617829-19	CCB		1		06/14/17 12:31
57	NI.061417.123527	L17060574-04	7060394-04	20/50	1		06/14/17 12:35
58	NI.061417.123833	L17060574-05	7060394-05	20/50	1		06/14/17 12:38
59	NI.061417.124138	L17060575-01	7060395-01	20/50	1		06/14/17 12:41
60	NI.061417.124444	L17060575-02	7060395-02	20/50	1		06/14/17 12:44
61	NI.061417.124749	L17060575-03	7060395-03	20/50	1		06/14/17 12:47
62	NI.061417.125055	L17060575-04	7060395-04	20/50	1		06/14/17 12:50
63	NI.061417.125400	L17060575-05	7060395-05	20/50	1		06/14/17 12:54
64	NI.061417.125705	L17060570-09	18CPTMW24-060917	20/50	50		06/14/17 12:57
65	NI.061417.130010	L17060570-01	102-060917	20/50	50		06/14/17 13:00
66	NI.061417.130317	WG617829-20	CCV		1		06/14/17 13:03
67	NI.061417.130623	WG617829-21	CCB		1		06/14/17 13:06
68	NI.061417.130929	WG617829-22	Low Level Continuing Calibra		1		06/14/17 13:09

Page: 2 Approved: June 16, 2017




Microbac Laboratories Inc.

Instrument Run Log

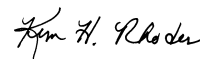
Instrument: ICP-MS2 Dataset: 061417C.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD81946 ICV Std: STD82261 Post Spike: STD79415
 ICSA: STD82264 ICSAB: STD82265 Int. Std: RGT39300
 CCV: STD81947 LLCCV: STD82263 Tuning Sol : STD82266
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617731

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.061417.135135	Blank	Blank		1		06/14/17 13:51
2	NI.061417.135441	WG617953-01	Calibration Point		1		06/14/17 13:54
3	NI.061417.135747	WG617953-02	Calibration Point		1		06/14/17 13:57
4	NI.061417.140052	WG617953-03	Calibration Point		1		06/14/17 14:00
5	NI.061417.140357	WG617953-04	Calibration Point		1		06/14/17 14:03
6	NI.061417.140704	WG617953-05	Initial Calibration Verification		1		06/14/17 14:07
7	NI.061417.141012	WG617953-06	Initial Calib Blank		1		06/14/17 14:10
8	NI.061417.141319	WG617953-07	Low Level Initial Calibration V		1		06/14/17 14:13
9	NI.061417.141624	WG617953-08	Interference Check		1		06/14/17 14:16
10	NI.061417.141929	WG617953-09	Interference Check		1		06/14/17 14:19
11	NI.061417.142236	WG617953-10	CCV		1		06/14/17 14:22
12	NI.061417.142541	WG617953-11	CCB		1		06/14/17 14:25
13	NI.061417.142848	WG617566-02	Method/Prep Blank	20/50	1		06/14/17 14:28
14	NI.061417.143154	WG617566-03	Laboratory Control S	20/50	1		06/14/17 14:31
15	NI.061417.143459	L17060575-06	7060395-06		1	WG617566-01	06/14/17 14:34
16	NI.061417.143805	WG617566-04	WG617566-01	20/50	1	L17060575-06	06/14/17 14:38
17	NI.061417.144111	WG617566-05	Matrix Spike Duplica	20/50	1	L17060575-06	06/14/17 14:41
18	NI.061417.144416	L17060484-01	LH18/24-SP650-6447-GRAB	20/50	1		06/14/17 14:44
19	NI.061417.144721	WG617731-01	Post Digestion Spike		1	L17060484-01	06/14/17 14:47
20	NI.061417.145027	WG617731-02	Serial Dilution		5	L17060484-01	06/14/17 14:50
21	NI.061417.145333	WG617731-02	Serial Dilution		25	L17060484-01	06/14/17 14:53
22	NI.061417.145640	WG617953-12	CCV		1		06/14/17 14:56
23	NI.061417.145945	WG617953-13	CCB		1		06/14/17 14:59
24	NI.061417.150252	L17060570-01	102-060917	20/50	1		06/14/17 15:02
25	NI.061417.150558	L17060570-02	129-060917	20/50	1		06/14/17 15:05
26	NI.061417.150903	L17060570-04	120F-060917	20/50	1		06/14/17 15:09
27	NI.061417.151209	L17060570-05	123-060917	20/50	1		06/14/17 15:12
28	NI.061417.151514	L17060570-07	125F-060917	20/50	1		06/14/17 15:15
29	NI.061417.151820	L17060570-08	109-060917	20/50	1		06/14/17 15:18
30	NI.061417.152125	L17060570-09	18CPTMW24-060917	20/50	1		06/14/17 15:21
31	NI.061417.152431	L17060574-01	7060394-01	20/50	1		06/14/17 15:24
32	NI.061417.152737	L17060574-02	7060394-02	20/50	1		06/14/17 15:27
33	NI.061417.153042	L17060574-03	7060394-03	20/50	1		06/14/17 15:30
34	NI.061417.153349	WG617953-14	CCV		1		06/14/17 15:33

Page: 1 Approved: June 16, 2017




Microbac Laboratories Inc.

Instrument Run Log

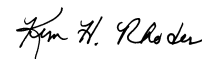
Instrument: ICP-MS2 Dataset: 061417C.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD81946 ICV Std: STD82261 Post Spike: STD79415
 ICSA: STD82264 ICSAB: STD82265 Int. Std: RGT39300
 CCV: STD81947 LLCCV: STD82263 Tuning Sol : STD82266
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617731

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.061417.153655	WG617953-15	CCB		1		06/14/17 15:36
36	NI.061417.154002	L17060574-04	7060394-04	20/50	1		06/14/17 15:40
37	NI.061417.154308	L17060574-05	7060394-05	20/50	1		06/14/17 15:43
38	NI.061417.154613	L17060575-01	7060395-01	20/50	1		06/14/17 15:46
39	NI.061417.154918	L17060575-02	7060395-02	20/50	1		06/14/17 15:49
40	NI.061417.155224	L17060575-03	7060395-03	20/50	1		06/14/17 15:52
41	NI.061417.155529	L17060575-04	7060395-04	20/50	1		06/14/17 15:55
42	NI.061417.155834	L17060575-05	7060395-05	20/50	1		06/14/17 15:58
43	NI.061417.160141	WG617953-16	CCV		1		06/14/17 16:01
44	NI.061417.160446	WG617953-17	CCB		1		06/14/17 16:04
45	NI.061417.160753	WG617953-18	Low Level Continuing Calibra		1		06/14/17 16:07

Page: 2 Approved: June 16, 2017




Microbac Laboratories Inc.

Data Checklist

Date: 14-JUN-2017
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A/200.8
 Instrument: ICP-MS
 Curve Workgroup: 617829
 Runlog ID: 82741
 Analytical Workgroups: 617719,617731

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	490,509,482,484,570,574,575
Client Forms	X
Level X	
Level 3	
Level 4	490,482,484,570,574
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JYH
Secondary Reviewer	KHR
Comments	

Primary Reviewer:

Secondary Reviewer:
16-JUN-2017



Microbac Laboratories Inc.

Data Checklist

Date: 14-JUN-2017
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A/200.8
 Instrument: ICP-MS
 Curve Workgroup: 617953
 Runlog ID: 82764
 Analytical Workgroups: 617731

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	
Client Forms	X
Level X	
Level 3	
Level 4	484,570,574
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JYH
Secondary Reviewer	KHR
Comments	

Primary Reviewer:

Secondary Reviewer:
16-JUN-2017



Analytical Method:6020A
Login Number:L17060482

AAB#:WG617731

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP140-7447-GRAB	01	06/07/17					06/13/2017	5.7	180		06/14/17	6.9	180	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060482 Work Group: WG617731
 Blank File ID: NI.061417.112040 Blank Sample ID: WG617566-02
 Prep Date: 06/13/17 08:11 Instrument ID: ICP-MS2
 Analyzed Date: 06/14/17 11:20 Method: 6020A
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617566-03	NI.061417.112345	06/14/17 11:23	01
LH18/24-SP140-7447-GRAB	L17060482-01	NI.061417.113607	06/14/17 11:36	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5336845
 Report generated 06/14/2017 13:30



Login Number: L17060482 Prep Date: 06/13/17 08:11 Sample ID: WG617566-02
Instrument ID: ICP-MS2 Run Date: 06/14/17 11:20 Prep Method: 3015A
File ID: NI.061417.112040 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG617731 Matrix: Water Units: mg/L
Contract #: Cal ID: ICP-MS - 14-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Silver, Total	0.000500	0.00200	0.000500	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5336846
14-JUN-2017 13:30



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617566-03
Instrument ID: ICP-MS2 Run Time: 11:23 Prep Method: 3015A
File ID: NI.061417.112345 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG617731 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD80296 Cal ID: ICP-MS - 14-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Silver, Total	0.125	0.116	93.0	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5336847
Report generated: 06/14/2017 13:30



Loginnum: L17060482 Cal ID: ICP-MS2- Worknum: WG617731
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG617566-01 File ID: NI.061417.112651 Dil: 1 Matrix: WATER
 Sample ID: WG617566-04 MS File ID: NI.061417.112956 Dil: 1 Units: mg/L
 Sample ID: WG617566-05 MSD File ID: NI.061417.113302 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Silver	ND	0.125	0.113	90.5	0.125	0.113	90.4	0.173	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L17060482 **Worknum:** WG617731
Instrument: ICP-MS2 **Method:** 6020A
Serial Dil: WG617731-02 **File ID:** NI.061417.114524 **Dil:** 5 **Units:** ug/L
Sample: L17060484-01 **File ID:** NI.061417.113913 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Silver	ND	U	ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 100 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 100 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5336842

06/14/2017 13:30



Microbac Laboratories Inc.
Serial Dilution Report

Login: L17060482 **Worknum:** WG617731
Instrument: ICP-MS2 **Method:** 6020A
Serial Dil: WG617731-02 **File ID:** NI.061417.114829 **Dil:** 25 **Units:** ug/L
Sample: L17060484-01 **File ID:** NI.061417.114524 **Dil:** 5

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Silver	ND	U	ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 100 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 100 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5336842

06/14/2017 13:30



Sample Login ID: L17060482 Worknum: WG617731
 Instrument ID: ICP-MS2 Method: 6020A
 Post Spike ID: WG617731-01 File ID: NI.061417.114219 Dil: 1 Units: ug/L
 Sample ID: L17060484-01 File ID: NI.061417.113913 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
SILVER	45.4		0	U	50	90.9	75 - 125	

N = % Recovery exceeds control limits

F = Result is between MDL and RL

U = Sample result is below MDL. A value of zero is used in the calculation



Login: L17060482 Workgroup (AAB#): WG617731
 Analytical Method: 6020A Instrument ID: ICP-MS2
 ICAL Worknum: WG617829 Initial Calibration Date: 14-JUN-2017 09:42

	WG617829-01		WG617829-02		WG617829-03		WG617829-04			
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	R	Q
SILVER	0	83.3	.4	279	50	202000	100	393000	.999995	

INT = Instrument intensity
 R = Coefficient of correlation
 Q = Data Qualifier
 * = Out of Compliance; R < 0.995



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617829-06
Instrument ID: ICP-MS2 Run Time: 09:48 Method: 6020A
File ID: NI.061417.094815 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG617731 Cal ID: ICP-MS2 - 14-JUN-17
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
SILVER	.2	.8	.2	U

U = Result is less than 2 x MDL
F = Result is between MDL and 2 x MDL
* = Result is above 2 x MDL



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617829-11
Instrument ID: ICP-MS2 Run Time: 10:03 Method: 6020A
File ID: NI.061417.100346 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Silver	0.200	0.800	0.200	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617829-15
 Instrument ID: ICP-MS2 Run Time: 11:08 Method: 6020A
 File ID: NI.061417.110854 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Silver	0.200	0.800	0.200	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5336856
 Report generated 06/14/2017 13:30



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617829-17
Instrument ID: ICP-MS2 Run Time: 11:54 Method: 6020A
File ID: NI.061417.115442 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Silver	0.200	0.800	0.200	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617829-05
Instrument ID: ICP-MS2 Run Time: 09:45 Method: 6020A
File ID: NI.061417.094508 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Silver	50	51.1	102	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617829-10
 Instrument ID: ICP-MS2 Run Time: 10:00 Method: 6020A
 File ID: NI.061417.100041 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Silver	0.0500	0.0517	mg/L	103	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617829-14
 Instrument ID: ICP-MS2 Run Time: 11:05 Method: 6020A
 File ID: NI.061417.110549 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Silver	0.0500	0.0475	mg/L	95.0	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617829-16
 Instrument ID: ICP-MS2 Run Time: 11:51 Method: 6020A
 File ID: NI.061417.115137 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Silver	0.0500	0.0475	mg/L	95.0	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617829-07
Instrument ID: ICP-MS2 Run Time: 09:51 Method: 6020A
File ID: NI.061417.095122 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Silver	0.400	0.390	ug/L	97.5	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17060482 Run Date: 06/14/2017 Sample ID: WG617829-22
 Instrument ID: ICP-MS2 Run Time: 13:09 Method: 6020A
 File ID: NI.061417.130929 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Silver	0.400	0.362	ug/L	90.6	70 - 130	

* Exceeds LIMITS Criteria



Login number: L17060482
 Instrument ID: ICP-MS2
 Sol. A: WG617829-08
 Sol. AB: WG617829-09

File ID: NI.061417.095427
 File ID: NI.061417.095733

Workgroup (AAB#): WG617731
 Method: 6020A
 Units: ug/L
 Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Silver	NS	0.0110	NS	100	83.5	83.5	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



INTERNAL STANDARD REPORT

Login: L17060482 Analytical Method: 6020
 Analytical Workgroup: WG617731 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 14-JUN-2017 09:32

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L17060482-01	SAMP	14-JUN-2017 11:36	98.966	102.234	109.53
L17060484-01	SAMP	14-JUN-2017 11:39	98.684	102.469	107.29
L17060484-01	SAMP	14-JUN-2017 11:45	98.946	97.541	100.91
WG617566-02	BLANK	14-JUN-2017 11:20	103.419	100.498	103.526
WG617566-03	LCS	14-JUN-2017 11:23	103.625	102.655	105.96
WG617731-01	PSPK	14-JUN-2017 11:42	100.201	102.936	107.278
WG617731-02	SERIAL	14-JUN-2017 11:45	98.946	97.541	100.91
WG617731-02	SERIAL	14-JUN-2017 11:48	99.167	95.517	98.516
WG617829-05	ICV	14-JUN-2017 09:45	99.117	100.371	99.861
WG617829-06	ICB	14-JUN-2017 09:48	95.387	92.315	93.05
WG617829-07	LLICV	14-JUN-2017 09:51	99.089	98.669	98.317
WG617829-08	ICS	14-JUN-2017 09:54	94.758	95.507	94.795
WG617829-09	ICS	14-JUN-2017 09:57	97.364	97.887	97.633
WG617829-10	CCV	14-JUN-2017 10:00	100.457	103.036	102.174
WG617829-11	CCB	14-JUN-2017 10:03	98.103	97.376	98.761
WG617829-14	CCV	14-JUN-2017 11:05	104.325	104.108	105.883
WG617829-15	CCB	14-JUN-2017 11:08	98.719	94.862	99.976
WG617829-16	CCV	14-JUN-2017 11:51	101.585	101.301	105.037
WG617829-17	CCB	14-JUN-2017 11:54	100.714	98.744	103.836
WG617829-22	LLCCV	14-JUN-2017 13:09	102.925	102.742	104.508

Acceptance criteria: 30% - 120% Underlined recoveries are out of range
 Acceptance criteria for CCVs and CCBs for method SW846-6020: 80% - 120%

INT_STD_ICPMS - Modified 07/28/2010
 PDF File ID: 5336850
 Report generated: 06/14/2017 13:30



Login Number: L17060482 Date: 04/12/2017
Instrument ID: ICP-MS2 Method: 6020A

Analyte	Integration Time (Sec.)	Concentration (ug/L)
Antimony	1.00	100.0
Arsenic	1.00	100.0
Barium	1.00	100.0
Cadmium	1.00	100.0
Chromium	1.00	100.0
Cobalt	1.00	100.0
Copper	1.00	100.0
Lead	1.00	100.0
Manganese	1.00	100.0
Nickel	1.00	100.0
Selenium	1.00	100.0
Silver	1.00	100.0
Thallium	1.00	100.0
Uranium	1.00	100.0
Vanadium	1.00	100.0
Zinc	1.00	100.0

Comments:

All analytes passed acceptance criteria at the specified concentration.



2.3 General Chemistry Data

2.3.1 Hexavalent Chromium Data

2.3.1.1 Summary Data



Login Number: L17060482
Department: Conventionals
Analyst: Dorothy Payne

METHOD

Analysis SM3500Cr-D/7196A (Hexavalent Chromium)

HOLDING TIMES

Sample Analysis: The samples were received past the recommended hold time. The analysis was performed out of hold per client's request.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 126502

Approved By: Sarah Vandenberg

Sarah Vandenberg

Lab Report #: L17060482

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060482-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP140-7447-GRAB	Prep Method: 7196A	Prep Date: N/A
Matrix: Water	Analytical Method: 7196A	Cal Date: 06/05/2017 10:10
Workgroup #: WG617322	Analyst: DLP	Run Date: 06/09/2017 15:00
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: 00.1706091500-05
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chromium, Hexavalent	18540-29-9	0.0100	U,H1	0.0200	0.0100	0.00500
U,H1	Not detected; Sample analysis performed past holding time.					

2.3.1.2 QC Summary Data

Example Calculations for Visible Spectrophotometric Methods

Linear Calibration Model

Step 1 - Retrieve Curve Data from ICAL

m = slope of the linear equation
 b = intercept from the linear equation
 y = instrument response as absorbance or OD
 x = concentration of analyte (mg/L)
 $y = mx + b$

Step 2: Calculate the instrument concentration, x

Where:

$$x = (y - b)/m$$

Step 3: Solve for analyte concentration in sample, Cx

$$Cx = (x) (D)$$

Example Calculation (LCS):

Value of m from plot:	7.809
Value of b from plot:	0.0004135
Absorbance of unknown from quantitation report (y):	0.31
Calculated concentration (x):	0.03964483
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	0.0396 mg/L

SmartChem Autoanalyzer - Quadratic Calibration for Chloride and Sulfate

Step 1 - Retrieve Curve Data from Smartchem ICAL

A, B, C = constants from the ICAL quadratic regression

x = instrument response as absorbance or OD

y = concentration of analyte (mg/L)

Step 2: Calculate the instrument concentration, y

Where:

$$y = Ax^2 + Bx + C$$

Step 3: Solve for analyte concentration in sample, Cy

$$Cy = (y) (D)$$

Example Calculation (LCS):

Value of A from plot:	101.2796
Value of B from plot:	318.9056
Value of C from plot:	-2.2712
Absorbance of unknown from quantitation report (x):	0.1583
Calculated concentration (y):	50.7495108
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	50.75 mg/L

Microbac Laboratories Inc.

Data Checklist

Date: 09-JUN-2017
 Analyst: DLP
 Analyst: NA
 Method: CR-6
 Instrument: UV-2600
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG617322

Calibration/Linearity	
Second Source Check	06-05-17
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Primary Reviewer	DLP
Secondary Reviewer	SAV
Comments	

Primary Reviewer:
09-JUN-2017

Secondary Reviewer:
15-JUN-2017

Dwight Payne

Sarah Vandenberg



Analytical Method: 7196A
Login Number: L17060482

AAB#: WG617322

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP140-7447-GRAB	01	06/07/17					06/09/2017	2	1	*	06/09/17	2	1	*

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060482 Work Group: WG617322
 Blank File ID: 00.1706091500-03 Blank Sample ID: WG617322-01
 Prep Date: 06/09/17 15:00 Instrument ID: UV-2600
 Analyzed Date: 06/09/17 15:00 Method: 7196A
 Analyst: DLP

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617322-02	00.1706091500-04	06/09/17 15:00	
LH18/24-SP140-7447-GRAB	L17060482-01	00.1706091500-05	06/09/17 15:00	
DUP	WG617322-05	00.1706091500-07	06/09/17 15:00	
LCS2	WG617322-03	00.1706091500-11	06/09/17 15:00	

Report Name: BLANK_SUMMARY
 PDF File ID: 5339278
 Report generated 06/15/2017 14:28



Login Number: L17060482 Prep Date: 06/09/17 15:00 Sample ID: WG617322-01
Instrument ID: UV-2600 Run Date: 06/09/17 15:00 Prep Method: 7196A
File ID: 00.1706091500-03 Analyst: DLP Method: 7196A
Workgroup (AAB#): WG617322 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: UV-260-07-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Chromium, Hexavalent	0.00500	0.0200	0.00500	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5339279
15-JUN-2017 14:28



Login Number: L17060482 Analyst: DLP Prep Method: 7196A
 Instrument ID: UV-2600 Matrix: Water Method: 7196A
 Workgroup (AAB#): WG617322 Units: mg/L
 QC Key: DOD4 Lot #: STD81994
 Sample ID: WG617322-02 LCS File ID: 00.1706091500-04 Run Date: 06/09/2017 15:00
 Sample ID: WG617322-03 LCS2 File ID: 00.1706091500-11 Run Date: 06/09/2017 15:00

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Chromium, Hexavalent	0.100	0.101	101	0.100	0.102	102	0.718	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5339280
 Report generated: 06/15/2017 14:28



2.3.1.3 Raw Data

Curves

Parameter: CR-10 Low

Spectrophotometer: UV-2400

Calibration (Curve) standard stock: 20872, 82188

Concentration: 50mg/L, 5mg/L

Recipe for preparation of curve standards found in:

SOP: 2184 Revision: 22 Page: 12

Second Source Stock: 81994 (concentration: 2mg/L)

Daily Preparation: 10(2)/200

concentration = ~0.1

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
0.2	100	5	540	0.822
0.1	100	5	540	0.432
0.05	100	5	540	0.209
0.02	100	5	540	0.083
0.01	100	5	540	0.041
0.00	100	5	540	0.004
		5	5	
2nd source dil	100	5	540	0.423

Analyst: Paul Shere

Date/Time: 6/5/17 @ 1010

DCN#126170



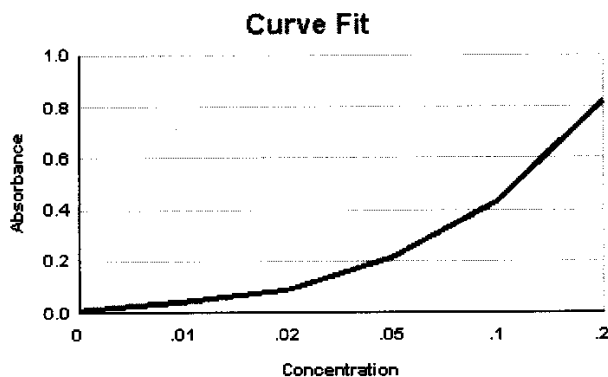
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG616556
Analytical Method: 3500CR
Instrument ID: UV-2600

Analyst: ADG
Initial Calibration Date: 06/05/2017

Analyte: **CHROMIUM, HEXAVALENT**
Number of Points: 6
Slope: 4.12523
Y-Intercept: 0.00390207
Coef. Of Correlation (R^2): 0.999348
Coef. Of Correlation (R): 0.999674

Concentration X	Absorbance Y	X^2	$X * Y$	Y-Fitted (mX^2+B)
0.00	0.00400	0.00	0.00	0.00390207
0.0100	0.0410	0.000100	0.000410	0.0451544
0.0200	0.0830	0.000400	0.00166	0.0864067
0.0500	0.209	0.00250	0.0105	0.210164
0.100	0.432	0.0100	0.0432	0.416425
0.200	0.822	0.0400	0.164	0.828948



WG ICAL_CAL_WET - Modified 03/06/2008
Report generated 06/05/2017 13:03

Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

Workgroup #: WG616556Instrument ID: UV-2600File ID: 00.1706051010-07Run Date: 06/05/2017CCV ID: WG616556-07Run Time: 10:10Units: mg/LAnalyst: ADGAnalyte: CHROMIUM, HEXAVALENTCal ID: UV-260 - 05-JUN-17 10:10:06

Analyte	Expected	Found	RF	%D	Q
Chromium, Hexavalent	.1	0.102	4.23	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET WG_SSCV - Modified 03/06/2008
Report generated 06/05/2017 13:03



WORKGROUP: WG617322

CHROMIUM (6)
(Cr6)

Standard Methods 3500 Cr-D (18th, 19th), 3500Cr-B(20th)

SOP K2186 Rev. # 22

SW846 7196A

SOP OVAP K3500-Cr Rev. # _____

CCV: 5182186

LCS: 2081994

Spike: 5180874 RGT 40360

Matrix: Liquid (mg/L)

Daily dilution: 1.5/100 =

Daily dilution: 10.2/200 =

Daily dilution: 0.25/10 = RGT 60A18097

Soil (mg/Kg)

Daily dilution: 0.05

Daily dilution: 0.10

Daily dilution: 0.10

Sample	Volume (mL)	pH adj. to 2 ± 0.5	Dilution	Cell size (cm)	Absorbance @ 540 nm
CCV: mg/L(1 cm)	100				
CCV: <u>0.05</u> mg/L(5 cm)	100	✓		5 cm	0.216
Blank/CCB:	100	✓		5 cm	0.002
LCS: ppm	100	✓		5 cm	0.420
LCS DUP: ppm	100	✓		5 cm	0.423
x 06-482-01	100	✓		5 cm	0.004
x 06-484-01	100	✓		5 cm	0.008
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
DUP: <u>06-482-01</u>	100	✓		5 cm	0.004
MS: () <u>484-01</u>	100	✓		5 cm	0.390
MSD: ()	100				
CCV: (1 cm)	100				
CCV: <u>0.05</u> (5 cm)	100	✓		5 cm	0.216
CCB:	100			5 cm	0.001

Analyst: Anthony Payne

Date / Time: 06-09-17, 1500

SW846 7196 (Dup and/or MS every 10 samples)

SM3500 Cr (Dup and MS/MSD every 20 samples)

* Samples were received out of hold.

DCN#126366



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG617322
Analyte: CHROMIUM, HEXAVALENT

Analyst: DLP
Date: 06/09/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG617322-01	100	100	0.00200	4.125	0.003902	-0.00046108	-0.00046108	1	mg/L
WG617322-02	100	100	0.420	4.125	0.003902	0.10087	0.10087	1	mg/L
L17060482-01	100	100	0.00400	4.125	0.003902	0.000023738	ND	1	mg/L
WG617322-04	100	100	0.00400	4.125	0.003902	0.000023738	0.000023738	1	mg/L
WG617322-06	100	100	0.00800	4.125	0.003902	0.00099338	0.00099338	1	mg/L
L17060484-01	100	100	0.00800	4.125	0.003902	0.00099338	ND	1	mg/L
WG617322-05	100	100	0.00400	4.125	0.003902	0.000023738	0.000023738	1	mg/L
WG617322-07	100	100	0.390	4.125	0.003902	0.093594	0.093594	1	mg/L
WG617322-03	100	100	0.423	4.125	0.003902	0.10159	0.10159	1	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 06/09/2017 17:22

Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00857466

Workgroup #: WG617365
File ID: 00.1706091500-01
CCV ID: WG617365-01
Units: mg/L
Analyte: CHROMIUM, HEXAVALENT

Instrument ID: UV-2600
Run Date: 06/09/2017
Run Time: 15:00
Analyst: DLP
Cal ID: UV-260 - 07-JUN-17

Analyte	Expected	Found	RF	%D	Q
Chromium, Hexavalent	.05	0.0514	4.32	2.8	

* Exceeds %D Limit
CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008
Report generated 06/09/2017 17:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00857467

Workgroup #: WG617365
File ID: 00.1706091500-09
CCV ID: WG617365-03
Units: mg/L
Analyte: CHROMIUM, HEXAVALENT

Instrument ID: UV-2600
Run Date: 06/09/2017
Run Time: 15:00
Analyst: DLP
Cal ID: UV-260 - 07-JUN-17

Analyte	Expected	Found	RF	%D	Q
Chromium, Hexavalent	.05	0.0514	4.32	2.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/09/2017 17:20



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
June 22, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
ALS - ADRIANE L. STEED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BLG - BRENDA L. GREENWALT	BNB - Brandi N. Bentley
BRG - BRENDA R. GREGORY	CAS - Craig A. Smith
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL	CV - Carl Volkman
DAK - DEAN A. KETELSEN	DCM - DAVID C. MERCKLE
DEV - DAVID E. VANDENBERG	DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER	DLP - DOROTHY L. PAYNE
DSM - DAVID S. MOSSOR	DTG - DOMINIC T. GEHRET
ECL - ERIC C. LAWSON	EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER	FJB - FRANCES J. BOLDEN
HRF - HEATHER R. FAIRCHILD	JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH	JKP - JACQUELINE K. PARSONS
JLD - JESSICA L. DELONG	JST - JOSHUA S. TAYLOR
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KDD - Katelyn D. Daley
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRP - KATHY R. PARSONS	LJH - Lacey J. Hendershot
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
OJE - OMOYEMWEN J. ENGLISH	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCA - SUEELLEN C. ADAMS
SCB - SARAH C. BOGOLIN	SCJ - SUE ELLEN C. JOHNSON
SDC - SHALYN D. CONLEY	TB - TODD BOYLE
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	ZTB - ZACH T. BARNES

List of Valid Qualifiers

June 22, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample receipt exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentatively identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound



List of Valid Qualifiers

June 22, 2017

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below



CHAIN OF CUSTODY

Name Of Lab Shipping To: MICROBAC (740) 373-4071 ATTN: STEPHANIE MOSSBURG

Project: AECOM
 LONGHORN ARMY AMMN. PLANT (LHAAP)
 GROUNDWATER TREATMENT PLANT (GWTP)
 KARNACK, TEXAS
 Project No. 60256135.GWTPT
 HRUMAR16

Job: GROUNDWATER TREATMENT PLANT
 MONTHLY INFLUENT SAMPLES

Prepared By: Scott Beesinger
 P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	Analyses				Remarks (Preservatives, etc.)	Lab I.D.#
			MS / MSD	No. OF CONTAINERS	SILVER & SELENIUM	HEXAVALENT CHROMIUM		
LH18/24-SP140-7447-Grab	Water	06/07/17 / 15:00	1	X				HNO3
LH18/24-SP140-7447-Grab	Water	06/07/17 / 15:00	2	X	X			NONE

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	06/07/17	15:30									

Received At Lab By: _____ Date: _____ Time: _____


Airbill No. _____ Date: _____ Time: _____

Temp of Container: _____ Seal No. _____ Condition: _____

For Lab Use Only

Received: 06/09/2017 10:09
 By: BRENDA GREENWALT

Microbac OVD

Barcode: 

Remarks: _____

COOLER TEMP >6° C LOG

Cooler ID 1877

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6
	°C	°C	°C	°C	°C	°C

CRD 6/9/17

pH Exceptions

pH Lot # H060354

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6

CRD 6/9/17

**PRESERVATIVE
EXCEPTIONS**
 NONE
 AS NOTED

CRD 6/9/17

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17060482

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 20-JUN-2017

Samplenum **Container ID** **Products**
L17060482-01 919306 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	09-JUN-2017 12:30	CLS		
2	ANALYZ	W1	SEM	13-JUN-2017 13:51	JWR	CLS	
3	STORE	SEM	A1	20-JUN-2017 13:05	CLS	JWR	

Samplenum **Container ID** **Products**
L17060482-01 919307 AG-MS SE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	09-JUN-2017 12:30	CLS		
2	PREP	W1	DIG	09-JUN-2017 14:06	VC	CLS	
3	ANALYZ*	DIG	METALS	13-JUN-2017 16:51	JYH	VC	
4	STORE	DIG	A1	16-JUN-2017 14:26	BRG	VC	

*Sample extract/digestate/leachate

Samplenum **Container ID** **Products**
L17060482-01 919308 CR-6

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	09-JUN-2017 12:30	CLS		
2	ANALYZ	V1	WET	09-JUN-2017 13:18	DLP	CLS	
3	STORE	WET	A1	12-JUN-2017 14:35	CLS	TB	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
 Total Halide by Bomb Combustion (TX)
 Particle Sizing - 200 Mesh (PS200)
 Specific Gravity/Density (SPGRAV)
 Total Residual Chlorine (CL-TRL)
 Total Volatile Solids (all forms) (TVS)
 Total Coliform Bacteria (all methods)
 Fecal Coliform Bacteria (all methods)
 Sulfite (SO₃)
 Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS

Nitrogen, Ammonia by Method 350.1
 Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
 Phenolics, Total by Method 420.1
 ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
 Acetic acid
 Butyric acid
 Lactic acid
 Propionic acid
 Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
 1-Methylnaphthalene
 1,4-Dioxane
 Atrazine
 Benzaldehyde
 Biphenyl
 Caprolactam
 Hexamethylphosphoramide (HMPA)
 Pentachlorobenzene
 Pentachloroethane

NELAP Accreditation by Laboratory SOP**NONPOTABLE WATER**OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALSOVD MSS01/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP**SOLID AND HAZARDOUS CHEMICALS**OVD MSV01/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)

Laboratory Report Number: L17060483

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on June 16 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Microbac Laboratories * Ohio Valley Division
158 Starlite Drive, Marietta, OH 45750 * T: (740) 373-4071 F: (740) 373-4835 * www.microbac.com

Lab Report #: L17060483

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

There were no discrepancies.

Discrepancy	Resolution

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0011846	H	1.0		1Z4984890169489494	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	NA

**Lab Report #:** L17060483**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP650-6448-GRAB	L17060483-01	06/07/2017 15:00	06/09/2017 10:09



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	NH3
Prep Batch Number(s):	WG617712	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-16 16:54:32



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	NH3
Prep Batch Number(s):	WG617712	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	NH3
Prep Batch Number(s):	WG617712	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	NH3
Prep Batch Number(s):	WG617712	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	NH3
Prep Batch Number(s):	WG617712	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	NH3
Prep Batch Number(s):	WG617712	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	PO4
Prep Batch Number(s):	WG617321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-16 16:53:57



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	PO4
Prep Batch Number(s):	WG617321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	PO4
Prep Batch Number(s):	WG617321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	PO4
Prep Batch Number(s):	WG617321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	PO4
Prep Batch Number(s):	WG617321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	PO4
Prep Batch Number(s):	WG617321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	TOC
Prep Batch Number(s):	WG617770	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-16 16:55:08



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	TOC
Prep Batch Number(s):	WG617770	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	TOC
Prep Batch Number(s):	WG617770	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	TOC
Prep Batch Number(s):	WG617770	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	TOC
Prep Batch Number(s):	WG617770	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060483
Project Name:		Method:	TOC
Prep Batch Number(s):	WG617770	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

Lab Report #: L17060483
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060483-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6448-GRAB	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 06/13/2017 16:47
Workgroup #: WG617712	Analyst: TB	Run Date: 06/13/2017 16:58
Collect Date: 06/07/2017 15:00	Dilution: 10	File ID: S2170613004.019
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	9.51		2.00	1.00	0.500

Certificate of Analysis

Sample #: L17060483-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6448-GRAB	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:45
Workgroup #: WG617321	Analyst: DLP	Run Date: 06/09/2017 14:00
Collect Date: 06/07/2017 15:00	Dilution: 5	File ID: 00.1706091400-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	1.97		0.500	0.250	0.125

Certificate of Analysis

Sample #: L17060483-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6448-GRAB	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG617770	Analyst: ADG	Run Date: 06/14/2017 22:08
Collect Date: 06/07/2017 15:00	Dilution: 5	File ID: TC06142017.037
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	79.0		10.0	5.00	2.50

2.1 General Chemistry Data

2.1.1 Ammonia Data

2.1.1.1 Summary Data

Lab Report #: L17060483

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060483-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6448-GRAB	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 06/13/2017 16:47
Workgroup #: WG617712	Analyst: TB	Run Date: 06/13/2017 16:58
Collect Date: 06/07/2017 15:00	Dilution: 10	File ID: S2170613004.019
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	9.51		2.00	1.00	0.500

2.1.1.2 QC Summary Data

Example Ammonia Calculations

$$(\text{absorbance} - \text{intercept}) / (\text{slope} * \text{dilution}) = \text{mg/L}$$

where:

absorbance = reading from the spectrophotometer

intercept = calculated from calibration standard absorbencies

slope = calculated from calibration standard absorbencies

dilution = dilution of the distillate in decimal form (ex. 1/5 dilution = 0.2)

Microbac Laboratories Inc.

Data Checklist

Date: 13-JUN-2017
 Analyst: TB
 Analyst: NA
 Method: NH3
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG617712

Calibration/Linearity	06/13/2017
Second Source Check	X
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	X
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	TB
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
14-JUN-2017

Todd Boyle

Secondary Reviewer:
16-JUN-2017

Denna Johnson



Analytical Method: 350.1
Login Number: L17060483

AAB#: WG617712

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6448-GRAB	01	06/07/17					06/13/2017	6.1	28		06/13/17	6.1	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060483
Blank File ID: S2170613004.011
Prep Date: 06/13/17 16:51
Analyzed Date: 06/13/17 16:51
Analyst: TB

Work Group: WG617712
Blank Sample ID: WG617712-01
Instrument ID: SMARTCHEM2
Method: 350.1

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617712-02	S2170613004.012	06/13/17 16:51	01
LCS2	WG617712-03	S2170613004.013	06/13/17 16:52	01
LH18/24-SP650-6448-GRAB	L17060483-01	S2170613004.019	06/13/17 16:58	DL01
DUP	WG617712-06	S2170613004.028	06/13/17 17:07	01

Report Name: BLANK_SUMMARY
PDF File ID: 5340128
Report generated 06/16/2017 10:06



Login Number: L17060483 Prep Date: 06/13/17 16:51 Sample ID: WG617712-01
 Instrument ID: SMARTCHEM2 Run Date: 06/13/17 16:51 Prep Method: 350.1
 File ID: S2170613004.011 Analyst: TB Method: 350.1
 Workgroup (AAB#): WG617712 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: SMARTC-13-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Nitrogen, Ammonia	0.0500	0.200	0.0500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5340129
 16-JUN-2017 10:06



Login Number: L17060483 Analyst: TB Prep Method: 350.1
 Instrument ID: SMARTCHEM2 Matrix: Water Method: 350.1
 Workgroup (AAB#): WG617712 Units: mg/L
 QC Key: DOD4 Lot #: STD80299
 Sample ID: WG617712-02 LCS File ID: S2170613004.012 Run Date: 06/13/2017 16:51
 Sample ID: WG617712-03 LCS2 File ID: S2170613004.013 Run Date: 06/13/2017 16:52

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Nitrogen, Ammonia	2.00	2.03	102	2.00	1.96	97.8	3.92	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5340130
 Report generated: 06/16/2017 10:06



2.1 General Chemistry Data

2.1.2 Orthophosphate Data

2.1.2.1 Summary Data

Lab Report #: L17060483

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060483-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6448-GRAB	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:45
Workgroup #: WG617321	Analyst: DLP	Run Date: 06/09/2017 14:00
Collect Date: 06/07/2017 15:00	Dilution: 5	File ID: 00.1706091400-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	1.97		0.500	0.250	0.125

2.1.2.2 QC Summary Data

Example Calculations for Visible Spectrophotometric Methods

Linear Calibration Model

Step 1 - Retrieve Curve Data from ICAL

m = slope of the linear equation
 b = intercept from the linear equation
 y = instrument response as absorbance or OD
 x = concentration of analyte (mg/L)
 $y = mx + b$

Step 2: Calculate the instrument concentration, x

Where:

$$x = (y - b)/m$$

Step 3: Solve for analyte concentration in sample, Cx

$$Cx = (x) (D)$$

Example Calculation (LCS):

Value of m from plot:	7.809
Value of b from plot:	0.0004135
Absorbance of unknown from quantitation report (y):	0.31
Calculated concentration (x):	0.03964483
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	0.0396 mg/L

SmartChem Autoanalyzer - Quadratic Calibration for Chloride and Sulfate

Step 1 - Retrieve Curve Data from Smartchem ICAL

A, B, C = constants from the ICAL quadratic regression

x = instrument response as absorbance or OD

y = concentration of analyte (mg/L)

Step 2: Calculate the instrument concentration, y

Where:

$$y = Ax^2 + Bx + C$$

Step 3: Solve for analyte concentration in sample, Cy

$$Cy = (y) (D)$$

Example Calculation (LCS):

Value of A from plot:	101.2796
Value of B from plot:	318.9056
Value of C from plot:	-2.2712
Absorbance of unknown from quantitation report (x):	0.1583
Calculated concentration (y):	50.7495108
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	50.75 mg/L

Microbac Laboratories Inc.

Data Checklist

Date: 09-JUN-2017
 Analyst: DLP
 Analyst: NA
 Method: PO4
 Instrument: V-1200
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG617321

Calibration/Linearity	
Second Source Check	06-07-17
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Primary Reviewer	DLP
Secondary Reviewer	SAV
Comments	

Primary Reviewer:
09-JUN-2017

Secondary Reviewer:
15-JUN-2017

Dwight Payne

Sarah Vandenberg



Analytical Method: 365.2
Login Number: L17060483

AAB#: WG617321

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6448-GRAB	01	06/07/17					06/09/2017	2	2		06/09/17	2	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060483
 Blank File ID: 00.1706091400-03
 Prep Date: 06/09/17 14:00
 Analyzed Date: 06/09/17 14:00
 Analyst: DLP

Work Group: WG617321
 Blank Sample ID: WG617321-01
 Instrument ID: V-1200
 Method: 365.2

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617321-02	00.1706091400-04	06/09/17 14:00	
LCS2	WG617321-03	00.1706091400-05	06/09/17 14:00	
LH18/24-SP650-6448-GRAB	L17060483-01	00.1706091400-06	06/09/17 14:00	
DUP	WG617321-05	00.1706091400-07	06/09/17 14:00	

Report Name: BLANK_SUMMARY
 PDF File ID: 5339330
 Report generated 06/15/2017 14:36



Login Number: L17060483 Prep Date: 06/09/17 14:00 Sample ID: WG617321-01
Instrument ID: V-1200 Run Date: 06/09/17 14:00 Prep Method: 365.2
File ID: 00.1706091400-03 Analyst: DLP Method: 365.2
Workgroup (AAB#): WG617321 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: V-1200-07-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Orthophosphate	0.0250	0.100	0.0250	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5339331
15-JUN-2017 14:36



Login Number: L17060483 Analyst: DLP Prep Method: 365.2
 Instrument ID: V-1200 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG617321 Units: mg/L
 QC Key: DOD4 Lot #: STD82182
 Sample ID: WG617321-02 LCS File ID: 00.1706091400-04 Run Date: 06/09/2017 14:00
 Sample ID: WG617321-03 LCS2 File ID: 00.1706091400-05 Run Date: 06/09/2017 14:00

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	1.03	103	1.00	1.03	103	0.466	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5339334
 Report generated: 06/15/2017 14:36



2.1.2.3 Raw Data

WG 616997

Curves

Parameter: P04

Spectrophotometer: V-1200

Calibration (Curve) standard stock: STD 79640

Concentration: 1000mg/L

Recipe for preparation of curve standards found in:

SOP: 3653 Revision: 17 Page: 9

Second Source Stock: 82182 (concentration: 10)

Daily Preparation: $\frac{10(10)/100 =}{1.0}$
concentration = 1.0

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
1.0	50	1cm	880	0.608 0.621
0.7				0.445
0.5				0.312
0.2				0.127
0.1				0.063
0.05				0.031
0				0.001
2nd Source (10)				0.659 0.637

Analyst: Jammy Morris

Date/Time: 6/7/17 @ 1545

DCN#126310



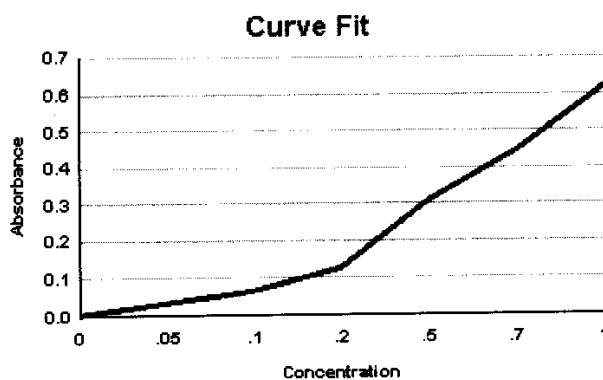
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG616997
Analytical Method: 300
Instrument ID: V-1200

Analyst: TMM
Initial Calibration Date: 06/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.624028
Y-Intercept: 0.00124690
Coef. Of Correlation (R^2): 0.999788
Coef. Of Correlation (R): 0.999894

Concentration X	Absorbance Y	X^2	$X * Y$	Y-Fitted (mX^2+B)
0.00	0.00100	0.00	0.00	0.00124690
0.0500	0.0310	0.00250	0.00155	0.0324483
0.100	0.0630	0.0100	0.00630	0.0636497
0.200	0.127	0.0400	0.0254	0.126053
0.500	0.312	0.250	0.156	0.313261
0.700	0.445	0.490	0.312	0.438067
1.00	0.621	1.00	0.621	0.625275



WG_ICAL_CAL_NET - Modified 03/06/2008
Report generated 06/07/2017 16:28

Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

Workgroup #: WG616997
File ID: 00.1706071545-08
CCV ID: WG616997-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 06/07/2017
Run Time: 15:45
Analyst: TMM
Cal ID: V-1200 - 07-JUN-17 15:45:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.02	0.637	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 06/07/2017 16:28



Orthophosphate
(orthophosphate1)

EPA 365.2 / SM4500-P E

SOP K3653 Rev 17

Color Reagent Chemicals

RGT 40286

RGT 58726

RGT 39475

COA 18278

CCV: 51082181
Daily Dilution: $\frac{515}{150} =$
Daily Dilution: 0.5
Spectrophotometer: 12200

LCS: 51082182
Daily Dilution: $\frac{1010}{110} =$
Daily Dilution: 1
Curve ID: 616997
6-07-17

Spike: 51082182
Daily Dilution: $\frac{210}{150} =$
Daily Dilution: 0.4

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: 0.5 mg/L	50	✓		0.325
BLK/CCB:	50	✓		0.000
LCS: 1.0 ppm	50	✓		0.646
LCS: 1.0 ppm	50	✓		0.643
06-483-01	50	✓	1/2 1/5	0.629 / 0.247
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
DUP 06-483-01	50	✓	1/5	0.246
MS: (483-01)	50	✓	1/5	0.216
MSD: ()	50			
CCV: ()	50			0.326
CCB:	50			0.001

Analyst: Christy Papp Date / Time: 06-09-17 1 1400

DCN#126365



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG617321
Analyte: ORTHOPHOSPHATE

Analyst: DLP
Date: 06/09/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG617321-01	50	50	0	0.6240	0.001247	-0.0019981	-0.0019981	1	mg/L
WG617321-02	50	50	0.646	0.6240	0.001247	1.0332	1.0332	1	mg/L
WG617321-03	50	50	0.643	0.6240	0.001247	1.0284	1.0284	1	mg/L
L17060483-01	50	50	0.247	0.6240	0.001247	0.39382	1.9691	5	mg/L
WG617321-04	50	50	0.247	0.6240	0.001247	0.39382	1.9691	5	mg/L
WG617321-05	50	50	0.246	0.6240	0.001247	0.39221	1.9611	5	mg/L
WG617321-06	50	50	0.296	0.6240	0.001247	0.47234	2.3617	5	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 06/09/2017 17:27

Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00857528

Workgroup #: WG617366
File ID: 00.1706091400-01
CCV ID: WG617366-01
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 06/09/2017
Run Time: 14:00
Analyst: DLP
Cal ID: V-1200 - 07-JUN-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.519	0.650	3.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/09/2017 17:25



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00857529

Workgroup #: WG617366 Instrument ID: V-1200
File ID: 00.1706091400-09 Run Date: 06/09/2017
CCV ID: WG617366-03 Run Time: 14:00
Units: mg/L Analyst: DLP
Analyte: ORTHOPHOSPHATE Cal ID: V-1200 - 07-JUN-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.520	0.652	4.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/09/2017 17:25



2.1 General Chemistry Data

2.1.3 Total Organic Carbon Data

2.1.3.1 Summary Data

Lab Report #: L17060483

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060483-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6448-GRAB	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG617770	Analyst: ADG	Run Date: 06/14/2017 22:08
Collect Date: 06/07/2017 15:00	Dilution: 5	File ID: TC06142017.037
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	79.0		10.0	5.00	2.50

2.1.3.2 QC Summary Data

**Total Organic Carbon Example Calculations
(Direct Readout Parameter)**

$$(\text{Readout})/(\text{dilution}) = \text{mg/L}$$

where:

Readout = direct readout from the instrument

dilution = dilution in decimal form (ex. 1/5 dilution = 0.2)

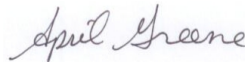
Microbac Laboratories Inc.

Data Checklist

Date: 14-JUN-2017
 Analyst: ADG
 Analyst: NA
 Method: TOC
 Instrument: TOCVWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG617770

Calibration/Linearity	02/10/17
Second Source Check	
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Primary Reviewer	ADG
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
16-JUN-2017



Secondary Reviewer:
16-JUN-2017




Analytical Method: 415.1
Login Number: L17060483

AAB#: WG617770

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6448-GRAB	01	06/07/17					06/14/2017	7.3	28		06/14/17	7.3	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060483 Work Group: WG617770
 Blank File ID: TC06142017.004 Blank Sample ID: WG617770-01
 Prep Date: 06/14/17 10:31 Instrument ID: TOC-VWP
 Analyzed Date: 06/14/17 10:31 Method: 415.1
 Analyst: ADG

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617770-02	TC06142017.005	06/14/17 10:50	01
LCS2	WG617770-03	TC06142017.006	06/14/17 11:11	01
DUP	WG617770-05	TC06142017.032	06/14/17 20:16	01
LH18/24-SP650-6448-GRAB	L17060483-01	TC06142017.037	06/14/17 22:08	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5341061
 Report generated 06/16/2017 11:21



Login Number: L17060483 Prep Date: 06/14/17 10:31 Sample ID: WG617770-01
 Instrument ID: TOC-VWP Run Date: 06/14/17 10:31 Prep Method: 415.1
 File ID: TC06142017.004 Analyst: ADG Method: 415.1
 Workgroup (AAB#): WG617770 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: TOC-VW-10-FEB-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Total Organic Carbon	0.500	2.00	0.500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5341062
 16-JUN-2017 11:21



Login Number: L17060483 Analyst: ADG Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG617770 Units: mg/L
 QC Key: DOD4 Lot #: STD80787
 Sample ID: WG617770-02 LCS File ID: TC06142017.005 Run Date: 06/14/2017 10:50
 Sample ID: WG617770-03 LCS2 File ID: TC06142017.006 Run Date: 06/14/2017 11:11

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	26.0	104	25.0	26.0	104	0.115	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5341063
 Report generated: 06/16/2017 11:21



2.1.3.3 Raw Data

Curve

~~WG 602411~~
~~WG 602476~~ *duh/1/13/17*
 WG 602481

Total Organic Carbon

MAKE DAILY

CCV (TOC): _____ LCS (TOC): _____
 (5/200)(1000) = 25mg/L (5/200)(1000) = 25mg/L

CCV (TIC): _____ MS (TOC): _____
 (5/200)(1000) = 25mg/L _____

Calibration Curve Date: _____ Reagent: RET 35944
RET 37673

SM5310-C : Matrix 2 WG _____
 EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K 4151 Rev. 18 *duh/1/13/17*
 Instrument: Shimadza TOC-VWP/ASI

- drain reservoir filled
 ASI water bottle full
 dilution water bottle full
- DAILY CHECK**
 3rd bottle full
 sufficient gas
 sufficient persulfate
- sufficient acid waste container

Position	Sample ID	Dilution	Position	Sample ID	Dilution	Position	Sample ID	Dilution
1	TC Curve		26	TC Curve		51		
2	TC ICV		27	Std 79318		52	See SOP	
3	TIC Curve		28			53	for point	
4	TIC ICV		29	TIC Curve		54	preparation	
5			30	Std 80415		55		
6			31			56		
7			32			57		
8			33	TOC (TC)		58		
9			34	ICV		59		
10			35	Std 77870		60	5/200 (1000) = 25	
11			36			61		
12			37	TIC ICV		62		
13			38	Std 80416		63		
14			39			64		
15			40			65		
16			41			66		
17			42			67		
18			43			68		
19	all points		44	analyzed in duplicate		69		
20			45			70		
21			46			71		
22			47			72		
23			48			73		
24			49			74		
25			50			75		

Analyst: David Merckel Date/Time: 2/10/17

DCN#123915



C:\TOC3201\Data\CURVES-02-10-2017.t32

	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TC	TCCURVE		Complete	2/10/2017 10:29:51 A	0, 1, 2, 3, 4, 5
2	TC	TOC ICV	TC:23.90mg/L	Complete	2/10/2017 10:47:48 A	6
3	IC	TICCURVE		Complete	2/10/2017 3:55:41 PM	0, 1, 2, 3, 4, 5
4	IC	TIC CURVE	IC:24.27mg/L	Complete	2/10/2017 4:12:07 PM	6
5	TC		TC:0.000mg/L	Complete	2/10/2017 4:31:41 PM	7
6	IC	TOC/TIC	IC:8.571mg/L	Complete	2/10/2017 4:42:05 PM	7
7	TC	TOC/TIC	TC:32.10mg/L	Complete	2/10/2017 5:01:02 PM	7

2/13/2017 7:01:58 AM

1/1

2/12/2017 11:18:36 AM

CURVES-02-10-2017.i32

Instr. Information

System
DetectorTOCVW ASI
Wet Chemical

Cal. Curve

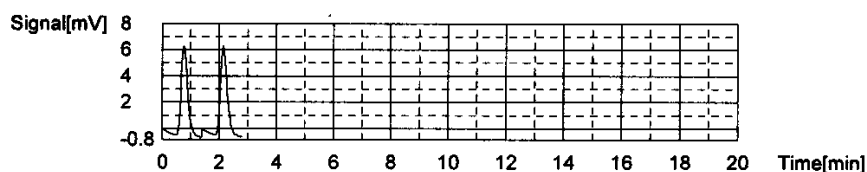
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

Type	Anal.
Standard	TC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.83	500uL	1	*****		2/10/2017 9:36:31 AM
2	10.82	500uL	1	*****		2/10/2017 9:40:05 AM

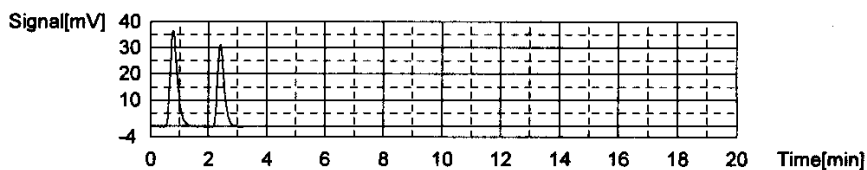
Acid Add. 0.000%
 Mean Area 10.82



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	64.31	500uL	1	*****		2/10/2017 9:45:28 AM
2	51.52	500uL	1	*****		2/10/2017 9:49:19 AM

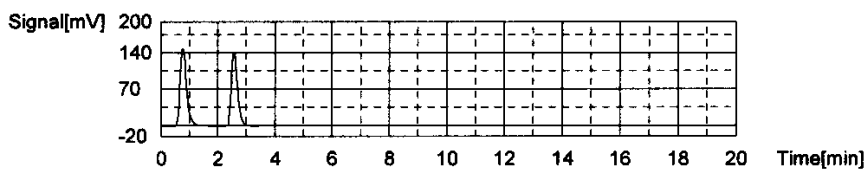
Acid Add. 0.000%
 Mean Area 57.92



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	238.4	500uL	1	*****		2/10/2017 9:55:04 AM
2	216.3	500uL	1	*****		2/10/2017 9:58:58 AM

Acid Add. 0.000%
 Mean Area 227.4

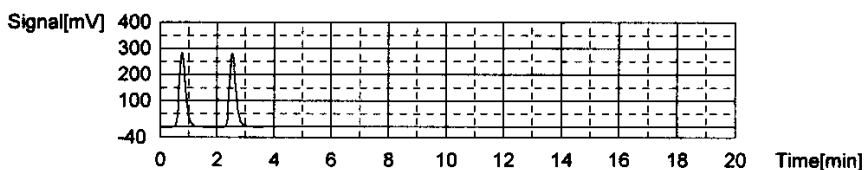


Conc: 10.00mg/L

1/6

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	442.5	500uL	1	*****		2/10/2017 10:04:41 AM
2	437.9	500uL	1	*****		2/10/2017 10:08:48 AM

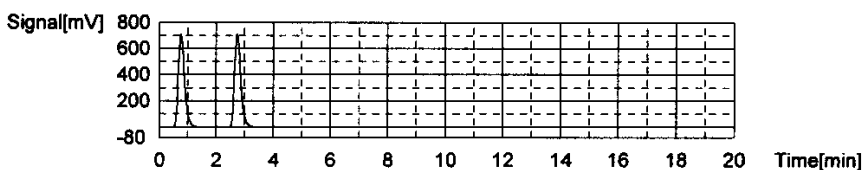
Acid Add. 0.000%
 Mean Area 440.2



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1091	500uL	1	*****		2/10/2017 10:14:47 AM
2	1092	500uL	1	*****		2/10/2017 10:19:05 AM

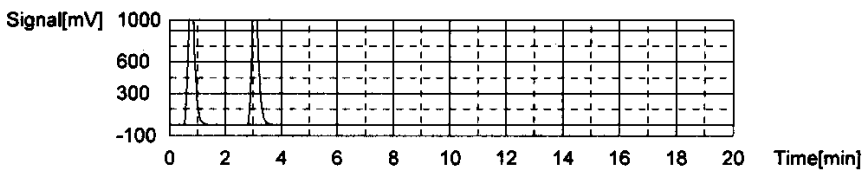
Acid Add. 0.000%
 Mean Area 1092



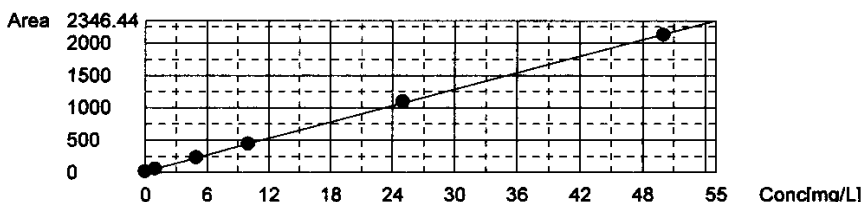
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	2132	500uL	1	*H*****		2/10/2017 10:25:19 AM
2	2118	500uL	1	*H*****		2/10/2017 10:29:51 AM

Acid Add. 0.000%
 Mean Area 2125



Slope: 42.33
 Intercept 16.87
 r^2 0.999887
 Zero Shift No



Sample

Sample Name: TOC ICV
 Sample ID: Untitled
 Origin: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:23.90mg/L

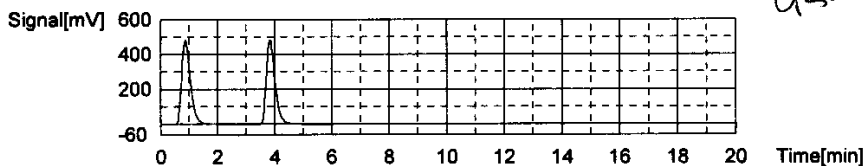
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1029	23.91mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 10:42:11 AM
2	1028	23.89mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 10:47:48 AM

95.6%

Mean Area 1029
Mean Conc. 23.90mg/L



Cal. Curve

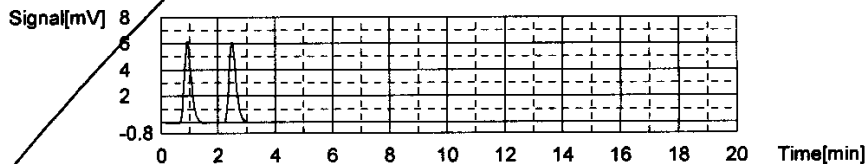
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

Type	Anal.
Standard	TC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.59	500uL	1	*****		2/10/2017 2:49:09 PM
2	10.43	500uL	1	*****		2/10/2017 2:53:06 PM

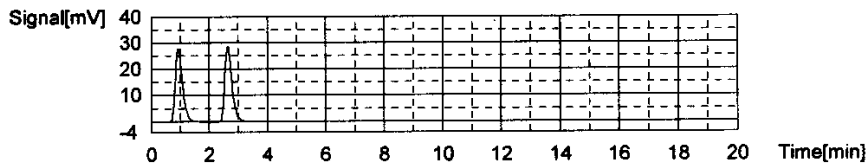
Acid Add. 3.000%
Mean Area 10.51



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	48.13	500uL	1	*****		2/10/2017 3:00:24 PM
2	49.13	500uL	1	*****		2/10/2017 3:04:41 PM

Acid Add. 3.000%
Mean Area 48.63

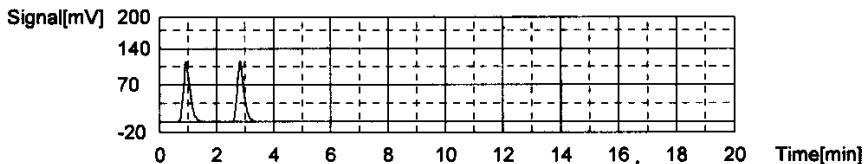


Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	189.0	500uL	1	*****		2/10/2017 3:12:24 PM
2	190.1	500uL	1	*****		2/10/2017 3:16:55 PM

*dcn
3/23/17*

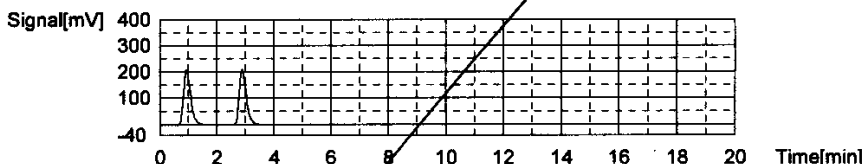
Acid Add. 3.000%
Mean Area 189.6



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	360.6	500uL	1	*****		2/10/2017 3:24:47 PM
2	362.2	500uL	1	*****		2/10/2017 3:29:24 PM

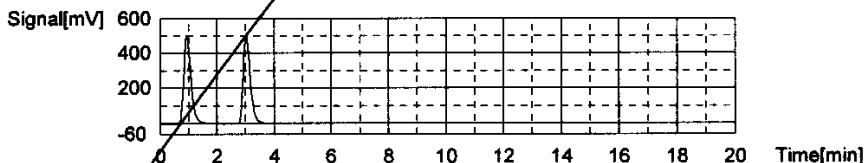
Acid Add. 3.000%
Mean Area 361.4



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	859.3	500uL	1	*****		2/10/2017 3:37:23 PM
2	856.9	500uL	1	*****		2/10/2017 3:42:16 PM

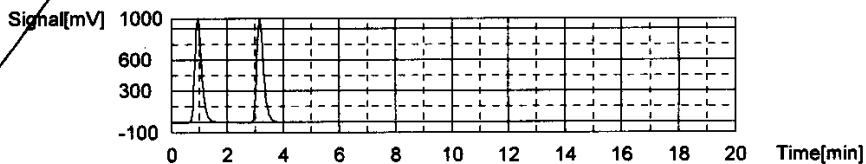
Acid Add. 3.000%
Mean Area 858.1



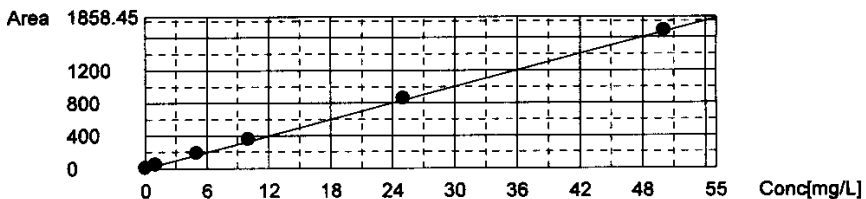
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1690	500uL	1	*****		2/10/2017 3:50:31 PM
2	1689	500uL	1	*****		2/10/2017 3:55:41 PM

Acid Add. 3.000%
Mean Area 1690



Slope: 33.49
Intercept: 0.000
r^2: 0.999919
Zero Shift: Yes



Sample

dcn

See following pages for curve, slope, intercept
and zero shift unchecked

TOC-V Cal Curve Information
TICCURVE-02-10-2017.2017_02_10_14_45_10.cal

Date of Creation 2:10:17 PM 2/10/2017
User
System TOCVW ASI

Cal. Curve

Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status Completed
Comment:

Type	Anal.
Standard	IC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.59	500uL	1	*****		2/10/2017 2:49:09 PM
2	10.43	500uL	1	*****		2/10/2017 2:53:06 PM

Acid Add. 3.000%
Mean Area 10.51
SD Area 0.1131
CV Area 1.08%
Vial 0

Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	48.13	500uL	1	*****		2/10/2017 3:00:24 PM
2	49.13	500uL	1	*****		2/10/2017 3:04:41 PM

Acid Add. 3.000%
Mean Area 48.63
SD Area 0.7071
CV Area 1.45%
Vial 1

Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	189.0	500uL	1	*****		2/10/2017 3:12:24 PM
2	190.1	500uL	1	*****		2/10/2017 3:16:55 PM

Acid Add. 3.000%
Mean Area 189.6
SD Area 0.7778
CV Area 0.41%
Vial 2

Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	360.6	500uL	1	*****		2/10/2017 3:24:47 PM
2	362.2	500uL	1	*****		2/10/2017 3:29:24 PM

Acid Add. 3.000%
 Mean Area 361.4
 SD Area 1.131
 CV Area 0.31%
 Vial 3

Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	859.3	500uL	1	*****		2/10/2017 3:37:23 PM
2	856.9	500uL	1	*****		2/10/2017 3:42:16 PM

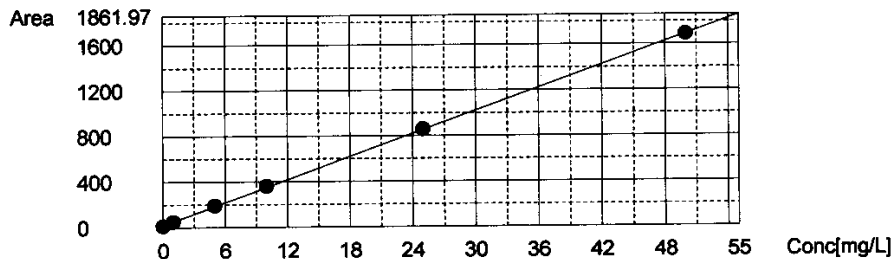
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1690	500uL	1	*****		2/10/2017 3:50:31 PM
2	1689	500uL	1	*****		2/10/2017 3:55:41 PM

Acid Add. 3.000%
 Mean Area 1690
 SD Area 0.7071
 CV Area 0.04%
 Vial 5

Slope: 33.49
 Intercept 18.41
 r² 0.999919
 Zero Shift No



Sample Name: TIC CURVE
 Sample ID: Untitled
 Origin: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed
 Chk. Result:

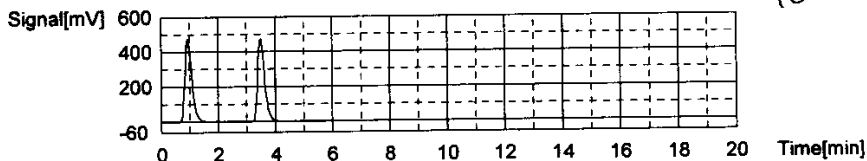
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

1. Det

Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	810.5	24.20mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 4:08:15 PM
2	814.6	24.33mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 4:12:07 PM

Mean Area 812.5
 Mean Conc. 24.27mg/L



Sample

Sample Name: Untitled
 Sample ID: TCCURVE-02-10-2017.2017_02_10_14_14_25.cal
 Origin: Completed
 Status: Completed
 Chk. Result:

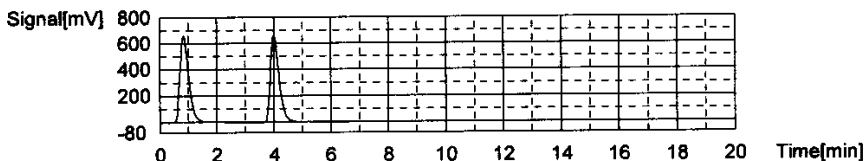
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1406	0.000mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_14_14	2/10/2017 4:25:42 PM
2	1411	0.000mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_14_14	2/10/2017 4:31:41 PM

Mean Area 1409
 Mean Conc. 0.000mg/L



Sample

Sample Name: TOC/TIC
 Sample ID: Untitled
 Origin: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed
 Chk. Result:

2/12/2017 11:18:36 AM

CURVES-02-10-2017.i32

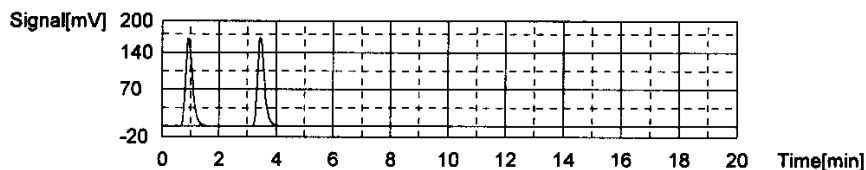
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

1. Det

Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	286.8	8.565mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	12/10/2017 4:37:09 PM
2	287.2	8.577mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	12/10/2017 4:42:05 PM

Mean Area 287.0
Mean Conc. 8.571mg/L



Sample

Sample Name: TOC/TIC
Sample ID: Untitled
Origin: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
Status: Completed
Chk. Result

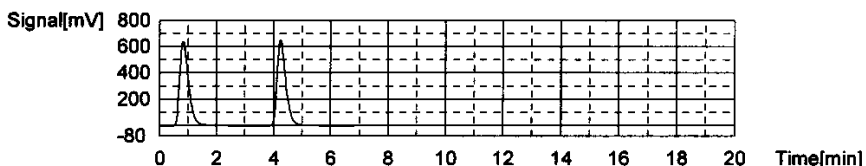
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1378	32.16mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	12/10/2017 4:55:07 PM
2	1373	32.04mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	12/10/2017 5:01:02 PM

Mean Area 1376
Mean Conc. 32.10mg/L



WORKGROUP: WG617770

Total Organic Carbon

MAKE DAILY

CCV (TOC): 80787
 $(5/200)(1000) = 25\text{mg/L}$

LCS (TOC): 80787
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): 80416
 $(5/200)(1000) = 25\text{mg/L}$

MS (TOC): 80787
 $0.4(1000)/40 = 10$

Calibration Curve Date: 2-10-17

Reagent: 40270
39266

SM5310-C: Matrix 2 WG U1776

EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K 1457 Rev. 19

SW846 9060A (4 rep) WG _____ Instrument: Shimadza TOC-VWP/ASI

- | | | |
|----------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------|
| <input checked="" type="checkbox"/> drain reservoir filled | <input checked="" type="checkbox"/> 3 rd bottle full | <input type="checkbox"/> sufficient acid waste container |
| <input checked="" type="checkbox"/> ASI water bottle full | <input checked="" type="checkbox"/> sufficient gas | |
| <input checked="" type="checkbox"/> dilution water bottle full | <input checked="" type="checkbox"/> sufficient persulfate | |

Position	Sample ID	Dilution	Position	Sample ID	Dilution	Position	Sample ID	Dilution
1	TIC		26	CCV		51		
2	TOC/TIC		27	CCB		52		
3	CCV		28	1029-01		53		
4	B12		29	02		54		
5	LCS		30	04		55		
6	LSDP		31	05		56		
7	TOC/TIC		32	MS 06-101-15 Dup		57		
8	468-01	1/50	33	MS 06-101-15		58		
9	02	1/50	34	468-01	1/100	59		
10	483-01		35	468-02	1/25	60		
11	506-01		36	506-01	1/3	61		
12	514-01		37	483-01 514-01	1/5	62		
13	561-01	1/50	38	CCV		63		
14	CCV		39	CCB		64		
15	CCB		40	CCV		65		
16	100-3832 MS water		41	CCB		66		
17	34		42	0468-01	1/200	67		
18	601-01		43	CCV		68		
19	03		44	CCB		69		
20	05		45			70		
21	07		46			71		
22	09		47			72		
23	11		48			73		
24	13		49			74		
25	15		50			75		

eti

Analyst: Cheryl Green Date/Time: 6/14/17

DCN#126437



	Analysis	Sample Name	Result	Status	Date / Time	Vial	
	1	TOC	TIC	TOC:1.845mg/L TC:28.69mg/L IC:26.84mg/L	Complete	6/14/2017 10:01:45 A	1
	2	TOC		TOC:0.6701mg/L TC:11.50mg/L IC:10.83mg/L	Complete	6/14/2017 10:13:51 A	2
	3	TOC	CCV	!!Error!! TOC:23.12mg/L TC:22.82mg/L IC:-0.2970mg/L	Complete	6/14/2017 10:26:08 A	3
617770-01	4	TOC	WG617770-01-BLK	!!Error!! TOC:0.1192mg/L TC:-0.1533mg/L IC:-0.2725mg/L	Complete	6/14/2017 10:42:29 A	0
u617770-02	5	TOC	WG617770-02-LCS	!!Error!! TOC:25.96mg/L TC:25.74mg/L IC:-0.2154mg/L	Complete	6/14/2017 11:03:38 A	5
u617770-03	6	TOC	WG617770-03-LCSDUP	!!Error!! TOC:25.99mg/L TC:25.71mg/L IC:-0.2839mg/L	Complete	6/14/2017 11:24:37 A	6
	7	TOC	TOC/TIC	TOC:27.79mg/L TC:35.99mg/L IC:8.197mg/L	Complete	6/14/2017 11:49:21 A	7
u617770-08	8	TOC	<Untitled>	TOC:74.27mg/L TC:108.7mg/L IC:34.44mg/L	Complete	6/14/2017 12:18:11 P	8
	9	TOC	<Untitled>	TOC:3.988mg/L TC:9.714mg/L IC:5.726mg/L	Complete	6/14/2017 12:39:45 P	9
	10	TOC	<Untitled>	TOC:53.02mg/L TC:114.8mg/L IC:61.76mg/L	Complete	6/14/2017 1:10:07 PM	10
	11	TOC	<Untitled>	!!Error!! TOC:-12.56mg/L TC:71.23mg/L IC:83.78mg/L	Complete	6/14/2017 1:37:20 PM	11
	12	TOC	L17060514-01	TOC:0.5677mg/L TC:0.6181mg/L IC:0.05033mg/L	Complete	6/14/2017 1:57:00 PM	12
	13	TOC	L17060561-01 (50)	TOC:32.88mg/L TC:32.97mg/L IC:0.09035mg/L	Complete	6/14/2017 2:20:31 PM	13
	14	TOC	CCV	!!Error!! TOC:24.24mg/L TC:23.98mg/L IC:-0.2548mg/L	Complete	6/14/2017 2:32:57 PM	14
	15	TOC	CCB	!!Error!! TOC:0.1137mg/L TC:-0.1471mg/L IC:-0.2608mg/L	Complete	6/14/2017 2:41:53 PM	0
	16	TOC	L17060600-32	TOC:1.670mg/L TC:2.6181mg/L IC:5.981mg/L	Complete	6/14/2017 3:02:46 PM	16
	17	TOC	L17060600-34	TOC:2.580mg/L TC:12.32mg/L IC:9.744mg/L	Complete	6/14/2017 3:24:03 PM	17
	18	TOC	L17060601-01	TOC:1.359mg/L TC:1.840mg/L IC:0.4804mg/L	Complete	6/14/2017 3:44:05 PM	18
	19	TOC	L17060601-03	TOC:1.043mg/L TC:1.375mg/L IC:0.3315mg/L	Complete	6/14/2017 4:04:00 PM	19
	20	TOC	L17060601-05	TOC:2.244mg/L TC:4.808mg/L IC:2.563mg/L	Complete	6/14/2017 4:24:39 PM	20
	21	TOC	L17060601-07	TOC:2.253mg/L TC:4.254mg/L IC:2.001mg/L	Complete	6/14/2017 4:45:18 PM	21
	22	TOC	L17060601-09	TOC:1.452mg/L TC:6.815mg/L IC:5.363mg/L	Complete	6/14/2017 5:15:39 PM	22
	23	TOC	L17060601-11	TOC:1.749mg/L TC:4.125mg/L IC:2.376mg/L	Complete	6/14/2017 5:36:01 PM	23
	24	TOC	L17060601-13	TOC:1.244mg/L TC:4.808mg/L IC:7.031mg/L	Complete	6/14/2017 5:56:47 PM	24
	25	TOC	L17060601-15	TOC:1.480mg/L TC:5.312mg/L IC:3.833mg/L	Complete	6/14/2017 6:17:14 PM	25
	26	TOC	CCV	!!Error!! TOC:23.64mg/L TC:23.39mg/L IC:-0.2483mg/L	Complete	6/14/2017 6:29:24 PM	26
	27	TOC	CCB	!!Error!! TOC:0.1138mg/L TC:-0.1639mg/L IC:-0.2777mg/L	Complete	6/14/2017 6:38:20 PM	0
	28	TOC	L17060629-01	TOC:4.819mg/L TC:23.61mg/L IC:18.79mg/L	Complete	6/14/2017 7:00:41 PM	28
	29	TOC	L17060629-02	TOC:4.707mg/L TC:21.90mg/L IC:17.19mg/L	Complete	6/14/2017 7:22:49 PM	29
	30	TOC	L17060629-0304	TOC:9.717mg/L TC:39.67mg/L IC:29.96mg/L	Complete	6/14/2017 7:45:53 PM	30
	31	TOC	L17060629-0408	TOC:7.595mg/L TC:36.88mg/L IC:29.29mg/L	Complete	6/14/2017 8:09:39 PM	31
	32	TOC	WG617770-05 DUP	TOC:1.511mg/L TC:3.550mg/L IC:2.039mg/L	Complete	6/14/2017 8:29:56 PM	32
	33	TOC	WG617770-06 MS	TOC:11.56mg/L TC:13.17mg/L IC:1.612mg/L	Complete	6/14/2017 8:50:42 PM	33
	34	TOC	<Untitled>	TOC:41.86mg/L TC:54.10mg/L IC:12.24mg/L	Complete	6/14/2017 9:15:46 PM	34
	35	TOC	L17060468-02 (25)	TOC:7.105mg/L TC:12.39mg/L IC:5.285mg/L	Complete	6/14/2017 9:37:38 PM	35
	36	TOC	L17060506-01 (3)	TOC:1.996mg/L TC:17.16mg/L IC:15.16mg/L	Complete	6/14/2017 9:59:31 PM	36
	37	TOC	L17060483-01 (5)	TOC:15.80mg/L TC:17.42mg/L IC:1.619mg/L	Complete	6/14/2017 10:23:46 P	37
	38	TOC	CCV	!!Error!! TOC:24.03mg/L TC:23.77mg/L IC:-0.2587mg/L	Complete	6/14/2017 10:35:58 P	38
	39	TOC	CCB	!!Error!! TOC:0.1247mg/L TC:-0.1426mg/L IC:-0.2673mg/L	Complete	6/14/2017 10:44:56 P	0
	40	TOC	CCV	!!Error!! TOC:24.12mg/L TC:23.98mg/L IC:-0.1351mg/L	Complete	6/15/2017 7:25:38 AM	40
	41	TOC	CCB	!!Error!! TOC:0.1232mg/L TC:-0.1305mg/L IC:-0.2537mg/L	Complete	6/15/2017 7:34:40 AM	0
	42	TOC	L17060468-01 (200)	TOC:20.54mg/L TC:27.76mg/L IC:7.224mg/L	Complete	6/15/2017 7:58:07 AM	42
	43	TOC	CCV	!!Error!! TOC:23.32mg/L TC:23.20mg/L IC:-0.1271mg/L	Complete	6/15/2017 8:10:22 AM	43
	44	TOC	CCB	!!Error!! TOC:0.1163mg/L TC:-0.1405mg/L IC:-0.2568mg/L	Complete	6/15/2017 8:19:19 AM	0

Instr. Information

System TOCVW ASI
 Detector Wet Chemical

Sample

Sample Name: TIC
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

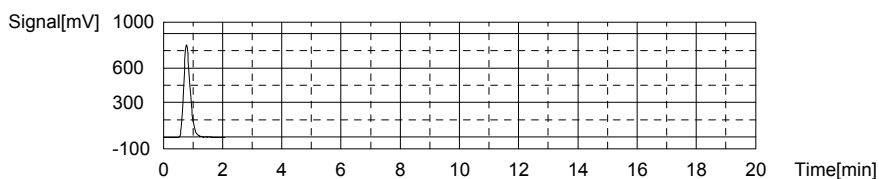
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.845mg/L TC:28.69mg/L IC:26.84mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1231	28.69mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 9:56:26 AM

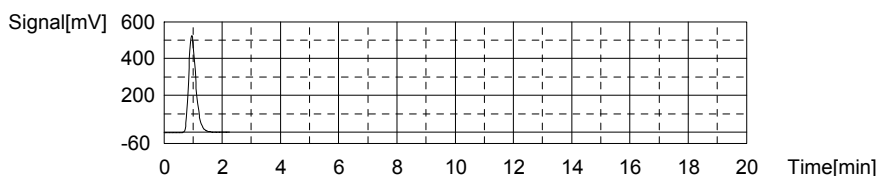
Mean Area 1231
 Mean Conc. 28.69mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	917.2	26.84mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 10:01:45 AM

Mean Area 917.2
 Mean Conc. 26.84mg/L



Sample

Sample Name: <Untitled>
 Sample ID: TOC-02-10-2017.met
 Origin: Completed
 Status: Completed
 Chk. Result

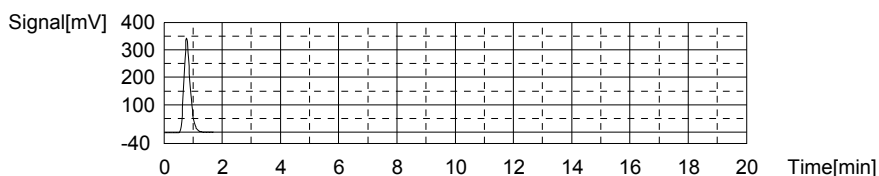
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.6701mg/L TC:11.50mg/L IC:10.83mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	503.4	11.50mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 10:08:53 AM

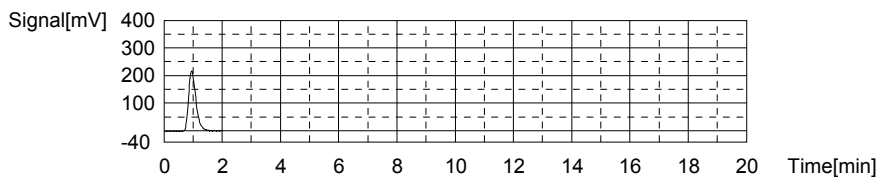
Mean Area 503.4
Mean Conc. 11.50mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	380.9	10.83mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 10:13:51 AM

Mean Area 380.9
Mean Conc. 10.83mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

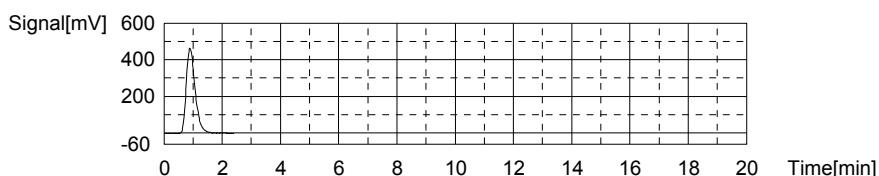
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.12mg/L TC:22.82mg/L IC:-0.2970mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	982.8	22.82mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 10:21:41 AM

Mean Area 982.8
Mean Conc. 22.82mg/L



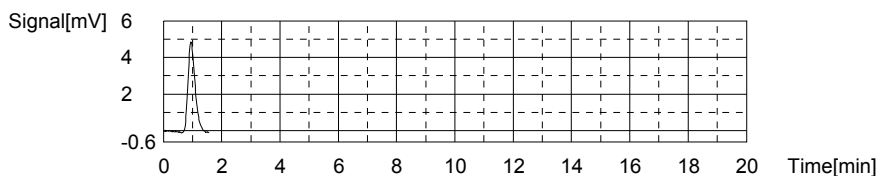
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.469	-0.2970mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 10:26:08 AM

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

Mean Area 8.469
Mean Conc. -0.2970mg/L



Sample

Sample Name: WG61770-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

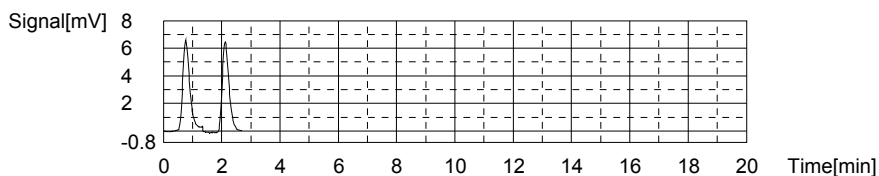
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1192mg/L TC:-0.1533mg/L IC:-0.2725mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.31	-0.1549mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 10:31:08 AM
2	10.44	-0.1518mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 10:34:37 AM

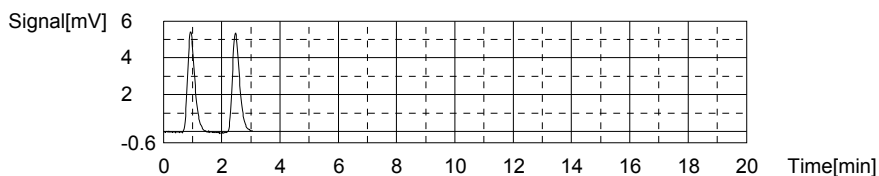
Mean Area 10.38
Mean Conc. -0.1533mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.387	-0.2696mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 10:38:34 AM
2	9.189	-0.2755mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 10:42:29 AM

Mean Area 9.288
Mean Conc. -0.2725mg/L



Sample

Sample Name: WG61770-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

3/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

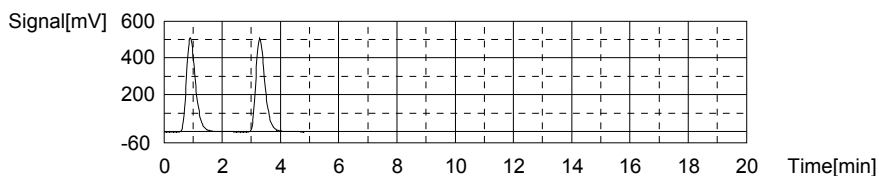
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.96mg/L TC:25.74mg/L IC:-0.2154mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1109	25.80mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 10:50:25 AM	
2	1104	25.69mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 10:55:06 AM	

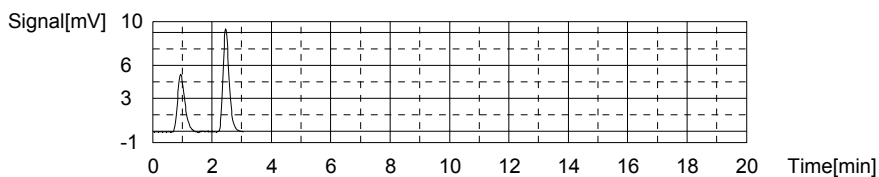
Mean Area 1107
Mean Conc. 25.74mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.911	-0.2838mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 10:59:31 AM	
2	13.49	-0.1471mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 11:03:38 AM	

Mean Area 11.20
Mean Conc. -0.2154mg/L



Sample

Sample Name: WG617770-3 LCSDUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

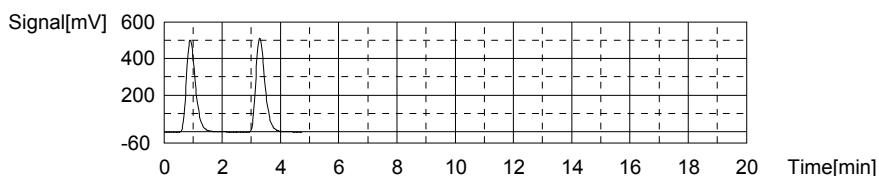
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.99mg/L TC:25.71mg/L IC:-0.2839mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1088	25.31mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 11:11:28 AM	
2	1122	26.11mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 11:16:05 AM	

Mean Area 1105
Mean Conc. 25.71mg/L



Anal.: IC

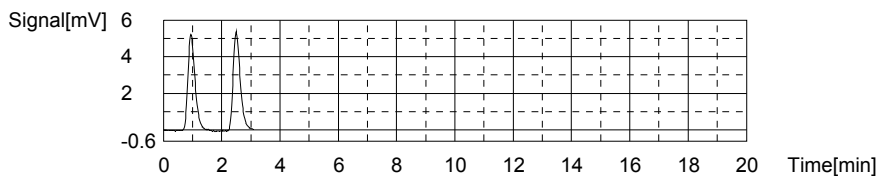
4/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.827	-0.2863mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 11:20:29 AM
2	8.992	-0.2814mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 11:24:37 AM

Mean Area 8.910
Mean Conc. -0.2839mg/L



Sample

Sample Name: TOC/TIC
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

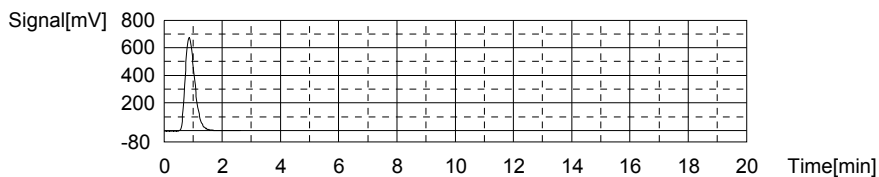
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.79mg/L TC:35.99mg/L IC:8.197mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1540	35.99mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 11:44:32 AM

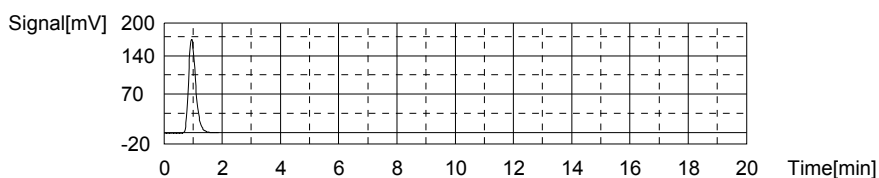
Mean Area 1540
Mean Conc. 35.99mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	292.9	8.197mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 11:49:21 AM

Mean Area 292.9
Mean Conc. 8.197mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

5/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

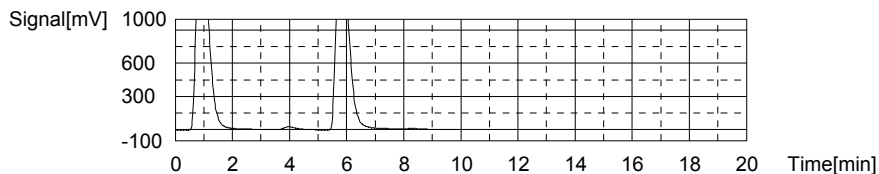
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:74.27mg/L TC:108.7mg/L IC:34.44mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	4601	108.3mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 11:59:41 AM	
2	4635	109.1mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 12:07:47 PM	

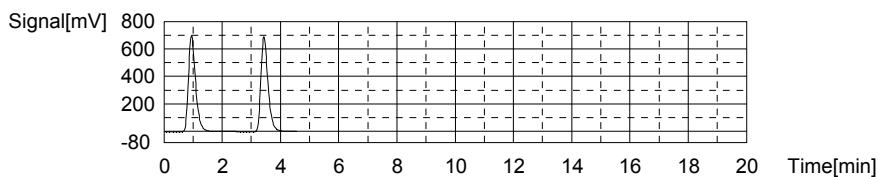
Mean Area 4618
Mean Conc. 108.7mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1180	34.69mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 12:13:19 PM	
2	1163	34.18mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 12:18:11 PM	

Mean Area 1172
Mean Conc. 34.44mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

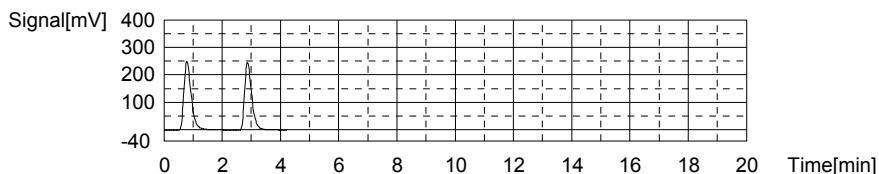
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.988mg/L TC:9.714mg/L IC:5.726mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	433.7	9.848mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 12:25:43 PM	
2	422.3	9.579mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 12:30:16 PM	

Mean Area 428.0
Mean Conc. 9.714mg/L



Anal.: IC

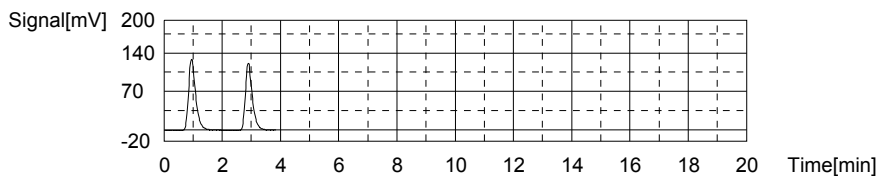
6/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	218.3	5.969mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 12:35:10 PM
2	202.0	5.482mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 12:39:45 PM

Mean Area 210.2
Mean Conc. 5.726mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result:

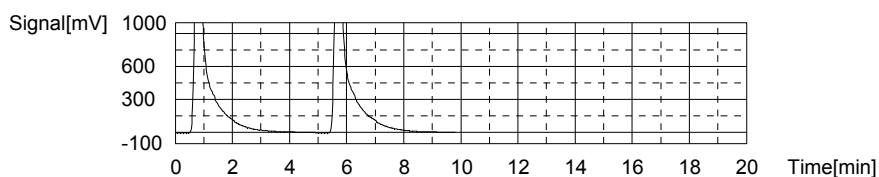
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:53.02mg/L TC:114.8mg/L IC:61.76mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	4807	113.2mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 12:50:06 PM
2	4943	116.4mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 12:59:11 PM

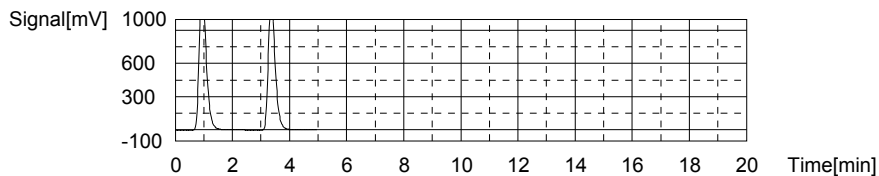
Mean Area 4875
Mean Conc. 114.8mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2214	65.57mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 1:04:45 PM
2	1959	57.95mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 1:10:07 PM

Mean Area 2087
Mean Conc. 61.76mg/L



Sample

7/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

Sample Name: <Untitled>
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

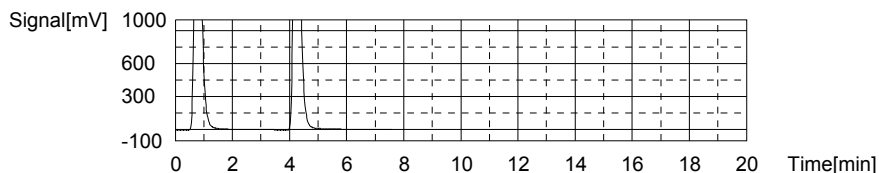
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-12.56mg/L TC:71.23mg/L IC:83.78mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	3010	70.72mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 1:19:02 PM	
2	3053	71.73mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 1:25:25 PM	

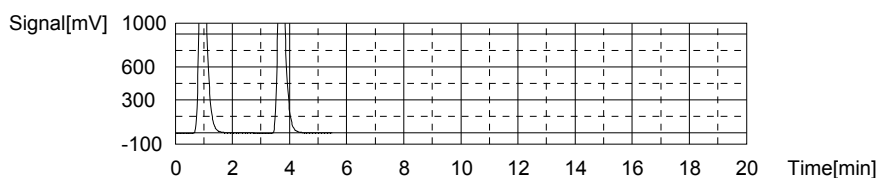
Mean Area 3032
 Mean Conc. 71.23mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2891	85.79mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 1:31:34 PM	
2	2757	81.78mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 1:37:20 PM	

Mean Area 2824
 Mean Conc. 83.78mg/L



Sample

Sample Name: L17060514-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.5677mg/L TC:0.6181mg/L IC:0.05033mg/L

1. Det

Anal.: TC

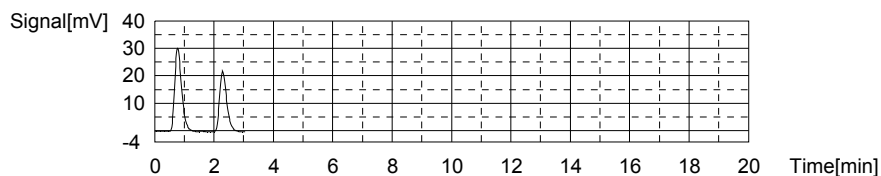
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	49.17	0.7633mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 1:44:17 PM	
2	36.88	0.4729mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 1:48:05 PM	

8/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

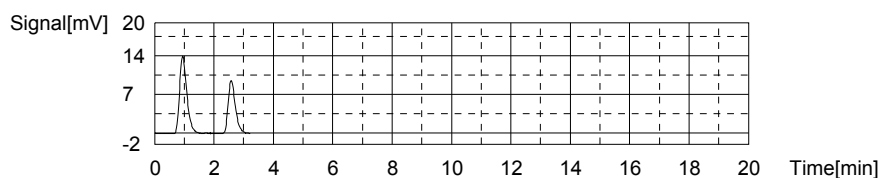
Mean Area 43.03
Mean Conc. 0.6181mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	23.89	0.1635mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 1:52:44 PM
2	16.31	-0.06285mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 1:57:00 PM

Mean Area 20.10
Mean Conc. 0.05033mg/L



Sample

Sample Name: L17060561-01 (50)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

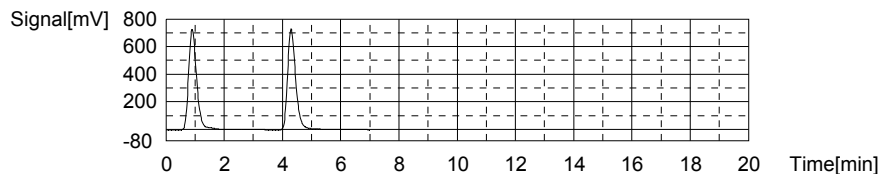
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:32.88mg/L TC:32.97mg/L IC:0.09035mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1403	32.75mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 2:05:51 PM
2	1422	33.20mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 2:11:46 PM

Mean Area 1413
Mean Conc. 32.97mg/L

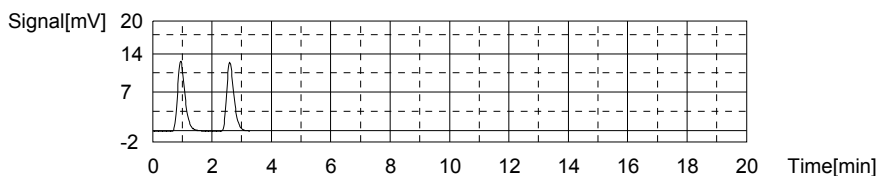


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	21.71	0.09841mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 2:16:17 PM
2	21.17	0.08229mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 2:20:31 PM

9/31

Mean Area 21.44
 Mean Conc. 0.09035mg/L



Sample

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

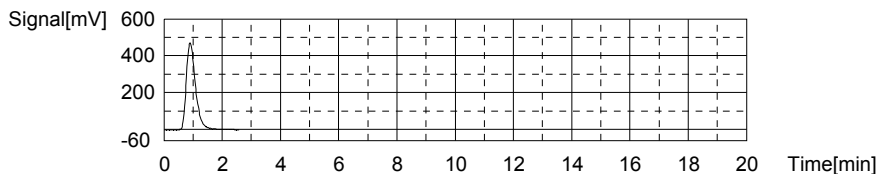
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.24mg/L TC:23.98mg/L IC:-0.2548mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1032	23.98mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 2:28:32 PM	

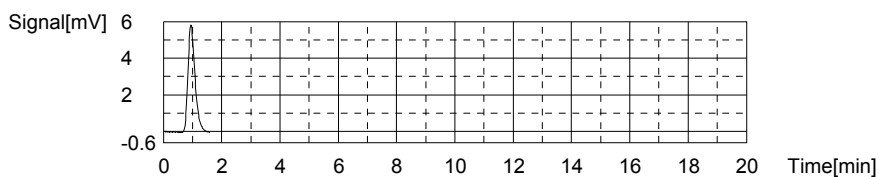
Mean Area 1032
 Mean Conc. 23.98mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.881	-0.2548mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16/14/2017 2:32:57 PM	

Mean Area 9.881
 Mean Conc. -0.2548mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1137mg/L TC:-0.1471mg/L IC:-0.2608mg/L

6/15/2017 8:23:21 AM

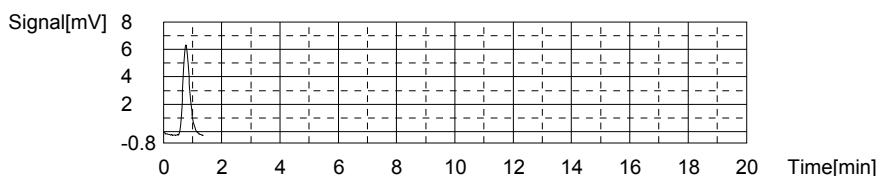
06-14-2017-ADG-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.64	-0.1471mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 2:37:58 PM

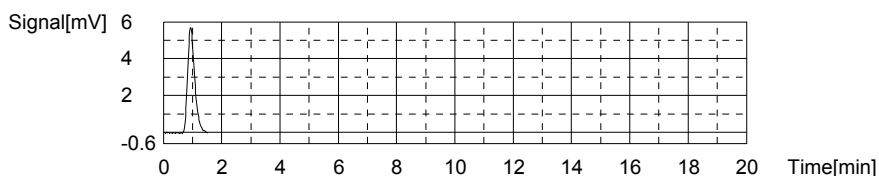
Mean Area 10.64
Mean Conc. -0.1471mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.682	-0.2608mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 2:41:53 PM

Mean Area 9.682
Mean Conc. -0.2608mg/L



Sample

Sample Name: L17060600-32
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

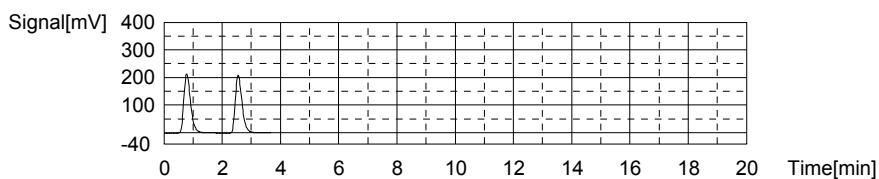
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.670mg/L TC:7.651mg/L IC:5.981mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	343.7	7.722mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 2:49:06 PM
2	337.7	7.580mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 2:53:17 PM

Mean Area 340.7
Mean Conc. 7.651mg/L

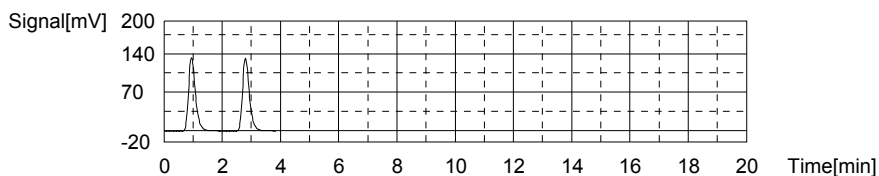


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	218.9	5.987mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 2:58:03 PM
2	218.5	5.975mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 3:02:46 PM

11/31

Mean Area 218.7
 Mean Conc. 5.981mg/L



Sample

Sample Name: L17060600-34
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

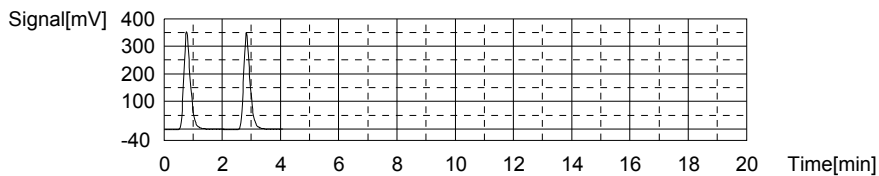
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.580mg/L TC:12.32mg/L IC:9.744mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	540.8	12.38mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 3:10:16 PM
2	536.2	12.27mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 3:14:34 PM

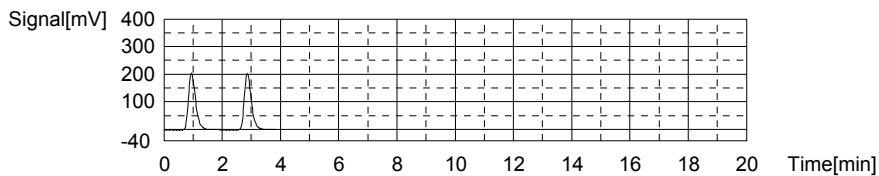
Mean Area 538.5
 Mean Conc. 12.32mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	346.4	9.795mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 3:19:23 PM
2	343.0	9.693mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 3:24:03 PM

Mean Area 344.7
 Mean Conc. 9.744mg/L



Sample

Sample Name: L17060601-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

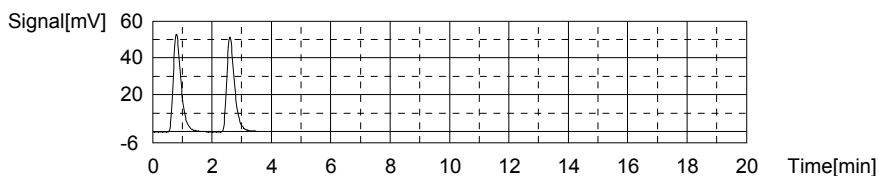
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.359mg/L TC:1.840mg/L IC:0.4804mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	96.72	1.887mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 3:31:18 PM	
2	92.74	1.793mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 3:35:18 PM	

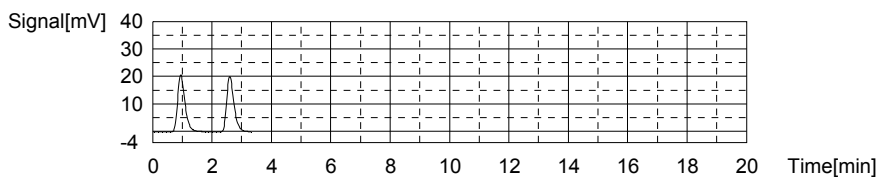
Mean Area 94.73
Mean Conc. 1.840mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	34.96	0.4941mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 3:39:48 PM	
2	34.04	0.4666mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 3:44:05 PM	

Mean Area 34.50
Mean Conc. 0.4804mg/L



Sample

Sample Name: L17060601-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

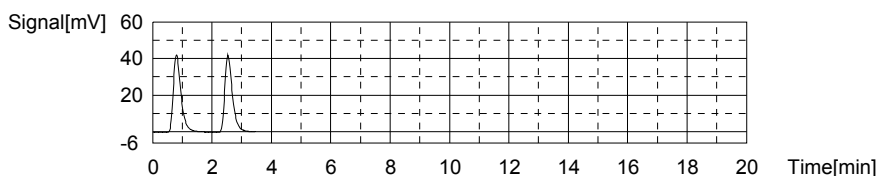
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.043mg/L TC:1.375mg/L IC:0.3315mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	75.30	1.381mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 3:51:16 PM	
2	74.79	1.369mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 3:55:16 PM	

Mean Area 75.05
Mean Conc. 1.375mg/L



Anal.: IC

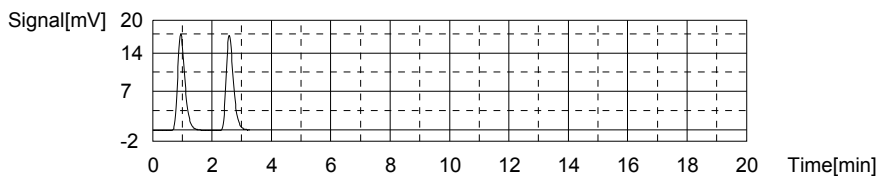
13/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	29.56	0.3328mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 3:59:47 PM
2	29.47	0.3302mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 4:04:00 PM

Mean Area 29.52
Mean Conc. 0.3315mg/L



Sample

Sample Name: L17060601-05
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result:

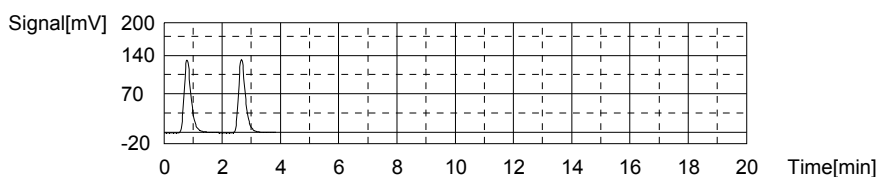
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.244mg/L TC:4.808mg/L IC:2.563mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	219.2	4.780mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 4:11:19 PM
2	221.5	4.835mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 4:15:34 PM

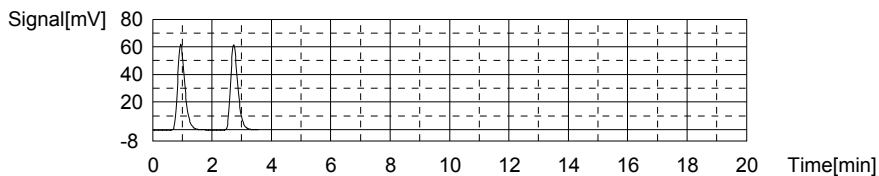
Mean Area 220.4
Mean Conc. 4.808mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	104.5	2.571mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 4:20:13 PM
2	104.0	2.556mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 4:24:39 PM

Mean Area 104.3
Mean Conc. 2.563mg/L



Sample

14/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

Sample Name: L17060601-07
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

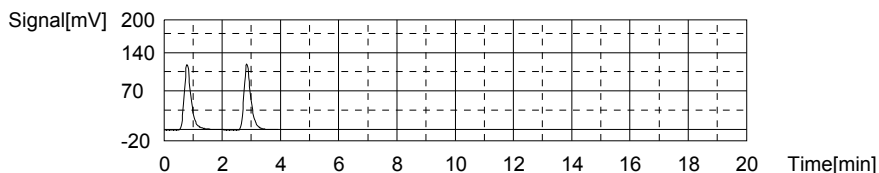
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.253mg/L TC:4.254mg/L IC:2.001mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	196.4	4.242mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 4:32:09 PM	
2	197.4	4.265mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 4:36:18 PM	

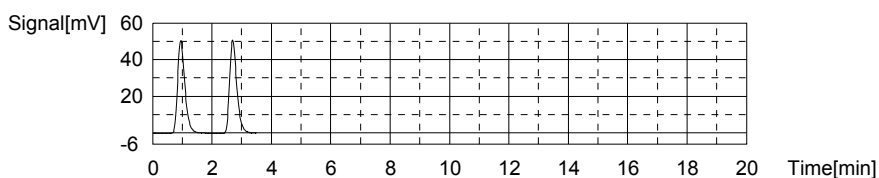
Mean Area 196.9
 Mean Conc. 4.254mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	85.40	2.000mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 4:40:54 PM	
2	85.41	2.001mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 4:45:18 PM	

Mean Area 85.41
 Mean Conc. 2.001mg/L



Sample

Sample Name: L17060601-09
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.452mg/L TC:6.815mg/L IC:5.363mg/L

1. Det

Anal.: TC

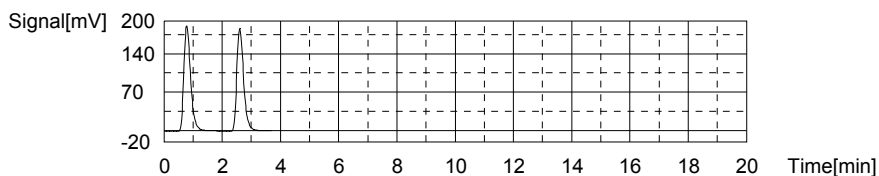
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	307.5	6.867mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 5:02:15 PM	
2	303.1	6.763mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 5:06:24 PM	

15/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

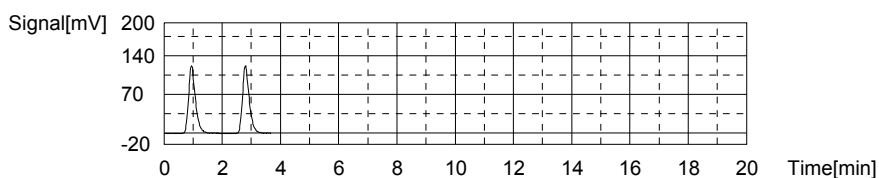
Mean Area 305.3
Mean Conc. 6.815mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	198.0	5.363mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 5:11:07 PM
2	198.0	5.363mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 5:15:39 PM

Mean Area 198.0
Mean Conc. 5.363mg/L



Sample

Sample Name: L17060601-11
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

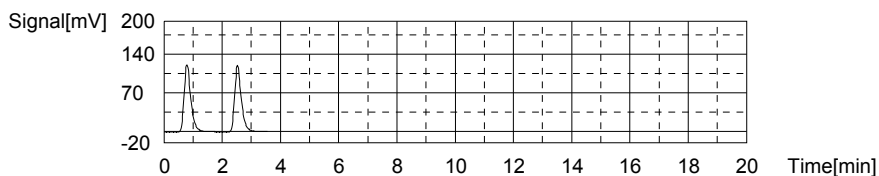
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.749mg/L TC:4.125mg/L IC:2.376mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	192.3	4.145mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/6/14/2017 5:22:50 PM
2	190.6	4.105mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/6/14/2017 5:26:56 PM

Mean Area 191.5
Mean Conc. 4.125mg/L



Anal.: IC

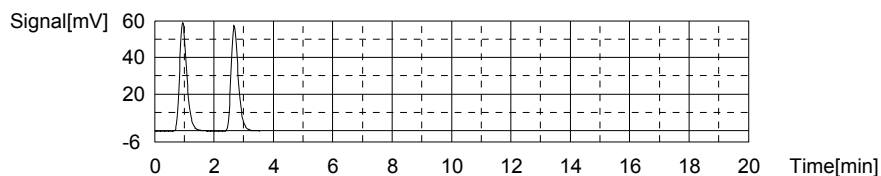
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	99.18	2.412mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 5:31:32 PM
2	96.75	2.339mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 5:36:01 PM

16/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

Mean Area 97.97
Mean Conc. 2.376mg/L



Sample

Sample Name: L17060601-13
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

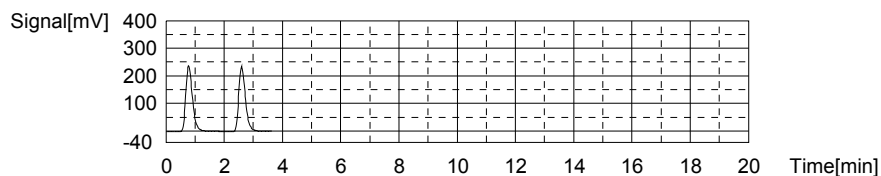
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.408mg/L TC:8.439mg/L IC:7.031mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	374.8	8.457mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 5:43:17 PM
2	373.3	8.421mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 5:47:23 PM

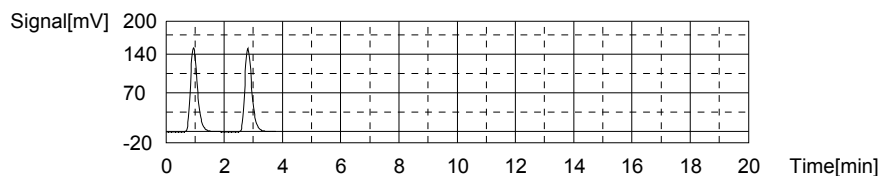
Mean Area 374.1
Mean Conc. 8.439mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	254.2	7.041mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 5:52:11 PM
2	253.5	7.020mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 5:56:47 PM

Mean Area 253.9
Mean Conc. 7.031mg/L



Sample

Sample Name: L17060601-15
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

17/31

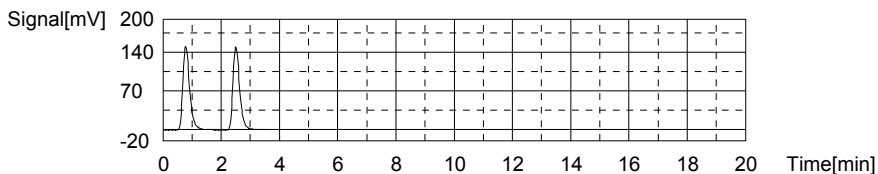
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.480mg/L TC:5.312mg/L IC:3.833mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	242.5	5.331mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 6:03:57 PM	
2	240.9	5.293mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 6:08:02 PM	

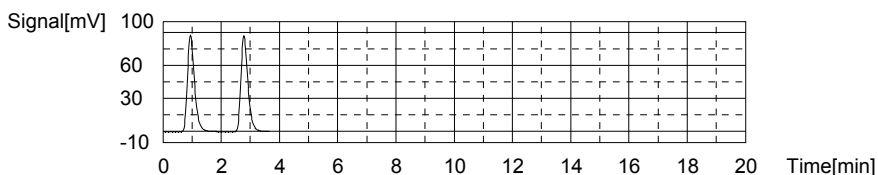
Mean Area 241.7
Mean Conc. 5.312mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	147.4	3.852mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 6:12:45 PM	
2	146.1	3.813mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 6:17:14 PM	

Mean Area 146.8
Mean Conc. 3.833mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result: Completed

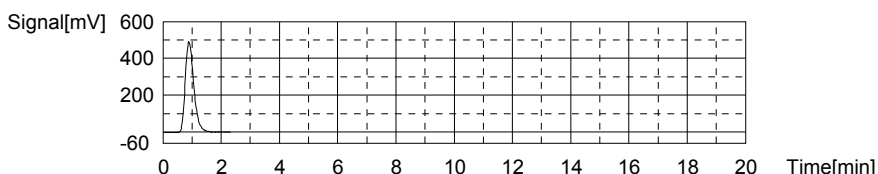
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.64mg/L TC:23.39mg/L IC:-0.2483mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1007	23.39mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 6:25:00 PM	

Mean Area 1007
Mean Conc. 23.39mg/L



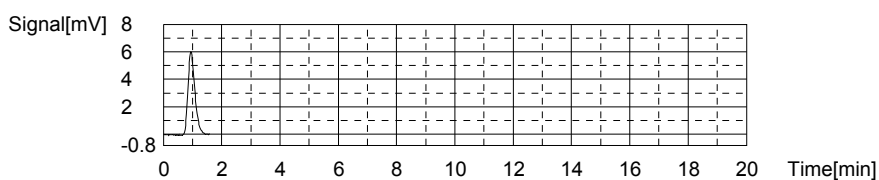
Anal.: IC

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.10	-0.2483mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 6:29:24 PM

Mean Area 10.10
Mean Conc. -0.2483mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

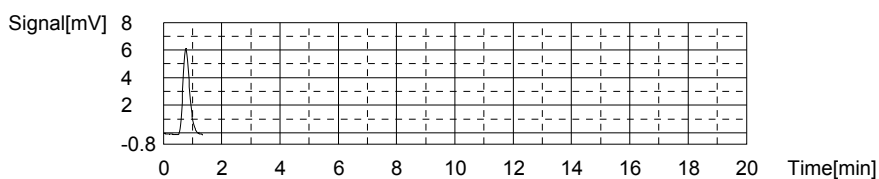
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1138mg/L TC:-0.1639mg/L IC:-0.2777mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.929	-0.1639mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 6:34:23 PM

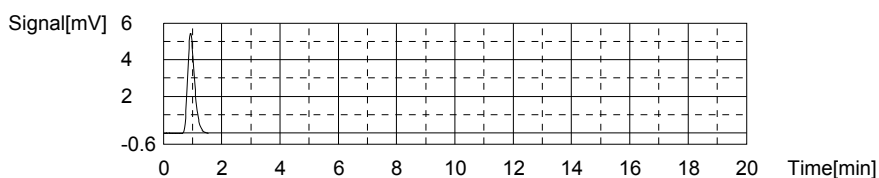
Mean Area 9.929
Mean Conc. -0.1639mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.116	-0.2777mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 6:38:20 PM

Mean Area 9.116
Mean Conc. -0.2777mg/L



Sample

Sample Name: L17060629-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

19/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

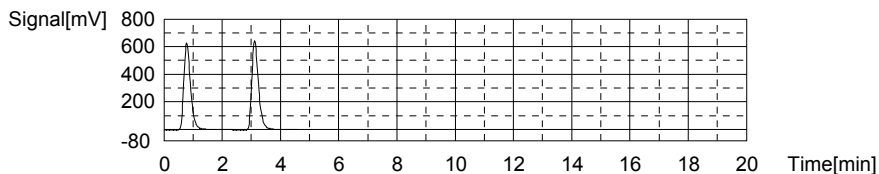
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.819mg/L TC:23.61mg/L IC:18.79mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1002	23.28mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 6:46:08 PM	
2	1030	23.94mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 6:50:49 PM	

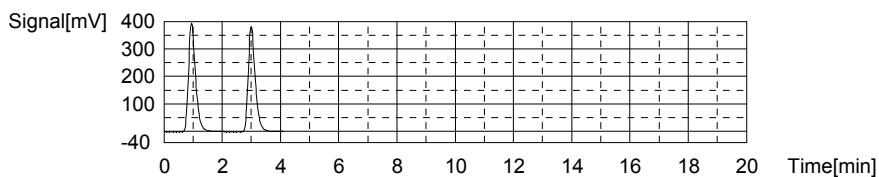
Mean Area 1016
Mean Conc. 23.61mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	660.2	19.17mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 6:55:53 PM	
2	634.8	18.41mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 7:00:41 PM	

Mean Area 647.5
Mean Conc. 18.79mg/L



Sample

Sample Name: L17060629-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

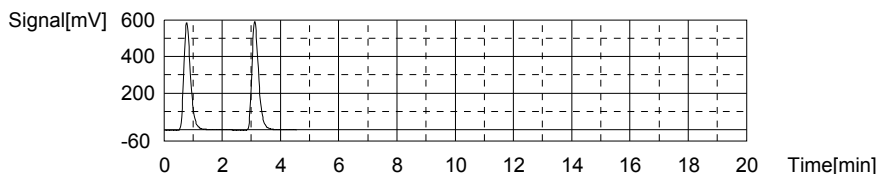
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.707mg/L TC:21.90mg/L IC:17.19mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	937.7	21.76mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 7:08:29 PM	
2	949.9	22.04mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 7:13:09 PM	

Mean Area 943.8
Mean Conc. 21.90mg/L



Anal.: IC

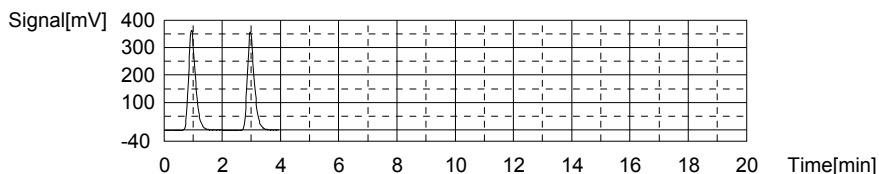
20/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	601.6	17.42mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 7:18:07 PM
2	586.7	16.97mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 7:22:49 PM

Mean Area 594.2
Mean Conc. 17.19mg/L



Sample

Sample Name: L17060629-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result:

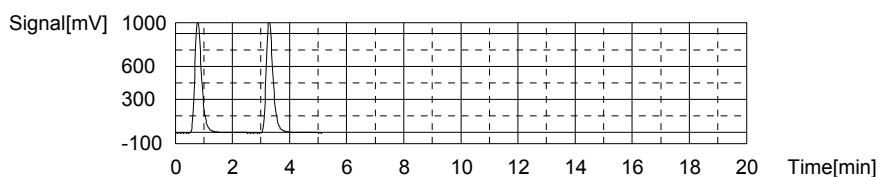
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:9.717mg/L TC:39.67mg/L IC:29.96mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1694	39.62mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 7:30:47 PM
2	1698	39.72mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 7:35:41 PM

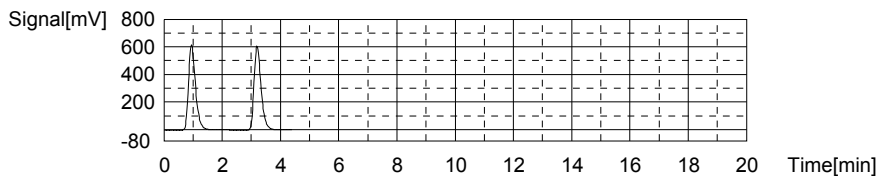
Mean Area 1696
Mean Conc. 39.67mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1026	30.09mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 7:40:57 PM
2	1017	29.82mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 7:45:53 PM

Mean Area 1022
Mean Conc. 29.96mg/L



Sample

21/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

Sample Name: L17060629-04
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

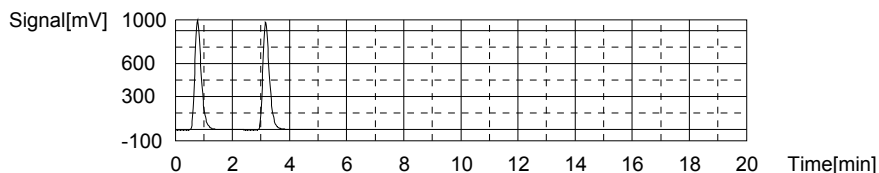
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.595mg/L TC:36.88mg/L IC:29.29mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1585	37.05mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 7:53:44 PM	
2	1571	36.72mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 7:59:27 PM	

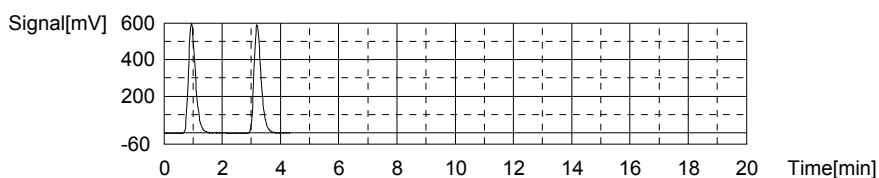
Mean Area 1578
 Mean Conc. 36.88mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1001	29.34mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 8:04:45 PM	
2	997.4	29.24mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 8:09:39 PM	

Mean Area 999.2
 Mean Conc. 29.29mg/L



Sample

Sample Name: WG617770-05 DUP
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.511mg/L TC:3.550mg/L IC:2.039mg/L

1. Det

Anal.: TC

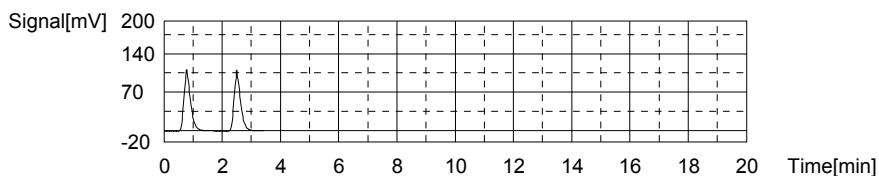
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	169.9	3.616mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 8:16:50 PM	
2	164.3	3.483mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 8:20:48 PM	

22/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

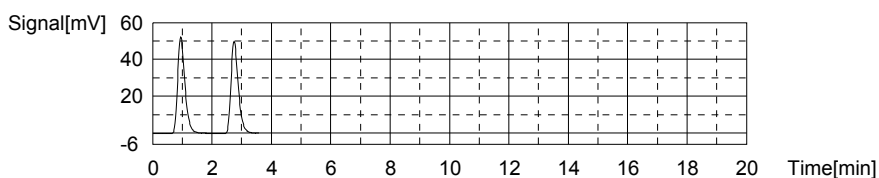
Mean Area 167.1
Mean Conc. 3.550mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	88.47	2.092mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 8:25:31 PM
2	84.90	1.985mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 8:29:56 PM

Mean Area 86.69
Mean Conc. 2.039mg/L



Sample

Sample Name: WG617770-06 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

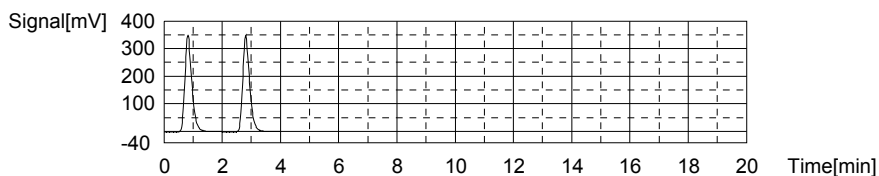
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.56mg/L TC:13.17mg/L IC:1.612mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	573.5	13.15mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	56/14/2017 8:37:23 PM
2	575.0	13.19mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	56/14/2017 8:41:40 PM

Mean Area 574.3
Mean Conc. 13.17mg/L



Anal.: IC

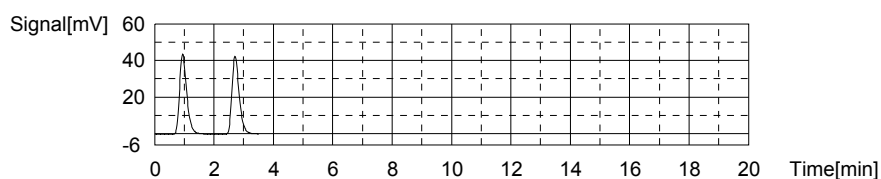
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	73.10	1.633mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 8:46:17 PM
2	71.72	1.592mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 8:50:42 PM

23/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

Mean Area 72.41
Mean Conc. 1.612mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

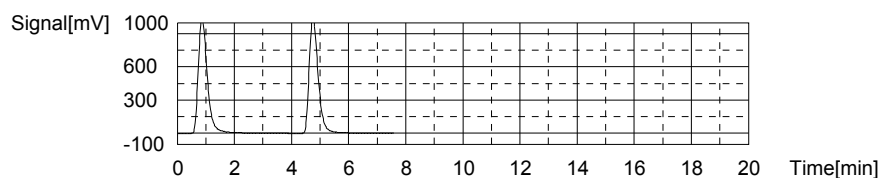
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:41.86mg/L TC:54.10mg/L IC:12.24mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2312	54.23mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 9:00:03 PM
2	2301	53.97mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 9:06:01 PM

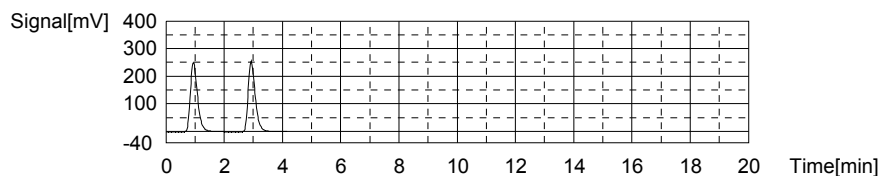
Mean Area 2307
Mean Conc. 54.10mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	425.5	12.16mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 9:10:56 PM
2	431.1	12.32mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 9:15:46 PM

Mean Area 428.3
Mean Conc. 12.24mg/L



Sample

Sample Name: L17060468-02 (25)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

24/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

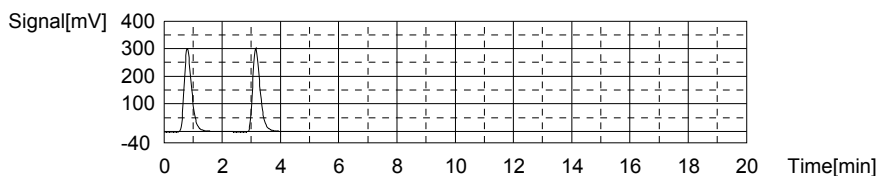
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.105mg/L TC:12.39mg/L IC:5.285mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	538.9	12.33mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 9:23:35 PM	
2	543.7	12.45mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 9:28:14 PM	

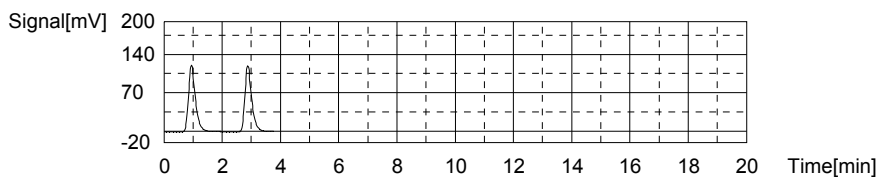
Mean Area 541.3
Mean Conc. 12.39mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	197.1	5.336mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 9:33:06 PM	
2	193.7	5.235mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16/14/2017 9:37:38 PM	

Mean Area 195.4
Mean Conc. 5.285mg/L



Sample

Sample Name: L17060506-01 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

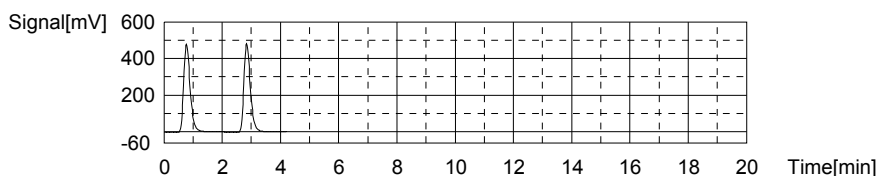
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.996mg/L TC:17.16mg/L IC:15.16mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	738.6	17.05mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 9:45:10 PM	
2	747.6	17.26mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56/14/2017 9:49:35 PM	

Mean Area 743.1
Mean Conc. 17.16mg/L



Anal.: IC

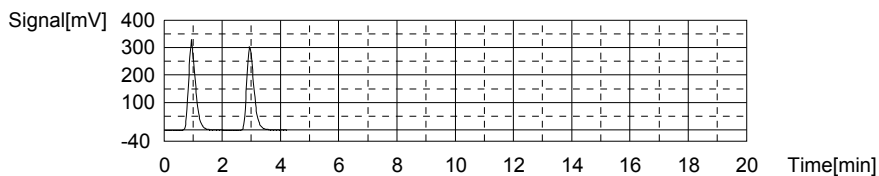
25/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	529.8	15.27mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 9:54:36 PM
2	522.5	15.05mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 9:59:31 PM

Mean Area 526.2
Mean Conc. 15.16mg/L



Sample

Sample Name: L17060483-01 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result:

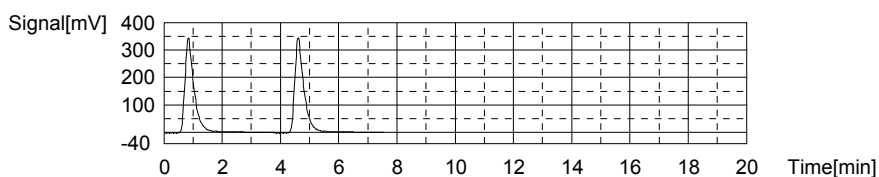
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:15.80mg/L TC:17.42mg/L IC:1.619mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	753.1	17.39mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 10:08:45 PM
2	755.5	17.45mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 10:14:59 PM

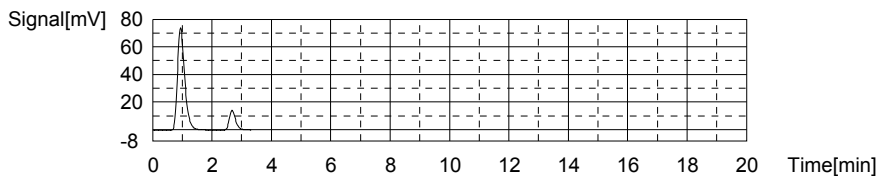
Mean Area 754.3
Mean Conc. 17.42mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	124.4	3.165mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 10:19:37 PM
2	20.86	0.07303mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/14/2017 10:23:46 PM

Mean Area 72.63
Mean Conc. 1.619mg/L



Sample

26/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

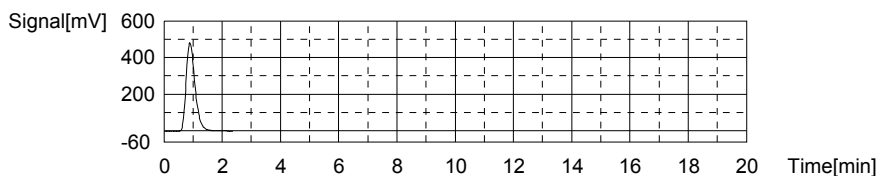
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.03mg/L TC:23.77mg/L IC:-0.2587mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1023	23.77mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 10:31:35 PM

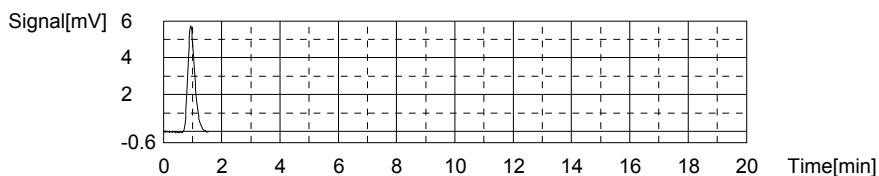
Mean Area 1023
 Mean Conc. 23.77mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.751	-0.2587mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 10:35:58 PM

Mean Area 9.751
 Mean Conc. -0.2587mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1247mg/L TC:-0.1426mg/L IC:-0.2673mg/L

1. Det

Anal.: TC

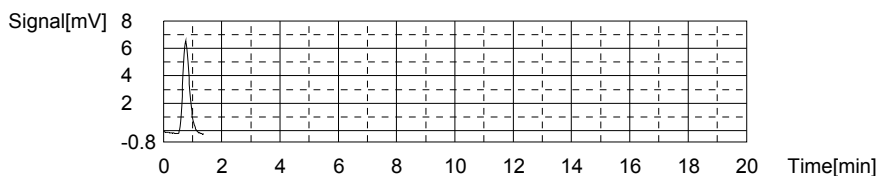
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.83	-0.1426mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/14/2017 10:40:59 PM

27/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

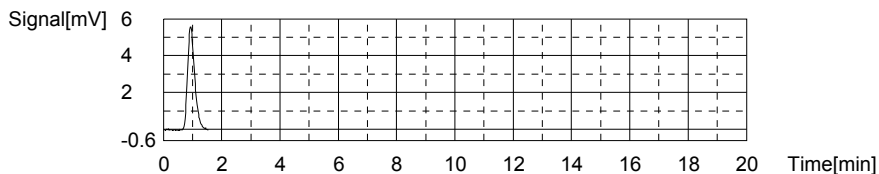
Mean Area 10.83
Mean Conc. -0.1426mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.465	-0.2673mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/14/2017 10:44:56 PM

Mean Area 9.465
Mean Conc. -0.2673mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

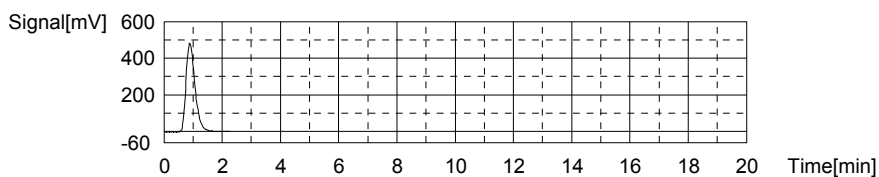
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.12mg/L TC:23.98mg/L IC:-0.1351mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1032	23.98mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/15/2017 7:21:10 AM

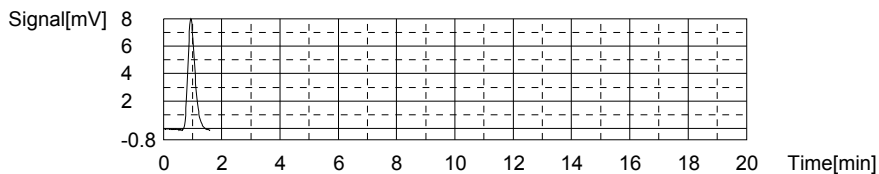
Mean Area 1032
Mean Conc. 23.98mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	13.89	-0.1351mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/15/2017 7:25:38 AM

Mean Area 13.89
Mean Conc. -0.1351mg/L



28/31

6/15/2017 8:23:21 AM

06-14-2017-ADG-TOC.i32

Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

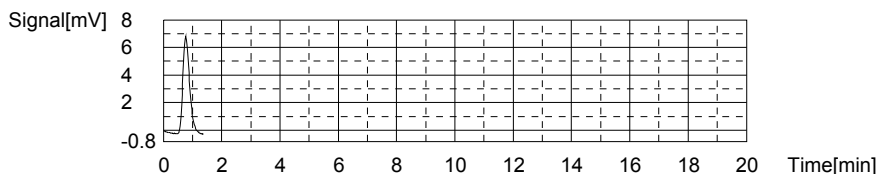
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1232mg/L TC:-0.1305mg/L IC:-0.2537mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.34	-0.1305mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/15/2017 7:30:38 AM

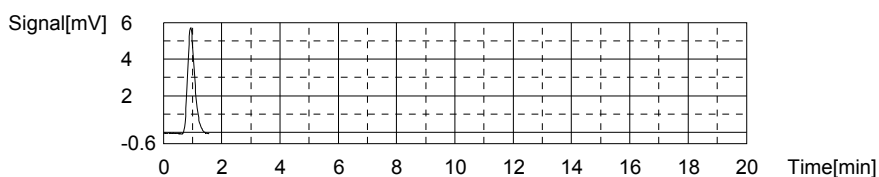
Mean Area 11.34
 Mean Conc. -0.1305mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.918	-0.2537mg/L	500uL	1	1	TICURVE-02-10-2017.2017_02_10_14_45_16	16/15/2017 7:34:40 AM

Mean Area 9.918
 Mean Conc. -0.2537mg/L



Sample

Sample Name: L17060468-01 (200)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:20.54mg/L TC:27.76mg/L IC:7.224mg/L

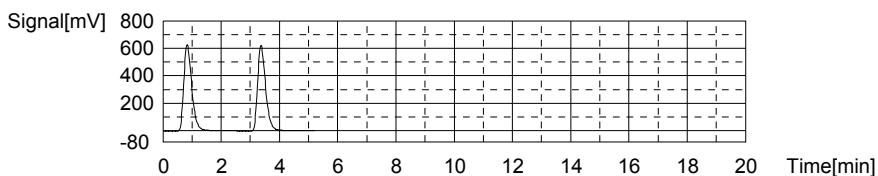
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1196	27.86mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/15/2017 7:42:40 AM
2	1188	27.67mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/15/2017 7:48:36 AM

29/31

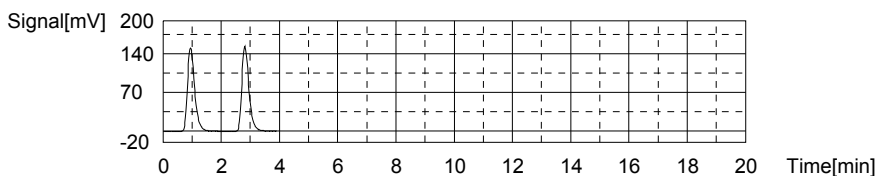
Mean Area 1192
Mean Conc. 27.76mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	258.1	7.158mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/15/2017 7:53:23 AM
2	262.5	7.289mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/15/2017 7:58:07 AM

Mean Area 260.3
Mean Conc. 7.224mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

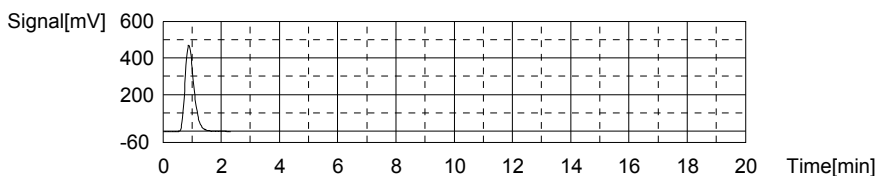
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.32mg/L TC:23.20mg/L IC:-0.1271mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	998.6	23.20mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/6/15/2017 8:05:54 AM

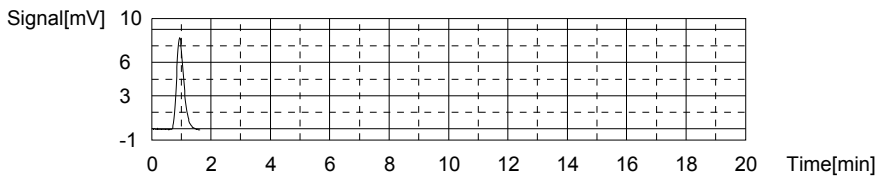
Mean Area 998.6
Mean Conc. 23.20mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	14.16	-0.1271mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/15/2017 8:10:22 AM

Mean Area 14.16
Mean Conc. -0.1271mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

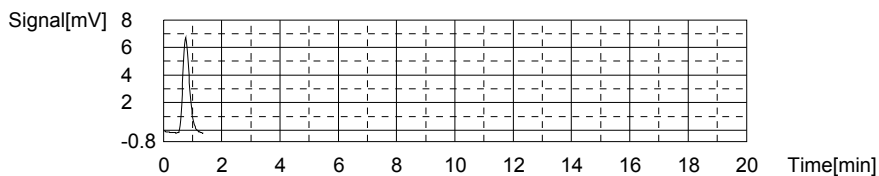
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1163mg/L TC:-0.1405mg/L IC:-0.2568mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.92	-0.1405mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/15/2017 8:15:23 AM

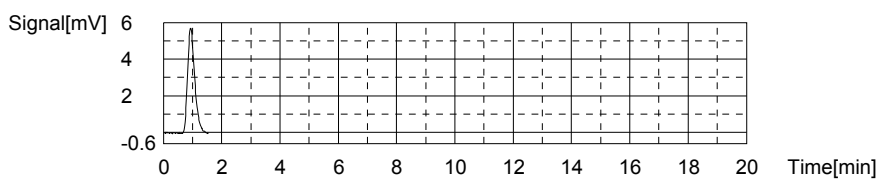
Mean Area 10.92
 Mean Conc. -0.1405mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.817	-0.2568mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/15/2017 8:19:19 AM

Mean Area 9.817
 Mean Conc. -0.2568mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
June 16, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
ALS - ADRIANE L. STEED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BLG - BRENDA L. GREENWALT	BNB - Brandi N. Bentley
BRG - BRENDA R. GREGORY	CAS - Craig A. Smith
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL	CV - Carl Volkman
DAK - DEAN A. KETELSEN	DCM - DAVID C. MERCKLE
DEV - DAVID E. VANDENBERG	DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER	DLP - DOROTHY L. PAYNE
DSM - DAVID S. MOSSOR	DTG - DOMINIC T. GEHRET
ECL - ERIC C. LAWSON	EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER	FJB - FRANCES J. BOLDEN
HRF - HEATHER R. FAIRCHILD	JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH	JKP - JACQUELINE K. PARSONS
JLD - JESSICA L. DELONG	JST - JOSHUA S. TAYLOR
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KDD - Katelyn D. Daley
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRP - KATHY R. PARSONS	LJH - Lacey J. Hendershot
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
OJE - OMOYEMWEN J. ENGLISH	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCA - SUEELLEN C. ADAMS
SCB - SARAH C. BOGOLIN	SCJ - SUE ELLEN C. JOHNSON
SDC - SHALYN D. CONLEY	TB - TODD BOYLE
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	ZTB - ZACH T. BARNES

List of Valid Qualifiers

June 16, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample receipt exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentatively identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound



List of Valid Qualifiers

June 16, 2017

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below



CHAIN OF CUSTODY

Name Of Lab Shipping To: **MICROBAC (740) 373-4071** AITTN: **STEPHANIE MOSSBURG**

Project: AECOM
 LONGHORN ARMY AMMIN. PLANT (LHAAP)
 GROUNDWATER TREATMENT PLANT (GWTP)
 KARNACK, TEXAS

Project No.
 60256135.GWTPT
 HRUMAR16

Job:
GROUNDWATER TREATMENT PLANT
WEEKLY SAMPLES

Prepared By:
Scott Beesinger

P.O. Number

Analyses

	MS / MSD	No. OF CONTAINERS	AMMONIA-N	ORTHO-PHOSPHATE	TOTAL ORGANIC CARBON	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650-6448-Grab	Water	06/07/17 / 15:00	X		X	H2SO4	
LH18/24-SP650-6448-Grab	Water	06/07/17 / 15:00		X		NONE	

Additional Remarks: Standard TAT on all parameters Send results to Linda Raabe at linda.raabe@aecom.com or call at 210-253-7518

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	06/07/17	15:30									

For Lab Use Only								
Received At Lab By:	Date	Time	Airbill No.	Date	Time	Temp of Container	Seal No.	Condition

Microbac OVD
 Received: 06/09/2017 10:09
 By: BRENDA GREENWALD
 221000101874



Revision 1 - A

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17060483

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 20-JUN-2017

Samplenum Container ID Products
L17060483-01 919309 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	09-JUN-2017 12:34	CLS		
2	ANALYZ	V1	WET	09-JUN-2017 13:18	DLP	CLS	
3	STORE	WET	A1	12-JUN-2017 14:35	CLS	TB	

Samplenum Container ID Products
L17060483-01 919310 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	WET	09-JUN-2017 12:34	CLS		<2
2	STORE	WET	A1	16-JUN-2017 07:48	AZH	ADG	

Samplenum Container ID Products
L17060483-01 919311 NH3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	09-JUN-2017 12:34	CLS		<2
2	ANALYZ	W1	WET	12-JUN-2017 08:50	TMM	CLS	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
 Total Halide by Bomb Combustion (TX)
 Particle Sizing - 200 Mesh (PS200)
 Specific Gravity/Density (SPGRAV)
 Total Residual Chlorine (CL-TRL)
 Total Volatile Solids (all forms) (TVS)
 Total Coliform Bacteria (all methods)
 Fecal Coliform Bacteria (all methods)
 Sulfite (SO₃)
 Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS

Nitrogen, Ammonia by Method 350.1
 Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
 Phenolics, Total by Method 420.1
 ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
 Acetic acid
 Butyric acid
 Lactic acid
 Propionic acid
 Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
 1-Methylnaphthalene
 1,4-Dioxane
 Atrazine
 Benzaldehyde
 Biphenyl
 Caprolactam
 Hexamethylphosphoramide (HMPA)
 Pentachlorobenzene
 Pentachloroethane

NELAP Accreditation by Laboratory SOP**NONPOTABLE WATER**OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALSOVD MSS01/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP**SOLID AND HAZARDOUS CHEMICALS**OVD MSV01/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)



Laboratory Report Number: L17060484

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on June 21 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Microbac Laboratories * Ohio Valley Division
158 Starlite Drive, Marietta, OH 45750 * T: (740) 373-4071 F: (740) 373-4835 * www.microbac.com

Lab Report #: L17060484

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

The following discrepancies were noted:

Discrepancy	Resolution
LH18/24-SP650-6447-Grab : the CR-6 was received out of hold. CLS	Client notified, please proceed. ALS

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0011846	H	1.0		1Z4984890169489494	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	No
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	Yes

**Lab Report #:** L17060484**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP650-6447-GRAB	L17060484-01	06/07/2017 15:00	06/09/2017 10:09
TRIP BLANK	L17060484-02	06/07/2017 00:01	06/09/2017 10:09



Login Number: L17060484
Department: Conventionals
Analyst: Dorothy Payne

METHOD

Analysis SM3500Cr-D/7196A (Hexavalent Chromium)

HOLDING TIMES

Sample Analysis: The samples were received past the recommended hold time. The analysis was performed out of hold per client's request.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 126503

Approved By: Sarah Vandenberg

Sarah Vandenberg



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-13 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Mary Schilling		Anaylst III	2017-06-13 14:40:32



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-13 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?	X				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-13 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-13 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?		X			1
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-13 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-13 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

1. In the CCV analyzed 6/12/17 on HPMS6, WG617416-02, carbon tetrachloride exceeded the limit for percent difference, biased high. The associated samples were non-detect for this analyte.




Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG617872	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Eric Lawson		Chemist III	2017-06-20 13:03:46



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG617872	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?		X			1
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?	X				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG617872	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?		X			2
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG617872	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG617872	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	827-DIOXANE
Prep Batch Number(s):	WG617872	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

1. Sample 01 was re-extracted out of hold time.
2. All LCS's had recoveries for 1,4-dioxane that were above the acceptance limit. Sample 02 had a hit of 1,4-dioxane that was about 5 times greater than the spiked amount. The re-extract of sample 02 yielded similar results.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Eric Lawson		Chemist III	2017-06-14 20:21:15



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6850
Prep Batch Number(s):	WG617701	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-14 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

There are no exceptions.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Kim Rhodes		Analyst III	2017-06-21 13:53:02



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports	X				
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?					
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?	X				
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6010
Prep Batch Number(s):	WG617642	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Kim Rhodes		Analyst III	2017-06-21 13:56:37



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports	X				
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?		X			ER#2
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?					
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?		X			ER#1
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?	X				
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	6020
Prep Batch Number(s):	WG617566	Reviewer Name:	Kim Rhodes
LRC Date:	2017-06-21 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

ER#1 - Due to the low level initial calibration verification failure for lead on 14-Jun-2017 at 13:09, client sample 01 and QA/QC were reanalyzed on a later calibration which was compliant for lead.

ER#2 - Client sample 01 required dilution analysis in order to obtain a result for barium within the calibration range.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-16 16:45:19



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?		X			
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060484
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG617322	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-16 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

The sample was received past the 24 hour holding time.

Lab Report #: L17060484

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: HPMS6
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 05/25/2017 15:51
Workgroup #: WG617417	Analyst: TMB	Run Date: 06/12/2017 18:19
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: 6M147948
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	7.31	J	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	Q	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	3.24		1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	114	70	120	
4-Bromofluorobenzene	98.7	75	120	
Dibromofluoromethane	110	85	115	
Toluene-d8	99.1	85	120	
J	Estimated value ; the analyte concentration was less than the LOQ.			
Q	One or more quality control criteria failed. See narrative.			
U	Analyte was not detected. The concentration is below the reported LOD.			

Lab Report #: L17060484
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: HPMS15
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3520C	Prep Date: 06/12/2017 16:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 05/04/2017 16:11
Workgroup #: WG617729	Analyst: LJH	Run Date: 06/14/2017 10:56
Collect Date: 06/07/2017 15:00	Dilution: 5	File ID: 15M21317
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,4-Dioxane	123-91-1	24.6		11.0	5.50	2.75
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,4-Dioxane-d8	57.5	20	129			

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: HPMS15
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3520C	Prep Date: 06/15/2017 14:26
Matrix: Water	Analytical Method: 8270D	Cal Date: 05/04/2017 16:11
Workgroup #: WG618285	Analyst: LJH	Run Date: 06/16/2017 16:55
Collect Date: 06/07/2017 15:00	Dilution: 5	File ID: 15M21327
Sample Tag: REDL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,4-Dioxane	123-91-1	23.9		10.0	5.00	2.50
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,4-Dioxane-d8	59.8	20	129			

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 6850	Prep Date: 06/13/2017 14:30
Matrix: Water	Analytical Method: 6850	Cal Date: 04/24/2017 15:40
Workgroup #: WG617701	Analyst: JWR	Run Date: 06/13/2017 17:51
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: 1LM.LM39827
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.200	U	0.400	0.200	0.100
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060484
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 11:40
Matrix: Water	Analytical Method: 6010C	Cal Date: 06/14/2017 13:33
Workgroup #: WG617838	Analyst: KKB	Run Date: 06/14/2017 18:49
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: T4.061417.184941
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Selenium, Total	7782-49-2	0.0200	U	0.0200	0.0200	0.0100
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060484
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 08:11
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/14/2017 14:03
Workgroup #: WG617731	Analyst: JYH	Run Date: 06/14/2017 14:44
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: NI.061417.144416
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Lead, Total	7439-92-1	0.000600	J	0.00200	0.00100	0.000500
J	Estimated value ; the analyte concentration was less than the LOQ.					
J	Estimated value ; the analyte concentration was greater than the highest standard					
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060484
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 08:11
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/14/2017 09:42
Workgroup #: WG617731	Analyst: JYH	Run Date: 06/14/2017 11:39
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: NI.061417.113913
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Silver, Total	7440-22-4	0.00100	U	0.00200	0.00100	0.000500
J	Estimated value ; the analyte concentration was less than the LOQ.					
J	Estimated value ; the analyte concentration was greater than the highest standard					
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060484
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 08:11
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/14/2017 09:42
Workgroup #: WG617731	Analyst: JYH	Run Date: 06/14/2017 11:45
Collect Date: 06/07/2017 15:00	Dilution: 5	File ID: NI.061417.114524
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Barium, Total	7440-39-3	0.287		0.0300	0.0150	0.00750
J	Estimated value ; the analyte concentration was less than the LOQ.					
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060484
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 7196A	Prep Date: N/A
Matrix: Water	Analytical Method: 7196A	Cal Date: 06/05/2017 10:10
Workgroup #: WG617322	Analyst: DLP	Run Date: 06/09/2017 15:00
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: 00.1706091500-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chromium, Hexavalent	18540-29-9	0.0100	U,H1	0.0200	0.0100	0.00500
U,H1	Not detected; Sample analysis performed past holding time.					

Certificate of Analysis

Sample #: L17060484-02	PrePrep Method: N/A	Instrument: HPMS6
Client ID: TRIP BLANK	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 05/25/2017 15:51
Workgroup #: WG617417	Analyst: TMB	Run Date: 06/12/2017 16:50
Collect Date: 06/07/2017 00:01	Dilution: 1	File ID: 6M147945
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	5.37	J	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	Q	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	112	70	120	
4-Bromofluorobenzene	101	75	120	
Dibromofluoromethane	107	85	115	
Toluene-d8	99.6	85	120	
J	Estimated value ; the analyte concentration was less than the LOQ.			
Q	One or more quality control criteria failed. See narrative.			
U	Analyte was not detected. The concentration is below the reported LOD.			

2.1 Volatiles Data

2.1.1 Volatiles GCMS Data (8260)

2.1.1.1 Summary Data

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: HPMS6
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 05/25/2017 15:51
Workgroup #: WG617417	Analyst: TMB	Run Date: 06/12/2017 18:19
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: 6M147948
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	7.31	J	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	Q	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	3.24		1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	114	70	120	
4-Bromofluorobenzene	98.7	75	120	
Dibromofluoromethane	110	85	115	
Toluene-d8	99.1	85	120	

J	Estimated value ; the analyte concentration was less than the LOQ.
Q	One or more quality control criteria failed. See narrative.
U	Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #: L17060484-02

PrePrep Method: N/A

Instrument: HPMS6

Client ID: TRIP BLANK

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 05/25/2017 15:51

Workgroup #: WG617417

Analyst: TMB

Run Date: 06/12/2017 16:50

Collect Date: 06/07/2017 00:01

Dilution: 1

File ID: 6M147945

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	5.37	J	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	Q	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	112	70	120	
4-Bromofluorobenzene	101	75	120	
Dibromofluoromethane	107	85	115	
Toluene-d8	99.6	85	120	

J	Estimated value ; the analyte concentration was less than the LOQ.
Q	One or more quality control criteria failed. See narrative.
U	Analyte was not detected. The concentration is below the reported LOD.

2.1.1.2 QC Summary Data

Example 8260 Calculations

1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:

$$RF = [(Ax) (Cis)] / [(Ais) (Cx)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured:	3399156
Cis = Concentration of the specific internal standard (ug/mL)	25
Ais = Area of the characteristic ion of the specific internal standard	846471
Cx = Concentration of the compound in the standard being measured (ug/mL)	100
RF = Calculated Response Factor	1.0039

2.0 Calculating the concentration (C) of a compound in water using the average RF: *

$$Cx = [(Ax) (Cis) (Vn)(D)] / [(Ais) (RF) (Vs)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured	3122498
Cis = Concentration of the specific internal standard (ug/L)	25
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	611048
RF = Average RF from the ICAL	1.004
Vs = Purge volume of sample (mL)	10
Vn = Nominal purge volume of sample (mL) (10.0 mL)	10
Cx = Concentration of the compound in the sample being measured (ug/L)	127.2428

3.0 Calculating the concentration (C) of a compound in soil using the average RF: *

$$Cx = [(Ax) (Cis) (Wn)(D)] / [(Ais) (RF) (Ws)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured	3122498
Cis = Concentration of the specific internal standard (ug/L)	25
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	611048
RF = Average RF from the ICAL	1.004
Ws = Weight of sample purged (g)	5
Wn = Nominal purge weight (g) (5.0 g)	5
Cx = Concentration of the compound in the sample being measured (ug/L)	127.2428

Dry weight correction:

Percent solids (PCT_S)	50
Cd = (Cx) (100)/PCT_S	254.4856

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

4.0 Concentration from Linear Regression

Step 1: Retrieve Curve Data From Plot, $y = mx + b$

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve = 0.213

b = intercept from curve = - 0.00642

Step 2: Calculate y from Quantitation Report

$$y = 86550/593147 = 0.1459$$

Step 3: Solve for x

$$x = (y - b)/m = [(0.1459 - (-0.00642))/0.213] = 0.7152$$

Step 4: Solve for analyte concentration Cx

$$Cx = Cis (x) = (25.0)(0.7152) = 17.88$$

Example Spreadsheet Calculation:

Slope from curve, m:	0.213
Intercept from curve, b:	-0.00642
Area of analyte, Ax:	86550
Area of Internal Standard, Ais:	593147
Concentration of IS, Cis	25.00
Response Ratio:	0.145917
Amount Ratio:	0.715195
Concentration:	17.87988
Units of Internal Standard:	ug/L

5.0 Concentration from Quadratic Regression**Step 1 - Retrieve Curve Data from Plot, $y = Ax^2 + Bx + C$**

Where:

$$Ax^2 + Bx + (C - y) = 0$$

A, B, C = constants from the ICAL quadratic regression

y = Response ratio = Area of analyte/Area of internal standard (IS)

x = Amount ratio = Concentration of analyte/concentration of IS

Step 2: Calculate y from Quantitation Report

$$y = Ax/Ais$$

Step 3: Solve for x using the quadratic formula

$$Ax^2 + Bx + C - y = 0$$

$$x = \frac{b \pm \sqrt{(b^2 - 4a(c - y))}}{2a} \quad (\text{Two possible solutions})$$

Step 4: Solve for analyte concentration Cx

$$Cx = (Cis)(\text{Amount ratio})$$

Example Spreadsheet Calculation:

Value of A from plot:	-0.00629
Value of B from plot:	0.511
Value of C from plot:	-0.0276
Area of unknown from quantitation report:	293821
Area of IS from quantitation report:	784848
Response ratio, y:	0.374367
C - y:	-0.40197
Root 1 - Computed amount ratio, X1:	80.44567
Root 2 - Computed amount ratio, X2:	0.794396 use this solution
Concentration of IS, Cis:	25.00
Concentration of analyte, Cx:	19.86 ug/L

Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 011217
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01 Rev: 24
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01 Rev: 18
 Maintenance Log ID: 54037

Internal Standard: STD79772 Surrogate Standard: STD79772
 CCV: STD79829; STD79571 LCS: STD79908; STD79496 MS/MSD: STD79909
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG598323; WG598431

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M144707	WG598323-01 50ng BFB STD 8260	NA	1	1	STD79474	01/12/17 08:36
6M144708	WG598323-02 5ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 09:02
6M144709	WG598323-03 20ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 09:37
6M144710	WG598323-04 50ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 10:10
6M144711	WG598323-05 100ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 10:42
6M144712	WG598323-06 200ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 11:14
6M144713	WG598323-07 300ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 11:47
6M144714	WG598323-08 400ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 12:19
6M144715	WG598323-09 500ug/L A9/FOO STD	NA	1	1	STD79571	01/12/17 12:52
6M144716	rinse	NA	1	1		01/12/17 13:25
6M144717	WG598323-10 100ug/L ALT SRC STD A9/F	NA	1	1	STD79496	01/12/17 13:56
6M144718	WG598430-01 50ng BFB STD 8260	NA	1	1	STD79474	01/12/17 14:27
6M144719	WG598430-02 50ug/L CCV STD 8260	NA	1	1	STD79829	01/12/17 14:52
6M144720	WG598452-01 100ug/L A9 CCV STD 8260	NA	1	1	STD79571	01/12/17 15:27
6M144721	WG598431-01 VBLK0112 BLANK STD 826	NA	1	1		01/12/17 15:59
6M144722	WG598431-02 20ug/L LCS STD 8260	NA	1	1	STD79908	01/12/17 16:32
6M144723	L16120615-05 B MS 826-A9-SPE	7	1	1	STD79909	01/12/17 17:04
6M144724	L16120615-06 B MSD 826-A9-SPE	7	1	1	STD79909	01/12/17 17:37
6M144725	WG598431-03 100ug/L A9/FOO LCS	NA	1	1	STD79496	01/12/17 18:09
6M144726	L16120718-01 B TB 826-AP-SPE	<2	1	1		01/12/17 18:42
6M144727	L16120973-01 B TB 826-AP-SPE	<2	1	1		01/12/17 19:14
6M144728	L16120615-01 B 826-AP-SPE	7	1	1		01/12/17 19:46
6M144729	L16120615-02 B 826-AP-SPE	7	1	1		01/12/17 20:19
6M144730	L16120615-03 B EB 826-AP-SPE	4	1	1		01/12/17 20:51
6M144731	L16120615-04 B RS 826-AP-SPE	7	1	1		01/12/17 21:23
6M144732	L16120615-07 B 826-AP-SPE	4	1	1		01/12/17 21:55
6M144733	L16120615-08 B 826-AP-SPE	7	1	1		01/12/17 22:27
6M144734	L16120615-09 B 826-AP-SPE	7	1	1		01/12/17 22:59
6M144735	L16120718-02 B 826-AP-SPE	7	1	1		01/12/17 23:31
6M144736	L16120718-03 B 826-AP-SPE	7	1	1		01/13/17 00:03
6M144737	L16120718-04 B 826-AP-SPE	4	1	1		01/13/17 00:36
6M144738	L16120718-05 B 826-AP-SPE	4	1	1		01/13/17 01:08
6M144739	L16120718-06 B 826-AP-SPE	7	1	1		01/13/17 01:40
6M144740	L16120718-07 B 826-AP-SPE	7	1	1		01/13/17 02:12

Approved: January 13, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 011217
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01 Rev: 24
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01 Rev: 18
 Maintenance Log ID: 54037

Internal Standard: STD79772 Surrogate Standard: STD79772
 CCV: STD79829; STD79571 LCS: STD79908; STD79496 MS/MSD: STD79909
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG598323; WG598431

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M144741	RINSE	NA	1	1		01/13/17 02:44
6M144742	WG598431-07 VBLK0112 BLANK STD 624	NA	2	1		01/13/17 03:16
6M144743	L17010300-04 A 624	7	2	1		01/13/17 03:47
6M144744	L17010466-03 A 624-SPE	7	2	1		01/13/17 04:20
6M144745	L17010446-02 A 624-SPE1	7	2	1		01/13/17 04:52
6M144746	CCV	NA	1	1		01/13/17 05:24
6M144747	RINSE	NA	1	1		01/13/17 05:56
6M144748	RINSE	NA	1	1		01/13/17 06:28

Approved: January 13, 2017

Page: 2

Sarah Vandenberg



Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 052517
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01/OVAP MSV01 Rev: 24/0
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01/OVAP PAT01 Rev: 18/1
 Maintenance Log ID: _____

Internal Standard: STD81995 Surrogate Standard: STD81995
 CCV: STD82074 LCS: STD82078 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG615531

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M147585	WG615531-01 50ng BFB STD 8260	NA	1	1	STD81972	05/25/17 09:59
6M147586	RINSE	NA	1	1		05/25/17 10:24
6M147587	WG615531-02 0.3ug/L STD 8260	NA	1	1	STD82074	05/25/17 10:54
6M147588	WG615531-03 0.4ug/L STD 8260	NA	1	1	STD82074	05/25/17 11:24
6M147589	WG615531-04 1ug/L STD 8260	NA	1	1	STD82074	05/25/17 11:54
6M147590	WG615531-05 2ug/L STD 8260	NA	1	1	STD82074	05/25/17 12:24
6M147591	WG615531-06 5ug/L STD 8260	NA	1	1	STD82074	05/25/17 12:54
6M147592	WG615531-04 1ug/L STD 8260	NA	1	1	STD82074	05/25/17 13:23
6M147593	WG615531-07 20ug/L STD 8260	NA	1	1	STD82074	05/25/17 13:53
6M147594	WG615531-08 50ug/L STD 8260	NA	1	1	STD82074	05/25/17 14:23
6M147595	WG615531-09 100ug/L STD 8260	NA	1	1	STD82074	05/25/17 14:53
6M147596	WG615531-10 200ug/L STD 8260	NA	1	1	STD82074	05/25/17 15:22
6M147597	WG615531-11 300ug/L STD 8260	NA	1	1	STD82074	05/25/17 15:51
6M147598	RINSE	NA	1	1		05/25/17 16:42
6M147599	RINSE	NA	1	1		05/25/17 17:13
6M147600	WG615531-12 20ug/L ALT SRC STD 8260	NA	1	1	STD82078	05/25/17 17:43
6M147601	RINSE	NA	1	1		05/25/17 18:13

Comments

Seq.	Rerun	Dil.	Reason	Analytes
5	X			
File ID: 6M147589				
Iodomethane didn't have a secondary. DNR.				

Approved: May 31, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 061217
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01/OVAP MSV01 Rev: 25/0
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01/OVAP PAT01 Rev: 18/1
 Maintenance Log ID: 54208

Internal Standard: STD81995 Surrogate Standard: STD81995
 CCV: STD82307 LCS: STD82280 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG617417

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M147931	RINSE	NA	1	1		06/12/17 08:42
6M147932	WG617416-01 50ng BFB STD 8260	NA	1	1	STD81972	06/12/17 10:17
6M147933	WG617416-02 50ug/L CCV STD 8260	NA	1	1	STD82307	06/12/17 10:42
6M147934	WG000000-01 100ug/L A9 CCV STD 8260	NA	1	1	STD82199	06/12/17 11:11
6M147935	WG617417-01 VBLK0612 BLANK STD 826	NA	1	1		06/12/17 11:41
6M147936	L17051567-01 MDL-A 826-SPE	NA	1	1	STD82281	06/12/17 12:11
6M147937	L17051567-02 MDL-A 826-SPE	NA	1	1	STD82281	06/12/17 12:40
6M147938	L17051567-03 MDL-A 826-SPE	NA	1	1	STD82281	06/12/17 13:10
6M147939	L17051567-04 MDL-A 826-SPE	NA	1	1	STD82281	06/12/17 13:49
6M147940	L17051567-05 MDL-A 826-SPE	NA	1	1	STD82281	06/12/17 14:20
6M147941	L17051567-06 MDL-A 826-SPE	NA	1	1	STD82281	06/12/17 14:50
6M147942	L17051567-07 MDL-A 826-SPE	NA	1	1	STD82281	06/12/17 15:20
6M147943	WG617417-02 20ugL LCS STD 8260	NA	1	1	STD82280	06/12/17 15:50
6M147944	WG617417-03 20ugL LCS2 STD 8260	NA	1	1	STD82280	06/12/17 16:20
6M147945	L17060484-02 A TB 826-SPE	<2	1	1		06/12/17 16:50
6M147946	L17051567-03 MDL-A 826-SPE	NA	1	1	STD82281	06/12/17 17:20
6M147947	RINSE	NA	1	1		06/12/17 17:49
6M147948	L17060484-01 A 826-SPE	<2	1	1		06/12/17 18:19
6M147949	CCV	NA	1	1		06/12/17 18:49
6M147950	RINSE	NA	1	1		06/12/17 19:20
6M147951	RINSE	NA	1	1		06/12/17 19:50
6M147952	RINSE	NA	1	1		06/12/17 20:21

Comments

Seq.	Rerun	Dil.	Reason	Analytes
8	X			
File ID: 6M147938				
Hexachl. was low, DNR.				

Approved: June 13, 2017

Page: 1

Mary Schilling



Microbac Laboratories Inc.

Data Checklist

Date: 12-JAN-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 79799
 Analytical Workgroups: WG598323; WG598431

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	NA
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	SAV
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
13-JAN-2017

Tiffany Bailey

Secondary Reviewer:
13-JAN-2017

Sarah Vandenberg



Microbac Laboratories Inc.

Data Checklist

Date: 25-MAY-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 82462
 Analytical Workgroups: WG615531

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	MES
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
30-MAY-2017

Tiffany Bailey

Secondary Reviewer:
31-MAY-2017

Mary Shieley



Microbac Laboratories Inc.

Data Checklist

Date: 12-JUN-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 82701
 Analytical Workgroups: WG617417

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	MES
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
12-JUN-2017

Tiffany Bailey

Secondary Reviewer:
13-JUN-2017

Mary Shieley



Analytical Method:8260B
Login Number:L17060484

AAB#:WG617417

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6447-GRAB	01	06/07/17					06/12/2017	5.1	14		06/12/17	5.1	14	
TRIP BLANK	02	06/07/17					06/12/2017	5.7	14		06/12/17	5.7	14	

* = SEE PROJECT QAPP REQUIREMENTS



Login Number:L17060484
 Instrument Id:HPMS6
 Workgroup (AAB#):WG617417

Method:8260
 CAL ID: HPMS6 - 25-MAY-17
 Matrix:Water

Sample Number	Dilution	Tag	1	2	3	4
L17060484-01	1.00	01	114	110	98.7	99.1
L17060484-02	1.00	01	112	107	101	99.6
WG617417-01	1.00	01	113	107	99.8	99.7
WG617417-02	1.00	01	112	108	98.7	98.8
WG617417-03	1.00	01	111	107	98.9	98.5

Surrogates	Surrogate Limits		
1 - 1,2-Dichloroethane-d4	70	-	120
2 - Dibromofluoromethane	85	-	115
3 - 4-Bromofluorobenzene	75	-	120
4 - Toluene-d8	85	-	120

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



METHOD BLANK SUMMARY

Login Number: L17060484
 Blank File ID: 6M147935
 Prep Date: 06/12/17 11:41
 Analyzed Date: 06/12/17 11:41
 Analyst: TMB

Work Group: WG617417
 Blank Sample ID: WG617417-01
 Instrument ID: HPMS6
 Method: 8260B

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617417-02	6M147943	06/12/17 15:50	01
LCS2	WG617417-03	6M147944	06/12/17 16:20	01
TRIP BLANK	L17060484-02	6M147945	06/12/17 16:50	01
LH18/24-SP650-6447-GRAB	L17060484-01	6M147948	06/12/17 18:19	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5333835
 Report generated 06/13/2017 10:41



Login Number: L17060484 Prep Date: 06/12/17 11:41 Sample ID: WG617417-01
 Instrument ID: HPMS6 Run Date: 06/12/17 11:41 Prep Method: 5030B/5030C/503
 File ID: 6M147935 Analyst: TMB Method: 8260B
 Workgroup (AAB#): WG617417 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS6-25-MAY-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
1,1,1-Trichloroethane	0.250	1.00	0.250	1	U
1,1,2-Trichloroethane	0.250	1.00	0.250	1	U
1,1-Dichloroethane	0.125	0.500	0.125	1	U
1,1-Dichloroethene	0.500	2.00	0.500	1	U
1,2-Dichloroethane	0.250	1.00	0.250	1	U
Acetone	2.50	10.0	2.50	1	U
Benzene	0.125	0.500	0.125	1	U
Carbon tetrachloride	0.250	1.00	0.250	1	U
Chloroform	0.125	0.500	0.125	1	U
Ethylbenzene	0.250	1.00	0.250	1	U
Methylene chloride	0.250	1.00	0.250	1	U
m,p-Xylene	0.500	2.00	0.500	1	U
o-Xylene	0.250	1.00	0.250	1	U
Styrene	0.125	0.500	0.125	1	U
Tetrachloroethene	0.250	1.00	0.250	1	U
Trichloroethene	0.250	1.00	0.250	1	U
Toluene	0.250	1.00	0.250	1	U
Vinyl chloride	0.250	1.00	0.250	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	113	70 - 120	PASS
4-Bromofluorobenzene	99.8	75 - 120	PASS
Dibromofluoromethane	107	85 - 115	PASS
Toluene-d8	99.7	85 - 120	PASS

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5333328
 13-JUN-2017 10:41



Login Number: L17060484 Analyst: TMB Prep Method: 5030B/5030C/503
 Instrument ID: HPMS6 Matrix: Water Method: 8260B
 Workgroup (AAB#): WG617417 Units: ug/L
 QC Key: DOD4 Lot #: STD82280

Sample ID: WG617417-02 LCS File ID: 6M147943 Run Date: 06/12/2017 15:50
 Sample ID: WG617417-03 LCS2 File ID: 6M147944 Run Date: 06/12/2017 16:20

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
1,1,1-Trichloroethane	20.0	23.0	115	20.0	22.3	111	3.25	65 - 130	30	
1,1,2-Trichloroethane	20.0	21.0	105	20.0	21.1	106	0.636	75 - 125	30	
1,1-Dichloroethane	20.0	20.8	104	20.0	20.7	103	0.557	70 - 135	30	
1,1-Dichloroethene	20.0	21.6	108	20.0	21.3	106	1.75	70 - 130	30	
1,2-Dichloroethane	20.0	23.6	118	20.0	23.4	117	0.679	70 - 130	30	
Acetone	20.0	24.6	123	20.0	23.7	118	3.74	40 - 140	30	
Benzene	20.0	20.3	101	20.0	20.1	101	0.733	80 - 120	30	
Carbon tetrachloride	20.0	24.9	124	20.0	24.2	121	2.60	65 - 140	30	
Chloroform	20.0	20.3	102	20.0	20.1	100	1.26	65 - 135	30	
Ethylbenzene	20.0	19.8	98.9	20.0	19.7	98.5	0.375	75 - 125	30	
m,p-Xylene	40.0	38.6	96.5	40.0	38.7	96.7	0.131	75 - 130	30	
Methylene chloride	20.0	20.3	101	20.0	20.2	101	0.126	55 - 140	30	
o-Xylene	20.0	20.2	101	20.0	20.2	101	0.277	80 - 120	30	
Styrene	20.0	20.3	101	20.0	20.4	102	0.769	65 - 135	30	
Tetrachloroethene	20.0	20.0	100	20.0	19.5	97.3	2.93	45 - 150	30	
Toluene	20.0	19.0	95.1	20.0	19.0	94.8	0.328	75 - 120	30	
Trichloroethene	20.0	22.1	111	20.0	21.7	108	1.92	70 - 125	30	
Vinyl chloride	20.0	23.0	115	20.0	23.2	116	0.617	50 - 145	30	

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
1,2-Dichloroethane-d4	112	111	70 - 120	PASS
Dibromofluoromethane	108	107	85 - 115	PASS
4-Bromofluorobenzene	98.7	98.9	75 - 120	PASS
Toluene-d8	98.8	98.5	85 - 120	PASS

* EXCEEDS %REC LIMIT
 # EXCEEDS RPD LIMIT



BFB

Login Number: L17060484 Tune ID: WG615531-01
 Instrument: HPMS6 Run Date: 05/25/2017
 Analyst: TMB Run Time: 09:59
 Workgroup: WG615531 File ID: 6M147585
 Cal ID: HPMS6-25-MAY-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	18.3	5863	PASS
75.0	95.0	30.0	60.0	48.2	15474	PASS
95.0	95.0	100	100	100	32082	PASS
96.0	95.0	5.00	9.00	6.88	2208	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	68.1	21858	PASS
175	174	5.00	9.00	7.28	1592	PASS
176	174	95.0	101	96.6	21117	PASS
177	176	5.00	9.00	6.63	1400	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG615531-02	STD	01	05/25/2017 10:54	
WG615531-03	STD	01	05/25/2017 11:24	
WG615531-05	STD	01	05/25/2017 12:24	
WG615531-06	STD	01	05/25/2017 12:54	
WG615531-04	STD	01	05/25/2017 13:23	
WG615531-07	STD	01	05/25/2017 13:53	
WG615531-08	STD-CCV	01	05/25/2017 14:23	
WG615531-09	STD	01	05/25/2017 14:53	
WG615531-10	STD	01	05/25/2017 15:22	
WG615531-11	STD	01	05/25/2017 15:51	
WG615531-12	SSCV	01	05/25/2017 17:43	

* Sample past 12 hour tune limit



BFB

Login Number: L17060484 Tune ID: WG617416-01
 Instrument: HPMS6 Run Date: 06/12/2017
 Analyst: TMB Run Time: 10:17
 Workgroup: WG617416 File ID: 6M147932
 Cal ID: HPMS6-25-MAY-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	19.4	5743	PASS
75.0	95.0	30.0	60.0	50.8	15059	PASS
95.0	95.0	100	100	100	29616	PASS
96.0	95.0	5.00	9.00	6.45	1910	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	69.0	20435	PASS
175	174	5.00	9.00	7.14	1459	PASS
176	174	95.0	101	97.2	19873	PASS
177	176	5.00	9.00	6.90	1371	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG617416-02	CCV	01	06/12/2017 10:42	
WG617417-01	BLANK	01	06/12/2017 11:41	
WG617417-02	LCS	01	06/12/2017 15:50	
WG617417-03	LCS2	01	06/12/2017 16:20	
L17060484-02	TRIP BLANK	01	06/12/2017 16:50	
L17060484-01	LH18/24-SP650-6447-GRAB	01	06/12/2017 18:19	

* Sample past 12 hour tune limit



Calibration Table Report
 Method: A9FOOWT.M
 Title: A9-FOO Water - IC: 011217 - HPMS6
 Last Calibration: Thu Jan 12 13:53:06 2017
 Curve: WG598323
 Calibration Files

Compound	5 20 50 100 200 300 400 500									Avg	%RSD
	6M144708.D	6M144709.D	6M144710.D	6M144711.D	6M144712.D	6M144713.D	6M144714.D	6M144715.D			
I Fluorobenzene	ISTD										
T Acetonitrile	0.021	0.019	0.018	0.017	0.018	0.016	0.017	0.017	0.018	8.729	
T 3-Chloro-1-propene	0.301	0.305	0.307	0.308	0.306	0.295	0.287	0.289	0.300	2.763	
T 2-Chloro-1,3-butadiene	0.348	0.368	0.380	0.385	0.382	0.371	0.361	0.364	0.370	3.335	
T Ethyl Acetate	0.144	0.163	0.169	0.166	0.171	0.152	0.159	0.159	0.160	5.700	
T Methacrylonitrile	0.076	0.087	0.089	0.088	0.089	0.080	0.083	0.083	0.084	5.535	
T Isobutyl Alcohol	0.004	0.006	0.006	0.005	0.005	0.004	0.005	0.006	0.005	13.176	
T 1-Butanol									0.000	0.000	
T Methyl methacrylate	0.146	0.173	0.185	0.185	0.188	0.171	0.177	0.178	0.175	7.640	
T 2-Nitropropane		0.063	0.071	0.071	0.076	0.070	0.075	0.074	0.071	6.228	
I Chlorobenzene-d5	ISTD										
I 1,4-Dichlorobenzene-d4	ISTD										
T Cyclohexanone		0.008	0.009	0.008	0.010	0.009	0.011	0.012	0.009	14.808	

Fri Jan 13 10:37:15 2017

T	1,2,3-Trichloropropane		0.159	0.184	0.214	0.219	0.207	0.203	0.203		0.1983	10.286	
T	trans-1,4-Dichloro-2-Butene		0.158	0.186	0.206	0.226	0.216	0.216	0.222	0.216	0.2057	11.014	
T	n-Propylbenzene	4.512	4.368	4.202	4.141	4.29	4.092	3.904	3.715		4.1531	6.1343	
T	Bromobenzene	0.731	0.746	0.865	0.838	0.838	0.841	0.795	0.766	0.751	0.7971	6.2596	
T	1,3,5-Trimethylbenzene		2.971	2.915	2.816	2.751	2.892	2.79	2.694	2.616	2.8057	4.226	
T	2-Chlorotoluene		3.148	3.108	2.942	2.882	3.046	2.675	2.588	2.548	2.8671	8.2441	
T	4-Chlorotoluene		2.827	2.515	2.528	2.44	2.358	2.492	2.39	2.276	2.4782	6.6453	
T	a-Methylstyrene					1.423	1.572	1.527	1.499	1.446	1.327	1.4656	5.9171
T	tert-Butylbenzene		0.527	0.521	0.518	0.542	0.524	0.508	0.495		0.5192	2.8616	
T	1,2,4-Trimethylbenzene		2.963	2.948	2.903	3.022	2.892	2.79	2.689		2.8866	3.9156	
T	sec-Butylbenzene		3.579	3.497	3.312	3.468	3.333	3.189	3.067		3.3494	5.39	
T	p-Isopropyltoluene			2.93	2.761	2.705	2.82	2.744	2.633	2.552	2.7352	4.5004	
T	1,3-Dichlorobenzene	1.768	1.634	1.586	1.576	1.591	1.552	1.482	1.43		1.5772	6.4005	
T	1,4-Dichlorobenzene	1.708	1.642	1.622	1.62	1.599	1.6	1.546	1.483	1.426	1.583	5.4062	
T	n-Butylbenzene			2.894	2.749	2.675	2.775	2.73	2.613	2.529	2.7091	4.3506	
T	1,2-Dichlorobenzene	1.468	1.534	1.524	1.504	1.501	1.505	1.469	1.398	1.342	1.4717	4.2873	
T	1,2-Dibromo-3-Chloropropane				0.12	0.144	0.146	0.15	0.147	0.147	0.1424	7.7877	
T	1,2,4-Trichlorobenzene		1.195	1.131	1.102	1.04	1.053	1.042	0.984	0.945	1.0615	7.5424	
T	Hexachlorobutadiene		0.394	0.37	0.365	0.336	0.355	0.337	0.322	0.313	0.3491	7.7311	
T	Naphthalene		2.574	2.48	2.443	2.43	2.428	2.392	2.268	2.152	2.396	5.4371	
T	1,2,3-Trichlorobenzene	1.012	1.188	1.009	0.987	0.983	0.979	0.947	0.896	0.858	0.9844	9.3675	

Tue May 30 12:32:10 2017

Login Number: L17060484 Run Date: 05/25/2017 Sample ID: WG615531-12
 Instrument ID: HPMS6 Run Time: 17:43 Method: 8260B
 File ID: 6M147600 Analyst: TMB QC Key: DOD4
 ICal Workgroup: WG615531 Cal ID: HPMS6 - 25-MAY-17

Analyte		Expected	Found	Units	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	20.0	20.7	ug/L	0.437	3.40	20	
Chloroform	CCC	20.0	18.4	ug/L	0.494	7.80	20	
Ethylbenzene	CCC	20.0	20.4	ug/L	0.553	2.00	20	
Toluene	CCC	20.0	19.8	ug/L	1.61	1.20	20	
Vinyl Chloride	CCC	20.0	21.8	ug/L	0.300	8.90	20	
1,1,2,2-Tetrachloroethane	SPCC	20.0	20.0	ug/L	0.766	0.100	20	
Chloromethane	SPCC	20.0	21.0	ug/L	0.429	5.10	20	
Bromoform	SPCC	20.0	18.9	ug/L	0.192	5.70	20	
Chlorobenzene	SPCC	20.0	20.1	ug/L	1.02	0.500	20	
1,1-Dichloroethane	SPCC	20.0	19.8	ug/L	0.529	0.800	20	
1,1,1-Trichloroethane		20.0	20.3	ug/L	0.419	1.30	20	
1,1,2-Trichloroethane		20.0	20.5	ug/L	0.300	2.40	20	
1,2-Dichloroethane		20.0	20.0	ug/L	0.355	0	20	
Acetone		20.0	18.6	ug/L	0.0555	6.80	20	
Benzene		20.0	19.7	ug/L	1.14	1.40	20	
Carbon Tetrachloride		20.0	21.3	ug/L	0.337	6.50	20	
Methylene Chloride		20.0	19.8	ug/L	0.291	1.20	20	
m-,p-Xylene		40.0	40.2	ug/L	0.670	0.400	20	
o-Xylene		20.0	20.7	ug/L	0.678	3.50	20	
Styrene		20.0	20.9	ug/L	1.16	4.50	20	
Tetrachloroethene		20.0	19.9	ug/L	0.337	0.600	20	
Trichloroethene		20.0	20.4	ug/L	0.256	2.20	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17060484 Run Date: 06/12/2017 Sample ID: WG617416-02
Instrument ID: HPMS6 Run Time: 10:42 Method: 8260B
File ID: 6M147933 Analyst: TMB QC Key: DOD4
Workgroup (AAB#): WG617417 Cal ID: HPMS6 - 25-MAY-17
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,2-Dichloropropane	CCC	50.0	53.3	ug/L	0.325	6.67	20	
1,1-Dichloroethene	CCC	50.0	56.8	ug/L	0.480	13.7	20	
Chloroform	CCC	50.0	51.2	ug/L	0.548	2.37	20	
Ethylbenzene	CCC	50.0	50.4	ug/L	0.547	0.869	20	
Toluene	CCC	50.0	48.9	ug/L	1.59	2.28	20	
Vinyl Chloride	CCC	50.0	57.1	ug/L	0.315	14.1	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	43.8	ug/L	0.670	12.4	20	
Bromoform	SPCC	50.0	50.9	ug/L	0.207	1.76	20	
Chlorobenzene	SPCC	50.0	49.0	ug/L	0.997	2.07	20	
Chloromethane	SPCC	50.0	36.7	ug/L	0.300	26.6	20	*
1,1-Dichloroethane	SPCC	50.0	54.4	ug/L	0.580	8.88	20	
Xylenes		150	151	ug/L	0.667	0.366	20	
1,1,1-Trichloroethane		50.0	58.8	ug/L	0.486	17.5	20	
1,1,2-Trichloroethane		50.0	48.9	ug/L	0.287	2.15	20	
1,2-Dichloroethane		50.0	56.8	ug/L	0.403	13.5	20	
Acetone		50.0	52.3	ug/L	0.0623	4.62	20	
Benzene		50.0	51.3	ug/L	1.19	2.58	20	
Carbon Tetrachloride		50.0	66.0	ug/L	0.417	31.9	20	*
Methylene Chloride		50.0	51.3	ug/L	0.302	2.52	20	
m-,p-Xylene		100	99.5	ug/L	0.664	0.547	20	
o-Xylene		50.0	51.1	ug/L	0.670	2.19	20	
Styrene		50.0	51.1	ug/L	1.13	2.25	20	
Tetrachloroethene		50.0	51.7	ug/L	0.351	3.45	20	
Trichloroethene		50.0	54.5	ug/L	0.273	8.92	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

CCV - Modified 03/05/2008

PDF File ID: 5333332

Report generated 06/13/2017 10:41



Login Number: L17060484
Instrument ID: HPMS6
Workgroup (AAB#): WG617417

ICAL CCV Number: WG615531-08
CAL ID: HPMS6 - 25-MAY-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG615531-08	NA	NA	167733	318587	459042
Upper Limit	NA	NA	335466	637174	918084
Lower Limit	NA	NA	83867	159294	229521
<u>L17060484-01</u>	1.00	01	134002	257040	354139
L17060484-02	1.00	01	133214	253527	356587
WG617417-01	1.00	01	133094	254436	352464
WG617417-02	1.00	01	138971	257387	345784
WG617417-03	1.00	01	140369	261941	356505

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO MIDPOINT OF ICAL)

00857673

Login Number: L17060484
Instrument ID: HPMS6
Workgroup (AAB#): WG617417

ICAL CCV Number: WG615531-08
CAL ID: HPMS6-25-MAY-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG615531-08	NA	NA	18.16	15.13	11.25
Upper Limit	NA	NA	18.66	15.63	11.75
Lower Limit	NA	NA	17.66	14.63	10.75
<u>L17060484-01</u>	1.00	01	18.15	15.12	11.25
<u>L17060484-02</u>	1.00	01	18.15	15.12	11.25
WG617417-01	1.00	01	18.15	15.12	11.25
WG617417-02	1.00	01	18.15	15.12	11.25
WG617417-03	1.00	01	18.15	15.12	11.25

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



2.2 General Chromatography Data

2.2.1 LC/MS Data (6850)

2.2.1.1 Summary Data

Lab Report #: L17060484

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 6850	Prep Date: 06/13/2017 14:30
Matrix: Water	Analytical Method: 6850	Cal Date: 04/24/2017 15:40
Workgroup #: WG617701	Analyst: JWR	Run Date: 06/13/2017 17:51
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: 1LM.LM39827
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.200	U	0.400	0.200	0.100
U	Analyte was not detected. The concentration is below the reported LOD.					

2.2.1.2 QC Summary Data

Example Calculation 6850 - Perchlorate**Concentration from Linear Regression****Step 1: Retrieve Curve Data From Plot, $y = mx + b$**

y = response ratio = response of analyte / response of internal standard (IS) = R_x/R_{istd}

x = amount ratio = concentration analyte/concentration internal standard (IS) = C_x / C_{istd}

m = slope from curve (1.45)

b = intercept from curve (-0.00242)

$y = 1.45x + -0.00242$

Step 2: Substitute the value for y

where $y = 12600/226000 = 0.055752$

Step 3: Solve for x

$x = (y - b)/m = 0.0040119$

Step 4: Solve for analyte concentration C_x

$C_x = (C_{is})(x) = (5 \text{ ug/L})(0.0040119) = 0.200594 \text{ ug/L}$

Example Calculation - Water:

Slope from curve, m :	1.45
Intercept from curve, b :	-0.00242
Response of analyte, R_x :	12600
Response of Internal Standard, R_{istd} :	226000
Concentration of IS, C_{istd} (ug/L):	5.00
Response Ratio:	0.05575
Amount Ratio:	0.04012
Analyte Concentration, C_x (ug/L) :	0.200594

Example Calculation - Soil:

Analyte Concentration, C_x (ug/L):	0.20059
Amount of soil extracted (g):	5.00
Final volume of extract (mL):	50.00
Percent solids (Pct wt.)	100
Concentration in soil (ug/kg):	2.005938

Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 042417_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG611327 (waters) Analytical WG611328 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: STD80234

Comments: ICAL WG611288 : Alternate Source STD80234
Analytical Column : RPPX 5um (250x4.6mm)
K'Prime S/N RPPX250-02115

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM39494	WG611288-01 CCB	1	1		04/24/17 13:27
2	1LM.LM39495	WG611288-02 STD (0.1 ug/L)	1	1	STD80232	04/24/17 13:46
3	1LM.LM39496	WG611288-03 STD (0.2 ug/L)	1	1	STD80232	04/24/17 14:05
4	1LM.LM39497	WG611288-04 STD (0.5 ug/L)	1	1	STD80232	04/24/17 14:24
5	1LM.LM39498	WG611288-05 STD (1.0 ug/L)	1	1	STD80232	04/24/17 14:43
6	1LM.LM39499	WG611288-06 STD (2.0 ug/L)	1	1	STD80232	04/24/17 15:02
7	1LM.LM39500	WG611288-07 STD (5.0 ug/L)	1	1	STD80232	04/24/17 15:21
8	1LM.LM39501	WG611288-08 STD (10 ug/L)	1	1	STD80232	04/24/17 15:40
9	1LM.LM39502	WG611288-09 SSCV (1.0 ug/L)	1	1	STD80234	04/24/17 15:59
10	1LM.LM39503	WG611330-01 CCB	1	1		04/24/17 16:18
11	1LM.LM39504	WG611330-02 CCV (1.0ug/L)	1	1	STD80232	04/24/17 16:37
12	1LM.LM39505	WG611327-07 MRL (0.2ug/L)	1	1	STD80232	04/24/17 16:56
13	1LM.LM39506	WG611327-01 MCT (0.2ug/L)	1	1	STD80234	04/24/17 17:14
14	1LM.LM39507	WG611327-02 BLANK	1	1		04/24/17 17:34
15	1LM.LM39508	WG611327-03 LCS (0.2ug/L)	1	1	STD80234	04/24/17 17:52
16	1LM.LM39509	L17040713-06 RS	1	1		04/24/17 18:11
17	1LM.LM39510	L17040713-07 MS	1	1	STD80234	04/24/17 18:30
18	1LM.LM39511	L17040713-08 MSD	1	1	STD80234	04/24/17 18:49
19	1LM.LM39512	L17040713-01	1	1		04/24/17 19:08
20	1LM.LM39513	L17040713-02	1	1		04/24/17 19:27
21	1LM.LM39514	L17040713-03	1	1		04/24/17 19:46
22	1LM.LM39515	L17040713-04	1	1		04/24/17 20:05
23	1LM.LM39516	WG611330-03 CCV (1.0ug/L)	1	1	STD80232	04/24/17 20:24
24	1LM.LM39517	WG611327-08 MRL (0.2ug/L)	1	1	STD80232	04/24/17 20:43
25	1LM.LM39518	WG611330-04 CCB	1	1		04/24/17 21:02
26	1LM.LM39519	L17040713-05	1	1		04/24/17 21:21
27	1LM.LM39520	L17040713-09	1	1		04/24/17 21:40
28	1LM.LM39521	L17040713-10	1	1		04/24/17 21:59
29	1LM.LM39522	L17040713-11	1	1		04/24/17 22:17
30	1LM.LM39523	L17040713-12	1	1		04/24/17 22:36
31	1LM.LM39524	L17040713-13	1	1		04/24/17 22:55
32	1LM.LM39525	WG611330-05 CCV (1.0ug/L)	1	1	STD80232	04/24/17 23:14
33	1LM.LM39526	WG611327-09 MRL (0.2ug/L)	1	1	STD80232	04/24/17 23:33

Page: 1

Approved: 25-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 042417_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG611327 (waters) Analytical WG611328 (waters)
 Internal STD: COA19471 Surrogate STD: NA STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 STD80234

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM39527	WG611328-07 MRL (0.2ug/L)	1	1	STD80232	04/24/17 23:52
35	1LM.LM39528	WG611330-06 CCB	1	1		04/25/17 00:11
36	1LM.LM39529	WG611328-01 MCT (0.2ug/L)	1	1	STD80234	04/25/17 00:30
37	1LM.LM39530	WG611328-02 BLANK	1	1		04/25/17 00:49
38	1LM.LM39531	WG611328-03 LCS (0.2ug/L)	1	1	STD80234	04/25/17 01:08
39	1LM.LM39532	L17040841-08 RS	1	1		04/25/17 01:27
40	1LM.LM39533	L17040841-09 MS	1	1	STD80234	04/25/17 01:46
41	1LM.LM39534	L17040841-10 MSD	1	1	STD80234	04/25/17 02:05
42	1LM.LM39535	L17040841-01	1	1		04/25/17 02:23
43	1LM.LM39536	L17040841-02	1	1		04/25/17 02:42
44	1LM.LM39537	L17040841-03	1	1		04/25/17 03:01
45	1LM.LM39538	L17040841-04	1	1		04/25/17 03:20
46	1LM.LM39539	WG611330-07 CCV (1.0ug/L)	1	1	STD80232	04/25/17 03:39
47	1LM.LM39540	WG611328-08 MRL (0.2ug/L)	1	1	STD80232	04/25/17 03:58
48	1LM.LM39541	WG611330-08 CCB	1	1		04/25/17 04:17
49	1LM.LM39542	L17040841-05	1	1		04/25/17 04:36
50	1LM.LM39543	L17040841-06	1	1		04/25/17 04:55
51	1LM.LM39544	L17040841-07	1	1		04/25/17 05:14
52	1LM.LM39545	L17040841-11	1	1		04/25/17 05:33
53	1LM.LM39546	L17040841-12	1	1		04/25/17 05:52
54	1LM.LM39547	L17040841-13	1	1		04/25/17 06:11
55	1LM.LM39548	WG611330-09 CCV (1.0ug/L)	1	1	STD80232	04/25/17 06:30
56	1LM.LM39549	WG611328-09 MRL (0.2ug/L)	1	1	STD80232	04/25/17 06:49
57	1LM.LM39550	WG611330-10 CCB	1	1		04/25/17 07:07

Comments

Seq.	Rerun	Dil.	Reason	Analytes
------	-------	------	--------	----------

Page: 2

Approved: 25-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 061317_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG617701 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: Samples L17060482-01 and L17060570(-01,-02,-03,-05,-06,-08,-09,-14) were analyzed at dilutions based on their historical results.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM39818	WG617708-01 CCB	1	1		06/13/17 15:01
2	1LM.LM39819	WG617708-02 CCV (1.0ug/L)	1	1	STD80232	06/13/17 15:19
3	1LM.LM39820	WG617701-05 MRL (0.2ug/L)	1	1	STD80232	06/13/17 15:38
4	1LM.LM39821	WG617701-01 MCT (0.2ug/L)	1	1	STD80234	06/13/17 15:57
5	1LM.LM39822	WG617701-02 BLANK	1	1		06/13/17 16:16
6	1LM.LM39823	WG617701-03 LCS (0.2ug/L)	1	1	STD80234	06/13/17 16:35
7	1LM.LM39824	WG617701-04 LCS2 (0.2ug/L)	1	1	STD80234	06/13/17 16:54
8	1LM.LM39825	L17060311-01	1	1		06/13/17 17:13
9	1LM.LM39826	L17060482-01 (10,000x)	1	10000		06/13/17 17:32
10	1LM.LM39827	L17060484-01	1	1		06/13/17 17:51
11	1LM.LM39828	L17060570-01 (100x)	1	100		06/13/17 18:10
12	1LM.LM39829	L17060570-02 (10,000x)(NR)	1	10000		06/13/17 18:29
13	1LM.LM39830	L17060570-03 (10,000x)	1	10000		06/13/17 18:48
14	1LM.LM39831	WG617708-03 CCV (1.0ug/L)	1	1	STD80232	06/13/17 19:07
15	1LM.LM39832	WG617701-06 MRL (0.2ug/L)	1	1	STD80232	06/13/17 19:26
16	1LM.LM39833	WG617708-04 CCB	1	1		06/13/17 19:45
17	1LM.LM39834	L17060570-05 (100x)(NR)	1	100		06/13/17 20:04
18	1LM.LM39835	L17060570-06 (1,000x)	1	1000		06/13/17 20:23
19	1LM.LM39836	L17060570-08 (10,000x)(NR)	1	10000		06/13/17 20:42
20	1LM.LM39837	L17060570-09 (50x)	1	50		06/13/17 21:01
21	1LM.LM39838	L17060570-10	1	1		06/13/17 21:20
22	1LM.LM39839	L17060570-11	1	1		06/13/17 21:39
23	1LM.LM39840	L17060570-12	1	1		06/13/17 21:58
24	1LM.LM39841	L17060570-14 (50,000x)	1	50000		06/13/17 22:17
25	1LM.LM39842	WG617708-05 CCV (1.0ug/L)	1	1	STD80232	06/13/17 22:36
26	1LM.LM39843	WG617701-07 MRL (0.2ug/L)	1	1	STD80232	06/13/17 22:55
27	1LM.LM39844	WG617708-06 CCB	1	1		06/13/17 23:14
28	1LM.LM39845	WG617708-07 CCV (1.0ug/L)	1	1	STD80232	06/14/17 11:24
29	1LM.LM39846	WG617701-08 MRL (0.2ug/L)	1	1	STD80232	06/14/17 11:43
30	1LM.LM39847	WG617708-08 CCB	1	1		06/14/17 12:02
31	1LM.LM39848	L17060570-02 (RR 1,000x)	1	1000		06/14/17 12:21
32	1LM.LM39849	L17060570-05 (RR Neat)	1	1		06/14/17 12:40
33	1LM.LM39850	L17060570-08 (RR 100x)	1	100		06/14/17 12:59

Page: 1

Approved: 14-JUN-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 061317_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG617701 (waters)
 Internal STD: COA19471 Surrogate STD: NA STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM39851	WG617708-09 CCV (1.0ug/L)	1	1	STD80232	06/14/17 13:18
35	1LM.LM39852	WG617701-09 MRL (0.2ug/L)	1	1	STD80232	06/14/17 13:37
36	1LM.LM39853	WG617708-10 CCB	1	1		06/14/17 13:56

Comments

Seq.	Rerun	Dil.	Reason	Analytes
12	X	1000	Analyzed too dilute	
			L17060570-02 (10,000x)(NR) : This sample was reanalyzed at a 1,000x dilution on the end of this run.	
17	X	1	Analyzed too dilute	
			L17060570-05 (100x)(NR) : This sample was reanalyzed as neat on the end of this run.	
19	X	100	Analyzed too dilute	
			L17060570-08 (10,000x)(NR) : This sample was reanalyzed at a 100x dilution on the end of this run.	

Eri C. Zimm



Microbac Laboratories Inc.

Data Checklist

Date: 24-APR-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: WG611288
 Runlog ID: 81726
 Analytical Workgroups: L17040713, L17040841

ANALYTICAL	
System Performance Check	NA
DFTPP (GCMS)	NA
Endrin/DDT breakdown (8081/GCMS)	NA
Pentachlorophenol/benzidine tailing (GCMS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	NA
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (GCMS)	X
Continuing calibration blank (CCB) (IC/LCMS)	X
Limit of quantitation verification (LOQV) (LCMS)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	X
Library searches (GCMS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	JWR
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
25-APR-2017

John Richards

Secondary Reviewer:
25-APR-2017

Eri C. Zimm

CHECKLIST1 - Modified 03/05/2008

Generated: APR-25-2017 14:21:32



Microbac Laboratories Inc.

Data Checklist

Date: 13-JUN-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 82758
 Analytical Workgroups: L17060311, L17060482, L17060484, L17060570

ANALYTICAL	
System Performance Check	NA
DFTPP (GCMS)	NA
Endrin/DDT breakdown (8081/GCMS)	NA
Pentachlorophenol/benzidine tailing (GCMS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (GCMS)	X
Continuing calibration blank (CCB) (IC/LCMS)	X
Limit of quantitation verification (LOQV) (LCMS)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	X
Library searches (GCMS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	
Check for completeness	X
Primary Reviewer	JWR
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
14-JUN-2017

John Richards

Secondary Reviewer:
14-JUN-2017

Eri C. Zum

CHECKLIST1 - Modified 03/05/2008

Generated: JUN-14-2017 16:28:31



Analytical Method:6850
Login Number:L17060484

AAB#:WG617701

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6447-GRAB	01	06/07/17					06/13/2017	6	28		06/13/17	.1	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060484
 Blank File ID: 1LM.LM39822
 Prep Date: 06/13/17 14:30
 Analyzed Date: 06/13/17 16:16
 Analyst: JWR

Work Group: WG617701
 Blank Sample ID: WG617701-02
 Instrument ID: LCMS1
 Method: 6850

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG617701-05	1LM.LM39820	06/13/17 15:38	01
MCT	WG617701-01	1LM.LM39821	06/13/17 15:57	01
LCS	WG617701-03	1LM.LM39823	06/13/17 16:35	01
LCS2	WG617701-04	1LM.LM39824	06/13/17 16:54	01
LH18/24-SP650-6447-GRAB	L17060484-01	1LM.LM39827	06/13/17 17:51	01
QCMRL	WG617701-06	1LM.LM39832	06/13/17 19:26	01
QCMRL	WG617701-07	1LM.LM39843	06/13/17 22:55	01
QCMRL	WG617701-08	1LM.LM39846	06/14/17 11:43	01
QCMRL	WG617701-09	1LM.LM39852	06/14/17 13:37	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5337238
 Report generated 06/14/2017 16:38



Login Number: L17060484 Prep Date: 06/13/17 14:30 Sample ID: WG617701-02
 Instrument ID: LCMS1 Run Date: 06/13/17 16:16 Prep Method: 6850
 File ID: 1LM.LM39822 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Perchlorate	0.100	0.400	0.100	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5337239
 14-JUN-2017 16:38



Login Number: L17060484 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG617701 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG617701-03 LCS File ID: 1LM.LM39823 Run Date: 06/13/2017 16:35
 Sample ID: WG617701-04 LCS2 File ID: 1LM.LM39824 Run Date: 06/13/2017 16:54

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.206	103	0.200	0.207	104	0.484	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5337240
 Report generated: 06/14/2017 16:38



Login Number: L17060484
Analytical Method: 6850
ICAL Workgroup: WG611288

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.286	4.98	1.00000	

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 5337560
Report generated 06/14/2017 16:38



Login Number: L17060484
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-02			WG611288-03			WG611288-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	21000.0000	1.332	0.200	38200.0000	1.222	0.500	104000.000	1.335

INT_CAL - Modified 03/06/2008
PDF File ID: 5337560
Report generated 06/14/2017 16:38



Login Number: L17060484
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-05			WG611288-06			WG611288-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	206000.000	1.288	2.00	412000.000	1.312	5.00	955000.000	1.270

INT_CAL - Modified 03/06/2008
PDF File ID: 5337560
Report generated 06/14/2017 16:38



Login Number: L17060484
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-08		
	CONC	RESP	RF
Perchlorate	10.0	1860000.00	1.244

INT_CAL - Modified 03/06/2008
PDF File ID: 5337560
Report generated 06/14/2017 16:38



Login Number: L17060484 Run Date: 04/24/2017 Sample ID: WG611288-09
 Instrument ID: LCMS1 Run Time: 15:59 Method: 6850
 File ID: 1LM.LM39502 Analyst: JWR QC Key: DOD4
 ICal Workgroup: WG611288 Cal ID: LCMS1 - 24-APR-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	0.977	ug/L	1.24	2.30	15	

* Exceeds %D Limit



Login Number: L17060484 Run Date: 06/13/2017 Sample ID: WG617708-01
Instrument ID: LCMS1 Run Time: 15:01 Method: 6850
File ID: 1LM.LM39818 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060484 Run Date: 06/13/2017 Sample ID: WG617708-04
Instrument ID: LCMS1 Run Time: 19:45 Method: 6850
File ID: LLM.LM39833 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060484 Run Date: 06/13/2017 Sample ID: WG617708-06
Instrument ID: LCMS1 Run Time: 23:14 Method: 6850
File ID: LLM.LM39844 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617708-08
Instrument ID: LCMS1 Run Time: 12:02 Method: 6850
File ID: LLM.LM39847 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617708-10
Instrument ID: LCMS1 Run Time: 13:56 Method: 6850
File ID: LLM.LM39853 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060484 Run Date: 06/13/2017 Sample ID: WG617708-02
 Instrument ID: LCMS1 Run Time: 15:19 Method: 6850
 File ID: 1LM.LM39819 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.08	ug/L	1.37	8.00	15	

* Exceeds %D Criteria



Login Number: L17060484 Run Date: 06/13/2017 Sample ID: WG617708-03
Instrument ID: LCMS1 Run Time: 19:07 Method: 6850
File ID: 1LM.LM39831 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.08	ug/L	1.37	8.00	15	

* Exceeds %D Criteria



Login Number: L17060484 Run Date: 06/13/2017 Sample ID: WG617708-05
 Instrument ID: LCMS1 Run Time: 22:36 Method: 6850
 File ID: 1LM.LM39842 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.09	ug/L	1.38	9.00	15	

* Exceeds %D Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617708-07
Instrument ID: LCMS1 Run Time: 11:24 Method: 6850
File ID: 1LM.LM39845 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.08	ug/L	1.37	8.00	15	

* Exceeds %D Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617708-09
 Instrument ID: LCMS1 Run Time: 13:18 Method: 6850
 File ID: 1LM.LM39851 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG617701 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.10	ug/L	1.40	10.0	15	

* Exceeds %D Criteria



Login Number: L17060484 Run Date: 06/13/2017 Sample ID: WG617701-05
Instrument ID: LCMS1 Run Time: 15:38 Prep Method: 6850
File ID: 1LM.LM39820 Analyst: JWR Method: 6850
Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.212	106	70 - 130	



Login Number: L17060484 Run Date: 06/13/2017 Sample ID: WG617701-06
Instrument ID: LCMS1 Run Time: 19:26 Prep Method: 6850
File ID: 1LM.LM39832 Analyst: JWR Method: 6850
Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.200	100	70 - 130	



Login Number: L17060484 Run Date: 06/13/2017 Sample ID: WG617701-07
Instrument ID: LCMS1 Run Time: 22:55 Prep Method: 6850
File ID: 1LM.LM39843 Analyst: JWR Method: 6850
Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.216	108	70 - 130	



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617701-08
 Instrument ID: LCMS1 Run Time: 11:43 Prep Method: 6850
 File ID: 1LM.LM39846 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.211	106	70 - 130	



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617701-09
 Instrument ID: LCMS1 Run Time: 13:37 Prep Method: 6850
 File ID: 1LM.LM39852 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG617701 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.220	110	70 - 130	



Login Number: L17060484
Instrument ID: LCMS1
Workgroup (AAB#): WG617701

ICAL CCV Number: WG611288-05
CAL ID: LCMS1-24-APR-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG611288	NA	NA	777000
Upper Limit	NA	NA	1165500
Lower Limit	NA	NA	388500
<u>L17060484-01</u>	1.00	01	561000
WG617701-02	1.00	01	615000
WG617701-03	1.00	01	613000
WG617701-04	1.00	01	625000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: 6850	Samplenum: L17060484-01
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39827
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 17:51	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	3000	881	3.41	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG611288-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39495
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 13:46	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	21000	6820	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG611288-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39496
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 14:05	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	38200	13500	2.83	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG611288-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39497
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 14:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	104000	33400	3.11	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG611288-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39498
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 14:43	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	206000	65300	3.15	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG611288-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39499
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 15:02	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	412000	130000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG611288-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39500
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 15:21	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	955000	298000	3.20	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG611288-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39501
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 15:40	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1860000	603000	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG611288-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39502
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 04/24/2017 15:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	197000	65000	3.03	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: 6850	Samplenum: WG617701-01
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39821
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 15:57	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	34800	11600	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484
Instrument: LCMS1
Analyst: JWR
Worknum: WG617701

Prep Method: 6850
Prep Date: 06/13/2017 14:30
Anal Method: 6850
Analysis Date: 06/13/2017 16:16

Samplenum: WG617701-02
File ID: 1LM.LM39822
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: 6850	Samplenum: WG617701-03
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39823
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 16:35	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	33000	10300	3.20	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: 6850	Samplenum: WG617701-04
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39824
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 16:54	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	33800	10800	3.13	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: 6850	Samplenum: WG617701-05
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39820
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 15:38	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	33800	11500	2.94	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: 6850	Samplenum: WG617701-06
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39832
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 19:26	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	36600	12900	2.84	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: 6850	Samplenum: WG617701-07
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39843
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 22:55	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	41000	13400	3.06	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: 6850	Samplenum: WG617701-08
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39846
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 11:43	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	34800	10100	3.45	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: 6850	Samplenum: WG617701-09
Instrument: LCMS1	Prep Date: 06/13/2017 14:30	File ID: 1LM.LM39852
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 13:37	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	40100	13200	3.04	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG617708-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39818
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 15:01	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	959	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG617708-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39819
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 15:19	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	171000	52500	3.26	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG617708-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39831
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 19:07	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	200000	63000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG617708-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39833
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 19:45	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	744	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG617708-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39842
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 22:36	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	201000	64100	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG617708-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39844
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/13/2017 23:14	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	534	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG617708-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39845
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 11:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	169000	53000	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG617708-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39847
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 12:02	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG617708-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39851
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 13:18	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	195000	61100	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060484	Prep Method: _____	Samplenum: WG617708-10
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39853
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG617701	Analysis Date: 06/14/2017 13:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

2.2 Semivolatiles Data

2.2.2 GC/MS Semivolatiles Data (827 Dioxane)

2.2.2.1 Summary Data

Lab Report #: L17060484

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: HPMS15
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3520C	Prep Date: 06/15/2017 14:26
Matrix: Water	Analytical Method: 8270D	Cal Date: 05/04/2017 16:11
Workgroup #: WG618285	Analyst: LJH	Run Date: 06/16/2017 16:55
Collect Date: 06/07/2017 15:00	Dilution: 5	File ID: 15M21327
Sample Tag: REDL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,4-Dioxane	123-91-1	23.9		10.0	5.00	2.50
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,4-Dioxane-d8	59.8	20	129			

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: HPMS15
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3520C	Prep Date: 06/12/2017 16:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 05/04/2017 16:11
Workgroup #: WG617729	Analyst: LJH	Run Date: 06/14/2017 10:56
Collect Date: 06/07/2017 15:00	Dilution: 5	File ID: 15M21317
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,4-Dioxane	123-91-1	24.6		11.0	5.50	2.75
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,4-Dioxane-d8	57.5	20	129			

2.2.2.2 QC Summary Data

Example 8270 Calculations**1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:**

$$RF = [(Ax) (Cis)] / [(Ais) (Cx)]$$

where:

Ax = Area of the characteristic ion for the compound being measured:	1261197
Cis = Concentration of the specific internal standard (ug/mL)	40
Ais = Area of the characteristic ion of the specific internal standard	608044
Cx = Concentration of the compound in the standard being measured (ug/mL)	50
RF = Calculated Response Factor	1.65935

Example**2.0 Calculating the concentration (C) of a compound in water using the data from the prep log and quantitation report: ***

$$Cx = [(Ax) (Cis) (Vf) (D)] / [(Ais) (RF) (Vi)]$$

where:

Ax = Area of the characteristic ion for the compound being measured	367250
Cis = Concentration of the specific internal standard (ug/mL)	40
Vf = Final volume of sample extract from prep log (mL)	1
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	511641
RF = Average RF from the ICAL	1.65935
Vi = Initial volume of sample extracted from prep log (mL)	1021
Cx = Concentration of the compound in the sample being measured (ug/mL)	0.016947
Cx = Concentration of the compound in the sample being measured (ug/L)	16.947

Example**3.0 Calculating the concentration (C) of a compound in soil using the data from the prep log and quantitation report: ***

$$Cx = [(Ax) (Cis) (Vf) (D)] / [(Ais) (RF) (Wi)]$$

where:

Ax = Area of the characteristic ion for the compound being measured	367250
Cis = Concentration of the specific internal standard (ug/mL)	40
Vf = Final volume of sample extract from prep log (mL)	1
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	511641
RF = Average RF from the ICAL	1.65935
Wi = Initial weight of sample extracted (g) from prep log	30
Cx = Concentration of the compound in the sample being measured (ug/g)	0.576763
Cx = Concentration of the compound in the sample being measured (ug/kg)	576.7627

Example

Dry weight correction:

Percent solids (PCT_S)	50
Cd = (Cx) (100)/PCT_S	1153.525 ug/kg

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

4.0 Concentration from Linear Regression**Step 1: Retrieve Curve Data From Plot, y = mx + b**

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve plot

b = intercept from curve plot

Step 2: Calculate y from Quantitation Report

y = 16790/784838 = 0.02139

Step 3: Solve for x

$$x = (y - b)/m = [(0.02139 - (-0.0435))/0.0783] = 0.829$$

Step 4: Solve for analyte concentration Cx

$$Cx = Cis (x) = (25.0)(0.829) = 20.72 \text{ ug/L}$$

Example Spreadsheet Calculation:

Slope from curve, m:	0.0783
Intercept from curve, b:	-0.0435
Area of analyte, Ax:	16790
Area of Internal Standard, Ais:	784484
Concentration of IS, Cis	25.00 ug/L
Response Ratio (y) :	0.021403
Amount Ratio:	0.828897
Concentration (Cx):	20.72241 ug/L

5.0 Concentration from Quadratic Regression**Step 1 - Retrieve Curve Data from Plot, $y = Ax^2 + Bx + C$**

Where:

$$Ax^2 + Bx + (C - y) = 0$$

A, B, C = constants from the ICAL quadratic regression

y = Response ratio = Area of analyte/Area of internal standard (IS)

x = Amount ratio = Concentration of analyte/concentration of IS

Step 2: Calculate y from Quantitation Report

$$y = Ax/Ais$$

Step 3: Solve for x using the quadratic formula

$$Ax^2 + Bx + C - y = 0$$

$$x = \frac{b \pm \sqrt{(b^2 - 4a(c - y))}}{2a} \quad (\text{Two possible solutions})$$

Step 4: Solve for analyte concentration Cx

$$Cx = (Cis)(\text{Amount ratio})$$

Example Spreadsheet Calculation:

Value of A from plot:	0.0259
Value of B from plot:	0.0596
Value of C from plot:	-0.0165
Area of analyte from quantitation report:	203233
Area of IS from quantitation report:	1425653
Response ratio, y:	0.142554
C - y:	-0.15905
Root 1 - Computed amount ratio, X1:	-3.88278
Root 2 - Computed amount ratio, X2:	1.581623 use this solution
Concentration of IS, Cis:	40.00
Concentration of analyte, Cx:	63.26 ug/L

Workgroup: WG617872 TIME ON: 14:55 OFF: 09:30 ON: _____ OFF: _____
 Analyst: CPD METHYLENE CHLORIDE Lot #: COA19787
 Spike Analyst: CPD Na2SO4, Anhydrous, Granular Lot #: COA19759
 Method: 3520C 1:1 H2SO4 Lot #: RGT40290
 Run Date: 06/15/2017 14:26
 SOP: EXB01 Revision 20
 Spike Witness: JDH
 Surr Solution: STD80323

	SAMPLE #	Type	Reference	Prod	pH	Init Amnt	Surr Amnt	Spike Amnt	Spike Sol	Final Vol	Color
1	L17060484-01	SAMP		827-DIOXANE	<2	1000 mL	.05 mL			1 mL	Transparent
2	WG617872-01	BLANK		827-DIOXANE	<2	1000 mL	.05 mL			1 mL	Transparent
3	WG617872-02	LCS		827-DIOXANE	<2	1000 mL	.05 mL	.05 mL	STD79978	1 mL	Transparent
4	WG617872-03	LCS2		827-DIOXANE	<2	1000 mL	.05 mL	.05 mL	STD79978	1 mL	Transparent

Due to insufficient sample volume, this preparation batch failed to include the method prescribed MS and MSD.
pH 0-3 Lot#230515

L17060484-01 RE-EXT OUT HOLD

Analyst: *Carlyle Davis*

Reviewer: *Justin Harrison*



Workgroup: WG617401 TIME ON: 16:35 OFF: 10:49 ON: _____ OFF: _____
 Analyst: CPD Methylene Chloride Lot #: COA19736
 Spike Analyst: CPD Na2SO4, Anhydrous, Granular Lot #: COA19759
 Method: 3520C 1:1 H2SO4 Lot #: RGT40290
 Run Date: 06/12/2017 16:00
 SOP: EXB01 Revision 20
 Spike Witness: JDH
 Surr Solution: STD80323

	SAMPLE #	Type	Reference	Prod	pH	Init Amnt	Surr Amnt	Spike Amnt	Spike Sol	Final Vol	Color
1	L17060484-01	SAMP		827-DIOXANE	<2	910 mL	.05 mL			1 mL	Transparent
2	WG617401-01	BLANK		827-DIOXANE	<2	1000 mL	.05 mL			1 mL	Transparent
3	WG617401-02	LCS		827-DIOXANE	<2	1000 mL	.05 mL	.05 mL	STD79978	1 mL	Transparent
4	WG617401-03	LCS2		827-DIOXANE	<2	1000 mL	.05 mL	.05 mL	STD79978	1 mL	Transparent

Due to insufficient sample volume, this preparation batch failed to include the method prescribed MS and MSD.
 pH 0-3 Lot#230515
 TV1P5,6

Analyst: *Robert Davis*

Reviewer: *Justin Harrison*



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 Dataset: 050417
 Analyst1: SCB Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 28

Maintenance Log ID: _____ Syringe Filter Lot#: _____

Eluent ID#: _____

Workgroups: _____
 Column 1 ID: RXI-5MS Column 2 ID: NA
WG612906, WG611968

Internal STD: STD81022 Surrogate STD: NA Calibration STD: _____

CCV STD: STD80097 LCS STD: _____ MS/MSD STD: _____

Comments: _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15M21101	BAKE OUT	1	1		05/04/17 13:29
2	15M21102	WG612906-01 5PPM LL DFTPP	1	1	STD80383	05/04/17 14:00
3	15M21103	WG612906-02 5PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 14:18
4	15M21104	WG612906-03 10PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 14:40
5	15M21105	WG612906-04 7.5PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 15:03
6	15M21106	WG612906-05 2.5PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 15:26
7	15M21107	WG612906-06 1PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 15:48
8	15M21108	WG612906-07 0.4PPM 1,4-DIOX STD	1	1	STD80097	05/04/17 16:11
9	15M21109	WG612906-08 5PPM ALT 1,4-DIOX STD	1	1	STD80098	05/04/17 16:48
10	15M21110	WG611678-01 BLANK 827-DIOXANE	7	1	SOIL	05/04/17 17:11
11	15M21111	L17040008-50 827-DIOXANE	7	1	SOIL	05/04/17 17:34
12	15M21112	L17040008-51 827-DIOXANE	7	1	SOIL	05/04/17 17:56
13	15M21113	L17040008-52 827-DIOXANE	7	1	SOIL	05/04/17 18:19
14	15M21114	L17040008-53 827-DIOXANE	7	1	SOIL	05/04/17 18:43
15	15M21115	BAKE OUT	1	1		05/04/17 19:05
16	15M21116	BAKE OUT	1	1		05/04/17 19:28
17	15M21117	BAKE OUT	1	1		05/04/17 19:51

Comments

Seq.	Rerun	Dil.	Reason	Analytes
12				
			L17040008-51 827-DIOXANE low recovery-remix and reanalyze.	

Page: 1

Approved: 05-MAY-17

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 Dataset: 061417
 Analyst1: LJH Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 28

Maintenance Log ID: _____ Syringe Filter Lot#: _____
 Eluent ID#: _____

Workgroups: _____ Column 1 ID: RXI-5MS Column 2 ID: NA
WG617729
 Internal STD: STD81998 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD80097 LCS STD: _____ MS/MSD STD: _____

Comments: L17060484-01 will need to be re-extracted due to LCS failing high and the sample has a hit.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15M21311	BAKE OUT	1	1		06/14/17 08:47
2	15M21312	WG617767-01 5PPM LL DFTPP	1	1	STD80383	06/14/17 09:06
3	15M21313	WG617767-02 5PPM 1,4-DIOXANE STD	1	1	STD80097	06/14/17 09:24
4	15M21314	WG617401-01 BLANK 827-DIOXANE	1	1		06/14/17 09:47
5	15M21315	WG617401-02 LCS 827-DIOXANE	1	1		06/14/17 10:10
6	15M21316	WG617401-03 LCS2 827-DIOXANE	1	1		06/14/17 10:33
7	15M21317	L17060484-01 5X 827-DIOXANE	1	5		06/14/17 10:56

Comments

Seq.	Rerun	Dil.	Reason	Analytes
5			LCS failure	1,4-Dioxane
			WG617401-02 LCS 827-DIOXANE failed high.	
6			LCS failure	1,4-Dioxane
			WG617401-03 LCS2 827-DIOXANE failed high.	
7				
			L17060484-01 5X 827-DIOXANE was ran at an initial dilution based on sample history.	

Page: 1

Approved: 14-JUN-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS15 Dataset: 061617
 Analyst1: LJH Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 28

Maintenance Log ID: _____ Syringe Filter Lot#: _____
 Eluent ID#: _____

Workgroups: _____
 Column 1 ID: RXI-5MS Column 2 ID: NA
WG618285
 Internal STD: STD81998 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD80097 LCS STD: _____ MS/MSD STD: _____

Comments: The LCS's failed high for dioxane.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	15M21321	BAKE OUT	1	1		06/16/17 13:10
2	15M21322	WG618238-01 5PPM LL DFTPP	1	1	STD80383	06/16/17 13:30
3	15M21323	WG618238-02 5PPM 1,4-DIOXANE STD	1	1	STD80097	06/16/17 13:58
4	15M21324	WG617872-01 BLANK 6/15	1	1		06/16/17 15:47
5	15M21325	WG617872-02 LCS 6/15	1	1		06/16/17 16:09
6	15M21326	WG617872-03 LCS2 6/15	1	1		06/16/17 16:32
7	15M21327	L17060484-01 RE 5X	1	5		06/16/17 16:55
8	15M21328	BAKE OUT	1	1		06/16/17 17:18
9	15M21329	BAKE OUT	1	1		06/16/17 17:40
10	15M21330	BAKE OUT	1	1		06/16/17 18:03

Comments

Seq.	Rerun	Dil.	Reason	Analytes
7				
			L17060484-01 RE 5X was ran at an initial dilution based on the history. QNS for re-extract.	

Page: 1

Approved: 19-JUN-17



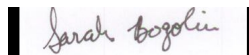

Microbac Laboratories Inc.

Data Checklist

Date: 04-MAY-2017
 Analyst: SCB
 Analyst: NA
 Method: 827-DIOX
 Instrument: HPMS15
 Curve Workgroup: NA
 Runlog ID: 81976
 Analytical Workgroups: WG612906, L17040008

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	X
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	X
TCL hits	X
Surrogate recoveries	X
LCS/LCSD (Laboratory Control Sample)	NA
Recoveries	NA
Surrogate recoveries	NA
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	SCB
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	MES

Primary Reviewer:
05-MAY-2017



Secondary Reviewer:
05-MAY-2017





Microbac Laboratories Inc.

Data Checklist

Date: 14-JUN-2017
 Analyst: LJH
 Analyst: NA
 Method: 827-DIOX
 Instrument: HPMS15
 Curve Workgroup: NA
 Runlog ID: 82744
 Analytical Workgroups: L17060484

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	X
TCL hits	X
Surrogate recoveries	X
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	X
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	
Check for completeness	X
Primary Reviewer	LJH
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
14-JUN-2017

Randy J. Bendorshot

Secondary Reviewer:
14-JUN-2017

Eric C. Zimm

CHECKLIST1 - Modified 03/05/2008

Generated: JUN-14-2017 12:11:45



Microbac Laboratories Inc.

Data Checklist

Date: 16-JUN-2017
 Analyst: LJH
 Analyst: NA
 Method: 827-DIOX
 Instrument: HPMS15
 Curve Workgroup: NA
 Runlog ID: 82826
 Analytical Workgroups: L17060484

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	X
TCL hits	X
Surrogate recoveries	X
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	X
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	
Check for completeness	X
Primary Reviewer	LJH
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
19-JUN-2017

Racey J. Bendorshot

Secondary Reviewer:
19-JUN-2017

Eri C. Zimm

CHECKLIST1 - Modified 03/05/2008

Generated: JUN-19-2017 11:06:50



Analytical Method:8270D
Login Number:L17060484

AAB#:WG617729

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6447-GRAB	01	06/07/17					06/12/2017	5	7		06/14/17	1.8	40	

* = SEE PROJECT QAPP REQUIREMENTS



Analytical Method:8270D
Login Number:L17060484

AAB#:WG618285

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6447-GRAB	01	06/07/17					06/15/2017	8	7	*	06/16/17	1.1	40	

* = SEE PROJECT QAPP REQUIREMENTS



Login Number:L17060484
Instrument Id:HPMS15
Workgroup (AAB#):WG617729

Method:827-DIOXANE
CAL ID: HPMS15-04-MAY-17
Matrix:Water

Sample Number	Dilution	Tag	1
L17060484-01	5.00	DL01	57.5
WG617401-01	1.00	01	53.0
WG617401-02	1.00	01	53.6
WG617401-03	1.00	01	53.3

Surrogates Surrogate Limits
1 - 1,4-Dioxane-d8 20 - 129

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

SURROGATES - Modified 03/06/2008
PDF File ID: 5336433
Report generated: 06/20/2017 08:52



Login Number: L17060484
 Instrument Id: HPMS15
 Workgroup (AAB#): WG618285

Method: 827-DIOXANE
 CAL ID: HPMS15-04-MAY-17
 Matrix: Water

Sample Number	Dilution	Tag	1
<u>L17060484-01</u>	5.00	REDL01	59.8
		1	
WG617872-01	1.00	01	39.3
WG617872-02	1.00	01	51.1
WG617872-03	1.00	01	48.5

Surrogates	Surrogate Limits
1 - 1,4-Dioxane-d8	20 - 129

Underline = Result out of surrogate limits
 DL = surrogate diluted out
 ND = surrogate not detected



METHOD BLANK SUMMARY

Login Number: L17060484 Work Group: WG617729
 Blank File ID: 15M21314 Blank Sample ID: WG617401-01
 Prep Date: 06/12/17 16:00 Instrument ID: HPMS15
 Analyzed Date: 06/14/17 09:47 Method: 8270D
 Analyst: LJH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617401-02	15M21315	06/14/17 10:10	01
LCS2	WG617401-03	15M21316	06/14/17 10:33	01
LH18/24-SP650-6447-GRAB	L17060484-01	15M21317	06/14/17 10:56	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5336425
 Report generated 06/20/2017 08:52



METHOD BLANK SUMMARY

Login Number:L17060484 Work Group:WG618285
 Blank File ID:15M21324 Blank Sample ID:WG617872-01
 Prep Date:06/15/17 14:26 Instrument ID:HPMS15
 Analyzed Date:06/16/17 15:47 Method:8270D
 Analyst:LJH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617872-02	15M21325	06/16/17 16:09	01
LCS2	WG617872-03	15M21326	06/16/17 16:32	01
LH18/24-SP650-6447-GRAB	L17060484-01	15M21327	06/16/17 16:55	REDL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5336425
 Report generated 06/20/2017 08:52



Login Number: L17060484 Prep Date: 06/12/17 16:00 Sample ID: WG617401-01
 Instrument ID: HPMS15 Run Date: 06/14/17 09:47 Prep Method: 3520C
 File ID: 15M21314 Analyst: LJH Method: 8270D
 Workgroup (AAB#): WG617729 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS15-04-MAY-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
1,4-Dioxane	0.500	2.00	0.500	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,4-Dioxane-d8	53.0	20 - 129	PASS

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5336426
 20-JUN-2017 08:52



Login Number: L17060484 Prep Date: 06/15/17 14:26 Sample ID: WG617872-01
 Instrument ID: HPMS15 Run Date: 06/16/17 15:47 Prep Method: 3520C
 File ID: 15M21324 Analyst: LJH Method: 8270D
 Workgroup (AAB#): WG618285 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS15-04-MAY-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
1,4-Dioxane	0.500	2.00	0.500	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,4-Dioxane-d8	39.3	20 - 129	PASS

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5336426
 20-JUN-2017 08:52



Login Number: L17060484 Analyst: LJH Prep Method: 3520C
 Instrument ID: HPMS15 Matrix: Water Method: 8270D
 Workgroup (AAB#): WG617729 Units: ug/L
 QC Key: DOD4 Lot #: STD79978
 Sample ID: WG617401-02 LCS File ID: 15M21315 Run Date: 06/14/2017 10:10
 Sample ID: WG617401-03 LCS2 File ID: 15M21316 Run Date: 06/14/2017 10:33

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
1,4-Dioxane	5.00	8.69	174	5.00	7.97	159	8.60	30 - 104	30	*

Surogates	LCS	LCS2	Surrogate Limits		Qualifier
	% Recovery	% Recovery			
1,4-Dioxane-d8	53.6	53.3	20	- 129	PASS

* EXCEEDS %REC LIMIT
EXCEEDS RPD LIMIT



Login Number: L17060484 Analyst: LJH Prep Method: 3520C
 Instrument ID: HPMS15 Matrix: Water Method: 8270D
 Workgroup (AAB#): WG618285 Units: ug/L
 QC Key: DOD4 Lot #: STD79978
 Sample ID: WG617872-02 LCS File ID: 15M21325 Run Date: 06/16/2017 16:09
 Sample ID: WG617872-03 LCS2 File ID: 15M21326 Run Date: 06/16/2017 16:32

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
1,4-Dioxane	5.00	7.70	154	5.00	7.24	145	6.16	30 - 104	30	*

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
1,4-Dioxane-d8	51.1	48.5	20 - 129	PASS

* EXCEEDS %REC LIMIT
EXCEEDS RPD LIMIT



DFTPP

Login Number: L17060484 Tune ID: WG612906-01
 Instrument: HPMS15 Run Date: 05/04/2017
 Analyst: SCB Run Time: 14:00
 Workgroup: WG612906 File ID: 15M21102
 Cal ID: HPMS15-04-MAY-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	39.8	100763	PASS
68.0	69.0	0	2.00	1.94	2347	PASS
69.0	198	0	100	47.6	120729	PASS
70.0	69.0	0	2.00	0.764	922	PASS
127	198	40.0	60.0	52.2	132295	PASS
197	198	0	1.00	0.399	1011	PASS
198	198	100	100	100	253422	PASS
199	198	5.00	9.00	6.86	17396	PASS
275	198	10.0	30.0	24.4	61731	PASS
365	198	1.00	100	2.74	6948	PASS
441	443	0.0100	100	72.9	21184	PASS
442	198	40.0	100	55.7	141072	PASS
443	442	17.0	23.0	20.6	29074	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG612906-02	STD-CCV	01	05/04/2017 14:18	
WG612906-03	STD	01	05/04/2017 14:40	
WG612906-04	STD	01	05/04/2017 15:03	
WG612906-05	STD	01	05/04/2017 15:26	
WG612906-06	STD	01	05/04/2017 15:48	
WG612906-07	STD	01	05/04/2017 16:11	
WG612906-08	SSCV	01	05/04/2017 16:48	

* Sample past 12 hour tune limit



DFTPP

Login Number: L17060484 Tune ID: WG617767-01
 Instrument: HPMS15 Run Date: 06/14/2017
 Analyst: LJH Run Time: 09:06
 Workgroup: WG617767 File ID: 15M21312
 Cal ID: HPMS15-04-MAY-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	42.8	92807	PASS
68.0	69.0	0	2.00	1.55	1608	PASS
69.0	198	0	100	47.7	103557	PASS
70.0	69.0	0	2.00	0.643	666	PASS
127	198	40.0	60.0	51.7	112262	PASS
197	198	0	1.00	0.00461	10	PASS
198	198	100	100	100	217092	PASS
199	198	5.00	9.00	6.85	14878	PASS
275	198	10.0	30.0	23.6	51224	PASS
365	198	1.00	100	2.89	6274	PASS
441	443	0.0100	100	72.6	16753	PASS
442	198	40.0	100	51.4	111627	PASS
443	442	17.0	23.0	20.7	23077	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG617767-02	CCV	01	06/14/2017 09:24	
WG617401-01	BLANK	01	06/14/2017 09:47	
WG617401-02	LCS	01	06/14/2017 10:10	
WG617401-03	LCS2	01	06/14/2017 10:33	
L17060484-01	LH18/24-SP650-6447-GRAB	DL01	06/14/2017 10:56	

* Sample past 12 hour tune limit



DFTPP

Login Number: L17060484 Tune ID: WG618238-01
 Instrument: HPMS15 Run Date: 06/16/2017
 Analyst: LJH Run Time: 13:30
 Workgroup: WG618238 File ID: 15M21322
 Cal ID: HPMS15-04-MAY-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	40.0	92340	PASS
68.0	69.0	0	2.00	1.89	2042	PASS
69.0	198	0	100	46.8	107939	PASS
70.0	69.0	0	2.00	0.741	800	PASS
127	198	40.0	60.0	50.0	115456	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	230835	PASS
199	198	5.00	9.00	6.97	16080	PASS
275	198	10.0	30.0	23.8	54992	PASS
365	198	1.00	100	3.00	6915	PASS
441	443	0.0100	100	70.7	18744	PASS
442	198	40.0	100	55.9	128968	PASS
443	442	17.0	23.0	20.5	26501	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG618238-02	CCV	01	06/16/2017 13:58	
WG617872-01	BLANK	01	06/16/2017 15:47	
WG617872-02	LCS	01	06/16/2017 16:09	
WG617872-03	LCS2	01	06/16/2017 16:32	
L17060484-01	LH18/24-SP650-6447-GRAB	REDL01	06/16/2017 16:55	

* Sample past 12 hour tune limit



Login Number: L17060484
Analytical Method: 8270D
ICAL Workgroup: WG612906

Instrument ID: HPMS15
Initial Calibration Date: 04-MAY-17 16:11
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
1,4-Dioxane	0.3110	1.82		

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 5336428
Report generated 06/20/2017 08:52



Login Number: L17060484
Analytical Method: 8270D

Instrument ID: HPMS15
Initial Calibration Date: 04-MAY-17 16:11
Column ID: F

Analyte	WG612906-02			WG612906-03			WG612906-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,4-Dioxane	5.00	126741.000	0.3085	10.0	226922.000	0.3188	7.50	171013.000	0.3132

INT_CAL - Modified 03/06/2008
PDF File ID: 5336428
Report generated 06/20/2017 08:52



Login Number: L17060484
Analytical Method: 8270D

Instrument ID: HPMS15
Initial Calibration Date: 04-MAY-17 16:11
Column ID: F

Analyte	WG612906-05			WG612906-06			WG612906-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,4-Dioxane	2.50	53891.0000	0.3099	1.00	21636.0000	0.3135	0.400	8746.00000	0.3020

INT_CAL - Modified 03/06/2008
PDF File ID: 5336428
Report generated 06/20/2017 08:52



Login Number: L17060484 Run Date: 05/04/2017 Sample ID: WG612906-08
 Instrument ID: HPMS15 Run Time: 16:48 Method: 8270D
 File ID: 15M21109 Analyst: SCB/LJH QC Key: DOD4
 ICal Workgroup: WG612906 Cal ID: HPMS15 - 04-MAY-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
1,4-Dioxane	5000	4430	ug/L	0.274	11.4	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617767-02
 Instrument ID: HPMS15 Run Time: 09:24 Method: 8270D
 File ID: 15M21313 Analyst: LJH QC Key: DOD4
 Workgroup (AAB#): WG617729 Cal ID: HPMS15 - 04-MAY-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
1,4-Dioxane	5000	4800	ug/L	0.298	4.08	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
 PDF File ID: 5336431
 Report generated 06/20/2017 08:52



Login Number: L17060484 Run Date: 06/16/2017 Sample ID: WG618238-02
 Instrument ID: HPMS15 Run Time: 13:58 Method: 8270D
 File ID: 15M21323 Analyst: LJH QC Key: DOD4
 Workgroup (AAB#): WG618285 Cal ID: HPMS15 - 04-MAY-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
1,4-Dioxane	5000	4810	ug/L	0.299	3.79	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17060484
Instrument ID: HPMS15
Workgroup (AAB#): WG617729

ICAL CCV Number: WG612906-02
CAL ID: HPMS15-04-MAY-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG612906-02	NA	NA	82158
Upper Limit	NA	NA	164316
Lower Limit	NA	NA	41079
<u>L17060484-01</u>	5.00	DL01	79127
WG617401-01	1.00	01	80510
WG617401-02	1.00	01	96392
WG617401-03	1.00	01	85162

IS-1 - 1,4-Dichlorobenzene-d4

Underline = Response outside limits



Login Number: L17060484
Instrument ID: HPMS15
Workgroup (AAB#): WG618285

ICAL CCV Number: WG612906-02
CAL ID: HPMS15-04-MAY-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG612906-02	NA	NA	82158
Upper Limit	NA	NA	164316
Lower Limit	NA	NA	41079
<u>L17060484-01</u>	<u>5.00</u>	<u>REDL0</u>	<u>105892</u>
		1	
WG617872-01	1.00	01	102918
WG617872-02	1.00	01	106089
WG617872-03	1.00	01	89001

IS-1 - 1,4-Dichlorobenzene-d4

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO MIDPOINT OF ICAL)

00857776

Login Number: L17060484
Instrument ID: HPMS15
Workgroup (AAB#): WG617729

ICAL CCV Number: WG612906-02
CAL ID: HPMS15-04-MAY-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG612906-02	NA	NA	7.2
Upper Limit	NA	NA	7.7
Lower Limit	NA	NA	6.7
<u>L17060484-01</u>	5.00	DL01	7.176
WG617401-01	1.00	01	7.176
WG617401-02	1.00	01	7.176
WG617401-03	1.00	01	7.176

IS-1 - 1,4-Dichlorobenzene-d4

Underline = Response outside limits

INTERNAL_STD_RT_ICAL - Modified 03/06/2008
PDF File ID: 5336434
Report generated: 06/20/2017 08:52



Microbac Laboratories Inc.
 INTERNAL STANDARD RETENTION TIME SUMMARY
 (COMPARED TO MIDPOINT OF ICAL)

00857777

Login Number: L17060484
 Instrument ID: HPMS15
 Workgroup (AAB#): WG618285

ICAL CCV Number: WG612906-02
 CAL ID: HPMS15-04-MAY-17
 Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG612906-02	NA	NA	7.2
Upper Limit	NA	NA	7.7
Lower Limit	NA	NA	6.7
<u>L17060484-01</u>	<u>5.00</u>	<u>REDL0</u>	<u>7.183</u>
		1	
WG617872-01	1.00	01	7.183
WG617872-02	1.00	01	7.183
WG617872-03	1.00	01	7.183

IS-1 - 1,4-Dichlorobenzene-d4

Underline = Response outside limits



2.3 Metals Data

2.3.1 Metals I C P Data

2.3.1.1 Summary Data

Lab Report #: L17060484

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 11:40
Matrix: Water	Analytical Method: 6010C	Cal Date: 06/14/2017 13:33
Workgroup #: WG617838	Analyst: KKB	Run Date: 06/14/2017 18:49
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: T4.061417.184941
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Selenium, Total	7782-49-2	0.0200	U	0.0200	0.0200	0.0100
U	Analyte was not detected. The concentration is below the reported LOD.					

2.3.1.2 QC Summary Data

Example 6010 Calculations

Thermo Scientific iCAP

1.0 Initial Calibration (ICAL) Parameters

For a multi-point calibration, the system performs linear regression from data consisting of a blank and four standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system in ug/mL (ppm)

Vf = Final volume (mL)

Vi = Initial volume (mL)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/mL (mg/L)

Example:

0.1

50

50

1

0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (mg/L) (ppm)

Vf = Final volume (mL)

Vi = Initial weight (g)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/g (mg/kg)

Example:

0.1

50

1

1

5

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

$Cdry$ = Concentration calculated as dry weight (mg/kg)

Example:

5

80

6.25

Example 6010 Calculations

Thermo Scientific iCAP

1.0 Initial Calibration (ICAL) Parameters

For a multi-point calibration, the system performs linear regression from data consisting of a blank and four standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system in ug/mL (ppm)

Vf = Final volume (mL)

Vi = Initial volume (mL)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/mL (mg/L)

Example:

0.1

50

50

1

0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (mg/L) (ppm)

Vf = Final volume (mL)

Vi = Initial weight (g)

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in ug/g (mg/kg)

Example:

0.1

50

1

1

5

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

$Cdry$ = Concentration calculated as dry weight (mg/kg)

Example:

5

80

6.25

Workgroup: WG617642
 Analyst: VC
 Spike Analyst: VC
 Run Date: 06/13/2017 11:40
 Method: 3015A
 Balance: BAL016
 Instrument: MW-3
 Instrument Start: 06/13/2017 11:44

SOP: ME407 Revision 19
 Spike Solution: STD82091
 Spike Witness: REK
 HNO3 Lot #: COA19718
 HCL Lot #: COA19685
 40 & 50 ML. DIGESTION TUCOA19764
 ICP FILTERS LOT#R6sa4256RGT40011

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG617642-02	BLANK	1	40 mL	50 mL	206.939 g	206.938 g	
2	WG617411-01	FBLK1	17	5 mL	50 mL	211.601 g	211.613 g	
3	WG617642-03	LCS	1	40 mL	50 mL	211.909 g	211.913 g	5 mL
4	L17060421-01	SAMP	17	5 mL	50 mL	209.218 g	209.208 g	06/16/17
5	L17060421-02	SAMP	17	5 mL	50 mL	212.442 g	212.438 g	06/16/17
6	L17060468-01	SAMP	1	20 mL	50 mL	206.805 g	206.753 g	06/16/17
7	L17060468-02	SAMP	1	40 mL	50 mL	204.168 g	204.149 g	06/16/17
8	L17060482-01	SAMP	1	40 mL	50 mL	207.754 g	207.733 g	06/20/17
9	L17060484-01	SAMP	1	40 mL	50 mL	205.805 g	205.782 g	06/20/17
10	WG617642-01	REF	17	5 mL	50 mL	209.586 g	209.582 g	
11	L17060488-01	SAMP	17	5 mL	50 mL	209.586 g	209.582 g	06/14/17
12	L17060488-02	SAMP	17	5 mL	50 mL	211.162 g	211.151 g	06/14/17
13	L17060506-01	SAMP	1	40 mL	50 mL	204.361 g	204.347 g	06/20/17
14	L17060538-01	SAMP	1	40 mL	50 mL	206.624 g	206.613 g	06/19/17
15	L17060539-01	SAMP	1	40 mL	50 mL	207.288 g	207.27 g	06/19/17
16	L17060540-01	SAMP	1	40 mL	50 mL	207.085 g	207.072 g	06/19/17
17	L17060540-02	SAMP	1	40 mL	50 mL	204.768 g	204.76 g	06/19/17
18	L17060541-01	SAMP	1	40 mL	50 mL	205.978 g	205.962 g	06/19/17
19	L17060542-01	SAMP	1	40 mL	50 mL	206.674 g	206.65 g	06/19/17
20	WG617642-04	MS	1	5 mL	50 mL	209.761 g	209.742 g	5 mL
21	WG617642-05	MSD	1	5 mL	50 mL	208.454 g	208.449 g	5 mL

L17060468-01 PH ADJ, FILTERED DIGESTATE

Analyst: Vesha Collier

Reviewer: [Signature]



Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061417T4.2R.TXT

Analyst1: KKB Analyst2: N/A

Method: 200.7/6010B/6010C SOP: ME600G Rev: 8

Maintenance Log ID: _____

Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131

ICSA: STD82116 IC SAB: STD82371 Int. Std: RGT39282

CCV: STD82185 LLCCV: COA19621 Tuning Sol: _____

Stannous: _____ Hydroxylamine: _____

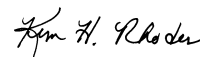
Workgroups: 617841,617843,617838

Comments:

--

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.061417.131910	WG617982-01	Calibration Point		1		06/14/17 13:19
2	T4.061417.132255	WG617982-02	Calibration Point		1		06/14/17 13:22
3	T4.061417.132640	WG617982-03	Calibration Point		1		06/14/17 13:26
4	T4.061417.133024	WG617982-04	Calibration Point		1		06/14/17 13:30
5	T4.061417.133352	WG617982-05	Calibration Point		1		06/14/17 13:33
6	T4.061417.133719	WG617982-06	Initial Calibration Verification		1		06/14/17 13:37
7	T4.061417.134107	WG617982-07	Initial Calib Blank		1		06/14/17 13:41
8	T4.061417.134450	WG617982-08	Low Level Initial Calibration V		1		06/14/17 13:44
9	T4.061417.135450	WG617982-09	LLICV		1		06/14/17 13:54
10	T4.061417.135832	WG617982-10	Low Level Initial Calibration V		1		06/14/17 13:58
11	T4.061417.140214	WG617982-11	Interference Check		1		06/14/17 14:02
12	T4.061417.140600	WG617982-12	Interference Check		1		06/14/17 14:06
13	T4.061417.140942	WG617982-13	CCV		1		06/14/17 14:09
14	T4.061417.141309	WG617982-14	CCB		1		06/14/17 14:13
15	T4.061417.143339	WG617808-02	Method/Prep Blank	40/50	1		06/14/17 14:33
16	T4.061417.143724	WG617808-03	Laboratory Control S	40/50	1		06/14/17 14:37
17	T4.061417.144052	WG617661-01	Fluid Blank 1		1		06/14/17 14:40
18	T4.061417.144437	WG617808-01	Reference Sample		1	L17060577-02	06/14/17 14:44
19	T4.061417.144819	WG617808-04	Matrix Spike	5/50	1	L17060577-02	06/14/17 14:48
20	T4.061417.145148	WG617808-05	Matrix Spike Duplica	5/50	1	L17060577-02	06/14/17 14:51
21	T4.061417.145516	L17060580-02	J7F0755-02	5/50	1		06/14/17 14:55
22	T4.061417.145857	L17060608-01	2212-154-A W1	40/50	1		06/14/17 14:58
23	T4.061417.150239	WG617841-01	Post Digestion Spike		1	L17060608-01	06/14/17 15:02
24	T4.061417.150608	WG617841-02	Serial Dilution		5	L17060608-01	06/14/17 15:06
25	T4.061417.150949	WG617982-15	CCV		1		06/14/17 15:09
26	T4.061417.151317	WG617982-16	CCB		1		06/14/17 15:13
27	T4.061417.151703	L17060609-01	15-12-17 ES-1	40/50	1		06/14/17 15:17
28	T4.061417.152046	L17060611-01	MEANS\ 28-012-100.04\ PR	40/50	1		06/14/17 15:20
29	T4.061417.152428	L17060611-02	MEANS\ 28-012-100.04\ PR	40/50	1		06/14/17 15:24
30	T4.061417.152809	L17060612-01	YOUNG\ 28-011-138\ PR\	40/50	1		06/14/17 15:28
31	T4.061417.153149	L17060612-02	YOUNG\ 28-011-138\ PR\	40/50	1		06/14/17 15:31
32	T4.061417.153528	L17060638-01	41702-B01-WQ-W0003	40/50	1		06/14/17 15:35
33	T4.061417.153913	L17060638-02	50608-B01-WQ-W0002	40/50	1		06/14/17 15:39
34	T4.061417.154257	L17060638-03	50608-D01-WQ-W0008	40/50	1		06/14/17 15:42

Page: 1 Approved: June 15, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061417T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RG739282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617841,617843,617838

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.061417.154641	L17060638-04	51105-F01-WQ-W0002	40/50	1		06/14/17 15:46
36	T4.061417.155026	L17060669-01	2017PRE-16780SWEATRD	40/50	1		06/14/17 15:50
37	T4.061417.155407	WG617982-17	CCV		1		06/14/17 15:54
38	T4.061417.155734	WG617982-18	CCB		1		06/14/17 15:57
39	T4.061417.160121	L17060682-01	FRAC TANK PRE	40/50	1		06/14/17 16:01
40	T4.061417.160502	L17060682-02	FRAC TANK PRE	40/50	1		06/14/17 16:05
41	T4.061417.160840	L17060682-03	FRAC TANK MID	40/50	1		06/14/17 16:08
42	T4.061417.161220	L17060682-04	FRAC TANK POST	40/50	1		06/14/17 16:12
43	T4.061417.161559	WG617982-19	CCV		1		06/14/17 16:15
44	T4.061417.161927	WG617982-20	CCB		1		06/14/17 16:19
45	T4.061417.162315	WG617982-21	Low Level Continuing Calibra		1		06/14/17 16:23
46	T4.061417.162655	WG617982-22	Low Level Continuing Calibra		1		06/14/17 16:26
47	T4.061417.163036	WG617982-23	LLCCV		1		06/14/17 16:30
48	T4.061417.163418	WG617665-02	Method/Prep Blank	40/50	1		06/14/17 16:34
49	T4.061417.163803	WG617665-03	Laboratory Control S	40/50	1		06/14/17 16:38
50	T4.061417.164131	L17060570-01	102-060917	40/50	1		06/14/17 16:41
51	T4.061417.164511	L17060570-02	129-060917	40/50	1		06/14/17 16:45
52	T4.061417.164854	L17060570-04	120F-060917	40/50	1		06/14/17 16:48
53	T4.061417.165235	L17060570-05	123-060917	40/50	1		06/14/17 16:52
54	T4.061417.165616	L17060570-07	125F-060917	40/50	1		06/14/17 16:56
55	T4.061417.165959	L17060570-08	109-060917	40/50	1		06/14/17 16:59
56	T4.061417.170342	WG617843-01	Post Digestion Spike		1	L17060570-08	06/14/17 17:03
57	T4.061417.170710	WG617843-02	Serial Dilution		5	L17060570-08	06/14/17 17:07
58	T4.061417.171056	WG617982-24	CCV		1		06/14/17 17:10
59	T4.061417.171424	WG617982-25	CCB		1		06/14/17 17:14
60	T4.061417.171809	L17060570-09	18CPTMW24-060917	40/50	1		06/14/17 17:18
61	T4.061417.172158	L17060570-10	18WW03-060917	40/50	1		06/14/17 17:21
62	T4.061417.172538	L17060570-11	18WW03FD-060917	40/50	1		06/14/17 17:25
63	T4.061417.172920	L17060570-13	18WW18F-060917	40/50	1		06/14/17 17:29
64	T4.061417.173258	L17060570-14	18WW17-060917	40/50	1		06/14/17 17:32
65	T4.061417.173644	L17060607-01	6-8-17 W1	40/50	1		06/14/17 17:36
66	T4.061417.174025	L17060607-02	6-10-5 W1	40/50	1		06/14/17 17:40
67	T4.061417.174406	L17060607-03	6-8-18 P1	40/50	1		06/14/17 17:44
68	T4.061417.174748	L17060607-04	6-8-18 W2	40/50	1		06/14/17 17:47

Page: 2 Approved: June 15, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061417T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RG739282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617841,617843,617838

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.061417.175129	L17060607-05	6-8-18 W1	40/50	1		06/14/17 17:51
70	T4.061417.175511	WG617982-26	CCV		1		06/14/17 17:55
71	T4.061417.175839	WG617982-27	CCB		1		06/14/17 17:58
72	T4.061417.180224	L17060607-06	6-10-10 S1	40/50	1		06/14/17 18:02
73	T4.061417.180605	L17060607-07	59-11-10.32 W1	40/50	1		06/14/17 18:06
74	T4.061417.180945	L17060610-01	LEMMON_28-011-121	40/50	1		06/14/17 18:09
75	T4.061417.181325	WG617665-01	Reference Sample		1	L17060610-02	06/14/17 18:13
76	T4.061417.181705	WG617665-04	Matrix Spike	40/50	1	L17060610-02	06/14/17 18:17
77	T4.061417.182033	WG617665-05	Matrix Spike Duplica	40/50	1	L17060610-02	06/14/17 18:20
78	T4.061417.182402	WG617982-28	CCV		1		06/14/17 18:24
79	T4.061417.182730	WG617982-29	CCB		1		06/14/17 18:27
80	T4.061417.183115	WG617642-02	Method/Prep Blank	40/50	1		06/14/17 18:31
81	T4.061417.183500	WG617642-03	Laboratory Control S	40/50	1		06/14/17 18:35
82	T4.061417.183828	L17060468-01	H7F0329-01 (SAMPLE 1)	20/50	1		06/14/17 18:38
83	T4.061417.184212	L17060468-02	H7F0329-02 (SAMPLE 2)	40/50	1		06/14/17 18:42
84	T4.061417.184600	L17060482-01	LH18/24-SP140-7447-GRAB	40/50	1		06/14/17 18:46
85	T4.061417.184941	L17060484-01	LH18/24-SP650-6447-GRAB	40/50	1		06/14/17 18:49
86	T4.061417.185320	L17060488-01	13837-SSP0567		1	WG617642-01	06/14/17 18:53
87	T4.061417.185701	WG617642-04	Matrix Spike	5/50	1	L17060488-01	06/14/17 18:57
88	T4.061417.190030	WG617642-05	Matrix Spike Duplica	5/50	1	L17060488-01	06/14/17 19:00
89	T4.061417.190358	L17060506-01	AAB9029	40/50	1		06/14/17 19:03
90	T4.061417.190737	WG617982-30	CCV		1		06/14/17 19:07
91	T4.061417.191105	WG617982-31	CCB		1		06/14/17 19:11
92	T4.061417.191449	L17060538-01	1001-220 W1	40/50	1		06/14/17 19:14
93	T4.061417.191830	L17060539-01	1001-145-C W1	40/50	1		06/14/17 19:18
94	T4.061417.192209	L17060540-01	1001-213 W1	40/50	1		06/14/17 19:22
95	T4.061417.192548	L17060540-02	1001-213 W2	40/50	1		06/14/17 19:25
96	T4.061417.192928	L17060541-01	1001-212 W1	40/50	1		06/14/17 19:29
97	T4.061417.193303	L17060542-01	1001-145-H P1	40/50	1		06/14/17 19:33
98	T4.061417.193645	WG617838-03	Post Digestion Spike		1	L17060542-01	06/14/17 19:36
99	T4.061417.194013	WG617838-04	Serial Dilution		5	L17060542-01	06/14/17 19:40
100	T4.061417.194358	WG617982-32	CCV		1		06/14/17 19:43
101	T4.061417.194725	WG617982-33	CCB		1		06/14/17 19:47
102	T4.061417.195111	WG617982-34	Low Level Continuing Calibra		1		06/14/17 19:51

Page: 3 Approved: June 15, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061417T4.2R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RG739282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

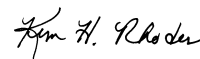
Workgroups: 617841,617843,617838

Comments:

--

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T4.061417.195451	WG617982-35	Low Level Continuing Calibra		1		06/14/17 19:54
104	T4.061417.195832	WG617982-36	LLCCV		1		06/14/17 19:58

Page: 4 Approved: June 15, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061517T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RGT39282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 617838,617843,618070

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.061517.112842	WG618082-01	Calibration Point		1		06/15/17 11:28
2	T4.061517.113226	WG618082-02	Calibration Point		1		06/15/17 11:32
3	T4.061517.113610	WG618082-03	Calibration Point		1		06/15/17 11:36
4	T4.061517.113956	WG618082-04	Calibration Point		1		06/15/17 11:39
5	T4.061517.114323	WG618082-05	Calibration Point		1		06/15/17 11:43
6	T4.061517.114650	WG618082-06	Initial Calibration Verification		1		06/15/17 11:46
7	T4.061517.115218	WG618082-07	Initial Calib Blank		1		06/15/17 11:52
8	T4.061517.115601	WG618082-08	Low Level Initial Calibration V		1		06/15/17 11:56
9	T4.061517.115942	WG618082-09	LLICV		1		06/15/17 11:59
10	T4.061517.120323	WG618082-10	LLICV		1		06/15/17 12:03
11	T4.061517.120705	WG618082-11	Interference Check		1		06/15/17 12:07
12	T4.061517.121052	WG618082-12	Interference Check		1		06/15/17 12:10
13	T4.061517.121433	WG618082-13	CCV		1		06/15/17 12:14
14	T4.061517.121801	WG618082-14	CCB		1		06/15/17 12:18
15	T4.061517.123858	WG617642-02	Method/Prep Blank	40/50	1		06/15/17 12:38
16	T4.061517.124244	WG617642-03	Laboratory Control S	40/50	1		06/15/17 12:42
17	T4.061517.124612	L17060468-01	H7F0329-01 (SAMPLE 1)	20/50	10		06/15/17 12:46
18	T4.061517.124955	L17060468-02	H7F0329-02 (SAMPLE 2)	40/50	5		06/15/17 12:49
19	T4.061517.125337	WG617642-01	Reference Sample		1	L17060488-01	06/15/17 12:53
20	T4.061517.125717	WG617642-04	Matrix Spike	5/50	1	L17060488-01	06/15/17 12:57
21	T4.061517.130045	WG617642-05	Matrix Spike Duplica	5/50	1	L17060488-01	06/15/17 13:00
22	T4.061517.130415	WG618082-15	CCV		1		06/15/17 13:04
23	T4.061517.130743	WG618082-16	CCB		1		06/15/17 13:07
24	T4.061517.131128	L17060506-01	AAB9029	40/50	1		06/15/17 13:11
25	T4.061517.131505	WG617838-03	Post Digestion Spike		1	L17060542-01	06/15/17 13:15
26	T4.061517.131833	WG617838-04	Serial Dilution		5	L17060542-01	06/15/17 13:18
27	T4.061517.132214	L17060506-01	AAB9029	40/50	5		06/15/17 13:22
28	T4.061517.132558	WG618082-17	CCV		1		06/15/17 13:25
29	T4.061517.132926	WG618082-18	CCB		1		06/15/17 13:29
30	T4.061517.133312	WG617665-02	Method/Prep Blank	40/50	1		06/15/17 13:33
31	T4.061517.133656	WG617665-03	Laboratory Control S	40/50	1		06/15/17 13:36
32	T4.061517.134024	L17060570-01	102-060917	40/50	1		06/15/17 13:40
33	T4.061517.134406	L17060570-02	129-060917	40/50	1		06/15/17 13:44
34	T4.061517.134748	L17060570-04	120F-060917	40/50	1		06/15/17 13:47

Page: 1 Approved: June 16, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061517T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RGT39282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617838,617843,618070

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.061517.135130	L17060570-05	123-060917	40/50	1		06/15/17 13:51
36	T4.061517.135512	L17060570-07	125F-060917	40/50	1		06/15/17 13:55
37	T4.061517.135856	WG617843-03	Post Digestion Spike		1	L17060570-07	06/15/17 13:58
38	T4.061517.140223	WG617843-04	Serial Dilution		5	L17060570-07	06/15/17 14:02
39	T4.061517.140608	L17060570-08	109-060917	40/50	1		06/15/17 14:06
40	T4.061517.140952	WG618082-19	CCV		1		06/15/17 14:09
41	T4.061517.141320	WG618082-20	CCB		1		06/15/17 14:13
42	T4.061517.141707	L17060570-09	18CPTMW24-060917	40/50	25		06/15/17 14:17
43	T4.061517.142049	L17060570-10	18WW03-060917	40/50	1		06/15/17 14:20
44	T4.061517.142431	L17060570-11	18WW03FD-060917	40/50	1		06/15/17 14:24
45	T4.061517.142812	L17060570-13	18WW18F-060917		10		06/15/17 14:28
46	T4.061517.143154	L17060570-14	18WW17-060917	40/50	1		06/15/17 14:31
47	T4.061517.143540	L17060570-14	18WW17-060917	40/50	25		06/15/17 14:35
48	T4.061517.143923	L17060570-13	18WW18F-060917	40/50	25		06/15/17 14:39
49	T4.061517.144342	WG617665-01	Reference Sample		1	L17060610-02	06/15/17 14:43
50	T4.061517.144722	WG617665-04	Matrix Spike	40/50	1	L17060610-02	06/15/17 14:47
51	T4.061517.145051	WG617665-05	Matrix Spike Duplica	40/50	1	L17060610-02	06/15/17 14:50
52	T4.061517.145420	WG618082-21	CCV		1		06/15/17 14:54
53	T4.061517.145749	WG618082-22	CCB		1		06/15/17 14:57
54	T4.061517.150136	WG618082-23	Low Level Continuing Calibra		1		06/15/17 15:01
55	T4.061517.150517	WG618082-24	LLCCV		1		06/15/17 15:05
56	T4.061517.150859	WG618082-25	LLCCV		1		06/15/17 15:08
57	T4.061517.160235	WG618082-26	CCV		1		06/15/17 16:02
58	T4.061517.160605	WG618082-27	CCB		1		06/15/17 16:06
59	T4.061517.160950	WG618025-02	Method/Prep Blank	40/50	1		06/15/17 16:09
60	T4.061517.161333	WG618025-03	Laboratory Control S	40/50	1		06/15/17 16:13
61	T4.061517.161701	WG617820-01	Fluid Blank 1		1		06/15/17 16:17
62	T4.061517.162046	L17060648-01	17F1236-01		1	WG618025-01	06/15/17 16:20
63	T4.061517.162431	WG618025-04	Matrix Spike	5/50	1	L17060648-01	06/15/17 16:24
64	T4.061517.162759	WG618025-05	Matrix Spike Duplica	5/50	1	L17060648-01	06/15/17 16:27
65	T4.061517.163128	L17060722-02	PERMEATE	1/50	1		06/15/17 16:31
66	T4.061517.163508	L17060722-04	BLEED	1/50	1		06/15/17 16:35
67	T4.061517.163852	WG618082-28	CCV		1		06/15/17 16:38
68	T4.061517.164219	WG618082-29	CCB		1		06/15/17 16:42

Page: 2 Approved: June 16, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 061517T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8

Maintenance Log ID: _____

Calibration Std: STD81957 ICV Std: STD81979 Post Spike: STD80131
 ICSA: STD82116 ICSAB: STD82371 Int. Std: RGT39282
 CCV: STD82185 LLCCV: COA19621 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617838,617843,618070

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.061517.164605	L17060722-06	N. DOCK FLUME	1/50	1		06/15/17 16:46
70	T4.061517.164950	L17060741-01	45-2-9 W1 (PRE)	40/50	1		06/15/17 16:49
71	T4.061517.165334	L17060741-02	45-2-9 W1 (POST)	40/50	1		06/15/17 16:53
72	T4.061517.165717	L17060742-01	45-2-3 W1 (PRE)	40/50	1		06/15/17 16:57
73	T4.061517.170059	L17060742-02	45-2-3 W1 (POST)	40/50	1		06/15/17 17:00
74	T4.061517.170441	L17060760-01	17F1527-01	5/50	1		06/15/17 17:04
75	T4.061517.170825	L17060760-02	17F1527-02	5/50	1		06/15/17 17:08
76	T4.061517.171206	L17060760-03	17F1527-03	5/50	1		06/15/17 17:12
77	T4.061517.171547	L17060760-04	17F1527-04	5/50	1		06/15/17 17:15
78	T4.061517.171930	L17060760-05	17F1527-05	5/50	1		06/15/17 17:19
79	T4.061517.172314	WG618082-30	CCV		1		06/15/17 17:23
80	T4.061517.172643	WG618082-31	CCB		1		06/15/17 17:26
81	T4.061517.173028	L17060769-01	39121-01-21466-PD1	40/50	1		06/15/17 17:30
82	T4.061517.173408	L17060769-02	39121-01-21466-PD1	40/50	1		06/15/17 17:34
83	T4.061517.173748	WG618070-01	Post Digestion Spike		1	L17060769-02	06/15/17 17:37
84	T4.061517.174117	WG618070-02	Serial Dilution		5	L17060769-02	06/15/17 17:41
85	T4.061517.174501	WG618082-32	CCV		1		06/15/17 17:45
86	T4.061517.174829	WG618082-33	CCB		1		06/15/17 17:48

Page: 3 Approved: June 16, 2017

Sam H. Rhodes



Microbac Laboratories Inc.

Data Checklist

Date: 14-JUN-2017
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 617982
 Runlog ID: 82755
 Analytical Workgroups: 617841,617843,617838

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	669
Level 4	638,570,482,484,506
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KKB
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
15-JUN-2017

Secondary Reviewer:
15-JUN-2017

Ki K Beck

Tom H. Rhodes



Microbac Laboratories Inc.

Data Checklist

Date: 15-JUN-2017
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 618082
 Runlog ID: 82785
 Analytical Workgroups: 617838,617843,618070

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	
Level 4	506,570
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KKB
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
16-JUN-2017

Secondary Reviewer:
16-JUN-2017

Ki K Beck

Tom H. Rhodes



Analytical Method:6010C
Login Number:L17060484

AAB#:WG617838

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6447-GRAB	01	06/07/17					06/13/2017	5.9	180		06/14/17	7.2	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5338620
Report generated 06/15/2017 10:42



METHOD BLANK SUMMARY

Login Number: L17060484 Work Group: WG617838
 Blank File ID: T4.061417.183115 Blank Sample ID: WG617642-02
 Prep Date: 06/13/17 11:40 Instrument ID: ICP-THERMO4
 Analyzed Date: 06/14/17 18:31 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617642-03	T4.061417.183500	06/14/17 18:35	01
LH18/24-SP650-6447-GRAB	L17060484-01	T4.061417.184941	06/14/17 18:49	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5338621
 Report generated 06/15/2017 10:42



Login Number: L17060484 Prep Date: 06/13/17 11:40 Sample ID: WG617642-02
 Instrument ID: ICP-THERMO4 Run Date: 06/14/17 18:31 Prep Method: 3015A
 File ID: T4.061417.183115 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG617838 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-TH-14-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Selenium, Total	0.0100	0.0200	0.0100	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5338622
 15-JUN-2017 10:42



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617642-03
Instrument ID: ICP-THERMO4 Run Time: 18:35 Prep Method: 3015A
File ID: T4.061417.183500 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG617838 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD82091 Cal ID: ICP-TH-14-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Selenium, Total	0.250	0.230	92.2	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5338623
Report generated: 06/15/2017 10:42



Loginnum: L17060484 Cal ID: ICP-THERMO4- Worknum: WG617838
 Instrument ID: ICP-THERMO4 Contract #: _____ Method: 6010C
 Parent ID: WG617642-01 File ID: T4.061417.185320 Dil: 1 Matrix: WATER
 Sample ID: WG617642-04 MS File ID: T4.061417.185701 Dil: 1 Units: mg/L
 Sample ID: WG617642-05 MSD File ID: T4.061417.190030 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Selenium	ND	2.00	1.91	95.3	2.00	1.90	95.2	0.121	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L17060484 **Worknum:** WG617838
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG617838-04 **File ID:** T4.061417.194013 **Dil:** 5 **Units:** ug/L
Sample: L17060542-01 **File ID:** T4.061417.193303 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Selenium	ND	U	ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 25 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 25 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5338618

06/15/2017 10:42



Sample Login ID: L17060484 Worknum: WG617838
 Instrument ID: ICP-THERMO4 Method: 6010C
 Post Spike ID: WG617838-03 File ID: T4.061417.193645 Dil: 1 Units: ug/L
 Sample ID: L17060542-01 File ID: T4.061417.193303 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
SELENIUM	182		0	U	200	90.9	75 - 125	

N = % Recovery exceeds control limits

F = Result is between MDL and RL

U = Sample result is below MDL. A value of zero is used in the calculation



Login: L17060484 Workgroup (AAB#): WG617838
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG617982 Initial Calibration Date: 14-JUN-2017 13:33

	WG617982-01		WG617982-02		WG617982-03		WG617982-04		WG617982-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
SELENIUM	0	-0.0000100	NA	NA	.008	0.0000600	.4	0.00631	.8	0.0125	.999721	

INT = Instrument intensity
 R = Coefficient of correlation
 Q = Data Qualifier
 * = Out of Compliance; R < 0.995



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-07
Instrument ID: ICP-THERMO4 Run Time: 13:41 Method: 6010C
File ID: T4.061417.134107 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG617838 Cal ID: ICP-THERI - 14-JUN-17
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
SELENIUM	.008	.016	.008	U

U = Result is less than 2 x MDL
F = Result is between MDL and 2 x MDL
* = Result is above 2 x MDL



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-14
Instrument ID: ICP-THERMO4 Run Time: 14:13 Method: 6010C
File ID: T4.061417.141309 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-29
 Instrument ID: ICP-THERMO4 Run Time: 18:27 Method: 6010C
 File ID: T4.061417.182730 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-31
 Instrument ID: ICP-THERMO4 Run Time: 19:11 Method: 6010C
 File ID: T4.061417.191105 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-33
 Instrument ID: ICP-THERMO4 Run Time: 19:47 Method: 6010C
 File ID: T4.061417.194725 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.00800	0.0160	0.00800	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5338633
 Report generated 06/15/2017 10:42



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-06
Instrument ID: ICP-THERMO4 Run Time: 13:37 Method: 6010C
File ID: T4.061417.133719 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Selenium	.4	0.410	102	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-13
Instrument ID: ICP-THERMO4 Run Time: 14:09 Method: 6010C
File ID: T4.061417.140942 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.406	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-28
Instrument ID: ICP-THERMO4 Run Time: 18:24 Method: 6010C
File ID: T4.061417.182402 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.400	mg/L	99.9	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-30
Instrument ID: ICP-THERMO4 Run Time: 19:07 Method: 6010C
File ID: T4.061417.190737 Analyst: KKB QC Key: DOD4
Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.401	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-32
 Instrument ID: ICP-THERMO4 Run Time: 19:43 Method: 6010C
 File ID: T4.061417.194358 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.400	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-08
 Instrument ID: ICP-THERMO4 Run Time: 13:44 Method: 6010C
 File ID: T4.061417.134450 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0139	mg/L	86.7	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-21
 Instrument ID: ICP-THERMO4 Run Time: 16:23 Method: 6010C
 File ID: T4.061417.162315 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0168	mg/L	105	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617982-34
 Instrument ID: ICP-THERMO4 Run Time: 19:51 Method: 6010C
 File ID: T4.061417.195111 Analyst: KKB QC Key: DOD4
 Workgroup (AAB#): WG617838 Cal ID: ICP-TH - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0154	mg/L	96.3	70 - 130	

* Exceeds LIMITS Criteria



Login number: L17060484
 Instrument ID: ICP-THERMO4
 Sol. A : WG617982-11
 Sol. AB : WG617982-12

File ID: T4.061417.140214
 File ID: T4.061417.140600

Workgroup (AAB#): WG617838
 Method: 6010C
 Units: mg/L
 Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Selenium	NS	-0.0000100	NS	0.250	0.250	100	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login Number: L17060484
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	AG	AL	AS	B	BA
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0.0000410	0	0	0
ARSENIC	189.00	0	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0.0145	0	-0.0000800
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0	0	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0.000378	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	-0.000289	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0.0000140	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	-0.0000120	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	0
ZINC	206.20	0	0.0000320	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338626
 Report generated: 06/15/2017 10:36



Login Number: L17060484
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	BE	CA	CD	CO	CR
ALUMINUM	308.20	0	0	0	-0.000820	0
ANTIMONY	206.80	0	0	0	0	0.0260
ARSENIC	189.00	0	0	0	0	-0.00730
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0.00343	0
CADMIUM	228.80	0	0	0	-0.00390	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	-0.000200
COPPER	224.70	0	0	0	0.0000770	-0.00100
IRON	261.10	0	0	0	0	-0.00100
LEAD	220.30	0	0	0	-0.0000130	-0.000132
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0.0000500
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	-0.000860	0
PHOSPHORUS	214.90	0	0	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0.00000500	0	0	0
THALLIUM	190.80	0	0	0	0.00240	0.000276
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	-0.00350
ZINC	206.20	0	0	0	0	-0.00180
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338626
 Report generated: 06/15/2017 10:36



Login Number: L17060484

Date: 01/04/2017

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	CU	FE	K	LI	MG
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0.0000560	0	0	0
ARSENIC	189.00	0	-0.0000490	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0.000648	0	0	0
CADMIUM	228.80	0	-0.00000500	0	0	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0.0000400	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0	0.00139	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0.000609	0	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0.0000220
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0.0000420	0	0	0
PHOSPHORUS	214.90	0.0390	0.000900	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	-0.000118	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	-0.000200	0	0	0
VANADIUM	292.40	0	0.0000700	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338626
 Report generated: 06/15/2017 10:36



Login Number: L17060484
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	MN	MO	NA	NI	P
ALUMINUM	308.20	0	0.0163	0	0	0
ANTIMONY	206.80	0	0.000910	0	-0.00190	0
ARSENIC	189.00	0	0.000139	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	-0.00190	0	0	0
CADMIUM	228.80	0	0.0000320	0	-0.000770	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0.000360	0	0	0	0
COBALT	228.60	0	-0.00200	0	0.000100	0
COPPER	224.70	0	0.00160	0	-0.0123	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	-0.000610	0	0.000110	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	-0.00290	-0.0230	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0.0000300	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0.00710	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0.000600	0.000580	0	0	0
SILICON	212.40	0	-0.354	0	0	0
SILVER	328.10	0	-0.0000100	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0.00100	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	-0.000153	0	0	0
VANADIUM	292.40	-0.000200	-0.00160	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338626
 Report generated: 06/15/2017 10:36



Login Number: L17060484
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	PB	SB	SE	SI	SN
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0	0	0	-0.0320
ARSENIC	189.00	0	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0	0	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0.00440	0	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	0	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	0	0	0	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.90	0	0	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338626
 Report generated: 06/15/2017 10:36



Login Number: L17060484
 Instrument ID: ICP-THERMO4

Date: 01/04/2017
 Method: 6010C

Analyte	Wave Length	SR	TI	TL	V	ZN
ALUMINUM	308.20	0	0	0	0.0720	0
ANTIMONY	206.80	0	0.000500	0	-0.00360	0
ARSENIC	189.00	0	0	0	0.000107	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	-0.00000700	0	0.000990	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0	0.000102	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0.0000550	0	0	0
COBALT	228.60	0	0.00170	0	0.0000200	0
COPPER	224.70	0	0.000269	0	0	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	0	0	-0.000126	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	0	-0.00290	0	0	0
MANGANESE	257.60	0	0	0	0	0
MOLYBDENUM	202.00	0	0	0	-0.000110	0
NICKEL	231.60	0	0	0	0	0
PHOSPHORUS	214.90	0	0	0	-0.00100	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.10	0	-0.000720	0	-0.000260	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	-0.00100	0	-0.0420	0
TIN	189.90	0	-0.00190	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0.000820	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338626
 Report generated: 06/15/2017 10:36



Login Number: L17060484

Date: 01/04/2017

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	ZR
ALUMINUM	308.20	0
ANTIMONY	206.80	0
ARSENIC	189.00	0
BARIUM	455.40	0
BERYLLIUM	313.10	0
BORON	249.60	0
CADMIUM	228.80	0
CALCIUM	422.60	0
CHROMIUM	267.70	0
COBALT	228.60	0
COPPER	224.70	0
IRON	261.10	0
LEAD	220.30	0
LITHIUM	670.70	0
MAGNESIUM	279.10	0
MANGANESE	257.60	0
MOLYBDENUM	202.00	0
NICKEL	231.60	0
PHOSPHORUS	214.90	0
POTASSIUM	766.40	0
SELENIUM	196.10	0
SILICON	212.40	0
SILVER	328.10	0
SODIUM	589.50	0
STRONTIUM	407.70	0
THALLIUM	190.80	0
TIN	189.90	0
TITANIUM	337.20	0
VANADIUM	292.40	0
ZINC	206.20	0
ZIRCONIUM	339.10	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5338626
 Report generated: 06/15/2017 10:36



Login Number: L17060484 Date: 04/05/2017
 Instrument ID: ICP-THERMO4 Method: 6010C

Analyte	Integration Time (Sec.)	Concentration (ug/L)
Aluminum	10.00	900.0
Antimony	20.00	45.0
Arsenic	10.00	45.0
Barium	10.00	45.0
Beryllium	10.00	1.8
Boron	20.00	45.0
Cadmium	20.00	4.5
Calcium	8.00	270.0
Chromium	20.00	36.0
Cobalt	20.00	45.0
Copper	20.00	180.0
Iron	8.00	720.0
Lead	20.00	225.0
Lithium	8.00	36.0
Magnesium	8.00	900.0
Manganese	10.00	36.0
Molybdenum	20.00	18.0
Nickel	20.00	90.0
Phosphorus	20.00	180.0
Potassium	8.00	360.0
Selenium	20.00	90.0
Silicon	20.00	36.0
Silver	10.00	4.5
Sodium	8.00	270.0
Strontium	8.00	9.0
Thallium	20.00	18.0
Tin	20.00	45.0
Titanium	8.00	45.0
Vanadium	20.00	27.0
Zinc	20.00	45.0
Zirconium	10.00	45.0

Comments:

All analytes passed acceptance criteria at the specified concentration.



2.3 Metals Data

2.3.2 Metals ICP-MS Data

2.3.2.1 Summary Data

Lab Report #: L17060484

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 08:11
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/14/2017 09:42
Workgroup #: WG617731	Analyst: JYH	Run Date: 06/14/2017 11:39
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: NI.061417.113913
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Silver, Total	7440-22-4	0.00100	U	0.00200	0.00100	0.000500
J	Estimated value ; the analyte concentration was less than the LOQ.					
J	Estimated value ; the analyte concentration was greater than the highest standard					
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060484

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 08:11
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/14/2017 14:03
Workgroup #: WG617731	Analyst: JYH	Run Date: 06/14/2017 14:44
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: NI.061417.144416
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Lead, Total	7439-92-1	0.000600	J	0.00200	0.00100	0.000500
J	Estimated value ; the analyte concentration was less than the LOQ.					
J	Estimated value ; the analyte concentration was greater than the highest standard					
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060484

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 3015A	Prep Date: 06/13/2017 08:11
Matrix: Water	Analytical Method: 6020A	Cal Date: 06/14/2017 09:42
Workgroup #: WG617731	Analyst: JYH	Run Date: 06/14/2017 11:45
Collect Date: 06/07/2017 15:00	Dilution: 5	File ID: NI.061417.114524
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Barium, Total	7440-39-3	0.287		0.0300	0.0150	0.00750
J	Estimated value ; the analyte concentration was less than the LOQ.					
U	Analyte was not detected. The concentration is below the reported LOD.					

2.3.2.2 QC Summary Data

Example 6020 Calculations
Perkin Elmer ELAN 6100

1.0 Initial Calibration (ICAL) Parameters

The system performs linear regression from data consisting of a blank and three standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (ug/L)

Vf = Final volume

Vi = Initial volume

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in (ug/L)

Example:

0.1

100

40

1

0.25

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:

Cs = Concentration computed by the data system (ug/L)

Vf = Final volume

Vi = Initial volume

D = Dilution factor as a multiplier (10X = 10)

Cx = Concentration of element in (ug/kg)

Example:

0.1

200

0.5

1

40

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

$Cdry$ = Concentration calculated as dry weight (ug/kg)

Example:

40

80

50

50 ug/kg = 0.050 mg/kg

Perkin Elmer ELAN ICP/MS

STANDARDS KEY

QC Std 1 - ICV

QC Std 2 - ICB

QC Std 3 - LLICV

QC Std 4 - ICSA

QC Std 5 - ICSAB

QC Std 6 - CCV

QC Std 7 - CCB

QC Std 8 - LLCCV

Calibration Solutions

Analyte	Stock Conc. (mg/L)	S1 (mg/L)	S2 (mg/L)	S3 (mg/L)	S4 (mg/L)
Al	10	0	0.0004	0.05	0.1
Sb	10	0	0.0004	0.05	0.1
As	10	0	0.0004	0.05	0.1
Ba	10	0	0.0004	0.05	0.1
Be	10	0	0.0004	0.05	0.1
Ca	1000	0	0.04	5	10
Cd	10	0	0.0004	0.05	0.1
Cr	10	0	0.0004	0.05	0.1
Co	10	0	0.0004	0.05	0.1
Cu	10	0	0.0004	0.05	0.1
Fe	1000	0	0.04	5	10
Pb	10	0	0.0004	0.05	0.1
Mg	1000	0	0.04	5	10
Mn	10	0	0.0004	0.05	0.1
Ni	10	0	0.0004	0.05	0.1
K	1000	0	0.04	5	10
Se	10	0	0.0004	0.05	0.1
Ag	10	0	0.0004	0.05	0.1
Na	1000	0	0.04	5	10
Tl	10	0	0.0004	0.05	0.1
V	10	0	0.0004	0.05	0.1
U	1000	0	0.0004	0.05	0.1
Zn	10	0	0.0004	0.05	0.1

Workgroup: WG617566
 Analyst: VC
 Spike Analyst: VC
 Run Date: 06/13/2017 08:11
 Method: 3015A
 Balance: BAL016
 Instrument: MW-4
 Instrument Start: 06/13/2017 08:16

SOP: ME407 Revision 19
 Spike Solution: STD80296
 Spike Witness: REK
 40 & 50 ML. DIGESTION TUCOA19764
 HNO3 Lot #: COA19650
 MS Filters- fisher-Lot#rRGT40013

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG617566-02	BLANK	1	20 mL	50 mL	182.948 g	182.943 g	
2	WG617566-03	LCS	1	20 mL	50 mL	183.209 g	183.203 g	.25 mL
3	L17060482-01	SAMP	1	20 mL	50 mL	182.359 g	182.339 g	
4	L17060484-01	SAMP	1	20 mL	50 mL	182.47 g	182.46 g	
5	L17060570-01	SAMP	1	20 mL	50 mL	182.258 g	182.256 g	
6	L17060570-02	SAMP	1	20 mL	50 mL	183.162 g	183.13 g	
7	L17060570-04	SAMP	1	20 mL	50 mL	182.017 g	182.004 g	
8	L17060570-05	SAMP	1	20 mL	50 mL	183.483 g	183.463 g	
9	L17060570-07	SAMP	1	20 mL	50 mL	184.275 g	184.267 g	
10	L17060570-08	SAMP	1	20 mL	50 mL	182.98 g	182.991 g	
11	L17060570-09	SAMP	1	20 mL	50 mL	183.35 g	183.347 g	
12	L17060574-01	SAMP	1	20 mL	50 mL	184.409 g	184.391 g	
13	L17060574-02	SAMP	1	20 mL	50 mL	181.413 g	181.417 g	
14	L17060574-03	SAMP	1	20 mL	50 mL	184.652 g	184.64 g	
15	L17060574-04	SAMP	1	20 mL	50 mL	182.495 g	182.477 g	
16	L17060574-05	SAMP	1	20 mL	50 mL	184.41 g	184.386 g	
17	L17060575-01	SAMP	1	20 mL	50 mL	183.69 g	183.69 g	
18	L17060575-02	SAMP	1	20 mL	50 mL	185.997 g	185.99 g	
19	L17060575-03	SAMP	1	20 mL	50 mL	183.663 g	183.655 g	
20	L17060575-04	SAMP	1	20 mL	50 mL	180.481 g	180.48 g	
21	L17060575-05	SAMP	1	20 mL	50 mL	185.389 g	185.375 g	
22	WG617566-01	REF	1	20 mL	50 mL	181.359 g	181.356 g	
23	L17060575-06	SAMP	1	20 mL	50 mL	181.359 g	181.356 g	
24	WG617566-04	MS	1	20 mL	50 mL	183.938 g	183.924 g	.25 mL
25	WG617566-05	MSD	1	20 mL	50 mL	181.776 g	181.763 g	.25 mL

L17060570-01	FILTERED DIGESTATE
L17060570-04	FILTERED DIGESTATE

Analyst: Veeha Collier

Reviewer: [Signature]



Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 061417B.REP

Analyst1: JYH Analyst2: N/A

Method: 6020/6020A/200.8 SOP: ME700A Rev: 3

Maintenance Log ID: _____

Calibration Std: STD81946 ICV Std: STD82261 Post Spike: STD79415

ICSA: STD82264 IC SAB: STD82265 Int. Std: RGT39300

CCV: STD81947 LLCCV: STD82263 Tuning Sol : STD82266

Stannous : _____ Hydroxylamine : _____

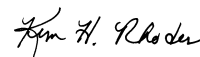
Workgroups: 617719,617731

Comments:

--

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.061417.092938	Blank	Blank		1		06/14/17 09:29
2	NI.061417.093244	WG617829-01	Calibration Point		1		06/14/17 09:32
3	NI.061417.093549	WG617829-02	Calibration Point		1		06/14/17 09:35
4	NI.061417.093855	WG617829-03	Calibration Point		1		06/14/17 09:38
5	NI.061417.094201	WG617829-04	Calibration Point		1		06/14/17 09:42
6	NI.061417.094508	WG617829-05	Initial Calibration Verification		1		06/14/17 09:45
7	NI.061417.094815	WG617829-06	Initial Calib Blank		1		06/14/17 09:48
8	NI.061417.095122	WG617829-07	Low Level Initial Calibration V		1		06/14/17 09:51
9	NI.061417.095427	WG617829-08	Interference Check		1		06/14/17 09:54
10	NI.061417.095733	WG617829-09	Interference Check		1		06/14/17 09:57
11	NI.061417.100041	WG617829-10	CCV		1		06/14/17 10:00
12	NI.061417.100346	WG617829-11	CCB		1		06/14/17 10:03
13	NI.061417.100707	WG617383-02	Method/Prep Blank	.25/100	1		06/14/17 10:07
14	NI.061417.101013	WG617383-03	Laboratory Control S	.25/100	1		06/14/17 10:10
15	NI.061417.101318	WG617383-01	Reference Sample		200	L17060509-01	06/14/17 10:13
16	NI.061417.101623	WG617383-04	Matrix Spike	.254/100	200	L17060509-01	06/14/17 10:16
17	NI.061417.101928	WG617383-05	Matrix Spike Duplica	.251/100	200	L17060509-01	06/14/17 10:19
18	NI.061417.102234	L17060490-01	GS203QGSS060717S	.25/100	1		06/14/17 10:22
19	NI.061417.102539	WG617719-01	Post Digestion Spike		1	L17060490-01	06/14/17 10:25
20	NI.061417.102844	WG617719-02	Serial Dilution		5	L17060490-01	06/14/17 10:28
21	NI.061417.103150	WG617719-02	Serial Dilution		25	L17060490-01	06/14/17 10:31
22	NI.061417.103456	WG617719-02	Serial Dilution		125	L17060490-01	06/14/17 10:34
23	NI.061417.103803	WG617829-12	CCV		1		06/14/17 10:38
24	NI.061417.104108	WG617829-13	CCB		1		06/14/17 10:41
25	NI.061417.104415	WG617391-02	Method/Prep Blank		1		06/14/17 10:44
26	NI.061417.104721	WG617391-03	Laboratory Control S		1		06/14/17 10:47
27	NI.061417.105025	WG617391-01	Reference Sample		1	L17060490-01	06/14/17 10:50
28	NI.061417.105331	WG617391-04	Matrix Spike		1	L17060490-01	06/14/17 10:53
29	NI.061417.105636	WG617391-05	Matrix Spike Duplica		1	L17060490-01	06/14/17 10:56
30	NI.061417.105942	WG617720-01	Post Digestion Spike		1	L17060490-01	06/14/17 10:59
31	NI.061417.110549	WG617829-14	CCV		1		06/14/17 11:05
32	NI.061417.110854	WG617829-15	CCB		1		06/14/17 11:08
33	NI.061417.112040	WG617566-02	Method/Prep Blank	20/50	1		06/14/17 11:20
34	NI.061417.112345	WG617566-03	Laboratory Control S	20/50	1		06/14/17 11:23

Page: 1 Approved: June 16, 2017




Microbac Laboratories Inc.

Instrument Run Log

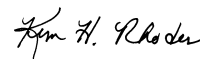
Instrument: ICP-MS2 Dataset: 061417B.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD81946 ICV Std: STD82261 Post Spike: STD79415
 ICSA: STD82264 ICSAB: STD82265 Int. Std: RGT39300
 CCV: STD81947 LLCCV: STD82263 Tuning Sol : STD82266
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617719,617731

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.061417.112651	WG617566-01	Reference Sample		1	L17060575-06	06/14/17 11:26
36	NI.061417.112956	WG617566-04	WG617566-01	20/50	1	L17060575-06	06/14/17 11:29
37	NI.061417.113302	WG617566-05	Matrix Spike Duplica	20/50	1	L17060575-06	06/14/17 11:33
38	NI.061417.113607	L17060482-01	LH18/24-SP140-7447-GRAB	20/50	1		06/14/17 11:36
39	NI.061417.113913	L17060484-01	LH18/24-SP650-6447-GRAB	20/50	1		06/14/17 11:39
40	NI.061417.114219	WG617731-01	Post Digestion Spike		1	L17060484-01	06/14/17 11:42
41	NI.061417.114524	L17060484-01	LH18/24-SP650-6447-GRAB		5		06/14/17 11:45
42	NI.061417.114829	WG617731-02	Serial Dilution		25	L17060484-01	06/14/17 11:48
43	NI.061417.115137	WG617829-16	CCV		1		06/14/17 11:51
44	NI.061417.115442	WG617829-17	CCB		1		06/14/17 11:54
45	NI.061417.115749	L17060570-01	102-060917	20/50	1		06/14/17 11:57
46	NI.061417.120054	L17060570-02	129-060917	20/50	1		06/14/17 12:00
47	NI.061417.120400	L17060570-04	120F-060917	20/50	1		06/14/17 12:04
48	NI.061417.120706	L17060570-05	123-060917	20/50	1		06/14/17 12:07
49	NI.061417.121010	L17060570-07	125F-060917	20/50	1		06/14/17 12:10
50	NI.061417.121316	L17060570-08	109-060917	20/50	1		06/14/17 12:13
51	NI.061417.121621	L17060570-09	18CPTMW24-060917	20/50	1		06/14/17 12:16
52	NI.061417.121927	L17060574-01	7060394-01	20/50	1		06/14/17 12:19
53	NI.061417.122232	L17060574-02	7060394-02	20/50	1		06/14/17 12:22
54	NI.061417.122537	L17060574-03	7060394-03	20/50	1		06/14/17 12:25
55	NI.061417.122844	WG617829-18	CCV		1		06/14/17 12:28
56	NI.061417.123150	WG617829-19	CCB		1		06/14/17 12:31
57	NI.061417.123527	L17060574-04	7060394-04	20/50	1		06/14/17 12:35
58	NI.061417.123833	L17060574-05	7060394-05	20/50	1		06/14/17 12:38
59	NI.061417.124138	L17060575-01	7060395-01	20/50	1		06/14/17 12:41
60	NI.061417.124444	L17060575-02	7060395-02	20/50	1		06/14/17 12:44
61	NI.061417.124749	L17060575-03	7060395-03	20/50	1		06/14/17 12:47
62	NI.061417.125055	L17060575-04	7060395-04	20/50	1		06/14/17 12:50
63	NI.061417.125400	L17060575-05	7060395-05	20/50	1		06/14/17 12:54
64	NI.061417.125705	L17060570-09	18CPTMW24-060917	20/50	50		06/14/17 12:57
65	NI.061417.130010	L17060570-01	102-060917	20/50	50		06/14/17 13:00
66	NI.061417.130317	WG617829-20	CCV		1		06/14/17 13:03
67	NI.061417.130623	WG617829-21	CCB		1		06/14/17 13:06
68	NI.061417.130929	WG617829-22	Low Level Continuing Calibra		1		06/14/17 13:09

Page: 2 Approved: June 16, 2017




Microbac Laboratories Inc.

Instrument Run Log

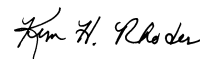
Instrument: ICP-MS2 Dataset: 061417C.REP
Analyst1: JYH Analyst2: N/A
Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
Maintenance Log ID: _____
Calibration Std: STD81946 ICV Std: STD82261 Post Spike: STD79415
ICSA: STD82264 ICSAB: STD82265 Int. Std: RGT39300
CCV: STD81947 LLCCV: STD82263 Tuning Sol : STD82266
Stannous : _____ Hydroxylamine : _____

Workgroups: 617731

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.061417.135135	Blank	Blank		1		06/14/17 13:51
2	NI.061417.135441	WG617953-01	Calibration Point		1		06/14/17 13:54
3	NI.061417.135747	WG617953-02	Calibration Point		1		06/14/17 13:57
4	NI.061417.140052	WG617953-03	Calibration Point		1		06/14/17 14:00
5	NI.061417.140357	WG617953-04	Calibration Point		1		06/14/17 14:03
6	NI.061417.140704	WG617953-05	Initial Calibration Verification		1		06/14/17 14:07
7	NI.061417.141012	WG617953-06	Initial Calib Blank		1		06/14/17 14:10
8	NI.061417.141319	WG617953-07	Low Level Initial Calibration V		1		06/14/17 14:13
9	NI.061417.141624	WG617953-08	Interference Check		1		06/14/17 14:16
10	NI.061417.141929	WG617953-09	Interference Check		1		06/14/17 14:19
11	NI.061417.142236	WG617953-10	CCV		1		06/14/17 14:22
12	NI.061417.142541	WG617953-11	CCB		1		06/14/17 14:25
13	NI.061417.142848	WG617566-02	Method/Prep Blank	20/50	1		06/14/17 14:28
14	NI.061417.143154	WG617566-03	Laboratory Control S	20/50	1		06/14/17 14:31
15	NI.061417.143459	L17060575-06	7060395-06		1	WG617566-01	06/14/17 14:34
16	NI.061417.143805	WG617566-04	WG617566-01	20/50	1	L17060575-06	06/14/17 14:38
17	NI.061417.144111	WG617566-05	Matrix Spike Duplica	20/50	1	L17060575-06	06/14/17 14:41
18	NI.061417.144416	L17060484-01	LH18/24-SP650-6447-GRAB	20/50	1		06/14/17 14:44
19	NI.061417.144721	WG617731-01	Post Digestion Spike		1	L17060484-01	06/14/17 14:47
20	NI.061417.145027	WG617731-02	Serial Dilution		5	L17060484-01	06/14/17 14:50
21	NI.061417.145333	WG617731-02	Serial Dilution		25	L17060484-01	06/14/17 14:53
22	NI.061417.145640	WG617953-12	CCV		1		06/14/17 14:56
23	NI.061417.145945	WG617953-13	CCB		1		06/14/17 14:59
24	NI.061417.150252	L17060570-01	102-060917	20/50	1		06/14/17 15:02
25	NI.061417.150558	L17060570-02	129-060917	20/50	1		06/14/17 15:05
26	NI.061417.150903	L17060570-04	120F-060917	20/50	1		06/14/17 15:09
27	NI.061417.151209	L17060570-05	123-060917	20/50	1		06/14/17 15:12
28	NI.061417.151514	L17060570-07	125F-060917	20/50	1		06/14/17 15:15
29	NI.061417.151820	L17060570-08	109-060917	20/50	1		06/14/17 15:18
30	NI.061417.152125	L17060570-09	18CPTMW24-060917	20/50	1		06/14/17 15:21
31	NI.061417.152431	L17060574-01	7060394-01	20/50	1		06/14/17 15:24
32	NI.061417.152737	L17060574-02	7060394-02	20/50	1		06/14/17 15:27
33	NI.061417.153042	L17060574-03	7060394-03	20/50	1		06/14/17 15:30
34	NI.061417.153349	WG617953-14	CCV		1		06/14/17 15:33

Page: 1 Approved: June 16, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 061417C.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____

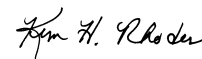
Calibration Std: STD81946 ICV Std: STD82261 Post Spike: STD79415
 ICSA: STD82264 ICSAB: STD82265 Int. Std: RG739300
 CCV: STD81947 LLCCV: STD82263 Tuning Sol : STD82266
 Stannous : _____ Hydroxylamine : _____

Workgroups: 617731

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.061417.153655	WG617953-15	CCB		1		06/14/17 15:36
36	NI.061417.154002	L17060574-04	7060394-04	20/50	1		06/14/17 15:40
37	NI.061417.154308	L17060574-05	7060394-05	20/50	1		06/14/17 15:43
38	NI.061417.154613	L17060575-01	7060395-01	20/50	1		06/14/17 15:46
39	NI.061417.154918	L17060575-02	7060395-02	20/50	1		06/14/17 15:49
40	NI.061417.155224	L17060575-03	7060395-03	20/50	1		06/14/17 15:52
41	NI.061417.155529	L17060575-04	7060395-04	20/50	1		06/14/17 15:55
42	NI.061417.155834	L17060575-05	7060395-05	20/50	1		06/14/17 15:58
43	NI.061417.160141	WG617953-16	CCV		1		06/14/17 16:01
44	NI.061417.160446	WG617953-17	CCB		1		06/14/17 16:04
45	NI.061417.160753	WG617953-18	Low Level Continuing Calibra		1		06/14/17 16:07

Page: 2 Approved: June 16, 2017




Microbac Laboratories Inc.

Data Checklist

Date: 14-JUN-2017
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A/200.8
 Instrument: ICP-MS
 Curve Workgroup: 617829
 Runlog ID: 82741
 Analytical Workgroups: 617719,617731

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	490,509,482,484,570,574,575
Client Forms	X
Level X	
Level 3	
Level 4	490,482,484,570,574
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JYH
Secondary Reviewer	KHR
Comments	

Primary Reviewer:

Secondary Reviewer:
16-JUN-2017



Microbac Laboratories Inc.

Data Checklist

Date: 14-JUN-2017
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A/200.8
 Instrument: ICP-MS
 Curve Workgroup: 617953
 Runlog ID: 82764
 Analytical Workgroups: 617731

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	
Client Forms	X
Level X	
Level 3	
Level 4	484,570,574
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JYH
Secondary Reviewer	KHR
Comments	

Primary Reviewer:

Secondary Reviewer:
16-JUN-2017



Analytical Method:6020A
Login Number:L17060484

AAB#:WG617731

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6447-GRAB	01	06/07/17					06/13/2017	5.7	180		06/14/17	6.9	180	
LH18/24-SP650-6447-GRAB	01	06/07/17					06/13/2017	5.7	180		06/14/17	6.9	180	
LH18/24-SP650-6447-GRAB	01	06/07/17					06/13/2017	5.7	180		06/14/17	7	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5336860
Report generated 06/15/2017 09:13



METHOD BLANK SUMMARY

Login Number: L17060484 Work Group: WG617731
 Blank File ID: NI.061417.112040 Blank Sample ID: WG617566-02
 Prep Date: 06/13/17 08:11 Instrument ID: ICP-MS2
 Analyzed Date: 06/14/17 11:20 Method: 6020A
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617566-03	NI.061417.112345	06/14/17 11:23	01
LH18/24-SP650-6447-GRAB	L17060484-01	NI.061417.113913	06/14/17 11:39	01
LH18/24-SP650-6447-GRAB	L17060484-01	NI.061417.114524	06/14/17 11:45	DL01
LCS	WG617566-03	NI.061417.143154	06/14/17 14:31	02
LH18/24-SP650-6447-GRAB	L17060484-01	NI.061417.144416	06/14/17 14:44	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5336861
 Report generated 06/15/2017 09:20



METHOD BLANK SUMMARY

Login Number: L17060484 Work Group: WG617731
 Blank File ID: NI.061417.142848 Blank Sample ID: WG617566-02
 Prep Date: 06/13/17 08:11 Instrument ID: ICP-MS2
 Analyzed Date: 06/14/17 14:28 Method: 6020A
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617566-03	NI.061417.112345	06/14/17 11:23	01
LH18/24-SP650-6447-GRAB	L17060484-01	NI.061417.113913	06/14/17 11:39	01
LH18/24-SP650-6447-GRAB	L17060484-01	NI.061417.114524	06/14/17 11:45	DL01
LCS	WG617566-03	NI.061417.143154	06/14/17 14:31	02
LH18/24-SP650-6447-GRAB	L17060484-01	NI.061417.144416	06/14/17 14:44	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5336861
 Report generated 06/15/2017 09:20



Login Number: L17060484 Prep Date: 06/13/17 08:11 Sample ID: WG617566-02
 Instrument ID: ICP-MS2 Run Date: 06/14/17 11:20 Prep Method: 3015A
 File ID: NI.061417.112040 Analyst: JYH Method: 6020A
 Workgroup (AAB#): WG617731 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-MS - 14-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Barium, Total	0.00150	0.00600	0.00150	1	U
Silver, Total	0.000500	0.00200	0.000500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5336862
 15-JUN-2017 09:20



Login Number: L17060484 Prep Date: 06/13/17 08:11 Sample ID: WG617566-02
 Instrument ID: ICP-MS2 Run Date: 06/14/17 14:28 Prep Method: 3015A
 File ID: NI.061417.142848 Analyst: JYH Method: 6020A
 Workgroup (AAB#): WG617731 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-MS-14-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Lead, Total	0.000500	0.00200	0.000500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5336862
 15-JUN-2017 09:20



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617566-03
Instrument ID: ICP-MS2 Run Time: 11:23 Prep Method: 3015A
File ID: NI.061417.112345 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG617731 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD80296 Cal ID: ICP-MS - 14-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Barium, Total	0.125	0.125	100	80 - 120	
Silver, Total	0.125	0.116	93.0	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5336863
Report generated: 06/15/2017 09:20



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617566-03
Instrument ID: ICP-MS2 Run Time: 14:31 Prep Method: 3015A
File ID: NI.061417.143154 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG617731 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD80296 Cal ID: ICP-MS - 14-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Lead, Total	0.125	0.119	95.4	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5336863
Report generated: 06/15/2017 09:20



Loginnum: L17060484 Cal ID: ICP-MS2- Worknum: WG617731
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG617566-01 File ID: NI.061417.112651 Dil: 1 Matrix: WATER
 Sample ID: WG617566-04 MS File ID: NI.061417.112956 Dil: 1 Units: mg/L
 Sample ID: WG617566-05 MSD File ID: NI.061417.113302 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Barium	0.0392	0.125	0.155	92.4	0.125	0.156	93.2	0.596	80 - 120	20	
Silver	ND	0.125	0.113	90.5	0.125	0.113	90.4	0.173	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Loginnum: L17060484 Cal ID: ICP-MS2- Worknum: WG617731
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG617566-01 File ID: NI.061417.143459 Dil: 1 Matrix: WATER
 Sample ID: WG617566-04 MS File ID: NI.061417.143805 Dil: 1 Units: mg/L
 Sample ID: WG617566-05 MSD File ID: NI.061417.144111 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Lead	ND	0.125	0.120	96.3	0.125	0.121	97.0	0.680	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L17060484 **Worknum:** WG617731
Instrument: ICP-MS2 **Method:** 6020A
Serial Dil: WG617731-02 **File ID:** NI.061417.145027 **Dil:** 5 **Units:** ug/L
Sample: L17060484-01 **File ID:** NI.061417.144416 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Barium	113		116		2.71	
Lead	0.240	F	ND	U		
Silver	ND	U	ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 100 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 100 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5336858

06/15/2017 09:20



Microbac Laboratories Inc.
Serial Dilution Report

Login: L17060484 **Worknum:** WG617731
Instrument: ICP-MS2 **Method:** 6020A
Serial Dil: WG617731-02 **File ID:** NI.061417.114524 **Dil:** 5 **Units:** ug/L
Sample: L17060484-01 **File ID:** NI.061417.113913 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Barium	112		115		2.67	
Lead	0.373	F	1.19	F	219.00	
Silver	ND	U	ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 100 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 100 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5336858

06/15/2017 09:20



Microbac Laboratories Inc.
Serial Dilution Report

Login: L17060484 **Worknum:** WG617731
Instrument: ICP-MS2 **Method:** 6020A
Serial Dil: WG617731-02 **File ID:** NI.061417.114829 **Dil:** 25 **Units:** ug/L
Sample: L17060484-01 **File ID:** NI.061417.114524 **Dil:** 5

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Barium	115	X	120	X	4.87	
Lead	1.19	F	ND	U		
Silver	ND	U	ND	U		

U = Result is below MDL.

F = Result is greater than or equal to MDL and less than the RL.

X = Result is greater than or equal to RL and less than 100 times the MDL.

E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 100 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 5336858

06/15/2017 09:20



Sample Login ID: L17060484

Worknum: WG617731

Instrument ID: ICP-MS2

Method: 6020A

Post Spike ID: WG617731-01

File ID: NI.061417.114219

Dil: 1

Units: ug/L

Sample ID: L17060484-01

File ID: NI.061417.113913

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
BARIUM	161		112		50	98.4	75 - 125	
LEAD	51.6		0.373	F	50	102.5	75 - 125	
SILVER	45.4		0	U	50	90.9	75 - 125	

N = % Recovery exceeds control limits

F = Result is between MDL and RL

U = Sample result is below MDL. A value of zero is used in the calculation



Sample Login ID: L17060484

Worknum: WG617731

Instrument ID: ICP-MS2

Method: 6020A

Post Spike ID: WG617731-01

File ID: NI.061417.144721

Dil: 1

Units: ug/L

Sample ID: L17060484-01

File ID: NI.061417.144416

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
BARIUM	168		113		50	110.2	75 - 125	
LEAD	51.8		0.240	F	50	103.0	75 - 125	
SILVER	48.6		0	U	50	97.2	75 - 125	

N = % Recovery exceeds control limits

F = Result is between MDL and RL

U = Sample result is below MDL. A value of zero is used in the calculation



Microbac Laboratories Inc.
Initial Calibration Summary

00857857

Login: L17060484 Workgroup (AAB#): WG617731
 Analytical Method: 6020A Instrument ID: ICP-MS2
 ICAL Worknum: WG617829 Initial Calibration Date: 14-JUN-2017 09:42

	WG617829-01		WG617829-02		WG617829-03		WG617829-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
BARIUM	0	24.7	.4	86.7	50	54700	100	107000	.999998	
LEAD	0	3360	.4	3890	50	616000	100	1200000	.999999	
SILVER	0	83.3	.4	279	50	202000	100	393000	.999995	

INT = Instrument intensity
 R = Coefficient of correlation
 Q = Data Qualifier
 * = Out of Compliance; R < 0.995



Microbac Laboratories Inc.
Initial Calibration Summary

00857858

Login: L17060484 Workgroup (AAB#): WG617731
Analytical Method: 6020A Instrument ID: ICP-MS2
ICAL Worknum: WG617953 Initial Calibration Date: 14-JUN-2017 14:03

	WG617953-01		WG617953-02		WG617953-03		WG617953-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
BARIUM	0	28.0	.4	93.3	50	55700	100	108000	.999954	
LEAD	0	1380	.4	2060	50	653000	100	1270000	.99998	
SILVER	0	89.7	.4	278	50	203000	100	393000	.999925	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

INT_CAL_ICP - Modified 03/06/2008
PDF File ID: 5336867
Report generated: 15-JUN-2017 09:14



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617829-06
Instrument ID: ICP-MS2 Run Time: 09:48 Method: 6020A
File ID: NI.061417.094815 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG617731 Cal ID: ICP-MS2 - 14-JUN-17
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
SILVER	.2	.8	.2	U
BARIUM	.6	2.4	.6	U
LEAD	.2	.8	.2	U

U = Result is less than 2 x MDL
F = Result is between MDL and 2 x MDL
* = Result is above 2 x MDL



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617953-06
Instrument ID: ICP-MS2 Run Time: 14:10 Method: 6020A
File ID: NI.061417.141012 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG617731 Cal ID: ICP-MS2 - 14-JUN-17
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
SILVER	.2	.8	.2	U
BARIUM	.6	2.4	.6	U
LEAD	.2	.8	.2	U

U = Result is less than 2 x MDL
F = Result is between MDL and 2 x MDL
* = Result is above 2 x MDL



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617829-11
 Instrument ID: ICP-MS2 Run Time: 10:03 Method: 6020A
 File ID: NI.061417.100346 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.600	2.40	0.600	U
Lead	0.200	0.800	0.200	U
Silver	0.200	0.800	0.200	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5336872
 Report generated 06/15/2017 09:14



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617829-15
 Instrument ID: ICP-MS2 Run Time: 11:08 Method: 6020A
 File ID: NI.061417.110854 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.600	2.40	0.600	U
Lead	0.200	0.800	0.200	U
Silver	0.200	0.800	0.200	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617829-17
 Instrument ID: ICP-MS2 Run Time: 11:54 Method: 6020A
 File ID: NI.061417.115442 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.600	2.40	0.600	U
Lead	0.200	0.800	0.200	U
Silver	0.200	0.800	0.200	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617953-11
 Instrument ID: ICP-MS2 Run Time: 14:25 Method: 6020A
 File ID: NI.061417.142541 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.600	2.40	0.600	U
Lead	0.200	0.800	0.200	U
Silver	0.200	0.800	0.200	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617953-13
 Instrument ID: ICP-MS2 Run Time: 14:59 Method: 6020A
 File ID: NI.061417.145945 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Barium	0.600	2.40	0.600	U
Lead	0.200	0.800	0.200	U
Silver	0.200	0.800	0.200	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.

CCB - Modified 03/05/2008
 PDF File ID: 5336872
 Report generated 06/15/2017 09:14



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617829-05
 Instrument ID: ICP-MS2 Run Time: 09:45 Method: 6020A
 File ID: NI.061417.094508 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Barium	50	50.9	102	90 - 110	
Lead	50	50.6	101	90 - 110	
Silver	50	51.1	102	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617953-05
 Instrument ID: ICP-MS2 Run Time: 14:07 Method: 6020A
 File ID: NI.061417.140704 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Barium	50	50.2	100	90 - 110	
Lead	50	49.6	99.3	90 - 110	
Silver	50	49.9	99.9	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617829-10
 Instrument ID: ICP-MS2 Run Time: 10:00 Method: 6020A
 File ID: NI.061417.100041 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.0500	0.0502	mg/L	100	90 - 110	
Lead	0.0500	0.0511	mg/L	102	90 - 110	
Silver	0.0500	0.0517	mg/L	103	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617829-14
 Instrument ID: ICP-MS2 Run Time: 11:05 Method: 6020A
 File ID: NI.061417.110549 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.0500	0.0500	mg/L	100	90 - 110	
Lead	0.0500	0.0502	mg/L	100	90 - 110	
Silver	0.0500	0.0475	mg/L	95.0	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617829-16
 Instrument ID: ICP-MS2 Run Time: 11:51 Method: 6020A
 File ID: NI.061417.115137 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.0500	0.0496	mg/L	99.3	90 - 110	
Lead	0.0500	0.0506	mg/L	101	90 - 110	
Silver	0.0500	0.0475	mg/L	95.0	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617953-10
 Instrument ID: ICP-MS2 Run Time: 14:22 Method: 6020A
 File ID: NI.061417.142236 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.0500	0.0489	mg/L	97.8	90 - 110	
Lead	0.0500	0.0493	mg/L	98.5	90 - 110	
Silver	0.0500	0.0486	mg/L	97.1	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617953-12
Instrument ID: ICP-MS2 Run Time: 14:56 Method: 6020A
File ID: NI.061417.145640 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.0500	0.0483	mg/L	96.5	90 - 110	
Lead	0.0500	0.0489	mg/L	97.8	90 - 110	
Silver	0.0500	0.0487	mg/L	97.5	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617829-07
 Instrument ID: ICP-MS2 Run Time: 09:51 Method: 6020A
 File ID: NI.061417.095122 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.750	0.690	ug/L	92.0	70 - 130	
Lead	0.200	0.238	ug/L	119	70 - 130	
Silver	0.400	0.390	ug/L	97.5	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617829-22
 Instrument ID: ICP-MS2 Run Time: 13:09 Method: 6020A
 File ID: NI.061417.130929 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.750	0.668	ug/L	89.1	70 - 130	
Lead	0.200	0.0668	ug/L	33.4	70 - 130	*
Silver	0.400	0.362	ug/L	90.6	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617953-07
 Instrument ID: ICP-MS2 Run Time: 14:13 Method: 6020A
 File ID: NI.061417.141319 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.750	0.727	ug/L	96.9	70 - 130	
Lead	0.200	0.207	ug/L	103	70 - 130	
Silver	0.400	0.388	ug/L	97.1	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17060484 Run Date: 06/14/2017 Sample ID: WG617953-18
 Instrument ID: ICP-MS2 Run Time: 16:07 Method: 6020A
 File ID: NI.061417.160753 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG617731 Cal ID: ICP-MS - 14-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Barium	0.750	0.778	ug/L	104	70 - 130	
Lead	0.200	0.179	ug/L	89.3	70 - 130	
Silver	0.400	0.384	ug/L	95.9	70 - 130	

* Exceeds LIMITS Criteria



Login number: L17060484
Instrument ID: ICP-MS2
Sol. A: WG617829-08
Sol. AB: WG617829-09

File ID: NI.061417.095427
File ID: NI.061417.095733

Workgroup (AAB#): WG617731
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Barium	NS	0.0319	NS	100	98.3	98.3	
Lead	NS	0.0513	NS	100	98.9	98.9	
Silver	NS	0.0110	NS	100	83.5	83.5	

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



Login number: L17060484
Instrument ID: ICP-MS2
Sol. A: WG617953-08
Sol. AB: WG617953-09

File ID: NI.061417.141624
File ID: NI.061417.141929

Workgroup (AAB#): WG617731
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Barium	NS	0.00510	NS	100	97.4	97.4	
Lead	NS	0.379	NS	100	97.1	97.1	
Silver	NS	0.00890	NS	100	43.1	43.1	*

NS = Not spiked

* = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.

= Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).

+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.



INTERNAL STANDARD REPORT

Login: L17060484 Analytical Method: 6020
 Analytical Workgroup: WG617731 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 14-JUN-2017 09:32

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L17060484-01	SAMP	14-JUN-2017 11:39	98.684	102.469	107.29
L17060484-01	SAMP	14-JUN-2017 11:45	98.946	97.541	100.91
WG617566-02	BLANK	14-JUN-2017 11:20	103.419	100.498	103.526
WG617566-03	LCS	14-JUN-2017 11:23	103.625	102.655	105.96
WG617731-01	PSPK	14-JUN-2017 11:42	100.201	102.936	107.278
WG617731-02	SERIAL	14-JUN-2017 11:45	98.946	97.541	100.91
WG617731-02	SERIAL	14-JUN-2017 11:48	99.167	95.517	98.516
WG617829-05	ICV	14-JUN-2017 09:45	99.117	100.371	99.861
WG617829-06	ICB	14-JUN-2017 09:48	95.387	92.315	93.05
WG617829-07	LLICV	14-JUN-2017 09:51	99.089	98.669	98.317
WG617829-08	ICS	14-JUN-2017 09:54	94.758	95.507	94.795
WG617829-09	ICS	14-JUN-2017 09:57	97.364	97.887	97.633
WG617829-10	CCV	14-JUN-2017 10:00	100.457	103.036	102.174
WG617829-11	CCB	14-JUN-2017 10:03	98.103	97.376	98.761
WG617829-14	CCV	14-JUN-2017 11:05	104.325	104.108	105.883
WG617829-15	CCB	14-JUN-2017 11:08	98.719	94.862	99.976
WG617829-16	CCV	14-JUN-2017 11:51	101.585	101.301	105.037
WG617829-17	CCB	14-JUN-2017 11:54	100.714	98.744	103.836
WG617829-22	LLCCV	14-JUN-2017 13:09	102.925	102.742	104.508

Acceptance criteria: 30% - 120% Underlined recoveries are out of range
 Acceptance criteria for CCVs and CCBs for method SW846-6020: 80% - 120%

INT_STD_ICPMS - Modified 07/28/2010
 PDF File ID: 5336866
 Report generated: 06/15/2017 09:19



INTERNAL STANDARD REPORT

Login: L17060484 Analytical Method: 6020
 Analytical Workgroup: WG617731 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 14-JUN-2017 13:54

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L17060484-01	SAMP	14-JUN-2017 14:44	94.947	102.129	103.725
WG617566-02	BLANK	14-JUN-2017 14:28	100.495	102.129	103.596
WG617566-03	LCS	14-JUN-2017 14:31	99.579	101.864	102.56
WG617731-01	PSPK	14-JUN-2017 14:47	93.977	98.939	100.705
WG617731-02	SERIAL	14-JUN-2017 14:50	96.238	97.333	97.741
WG617953-05	ICV	14-JUN-2017 14:07	97.394	99.64	99.425
WG617953-06	ICB	14-JUN-2017 14:10	98.929	99.635	100.071
WG617953-07	LLICV	14-JUN-2017 14:13	97.407	97.758	97.518
WG617953-08	ICS	14-JUN-2017 14:16	92.029	93.303	93.031
WG617953-09	ICS	14-JUN-2017 14:19	96.304	98.661	100.846
WG617953-10	CCV	14-JUN-2017 14:22	98.665	101.816	103.877
WG617953-11	CCB	14-JUN-2017 14:25	100.141	102.112	104.323
WG617953-12	CCV	14-JUN-2017 14:56	99.542	102.749	103.87
WG617953-13	CCB	14-JUN-2017 14:59	100.21	102.444	103.944
WG617953-18	LLCCV	14-JUN-2017 16:07	101.928	105.388	106.243

Acceptance criteria: 30% - 120% Underlined recoveries are out of range
 Acceptance criteria for CCVs and CCBs for method SW846-6020: 80% - 120%

INT_STD_ICPMS - Modified 07/28/2010
 PDF File ID: 5336866
 Report generated: 06/15/2017 09:19



Login Number: L17060484 Date: 04/12/2017
Instrument ID: ICP-MS2 Method: 6020A

Analyte	Integration Time (Sec.)	Concentration (ug/L)
Antimony	1.00	100.0
Arsenic	1.00	100.0
Barium	1.00	100.0
Cadmium	1.00	100.0
Chromium	1.00	100.0
Cobalt	1.00	100.0
Copper	1.00	100.0
Lead	1.00	100.0
Manganese	1.00	100.0
Nickel	1.00	100.0
Selenium	1.00	100.0
Silver	1.00	100.0
Thallium	1.00	100.0
Uranium	1.00	100.0
Vanadium	1.00	100.0
Zinc	1.00	100.0

Comments:

All analytes passed acceptance criteria at the specified concentration.



2.4 General Chemistry Data

2.4.1 Hexavalent Chromium Data

2.4.1.1 Summary Data



Login Number: L17060484
Department: Conventionals
Analyst: Dorothy Payne

METHOD

Analysis SM3500Cr-D/7196A (Hexavalent Chromium)

HOLDING TIMES

Sample Analysis: The samples were received past the recommended hold time. The analysis was performed out of hold per client's request.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 126503

Approved By: Sarah Vandenberg

Sarah Vandenberg

Lab Report #: L17060484

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060484-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6447-GRAB	Prep Method: 7196A	Prep Date: N/A
Matrix: Water	Analytical Method: 7196A	Cal Date: 06/05/2017 10:10
Workgroup #: WG617322	Analyst: DLP	Run Date: 06/09/2017 15:00
Collect Date: 06/07/2017 15:00	Dilution: 1	File ID: 00.1706091500-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chromium, Hexavalent	18540-29-9	0.0100	U,H1	0.0200	0.0100	0.00500
U,H1	Not detected; Sample analysis performed past holding time.					

2.4.1.2 QC Summary Data

Example Calculations for Visible Spectrophotometric Methods

Linear Calibration Model

Step 1 - Retrieve Curve Data from ICAL

m = slope of the linear equation
 b = intercept from the linear equation
 y = instrument response as absorbance or OD
 x = concentration of analyte (mg/L)
 $y = mx + b$

Step 2: Calculate the instrument concentration, x

Where:

$$x = (y - b)/m$$

Step 3: Solve for analyte concentration in sample, Cx

$$Cx = (x) (D)$$

Example Calculation (LCS):

Value of m from plot:	7.809
Value of b from plot:	0.0004135
Absorbance of unknown from quantitation report (y):	0.31
Calculated concentration (x):	0.03964483
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	0.0396 mg/L

SmartChem Autoanalyzer - Quadratic Calibration for Chloride and Sulfate

Step 1 - Retrieve Curve Data from Smartchem ICAL

A, B, C = constants from the ICAL quadratic regression

x = instrument response as absorbance or OD

y = concentration of analyte (mg/L)

Step 2: Calculate the instrument concentration, y

Where:

$$y = Ax^2 + Bx + C$$

Step 3: Solve for analyte concentration in sample, Cy

$$Cy = (y) (D)$$

Example Calculation (LCS):

Value of A from plot:	101.2796
Value of B from plot:	318.9056
Value of C from plot:	-2.2712
Absorbance of unknown from quantitation report (x):	0.1583
Calculated concentration (y):	50.7495108
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	50.75 mg/L

Microbac Laboratories Inc.

Data Checklist

Date: 09-JUN-2017
 Analyst: DLP
 Analyst: NA
 Method: CR-6
 Instrument: UV-2600
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG617322

Calibration/Linearity	
Second Source Check	06-05-17
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Primary Reviewer	DLP
Secondary Reviewer	SAV
Comments	

Primary Reviewer:
09-JUN-2017

Secondary Reviewer:
15-JUN-2017

Dwight Payne

Sarah Vandenberg



Analytical Method: 7196A
Login Number: L17060484

AAB#: WG617322

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6447-GRAB	01	06/07/17					06/09/2017	2	1	*	06/09/17	2	1	*

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060484
 Blank File ID: 00.1706091500-03
 Prep Date: 06/09/17 15:00
 Analyzed Date: 06/09/17 15:00
 Analyst: DLP

Work Group: WG617322
 Blank Sample ID: WG617322-01
 Instrument ID: UV-2600
 Method: 7196A

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG617322-02	00.1706091500-04	06/09/17 15:00	
LH18/24-SP650-6447-GRAB	L17060484-01	00.1706091500-06	06/09/17 15:00	
DUP	WG617322-05	00.1706091500-07	06/09/17 15:00	
LCS2	WG617322-03	00.1706091500-11	06/09/17 15:00	

Report Name: BLANK_SUMMARY
 PDF File ID: 5339282
 Report generated 06/15/2017 14:28



Login Number: L17060484 Prep Date: 06/09/17 15:00 Sample ID: WG617322-01
 Instrument ID: UV-2600 Run Date: 06/09/17 15:00 Prep Method: 7196A
 File ID: 00.1706091500-03 Analyst: DLP Method: 7196A
 Workgroup (AAB#): WG617322 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: UV-260-07-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Chromium, Hexavalent	0.00500	0.0200	0.00500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5339283
 15-JUN-2017 14:28



Login Number: L17060484 Analyst: DLP Prep Method: 7196A
 Instrument ID: UV-2600 Matrix: Water Method: 7196A
 Workgroup (AAB#): WG617322 Units: mg/L
 QC Key: DOD4 Lot #: STD81994
 Sample ID: WG617322-02 LCS File ID: 00.1706091500-04 Run Date: 06/09/2017 15:00
 Sample ID: WG617322-03 LCS2 File ID: 00.1706091500-11 Run Date: 06/09/2017 15:00

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Chromium, Hexavalent	0.100	0.101	101	0.100	0.102	102	0.718	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5339284
 Report generated: 06/15/2017 14:28



2.4.1.3 Raw Data

Curves

Parameter: CR-10 Low

Spectrophotometer: UV-2400

Calibration (Curve) standard stock: 20872, 82188

Concentration: 50mg/L, 5mg/L

Recipe for preparation of curve standards found in:

SOP: 2184 Revision: 22 Page: 12

Second Source Stock: 81994 (concentration: 2mg/L)

Daily Preparation: 10(2)/200

concentration = 0.1

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
0.2	100	5	540	0.822
0.1	100	5	540	0.432
0.05	100	5	540	0.209
0.02	100	5	540	0.083
0.01	100	5	540	0.041
0.00	100	5	540	0.004
		5	5	
2nd source dil	100	5	540	0.423

Analyst: Paul Shere

Date/Time: 6/5/17 @ 1010

DCN#126170



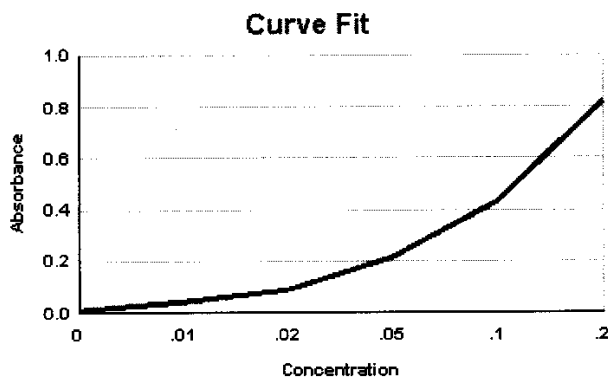
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG616556
Analytical Method: 3500CR
Instrument ID: UV-2600

Analyst: ADG
Initial Calibration Date: 06/05/2017

Analyte: **CHROMIUM, HEXAVALENT**
Number of Points: 6
Slope: 4.12523
Y-Intercept: 0.00390207
Coef. Of Correlation (R^2): 0.999348
Coef. Of Correlation (R): 0.999674

Concentration X	Absorbance Y	X^2	$X * Y$	Y-Fitted (mX^2+B)
0.00	0.00400	0.00	0.00	0.00390207
0.0100	0.0410	0.000100	0.000410	0.0451544
0.0200	0.0830	0.000400	0.00166	0.0864067
0.0500	0.209	0.00250	0.0105	0.210164
0.100	0.432	0.0100	0.0432	0.416425
0.200	0.822	0.0400	0.164	0.828948



WG ICAL_CAL_WET - Modified 03/06/2008
Report generated 06/05/2017 13:03

Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

Workgroup #: WG616556Instrument ID: UV-2600File ID: 00.1706051010-07Run Date: 06/05/2017CCV ID: WG616556-07Run Time: 10:10Units: mg/LAnalyst: ADGAnalyte: CHROMIUM, HEXAVALENTCal ID: UV-260 - 05-JUN-17 10:10:06

Analyte	Expected	Found	RF	%D	Q
Chromium, Hexavalent	.1	0.102	4.23	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET WG_SSCV - Modified 03/06/2008
Report generated 06/05/2017 13:03



WORKGROUP: WG617322

CHROMIUM (6)

(Cr6)

Standard Methods 3500 Cr-D (18th, 19th), 3500Cr-B(20th)

SOP K2186 Rev. # 22 SW846 7196A

SOP OVAP K3500-Cr Rev. # _____ CCV: 0.05

Matrix: Liquid (mg/L) Daily dilution: 1.5/100 =

Soil (mg/Kg) Daily dilution: 0.05

SPEC: WV 2600 WG616556 6-05-17

Curve ID: WG 605860 3-10-17

LCS: 2081994 Spike: 2080874 RGT 40360

Daily dilution: 1.5/100 = Daily dilution: 0.2/10 = RGT 6018997

Daily dilution: 0.110 Daily dilution: 0.10

x
x

Sample	Volume (mL)	pH adj. to 2 ± 0.5	Dilution	Cell size (cm)	Absorbance @ 540 nm
CCV: mg/L(1 cm)	100				
CCV: <u>0.05</u> mg/L(5 cm)	100	✓		5 cm	0.216
Blank/CCB:	100	✓		5 cm	0.002
LCS: ppm	100	✓		5 cm	0.420
LCS DUP: ppm	100	✓		5 cm	0.423
<u>06-482-01</u>	100	✓		5 cm	0.004
<u>06-484-01</u>	100	✓		5 cm	0.008
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
DUP: <u>06-482-01</u>	100	✓		5 cm	0.004
MS: () <u>484-01</u>	100	✓		5 cm	0.390
MSD: ()	100				
CCV: (1 cm)	100				
CCV: <u>0.05</u> (5 cm)	100	✓		5 cm	0.216
CCB:	100			5 cm	0.001

Analyst: Anthony Payne

Date / Time: 06-09-17 1:500

SW846 7196 (Dup and/or MS every 10 samples)

SM3500 Cr (Dup and MS/MSD every 20 samples)

* Samples were received out of hold.

DCN#126366



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG617322
Analyte: CHROMIUM, HEXAVALENT

Analyst: DLP
Date: 06/09/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG617322-01	100	100	0.00200	4.125	0.003902	-0.00046108	-0.00046108	1	mg/L
WG617322-02	100	100	0.420	4.125	0.003902	0.10087	0.10087	1	mg/L
L17060482-01	100	100	0.00400	4.125	0.003902	0.000023738	ND	1	mg/L
WG617322-04	100	100	0.00400	4.125	0.003902	0.000023738	0.000023738	1	mg/L
WG617322-06	100	100	0.00800	4.125	0.003902	0.00099338	0.00099338	1	mg/L
L17060484-01	100	100	0.00800	4.125	0.003902	0.00099338	ND	1	mg/L
WG617322-05	100	100	0.00400	4.125	0.003902	0.000023738	0.000023738	1	mg/L
WG617322-07	100	100	0.390	4.125	0.003902	0.093594	0.093594	1	mg/L
WG617322-03	100	100	0.423	4.125	0.003902	0.10159	0.10159	1	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 06/09/2017 17:22

Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00857901

Workgroup #: WG617365
File ID: 00.1706091500-01
CCV ID: WG617365-01
Units: mg/L
Analyte: CHROMIUM, HEXAVALENT

Instrument ID: UV-2600
Run Date: 06/09/2017
Run Time: 15:00
Analyst: DLP
Cal ID: UV-260 - 07-JUN-17

Analyte	Expected	Found	RF	%D	Q
Chromium, Hexavalent	.05	0.0514	4.32	2.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/09/2017 17:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00857902

Workgroup #: WG617365
File ID: 00.1706091500-09
CCV ID: WG617365-03
Units: mg/L
Analyte: CHROMIUM, HEXAVALENT

Instrument ID: UV-2600
Run Date: 06/09/2017
Run Time: 15:00
Analyst: DLP
Cal ID: UV-260 - 07-JUN-17

Analyte	Expected	Found	RF	%D	Q
Chromium, Hexavalent	.05	0.0514	4.32	2.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/09/2017 17:20



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
June 21, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
ALS - ADRIANE L. STEED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BLG - BRENDA L. GREENWALT	BNB - Brandi N. Bentley
BRG - BRENDA R. GREGORY	CAS - Craig A. Smith
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL	CV - Carl Volkman
DAK - DEAN A. KETELSEN	DCM - DAVID C. MERCKLE
DEV - DAVID E. VANDENBERG	DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER	DLP - DOROTHY L. PAYNE
DSM - DAVID S. MOSSOR	DTG - DOMINIC T. GEHRET
ECL - ERIC C. LAWSON	EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER	FJB - FRANCES J. BOLDEN
HRF - HEATHER R. FAIRCHILD	JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH	JKP - JACQUELINE K. PARSONS
JLD - JESSICA L. DELONG	JST - JOSHUA S. TAYLOR
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KDD - Katelyn D. Daley
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRP - KATHY R. PARSONS	LJH - Lacey J. Hendershot
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
OJE - OMOYEMWEN J. ENGLISH	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCA - SUEELLEN C. ADAMS
SCB - SARAH C. BOGOLIN	SCJ - SUE ELLEN C. JOHNSON
SDC - SHALYN D. CONLEY	TB - TODD BOYLE
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	ZTB - ZACH T. BARNES

List of Valid Qualifiers

June 21, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample receipt exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentatively identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound



List of Valid Qualifiers

June 21, 2017

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below



CHAIN OF CUSTODY

Name Of Lab Shipping To: MICROBAC (740) 373-4071 ATTN: STEPHANIE MOSSBURG

Project: AECOM
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS
Project No.
60256135.GWTP
HRUMAR16

Job:
**GROUNDWATER TREATMENT PLANT
MONTHLY EFFLUENT SAMPLES**

Prepared By:
Scott Beesinger
P.O. Number


Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses						Remarks (Preservatives, etc.)	Lab I.D.#
					VOLATILES	SILVER, SELENIUM, LEAD, BARIUM	HEXAVALENT CHROMIUM	1, 4 - DIOXANE	PERCHLORATE			
LH18/24-SP650-6447-Grab	Water	06/07/17 / 15:00		3	X						HCL	
LH18/24-SP650-6447-Grab	Water	06/07/17 / 15:00		4		X	X	X			NONE	
LH18/24-SP650-6447-Grab	Water	06/07/17 / 15:00		1		X					HNO3	
Trip Blank	Water	06/07/17		2	X						HCL	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	06/07/17	15:30									

Received At Lab By:	Date	Time	Airbill No.	Date	Time	Temp of Container	Seal No.	Condition

Microbac OVD
 Received: 06/09/2017 10:09
 By: BRENDA GREENWALT
 221000101876



Remarks:

COOLER TEMP >6° C LOG

Cooler ID 1876

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C

CSO 6/19/17

pH Exceptions

pH Lot # H060351

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6

CSO 6/19/17

**PRESERVATIVE
EXCEPTIONS
✓ NONE
AS NOTED**
CSO 6/19/17

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17060484

Account: 2551

Project: 2551.096

Samples: 2

Due Date: 20-JUN-2017

Samplenum Container ID Products

L17060484-01 919312

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	09-JUN-2017 12:38	CLS		
2	ANALYZ	V1	ORG4	09-JUN-2017 14:00	TMB	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	09-JUN-2017 12:38	CLS		
2	ANALYZ	V1	ORG4	09-JUN-2017 14:00	TMB	CLS	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	09-JUN-2017 12:38	CLS		
2	ANALYZ	V1	ORG4	09-JUN-2017 14:00	TMB	CLS	

Samplenum Container ID Products

L17060484-01 919313

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	09-JUN-2017 12:38	CLS		
2	PREP	W1	EXT	12-JUN-2017 16:09	CPD	BRG	

Comments:Products cancelled.

3	DISP	A2	DISP	14-JUN-2017 13:53	BJO	BJO	
---	------	----	------	-------------------	-----	-----	--

Comments:Products cancelled.

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	09-JUN-2017 12:38	CLS		
2	PREP	W1	EXT	15-JUN-2017 14:34	CPD	BRG	

Comments:Products cancelled.

3	DISP	A1	DISP	16-JUN-2017 14:41	BJO	BJO	
---	------	----	------	-------------------	-----	-----	--

Comments:Products cancelled.

4	DISP	A1	DISP	19-JUN-2017 09:27	BJO	BJO	
---	------	----	------	-------------------	-----	-----	--

Comments:Products cancelled.

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17060484

Account: 2551

Project: 2551.096

Samples: 2

Due Date: 20-JUN-2017

Samplenum **Container ID** **Products**
L17060484-01 919314 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	09-JUN-2017 12:38	CLS		
2	ANALYZ	W1	SEM	13-JUN-2017 13:51	JWR	CLS	
3	STORE	SEM	A1	20-JUN-2017 13:05	CLS	JWR	

Samplenum **Container ID** **Products**
L17060484-01 919315 AG-MS BA-MS PB-MS SE-AX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	09-JUN-2017 12:38	CLS		
2	PREP	W1	DIG	09-JUN-2017 14:06	VC	CLS	
3	ANALYZ*	DIG	METALS	13-JUN-2017 16:51	JYH	VC	
4	STORE	DIG	A1	16-JUN-2017 14:26	BRG	VC	

*Sample extract/digestate/leachate

Samplenum **Container ID** **Products**
L17060484-01 919316 826-SPE 827-DIOXANE CR-6

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	09-JUN-2017 12:38	CLS		
2	ANALYZ	V1	WET	09-JUN-2017 13:18	DLP	CLS	
3	STORE	WET	A1	12-JUN-2017 14:35	CLS	TB	

Samplenum **Container ID** **Products**
L17060484-02 919317 826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	09-JUN-2017 12:38	CLS		
2	ANALYZ	V1	ORG4	09-JUN-2017 14:00	TMB	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	09-JUN-2017 12:38	CLS		
2	ANALYZ	V1	ORG4	09-JUN-2017 14:00	TMB	CLS	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
 Total Halide by Bomb Combustion (TX)
 Particle Sizing - 200 Mesh (PS200)
 Specific Gravity/Density (SPGRAV)
 Total Residual Chlorine (CL-TRL)
 Total Volatile Solids (all forms) (TVS)
 Total Coliform Bacteria (all methods)
 Fecal Coliform Bacteria (all methods)
 Sulfite (SO₃)
 Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS

Nitrogen, Ammonia by Method 350.1
 Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
 Phenolics, Total by Method 420.1
 ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
 Acetic acid
 Butyric acid
 Lactic acid
 Propionic acid
 Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
 1-Methylnaphthalene
 1,4-Dioxane
 Atrazine
 Benzaldehyde
 Biphenyl
 Caprolactam
 Hexamethylphosphoramide (HMPA)
 Pentachlorobenzene
 Pentachloroethane

NELAP Accreditation by Laboratory SOP**NONPOTABLE WATER**OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALSOVD MSS01/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP**SOLID AND HAZARDOUS CHEMICALS**OVD MSV01/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)



Laboratory Report Number: L17060853

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on June 21 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Microbac Laboratories * Ohio Valley Division
158 Starlite Drive, Marietta, OH 45750 * T: (740) 373-4071 F: (740) 373-4835 * www.microbac.com

Lab Report #: L17060853

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

There were no discrepancies.

Discrepancy	Resolution

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0019178	I	2.0		J4616881864	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	NA

**Lab Report #:** L17060853**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP650-6450	L17060853-01	06/14/2017 15:00	06/15/2017 15:17



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	NH3
Prep Batch Number(s):	WG618722	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-21 17:12:50



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	NH3
Prep Batch Number(s):	WG618722	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	NH3
Prep Batch Number(s):	WG618722	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	NH3
Prep Batch Number(s):	WG618722	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	NH3
Prep Batch Number(s):	WG618722	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	NH3
Prep Batch Number(s):	WG618722	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618179	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-21 17:13:29



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618179	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618179	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618179	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618179	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618179	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	TOC
Prep Batch Number(s):	WG618111	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-21 17:13:58



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	TOC
Prep Batch Number(s):	WG618111	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	TOC
Prep Batch Number(s):	WG618111	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	TOC
Prep Batch Number(s):	WG618111	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	TOC
Prep Batch Number(s):	WG618111	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060853
Project Name:		Method:	TOC
Prep Batch Number(s):	WG618111	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-21 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

Lab Report #: L17060853
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060853-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6450	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 06/21/2017 10:40
Workgroup #: WG618722	Analyst: TB	Run Date: 06/21/2017 10:51
Collect Date: 06/14/2017 15:00	Dilution: 5	File ID: S2170621001.018
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	5.37		1.00	0.500	0.250

Certificate of Analysis

Sample #: L17060853-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6450	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:45
Workgroup #: WG618179	Analyst: DLP	Run Date: 06/16/2017 10:45
Collect Date: 06/14/2017 15:00	Dilution: 2	File ID: 00.1706161045-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	1.40		0.200	0.100	0.0500

Certificate of Analysis

Sample #: L17060853-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6450	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG618111	Analyst: DCM	Run Date: 06/16/2017 23:24
Collect Date: 06/14/2017 15:00	Dilution: 3	File ID: TC06162017.079
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	49.0		6.00	3.00	1.50

2.1 General Chemistry Data

2.1.1 Ammonia Data

2.1.1.1 Summary Data

Lab Report #: L17060853

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060853-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6450	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 06/21/2017 10:40
Workgroup #: WG618722	Analyst: TB	Run Date: 06/21/2017 10:51
Collect Date: 06/14/2017 15:00	Dilution: 5	File ID: S2170621001.018
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	5.37		1.00	0.500	0.250

2.1.1.2 QC Summary Data

Example Ammonia Calculations

$$(\text{absorbance} - \text{intercept}) / (\text{slope} * \text{dilution}) = \text{mg/L}$$

where:

absorbance = reading from the spectrophotometer

intercept = calculated from calibration standard absorbencies

slope = calculated from calibration standard absorbencies

dilution = dilution of the distillate in decimal form (ex. 1/5 dilution = 0.2)

Microbac Laboratories Inc.

Data Checklist

Date: 21-JUN-2017
 Analyst: TB
 Analyst: NA
 Method: NH3
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG618722

Calibration/Linearity	06/21/2017
Second Source Check	X
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	X
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	TB
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
21-JUN-2017

Todd Boyle

Secondary Reviewer:
21-JUN-2017

Denna Johnson



Analytical Method: 350.1
Login Number: L17060853

AAB#: WG618722

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6450	01	06/14/17					06/21/2017	6.8	28		06/21/17	6.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060853 Work Group: WG618722
 Blank File ID: S2170621001.011 Blank Sample ID: WG618722-01
 Prep Date: 06/21/17 10:45 Instrument ID: SMARTCHEM2
 Analyzed Date: 06/21/17 10:45 Method: 350.1
 Analyst: TB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG618722-02	S2170621001.012	06/21/17 10:46	01
LH18/24-SP650-6450	L17060853-01	S2170621001.018	06/21/17 10:51	DL01
LCS2	WG618722-03	S2170621001.036	06/21/17 11:12	01
DUP	WG618722-06	S2170621001.042	06/21/17 11:29	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5347592
 Report generated 06/21/2017 13:08



Login Number: L17060853 Prep Date: 06/21/17 10:45 Sample ID: WG618722-01
 Instrument ID: SMARTCHEM2 Run Date: 06/21/17 10:45 Prep Method: 350.1
 File ID: S2170621001.011 Analyst: TB Method: 350.1
 Workgroup (AAB#): WG618722 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: SMARTC-21-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Nitrogen, Ammonia	0.0500	0.200	0.0500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5347593
 21-JUN-2017 13:08



Login Number: L17060853 Analyst: TB Prep Method: 350.1
 Instrument ID: SMARTCHEM2 Matrix: Water Method: 350.1
 Workgroup (AAB#): WG618722 Units: mg/L
 QC Key: DOD4 Lot #: STD80299
 Sample ID: WG618722-02 LCS File ID: S2170621001.012 Run Date: 06/21/2017 10:46
 Sample ID: WG618722-03 LCS2 File ID: S2170621001.036 Run Date: 06/21/2017 11:12

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Nitrogen, Ammonia	2.00	1.82	90.8	2.00	1.83	91.3	0.620	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5347594
 Report generated: 06/21/2017 13:08



2.1 General Chemistry Data

2.1.2 Orthophosphate Data

2.1.2.1 Summary Data

Lab Report #: L17060853

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060853-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6450	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:45
Workgroup #: WG618179	Analyst: DLP	Run Date: 06/16/2017 10:45
Collect Date: 06/14/2017 15:00	Dilution: 2	File ID: 00.1706161045-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	1.40		0.200	0.100	0.0500

2.1.2.2 QC Summary Data

Example Calculations for Visible Spectrophotometric Methods

Linear Calibration Model

Step 1 - Retrieve Curve Data from ICAL

m = slope of the linear equation
 b = intercept from the linear equation
 y = instrument response as absorbance or OD
 x = concentration of analyte (mg/L)
 $y = mx + b$

Step 2: Calculate the instrument concentration, x

Where:

$$x = (y - b)/m$$

Step 3: Solve for analyte concentration in sample, Cx

$$C_x = (x) (D)$$

Example Calculation (LCS):

Value of m from plot:	7.809
Value of b from plot:	0.0004135
Absorbance of unknown from quantitation report (y):	0.31
Calculated concentration (x):	0.03964483
Dilution factor (D):	1.00
Concentration of analyte in sample, C _y :	0.0396 mg/L

SmartChem Autoanalyzer - Quadratic Calibration for Chloride and Sulfate

Step 1 - Retrieve Curve Data from Smartchem ICAL

A, B, C = constants from the ICAL quadratic regression

x = instrument response as absorbance or OD

y = concentration of analyte (mg/L)

Step 2: Calculate the instrument concentration, y

Where:

$$y = Ax^2 + Bx + C$$

Step 3: Solve for analyte concentration in sample, C_y

$$C_y = (y) (D)$$

Example Calculation (LCS):

Value of A from plot:	101.2796
Value of B from plot:	318.9056
Value of C from plot:	-2.2712
Absorbance of unknown from quantitation report (x):	0.1583
Calculated concentration (y):	50.7495108
Dilution factor (D):	1.00
Concentration of analyte in sample, C _y :	50.75 mg/L

Microbac Laboratories Inc.

Data Checklist

Date: 16-JUN-2017
 Analyst: DLP
 Analyst: NA
 Method: PO4
 Instrument: V-1200
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG618179

Calibration/Linearity	
Second Source Check	06-07-17
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Primary Reviewer	DLP
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
16-JUN-2017

Secondary Reviewer:
20-JUN-2017

Dwight Payne

Denna Johnson



Analytical Method: 365.2
Login Number: L17060853

AAB#: WG618179

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6450	01	06/14/17					06/16/2017	1.8	2		06/16/17	1.8	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060853 Work Group: WG618179
 Blank File ID: 00.1706161045-03 Blank Sample ID: WG618179-01
 Prep Date: 06/16/17 10:45 Instrument ID: V-1200
 Analyzed Date: 06/16/17 10:45 Method: 365.2
 Analyst: DLP

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG618179-02	00.1706161045-04	06/16/17 10:45	
LCS2	WG618179-03	00.1706161045-05	06/16/17 10:45	
LH18/24-SP650-6450	L17060853-01	00.1706161045-06	06/16/17 10:45	
DUP	WG618179-05	00.1706161045-07	06/16/17 10:45	

Report Name: BLANK_SUMMARY
 PDF File ID: 5345569
 Report generated 06/20/2017 12:58



Login Number: L17060853 Prep Date: 06/16/17 10:45 Sample ID: WG618179-01
 Instrument ID: V-1200 Run Date: 06/16/17 10:45 Prep Method: 365.2
 File ID: 00.1706161045-03 Analyst: DLP Method: 365.2
 Workgroup (AAB#): WG618179 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: V-1200-15-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Orthophosphate	0.0250	0.100	0.0250	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5345570
 20-JUN-2017 12:58



Login Number: L17060853 Analyst: DLP Prep Method: 365.2
 Instrument ID: V-1200 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG618179 Units: mg/L
 QC Key: DOD4 Lot #: STD82374
 Sample ID: WG618179-02 LCS File ID: 00.1706161045-04 Run Date: 06/16/2017 10:45
 Sample ID: WG618179-03 LCS2 File ID: 00.1706161045-05 Run Date: 06/16/2017 10:45

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	1.01	101	1.00	1.01	101	0.158	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5345571
 Report generated: 06/20/2017 12:58



2.1.2.3 Raw Data

WG 616997

Curves

Parameter: P04

Spectrophotometer: V-1200

Calibration (Curve) standard stock: STD 79640

Concentration: 1000mg/L

Recipe for preparation of curve standards found in:

SOP: 3653 Revision: 17 Page: 9

Second Source Stock: 82182 (concentration: 10)

Daily Preparation: $\frac{10(10)/100 =}{1.0}$
concentration = 1.0

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
1.0	50	1cm	880	0.608 0.621
0.7				0.445
0.5				0.312
0.2				0.127
0.1				0.063
0.05				0.031
0				0.001
2nd Source (10)				0.659 0.637

Analyst: Jammy Morris

Date/Time: 6/7/17 @ 1545

DCN#126310



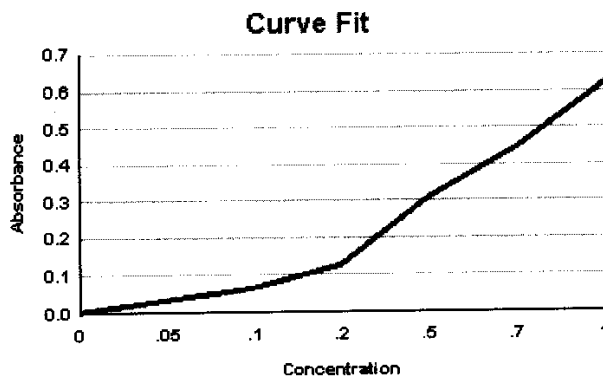
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG616997
Analytical Method: 300
Instrument ID: V-1200

Analyst: TMM
Initial Calibration Date: 06/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.624028
Y-Intercept: 0.00124690
Coef. Of Correlation (R^2): 0.999788
Coef. Of Correlation (R): 0.999894

Concentration X	Absorbance Y	X^2	$X * Y$	Y-Fitted (mX^2+B)
0.00	0.00100	0.00	0.00	0.00124690
0.0500	0.0310	0.00250	0.00155	0.0324483
0.100	0.0630	0.0100	0.00630	0.0636497
0.200	0.127	0.0400	0.0254	0.126053
0.500	0.312	0.250	0.156	0.313261
0.700	0.445	0.490	0.312	0.438067
1.00	0.621	1.00	0.621	0.625275



WG_ICAL_CAL_NET - Modified 03/06/2008
Report generated 06/07/2017 16:28

Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

Workgroup #: WG616997
 File ID: 00.1706071545-08
 CCV ID: WG616997-08
 Units: mg/L
 Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
 Run Date: 06/07/2017
 Run Time: 15:45
 Analyst: TMM
 Cal ID: V-1200 - 07-JUN-17 15:45:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.02	0.637	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
 Report generated 06/07/2017 16:28



Orthophosphate
(orthophosphate1)

EPA 365.2 / SM4500-P E
SOP K3653 Rev 17
Color Reagent Chemicals
RGT 40280
RGT 40466
RGT 39475
CBA 18278

CCV: SM82376 LCS: SM82374 Spike: SM82374
Daily Dilution: 10/10/100 = Daily Dilution: 2/10/150 =
Daily Dilution: 0.5 Daily Dilution: 1/4 Daily Dilution: 0.4
Spectrophotometer: 1200 Curve ID: 616997
6-07-17

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: 0.5 mg/L	50			0.316
BLK/CCB:	50			0.002
LCS: 1 ppm	50			0.633
LCSD: 1 ppm	50			2.632
<u>06-853-01</u>	50		<u>1/2</u>	<u>0.438</u>
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
DUR <u>06-853-01</u>	50		<u>1/2</u>	<u>0.438</u>
MS: (<u>853-01</u>)	50		<u>1/2</u>	<u>0.568</u>
MSD: ()	50			
CCV: (<u>0.5</u>)	50			<u>0.316</u>
CCB:	50			<u>0.002</u>

Analyst: Quinty Peep Date / Time 06-18-17 | 1045

DCN#126498



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG618179
Analyte: ORTHOPHOSPHATE

Analyst: DLP
Date: 06/16/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG618179-01	50	50	0.00200	0.6240	0.001247	0.0012068	0.0012068	1	mg/L
WG618179-02	50	50	0.633	0.6240	0.001247	1.0124	1.0124	1	mg/L
WG618179-03	50	50	0.632	0.6240	0.001247	1.0108	1.0108	1	mg/L
L17060853-01	50	50	0.438	0.6240	0.001247	0.69989	1.3998	2	mg/L
WG618179-04	50	50	0.438	0.6240	0.001247	0.69989	1.3998	2	mg/L
WG618179-05	50	50	0.438	0.6240	0.001247	0.69989	1.3998	2	mg/L
WG618179-06	50	50	0.568	0.6240	0.001247	0.90822	1.8164	2	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 06/16/2017 16:51

Workgroup #: WG618296
File ID: 00.1706161045-01
CCV ID: WG618296-01
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 06/16/2017
Run Time: 10:45
Analyst: DLP
Cal ID: V-1200 - 15-JUN-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.504	0.632	0.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/16/2017 16:49



Workgroup #: WG618296
File ID: 00.1706161045-09
CCV ID: WG618296-03
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 06/16/2017
Run Time: 10:45
Analyst: DLP
Cal ID: V-1200 - 15-JUN-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.504	0.632	0.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/16/2017 16:49



2.1 General Chemistry Data

2.1.3 Total Organic Carbon Data

2.1.3.1 Summary Data

Lab Report #: L17060853

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060853-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6450	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG618111	Analyst: DCM	Run Date: 06/16/2017 23:24
Collect Date: 06/14/2017 15:00	Dilution: 3	File ID: TC06162017.079
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	49.0		6.00	3.00	1.50

2.1.3.2 QC Summary Data

**Total Organic Carbon Example Calculations
(Direct Readout Parameter)**

$$(\text{Readout})/(\text{dilution}) = \text{mg/L}$$

where:

Readout = direct readout from the instrument

dilution = dilution in decimal form (ex. 1/5 dilution = 0.2)

Microbac Laboratories Inc.

Data Checklist

Date: 16-JUN-2017
 Analyst: DCM
 Analyst: NA
 Method: TOC
 Instrument: TOC-VWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG618110 WG618111 WG618108

Calibration/Linearity	02-10-2017
Second Source Check	X
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	X
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	DCM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
20-JUN-2017



Secondary Reviewer:
20-JUN-2017




Analytical Method: 415.1
Login Number: L17060853

AAB#: WG618111

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6450	01	06/14/17					06/16/2017	2.4	28		06/16/17	2.4	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5345679
Report generated 06/20/2017 13:36



METHOD BLANK SUMMARY

Login Number: L17060853 Work Group: WG618111
 Blank File ID: TC06162017.064 Blank Sample ID: WG618111-01
 Prep Date: 06/16/17 20:15 Instrument ID: TOC-VWP
 Analyzed Date: 06/16/17 20:15 Method: 415.1
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG618111-02	TC06162017.065	06/16/17 20:27	01
LCS2	WG618111-03	TC06162017.066	06/16/17 20:39	01
LH18/24-SP650-6450	L17060853-01	TC06162017.079	06/16/17 23:24	DL01
DUP	WG618111-05	TC06162017.091	06/17/17 01:49	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5345680
 Report generated 06/20/2017 13:36



Login Number: L17060853 Prep Date: 06/16/17 20:15 Sample ID: WG618111-01
 Instrument ID: TOC-VWP Run Date: 06/16/17 20:15 Prep Method: 415.1
 File ID: TC06162017.064 Analyst: DCM Method: 415.1
 Workgroup (AAB#): WG618111 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: TOC-VW-10-FEB-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Total Organic Carbon	0.500	2.00	0.500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5345681
 20-JUN-2017 13:36



Login Number: L17060853 Analyst: DCM Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG618111 Units: mg/L
 QC Key: DOD4 Lot #: STD80787
 Sample ID: WG618111-02 LCS File ID: TC06162017.065 Run Date: 06/16/2017 20:27
 Sample ID: WG618111-03 LCS2 File ID: TC06162017.066 Run Date: 06/16/2017 20:39

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	26.4	106	25.0	25.4	102	3.74	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5345682
 Report generated: 06/20/2017 13:36



2.1.3.3 Raw Data

Curve

~~WG 602411~~
~~WG 602476~~ *dm/11/13/17*
 WG 602481

Total Organic Carbon

MAKE DAILY

CCV (TOC): _____ LCS (TOC): _____
 (5/200)(1000) = 25mg/L (5/200)(1000) = 25mg/L

CCV (TIC): _____ MS (TOC): _____
 (5/200)(1000) = 25mg/L _____

Calibration Curve Date: _____ Reagent: RET 35944
RET 37673

SM5310-C : Matrix 2 WG _____
 EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K 4151 Rev. 18 *dm/11/13/17*
 Instrument: Shimadza TOC-VWP/ASI

- | | | |
|----------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------|
| <input checked="" type="checkbox"/> drain reservoir filled | <input checked="" type="checkbox"/> DAILY CHECK | <input checked="" type="checkbox"/> sufficient acid waste container |
| <input checked="" type="checkbox"/> ASI water bottle full | <input checked="" type="checkbox"/> 3 rd bottle full | |
| <input checked="" type="checkbox"/> dilution water bottle full | <input checked="" type="checkbox"/> sufficient gas | |
| | <input checked="" type="checkbox"/> sufficient persulfate | |

Position	Sample ID	Dilution	Position	Sample ID	Dilution	Position	Sample ID	Dilution
1	TC Curve		26	TC Curve		51		
2	TC ICV		27	Std 79318		52	See SOP	
3	TIC Curve		28			53	for point	
4	TIC ICV		29	TIC Curve		54	preparation	
5			30	Std 80415		55		
6			31			56		
7			32			57		
8			33	TOC (TC)		58		
9			34	ICV		59		
10			35	Std 77870		60	5/200 (1000) = 25	
11			36			61		
12			37	TIC ICV		62		
13			38	Std 80416		63		
14			39			64		
15			40			65		
16			41			66		
17			42			67		
18			43			68		
19	all points		44	analyzed in duplicate		69		
20			45			70		
21			46			71		
22			47			72		
23			48			73		
24			49			74		
25			50			75		

Analyst: David Merckel Date/Time: 2/10/17

DCN#123915



C:\TOC3201\Data\CURVES-02-10-2017.t32

	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TC	TCCURVE		Complete	2/10/2017 10:29:51 A	0, 1, 2, 3, 4, 5
2	TC	TOC ICV	TC:23.90mg/L	Complete	2/10/2017 10:47:48 A	6
3	IC	TICCURVE		Complete	2/10/2017 3:55:41 PM	0, 1, 2, 3, 4, 5
4	IC	TIC CURVE	IC:24.27mg/L	Complete	2/10/2017 4:12:07 PM	6
5	TC		TC:0.000mg/L	Complete	2/10/2017 4:31:41 PM	7
6	IC	TOC/TIC	IC:8.571mg/L	Complete	2/10/2017 4:42:05 PM	7
7	TC	TOC/TIC	TC:32.10mg/L	Complete	2/10/2017 5:01:02 PM	7

2/13/2017 7:01:58 AM

1/1

2/12/2017 11:18:36 AM

CURVES-02-10-2017.i32

Instr. Information

System
DetectorTOCVW ASI
Wet Chemical

Cal. Curve

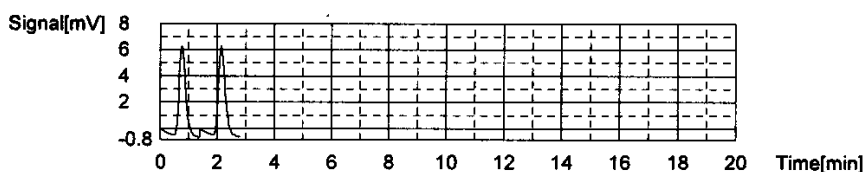
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

Type	Anal.
Standard	TC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.83	500uL	1	*****		2/10/2017 9:36:31 AM
2	10.82	500uL	1	*****		2/10/2017 9:40:05 AM

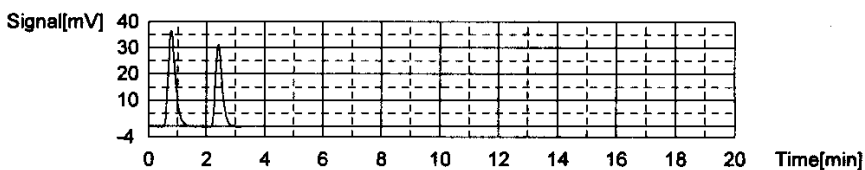
Acid Add. 0.000%
 Mean Area 10.82



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	64.31	500uL	1	*****		2/10/2017 9:45:28 AM
2	51.52	500uL	1	*****		2/10/2017 9:49:19 AM

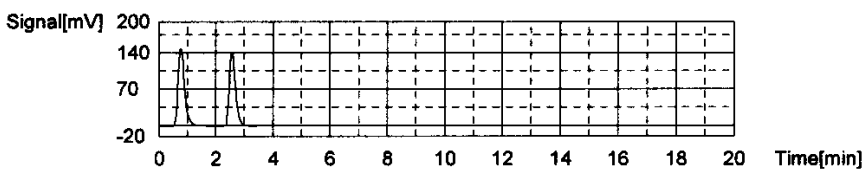
Acid Add. 0.000%
 Mean Area 57.92



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	238.4	500uL	1	*****		2/10/2017 9:55:04 AM
2	216.3	500uL	1	*****		2/10/2017 9:58:58 AM

Acid Add. 0.000%
 Mean Area 227.4

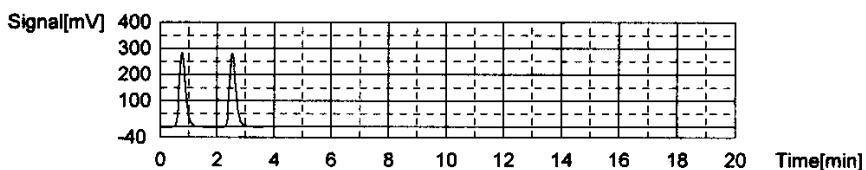


Conc: 10.00mg/L

1/6

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	442.5	500uL	1	*****		2/10/2017 10:04:41 AM
2	437.9	500uL	1	*****		2/10/2017 10:08:48 AM

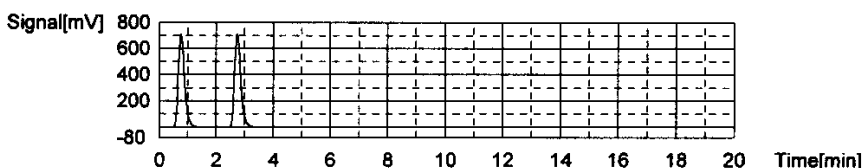
Acid Add. 0.000%
 Mean Area 440.2



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1091	500uL	1	*****		2/10/2017 10:14:47 AM
2	1092	500uL	1	*****		2/10/2017 10:19:05 AM

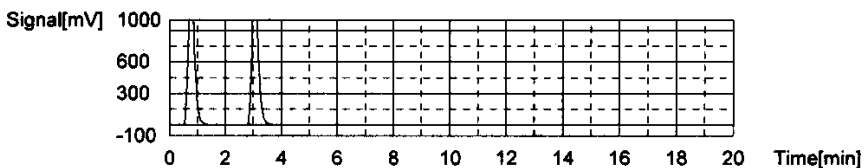
Acid Add. 0.000%
 Mean Area 1092



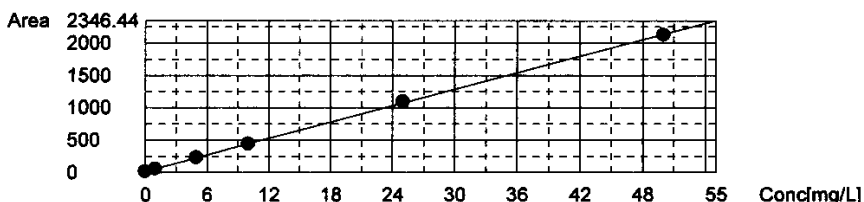
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	2132	500uL	1	*H*****		2/10/2017 10:25:19 AM
2	2118	500uL	1	*H*****		2/10/2017 10:29:51 AM

Acid Add. 0.000%
 Mean Area 2125



Slope: 42.33
 Intercept 16.87
 r^2 0.999887
 Zero Shift No



Sample

Sample Name: TOC ICV
 Sample ID: Untitled
 Origin: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:23.90mg/L

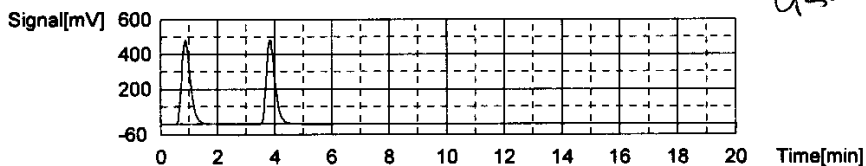
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1029	23.91mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 10:42:11 AM
2	1028	23.89mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 10:47:48 AM

95.6%

Mean Area 1029
Mean Conc. 23.90mg/L



Cal. Curve

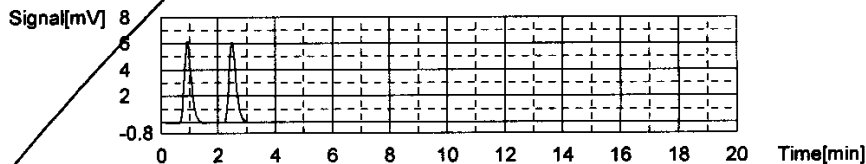
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

Type	Anal.
Standard	TC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.59	500uL	1	*****		2/10/2017 2:49:09 PM
2	10.43	500uL	1	*****		2/10/2017 2:53:06 PM

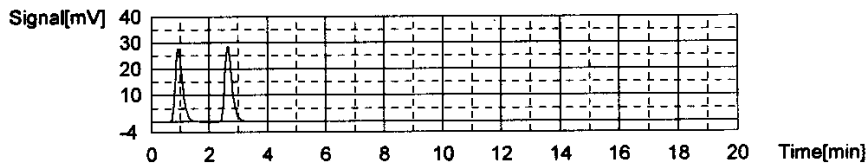
Acid Add. 3.000%
Mean Area 10.51



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	48.13	500uL	1	*****		2/10/2017 3:00:24 PM
2	49.13	500uL	1	*****		2/10/2017 3:04:41 PM

Acid Add. 3.000%
Mean Area 48.63

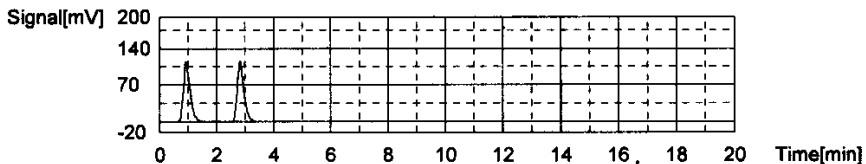


Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	189.0	500uL	1	*****		2/10/2017 3:12:24 PM
2	190.1	500uL	1	*****		2/10/2017 3:16:55 PM

*dem
3/23/17*

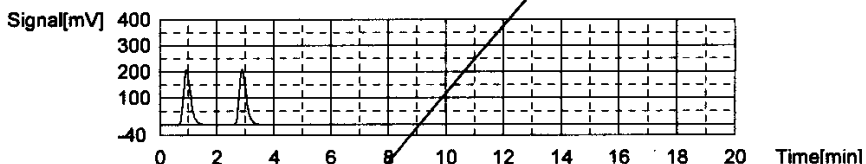
Acid Add. 3.000%
Mean Area 189.6



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	360.6	500uL	1	*****		2/10/2017 3:24:47 PM
2	362.2	500uL	1	*****		2/10/2017 3:29:24 PM

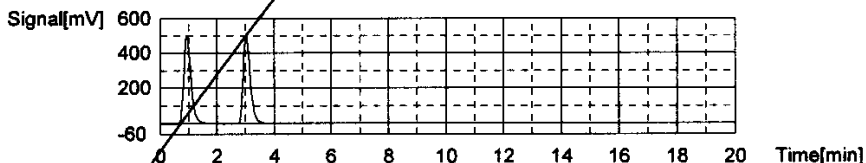
Acid Add. 3.000%
Mean Area 361.4



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	859.3	500uL	1	*****		2/10/2017 3:37:23 PM
2	856.9	500uL	1	*****		2/10/2017 3:42:16 PM

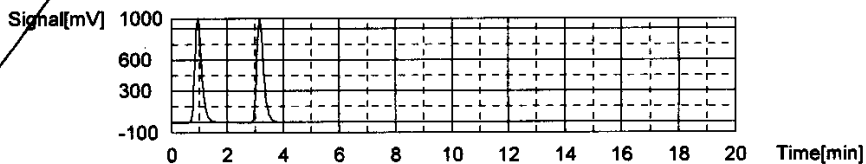
Acid Add. 3.000%
Mean Area 858.1



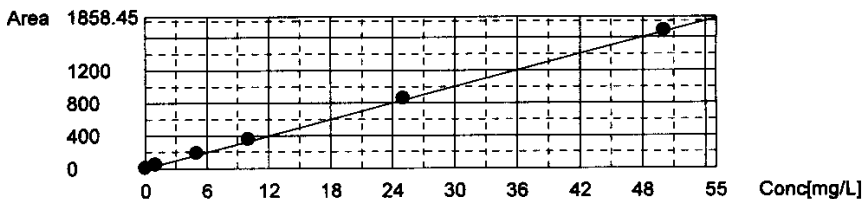
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1690	500uL	1	*****		2/10/2017 3:50:31 PM
2	1689	500uL	1	*****		2/10/2017 3:55:41 PM

Acid Add. 3.000%
Mean Area 1690



Slope: 33.49
Intercept: 0.000
 r^2 : 0.999919
Zero Shift: Yes



Sample

dcm

See following pages for curve, slope, intercept
and zero shift unchecked

TOC-V Cal Curve Information
TICCURVE-02-10-2017.2017_02_10_14_45_10.cal

Date of Creation 2:10:17 PM 2/10/2017
User
System TOCVW ASI

Cal. Curve

Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status Completed
Comment:

Type	Anal.
Standard	IC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.59	500uL	1	*****		2/10/2017 2:49:09 PM
2	10.43	500uL	1	*****		2/10/2017 2:53:06 PM

Acid Add. 3.000%
Mean Area 10.51
SD Area 0.1131
CV Area 1.08%
Vial 0

Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	48.13	500uL	1	*****		2/10/2017 3:00:24 PM
2	49.13	500uL	1	*****		2/10/2017 3:04:41 PM

Acid Add. 3.000%
Mean Area 48.63
SD Area 0.7071
CV Area 1.45%
Vial 1

Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	189.0	500uL	1	*****		2/10/2017 3:12:24 PM
2	190.1	500uL	1	*****		2/10/2017 3:16:55 PM

Acid Add. 3.000%
Mean Area 189.6
SD Area 0.7778
CV Area 0.41%
Vial 2

Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	360.6	500uL	1	*****		2/10/2017 3:24:47 PM
2	362.2	500uL	1	*****		2/10/2017 3:29:24 PM

Acid Add. 3.000%
 Mean Area 361.4
 SD Area 1.131
 CV Area 0.31%
 Vial 3

Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	859.3	500uL	1	*****		2/10/2017 3:37:23 PM
2	856.9	500uL	1	*****		2/10/2017 3:42:16 PM

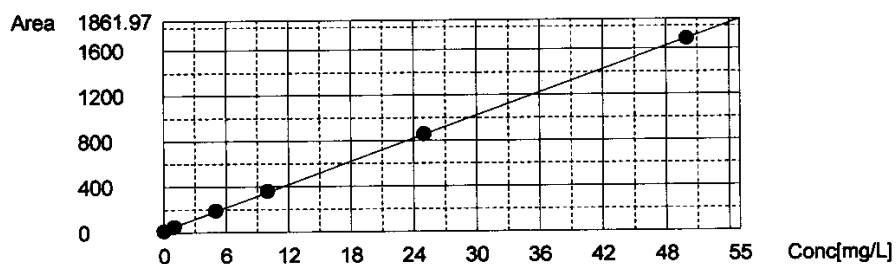
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1690	500uL	1	*****		2/10/2017 3:50:31 PM
2	1689	500uL	1	*****		2/10/2017 3:55:41 PM

Acid Add. 3.000%
 Mean Area 1690
 SD Area 0.7071
 CV Area 0.04%
 Vial 5

Slope: 33.49
 Intercept 18.41
 r^2 0.999919
 Zero Shift No



Sample Name: TIC CURVE
 Sample ID: Untitled
 Origin: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed
 Chk. Result:

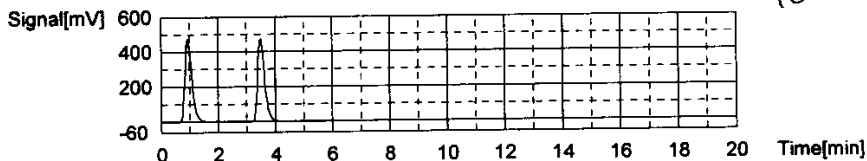
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

1. Det

Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	810.5	24.20mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 4:08:15 PM
2	814.6	24.33mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 4:12:07 PM

Mean Area 812.5
 Mean Conc. 24.27mg/L



Sample

Sample Name: Untitled
 Sample ID: TCCURVE-02-10-2017.2017_02_10_14_14_25.cal
 Origin: Completed
 Status: Completed
 Chk. Result:

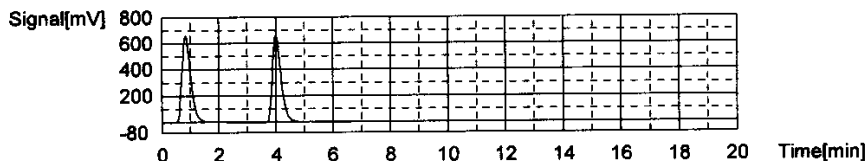
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1406	0.000mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_14_14	2/10/2017 4:25:42 PM
2	1411	0.000mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_14_14	2/10/2017 4:31:41 PM

Mean Area 1409
 Mean Conc. 0.000mg/L



Sample

Sample Name: TOC/TIC
 Sample ID: Untitled
 Origin: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed
 Chk. Result:

2/12/2017 11:18:36 AM

CURVES-02-10-2017.i32

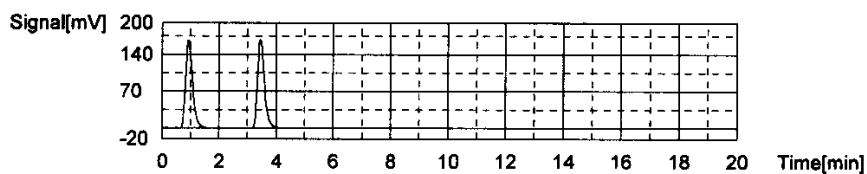
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

1. Det

Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	286.8	8.565mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	12/10/2017 4:37:09 PM
2	287.2	8.577mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	12/10/2017 4:42:05 PM

Mean Area 287.0
Mean Conc. 8.571mg/L



Sample

Sample Name: TOC/TIC
Sample ID: Untitled
Origin: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
Status: Completed
Chk. Result

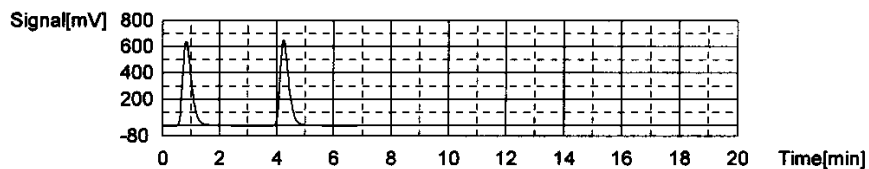
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1378	32.16mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	12/10/2017 4:55:07 PM
2	1373	32.04mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	12/10/2017 5:01:02 PM

Mean Area 1376
Mean Conc. 32.10mg/L



6/6

6/8/17

Total Organic Carbon

MAKE DAILY

CCV (TOC): Std 79381
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): Std 80416
 $(5/200)(1000) = 25\text{mg/L}$

Calibration Curve Date: 2/10/17

LCS (TOC): Std 80787
 $(5/200)(1000) = 25\text{mg/L}$

MS (TOC): Std 80787
 $(5/200)(1000) = 25\text{mg/L}$

Reagent: REG 40270
REG 39266

SM5310-C : Matrix 2 WG
 EPA 415.1/9060A(mod): Matrix 1 WG
 SW846 9060A (4 rep) WG

SOP: K 4151 Rev. 19
Instrument: Shimadza TOC-VWP/ASI

6/8/17

- drain reservoir filled
 ASI water bottle full
 dilution water bottle full
- 3rd bottle full
 sufficient gas
 sufficient persulfate
- sufficient acid waste container

Position	Sample ID	Dilution
1	TIC	
2	TOC/TIC	
3	CCV	
4	Blk	
5	LCS	
6	LCS Dup	
7	06-707-C1	
8	06-708-C1	
9	06-701-C1	
10	C2	
11	C3	
12	C4	
13	C5	
14	CCV	
15	CCB	
16	06-701-06	
17	C7	
18	C8	
19	C9	
20	C10	
21	C11	
22	C12	
23	C13	
24	C14	
25	C15	

Position	Sample ID	Dilution
26	CCV	
27	CCB	
28	06-701-16	
29	17	
30	18	
31	DUP 06-701-18	
32	MS 06-701-18	
33	Blk	
34	LCS	
35	LCS Dup	
36	06-701-19	
37	20	
38	CCV	
39	CCB	
40	06-701-21	
41	22	
42	23	
43	24	
44	25	
45	26	
46	27	
47	28	
48	29	
49	30	
50	CCV	

Position	Sample ID	Dilution
51	CCB	
52	06-701-31	
53	32	
54	33	
55	34	
56	35	
57	36	
58	37	
59	38	
60	DUP 39	06-701-38
61	MS 40	06-701-38
62	CCV	
63	CCB	
64	Blk	
65	LCS	
66	LCS Dup	
67	06-701-39	
68	40	
69	41	
70	42	
71	43	
72	44	
73	45	
74	CCV	
75	CCB	

from 6/16/17

done 6/16/17

Analyst: David Merseth Date/Time: 6/16/17 0740

PS.1

DCN#126486



Total Organic Carbon

MAKE DAILY

CCV (TOC): _____
 (5/200)(1000) = 25mg/L

LCS (TOC): _____
 (5/200)(1000) = 25mg/L

CCV (TIC): _____
 (5/200)(1000) = 25mg/L

MS (TOC): _____

Calibration Curve Date: _____

Reagent: _____

SM5310-C : Matrix 2 WG
 EPA 415.1/9060A(mod): Matrix 1 WG
 SW846 9060A (4 rep) WG

SOP: K _____ Rev. _____
Instrument: Shimadza TOC-VWP/ASI

see pg. 1

- | | | |
|-----------------------------------------------------|------------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> drain reservoir filled | <input type="checkbox"/> DAILY CHECK | <input type="checkbox"/> sufficient acid |
| <input type="checkbox"/> ASI water bottle full | <input type="checkbox"/> 3 rd bottle full | <input type="checkbox"/> waste container |
| <input type="checkbox"/> dilution water bottle full | <input type="checkbox"/> sufficient gas | |
| | <input type="checkbox"/> sufficient persulfate | |

Position	Sample ID	Dilution
1	761-41	
2	42	
3	43	
4	44	
5	45	
6	CLV	
7	CLB	
8	761-46	
9	47	
10	48	
11	853-01	1/3
12	718-05	1/3
13	06	1/5
14	07	1/5
15	08	1/5
16	14	1/3
17	0898-01	1/2
18	CLV	
19	CLB	
20	0898-03	1/3
21	04	1/3
22	05	1/2
23	DUP da-761-48	
24	MS da-761-48	
25		

Position	Sample ID	Dilution
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		

Position	Sample ID	Dilution
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		

Analyst: dcn Date/Time: 6/16/17

pg. 2

DCN#126486



	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:1.347mg/L TC:24.60mg/L IC:23.25mg/L	Complete	6/16/2017 7:40:46 AM	1
2	TOC	TOC/TIC	TOC:27.05mg/L TC:36.32mg/L IC:9.263mg/L	Complete	6/16/2017 7:53:28 AM	2
3	TOC	CCV	!!Error!! TOC:23.20mg/L TC:22.87mg/L IC:-0.3269mg/L	Complete	6/16/2017 8:05:49 AM	3
4	TOC	WG618108-01 BLK	!!Error!! TOC:0.1274mg/L TC:-0.1357mg/L IC:-0.2632mg/L	Complete	6/16/2017 8:14:50 AM	0
5	TOC	WG618108-02 LCS	!!Error!! TOC:26.59mg/L TC:26.23mg/L IC:-0.3599mg/L	Complete	6/16/2017 8:27:01 AM	5
6	TOC	WG618108-03 LCSDUP	!!Error!! TOC:25.68mg/L TC:25.33mg/L IC:-0.3537mg/L	Complete	6/16/2017 8:39:16 AM	6
7	TOC	L17060707-01	TOC:28.33mg/L TC:28.57mg/L IC:0.2424mg/L	Complete	6/16/2017 8:59:52 AM	7
8	TOC	L17060708-01	TOC:28.83mg/L TC:29.04mg/L IC:0.2098mg/L	Complete	6/16/2017 9:12:22 AM	8
9	TOC	L17060761-01	TOC:2.588mg/L TC:21.75mg/L IC:19.16mg/L	Complete	6/16/2017 9:24:59 AM	9
10	TOC	L17060761-02	TOC:2.275mg/L TC:21.13mg/L IC:18.86mg/L	Complete	6/16/2017 9:37:32 AM	10
11	TOC	L17060761-03	TOC:1.948mg/L TC:20.81mg/L IC:18.86mg/L	Complete	6/16/2017 9:50:24 AM	11
12	TOC	L17060761-04	TOC:2.161mg/L TC:18.77mg/L IC:16.60mg/L	Complete	6/16/2017 10:03:10 A	12
13	TOC	L17060761-05	TOC:2.060mg/L TC:19.08mg/L IC:17.02mg/L	Complete	6/16/2017 10:15:57 A	13
14	TOC	CCV	!!Error!! TOC:23.50mg/L TC:23.25mg/L IC:-0.2441mg/L	Complete	6/16/2017 10:28:09 A	14
15	TOC	CCB	!!Error!! TOC:0.1237mg/L TC:-0.1379mg/L IC:-0.2616mg/L	Complete	6/16/2017 10:37:08 A	0
16	TOC	L17060761-06	TOC:3.878mg/L TC:18.88mg/L IC:15.00mg/L	Complete	6/16/2017 10:49:50 A	16
17	TOC	L17060761-07	TOC:3.518mg/L TC:19.06mg/L IC:15.54mg/L	Complete	6/16/2017 11:02:28 A	17
18	TOC	L17060761-08	TOC:2.214mg/L TC:18.45mg/L IC:16.24mg/L	Complete	6/16/2017 11:15:11 A	18
19	TOC	L17060761-09	TOC:2.240mg/L TC:19.19mg/L IC:16.95mg/L	Complete	6/16/2017 11:27:48 A	19
20	TOC	L17060761-10	TOC:2.234mg/L TC:15.36mg/L IC:13.12mg/L	Complete	6/16/2017 11:40:20 A	20
21	TOC	L17060761-11	TOC:2.074mg/L TC:13.97mg/L IC:11.90mg/L	Complete	6/16/2017 11:52:53 A	21
22	TOC	L17060761-12	TOC:2.296mg/L TC:16.64mg/L IC:14.34mg/L	Complete	6/16/2017 12:05:12 P	22
23	TOC	L17060761-13	TOC:2.201mg/L TC:13.46mg/L IC:11.26mg/L	Complete	6/16/2017 12:17:22 P	23
24	TOC	L17060761-14	TOC:2.036mg/L TC:13.71mg/L IC:11.67mg/L	Complete	6/16/2017 12:29:31 P	24
25	TOC	L17060761-15	TOC:2.469mg/L TC:13.13mg/L IC:10.66mg/L	Complete	6/16/2017 12:41:47 P	25
26	TOC	CCV	!!Error!! TOC:23.02mg/L TC:22.77mg/L IC:-0.2462mg/L	Complete	6/16/2017 12:54:01 P	26
27	TOC	CCB	!!Error!! TOC:0.1297mg/L TC:-0.1395mg/L IC:-0.2693mg/L	Complete	6/16/2017 1:03:02 PM	0
28	TOC	L17060761-16	TOC:1.871mg/L TC:4.322mg/L IC:2.451mg/L	Complete	6/16/2017 1:14:54 PM	28
29	TOC	L17060761-17	TOC:1.896mg/L TC:4.372mg/L IC:2.475mg/L	Complete	6/16/2017 1:26:45 PM	29
30	TOC	L17060761-18	TOC:1.826mg/L TC:3.909mg/L IC:2.083mg/L	Complete	6/16/2017 1:38:35 PM	30
31	TOC	WG618108-05 DUP	TOC:1.901mg/L TC:3.961mg/L IC:2.060mg/L	Complete	6/16/2017 1:50:25 PM	31
32	TOC	WG618108-06 MS	TOC:13.43mg/L TC:14.73mg/L IC:1.300mg/L	Complete	6/16/2017 2:02:29 PM	32
33	TOC	WG618110-01 BLK	!!Error!! TOC:0.1218mg/L TC:-0.1483mg/L IC:-0.2700mg/L	Complete	6/16/2017 2:11:26 PM	0
34	TOC	WG618110-02 LCS	!!Error!! TOC:25.80mg/L TC:25.52mg/L IC:-0.2849mg/L	Complete	6/16/2017 2:23:41 PM	34
35	TOC	WG618110-03 LCSDUP	!!Error!! TOC:26.57mg/L TC:26.28mg/L IC:-0.2916mg/L	Complete	6/16/2017 2:35:54 PM	35
36	TOC	L17060761-19	TOC:1.590mg/L TC:6.621mg/L IC:3.17mg/L	Complete	6/16/2017 2:47:59 PM	36
37	TOC	L17060761-20	TOC:1.516mg/L TC:8.178mg/L IC:6.662mg/L	Complete	6/16/2017 3:00:00 PM	37
38	TOC	CCV	!!Error!! TOC:23.58mg/L TC:23.32mg/L IC:-0.2551mg/L	Complete	6/16/2017 3:12:12 PM	38
39	TOC	CCB	!!Error!! TOC:0.1269mg/L TC:-0.1539mg/L IC:-0.2808mg/L	Complete	6/16/2017 3:21:16 PM	0
40	TOC	L17060761-21	TOC:1.837mg/L TC:6.621mg/L IC:4.784mg/L	Complete	6/16/2017 3:33:18 PM	40
41	TOC	L17060761-22	TOC:2.085mg/L TC:13.00mg/L IC:10.92mg/L	Complete	6/16/2017 3:45:40 PM	41
42	TOC	L17060761-23	TOC:1.858mg/L TC:11.46mg/L IC:9.607mg/L	Complete	6/16/2017 3:58:01 PM	42
43	TOC	L17060761-24	TOC:1.822mg/L TC:12.38mg/L IC:10.56mg/L	Complete	6/16/2017 4:10:31 PM	43
44	TOC	L17060761-25	TOC:1.777mg/L TC:4.925mg/L IC:3.147mg/L	Complete	6/16/2017 4:22:26 PM	44
45	TOC	L17060761-26	TOC:1.867mg/L TC:5.874mg/L IC:4.007mg/L	Complete	6/16/2017 4:34:23 PM	45
46	TOC	L17060761-27	TOC:1.729mg/L TC:4.452mg/L IC:2.723mg/L	Complete	6/16/2017 4:51:23 PM	46
47	TOC	L17060761-28	TOC:1.901mg/L TC:9.617mg/L IC:7.716mg/L	Complete	6/16/2017 5:03:32 PM	47
48	TOC	L17060761-29	TOC:1.605mg/L TC:7.705mg/L IC:6.101mg/L	Complete	6/16/2017 5:15:31 PM	48
49	TOC	L17060761-30	TOC:2.072mg/L TC:9.362mg/L IC:7.289mg/L	Complete	6/16/2017 5:27:31 PM	49
50	TOC	CCV	!!Error!! TOC:23.55mg/L TC:23.30mg/L IC:-0.2555mg/L	Complete	6/16/2017 5:39:39 PM	50
51	TOC	CCB	!!Error!! TOC:0.1209mg/L TC:-0.1553mg/L IC:-0.2763mg/L	Complete	6/16/2017 5:48:38 PM	0
52	TOC	L17060761-31	TOC:2.150mg/L TC:7.098mg/L IC:4.948mg/L	Complete	6/16/2017 6:00:46 PM	52
53	TOC	L17060761-32	TOC:2.382mg/L TC:7.431mg/L IC:5.049mg/L	Complete	6/16/2017 6:12:55 PM	53
54	TOC	L17060761-33	TOC:2.006mg/L TC:6.512mg/L IC:4.506mg/L	Complete	6/16/2017 6:24:51 PM	54
55	TOC	L17060761-34	TOC:1.905mg/L TC:7.247mg/L IC:5.342mg/L	Complete	6/16/2017 6:37:03 PM	55
56	TOC	L17060761-35	TOC:1.974mg/L TC:6.895mg/L IC:4.921mg/L	Complete	6/16/2017 6:49:07 PM	56
57	TOC	L17060761-36	TOC:2.088mg/L TC:6.973mg/L IC:4.885mg/L	Complete	6/16/2017 7:01:09 PM	57
58	TOC	L17060761-37	TOC:2.043mg/L TC:6.328mg/L IC:4.285mg/L	Complete	6/16/2017 7:13:10 PM	58
59	TOC	L17060761-38	TOC:2.106mg/L TC:6.111mg/L IC:4.004mg/L	Complete	6/16/2017 7:25:17 PM	59
60	TOC	WG618110-05 DUP	TOC:2.029mg/L TC:6.699mg/L IC:4.670mg/L	Complete	6/16/2017 7:37:22 PM	60
61	TOC	WG618110-06 MS	TOC:13.58mg/L TC:15.39mg/L IC:1.812mg/L	Complete	6/16/2017 7:49:28 PM	61
62	TOC	CCV	!!Error!! TOC:24.45mg/L TC:24.17mg/L IC:-0.2745mg/L	Complete	6/16/2017 8:01:41 PM	62
63	TOC	CCB	!!Error!! TOC:0.1223mg/L TC:-0.1516mg/L IC:-0.2739mg/L	Complete	6/16/2017 8:10:39 PM	0
64	TOC	WG618111-01 BLK	!!Error!! TOC:0.1217mg/L TC:-0.1537mg/L IC:-0.2754mg/L	Complete	6/16/2017 8:19:37 PM	0
65	TOC	WG618111-02 LCS	!!Error!! TOC:26.39mg/L TC:26.11mg/L IC:-0.2809mg/L	Complete	6/16/2017 8:31:57 PM	65
66	TOC	WG618111-03 LCSDUP	!!Error!! TOC:25.42mg/L TC:25.14mg/L IC:-0.2797mg/L	Complete	6/16/2017 8:44:12 PM	66
67	TOC	L17060761-39	TOC:2.137mg/L TC:9.073mg/L IC:6.937mg/L	Complete	6/16/2017 8:56:22 PM	67

6/19/2017 7:16:51 AM

1/2

	Analysis	Sample Name	Result	Status	Date / Time	Vial
68	TOC	L17060761-40	TOC:1.889mg/L TC:8.710mg/L IC:6.820mg/L	Complete	6/16/2017 9:08:26 PM	68
69	TOC	L17060761-41	TOC:1.785mg/L TC:10.28mg/L IC:8.498mg/L	Complete	6/16/2017 9:20:46 PM	1
70	TOC	L17060761-42	TOC:1.599mg/L TC:10.33mg/L IC:8.732mg/L	Complete	6/16/2017 9:32:51 PM	2
71	TOC	L17060761-43	TOC:15.14mg/L TC:24.83mg/L IC:9.693mg/L	Complete	6/16/2017 9:46:55 PM	3
72	TOC	L17060761-44	TOC:14.43mg/L TC:24.06mg/L IC:9.622mg/L	Complete	6/16/2017 10:00:31 P	4
73	TOC	L17060761-45	TOC:14.25mg/L TC:24.01mg/L IC:9.753mg/L	Complete	6/16/2017 10:14:06 P	5
74	TOC	CCV	!!Error!! TOC:23.67mg/L TC:23.42mg/L IC:-0.2548mg/L	Complete	6/16/2017 10:35:16 P	6
75	TOC	CCB	!!Error!! TOC:0.1147mg/L TC:-0.1504mg/L IC:-0.2651mg/L	Complete	6/16/2017 10:35:15 P	0
76	TOC	L17060761-46	TOC:13.95mg/L TC:21.05mg/L IC:7.104mg/L	Complete	6/16/2017 10:48:43 P	8
77	TOC	L17060761-47	TOC:13.90mg/L TC:19.63mg/L IC:5.736mg/L	Complete	6/16/2017 11:02:24 P	9
78	TOC	L17060761-48	TOC:14.65mg/L TC:25.31mg/L IC:10.66mg/L	Complete	6/16/2017 11:16:07 P	10
79	TOC	L17060853-01 (3)	TOC:16.33mg/L TC:23.25mg/L IC:6.925mg/L	Complete	6/16/2017 11:29:03 P	11
80	TOC	L17060718-05 (3)	TOC:1.984mg/L TC:13.25mg/L IC:11.27mg/L	Complete	6/16/2017 11:41:24 P	12
81	TOC		TOC:1.130mg/L TC:7.694mg/L IC:6.564mg/L	Complete	6/16/2017 11:53:38 P	13
82	TOC		TOC:1.293mg/L TC:9.123mg/L IC:7.830mg/L	Complete	6/17/2017 12:05:52 A	14
83	TOC		TOC:1.151mg/L TC:6.947mg/L IC:5.796mg/L	Complete	6/17/2017 12:17:49 A	15
84	TOC		TOC:2.242mg/L TC:6.775mg/L IC:4.533mg/L	Complete	6/17/2017 12:29:50 A	16
85	TOC	L17060898-01 (2)	TOC:2.635mg/L TC:13.50mg/L IC:10.86mg/L	Complete	6/17/2017 12:42:22 A	17
86	TOC	CCV	!!Error!! TOC:22.79mg/L TC:22.54mg/L IC:-0.2480mg/L	Complete	6/17/2017 12:54:36 A	18
87	TOC	CCB	!!Error!! TOC:0.1223mg/L TC:-0.1431mg/L IC:-0.2653mg/L	Complete	6/17/2017 1:03:34 AM	0
88	TOC	L17060898-03 (3)	TOC:1.496mg/L TC:10.83mg/L IC:9.335mg/L	Complete	6/17/2017 1:15:39 AM	20
89	TOC	L17060898-04 (3)	TOC:2.696mg/L TC:17.22mg/L IC:14.53mg/L	Complete	6/17/2017 1:28:15 AM	21
90	TOC		TOC:1.796mg/L TC:7.807mg/L IC:6.011mg/L	Complete	6/17/2017 1:40:29 AM	22
91	TOC	WG618111-05 DUP	TOC:13.86mg/L TC:19.88mg/L IC:6.011mg/L	Complete	6/17/2017 1:53:58 AM	23
92	TOC	WG618111-06 MS	TOC:25.31mg/L TC:29.39mg/L IC:4.085mg/L	Complete	6/17/2017 2:07:34 AM	24
93	TOC	CCV	!!Error!! TOC:23.59mg/L TC:23.32mg/L IC:-0.2663mg/L	Complete	6/17/2017 2:19:48 AM	25
94	TOC	CCB	!!Error!! TOC:0.1196mg/L TC:-0.1445mg/L IC:-0.2641mg/L	Complete	6/17/2017 2:28:48 AM	0

6/19/2017 7:16:51 AM

2/2

Instr. Information

System TOCVW ASI
 Detector Wet Chemical

Sample

Sample Name: TIC
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

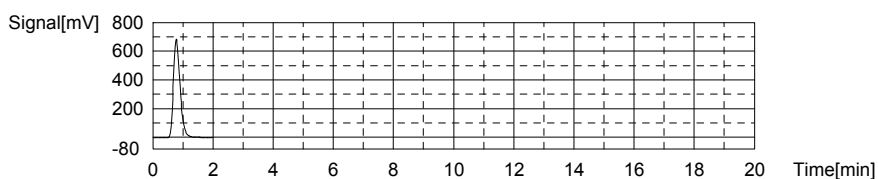
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.347mg/L TC:24.60mg/L IC:23.25mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1058	24.60mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 7:35:32 AM

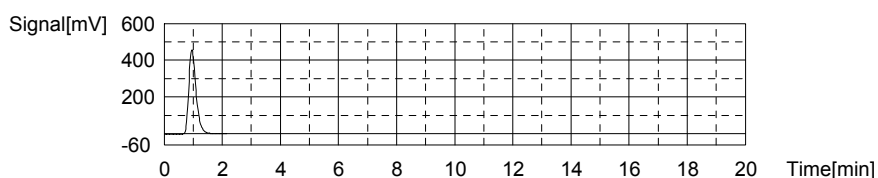
Mean Area 1058
 Mean Conc. 24.60mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	797.0	23.25mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 7:40:46 AM

Mean Area 797.0
 Mean Conc. 23.25mg/L



Sample

Sample Name: TOC\TIC
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

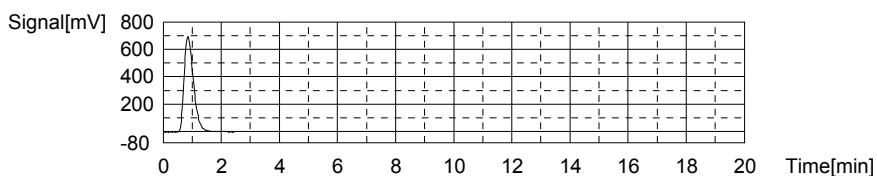
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.05mg/L TC:36.32mg/L IC:9.263mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1554	36.32mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 7:48:39 AM

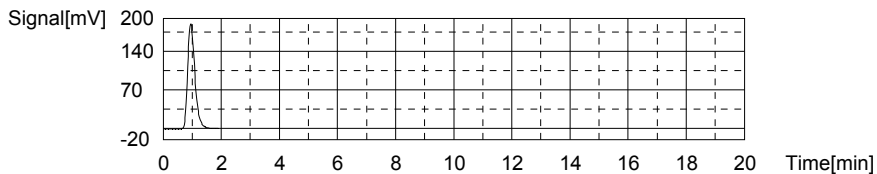
Mean Area 1554
Mean Conc. 36.32mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	328.6	9.263mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 7:53:28 AM

Mean Area 328.6
Mean Conc. 9.263mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

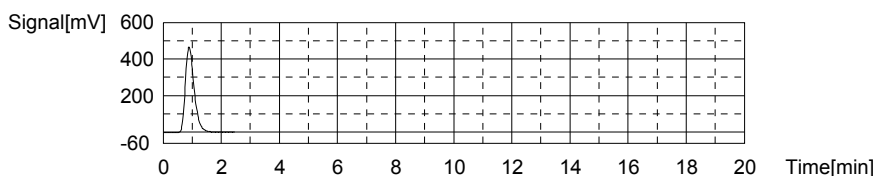
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.20mg/L TC:22.87mg/L IC:-0.3269mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	984.9	22.87mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 8:01:22 AM

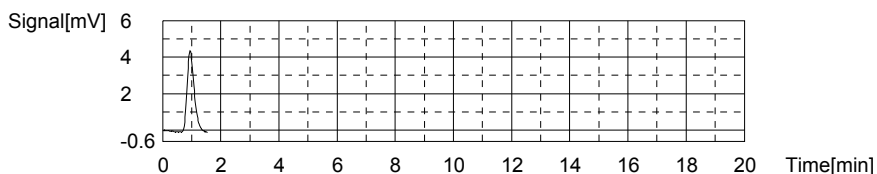
Mean Area 984.9
Mean Conc. 22.87mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.469	-0.3269mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 8:05:49 AM

Mean Area 7.469
 Mean Conc. -0.3269mg/L



Sample

Sample Name: WG618108-01 BLK
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

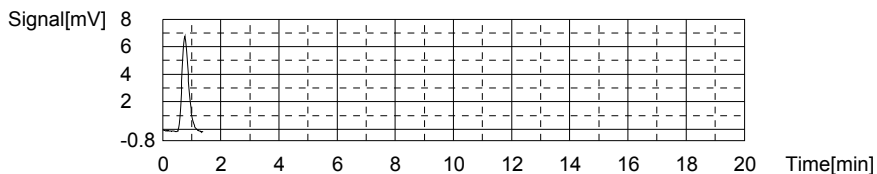
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1274mg/L TC:-0.1357mg/L IC:-0.2632mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.12	-0.1357mg/L	500uL	1		TC	16/16/2017 8:10:51 AM

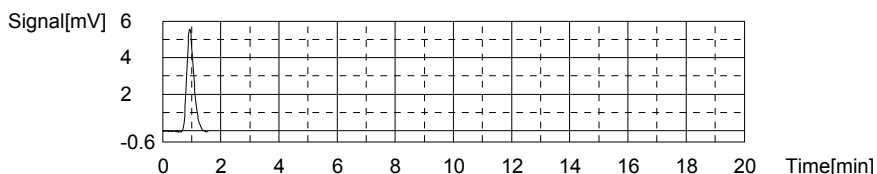
Mean Area 11.12
 Mean Conc. -0.1357mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.602	-0.2632mg/L	500uL	1		IC	16/16/2017 8:14:50 AM

Mean Area 9.602
 Mean Conc. -0.2632mg/L



Sample

Sample Name: WG618108-02 LCS
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.59mg/L TC:26.23mg/L IC:-0.3599mg/L

6/19/2017 7:16:55 AM

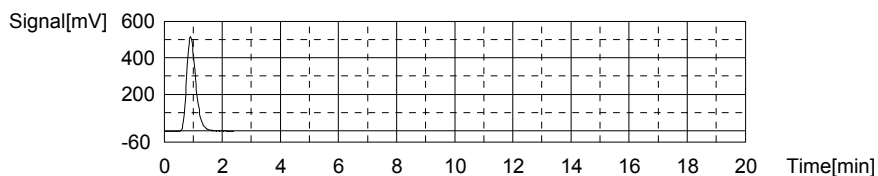
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1127	26.23mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 8:22:40 AM

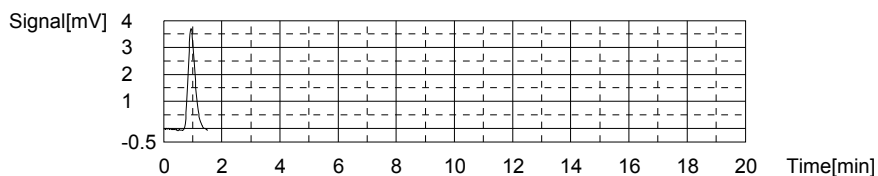
Mean Area 1127
Mean Conc. 26.23mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.362	-0.3599mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 8:27:01 AM

Mean Area 6.362
Mean Conc. -0.3599mg/L



Sample

Sample Name: WG618108-03 LCSDUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

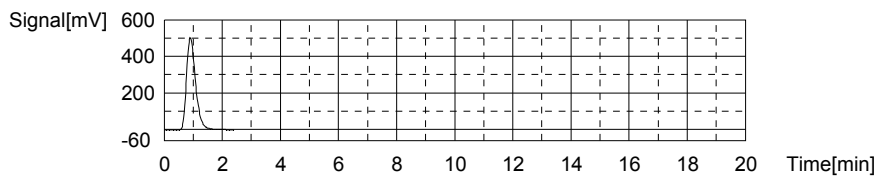
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.68mg/L TC:25.33mg/L IC:-0.3537mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1089	25.33mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 8:34:52 AM

Mean Area 1089
Mean Conc. 25.33mg/L

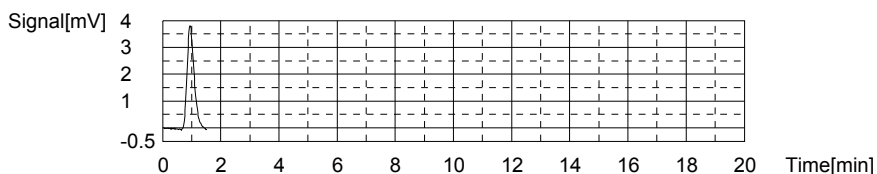


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.569	-0.3537mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 8:39:16 AM

4/63

Mean Area 6.569
 Mean Conc. -0.3537mg/L



Sample

Sample Name: L17060707-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

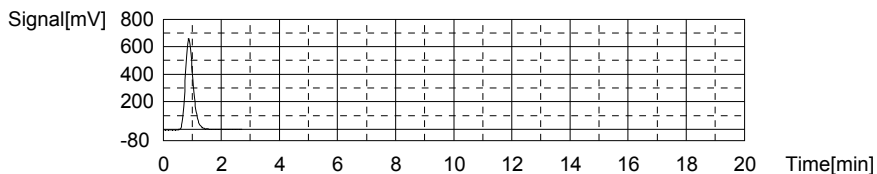
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:28.33mg/L TC:28.57mg/L IC:0.2424mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1226	28.57mg/L	500uL	1		TC	16/16/2017 8:55:16 AM

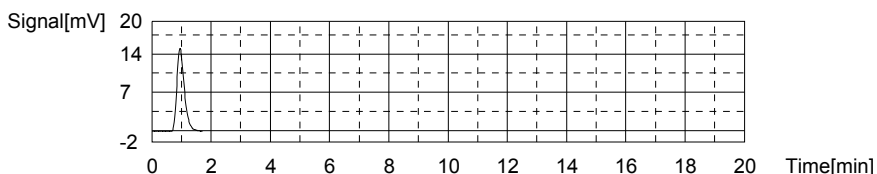
Mean Area 1226
 Mean Conc. 28.57mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	26.53	0.2424mg/L	500uL	1		IC	16/16/2017 8:59:52 AM

Mean Area 26.53
 Mean Conc. 0.2424mg/L



Sample

Sample Name: L17060708-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

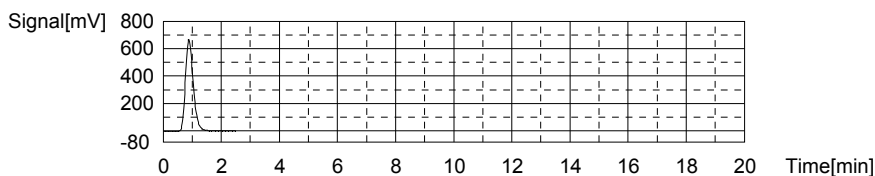
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:28.83mg/L TC:29.04mg/L IC:0.2098mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1246	29.04mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 9:07:49 AM

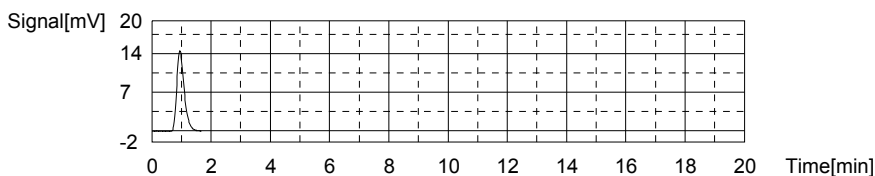
Mean Area 1246
Mean Conc. 29.04mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	25.44	0.2098mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 9:12:22 AM

Mean Area 25.44
Mean Conc. 0.2098mg/L



Sample

Sample Name: L17060761-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

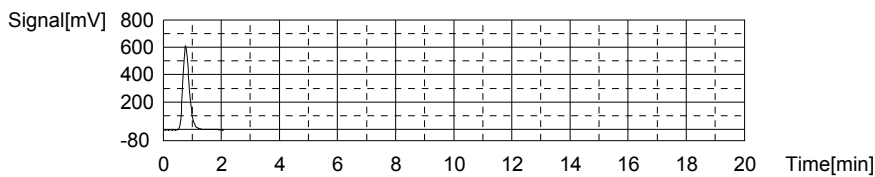
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.588mg/L TC:21.75mg/L IC:19.16mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	937.5	21.75mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 9:19:54 AM

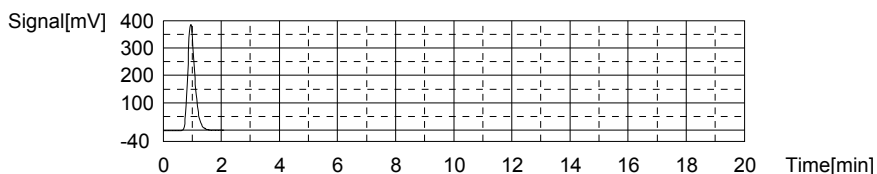
Mean Area 937.5
Mean Conc. 21.75mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	660.1	19.16mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 9:24:59 AM

Mean Area 660.1
Mean Conc. 19.16mg/L



Sample

Sample Name: L17060761-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

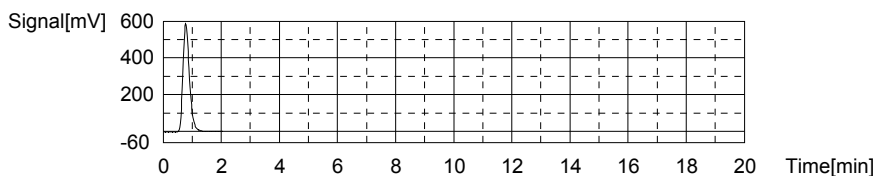
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.275mg/L TC:21.13mg/L IC:18.86mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	911.2	21.13mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/2017 9:32:29 AM

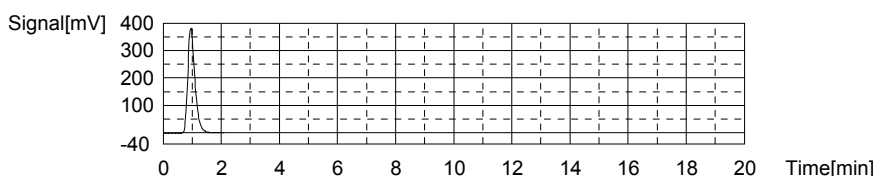
Mean Area 911.2
Mean Conc. 21.13mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	649.8	18.86mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/2017 9:37:32 AM

Mean Area 649.8
Mean Conc. 18.86mg/L



Sample

Sample Name: L17060761-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.948mg/L TC:20.81mg/L IC:18.86mg/L

6/19/2017 7:16:55 AM

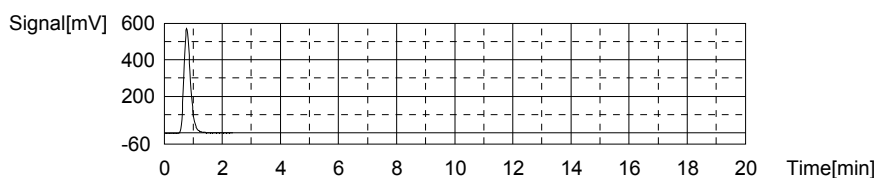
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	897.5	20.81mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 9:45:20 AM

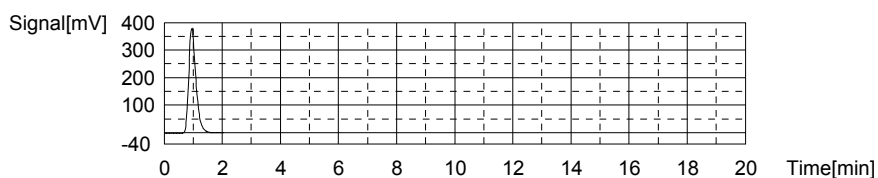
Mean Area 897.5
Mean Conc. 20.81mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	649.9	18.86mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 9:50:24 AM

Mean Area 649.9
Mean Conc. 18.86mg/L



Sample

Sample Name: L17060761-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

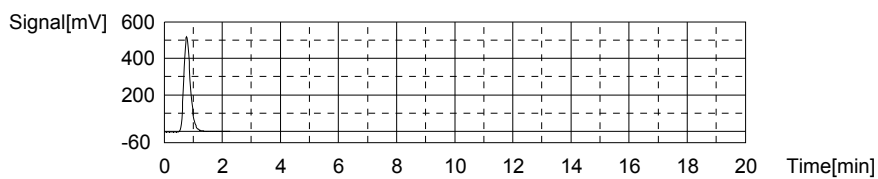
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.161mg/L TC:18.77mg/L IC:16.60mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	811.1	18.77mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 9:58:06 AM

Mean Area 811.1
Mean Conc. 18.77mg/L

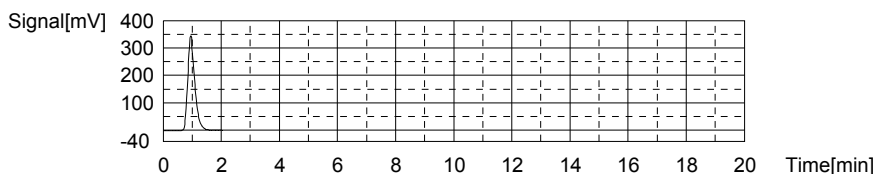


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	574.4	16.60mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 10:03:10 AM

8/63

Mean Area 574.4
Mean Conc. 16.60mg/L



Sample

Sample Name: L17060761-05
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

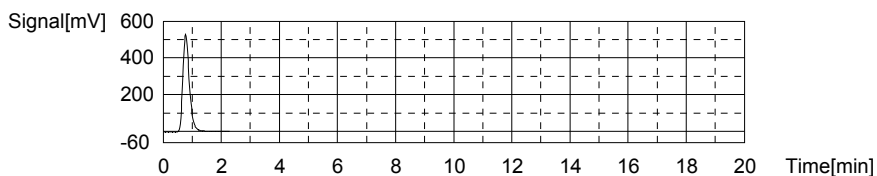
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.060mg/L TC:19.08mg/L IC:17.02mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	824.5	19.08mg/L	500uL	1		TC	16/16/2017 10:10:54 AM

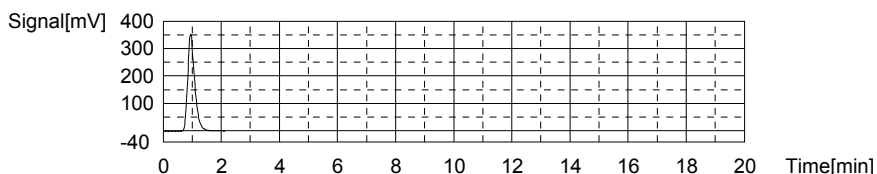
Mean Area 824.5
Mean Conc. 19.08mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	588.4	17.02mg/L	500uL	1		IC	16/16/2017 10:15:57 AM

Mean Area 588.4
Mean Conc. 17.02mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

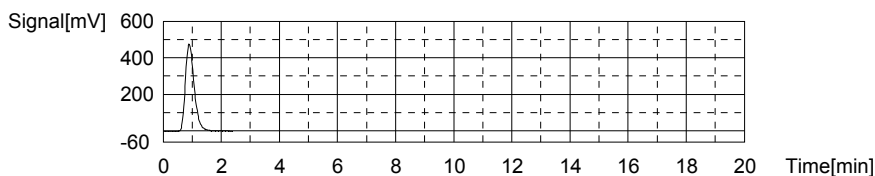
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.50mg/L TC:23.25mg/L IC:-0.2441mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1001	23.25mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 10:23:46 AM

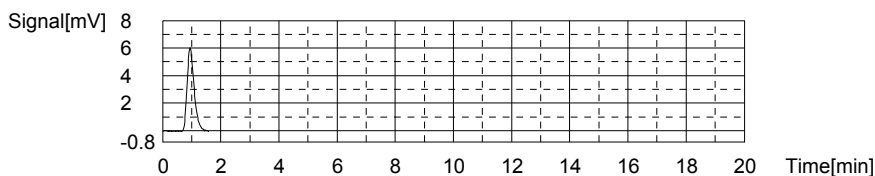
Mean Area 1001
Mean Conc. 23.25mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.24	-0.2441mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 10:28:09 AM

Mean Area 10.24
Mean Conc. -0.2441mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

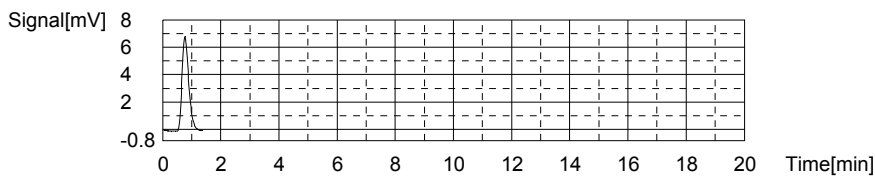
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1237mg/L TC:-0.1379mg/L IC:-0.2616mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.03	-0.1379mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 10:33:11 AM

Mean Area 11.03
Mean Conc. -0.1379mg/L



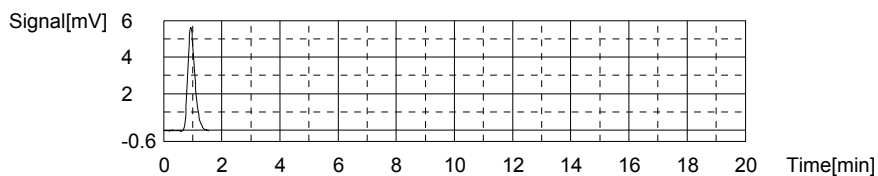
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.656	-0.2616mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 10:37:08 AM

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 9.656
Mean Conc. -0.2616mg/L



Sample

Sample Name: L17060761-06
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

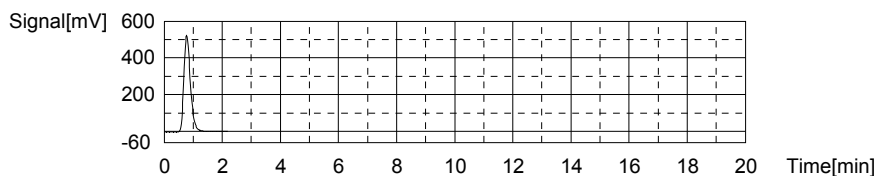
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.878mg/L TC:18.88mg/L IC:15.00mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	816.0	18.88mg/L	500uL	1		TC	16/16/2017 10:44:47 AM

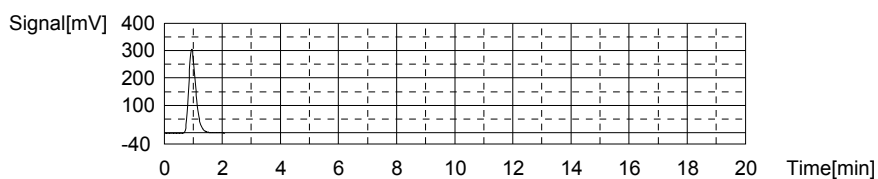
Mean Area 816.0
Mean Conc. 18.88mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	520.8	15.00mg/L	500uL	1		IC	16/16/2017 10:49:50 AM

Mean Area 520.8
Mean Conc. 15.00mg/L



Sample

Sample Name: L17060761-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.518mg/L TC:19.06mg/L IC:15.54mg/L

11/63

6/19/2017 7:16:55 AM

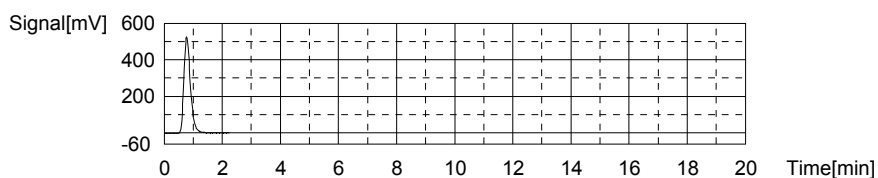
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	823.4	19.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 10:57:30 AM

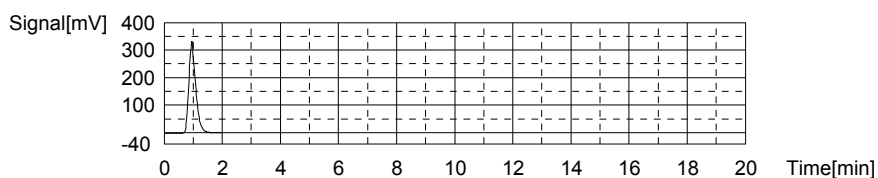
Mean Area 823.4
Mean Conc. 19.06mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	538.7	15.54mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 11:02:28 AM

Mean Area 538.7
Mean Conc. 15.54mg/L



Sample

Sample Name: L17060761-08
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

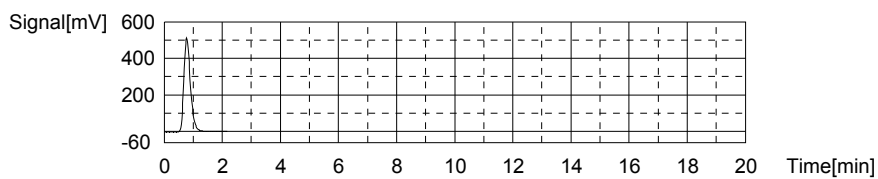
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.214mg/L TC:18.45mg/L IC:16.24mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	797.9	18.45mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 11:10:06 AM

Mean Area 797.9
Mean Conc. 18.45mg/L



Anal.: IC

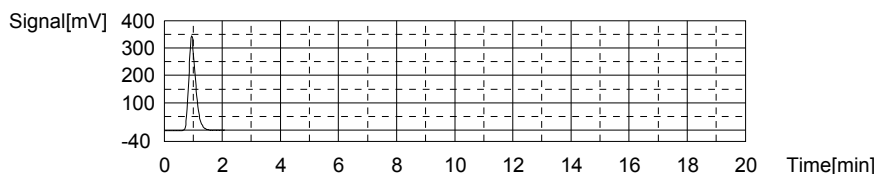
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	562.2	16.24mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 11:15:11 AM

12/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 562.2
Mean Conc. 16.24mg/L



Sample

Sample Name: L17060761-09
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

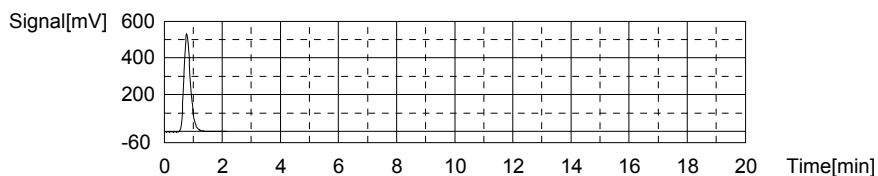
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.240mg/L TC:19.19mg/L IC:16.95mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	829.2	19.19mg/L	500uL	1		TC	16/16/2017 11:22:46 AM

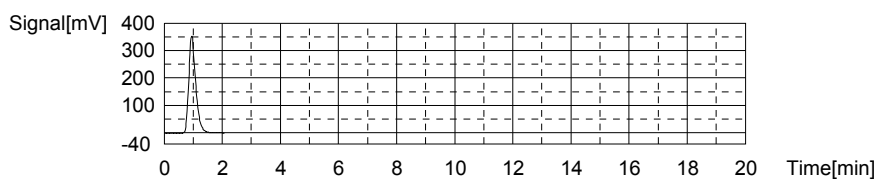
Mean Area 829.2
Mean Conc. 19.19mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	586.1	16.95mg/L	500uL	1		IC	16/16/2017 11:27:48 AM

Mean Area 586.1
Mean Conc. 16.95mg/L



Sample

Sample Name: L17060761-10
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.234mg/L TC:15.36mg/L IC:13.12mg/L

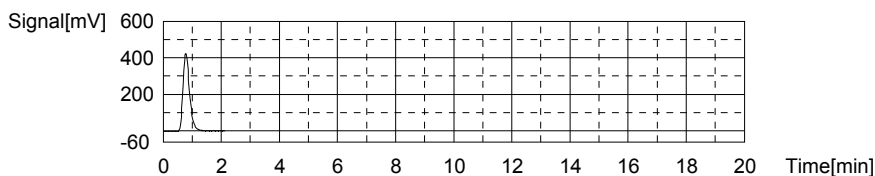
13/63

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	666.9	15.36mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 11:35:22 AM

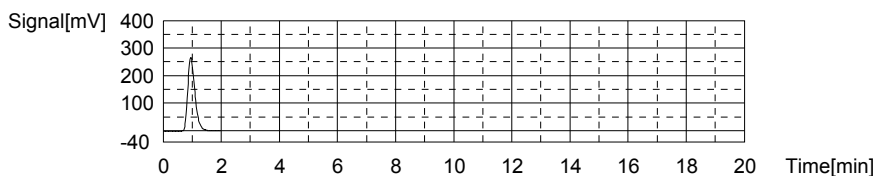
Mean Area 666.9
Mean Conc. 15.36mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	457.9	13.12mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 11:40:20 AM

Mean Area 457.9
Mean Conc. 13.12mg/L



Sample

Sample Name: L17060761-11
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

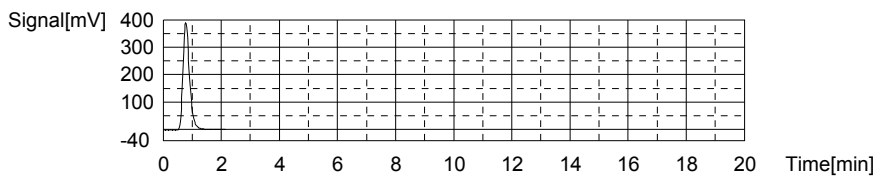
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.074mg/L TC:13.97mg/L IC:11.90mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	608.2	13.97mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 11:47:55 AM

Mean Area 608.2
Mean Conc. 13.97mg/L



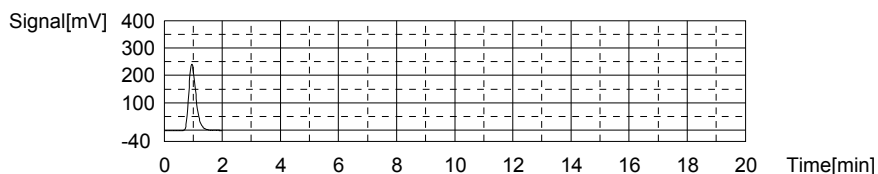
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	416.8	11.90mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 11:52:53 AM

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 416.8
Mean Conc. 11.90mg/L



Sample

Sample Name: L17060761-12
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

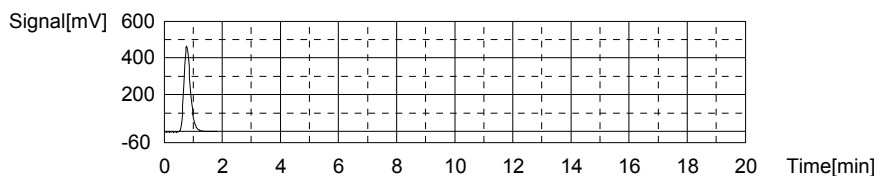
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.296mg/L TC:16.64mg/L IC:14.34mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	721.0	16.64mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 12:00:09 PM

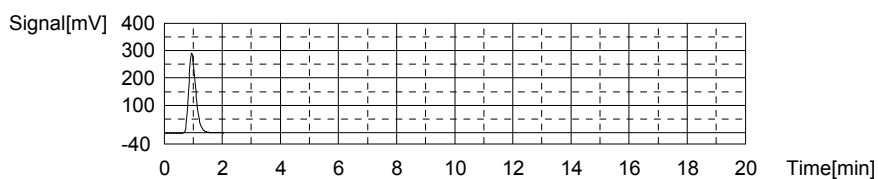
Mean Area 721.0
Mean Conc. 16.64mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	498.6	14.34mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 12:05:12 PM

Mean Area 498.6
Mean Conc. 14.34mg/L



Sample

Sample Name: L17060761-13
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.201mg/L TC:13.46mg/L IC:11.26mg/L

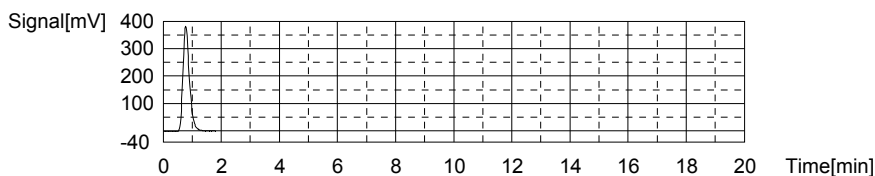
15/63

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	586.4	13.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 12:12:27 PM

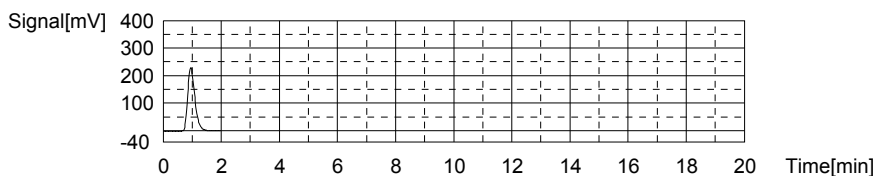
Mean Area 586.4
Mean Conc. 13.46mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	395.3	11.26mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 12:17:22 PM

Mean Area 395.3
Mean Conc. 11.26mg/L



Sample

Sample Name: L17060761-14
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

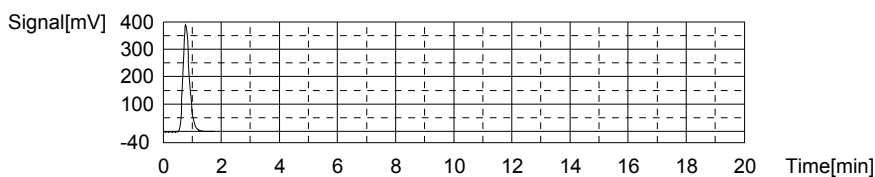
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.036mg/L TC:13.71mg/L IC:11.67mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	597.0	13.71mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 12:24:34 PM

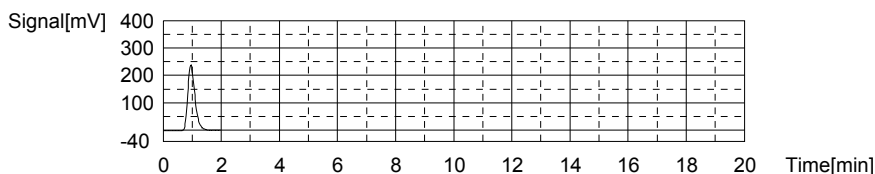
Mean Area 597.0
Mean Conc. 13.71mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	409.2	11.67mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 12:29:31 PM

Mean Area 409.2
Mean Conc. 11.67mg/L



Sample

Sample Name: L17060761-15
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

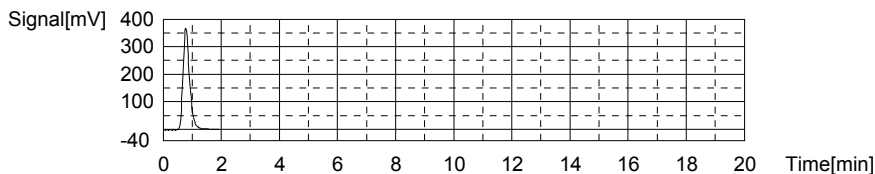
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.469mg/L TC:13.13mg/L IC:10.66mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	572.6	13.13mg/L	500uL	1		TC	16/16/2017 12:36:52 PM

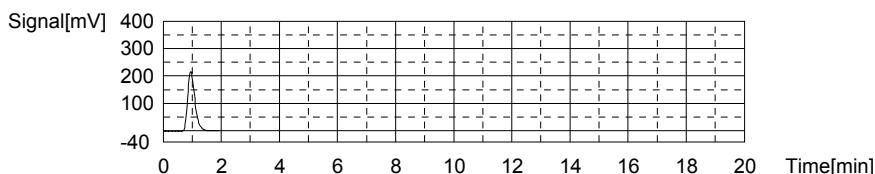
Mean Area 572.6
Mean Conc. 13.13mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	375.4	10.66mg/L	500uL	1		IC	16/16/2017 12:41:47 PM

Mean Area 375.4
Mean Conc. 10.66mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.02mg/L TC:22.77mg/L IC:-0.2462mg/L

6/19/2017 7:16:55 AM

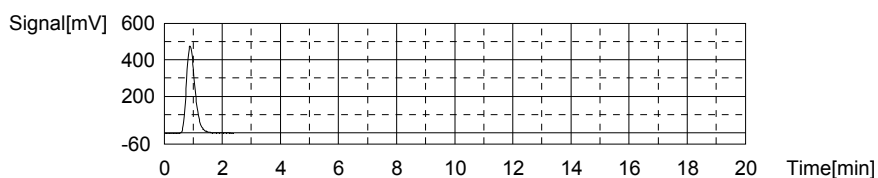
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	980.7	22.77mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 12:49:36 PM

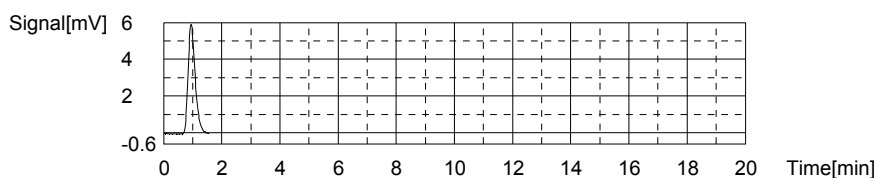
Mean Area 980.7
Mean Conc. 22.77mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.17	-0.2462mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 12:54:01 PM

Mean Area 10.17
Mean Conc. -0.2462mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

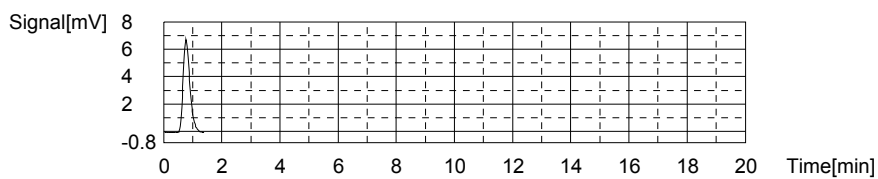
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1297mg/L TC:-0.1395mg/L IC:-0.2693mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.96	-0.1395mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 12:59:03 PM

Mean Area 10.96
Mean Conc. -0.1395mg/L



Anal.: IC

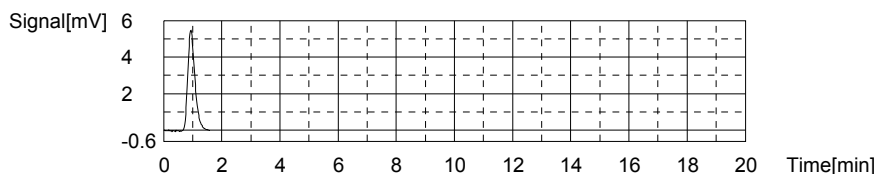
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.398	-0.2693mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 1:03:02 PM

18/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 9.398
Mean Conc. -0.2693mg/L



Sample

Sample Name: L17060761-16
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

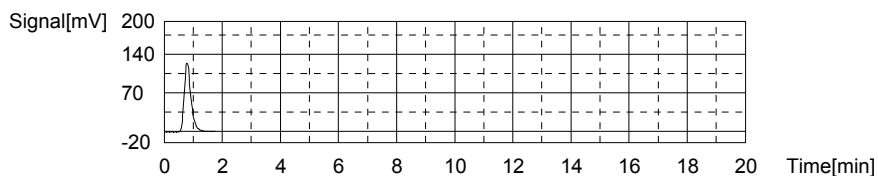
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.871mg/L TC:4.322mg/L IC:2.451mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	199.8	4.322mg/L	500uL	1		TC	16/16/2017 1:10:14 PM

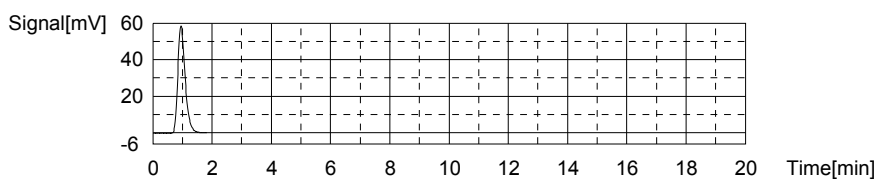
Mean Area 199.8
Mean Conc. 4.322mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	100.5	2.451mg/L	500uL	1		IC	16/16/2017 1:14:54 PM

Mean Area 100.5
Mean Conc. 2.451mg/L



Sample

Sample Name: L17060761-17
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.896mg/L TC:4.372mg/L IC:2.475mg/L

19/63

6/19/2017 7:16:55 AM

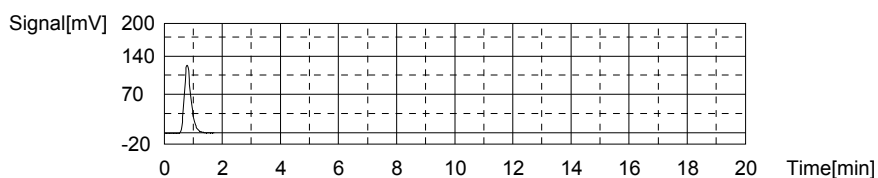
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	201.9	4.372mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 1:22:06 PM

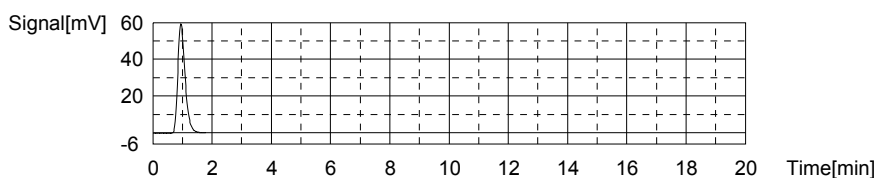
Mean Area 201.9
Mean Conc. 4.372mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	101.3	2.475mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 1:26:45 PM

Mean Area 101.3
Mean Conc. 2.475mg/L



Sample

Sample Name: L17060761-18
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

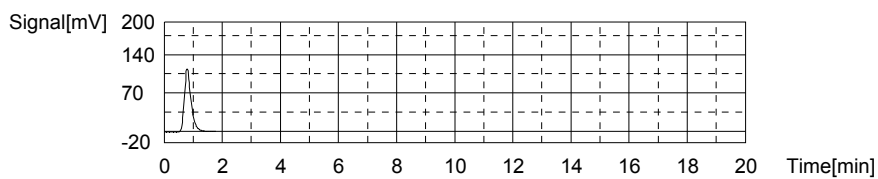
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.826mg/L TC:3.909mg/L IC:2.083mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	182.3	3.909mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 1:33:59 PM

Mean Area 182.3
Mean Conc. 3.909mg/L



Anal.: IC

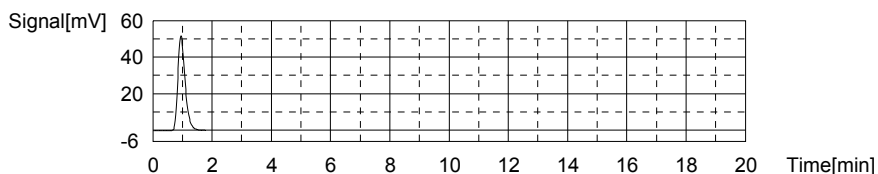
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	88.17	2.083mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 1:38:35 PM

20/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 88.17
Mean Conc. 2.083mg/L



Sample

Sample Name: WG618108-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

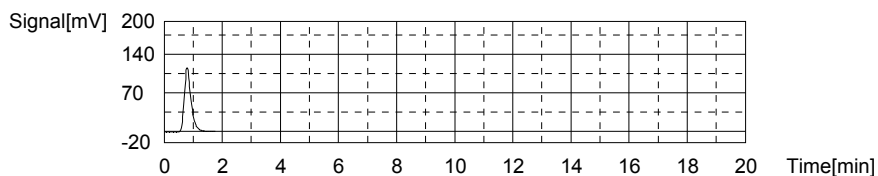
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.901mg/L TC:3.961mg/L IC:2.060mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	184.5	3.961mg/L	500uL	1		TC	16/16/2017 1:45:48 PM

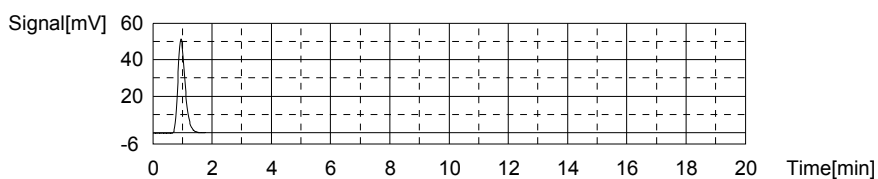
Mean Area 184.5
Mean Conc. 3.961mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	87.38	2.060mg/L	500uL	1		IC	16/16/2017 1:50:25 PM

Mean Area 87.38
Mean Conc. 2.060mg/L



Sample

Sample Name: WG618108-06 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:13.43mg/L TC:14.73mg/L IC:1.300mg/L

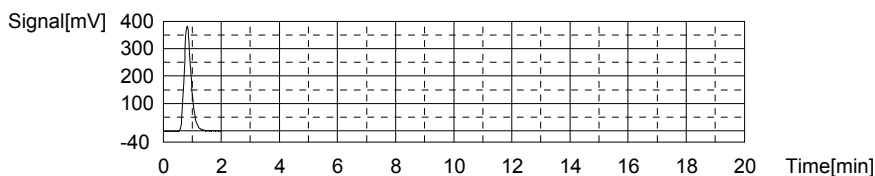
21/63

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	640.2	14.73mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 1:57:53 PM

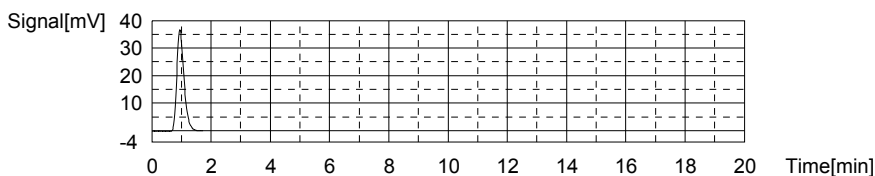
Mean Area 640.2
Mean Conc. 14.73mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	61.96	1.300mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 2:02:29 PM

Mean Area 61.96
Mean Conc. 1.300mg/L



Sample

Sample Name: WG618110-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

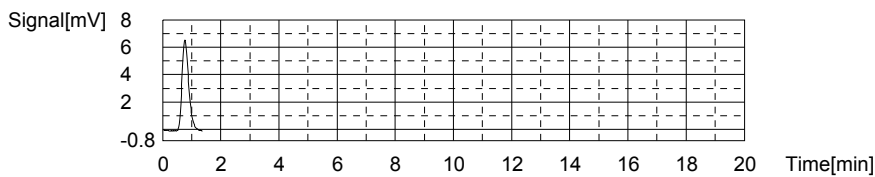
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1218mg/L TC:-0.1483mg/L IC:-0.2700mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.59	-0.1483mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 2:07:30 PM

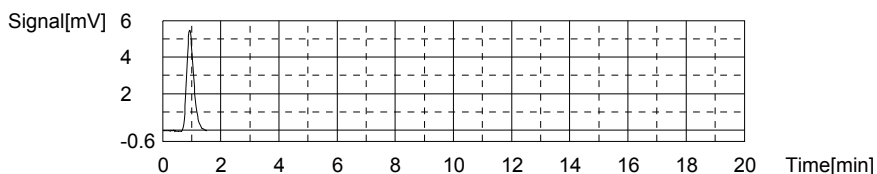
Mean Area 10.59
Mean Conc. -0.1483mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.372	-0.2700mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 2:11:26 PM

Mean Area 9.372
 Mean Conc. -0.2700mg/L



Sample

Sample Name: WG618110-02 LCS
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

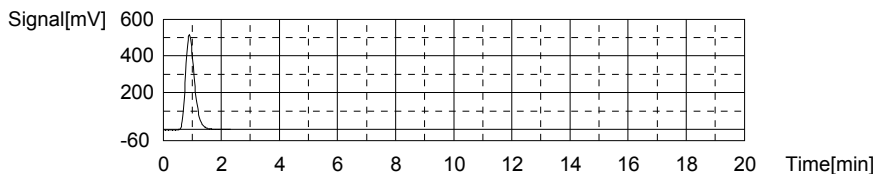
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.80mg/L TC:25.52mg/L IC:-0.2849mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1097	25.52mg/L	500uL	1		TC	16/16/2017 2:19:19 PM

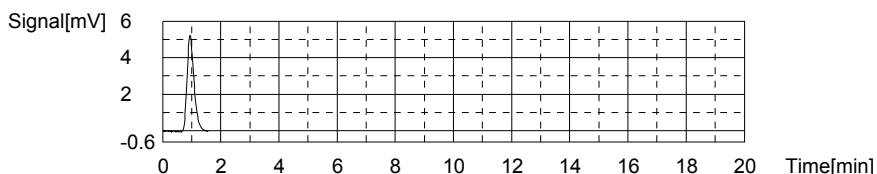
Mean Area 1097
 Mean Conc. 25.52mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.876	-0.2849mg/L	500uL	1		IC	16/16/2017 2:23:41 PM

Mean Area 8.876
 Mean Conc. -0.2849mg/L



Sample

Sample Name: WG618110-03 LCSDUP
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.57mg/L TC:26.28mg/L IC:-0.2916mg/L

6/19/2017 7:16:55 AM

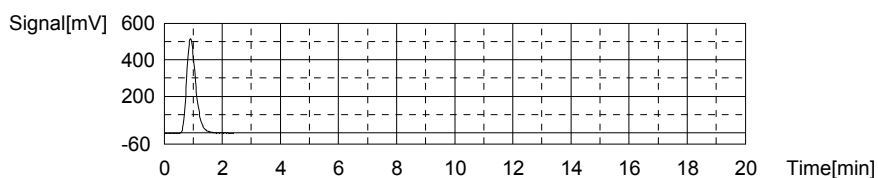
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1129	26.28mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 2:31:32 PM

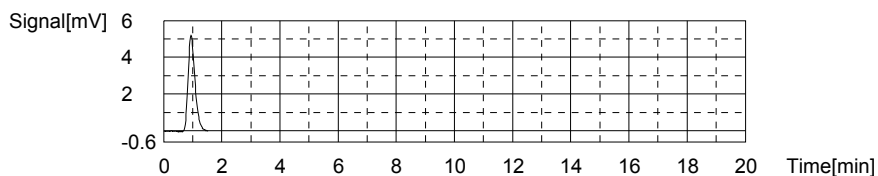
Mean Area 1129
Mean Conc. 26.28mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.651	-0.2916mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 2:35:54 PM

Mean Area 8.651
Mean Conc. -0.2916mg/L



Sample

Sample Name: L17060761-19
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

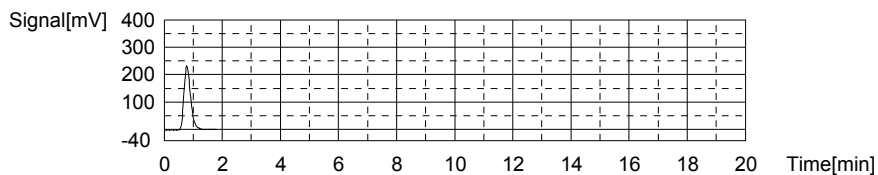
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.590mg/L TC:8.317mg/L IC:6.728mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	368.9	8.317mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 2:43:09 PM

Mean Area 368.9
Mean Conc. 8.317mg/L

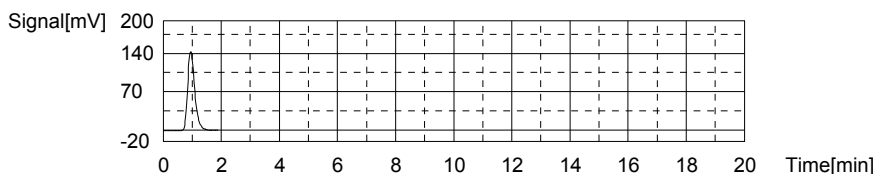


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	243.7	6.728mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 2:47:59 PM

24/63

Mean Area 243.7
Mean Conc. 6.728mg/L



Sample

Sample Name: L17060761-20
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

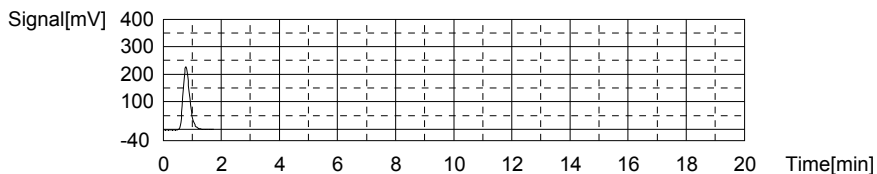
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.516mg/L TC:8.178mg/L IC:6.662mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	363.0	8.178mg/L	500uL	1		TC	16/16/2017 2:55:11 PM

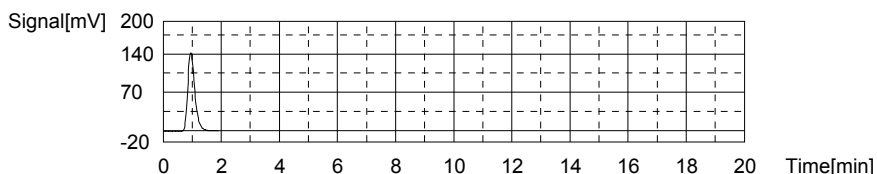
Mean Area 363.0
Mean Conc. 8.178mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	241.5	6.662mg/L	500uL	1		IC	16/16/2017 3:00:00 PM

Mean Area 241.5
Mean Conc. 6.662mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.58mg/L TC:23.32mg/L IC:-0.2551mg/L

6/19/2017 7:16:55 AM

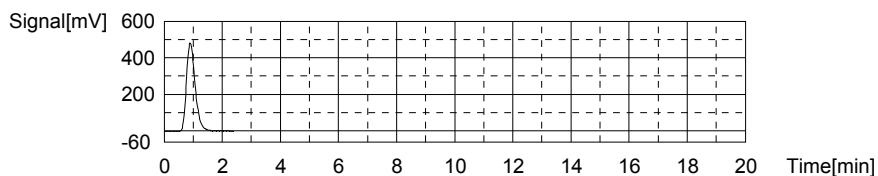
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1004	23.32mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 3:07:50 PM

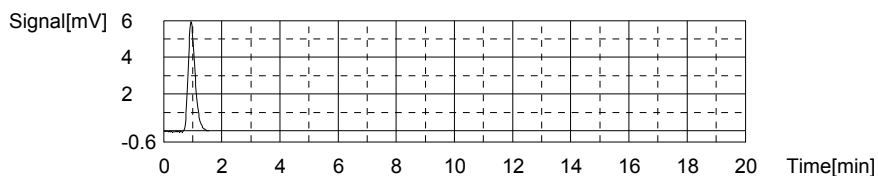
Mean Area 1004
Mean Conc. 23.32mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.873	-0.2551mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 3:12:12 PM

Mean Area 9.873
Mean Conc. -0.2551mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

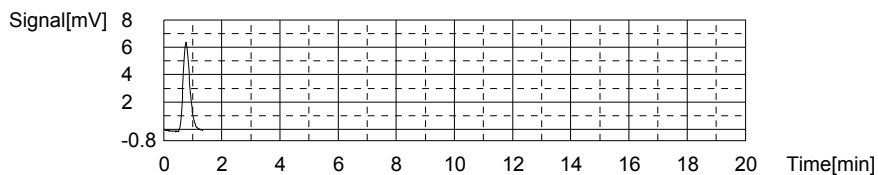
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1269mg/L TC:-0.1539mg/L IC:-0.2808mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.35	-0.1539mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 3:17:22 PM

Mean Area 10.35
Mean Conc. -0.1539mg/L



Anal.: IC

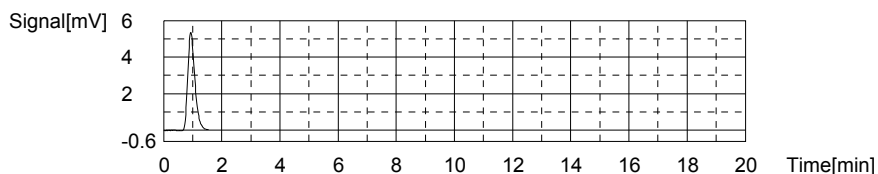
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.011	-0.2808mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 3:21:16 PM

26/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 9.011
Mean Conc. -0.2808mg/L



Sample

Sample Name: L17060761-21
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

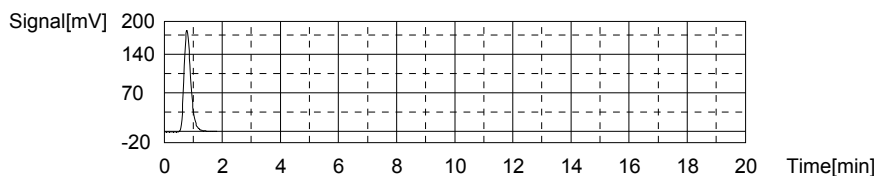
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.837mg/L TC:6.621mg/L IC:4.784mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	297.1	6.621mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 3:28:33 PM

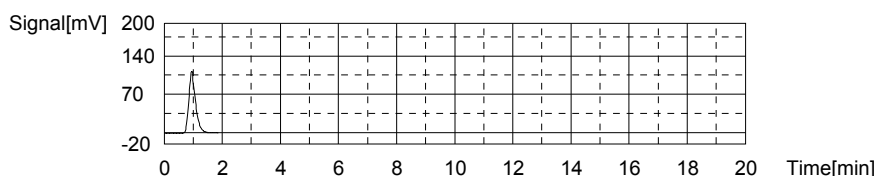
Mean Area 297.1
Mean Conc. 6.621mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	178.6	4.784mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 3:33:18 PM

Mean Area 178.6
Mean Conc. 4.784mg/L



Sample

Sample Name: L17060761-22
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.085mg/L TC:13.00mg/L IC:10.92mg/L

27/63

6/19/2017 7:16:55 AM

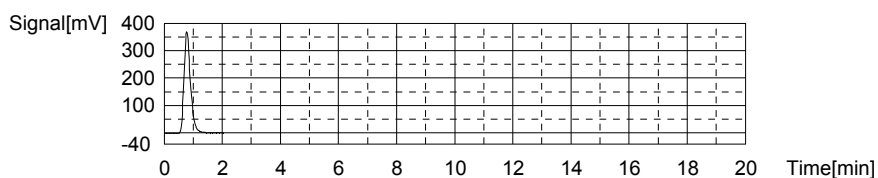
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	567.2	13.00mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 3:40:49 PM

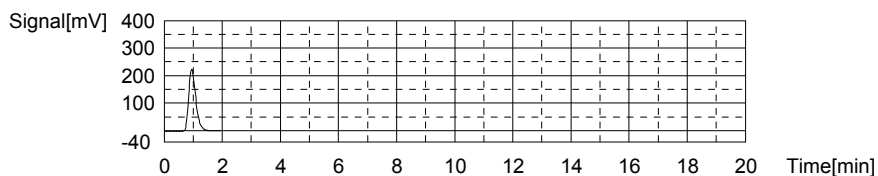
Mean Area 567.2
Mean Conc. 13.00mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	384.0	10.92mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 3:45:40 PM

Mean Area 384.0
Mean Conc. 10.92mg/L



Sample

Sample Name: L17060761-23
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

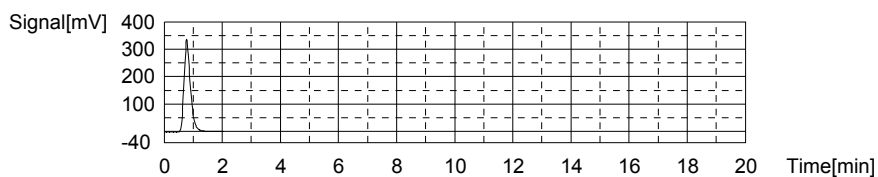
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.858mg/L TC:11.46mg/L IC:9.607mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	502.1	11.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 3:53:09 PM

Mean Area 502.1
Mean Conc. 11.46mg/L

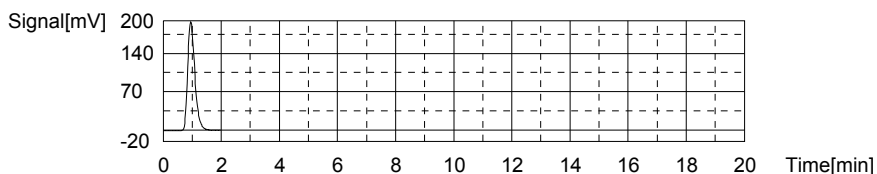


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	340.1	9.607mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 3:58:01 PM

28/63

Mean Area 340.1
 Mean Conc. 9.607mg/L



Sample

Sample Name: L17060761-24
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

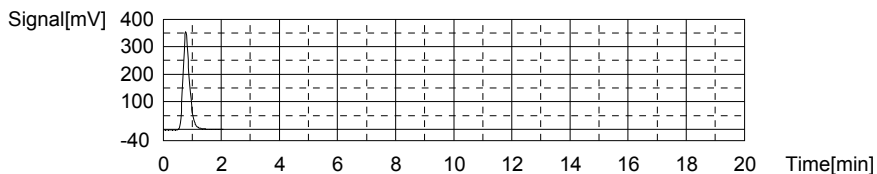
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.822mg/L TC:12.38mg/L IC:10.56mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	540.8	12.38mg/L	500uL	1		TC	16/16/2017 4:05:33 PM

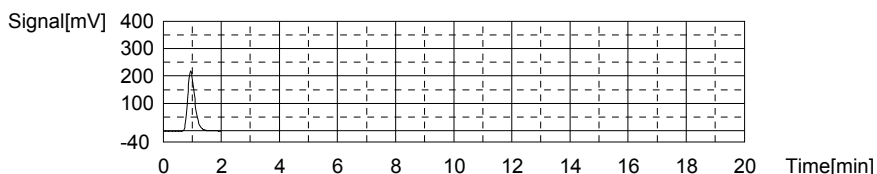
Mean Area 540.8
 Mean Conc. 12.38mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	371.9	10.56mg/L	500uL	1		IC	16/16/2017 4:10:31 PM

Mean Area 371.9
 Mean Conc. 10.56mg/L



Sample

Sample Name: L17060761-25
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

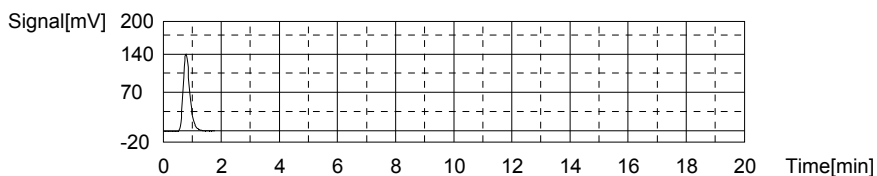
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.777mg/L TC:4.925mg/L IC:3.147mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	225.3	4.925mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 4:17:45 PM

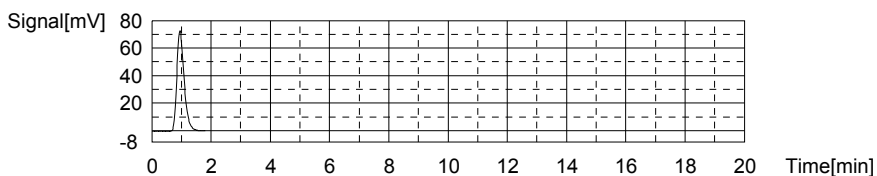
Mean Area 225.3
Mean Conc. 4.925mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	123.8	3.147mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 4:22:26 PM

Mean Area 123.8
Mean Conc. 3.147mg/L



Sample

Sample Name: L17060761-26
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

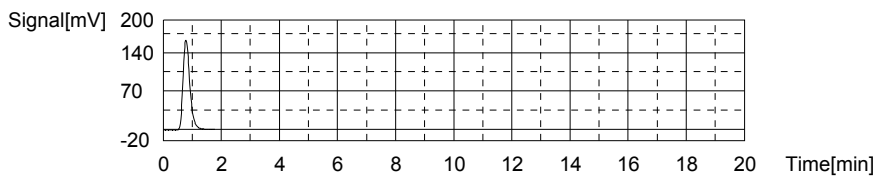
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.867mg/L TC:5.874mg/L IC:4.007mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	265.5	5.874mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 4:29:39 PM

Mean Area 265.5
Mean Conc. 5.874mg/L



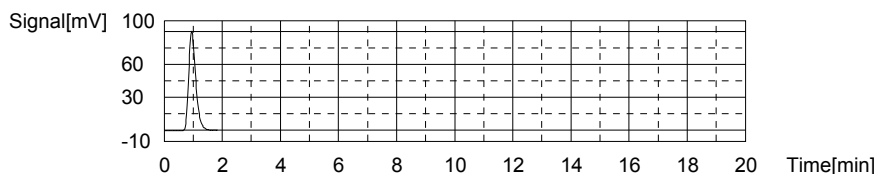
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	152.6	4.007mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 4:34:23 PM

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 152.6
Mean Conc. 4.007mg/L



Sample

Sample Name: L17060761-27
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

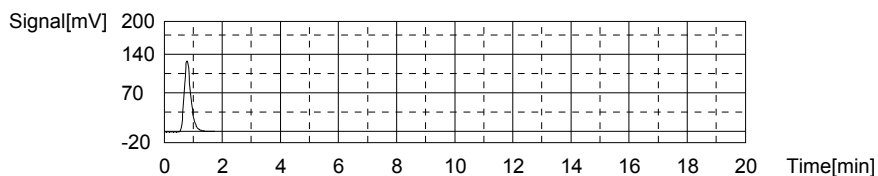
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.729mg/L TC:4.452mg/L IC:2.723mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	205.3	4.452mg/L	500uL	1		TC	16/16/2017 4:46:44 PM

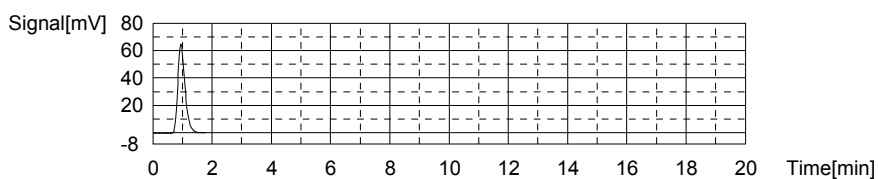
Mean Area 205.3
Mean Conc. 4.452mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	109.6	2.723mg/L	500uL	1		IC	16/16/2017 4:51:23 PM

Mean Area 109.6
Mean Conc. 2.723mg/L



Sample

Sample Name: L17060761-28
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.901mg/L TC:9.617mg/L IC:7.716mg/L

31/63

6/19/2017 7:16:55 AM

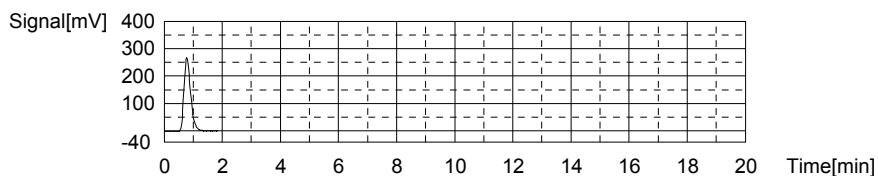
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	423.9	9.617mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 4:58:42 PM

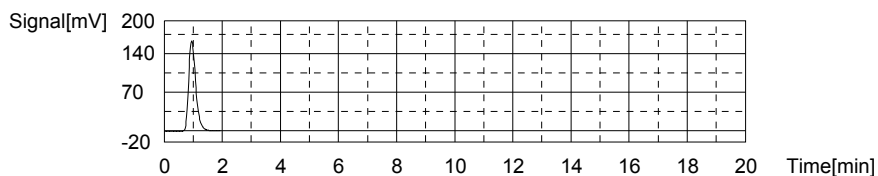
Mean Area 423.9
Mean Conc. 9.617mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	276.8	7.716mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 5:03:32 PM

Mean Area 276.8
Mean Conc. 7.716mg/L



Sample

Sample Name: L17060761-29
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

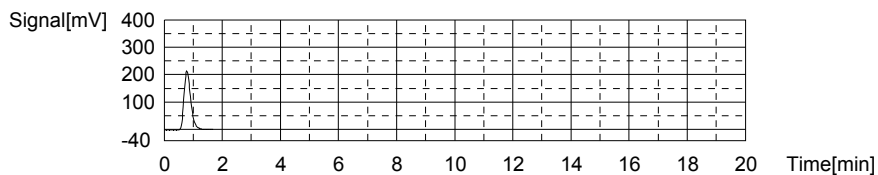
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.605mg/L TC:7.705mg/L IC:6.101mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	343.0	7.705mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 5:10:42 PM

Mean Area 343.0
Mean Conc. 7.705mg/L

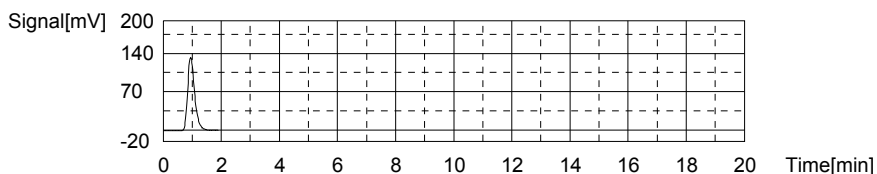


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	222.7	6.101mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 5:15:31 PM

32/63

Mean Area 222.7
Mean Conc. 6.101mg/L



Sample

Sample Name: L17060761-30
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

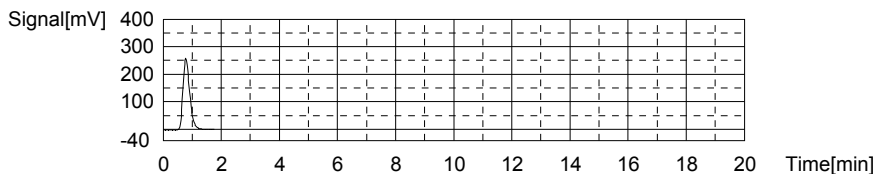
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.072mg/L TC:9.362mg/L IC:7.289mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	413.1	9.362mg/L	500uL	1		TC	16/16/2017 5:22:45 PM

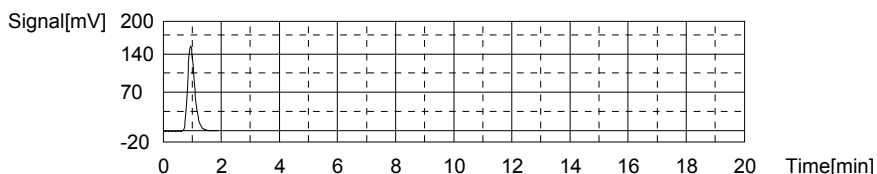
Mean Area 413.1
Mean Conc. 9.362mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	262.5	7.289mg/L	500uL	1		IC	16/16/2017 5:27:31 PM

Mean Area 262.5
Mean Conc. 7.289mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.55mg/L TC:23.30mg/L IC:-0.2555mg/L

6/19/2017 7:16:55 AM

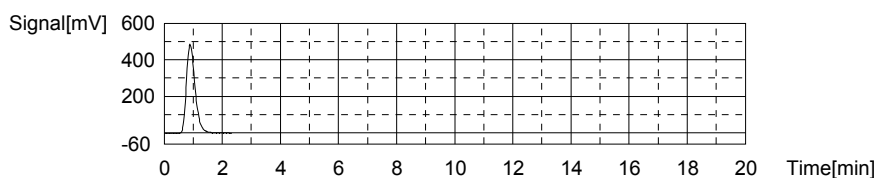
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1003	23.30mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 5:35:18 PM

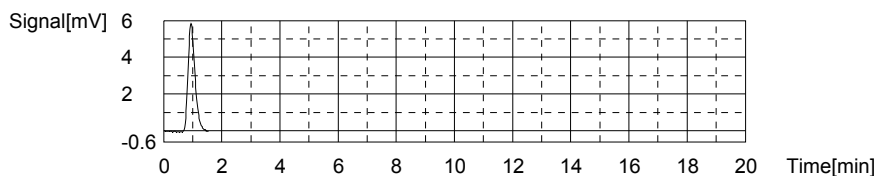
Mean Area 1003
Mean Conc. 23.30mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.858	-0.2555mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 5:39:39 PM

Mean Area 9.858
Mean Conc. -0.2555mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

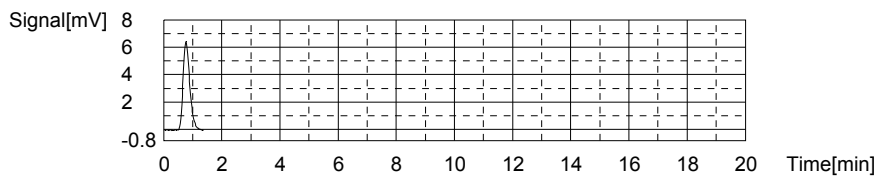
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1209mg/L TC:-0.1553mg/L IC:-0.2763mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.29	-0.1553mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 5:44:40 PM

Mean Area 10.29
Mean Conc. -0.1553mg/L



Anal.: IC

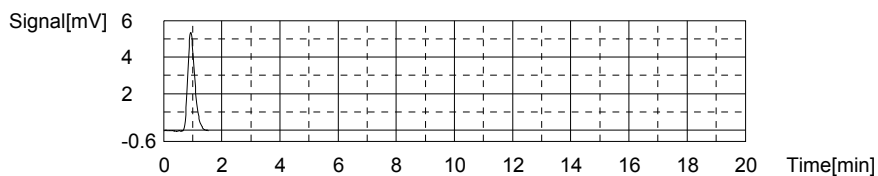
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.164	-0.2763mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 5:48:38 PM

34/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 9.164
Mean Conc. -0.2763mg/L



Sample

Sample Name: L17060761-31
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

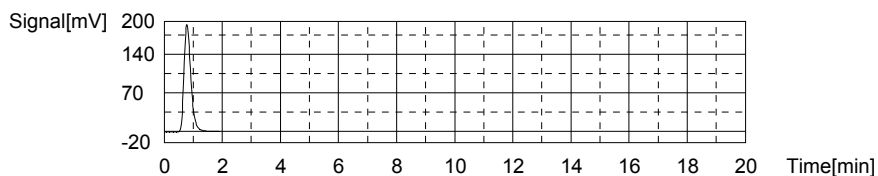
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.150mg/L TC:7.098mg/L IC:4.948mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	317.3	7.098mg/L	500uL	1		TC	16/16/2017 5:56:01 PM

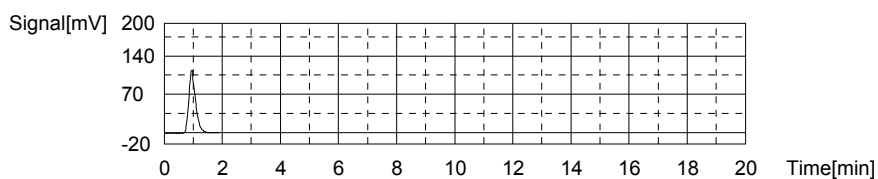
Mean Area 317.3
Mean Conc. 7.098mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	184.1	4.948mg/L	500uL	1		IC	16/16/2017 6:00:46 PM

Mean Area 184.1
Mean Conc. 4.948mg/L



Sample

Sample Name: L17060761-32
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.382mg/L TC:7.431mg/L IC:5.049mg/L

35/63

6/19/2017 7:16:55 AM

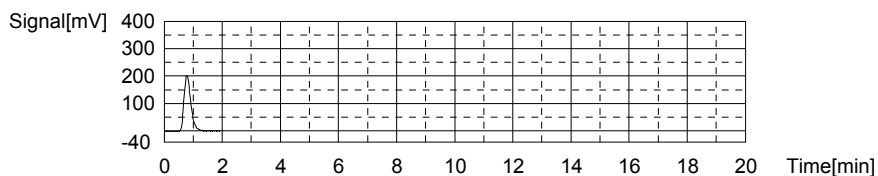
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	331.4	7.431mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 6:08:08 PM

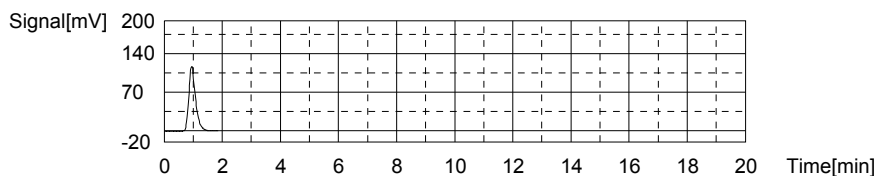
Mean Area 331.4
Mean Conc. 7.431mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	187.5	5.049mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 6:12:55 PM

Mean Area 187.5
Mean Conc. 5.049mg/L



Sample

Sample Name: L17060761-33
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

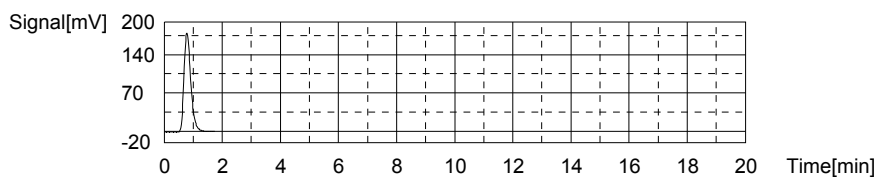
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.006mg/L TC:6.512mg/L IC:4.506mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	292.5	6.512mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 6:20:08 PM

Mean Area 292.5
Mean Conc. 6.512mg/L



Anal.: IC

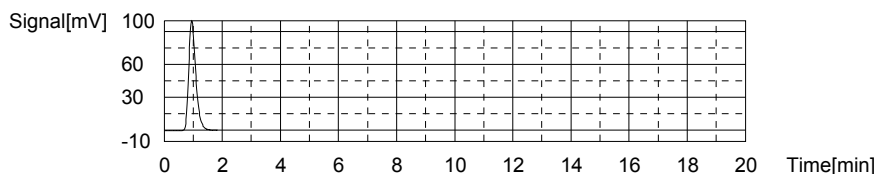
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	169.3	4.506mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 6:24:51 PM

36/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 169.3
Mean Conc. 4.506mg/L



Sample

Sample Name: L17060761-34
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

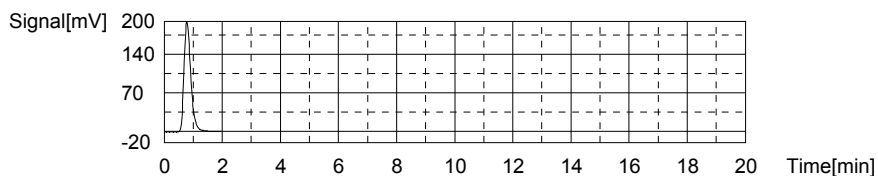
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.905mg/L TC:7.247mg/L IC:5.342mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	323.6	7.247mg/L	500uL	1		TC	16/16/2017 6:32:18 PM

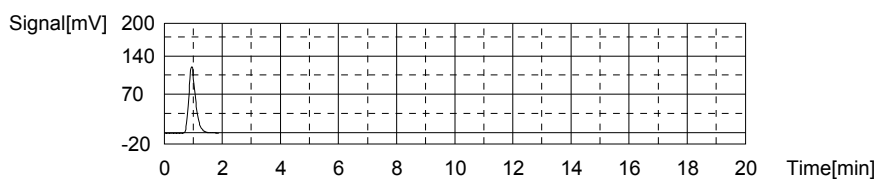
Mean Area 323.6
Mean Conc. 7.247mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	197.3	5.342mg/L	500uL	1		IC	16/16/2017 6:37:03 PM

Mean Area 197.3
Mean Conc. 5.342mg/L



Sample

Sample Name: L17060761-35
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.974mg/L TC:6.895mg/L IC:4.921mg/L

37/63

6/19/2017 7:16:55 AM

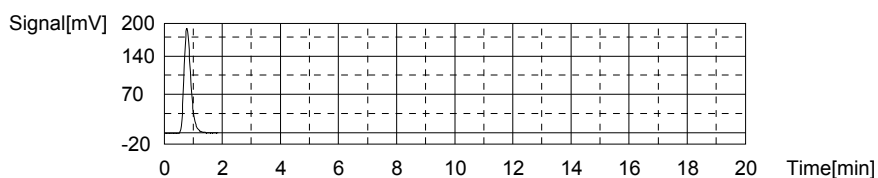
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	308.7	6.895mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 6:44:23 PM

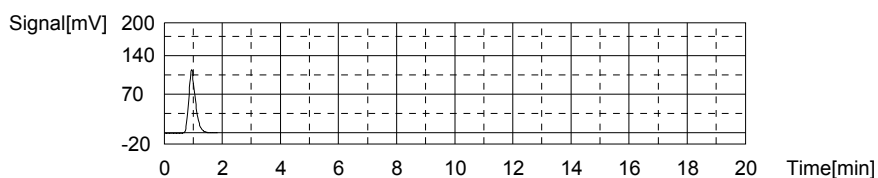
Mean Area 308.7
Mean Conc. 6.895mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	183.2	4.921mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 6:49:07 PM

Mean Area 183.2
Mean Conc. 4.921mg/L



Sample

Sample Name: L17060761-36
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

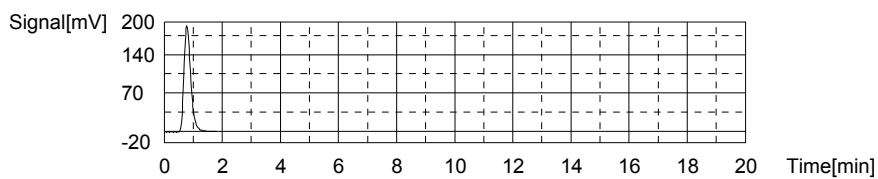
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.088mg/L TC:6.973mg/L IC:4.885mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	312.0	6.973mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 6:56:25 PM

Mean Area 312.0
Mean Conc. 6.973mg/L



Anal.: IC

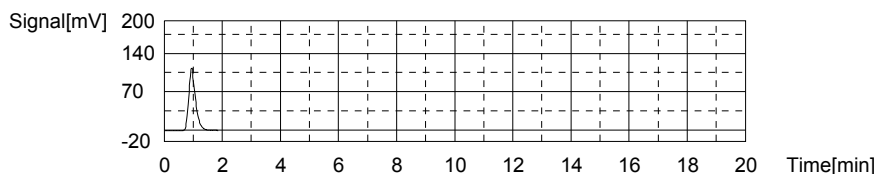
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	182.0	4.885mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 7:01:09 PM

38/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 182.0
Mean Conc. 4.885mg/L



Sample

Sample Name: L17060761-37
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

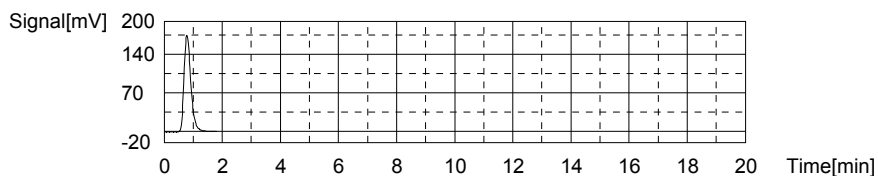
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.043mg/L TC:6.328mg/L IC:4.285mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	284.7	6.328mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/2017 7:08:26 PM

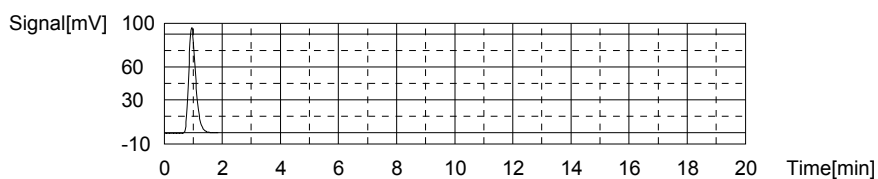
Mean Area 284.7
Mean Conc. 6.328mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	161.9	4.285mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/2017 7:13:10 PM

Mean Area 161.9
Mean Conc. 4.285mg/L



Sample

Sample Name: L17060761-38
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.106mg/L TC:6.111mg/L IC:4.004mg/L

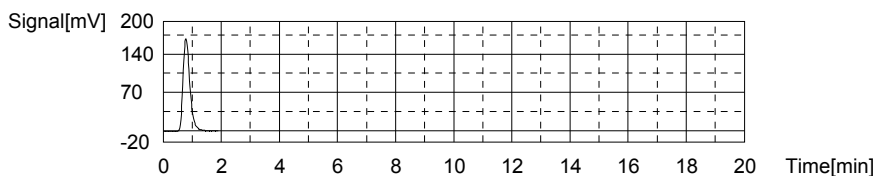
39/63

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	275.5	6.111mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 7:20:33 PM

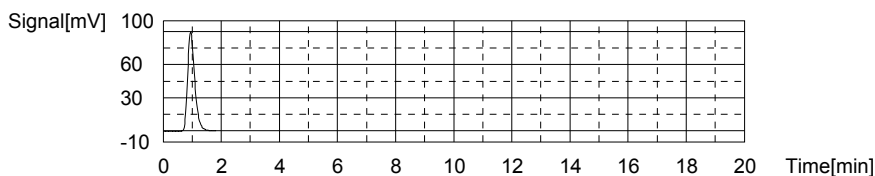
Mean Area 275.5
Mean Conc. 6.111mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	152.5	4.004mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 7:25:17 PM

Mean Area 152.5
Mean Conc. 4.004mg/L



Sample

Sample Name: WG618110-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

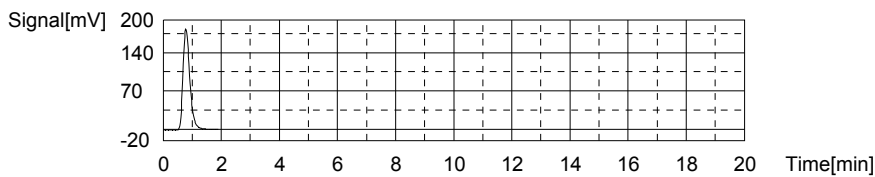
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.029mg/L TC:6.699mg/L IC:4.670mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	300.4	6.699mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 7:32:39 PM

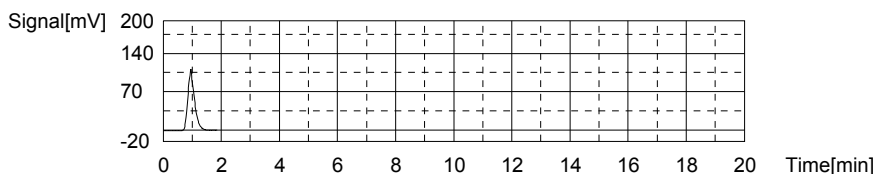
Mean Area 300.4
Mean Conc. 6.699mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	174.8	4.670mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 7:37:22 PM

Mean Area 174.8
Mean Conc. 4.670mg/L



Sample

Sample Name: WG618110-06 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

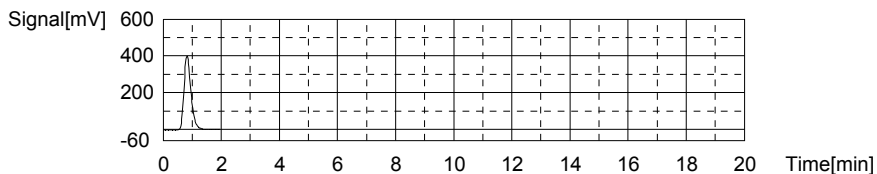
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:13.58mg/L TC:15.39mg/L IC:1.812mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	668.2	15.39mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 7:44:49 PM

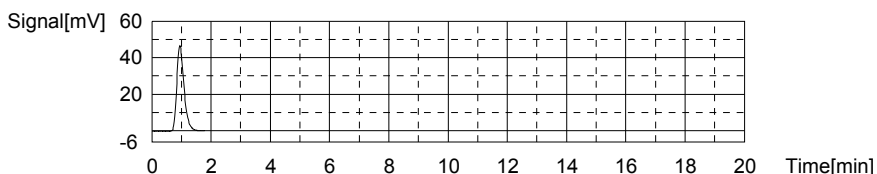
Mean Area 668.2
Mean Conc. 15.39mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	79.10	1.812mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 7:49:28 PM

Mean Area 79.10
Mean Conc. 1.812mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

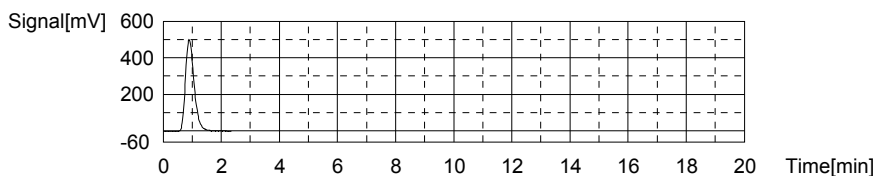
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.45mg/L TC:24.17mg/L IC:0.2745mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1040	24.17mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/2017 7:57:19 PM

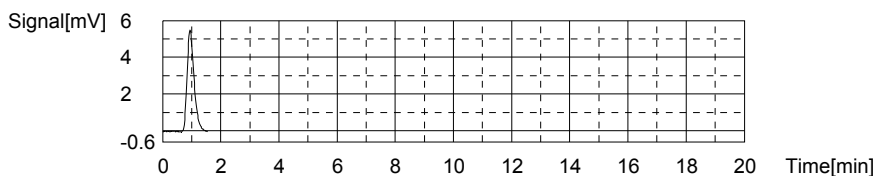
Mean Area 1040
Mean Conc. 24.17mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.223	-0.2745mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/2017 8:01:41 PM

Mean Area 9.223
Mean Conc. -0.2745mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

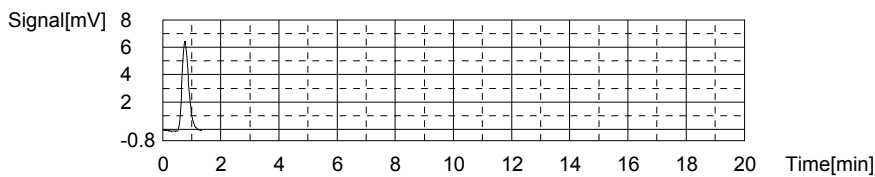
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1223mg/L TC:-0.1516mg/L IC:-0.2739mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.45	-0.1516mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/2017 8:06:45 PM

Mean Area 10.45
Mean Conc. -0.1516mg/L



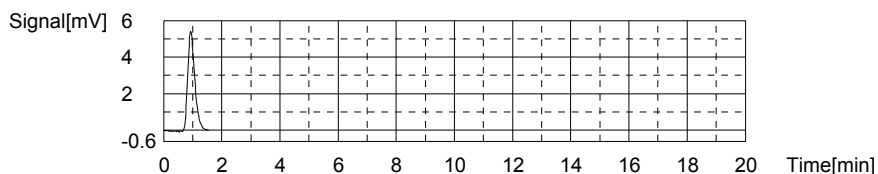
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.244	-0.2739mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/2017 8:10:39 PM

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 9.244
Mean Conc. -0.2739mg/L



Sample

Sample Name: WG618111-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

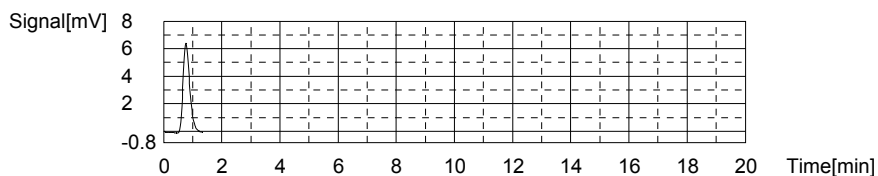
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1217mg/L TC:-0.1537mg/L IC:-0.2754mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.36	-0.1537mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_09_32_56	16/2017 8:15:39 PM

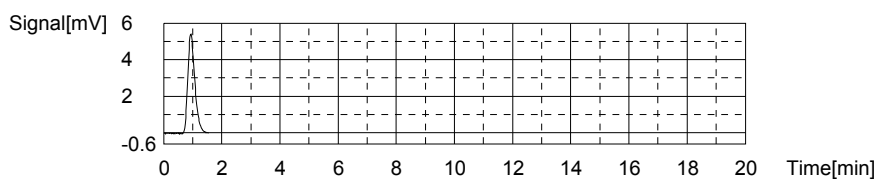
Mean Area 10.36
Mean Conc. -0.1537mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.194	-0.2754mg/L	500uL	1		IC-CURVE-02-10-2017.2017_02_10_14_45_16	16/2017 8:19:37 PM

Mean Area 9.194
Mean Conc. -0.2754mg/L



Sample

Sample Name: WG618111-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.39mg/L TC:26.11mg/L IC:-0.2809mg/L

43/63

6/19/2017 7:16:55 AM

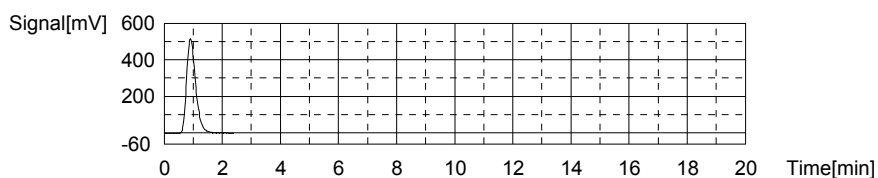
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1122	26.11mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 8:27:34 PM

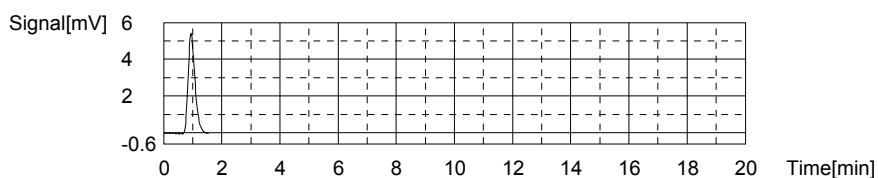
Mean Area 1122
Mean Conc. 26.11mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.010	-0.2809mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 8:31:57 PM

Mean Area 9.010
Mean Conc. -0.2809mg/L



Sample

Sample Name: WG618111-03 LCSDUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

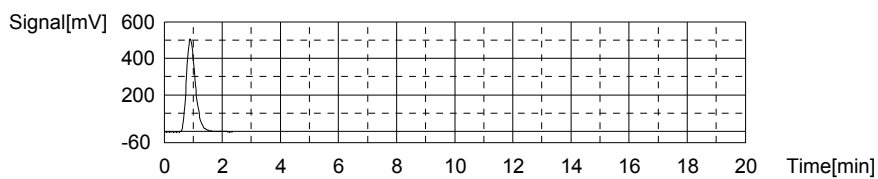
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.42mg/L TC:25.14mg/L IC:-0.2797mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1081	25.14mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 8:39:48 PM

Mean Area 1081
Mean Conc. 25.14mg/L



Anal.: IC

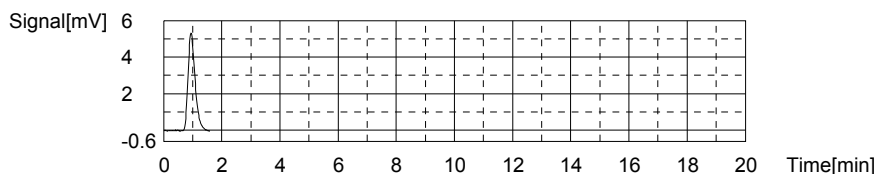
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.050	-0.2797mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 8:44:12 PM

44/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 9.050
Mean Conc. -0.2797mg/L



Sample

Sample Name: L17060761-39
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

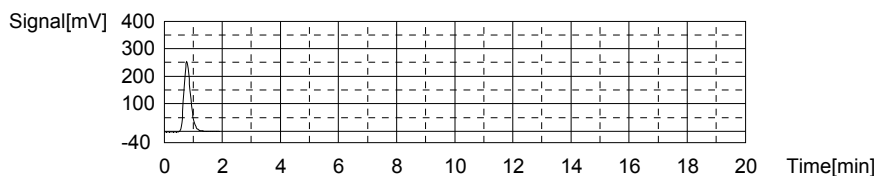
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.137mg/L TC:9.073mg/L IC:6.937mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	400.9	9.073mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 8:51:36 PM

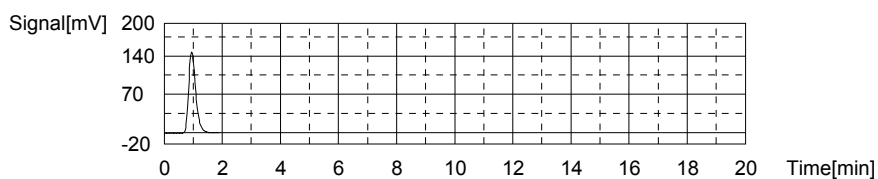
Mean Area 400.9
Mean Conc. 9.073mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	250.7	6.937mg/L	500uL	1		IC-CURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 8:56:22 PM

Mean Area 250.7
Mean Conc. 6.937mg/L



Sample

Sample Name: L17060761-40
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.889mg/L TC:8.710mg/L IC:6.820mg/L

45/63

6/19/2017 7:16:55 AM

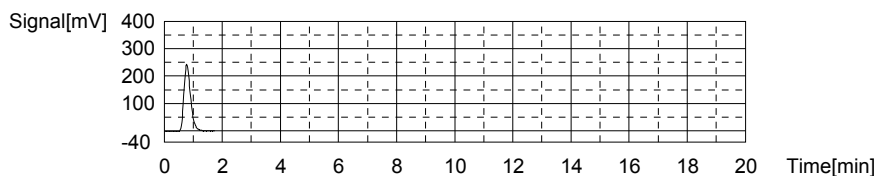
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	385.5	8.710mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 9:03:37 PM

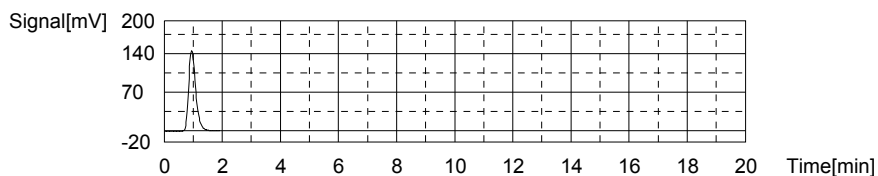
Mean Area 385.5
Mean Conc. 8.710mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	246.8	6.820mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 9:08:26 PM

Mean Area 246.8
Mean Conc. 6.820mg/L



Sample

Sample Name: L17060761-41
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

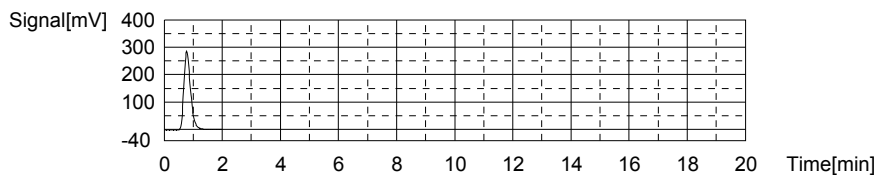
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.785mg/L TC:10.28mg/L IC:8.496mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	452.0	10.28mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 9:15:54 PM

Mean Area 452.0
Mean Conc. 10.28mg/L



Anal.: IC

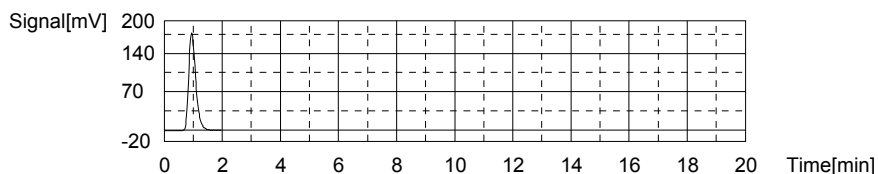
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	302.9	8.496mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 9:20:46 PM

46/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 302.9
Mean Conc. 8.496mg/L



Sample

Sample Name: L17060761-42
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

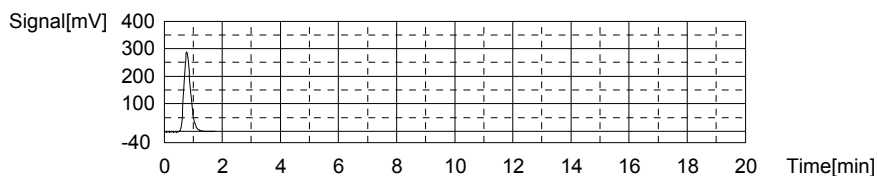
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.599mg/L TC:10.33mg/L IC:8.732mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	454.1	10.33mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/2017 9:27:58 PM

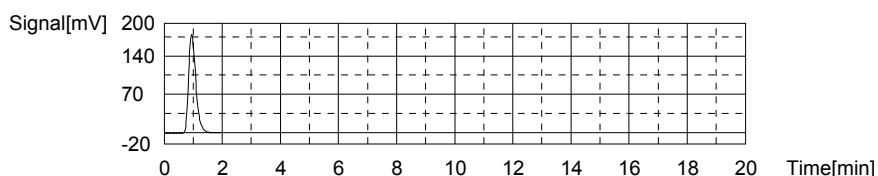
Mean Area 454.1
Mean Conc. 10.33mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	310.8	8.732mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/2017 9:32:51 PM

Mean Area 310.8
Mean Conc. 8.732mg/L



Sample

Sample Name: L17060761-43
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:15.14mg/L TC:24.83mg/L IC:9.693mg/L

47/63

6/19/2017 7:16:55 AM

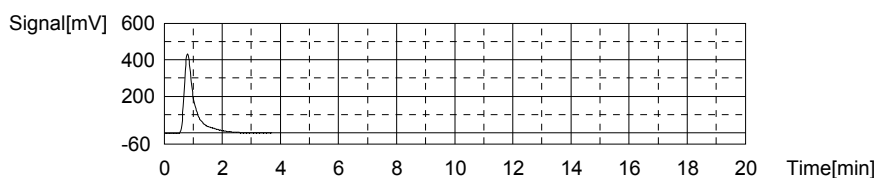
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1068	24.83mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 9:42:01 PM

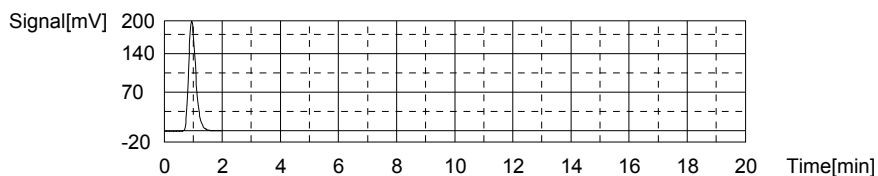
Mean Area 1068
Mean Conc. 24.83mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	343.0	9.693mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 9:46:55 PM

Mean Area 343.0
Mean Conc. 9.693mg/L



Sample

Sample Name: L17060761-44
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

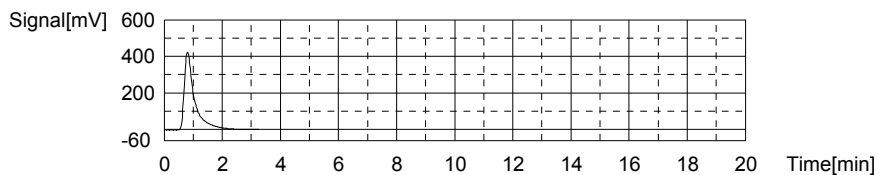
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.43mg/L TC:24.06mg/L IC:9.622mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1035	24.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 9:55:37 PM

Mean Area 1035
Mean Conc. 24.06mg/L

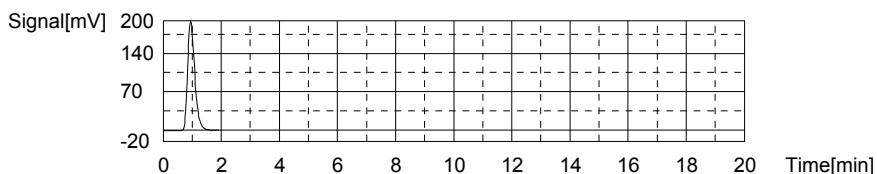


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	340.6	9.622mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 10:00:31 PM

48/63

Mean Area 340.6
Mean Conc. 9.622mg/L



Sample

Sample Name: L17060761-45
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

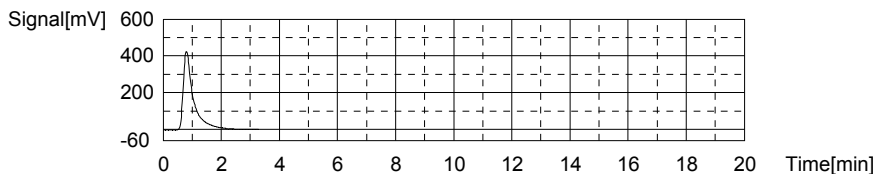
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.25mg/L TC:24.01mg/L IC:9.753mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1033	24.01mg/L	500uL	1		TC	16/16/2017 10:09:15 PM

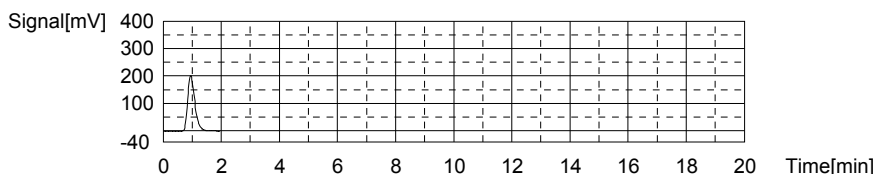
Mean Area 1033
Mean Conc. 24.01mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	345.0	9.753mg/L	500uL	1		IC	16/16/2017 10:14:06 PM

Mean Area 345.0
Mean Conc. 9.753mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.67mg/L TC:23.42mg/L IC:-0.2548mg/L

6/19/2017 7:16:55 AM

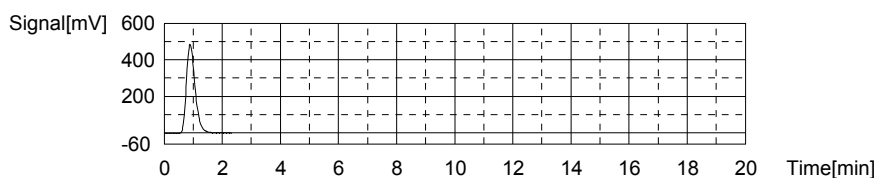
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1008	23.42mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 10:21:52 PM

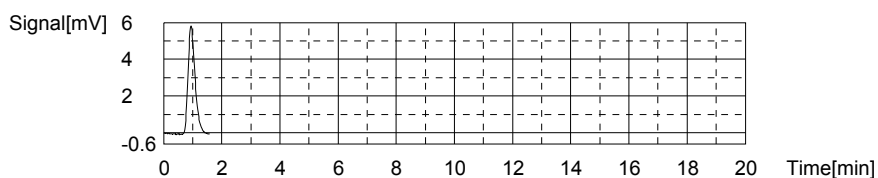
Mean Area 1008
Mean Conc. 23.42mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.884	-0.2548mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 10:26:16 PM

Mean Area 9.884
Mean Conc. -0.2548mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

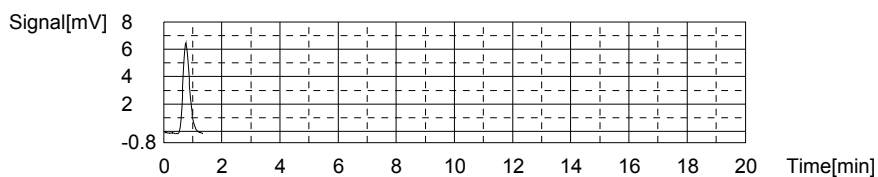
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1147mg/L TC:-0.1504mg/L IC:-0.2651mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.50	-0.1504mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 10:31:15 PM

Mean Area 10.50
Mean Conc. -0.1504mg/L



Anal.: IC

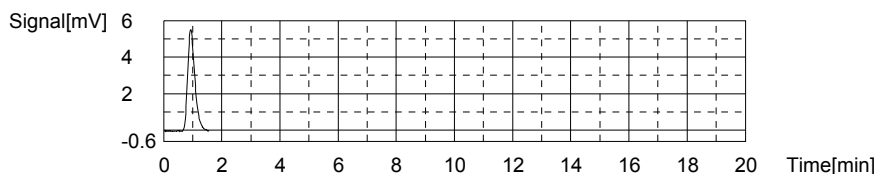
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.539	-0.2651mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 10:35:15 PM

50/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 9.539
Mean Conc. -0.2651mg/L



Sample

Sample Name: L17060761-46
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

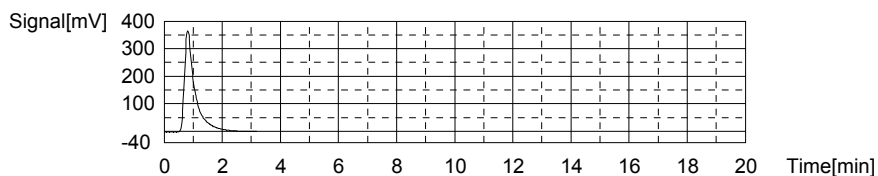
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:13.95mg/L TC:21.05mg/L IC:7.104mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	907.9	21.05mg/L	500uL	1		TC	16/16/2017 10:43:53 PM

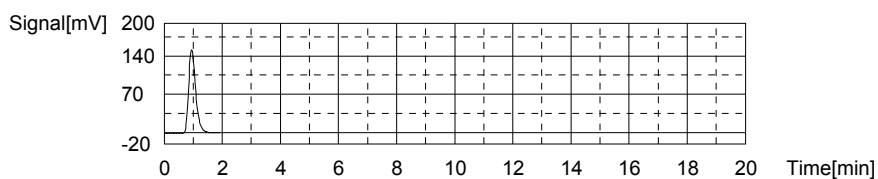
Mean Area 907.9
Mean Conc. 21.05mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	256.3	7.104mg/L	500uL	1		IC	16/16/2017 10:48:43 PM

Mean Area 256.3
Mean Conc. 7.104mg/L



Sample

Sample Name: L17060761-47
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:13.90mg/L TC:19.63mg/L IC:5.736mg/L

51/63

6/19/2017 7:16:55 AM

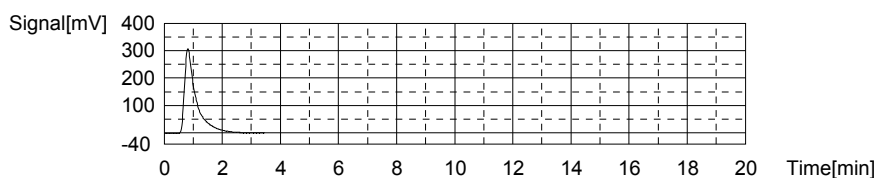
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	847.9	19.63mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 10:57:37 PM

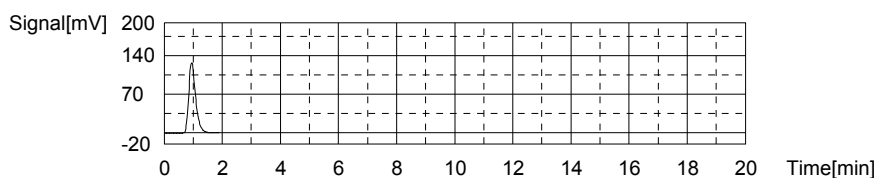
Mean Area 847.9
Mean Conc. 19.63mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	210.5	5.736mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 11:02:24 PM

Mean Area 210.5
Mean Conc. 5.736mg/L



Sample

Sample Name: L17060761-48
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

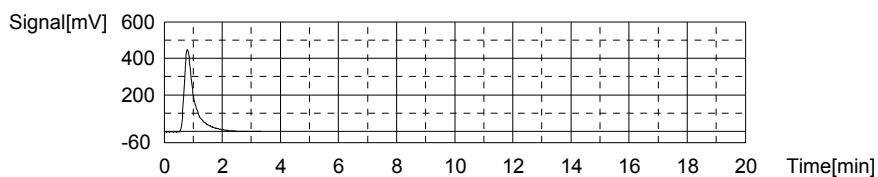
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.65mg/L TC:25.31mg/L IC:10.66mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1088	25.31mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 11:11:11 PM

Mean Area 1088
Mean Conc. 25.31mg/L

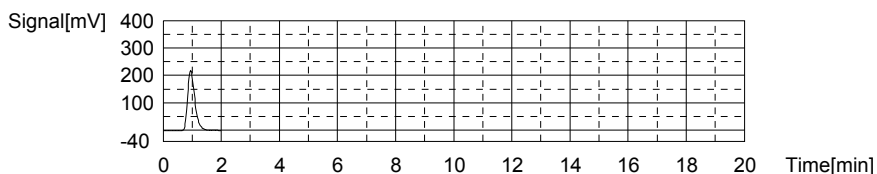


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	375.4	10.66mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 11:16:07 PM

52/63

Mean Area 375.4
 Mean Conc. 10.66mg/L



Sample

Sample Name: L17060853-01 (3)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

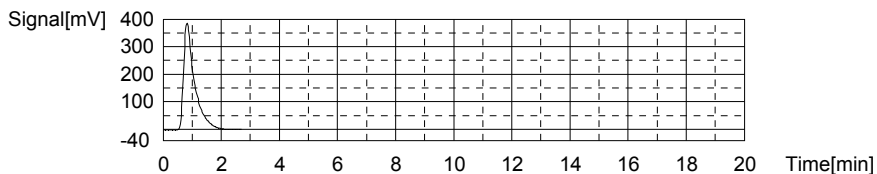
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:16.33mg/L TC:23.25mg/L IC:6.925mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1001	23.25mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/2017 11:24:15 PM

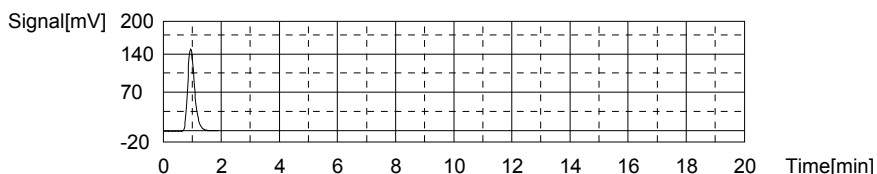
Mean Area 1001
 Mean Conc. 23.25mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	250.3	6.925mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/2017 11:29:03 PM

Mean Area 250.3
 Mean Conc. 6.925mg/L



Sample

Sample Name: L17060718-05 (3)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.984mg/L TC:13.25mg/L IC:11.27mg/L

6/19/2017 7:16:55 AM

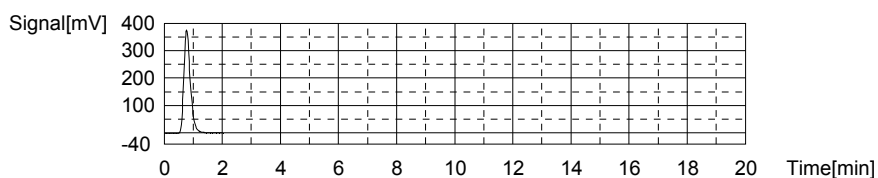
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	577.7	13.25mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 11:36:31 PM

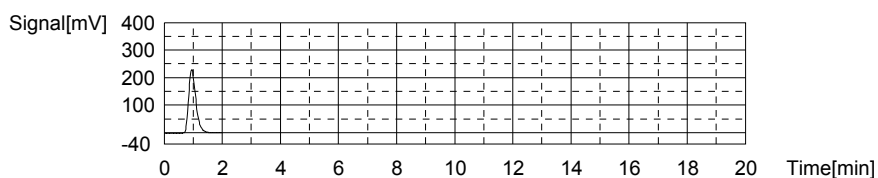
Mean Area 577.7
Mean Conc. 13.25mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	395.7	11.27mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 11:41:24 PM

Mean Area 395.7
Mean Conc. 11.27mg/L



Sample

Sample Name:
Sample ID:
Origin:
Status
Chk. Result

<Untitled>
TOC-02-10-2017.met
Completed

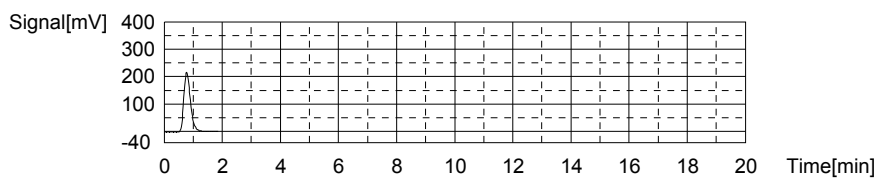
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.130mg/L TC:7.694mg/L IC:6.564mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	342.5	7.694mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/16/2017 11:48:42 PM

Mean Area 342.5
Mean Conc. 7.694mg/L



Anal.: IC

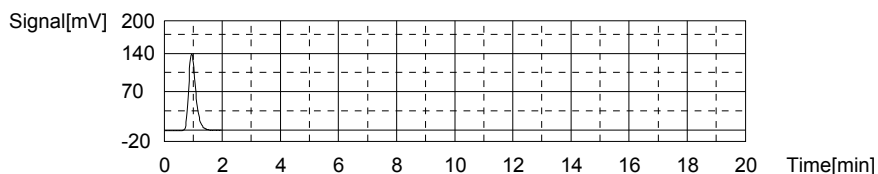
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	238.2	6.564mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/16/2017 11:53:38 PM

54/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 238.2
Mean Conc. 6.564mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

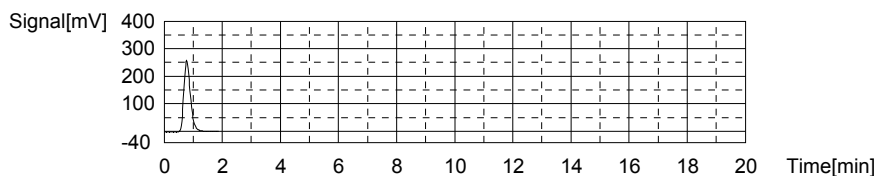
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.293mg/L TC:9.123mg/L IC:7.830mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	403.0	9.123mg/L	500uL	1		TC	16/17/2017 12:01:00 AM

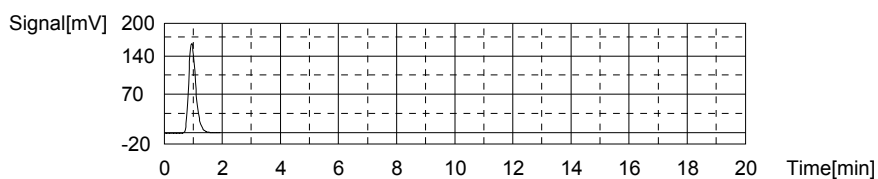
Mean Area 403.0
Mean Conc. 9.123mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	280.6	7.830mg/L	500uL	1		IC	16/17/2017 12:05:52 AM

Mean Area 280.6
Mean Conc. 7.830mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.151mg/L TC:6.947mg/L IC:5.796mg/L

55/63

6/19/2017 7:16:55 AM

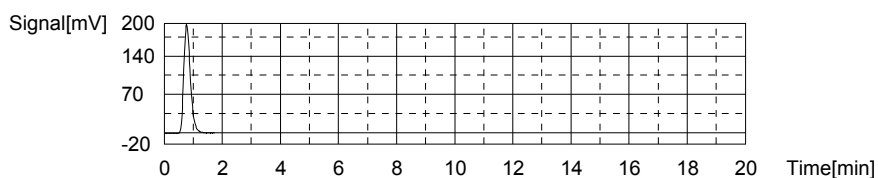
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	310.9	6.947mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/17/2017 12:13:03 AM

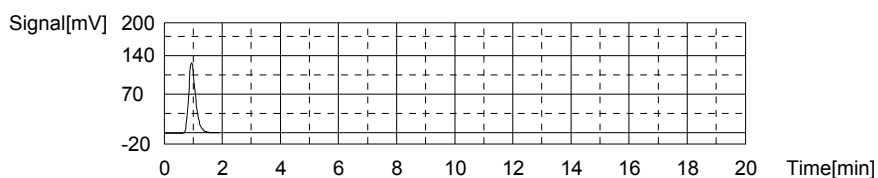
Mean Area 310.9
Mean Conc. 6.947mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	212.5	5.796mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/17/2017 12:17:49 AM

Mean Area 212.5
Mean Conc. 5.796mg/L



Sample

Sample Name:
Sample ID:
Origin:
Status
Chk. Result

<Untitled>
TOC-02-10-2017.met
Completed

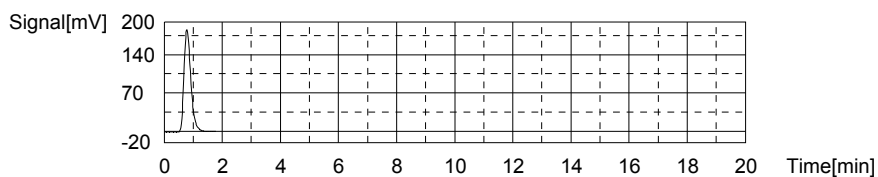
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.242mg/L TC:6.775mg/L IC:4.533mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	303.6	6.775mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/17/2017 12:25:03 AM

Mean Area 303.6
Mean Conc. 6.775mg/L

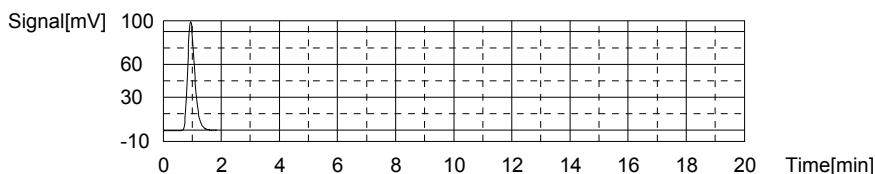


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	170.2	4.533mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/17/2017 12:29:50 AM

56/63

Mean Area 170.2
 Mean Conc. 4.533mg/L



Sample

Sample Name: L17060898-01 (2)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

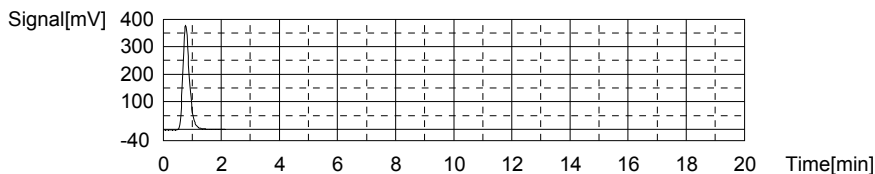
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.635mg/L TC:13.50mg/L IC:10.86mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	588.2	13.50mg/L	500uL	1		TC	16/17/2017 12:37:25 AM

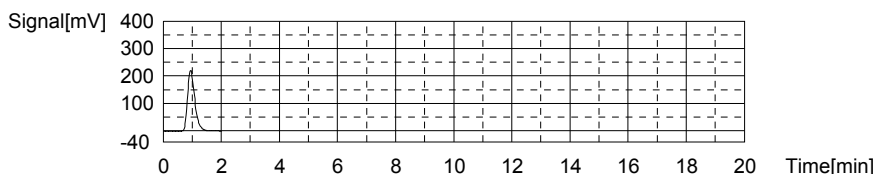
Mean Area 588.2
 Mean Conc. 13.50mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	382.2	10.86mg/L	500uL	1		IC	16/17/2017 12:42:22 AM

Mean Area 382.2
 Mean Conc. 10.86mg/L



Sample

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:22.79mg/L TC:22.54mg/L IC:-0.2480mg/L

6/19/2017 7:16:55 AM

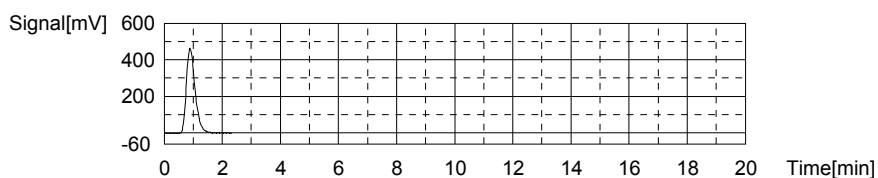
06-16-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	971.0	22.54mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/17/2017 12:50:08 AM

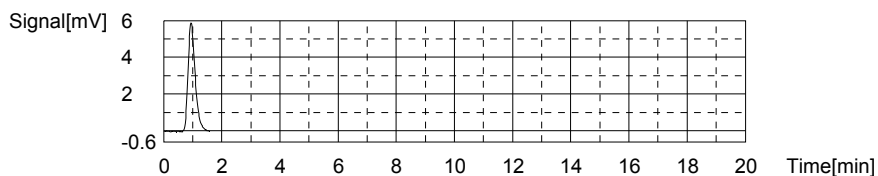
Mean Area 971.0
Mean Conc. 22.54mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.11	-0.2480mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/17/2017 12:54:36 AM

Mean Area 10.11
Mean Conc. -0.2480mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

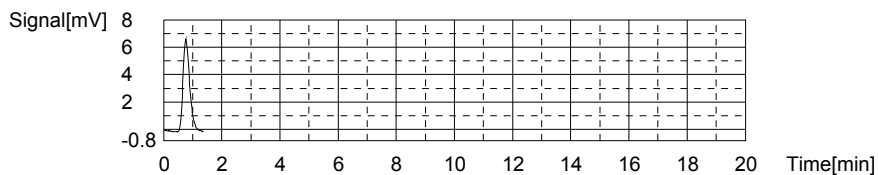
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1223mg/L TC:-0.1431mg/L IC:-0.2653mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.81	-0.1431mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/17/2017 12:59:36 AM

Mean Area 10.81
Mean Conc. -0.1431mg/L



Anal.: IC

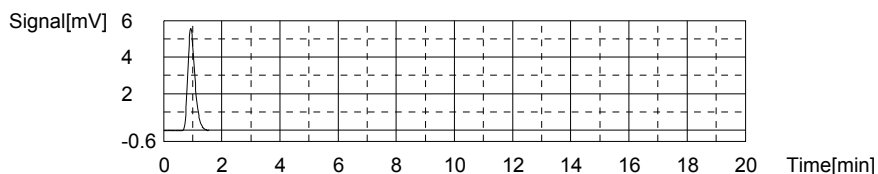
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.530	-0.2653mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/17/2017 1:03:34 AM

58/63

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 9.530
Mean Conc. -0.2653mg/L



Sample

Sample Name: L17060898-03 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

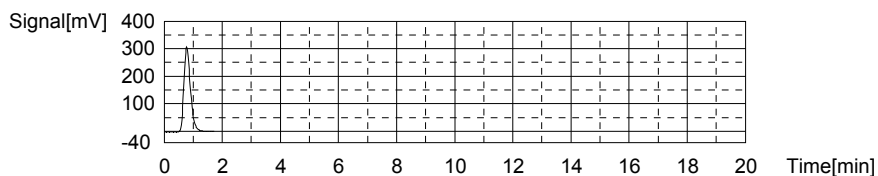
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.496mg/L TC:10.83mg/L IC:9.335mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	475.3	10.83mg/L	500uL	1		TC	16/17/2017 1:10:45 AM

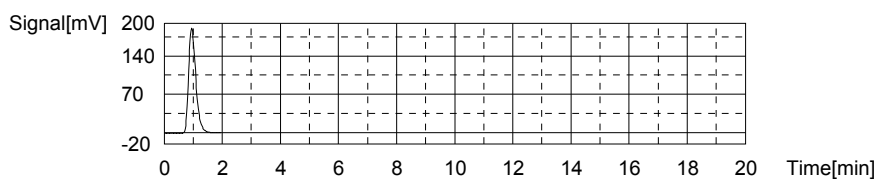
Mean Area 475.3
Mean Conc. 10.83mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	331.0	9.335mg/L	500uL	1		IC	16/17/2017 1:15:39 AM

Mean Area 331.0
Mean Conc. 9.335mg/L



Sample

Sample Name: L17060898-04 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.696mg/L TC:17.22mg/L IC:14.53mg/L

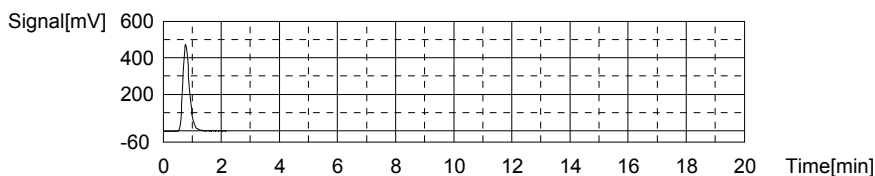
59/63

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	745.9	17.22mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/17/2017 1:23:17 AM

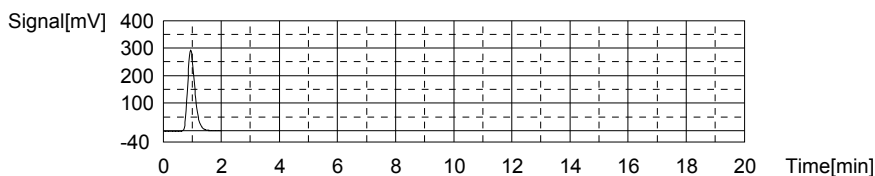
Mean Area 745.9
Mean Conc. 17.22mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	504.9	14.53mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/17/2017 1:28:15 AM

Mean Area 504.9
Mean Conc. 14.53mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

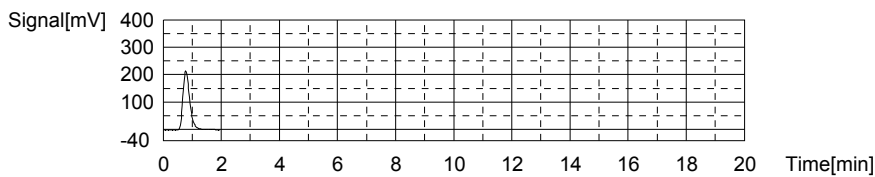
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.796mg/L TC:7.807mg/L IC:6.011mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	347.3	7.807mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/17/2017 1:35:39 AM

Mean Area 347.3
Mean Conc. 7.807mg/L



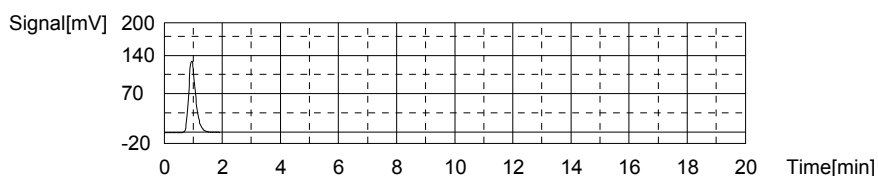
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	219.7	6.011mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/17/2017 1:40:29 AM

6/19/2017 7:16:55 AM

06-16-2017-DCM-TOC.i32

Mean Area 219.7
Mean Conc. 6.011mg/L



Sample

Sample Name: WG618111-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

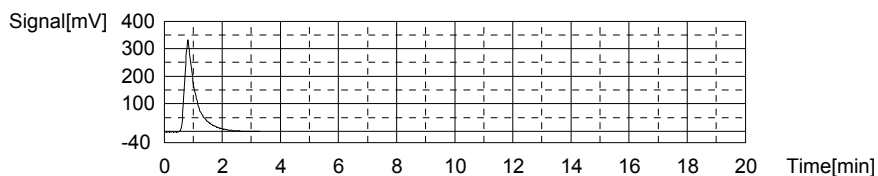
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:13.86mg/L TC:19.88mg/L IC:6.011mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	858.1	19.88mg/L	500uL	1		TC	16/17/2017 1:49:14 AM

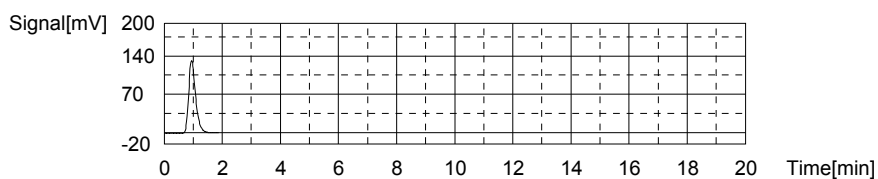
Mean Area 858.1
Mean Conc. 19.88mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	219.7	6.011mg/L	500uL	1		IC	16/17/2017 1:53:58 AM

Mean Area 219.7
Mean Conc. 6.011mg/L



Sample

Sample Name: WG618111-06 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:25.31mg/L TC:29.39mg/L IC:4.085mg/L

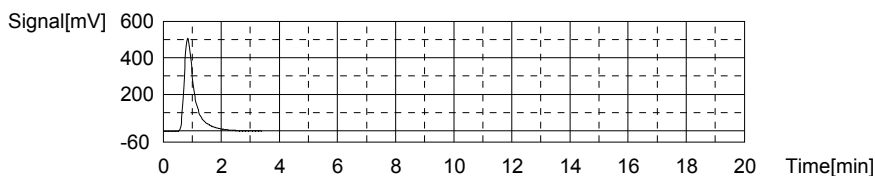
61/63

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1261	29.39mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/17/2017 2:02:48 AM

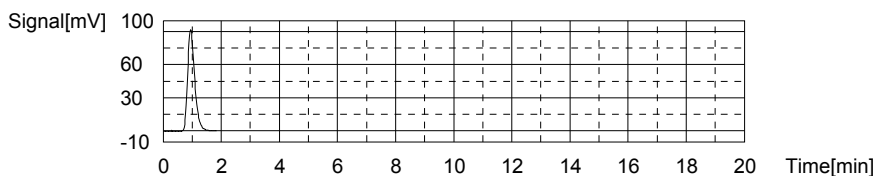
Mean Area 1261
Mean Conc. 29.39mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	155.2	4.085mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/17/2017 2:07:34 AM

Mean Area 155.2
Mean Conc. 4.085mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

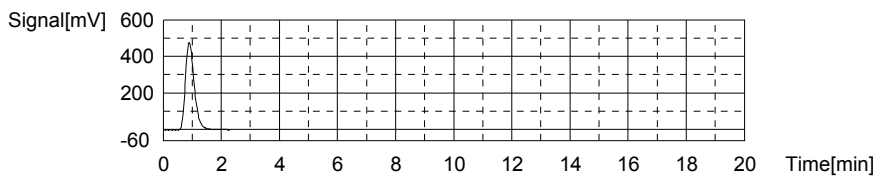
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.59mg/L TC:23.32mg/L IC:-0.2663mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1004	23.32mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/17/2017 2:15:19 AM

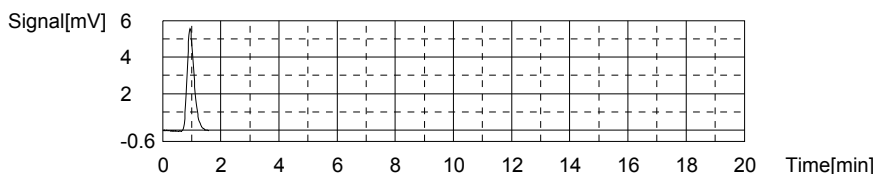
Mean Area 1004
Mean Conc. 23.32mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.497	-0.2663mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/17/2017 2:19:48 AM

Mean Area 9.497
 Mean Conc. -0.2663mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

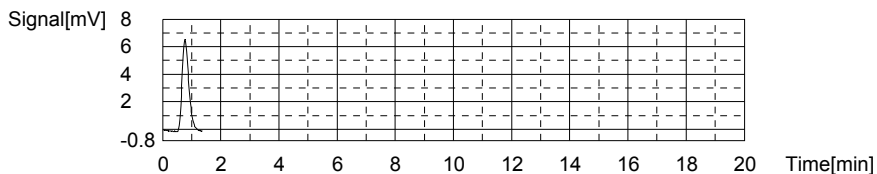
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1196mg/L TC:-0.1445mg/L IC:-0.2641mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.75	-0.1445mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/17/2017 2:24:49 AM

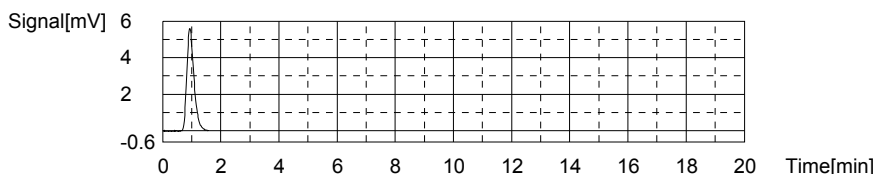
Mean Area 10.75
 Mean Conc. -0.1445mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.571	-0.2641mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/17/2017 2:28:48 AM

Mean Area 9.571
 Mean Conc. -0.2641mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
June 21, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
ALS - ADRIANE L. STEED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BLG - BRENDA L. GREENWALT	BNB - Brandi N. Bentley
BRG - BRENDA R. GREGORY	CAS - Craig A. Smith
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL	CV - Carl Volkman
DAK - DEAN A. KETELSEN	DCM - DAVID C. MERCKLE
DEV - DAVID E. VANDENBERG	DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER	DLP - DOROTHY L. PAYNE
DSM - DAVID S. MOSSOR	DTG - DOMINIC T. GEHRET
ECL - ERIC C. LAWSON	EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER	FJB - FRANCES J. BOLDEN
HRF - HEATHER R. FAIRCHILD	JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH	JKP - JACQUELINE K. PARSONS
JLD - JESSICA L. DELONG	JST - JOSHUA S. TAYLOR
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KDD - Katelyn D. Daley
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRP - KATHY R. PARSONS	LJH - Lacey J. Hendershot
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
OJE - OMOYEMWEN J. ENGLISH	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCA - SUEELLEN C. ADAMS
SCB - SARAH C. BOGOLIN	SCJ - SUE ELLEN C. JOHNSON
SDC - SHALYN D. CONLEY	TB - TODD BOYLE
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	ZTB - ZACH T. BARNES

List of Valid Qualifiers

June 21, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample receipt exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentatively identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound



List of Valid Qualifiers

June 21, 2017

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below





Chain of Custody Record

COC Number:

Laboratory: Microbac POC: Stephanie Mossburg
 Address: 158 Starlite Drive
 Marietta, OH 45750
 Phone: 1-800-373-4071
 Client: AECOM
 Address: 112 East Pecan Ste. 400
 San Antonio, TX 78205
 Turn Around Time: **STANDARD**
 Project Name/Location: Longhorn
 Project Number: **6025635. GUPTRUMAR16**

Project Manager: ~~Stephanie Mossburg~~ **ELSPATH SHARP**
 Phone/Fax Number: 210-296-2000
 Sampler (print): Scott Beesinger
 Signature: *Scott Beesinger*
 Mail to: Linda Raabe
 112 East Pecan STE. 400
 San Antonio, TX. 78205
 210-296-2000
 Fed Ex Airbill No:

Site Name	Sample ID/Location ID	SBD	SED	Date	Time	Comp.	Grab	Matrix	Number of Containers	pH:	ERPIMS REQUIRED FIELDS						
											SA CODE	Cooler ID	LOT CONTROL NUMBERS				
											ABL	EBL	TBL				
<i>WEEKLY</i>	<i>1A824-SR650-6450</i>			<i>6/14/17</i>	<i>1500</i>		<i>X</i>	<i>W</i>	<i>3</i>	<i>TOC</i>	<i>X</i>	<i>X</i>					
										<i>Ammonia-N</i>	<i>X</i>						
										<i>Orthophosphate</i>	<i>X</i>						

Comments: **STANDARD TAP**
 Relinquished by: *Scott Beesinger* Date: *6/14/17* Time: *1600*
 Relinquished by: (Signature) (Date) (Time)
 Relinquished by: (Signature) (Date) (Time)
 Received by: (Signature) (Date) (Time)
 Received by: *Anna Stinson* Date: *6/15/2017* Time: *15:17*
 Received by: (Signature) (Date) (Time)
 By: *CARA STRICKLER*
 By: (Name) (Date) (Time)
 Relinquished by: (Signature) (Date) (Time)
 Relinquished by: (Signature) (Date) (Time)

Homogenize all composite samples prior to analysis

Distribution: White to Laboratory, Canary to Project Manager, Pink QA/QC Manager



COOLER TEMP >6° C LOG

Cooler ID 2180

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C

CHD 6/15/17

pH Exceptions

pH Lot # HCL601354

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6

CHD 6/15/17

PRESERVATIVE EXCEPTIONS

NONE AS NOTED

CHD 6/15/17

Document Control # 1957
Last 10-07-2016

Issued to: Document Master File

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17060853

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 26-JUN-2017

Samplenum **Container ID** **Products**
L17060853-01 922070 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	15-JUN-2017 15:48	CLS		
2	ANALYZ	W1	WET	16-JUN-2017 08:09	DLP	CLS	
3	STORE	WET	A1	20-JUN-2017 08:04	CLS	DLP	

Samplenum **Container ID** **Products**
L17060853-01 922071 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	15-JUN-2017 15:48	CLS		<2
2	ANALYZ	W1	WET	16-JUN-2017 07:42	DCM	CLS	

Samplenum **Container ID** **Products**
L17060853-01 922072 NH3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	15-JUN-2017 15:48	CLS		<2
2	ANALYZ	W1	WET	20-JUN-2017 13:26	DLP	BRG	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
 Total Halide by Bomb Combustion (TX)
 Particle Sizing - 200 Mesh (PS200)
 Specific Gravity/Density (SPGRAV)
 Total Residual Chlorine (CL-TRL)
 Total Volatile Solids (all forms) (TVS)
 Total Coliform Bacteria (all methods)
 Fecal Coliform Bacteria (all methods)
 Sulfite (SO₃)
 Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS

Nitrogen, Ammonia by Method 350.1
 Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
 Phenolics, Total by Method 420.1
 ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
 Acetic acid
 Butyric acid
 Lactic acid
 Propionic acid
 Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
 1-Methylnaphthalene
 1,4-Dioxane
 Atrazine
 Benzaldehyde
 Biphenyl
 Caprolactam
 Hexamethylphosphoramide (HMPA)
 Pentachlorobenzene
 Pentachloroethane

NELAP Accreditation by Laboratory SOP**NONPOTABLE WATER**OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALSOVD MSS01/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP**SOLID AND HAZARDOUS CHEMICALS**OVD MSV01/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)



Laboratory Report Number: L17060856

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on June 26 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Microbac Laboratories * Ohio Valley Division
158 Starlite Drive, Marietta, OH 45750 * T: (740) 373-4071 F: (740) 373-4835 * www.microbac.com

Lab Report #: L17060856

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

There were no discrepancies.

Discrepancy	Resolution

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0019178	I	2.0		J4616881864	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	Yes

**Lab Report #:** L17060856**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP650-6449	L17060856-01	06/14/2017 15:00	06/15/2017 15:17
TRIP BLANK	L17060856-02	06/14/2017 00:01	06/15/2017 15:17



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-23 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Mary Schilling		Anaylst III	2017-06-23 19:45:04



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-23 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?	X				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?		X			1
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-23 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-23 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-23 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-06-23 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

1) In the blank analyzed 6/20/17 on HPMS8, methylene chloride was above the DL, but less than one-half the LOQ. The associated samples were non-detect for methylene chloride. All other acceptance criteria were met.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	6850
Prep Batch Number(s):	WG618450	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Eric Lawson		Chemist III	2017-06-20 20:50:14



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	6850
Prep Batch Number(s):	WG618450	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	6850
Prep Batch Number(s):	WG618450	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	6850
Prep Batch Number(s):	WG618450	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	6850
Prep Batch Number(s):	WG618450	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	6850
Prep Batch Number(s):	WG618450	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-20 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

There are no exceptions.




Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	9056
Prep Batch Number(s):	WG619023	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-26 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Eric Lawson		Chemist III	2017-06-26 15:43:36



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	9056
Prep Batch Number(s):	WG619023	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-26 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	9056
Prep Batch Number(s):	WG619023	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-26 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	9056
Prep Batch Number(s):	WG619023	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-26 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	9056
Prep Batch Number(s):	WG619023	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-26 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17060856
Project Name:		Method:	9056
Prep Batch Number(s):	WG619023	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-26 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

There are no exceptions.

Lab Report #: L17060856

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060856-01	PrePrep Method: N/A	Instrument: HPMS8
Client ID: LH18/24-SP650-6449	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 06/12/2017 19:10
Workgroup #: WG618571	Analyst: TMB	Run Date: 06/20/2017 17:53
Collect Date: 06/14/2017 15:00	Dilution: 1	File ID: 8M420189
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	5.61	J	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	1.18		1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,2-Dichloroethane-d4	100	70	120			
4-Bromofluorobenzene	101	75	120			
Dibromofluoromethane	102	85	115			
Toluene-d8	101	85	120			
J	Estimated value ; the analyte concentration was less than the LOQ.					
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060856
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060856-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6449	Prep Method: 6850	Prep Date: 06/19/2017 15:00
Matrix: Water	Analytical Method: 6850	Cal Date: 04/24/2017 15:40
Workgroup #: WG618450	Analyst: JWJ	Run Date: 06/19/2017 23:03
Collect Date: 06/14/2017 15:00	Dilution: 1	File ID: 1LM.LM39924
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.911		0.400	0.200	0.100

Certificate of Analysis

Sample #: L17060856-01	PrePrep Method: N/A	Instrument: IC1
Client ID: LH18/24-SP650-6449	Prep Method: 9056	Prep Date: 06/22/2017 17:32
Matrix: Water	Analytical Method: 9056	Cal Date: 02/14/2017 15:22
Workgroup #: WG619023	Analyst: CAS	Run Date: 06/22/2017 23:55
Collect Date: 06/14/2017 15:00	Dilution: 5	File ID: I1_062217-24
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Sulfate	14808-79-8	22.5		10.0	5.00	2.50
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17060856
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060856-01	PrePrep Method: N/A	Instrument: IC1
Client ID: LH18/24-SP650-6449	Prep Method: 9056	Prep Date: 06/22/2017 17:32
Matrix: Water	Analytical Method: 9056	Cal Date: 02/14/2017 15:22
Workgroup #: WG619023	Analyst: CAS	Run Date: 06/23/2017 00:13
Collect Date: 06/14/2017 15:00	Dilution: 50	File ID: I1_062217-25
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chloride	16887-00-6	500		20.0	10.0	5.00
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17060856

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060856-02	PrePrep Method: N/A	Instrument: HPMS8
Client ID: TRIP BLANK	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 06/12/2017 19:10
Workgroup #: WG618571	Analyst: TMB	Run Date: 06/20/2017 17:22
Collect Date: 06/14/2017 00:01	Dilution: 1	File ID: 8M420188
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	5.00	U	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	102	70	120	
4-Bromofluorobenzene	100	75	120	
Dibromofluoromethane	101	85	115	
Toluene-d8	102	85	120	
U	Analyte was not detected. The concentration is below the reported LOD.			

Lab Report #: L17060856

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

2.1 Volatiles Data

2.1.1 Volatiles GCMS Data (8260)

2.1.1.1 Summary Data

Certificate of Analysis

Sample #: L17060856-01	PrePrep Method: N/A	Instrument: HPMS8
Client ID: LH18/24-SP650-6449	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 06/12/2017 19:10
Workgroup #: WG618571	Analyst: TMB	Run Date: 06/20/2017 17:53
Collect Date: 06/14/2017 15:00	Dilution: 1	File ID: 8M420189
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	5.61	J	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	1.18		1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	100	70	120	
4-Bromofluorobenzene	101	75	120	
Dibromofluoromethane	102	85	115	
Toluene-d8	101	85	120	

J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #: L17060856-02

PrePrep Method: N/A

Instrument: HPMS8

Client ID: TRIP BLANK

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 06/12/2017 19:10

Workgroup #: WG618571

Analyst: TMB

Run Date: 06/20/2017 17:22

Collect Date: 06/14/2017 00:01

Dilution: 1

File ID: 8M420188

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	5.00	U	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,2-Dichloroethane-d4	102	70	120			
4-Bromofluorobenzene	100	75	120			
Dibromofluoromethane	101	85	115			
Toluene-d8	102	85	120			
U	Analyte was not detected. The concentration is below the reported LOD.					

2.1.1.2 QC Summary Data

Example 8260 Calculations

1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:

$$RF = [(Ax) (Cis)] / [(Ais) (Cx)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured:	3399156
Cis = Concentration of the specific internal standard (ug/mL)	25
Ais = Area of the characteristic ion of the specific internal standard	846471
Cx = Concentration of the compound in the standard being measured (ug/mL)	100
RF = Calculated Response Factor	1.0039

2.0 Calculating the concentration (C) of a compound in water using the average RF: *

$$Cx = [(Ax) (Cis) (Vn)(D)] / [(Ais) (RF) (Vs)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured	3122498
Cis = Concentration of the specific internal standard (ug/L)	25
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	611048
RF = Average RF from the ICAL	1.004
Vs = Purge volume of sample (mL)	10
Vn = Nominal purge volume of sample (mL) (10.0 mL)	10
Cx = Concentration of the compound in the sample being measured (ug/L)	127.2428

3.0 Calculating the concentration (C) of a compound in soil using the average RF: *

$$Cx = [(Ax) (Cis) (Wn)(D)] / [(Ais) (RF) (Ws)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured	3122498
Cis = Concentration of the specific internal standard (ug/L)	25
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	611048
RF = Average RF from the ICAL	1.004
Ws = Weight of sample purged (g)	5
Wn = Nominal purge weight (g) (5.0 g)	5
Cx = Concentration of the compound in the sample being measured (ug/L)	127.2428

Dry weight correction:

Percent solids (PCT_S)	50
Cd = (Cx) (100)/PCT_S	254.4856

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

4.0 Concentration from Linear Regression

Step 1: Retrieve Curve Data From Plot, $y = mx + b$

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve = 0.213

b = intercept from curve = - 0.00642

Step 2: Calculate y from Quantitation Report

$$y = 86550/593147 = 0.1459$$

Step 3: Solve for x

$$x = (y - b)/m = [(0.1459 - (-0.00642))/0.213] = 0.7152$$

Step 4: Solve for analyte concentration Cx

$$Cx = Cis (x) = (25.0)(0.7152) = 17.88$$

Example Spreadsheet Calculation:

Slope from curve, m:	0.213
Intercept from curve, b:	-0.00642
Area of analyte, Ax:	86550
Area of Internal Standard, Ais:	593147
Concentration of IS, Cis	25.00
Response Ratio:	0.145917
Amount Ratio:	0.715195
Concentration:	17.87988
Units of Internal Standard:	ug/L

5.0 Concentration from Quadratic Regression**Step 1 - Retrieve Curve Data from Plot, $y = Ax^2 + Bx + C$**

Where:

$$Ax^2 + Bx + (C - y) = 0$$

A, B, C = constants from the ICAL quadratic regression

y = Response ratio = Area of analyte/Area of internal standard (IS)

x = Amount ratio = Concentration of analyte/concentration of IS

Step 2: Calculate y from Quantitation Report

$$y = Ax/Ais$$

Step 3: Solve for x using the quadratic formula

$$Ax^2 + Bx + C - y = 0$$

$$x = \frac{b \pm \sqrt{(b^2 - 4a(c - y))}}{2a} \quad (\text{Two possible solutions})$$

Step 4: Solve for analyte concentration Cx

$$Cx = (Cis)(\text{Amount ratio})$$

Example Spreadsheet Calculation:

Value of A from plot:	-0.00629
Value of B from plot:	0.511
Value of C from plot:	-0.0276
Area of unknown from quantitation report:	293821
Area of IS from quantitation report:	784848
Response ratio, y:	0.374367
C - y:	-0.40197
Root 1 - Computed amount ratio, X1:	80.44567
Root 2 - Computed amount ratio, X2:	0.794396 use this solution
Concentration of IS, Cis:	25.00
Concentration of analyte, Cx:	19.86 ug/L

Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS8 Dataset: 041217
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01/OVAP MSV01 Rev: 24/0
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01/OVAP PAT01 Rev: 18/1
 Maintenance Log ID: 54128

Internal Standard: STD81235 Surrogate Standard: STD81235
 CCV: STD81397 LCS: STD81404 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG609829

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
8M418914	WG609829-01 50ng BFB STD 8260	NA	1	1	STD80989	04/12/17 10:17
8M418915	RINSE	NA	1	1	STD80989	04/12/17 10:42
8M418916	WG609829-02 5ug/L STD A9/FOO	NA	1	1	STD81397	04/12/17 11:11
8M418917	WG609829-03 20ug/L STD A9/FOO	NA	1	1	STD81397	04/12/17 11:40
8M418918	WG609829-04 50ug/L STD A9/FOO	NA	1	1	STD81397	04/12/17 12:10
8M418919	WG609829-05 100ug/L STD A9/FOO	NA	1	1	STD81397	04/12/17 12:41
8M418920	WG609829-06 200ug/L STD A9/FOO	NA	1	1	STD81397	04/12/17 13:10
8M418921	WG609829-07 300ug/L STD A9/FOO	NA	1	1	STD81397	04/12/17 13:40
8M418922	WG609829-08 400ug/L STD A9/FOO	NA	1	1	STD81397	04/12/17 14:10
8M418923	WG609829-09 500ug/L STD A9/FOO	NA	1	1	STD81397	04/12/17 14:39
8M418924	RINSE	NA	1	1		04/12/17 15:09
8M418925	RINSE	NA	1	1		04/12/17 15:39
8M418926	WG609829-10 100ug/L ALT SRC STD A9/F	NA	1	1	STD81404	04/12/17 16:10
8M418927	WG609948-01 50ug/L CCV STD 8260	NA	1	1	STD81377	04/12/17 16:39
8M418928	RINSE	NA	1	1		04/12/17 17:09

Approved: April 18, 2017

Page: 1

[Signature]



Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS8 Dataset: 061217
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01/OVAP MSV01 Rev: 25/0
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01/OVAP PAT01 Rev: 18/1
 Maintenance Log ID: 54209

Internal Standard: STD82231 Surrogate Standard: STD82231
 CCV: STD82307 LCS: STD82323 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG617492

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
8M420009	RINSE	NA	1	1		06/12/17 09:18
8M420010	CCV	NA	1	1		06/12/17 12:17
8M420011	RINSE	NA	1	1		06/12/17 12:46
8M420012	RINSE	NA	1	1		06/12/17 13:15
8M420013	WG617492-01 50ng BFB STD 8260	NA	1	1	STD81972	06/12/17 13:57
8M420014	WG617492-02 0.3ug/L STD 8260	NA	1	1	STD82307	06/12/17 14:32
8M420015	WG617492-03 0.4ug/L STD 8260	NA	1	1	STD82307	06/12/17 15:02
8M420016	WG617492-04 1ug/L STD 8260	NA	1	1	STD82307	06/12/17 15:32
8M420017	WG617492-05 2ug/L STD 8260	NA	1	1	STD82307	06/12/17 16:04
8M420018	WG617492-06 5ug/L STD 8260	NA	1	1	STD82307	06/12/17 16:38
8M420019	WG617492-07 20ug/L STD 8260	NA	1	1	STD82307	06/12/17 17:07
8M420020	WG617492-08 50ug/L STD 8260	NA	1	1	STD82307	06/12/17 17:37
8M420021	WG617492-09 100ug/L STD 8260	NA	1	1	STD82307	06/12/17 18:08
8M420022	WG617492-10 200ug/L STD 8260	NA	1	1	STD82307	06/12/17 18:39
8M420023	WG617492-11 300ug/L STD 8260	NA	1	1	STD82307	06/12/17 19:10
8M420024	RINSE	NA	1	1		06/12/17 19:42
8M420025	RINSE	NA	1	1		06/12/17 20:12
8M420026	WG617492-12 20ug/L ALT SRC STD 8260	NA	1	1	STD82323	06/12/17 20:43
8M420027	CCV CHECK	NA	1	1	STD82307	06/12/17 21:14
8M420028	RINSE	NA	1	1		06/12/17 21:45
8M420029	RINSE	NA	1	1		06/12/17 22:15

Approved: June 14, 2017

Page: 1

Mary Schilling



Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS8 Dataset: 062017
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01/OVAP MSV01 Rev: 25/0
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01/OVAP PAT01 Rev: 18/1
 Maintenance Log ID: 54228

Internal Standard: STD82231 Surrogate Standard: STD82231
 CCV: STD82307 LCS: STD82473 MS/MSD: STD82475
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG618571; WG618683

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
8M420173	WG618570-01 50ng BFB STD 8260	NA	1	1	STD82467	06/20/17 10:01
8M420174	WG618570-02 50ug/L CCV STD 8260	NA	1	1	STD82307	06/20/17 10:27
8M420175	WG618570-02 50ug/L CCV STD 8260	NA	1	1	STD82307	06/20/17 10:58
8M420176	WG000000-01 100ug/L A9 CCV STD 8260	NA	1	1	STD82199	06/20/17 11:28
8M420177	WG618571-01 VBLK0620 STD 8260	NA	1	1		06/20/17 11:57
8M420178	WG618571-02 20ug/L LCS STD 8260	NA	1	1	STD82473	06/20/17 12:26
8M420179	L17060697-01 B 500X 826-TC D1	NA	17	500		06/20/17 12:56
8M420180	L17060716-06 B 10000X 826-LOW D1	<2	1	10000		06/20/17 13:25
8M420181	L17060716-07 B 10000X 826-LOW D1	<2	1	10000		06/20/17 13:55
8M420182	L17060716-10 B 10X 826-LOW D1	<2	1	10		06/20/17 14:24
8M420183	L17060716-12 B 100X 826-LOW D1	<2	1	100		06/20/17 14:54
8M420184	L17060716-14 B 10X 826-LOW D1	<2	1	10		06/20/17 15:24
8M420185	L17060859-02 B 50X 826-SPE D1	<2	1	50		06/20/17 15:53
8M420186	L17060586-14 B 826-SPE	<2	1	1		06/20/17 16:22
8M420187	L17060884-03 TB A 826-BETX	<2	1	1		06/20/17 16:52
8M420188	L17060856-02 TB A 826-SPE	<2	1	1		06/20/17 17:22
8M420189	L17060856-01 A 826-SPE	<2	1	1		06/20/17 17:53
8M420190	L17060884-01 A 826-BETX	<2	1	1		06/20/17 18:23
8M420191	L17061018-04 A TB 826-SPE	<2	1	1		06/20/17 18:52
8M420192	L17061018-01 A RS 826-SPE	<2	1	1		06/20/17 19:23
8M420193	L17061018-02 A MS 826-SPE	<2	1	1	STD82473	06/20/17 19:52
8M420194	L17061018-03 A MSD 826-SPE	<2	1	1	STD82473	06/20/17 20:22
8M420195	L17060873-01 A 10X 826-TC	NA	17	10		06/20/17 20:52
8M420196	L17060873-02 A 10X 826-TC	NA	17	10		06/20/17 21:22
8M420197	L17060932-01 A 10X 826-TC	NA	17	10		06/20/17 21:52
8M420198	RINSE	NA	1	1		06/20/17 22:21
8M420199	WG618683-02 20ug/L LCS STD 624	NA	2	1	STD82475	06/20/17 22:51
8M420200	WG618683-03 20ug/L LC2 STD 624	NA	2	1	STD82475	06/20/17 23:21
8M420201	RINSE	NA	2	1		06/20/17 23:50
8M420202	WG618683-01 VBLK0620 STD 624	NA	2	1		06/21/17 00:20
8M420203	L17061055-01 A 624-SPE3	<2	2	1		06/21/17 00:49
8M420204	L17061055-02 A 624-SPE	6	2	1		06/21/17 01:19
8M420205	L17061055-03 A 624-SPE1	6	2	1		06/21/17 01:48
8M420206	L17061055-04 A 624-SPE2	6	2	1		06/21/17 02:16

Approved: June 22, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS8 Dataset: 062017
 Analyst1: TMB Analyst2: NA
 Method: 8260B SOP: MSV01/OVAP MSV01 Rev: 25/0
 Method: 624 SOP: MSV10 Rev: 15
 Method: 5030B/5030C/5035A SOP: PAT01/OVAP PAT01 Rev: 18/1
 Maintenance Log ID: 54228

Internal Standard: STD82231 Surrogate Standard: STD82231
 CCV: STD82307 LCS: STD82473 MS/MSD: STD82475
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG618571; WG618683

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
8M420207	L17061056-01 A 624-SPE	6	2	1		06/21/17 02:46
8M420208	CCV	NA	1	1		06/21/17 03:15
8M420209	RINSE	NA	1	1		06/21/17 03:44
8M420210	RINSE	NA	1	1		06/21/17 04:13

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2	X			
File ID: 8M420174				
VC was high, DNR.				
4				
File ID: 8M420176				
Not needed, DNR.				
5				
File ID: 8M420177				
MECL was 0.3463ug/L.				
7	X	2000	Over Calibration Range	CB
File ID: 8M420179				

Approved: June 22, 2017

Page: 2

Sarah Vandenberg



Microbac Laboratories Inc.

Data Checklist

Date: 12-APR-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS8
 Curve Workgroup: NA
 Runlog ID: 81580
 Analytical Workgroups: WG609829

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	NA
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	FJB
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
17-APR-2017



Secondary Reviewer:
18-APR-2017




Microbac Laboratories Inc.

Data Checklist

Date: 12-JUN-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS8
 Curve Workgroup: NA
 Runlog ID: 82713
 Analytical Workgroups: WG617492

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	X
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	NA
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	MES
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
13-JUN-2017

Tiffany Bailey

Secondary Reviewer:
14-JUN-2017

Mary Shieley



Microbac Laboratories Inc.

Data Checklist

Date: 20-JUN-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS8
 Curve Workgroup: NA
 Runlog ID: 82881
 Analytical Workgroups: WG618571; WG618683

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	TMB
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	TMB
Secondary Reviewer	SAV
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
21-JUN-2017

Tiffany Bailey

Secondary Reviewer:
22-JUN-2017

Sarah Vandenberg



Analytical Method:8260B
Login Number:L17060856

AAB#:WG618571

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6449	01	06/14/17					06/20/2017	6.1	14		06/20/17	6.1	14	
TRIP BLANK	02	06/14/17					06/20/2017	6.7	14		06/20/17	6.7	14	

* = SEE PROJECT QAPP REQUIREMENTS



Login Number:L17060856
 Instrument Id:HPMS8
 Workgroup (AAB#):WG618571

Method:8260
 CAL ID: HPMS8-12-JUN-17
 Matrix:Water

Sample Number	Dilution	Tag	1	2	3	4
L17060856-01	1.00	01	100	102	101	101
L17060856-02	1.00	01	102	101	100	102
WG618571-01	1.00	01	99.9	99.8	99.5	99.6
WG618571-02	1.00	01	99.8	99.8	95.4	99.4

Surrogates	Surrogate Limits		
1 - 1,2-Dichloroethane-d4	70	-	120
2 - Dibromofluoromethane	85	-	115
3 - 4-Bromofluorobenzene	75	-	120
4 - Toluene-d8	85	-	120

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



METHOD BLANK SUMMARY

Login Number: L17060856 Work Group: WG618571
 Blank File ID: 8M420177 Blank Sample ID: WG618571-01
 Prep Date: 06/20/17 11:57 Instrument ID: HPMS8
 Analyzed Date: 06/20/17 11:57 Method: 8260B
 Analyst: TMB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG618571-02	8M420178	06/20/17 12:26	01
TRIP BLANK	L17060856-02	8M420188	06/20/17 17:22	01
LH18/24-SP650-6449	L17060856-01	8M420189	06/20/17 17:53	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5349256
 Report generated 06/23/2017 15:33



Login Number: L17060856 Prep Date: 06/20/17 11:57 Sample ID: WG618571-01
 Instrument ID: HPMS8 Run Date: 06/20/17 11:57 Prep Method: 5030B/5030C/503
 File ID: 8M420177 Analyst: TMB Method: 8260B
 Workgroup (AAB#): WG618571 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS8-12-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
1,1,1-Trichloroethane	0.250	1.00	0.250	1	U
1,1,2-Trichloroethane	0.250	1.00	0.250	1	U
1,1-Dichloroethane	0.125	0.500	0.125	1	U
1,1-Dichloroethene	0.500	2.00	0.500	1	U
1,2-Dichloroethane	0.250	1.00	0.250	1	U
Acetone	2.50	10.0	2.50	1	U
Benzene	0.125	0.500	0.125	1	U
Carbon tetrachloride	0.250	1.00	0.250	1	U
Chloroform	0.125	0.500	0.125	1	U
Ethylbenzene	0.250	1.00	0.250	1	U
Methylene chloride	0.250	1.00	0.346	1	J
m,p-Xylene	0.500	2.00	0.500	1	U
o-Xylene	0.250	1.00	0.250	1	U
Styrene	0.125	0.500	0.125	1	U
Tetrachloroethene	0.250	1.00	0.250	1	U
Trichloroethene	0.250	1.00	0.250	1	U
Toluene	0.250	1.00	0.250	1	U
Vinyl chloride	0.250	1.00	0.250	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	99.9	70 - 120	PASS
4-Bromofluorobenzene	99.5	75 - 120	PASS
Dibromofluoromethane	99.8	85 - 115	PASS
Toluene-d8	99.6	85 - 120	PASS

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5347121
 23-JUN-2017 15:33



Login Number: L17060856 Run Date: 06/20/2017 Sample ID: WG618571-02
 Instrument ID: HPMS8 Run Time: 12:26 Prep Method: 5030B/5030C/503
 File ID: 8M420178 Analyst: TMB Method: 8260B
 Workgroup (AAB#): WG618571 Matrix: Water Units: ug/L
 QC Key: DOD4 Lot#: STD82370 Cal ID: HPMS8-12-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
1,1,1-Trichloroethane	20.0	19.5	97.7	65 - 130	
1,1,2-Trichloroethane	20.0	19.6	97.9	75 - 125	
1,1-Dichloroethane	20.0	18.8	94.2	70 - 135	
1,1-Dichloroethene	20.0	18.4	92.1	70 - 130	
1,2-Dichloroethane	20.0	20.1	100	70 - 130	
Acetone	20.0	19.6	97.8	40 - 140	
Benzene	20.0	19.5	97.7	80 - 120	
Carbon tetrachloride	20.0	19.1	95.6	65 - 140	
Chloroform	20.0	18.2	90.8	65 - 135	
Ethylbenzene	20.0	19.4	97.0	75 - 125	
Methylene chloride	20.0	19.1	95.5	55 - 140	
m,p-Xylene	40.0	40.5	101	75 - 130	
o-Xylene	20.0	20.5	102	80 - 120	
Styrene	20.0	21.5	107	65 - 135	
Tetrachloroethene	20.0	18.7	93.4	45 - 150	
Trichloroethene	20.0	18.7	93.4	70 - 125	
Toluene	20.0	19.5	97.6	75 - 120	
Vinyl chloride	20.0	25.8	129	50 - 145	

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	99.8	70 - 120	PASS
4-Bromofluorobenzene	95.4	75 - 120	PASS
Dibromofluoromethane	99.8	85 - 115	PASS
Toluene-d8	99.4	85 - 120	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
 PDF File ID: 5347122
 Report generated: 06/23/2017 15:33



BFB

Login Number: L17060856 Tune ID: WG617492-01
 Instrument: HPMS8 Run Date: 06/12/2017
 Analyst: TMB Run Time: 13:57
 Workgroup: WG617492 File ID: 8M420013
 Cal ID: HPMS8-

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	18.8	6609	PASS
75.0	95.0	30.0	60.0	49.7	17473	PASS
95.0	95.0	100	100	100	35160	PASS
96.0	95.0	5.00	9.00	6.98	2454	PASS
173	174	0	2.00	0.515	144	PASS
174	95.0	50.0	100	79.5	27957	PASS
175	174	5.00	9.00	7.39	2066	PASS
176	174	95.0	101	98.3	27495	PASS
177	176	5.00	9.00	6.84	1880	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG617492-02	STD	01	06/12/2017 14:32	
WG617492-03	STD	01	06/12/2017 15:02	
WG617492-04	STD	01	06/12/2017 15:32	
WG617492-05	STD	01	06/12/2017 16:04	
WG617492-06	STD	01	06/12/2017 16:38	
WG617492-07	STD	01	06/12/2017 17:07	
WG617492-08	STD-CCV	01	06/12/2017 17:37	
WG617492-09	STD	01	06/12/2017 18:08	
WG617492-10	STD	01	06/12/2017 18:39	
WG617492-11	STD	01	06/12/2017 19:10	
WG617492-12	SSCV	01	06/12/2017 20:43	

* Sample past 12 hour tune limit



BFB

Login Number: L17060856 Tune ID: WG618570-01
 Instrument: HPMS8 Run Date: 06/20/2017
 Analyst: TMB Run Time: 10:01
 Workgroup: WG618570 File ID: 8M420173
 Cal ID: HPMS8-12-JUN-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	18.3	4925	PASS
75.0	95.0	30.0	60.0	48.9	13192	PASS
95.0	95.0	100	100	100	26985	PASS
96.0	95.0	5.00	9.00	6.00	1618	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	83.8	22605	PASS
175	174	5.00	9.00	7.44	1682	PASS
176	174	95.0	101	100	22717	PASS
177	176	5.00	9.00	5.70	1294	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG618570-02	CCV	01	06/20/2017 10:58	
WG618571-01	BLANK	01	06/20/2017 11:57	
WG618571-02	LCS	01	06/20/2017 12:26	
L17060856-02	TRIP BLANK	01	06/20/2017 17:22	
L17060856-01	LH18/24-SP650-6449	01	06/20/2017 17:53	

* Sample past 12 hour tune limit



Calibration Table Report
 Method: A9FOOWT.M
 Title: A9-FOO Water SOP:MSV01 04-12-17 HPMS8
 Last Calibration: Thu Apr 13 16:40:13 2017
 Curve: WG609829
 Calibration Files

Compound	5	20	50	100	200	300	400	500	Avg	%RSD
	8M418916.D	8M418917.D	8M418918.D	8M418919.D	8M418920.D	8M418921.D	8M418922.D	8M418923.D		
I Fluorobenzene	ISTD									
T Acetonitrile	0.013	0.012	0.013	0.013	0.012	0.013	0.013	0.013	0.013	3.572
T 3-Chloro-1-propene	0.312	0.315	0.327	0.337	0.346	0.341	0.344	0.341	0.333	3.984
T 2-Chloro-1,3-butadiene	0.285	0.299	0.317	0.330	0.340	0.336	0.337	0.336	0.322	6.267
T Ethyl Acetate	0.099	0.101	0.098	0.101	0.108	0.103	0.106	0.109	0.103	4.045
T Methacrylonitrile	0.052	0.059	0.057	0.059	0.064	0.061	0.063	0.065	0.060	7.025
T Isobutyl Alcohol		0.003	0.004	0.004	0.004	0.005	0.005	0.004	0.000	12.096
T 1-Butanol									0.000	0.000
T Methyl methacrylate	0.096	0.101	0.103	0.107	0.116	0.112	0.116	0.121	0.109	7.922
T 2-Nitropropane	0.027	0.028	0.031	0.034	0.034	0.035	0.037	0.032	0.032	11.358
I Chlorobenzene-d5	ISTD									
I 1,4-Dichlorobenzene-d4	ISTD									
T Cyclohexanone	0.006	0.006	0.007	0.008	0.007	0.008	0.009	0.007	0.007	13.841

Mon Apr 17 15:45:45 2017

Calibration Table Report
 Method: 8260WTR.M
 Title: Method 8260B/624 WTR-SOP:OVLMSV01 06-12-17 HPMS8
 Last Calibration: Tue Jun 13 08:34:21 2017
 Curve: WG617492
 Calibration Files

Compound	0.3 0.4 1 2 5 20 50 100 200 300										Avg	%RSD	Linear	Quad
	8M420014.D	8M420015.D	8M420016.D	8M420017.D	8M420018.D	8M420019.D	8M420020.D	8M420021.D	8M420022.D	8M420023.D				
I Fluorobenzene	ISTD													
T Dichlorodifluoromethane			0.296	0.324	0.300	0.366	0.345	0.365	0.383		0.340	9.987		
P Chloromethane			0.588	0.482	0.444	0.448	0.416	0.423	0.434		0.462	12.833		
C Vinyl Chloride	0.481	0.476	0.468	0.451	0.456	0.396	0.402	0.381		0.439	9.092			
T 1,3-Butadiene				0.339	0.319	0.252	0.207	0.192	0.162	0.162	0.245	29.079	1.001	
T Bromomethane		0.064	0.070	0.086	0.124	0.142	0.202				0.115	45.895	0.998	
T Chloroethane	0.142	0.163	0.174	0.175	0.180	0.170	0.180	0.187			0.171	8.049		
T Trichlorofluoromethane	0.424	0.421	0.455	0.438	0.448	0.449	0.437	0.476		0.444	4.061			
T Diethyl ether		0.158	0.186	0.170	0.180	0.189	0.189		0.208	0.183	8.691			
T Isoprene				0.353	0.367	0.374	0.379	0.390	0.405	0.378	4.709			
T Acrolein			0.025	0.020	0.024	0.026	0.027		0.027	0.025	11.119			
T 1,1,2-Trichloro-1,2,2-Trifluoroethane		0.263	0.265	0.253	0.252	0.255	0.251	0.268		0.258	2.682			
T Acetone				0.039	0.049	0.050	0.048	0.051	0.047	0.047	9.043			
C 1,1-Dichloroethene	0.371	0.361	0.361	0.362	0.365	0.380	0.366	0.394		0.370	3.131			
T Tert-Butyl Alcohol			0.014	0.011	0.013	0.014	0.014		0.015	0.014	10.143			
T Dimethyl Sulfide				0.226	0.252	0.251	0.258	0.272	0.275	0.256	7.031			
T Iodomethane	0.117	0.123	0.153	0.228	0.208	0.261	0.232	0.245	0.196		28.995	0.998		
T Methyl acetate				0.124	0.152	0.158	0.157	0.167	0.168	0.154	10.428			
T Methylene Chloride	0.261	0.261	0.251	0.265	0.260	0.265	0.285		0.264	3.939				
T Carbon Disulfide	0.828	0.831	0.798	0.827	0.801	0.831	0.855	0.762	0.817	3.492				
T Acrylonitrile	0.041	0.062	0.052	0.064	0.069	0.069		0.063	0.060	16.941	0.995			
T Methyl Tert Butyl Ether		0.518	0.587	0.519	0.611	0.632	0.603	0.637		0.587	8.471			
T trans-1,2-Dichloroethene	0.355	0.350	0.348	0.340	0.350	0.362	0.352	0.379		0.354	3.276			
T n-Hexane				0.339	0.330	0.328	0.338	0.361	0.352	0.341	3.706			
T Diisopropyl ether		0.788	0.866	0.825	0.830	0.843	0.838		0.826	0.831	2.807			
T Vinyl Acetate				0.294	0.301	0.309	0.304	0.315	0.272	0.299	5.049			
P 1,1-Dichloroethane	0.433	0.445	0.453	0.448	0.458	0.477	0.457	0.484		0.457	3.656			
T Ethyl-Tert-Butyl ether		0.641	0.739	0.688	0.718	0.737	0.738		0.742	0.715	5.277			
T 2-Butanone				0.061	0.076	0.079	0.077	0.080	0.080	0.076	9.542			
T Propionitrile		0.014	0.023	0.018	0.022	0.023	0.023		0.024	0.021	16.814	0.997		
T 2,2-Dichloropropane	0.336	0.382	0.384	0.389	0.375	0.387	0.373	0.394		0.377	4.842			
T cis-1,2-Dichloroethene	0.326	0.305	0.293	0.288	0.290	0.306	0.294	0.313		0.302	4.346			
C Chloroform	0.607	0.633	0.518	0.466	0.462	0.481	0.457	0.480		0.508	13.034			
T 1-Bromopropane		0.038	0.050	0.055	0.055	0.056	0.056	0.059	0.060	0.054	13.067			
T Bromochloromethane	0.154	0.170	0.179	0.162	0.179	0.177	0.176	0.186		0.173	6.073			
T Tetrahydrofuran		0.046	0.049	0.041	0.049	0.052	0.051		0.053	0.049	8.583			
S Dibromofluoromethane			0.258	0.262	0.268	0.277	0.270	0.278	0.280	0.270	3.088			
T 1,1,1-Trichloroethane	0.365	0.390	0.397	0.395	0.413	0.428	0.418	0.458		0.408	6.848			
T Cyclohexane		0.408	0.411	0.407	0.411	0.418	0.429	0.469	0.444	0.425	5.123			
T 1,1-Dichloropropene		0.324	0.341	0.340	0.352	0.359	0.352	0.378		0.349	4.869			
T Tert-Amyl-Methyl ether		0.560	0.686	0.618	0.674	0.694	0.692		0.678	0.658	7.640			
T Carbon Tetrachloride	0.365	0.374	0.391	0.372	0.39	0.405	0.4	0.416		0.3891	4.51585			
S 1,2-Dichloroethane-d4			0.263	0.244	0.267	0.269	0.26	0.267	0.268	0.2625	3.38531			
T Heptane										0	0			
T 1,2-Dichloroethane	0.285	0.294	0.324	0.295	0.333	0.34	0.325	0.349		0.3181	7.49232			
T Benzene	1.038	1.041	1.062	1.019	1.046	1.042	1.016	0.999		1.0329	1.94698			
T Trichloroethene	0.287	0.269	0.286	0.273	0.293	0.298	0.296	0.323		0.2907	5.71371			
T Methylcyclohexane				0.416	0.428	0.418	0.434	0.463	0.452	0.4351	4.40189			
C 1,2-Dichloropropane	0.237	0.246	0.249	0.244	0.266	0.27	0.262	0.284		0.2572	6.10772			
T Bromodichloromethane	0.319	0.314	0.328	0.325	0.356	0.373	0.361	0.386		0.3452	7.85901			
T 1,4-Dioxane				0.001	0.002	0.002	0.002		0.002	0.0016	11.7799			
T Dibromomethane	0.107	0.139	0.146	0.138	0.157	0.164	0.156	0.172		0.1474	13.547			
T 2-Chloroethyl Vinyl Ether			0.12	0.11	0.141	0.147	0.147	0.157	0.159	0.14	13.303			
T 4-Methyl-2-Pentanone				0.05	0.066	0.069	0.067	0.074	0.073	0.0663	12.7604			
T cis-1,3-Dichloropropene	0.371	0.362	0.381	0.369	0.422	0.435	0.426	0.456		0.4026	8.9284			

T	Dimethyl Disulfide				0.168	0.223	0.246	0.252	0.278	0.277	0.2409	17.0081	0.999
I	Chlorobenzene-d5	ISTD											
S	Toluene-d8			1.248	1.204	1.197	1.193	1.158	1.179	1.205	1.1975	2.29354	
C	Toluene	1.391	1.422	1.456	1.472	1.481	1.464	1.388	1.296		1.4211	4.35705	
T	Ethyl Methacrylate		0.227	0.291	0.278	0.356	0.373	0.359	0.382	0.388	0.3317	17.6943	0.999
T	Paraldehyde										0	0	
T	trans-1,3-Dichloropropene		0.405	0.429	0.418	0.483	0.503	0.478	0.506		0.4602	9.1334	
T	1,1,2-Trichloroethane	0.223	0.234	0.273	0.249	0.276	0.284	0.266	0.285		0.2614	9.01467	
T	2-Hexanone				0.054	0.077	0.082	0.079	0.083	0.085	0.0767	14.9249	
T	1,3-Dichloropropane	0.353	0.4	0.484	0.417	0.468	0.48	0.449	0.471		0.4403	10.572	
T	Tetrachloroethene	0.288	0.282	0.298	0.312	0.305	0.309	0.308	0.338		0.3049	5.57949	
T	Dibromochloromethane	0.263	0.296	0.322	0.303	0.36	0.379	0.361	0.391		0.3343	13.5186	
T	1,2-Dibromoethane	0.202	0.246	0.257	0.237	0.286	0.291	0.278	0.297		0.2615	12.432	
T	1-Chlorohexane	0.432	0.409	0.47	0.467	0.477	0.48	0.486	0.516	0.516	0.4725	7.41006	
P	Chlorobenzene	0.987	0.979	0.979	0.964	0.99	1.021	1.016	1.048		0.9981	2.79024	
T	1,1,1,2-Tetrachloroethane	0.318	0.31	0.35	0.346	0.381	0.41	0.42			0.362	11.8707	
C	Ethylbenzene	0.474	0.491	0.529	0.517	0.553	0.576	0.605	0.688		0.5542	12.4475	
T	m-p-Xylene	0.626	0.598	0.638	0.64	0.66	0.674	0.692	0.658		0.6483	4.4968	
T	o-Xylene		0.575	0.584	0.595	0.63	0.641	0.663	0.728		0.6308	8.46311	
T	Styrene	0.817	0.889	0.938	0.973	1.086	1.109	1.13	1.127		1.0088	11.9701	
P	Bromoform		0.164	0.184	0.172	0.234	0.248	0.243	0.269		0.2164	19.476	0.997
T	Isopropylbenzene	1.48	1.441	1.554	1.572	1.645	1.619	1.593	1.448		1.544	5.07698	
I	1,4-Dichlorobenzene-d4	ISTD											
P	1,1,2,2-Tetrachloroethane	0.482	0.545	0.62	0.54	0.599	0.605	0.555	0.585		0.5664	7.93464	
S	p-Bromofluorobenzene			0.923	0.868	0.869	0.888	0.86	0.892	0.962	0.8944	4.07431	
T	1,2,3-Trichloropropane		0.14	0.155	0.165	0.184	0.184	0.167	0.178		0.1675	9.57873	
T	trans-1,4-Dichloro-2-Butene		0.095	0.147	0.138	0.166	0.179	0.168	0.164	0.164	0.1527	17.4902	0.999
T	n-Propylbenzene	3.527	3.568	3.724	3.781	3.744	3.651	3.362	2.771		3.5161	9.40531	
T	Bromobenzene	0.775	0.772	0.836	0.894	0.849	0.875	0.884	0.848	0.905	0.8487	5.68699	
T	1,3,5-Trimethylbenzene	2.198	2.408	2.484	2.568	2.612	2.581	2.536	2.312		2.4625	5.92082	
T	2-Chlorotoluene	2.354	2.312	2.363	2.307	2.278	2.272	2.144	2.063		2.2615	4.63373	
T	4-Chlorotoluene	2.25	2.314	2.3	2.262	2.255	2.25	2.196	1.969		2.2244	4.91025	
T	a-Methylstyrene				1.345	1.456	1.504	1.537	1.547	1.466	1.4759	4.9956	
T	tert-Butylbenzene		0.513	0.57	0.564	0.573	0.583	0.59	0.657		0.5786	7.35452	
T	1,2,4-Trimethylbenzene	2.366	2.567	2.681	2.681	2.733	2.689	2.652	2.377		2.5933	5.58083	
T	sec-Butylbenzene		3.333	3.388	3.39	3.4	3.326	3.176	2.723		3.2482	7.50962	
T	p-Isopropyltoluene		2.559	2.684	2.78	2.852	2.793	2.751	2.443		2.6947	5.38648	
T	1,3-Dichlorobenzene	1.787	1.595	1.625	1.607	1.623	1.614	1.605	1.593		1.6311	3.93037	
T	1,4-Dichlorobenzene	1.425	1.641	1.63	1.626	1.58	1.633	1.611	1.602	1.572	1.5913	4.18519	
T	n-Butylbenzene		2.643	2.722	2.721	2.669	2.591	2.591	2.284		2.603	5.78586	
T	1,2-Dichlorobenzene	1.172	1.454	1.405	1.452	1.394	1.504	1.501	1.49	1.489	1.429	7.31201	
T	1,2-Dibromo-3-Chloropropane			0.093	0.069	0.098	0.103	0.102	0.108		0.0956	14.7143	
T	1,2,4-Trichlorobenzene	1.141	1.047	1.07	1.019	1.111	1.099	1.186	1.23		1.113	6.34993	
T	Hexachlorobutadiene	0.506	0.559	0.493	0.521	0.513	0.514	0.56	0.608		0.5342	7.18008	
T	Naphthalene	1.834	1.562	1.877	1.691	2.07	1.988	2.025	1.875		1.8653	9.2083	
T	1,2,3-Trichlorobenzene	0.795	0.937	0.904	0.999	0.893	1.021	1.002	1.07	1.115	0.9707	10.1341	

Tue Jun 13 10:29:46 2017

Login Number: L17060856 Run Date: 06/12/2017 Sample ID: WG617492-12
 Instrument ID: HPMS8 Run Time: 20:43 Method: 8260B
 File ID: 8M420026 Analyst: TMB QC Key: DOD4
 ICal Workgroup: WG617492 Cal ID: HPMS8 - 12-JUN-17

Analyte		Expected	Found	Units	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	20.0	18.2	ug/L	0.337	8.90	20	
Chloroform	CCC	20.0	17.5	ug/L	0.444	12.7	20	
Ethylbenzene	CCC	20.0	18.9	ug/L	0.523	5.70	20	
Toluene	CCC	20.0	19.4	ug/L	1.38	2.90	20	
Vinyl Chloride	CCC	20.0	21.6	ug/L	0.475	8.20	20	
1,1,2,2-Tetrachloroethane	SPCC	20.0	18.2	ug/L	0.517	8.80	20	
Chloromethane	SPCC	20.0	20.8	ug/L	0.482	4.20	20	
Chlorobenzene	SPCC	20.0	19.0	ug/L	0.947	5.20	20	
Bromoform	SPCC	20.0	16.6	ug/L	0.207	16.9	20	
1,1-Dichloroethene	SPCC	20.0	18.1	ug/L	0.414	9.40	20	
1,1,1-Trichloroethane		20.0	19.3	ug/L	0.394	3.30	20	
1,1,2-Trichloroethane		20.0	19.8	ug/L	0.258	1.10	20	
1,2-Dichloroethane		20.0	19.4	ug/L	0.309	2.90	20	
Acetone		20.0	19.1	ug/L	0.0453	4.40	20	
Benzene		20.0	19.1	ug/L	0.987	4.50	20	
Carbon Tetrachloride		20.0	18.6	ug/L	0.362	6.90	20	
Methylene Chloride		20.0	18.8	ug/L	0.248	6.10	20	
m-,p-Xylene		40.0	39.5	ug/L	0.641	1.20	20	
o-Xylene		20.0	19.7	ug/L	0.622	1.40	20	
Styrene		20.0	20.8	ug/L	1.05	3.90	20	
Tetrachloroethene		20.0	19.3	ug/L	0.295	3.30	20	
Trichloroethene		20.0	19.4	ug/L	0.282	3.00	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17060856 Run Date: 06/20/2017 Sample ID: WG618570-02
Instrument ID: HPMS8 Run Time: 10:58 Method: 8260B
File ID: 8M420175 Analyst: TMB QC Key: DOD4
Workgroup (AAB#): WG618571 Cal ID: HPMS8 - 12-JUN-17
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,2-Dichloropropane	CCC	50.0	52.7	ug/L	0.271	5.34	20	
1,1-Dichloroethene	CCC	50.0	51.6	ug/L	0.382	3.25	20	
Chloroform	CCC	50.0	47.4	ug/L	0.482	5.13	20	
Ethylbenzene	CCC	50.0	51.6	ug/L	0.572	3.24	20	
Toluene	CCC	50.0	50.4	ug/L	1.43	0.749	20	
Vinyl Chloride	CCC	50.0	59.0	ug/L	0.518	18.1	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	48.4	ug/L	0.549	3.16	20	
Bromoform	SPCC	50.0	44.3	ug/L	0.226	11.3	20	
Chlorobenzene	SPCC	50.0	49.9	ug/L	0.996	0.178	20	
Chloromethane	SPCC	50.0	59.4	ug/L	0.549	18.9	20	
1,1-Dichloroethane	SPCC	50.0	52.4	ug/L	0.479	4.75	20	
Xylenes		150	159	ug/L	0.676	6.17	20	
1,1,1-Trichloroethane		50.0	52.7	ug/L	0.430	5.45	20	
1,1,2-Trichloroethane		50.0	48.5	ug/L	0.254	2.97	20	
1,2-Dichloroethane		50.0	51.8	ug/L	0.330	3.68	20	
Acetone		50.0	47.7	ug/L	0.0452	4.67	20	
Benzene		50.0	52.1	ug/L	1.08	4.18	20	
Carbon Tetrachloride		50.0	52.8	ug/L	0.411	5.62	20	
Methylene Chloride		50.0	52.5	ug/L	0.277	4.98	20	
m-,p-Xylene		100	107	ug/L	0.694	7.06	20	
o-Xylene		50.0	52.2	ug/L	0.659	4.38	20	
Styrene		50.0	56.2	ug/L	1.13	12.4	20	
Tetrachloroethene		50.0	48.3	ug/L	0.295	3.35	20	
Trichloroethene		50.0	49.6	ug/L	0.288	0.834	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
PDF File ID: 5347125
Report generated 06/23/2017 15:33



Login Number: L17060856
Instrument ID: HPMS8
Workgroup (AAB#): WG618571

ICAL CCV Number: WG617492-08
CAL ID: HPMS8-12-JUN-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG617492-08	NA	NA	375829	718679	931199
Upper Limit	NA	NA	751658	1437358	1862398
Lower Limit	NA	NA	187915	359340	465600
<u>L17060856-01</u>	1.00	01	225880	440835	558698
<u>L17060856-02</u>	1.00	01	220141	426036	541778
WG618571-01	1.00	01	267628	512152	641795
WG618571-02	1.00	01	311640	554144	685627

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO MIDPOINT OF ICAL)

00858120

Login Number: L17060856
Instrument ID: HPMS8
Workgroup (AAB#): WG618571

ICAL CCV Number: WG617492-08
CAL ID: HPMS8-12-JUN-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG617492-08	NA	NA	17.82	14.79	10.92
Upper Limit	NA	NA	18.32	15.29	11.42
Lower Limit	NA	NA	17.32	14.29	10.42
<u>L17060856-01</u>	1.00	01	17.81	14.79	10.92
<u>L17060856-02</u>	1.00	01	17.82	14.79	10.92
<u>WG618571-01</u>	1.00	01	17.81	14.79	10.92
<u>WG618571-02</u>	1.00	01	17.81	14.79	10.91

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



2.2 General Chromatography Data

2.2.1 LC/MS Data (6850)

2.2.1.1 Summary Data

Lab Report #: L17060856

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060856-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6449	Prep Method: 6850	Prep Date: 06/19/2017 15:00
Matrix: Water	Analytical Method: 6850	Cal Date: 04/24/2017 15:40
Workgroup #: WG618450	Analyst: JWR	Run Date: 06/19/2017 23:03
Collect Date: 06/14/2017 15:00	Dilution: 1	File ID: 1LM.LM39924
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.911		0.400	0.200	0.100

2.2.1.2 QC Summary Data

Example Calculation 6850 - Perchlorate**Concentration from Linear Regression****Step 1: Retrieve Curve Data From Plot, $y = mx + b$**

y = response ratio = response of analyte / response of internal standard (IS) = R_x/R_{istd}

x = amount ratio = concentration analyte/concentration internal standard (IS) = C_x / C_{istd}

m = slope from curve (1.45)

b = intercept from curve (-0.00242)

$y = 1.45x + -0.00242$

Step 2: Substitute the value for y

where $y = 12600/226000 = 0.055752$

Step 3: Solve for x

$x = (y - b)/m = 0.0040119$

Step 4: Solve for analyte concentration C_x

$C_x = (C_{is})(x) = (5 \text{ ug/L})(0.0040119) = 0.200594 \text{ ug/L}$

Example Calculation - Water:

Slope from curve, m :	1.45
Intercept from curve, b :	-0.00242
Response of analyte, R_x :	12600
Response of Internal Standard, R_{istd} :	226000
Concentration of IS, C_{istd} (ug/L):	5.00
Response Ratio:	0.05575
Amount Ratio:	0.04012
Analyte Concentration, C_x (ug/L) :	0.200594

Example Calculation - Soil:

Analyte Concentration, C_x (ug/L):	0.20059
Amount of soil extracted (g):	5.00
Final volume of extract (mL):	50.00
Percent solids (Pct wt.)	100
Concentration in soil (ug/kg):	2.005938

Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 042417_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG611327 (waters) Analytical WG611328 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: STD80234

Comments: ICAL WG611288 : Alternate Source STD80234
 Analytical Column : RPPX 5um (250x4.6mm)
 K'Prime S/N RPPX250-02115

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM39494	WG611288-01 CCB	1	1		04/24/17 13:27
2	1LM.LM39495	WG611288-02 STD (0.1 ug/L)	1	1	STD80232	04/24/17 13:46
3	1LM.LM39496	WG611288-03 STD (0.2 ug/L)	1	1	STD80232	04/24/17 14:05
4	1LM.LM39497	WG611288-04 STD (0.5 ug/L)	1	1	STD80232	04/24/17 14:24
5	1LM.LM39498	WG611288-05 STD (1.0 ug/L)	1	1	STD80232	04/24/17 14:43
6	1LM.LM39499	WG611288-06 STD (2.0 ug/L)	1	1	STD80232	04/24/17 15:02
7	1LM.LM39500	WG611288-07 STD (5.0 ug/L)	1	1	STD80232	04/24/17 15:21
8	1LM.LM39501	WG611288-08 STD (10 ug/L)	1	1	STD80232	04/24/17 15:40
9	1LM.LM39502	WG611288-09 SSCV (1.0 ug/L)	1	1	STD80234	04/24/17 15:59
10	1LM.LM39503	WG611330-01 CCB	1	1		04/24/17 16:18
11	1LM.LM39504	WG611330-02 CCV (1.0ug/L)	1	1	STD80232	04/24/17 16:37
12	1LM.LM39505	WG611327-07 MRL (0.2ug/L)	1	1	STD80232	04/24/17 16:56
13	1LM.LM39506	WG611327-01 MCT (0.2ug/L)	1	1	STD80234	04/24/17 17:14
14	1LM.LM39507	WG611327-02 BLANK	1	1		04/24/17 17:34
15	1LM.LM39508	WG611327-03 LCS (0.2ug/L)	1	1	STD80234	04/24/17 17:52
16	1LM.LM39509	L17040713-06 RS	1	1		04/24/17 18:11
17	1LM.LM39510	L17040713-07 MS	1	1	STD80234	04/24/17 18:30
18	1LM.LM39511	L17040713-08 MSD	1	1	STD80234	04/24/17 18:49
19	1LM.LM39512	L17040713-01	1	1		04/24/17 19:08
20	1LM.LM39513	L17040713-02	1	1		04/24/17 19:27
21	1LM.LM39514	L17040713-03	1	1		04/24/17 19:46
22	1LM.LM39515	L17040713-04	1	1		04/24/17 20:05
23	1LM.LM39516	WG611330-03 CCV (1.0ug/L)	1	1	STD80232	04/24/17 20:24
24	1LM.LM39517	WG611327-08 MRL (0.2ug/L)	1	1	STD80232	04/24/17 20:43
25	1LM.LM39518	WG611330-04 CCB	1	1		04/24/17 21:02
26	1LM.LM39519	L17040713-05	1	1		04/24/17 21:21
27	1LM.LM39520	L17040713-09	1	1		04/24/17 21:40
28	1LM.LM39521	L17040713-10	1	1		04/24/17 21:59
29	1LM.LM39522	L17040713-11	1	1		04/24/17 22:17
30	1LM.LM39523	L17040713-12	1	1		04/24/17 22:36
31	1LM.LM39524	L17040713-13	1	1		04/24/17 22:55
32	1LM.LM39525	WG611330-05 CCV (1.0ug/L)	1	1	STD80232	04/24/17 23:14
33	1LM.LM39526	WG611327-09 MRL (0.2ug/L)	1	1	STD80232	04/24/17 23:33

Page: 1

Approved: 25-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 042417_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG611327 (waters) Analytical WG611328 (waters)
 Internal STD: COA19471 Surrogate STD: NA STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 STD80234

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM39527	WG611328-07 MRL (0.2ug/L)	1	1	STD80232	04/24/17 23:52
35	1LM.LM39528	WG611330-06 CCB	1	1		04/25/17 00:11
36	1LM.LM39529	WG611328-01 MCT (0.2ug/L)	1	1	STD80234	04/25/17 00:30
37	1LM.LM39530	WG611328-02 BLANK	1	1		04/25/17 00:49
38	1LM.LM39531	WG611328-03 LCS (0.2ug/L)	1	1	STD80234	04/25/17 01:08
39	1LM.LM39532	L17040841-08 RS	1	1		04/25/17 01:27
40	1LM.LM39533	L17040841-09 MS	1	1	STD80234	04/25/17 01:46
41	1LM.LM39534	L17040841-10 MSD	1	1	STD80234	04/25/17 02:05
42	1LM.LM39535	L17040841-01	1	1		04/25/17 02:23
43	1LM.LM39536	L17040841-02	1	1		04/25/17 02:42
44	1LM.LM39537	L17040841-03	1	1		04/25/17 03:01
45	1LM.LM39538	L17040841-04	1	1		04/25/17 03:20
46	1LM.LM39539	WG611330-07 CCV (1.0ug/L)	1	1	STD80232	04/25/17 03:39
47	1LM.LM39540	WG611328-08 MRL (0.2ug/L)	1	1	STD80232	04/25/17 03:58
48	1LM.LM39541	WG611330-08 CCB	1	1		04/25/17 04:17
49	1LM.LM39542	L17040841-05	1	1		04/25/17 04:36
50	1LM.LM39543	L17040841-06	1	1		04/25/17 04:55
51	1LM.LM39544	L17040841-07	1	1		04/25/17 05:14
52	1LM.LM39545	L17040841-11	1	1		04/25/17 05:33
53	1LM.LM39546	L17040841-12	1	1		04/25/17 05:52
54	1LM.LM39547	L17040841-13	1	1		04/25/17 06:11
55	1LM.LM39548	WG611330-09 CCV (1.0ug/L)	1	1	STD80232	04/25/17 06:30
56	1LM.LM39549	WG611328-09 MRL (0.2ug/L)	1	1	STD80232	04/25/17 06:49
57	1LM.LM39550	WG611330-10 CCB	1	1		04/25/17 07:07

Comments

Seq.	Rerun	Dil.	Reason	Analytes
------	-------	------	--------	----------

Page: 2

Approved: 25-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 061917_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG618450 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: Samples L17060716(-03,-05,-06,-07,-10,-12) were analyzed at dilutions based on their historical results.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM39901	WG618457-01 CCB	1	1		06/19/17 15:47
2	1LM.LM39902	WG618457-02 CCV (1.0ug/L)	1	1	STD80232	06/19/17 16:06
3	1LM.LM39903	WG618450-05 MRL (0.2ug/L)	1	1	STD80232	06/19/17 16:25
4	1LM.LM39904	WG618450-01 MCT (0.2ug/L)	1	1	STD80234	06/19/17 16:44
5	1LM.LM39905	WG618450-02 BLANK	1	1		06/19/17 17:03
6	1LM.LM39906	WG618450-03 LCS (0.2ug/L)	1	1	STD80234	06/19/17 17:22
7	1LM.LM39907	WG618450-04 LCS2 (0.2ug/L)	1	1	STD80234	06/19/17 17:41
8	1LM.LM39908	L17060716-01	1	1		06/19/17 18:00
9	1LM.LM39909	L17060716-02	1	1		06/19/17 18:19
10	1LM.LM39910	L17060716-03 (250x)	1	250		06/19/17 18:38
11	1LM.LM39911	L17060716-04	1	1		06/19/17 18:57
12	1LM.LM39912	L17060716-05 (5x) (NR)	1	5		06/19/17 19:16
13	1LM.LM39913	L17060716-06 (1,000x)	1	1000		06/19/17 19:35
14	1LM.LM39914	WG618457-03 CCV (1.0ug/L)	1	1	STD80232	06/19/17 19:54
15	1LM.LM39915	WG618450-06 MRL (0.2ug/L)	1	1	STD80232	06/19/17 20:13
16	1LM.LM39916	WG618457-04 CCB	1	1		06/19/17 20:31
17	1LM.LM39917	L17060716-07 (1,000x)	1	1000		06/19/17 20:50
18	1LM.LM39918	L17060716-08	1	1		06/19/17 21:09
19	1LM.LM39919	L17060716-09	1	1		06/19/17 21:28
20	1LM.LM39920	L17060716-10 (10,000x)	1	10000		06/19/17 21:47
21	1LM.LM39921	L17060716-11	1	1		06/19/17 22:06
22	1LM.LM39922	L17060716-12 (100x) (NR)	1	100		06/19/17 22:25
23	1LM.LM39923	L17060716-14	1	1		06/19/17 22:44
24	1LM.LM39924	L17060856-01	1	1		06/19/17 23:03
25	1LM.LM39925	WG618457-05 CCV (1.0ug/L)	1	1	STD80232	06/19/17 23:22
26	1LM.LM39926	WG618450-07 MRL (0.2ug/L)	1	1	STD80232	06/19/17 23:41
27	1LM.LM39927	WG618457-06 CCB	1	1		06/20/17 00:00
28	1LM.LM39928	WG618457-07 CCV (1.0ug/L)	1	1	STD80232	06/20/17 11:25
29	1LM.LM39929	WG618450-08 MRL (0.2ug/L)	1	1	STD80232	06/20/17 11:43
30	1LM.LM39930	WG618457-08 CCB	1	1		06/20/17 12:02
31	1LM.LM39931	L17060716-05 RR (50x)	1	50		06/20/17 12:21
32	1LM.LM39932	L17060716-12 RR (1,000x)	1	1000		06/20/17 12:40
33	1LM.LM39933	WG618457-09 CCV (1.0ug/L)	1	1	STD80232	06/20/17 12:59

Page: 1

Approved: 20-JUN-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 061917_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG618450 (waters)
 Internal STD: COA19471 Surrogate STD: NA STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM39934	WG618450-09 MRL (0.2ug/L)	1	1	STD80232	06/20/17 13:18
35	1LM.LM39935	WG618457-10 CCB	1	1		06/20/17 13:37

Comments

Seq.	Rerun	Dil.	Reason	Analytes
12	X	50	Over Calibration Range	
L17060716-05 (5x) (NR) : This sample was reanalyzed at a 50x dilution on the end of this run.				
22	X	1000	Over Calibration Range	
L17060716-12 (100x) (NR) : This sample was reanalyzed at a 1,000x dilution on the end of this run.				

Page: 2

Approved: 20-JUN-17




Microbac Laboratories Inc.

Data Checklist

Date: 24-APR-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: WG611288
 Runlog ID: 81726
 Analytical Workgroups: L17040713, L17040841

ANALYTICAL	
System Performance Check	NA
DFTPP (GCMS)	NA
Endrin/DDT breakdown (8081/GCMS)	NA
Pentachlorophenol/benzidine tailing (GCMS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	NA
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (GCMS)	X
Continuing calibration blank (CCB) (IC/LCMS)	X
Limit of quantitation verification (LOQV) (LCMS)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	X
Library searches (GCMS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	JWR
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
25-APR-2017



Secondary Reviewer:
25-APR-2017




Microbac Laboratories Inc.

Data Checklist

Date: 19-JUN-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 82871
 Analytical Workgroups: L17060716, L17060856

ANALYTICAL	
System Performance Check	NA
DFTPP (GCMS)	NA
Endrin/DDT breakdown (8081/GCMS)	NA
Pentachlorophenol/benzidine tailing (GCMS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (GCMS)	X
Continuing calibration blank (CCB) (IC/LCMS)	X
Limit of quantitation verification (LOQV) (LCMS)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	X
Library searches (GCMS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	JWR
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
20-JUN-2017

John Richards

Secondary Reviewer:
20-JUN-2017

Eri C. Zimm

CHECKLIST1 - Modified 03/05/2008

Generated: JUN-20-2017 16:47:55



Analytical Method:6850
Login Number:L17060856

AAB#:WG618450

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6449	01	06/14/17					06/19/2017	5	28		06/19/17	.3	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060856 Work Group: WG618450
 Blank File ID: 1LM.LM39905 Blank Sample ID: WG618450-02
 Prep Date: 06/19/17 15:00 Instrument ID: LCMS1
 Analyzed Date: 06/19/17 17:03 Method: 6850
 Analyst: JWR

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG618450-05	1LM.LM39903	06/19/17 16:25	01
MCT	WG618450-01	1LM.LM39904	06/19/17 16:44	01
LCS	WG618450-03	1LM.LM39906	06/19/17 17:22	01
LCS2	WG618450-04	1LM.LM39907	06/19/17 17:41	01
QCMRL	WG618450-06	1LM.LM39915	06/19/17 20:13	01
LH18/24-SP650-6449	L17060856-01	1LM.LM39924	06/19/17 23:03	01
QCMRL	WG618450-07	1LM.LM39926	06/19/17 23:41	01
QCMRL	WG618450-08	1LM.LM39929	06/20/17 11:43	01
QCMRL	WG618450-09	1LM.LM39934	06/20/17 13:18	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5346058
 Report generated 06/21/2017 09:01



Login Number: L17060856 Prep Date: 06/19/17 15:00 Sample ID: WG618450-02
Instrument ID: LCMS1 Run Date: 06/19/17 17:03 Prep Method: 6850
File ID: 1LM.LM39905 Analyst: JWR Method: 6850
Workgroup (AAB#): WG618450 Matrix: Water Units: ug/L
Contract #: Cal ID: LCMS1-24-APR-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Perchlorate	0.100	0.400	0.100	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5346059
21-JUN-2017 09:01



Login Number: L17060856 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG618450 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG618450-03 LCS File ID: 1LM.LM39906 Run Date: 06/19/2017 17:22
 Sample ID: WG618450-04 LCS2 File ID: 1LM.LM39907 Run Date: 06/19/2017 17:41

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.201	101	0.200	0.204	102	1.48	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5346060
 Report generated: 06/21/2017 09:01



Login Number: L17060856
Analytical Method: 6850
ICAL Workgroup: WG611288

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.286	4.98	1.00000	

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 5346362
Report generated 06/21/2017 09:01



Login Number: L17060856
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 24-APR-17 15:40
 Column ID: F

Analyte	WG611288-02			WG611288-03			WG611288-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	21000.0000	1.332	0.200	38200.0000	1.222	0.500	104000.000	1.335

INT_CAL - Modified 03/06/2008
 PDF File ID: 5346362
 Report generated 06/21/2017 09:01



Login Number: L17060856
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 24-APR-17 15:40
 Column ID: F

Analyte	WG611288-05			WG611288-06			WG611288-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	206000.000	1.288	2.00	412000.000	1.312	5.00	955000.000	1.270

INT_CAL - Modified 03/06/2008
 PDF File ID: 5346362
 Report generated 06/21/2017 09:01



Login Number: L17060856
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-08		
	CONC	RESP	RF
Perchlorate	10.0	1860000.00	1.244

INT_CAL - Modified 03/06/2008
PDF File ID: 5346362
Report generated 06/21/2017 09:01



Login Number: L17060856 Run Date: 04/24/2017 Sample ID: WG611288-09
 Instrument ID: LCMS1 Run Time: 15:59 Method: 6850
 File ID: 1LM.LM39502 Analyst: JWR QC Key: DOD4
 ICal Workgroup: WG611288 Cal ID: LCMS1 - 24-APR-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	0.977	ug/L	1.24	2.30	15	

* Exceeds %D Limit



Login Number: L17060856 Run Date: 06/19/2017 Sample ID: WG618457-01
 Instrument ID: LCMS1 Run Time: 15:47 Method: 6850
 File ID: LLM.LM39901 Analyst: JWR Units: ug/L
 Workgroup (AAB#): WG618450 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060856 Run Date: 06/19/2017 Sample ID: WG618457-04
Instrument ID: LCMS1 Run Time: 20:31 Method: 6850
File ID: LLM.LM39916 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG618450 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060856 Run Date: 06/20/2017 Sample ID: WG618457-06
Instrument ID: LCMS1 Run Time: 00:00 Method: 6850
File ID: 1LM.LM39927 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG618450 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060856 Run Date: 06/20/2017 Sample ID: WG618457-08
Instrument ID: LCMS1 Run Time: 12:02 Method: 6850
File ID: LLM.LM39930 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG618450 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 5346063
Report generated 06/21/2017 09:02



Login Number: L17060856 Run Date: 06/20/2017 Sample ID: WG618457-10
Instrument ID: LCMS1 Run Time: 13:37 Method: 6850
File ID: LLM.LM39935 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG618450 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060856 Run Date: 06/19/2017 Sample ID: WG618457-02
 Instrument ID: LCMS1 Run Time: 16:06 Method: 6850
 File ID: 1LM.LM39902 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG618450 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.06	ug/L	1.35	6.00	15	

* Exceeds %D Criteria



Login Number: L17060856 Run Date: 06/19/2017 Sample ID: WG618457-03
Instrument ID: LCMS1 Run Time: 19:54 Method: 6850
File ID: 1LM.LM39914 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG618450 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.05	ug/L	1.34	5.00	15	

* Exceeds %D Criteria



Login Number: L17060856 Run Date: 06/19/2017 Sample ID: WG618457-05
Instrument ID: LCMS1 Run Time: 23:22 Method: 6850
File ID: 1LM.LM39925 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG618450 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.02	ug/L	1.30	2.00	15	

* Exceeds %D Criteria



Login Number: L17060856 Run Date: 06/20/2017 Sample ID: WG618457-07
Instrument ID: LCMS1 Run Time: 11:25 Method: 6850
File ID: 1LM.LM39928 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG618450 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.06	ug/L	1.35	6.00	15	

* Exceeds %D Criteria



Login Number: L17060856 Run Date: 06/20/2017 Sample ID: WG618457-09
Instrument ID: LCMS1 Run Time: 12:59 Method: 6850
File ID: 1LM.LM39933 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG618450 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.07	ug/L	1.36	7.00	15	

* Exceeds %D Criteria



Login Number: L17060856 Run Date: 06/19/2017 Sample ID: WG618450-05
 Instrument ID: LCMS1 Run Time: 16:25 Prep Method: 6850
 File ID: 1LM.LM39903 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG618450 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.222	111	70 - 130	



Login Number: L17060856 Run Date: 06/19/2017 Sample ID: WG618450-06
 Instrument ID: LCMS1 Run Time: 20:13 Prep Method: 6850
 File ID: 1LM.LM39915 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG618450 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.213	107	70 - 130	



Login Number: L17060856 Run Date: 06/19/2017 Sample ID: WG618450-07
Instrument ID: LCMS1 Run Time: 23:41 Prep Method: 6850
File ID: 1LM.LM39926 Analyst: JWR Method: 6850
Workgroup (AAB#): WG618450 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.211	106	70 - 130	



Login Number: L17060856 Run Date: 06/20/2017 Sample ID: WG618450-08
 Instrument ID: LCMS1 Run Time: 11:43 Prep Method: 6850
 File ID: 1LM.LM39929 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG618450 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.222	111	70 - 130	



Login Number: L17060856 Run Date: 06/20/2017 Sample ID: WG618450-09
 Instrument ID: LCMS1 Run Time: 13:18 Prep Method: 6850
 File ID: 1LM.LM39934 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG618450 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.224	112	70 - 130	



Login Number: L17060856
Instrument ID: LCMS1
Workgroup (AAB#): WG618450

ICAL CCV Number: WG611288-05
CAL ID: LCMS1-24-APR-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG611288	NA	NA	777000
Upper Limit	NA	NA	1165500
Lower Limit	NA	NA	388500
<u>L17060856-01</u>	1.00	01	568000
WG618450-02	1.00	01	655000
WG618450-03	1.00	01	688000
WG618450-04	1.00	01	694000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: 6850	Samplenum: L17060856-01
Instrument: LCMS1	Prep Date: 06/19/2017 15:00	File ID: 1LM.LM39924
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 23:03	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	131000	41100	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG611288-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39495
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 04/24/2017 13:46	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	21000	6820	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG611288-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39496
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 04/24/2017 14:05	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	38200	13500	2.83	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG611288-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39497
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 04/24/2017 14:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	104000	33400	3.11	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG611288-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39498
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 04/24/2017 14:43	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	206000	65300	3.15	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG611288-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39499
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 04/24/2017 15:02	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	412000	130000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG611288-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39500
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 04/24/2017 15:21	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	955000	298000	3.20	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG611288-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39501
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 04/24/2017 15:40	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1860000	603000	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG611288-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39502
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 04/24/2017 15:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	197000	65000	3.03	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: 6850	Samplenum: WG618450-01
Instrument: LCMS1	Prep Date: 06/19/2017 15:00	File ID: 1LM.LM39904
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 16:44	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	39900	11800	3.38	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856
Instrument: LCMS1
Analyst: JWR
Worknum: WG618450

Prep Method: 6850
Prep Date: 06/19/2017 15:00
Anal Method: 6850
Analysis Date: 06/19/2017 17:03

Samplenum: WG618450-02
File ID: 1LM.LM39905
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: 6850	Samplenum: WG618450-03
Instrument: LCMS1	Prep Date: 06/19/2017 15:00	File ID: 1LM.LM39906
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 17:22	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	36100	12100	2.98	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: 6850	Samplenum: WG618450-04
Instrument: LCMS1	Prep Date: 06/19/2017 15:00	File ID: 1LM.LM39907
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 17:41	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	37100	12300	3.02	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: 6850	Samplenum: WG618450-05
Instrument: LCMS1	Prep Date: 06/19/2017 15:00	File ID: 1LM.LM39903
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 16:25	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	35700	11900	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: 6850	Samplenum: WG618450-06
Instrument: LCMS1	Prep Date: 06/19/2017 15:00	File ID: 1LM.LM39915
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 20:13	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	43100	13600	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: 6850	Samplenum: WG618450-07
Instrument: LCMS1	Prep Date: 06/19/2017 15:00	File ID: 1LM.LM39926
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 23:41	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	42400	13600	3.12	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: 6850	Samplenum: WG618450-08
Instrument: LCMS1	Prep Date: 06/19/2017 15:00	File ID: 1LM.LM39929
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/20/2017 11:43	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	37000	12400	2.98	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: 6850	Samplenum: WG618450-09
Instrument: LCMS1	Prep Date: 06/19/2017 15:00	File ID: 1LM.LM39934
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/20/2017 13:18	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	41700	13500	3.09	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG618457-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39901
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 15:47	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1640	1070	1.53	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG618457-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39902
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 16:06	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	159000	50700	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG618457-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39914
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 19:54	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	204000	63000	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG618457-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39916
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 20:31	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2540	1330	1.91	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG618457-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39925
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/19/2017 23:22	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	191000	60100	3.18	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG618457-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39927
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/20/2017 00:00	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2600	1290	2.02	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG618457-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39928
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/20/2017 11:25	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	162000	52100	3.11	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856
Instrument: LCMS1
Analyst: JWR
Worknum: WG618450

Prep Method: _____
Prep Date: _____
Anal Method: 6850
Analysis Date: 06/20/2017 12:02

Samplenum: WG618457-08
File ID: 1LM.LM39930
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2820	982	2.87	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG618457-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39933
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/20/2017 12:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	190000	59700	3.18	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17060856	Prep Method: _____	Samplenum: WG618457-10
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39935
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG618450	Analysis Date: 06/20/2017 13:37	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2810	1650	1.70	2.3	3.8	*

2.3 General Chemistry Data

2.3.1 Method 9056

2.3.1.1 Summary Data

Lab Report #: L17060856

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060856-01	PrePrep Method: N/A	Instrument: IC1
Client ID: LH18/24-SP650-6449	Prep Method: 9056	Prep Date: 06/22/2017 17:32
Matrix: Water	Analytical Method: 9056	Cal Date: 02/14/2017 15:22
Workgroup #: WG619023	Analyst: CAS	Run Date: 06/22/2017 23:55
Collect Date: 06/14/2017 15:00	Dilution: 5	File ID: I1_062217-24
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Sulfate	14808-79-8	22.5		10.0	5.00	2.50
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17060856

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17060856-01	PrePrep Method: N/A	Instrument: IC1
Client ID: LH18/24-SP650-6449	Prep Method: 9056	Prep Date: 06/22/2017 17:32
Matrix: Water	Analytical Method: 9056	Cal Date: 02/14/2017 15:22
Workgroup #: WG619023	Analyst: CAS	Run Date: 06/23/2017 00:13
Collect Date: 06/14/2017 15:00	Dilution: 50	File ID: I1_062217-25
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chloride	16887-00-6	500		20.0	10.0	5.00
U	Analyte was not detected. The concentration is below the reported LOD.					

2.3.1.2 QC Summary Data

The concentrations (ppm) of the calibration standards and the resulting area counts are used to determine the equation of a linear or quadratic plot.

The slope and y-intercept of that line are used to calculate the quantity of the analyzed unknown samples.

Amount(ppm) = [(slope)(area count of unknown) + y-intercept](dilution)

(The slope is the amt/area also identified as the CF or calibration factor)

TCLP Non-Volatile

Analyst(s): BMB
 Date: 6-19-17
 Filter Lot #: 9480030
 Microbac SOP: TCLP01 Rev #: 12

Balance ID: BAL020
 pH Probe ID: T5
 Temp probe ID: 1025 1023

Analyst / Date		Analyst / Date	
BMB	6-19-17	BMB	6-20-17
Time On	Temp On °C	Time Off	Temp Off °C
4:52	23.3	7:25	22.5

Agitator Speed 30 ± 2 rpm

Jug #	Sample #	Tests	Method	Fluid #	Matrix *	% Solid	Pretest pH		Int. Wt. (g)	Fluid Vol. (mL)	Final extract pH
							Initial	Final			
16	06-0917-02	Pest, Herb	1311	F1-247	S	100	7.08	1.90	100.24	2004	5.02
D	06-0820-03	Me	↓	↓	↓	↓	7.40	1.84	100.33	2006	5.03
17	06-0932-01	SV	↓	↓	↓	↓	7.53	1.81	100.01	2012	5.07
D	06-0888-01	300	1312	F1-85	S	100	NA	NA	100.30	2004	9.75
D	06-0888-02	↓	↓	↓	↓	↓	↓	↓	100.77	2015	9.51
D	06-0888-03	↓	↓	↓	↓	↓	↓	↓	100.54	2010	9.58
D	06-0888-04	↓	↓	↓	↓	↓	↓	↓	100.59	2011	9.64
D	06-0888-05	↓	↓	↓	↓	↓	↓	↓	100.81	2016	9.65
D	06-0888-06	↓	↓	↓	↓	↓	↓	↓	100.13	2002	9.56
D	06-0888-07	↓	↓	↓	↓	↓	↓	↓	100.14	2003	9.73
D	06-0888-08	↓	↓	↓	↓	↓	↓	↓	100.05	2001	9.68
20	06-0873-01	Me, SV	1311	F1-247	S	100	7.32	1.84	100.50	2010	5.35
25	06-0873-02	Me, SV	↓	↓	↓	↓	6.96	1.83	100.64	2012	5.17
D	06-0916-01	Me	1311	↓	S	100	8.05	2.41	100.69	2013	6.07
NA	06-0978-02	Me	↓	F1C	W	<0.5	NA	NA	100	100	3.53
NA	06-0978-08	Me, SV	↓	↓	W	<0.5	↓	↓	↓	↓	9.46
NA	FBIK-1	Me, SV, Pest, Herb	1311	F1-247	NA	NA	NA	NA	100	100	4.92
NA	FBIK-1	300	1312	F1-85	↓	↓	↓	↓	↓	↓	4.15
BMB 6-20-17											

BMB 6-20-17
9.68

*Matrix Code: (S = solid, sand, soil or sludge) (P = paint) (O = organic) (W = water or aqueous waste)
 D = Disposable plastic jug
 TCLP Pretest weight will be 5.0 g (± 0.1) unless otherwise noted.
 Temperature shall be maintained at 23° ± 2 for 18 ± 2 hours unless otherwise noted.

Comments: Notes on Accts for 06-0978-02 and -08 say Caution-Corrosive!

Peer Review By: [Signature]

Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC1 Dataset: 021417 ICAL IC1.SEQ
 Analyst1: JWR Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 160804254
 Eluent ID#: RGT39248

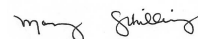
Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM
 Analytical WG602639 (soils) Analytical WG602643 (waters)
 Internal STD: NA Surrogate STD: NA Calibration STD STD77046 (02/14/2017)
 CCV STD: STD77046 LCS STD: STD79166 MS/MSD STD: NA

Comments: ICAL WG602634 : Alternate Source STD79166
 Guard Column : Ionpac AG14A (4x50mm)
 Dionex S/N 013738
 Analytical Column : Ionpac AS14A (4x250mm)
 Dionex S/N 010890
 Cond Suppressor : AERS 500 (4mm)
 Dionex S/N 170116007
 System backpressure = 1588psi

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I1_021417-01	ELUENT	1	1		02/14/17 13:14
2	I1_021417-02	DI WATER	1	1		02/14/17 13:32
3	I1_021417-03	WG602634-01 STD	1	1	STD77046	02/14/17 13:50
4	I1_021417-04	WG602634-02 STD	1	1	STD77046	02/14/17 14:09
5	I1_021417-05	WG602634-03 STD	1	1	STD77046	02/14/17 14:27
6	I1_021417-06	WG602634-04 STD-CCV	1	1	STD77046	02/14/17 14:45
7	I1_021417-07	WG602634-05 STD	1	1	STD77046	02/14/17 15:04
8	I1_021417-08	WG602634-06 STD	1	1	STD77046	02/14/17 15:22
9	I1_021417-09	WG602634-07 SSCV	1	1	STD79166	02/14/17 15:40
10	I1_021417-10	LCRV @Level-6	1	1	STD79166	02/14/17 15:58
11	I1_021417-11	LCRV @Level-4	1	1	STD79166	02/14/17 16:17
12	I1_021417-12	LCRV @Level-2	1	1	STD79166	02/14/17 16:35
13	I1_021417-13	LCRV @Level-0	1	1		02/14/17 16:53
14	I1_021417-14	WG602639-01 ANION BLANK-SOIL	7	1		02/14/17 17:11
15	I1_021417-15	WG602639-02 ANION LCS-SOIL	7	1	STD79166	02/14/17 17:29
16	I1_021417-16	WG602639-03 ANION LCS2-SOIL	7	1	STD79166	02/14/17 17:48
17	I1_021417-17	L17010002-01 LOD (F,CL,Br,SO4)	7	1	STD79166	02/14/17 18:06
18	I1_021417-18	L17010002-01 LOD (NO2,NO3)	7	1	STD79166	02/14/17 18:24
19	I1_021417-19	L17010004-01 LOQ (F,CL,Br,SO4)	7	1	STD79166	02/14/17 18:42
20	I1_021417-20	L17010004-01 LOQ (NO2,NO3)	7	1	STD79166	02/14/17 19:00
21	I1_021417-21	WG602647-01 ANION CCV	1	1	STD77046	02/14/17 19:19
22	I1_021417-22	WG602647-02 ANION CCB	1	1		02/14/17 19:37
23	I1_021417-23	WG602643-01 ANION BLANK	1	1		02/14/17 19:55
24	I1_021417-24	WG602643-02 ANION LCS	1	1	STD79166	02/14/17 20:13
25	I1_021417-25	WG602643-03 ANION LCS2	1	1	STD79166	02/14/17 20:31
26	I1_021417-26	L17010001-01 LOD (F,CL,Br,SO4)	1	1	STD79166	02/14/17 20:50
27	I1_021417-27	L17010001-01 LOD (NO2,NO3)	1	1	STD79166	02/14/17 21:08
28	I1_021417-28	L17010003-01 LOQ (F,CL,Br,SO4)	1	1	STD79166	02/14/17 21:26
29	I1_021417-29	L17010003-01 LOQ (NO2,NO3)	1	1	STD79166	02/14/17 21:44
30	I1_021417-30	WG602647-03 ANION CCV	1	1	STD77046	02/14/17 22:02

Page: 1

Approved: 16-FEB-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC1 _____ Dataset: 021417 ICAL IC1.SEQ _____
 Analyst1: JWR _____ Analyst2: NA _____
 Method: 300/9056 _____ SOP: IC01 _____ Rev: 19 _____

Maintenance Log ID: _____ Syringe Filter Lot#: 160804254 _____
 Eluent ID#: RGT39248 _____

Workgroups: Column 1 ID: AG14A-4MM _____ Column 2 ID: AS14A-4MM _____
 Analytical WG602639 (soils) Analytical WG602643 (waters) _____
 Internal STD: NA _____ Surrogate STD: NA _____ STD77046 (02/14/2017) _____
 CCV STD: STD77046 _____ LCS STD: STD79166 _____ NA _____

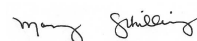
Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
31	I1_021417-31	WG602647-04 ANION CCB	1	1		02/14/17 22:21
32	I1_021417-32	END	1	1		02/14/17 22:39

Comments

Seq.	Rerun	Dil.	Reason	Analytes

Page: 2

Approved: 16-FEB-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC1 _____ Dataset: 062217 IC1.SEQ _____
 Analyst1: CAS _____ Analyst2: NA _____
 Method: 300/9056 _____ SOP: IC01 _____ Rev: 19 _____

Maintenance Log ID: _____ Syringe Filter Lot#: 161205254 _____
 Eluent ID#: RGT40564 _____

Workgroups: Column 1 ID: AG14A 4-MM _____ Column 2 ID: AS14A 4-MM _____
 Analytical WG619023 (Waters) _____
 Internal STD: NA _____ Surrogate STD: NA _____ Calibration STD STD77046 (14-FEB-2017) _____
 CCV STD: STD81395 _____ LCS STD: STD81396 _____ MS/MSD STD: STD81396 _____

Comments: System Backpressure: 1691 psi

Samples L17060856-01 and L17061011-01 were analyzed at dilutions only due to their pre-run screen results for chloride, which were greater than 200 ppm.

Samples L17060922, (-03,05,07) L17060984-01, and L17061033 (-01,03) were analyzed at dilutions only due to their pre-run screen results for sulfate, which were greater than the calibration maximum.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I1_062217-01	ELUENT	1	1		06/22/17 16:56
2	I1_062217-02	DI WATER	1	1		06/22/17 17:14
3	I1_062217-03	WG619024-01 ANION CCV	1	1	STD81395	06/22/17 17:32
4	I1_062217-04	WG619024-02 ANION CCB	1	1		06/22/17 17:51
5	I1_062217-05	WG619023-01 ANION BLANK	1	1		06/22/17 18:09
6	I1_062217-06	WG619023-02 ANION LCS	1	1	STD81396	06/22/17 18:27
7	I1_062217-07	L17060806-01 (SO4)	2	1		06/22/17 18:45
8	I1_062217-08	L17060808-01 (SO4) REF	1	1		06/22/17 19:03
9	I1_062217-09	WG619023-04 DUP 0808-01	2	1		06/22/17 19:22
10	I1_062217-10	WG619023-05 MS 0808-01	2	1	STD81396	06/22/17 19:40
11	I1_062217-11	WG619023-06 MSD 0808-01	2	1	STD81396	06/22/17 19:58
12	I1_062217-12	L17060808-02 (SO4)	2	1		06/22/17 20:16
13	I1_062217-13	L17060888-01 (CL)	18	1		06/22/17 20:34
14	I1_062217-14	L17060888-02 (CL)	18	1		06/22/17 20:53
15	I1_062217-15	WG619024-03 ANION CCV	1	1	STD81395	06/22/17 21:11
16	I1_062217-16	WG619024-04 ANION CCB	1	1		06/22/17 21:29
17	I1_062217-17	L17060888-03 (CL)	18	1		06/22/17 21:47
18	I1_062217-18	L17060888-04 (CL)	18	1		06/22/17 22:06
19	I1_062217-19	L17060888-05 (CL)	18	1		06/22/17 22:24
20	I1_062217-20	L17060888-06 (CL)	18	1		06/22/17 22:42
21	I1_062217-21	L17060888-07 (CL)	18	1		06/22/17 23:00
22	I1_062217-22	L17060888-08 (CL)	18	1		06/22/17 23:18
23	I1_062217-23	WG618357-01 FLUID BLANK	18	1		06/22/17 23:37
24	I1_062217-24	L17060856-01 (CL,SO4) 5x	1	5		06/22/17 23:55
25	I1_062217-25	L17060856-01 RR CL 50x	1	50		06/23/17 00:13
26	I1_062217-26	WG619024-05 ANION CCV	1	1	STD81395	06/23/17 00:31
27	I1_062217-27	WG619024-06 ANION CCB	1	1		06/23/17 00:49
28	I1_062217-28	L17060922-01 (SO4) REF	1	1		06/23/17 01:08
29	I1_062217-29	WG619023-08 DUP 0922-01	2	1		06/23/17 01:26
30	I1_062217-30	L17060922-03 (SO4) 20x	2	20		06/23/17 01:44

Page: 1

Approved: 23-JUN-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC1 _____ Dataset: 062217 IC1.SEQ _____
 Analyst1: CAS _____ Analyst2: NA _____
 Method: 300/9056 _____ SOP: IC01 _____ Rev: 19 _____

Maintenance Log ID: _____ Syringe Filter Lot#: 161205254 _____
 Eluent ID#: RGT40564 _____

Workgroups: Column 1 ID: AG14A 4-MM _____ Column 2 ID: AS14A 4-MM _____
 Analytical WG619023 (Waters) _____
 Internal STD: NA _____ Surrogate STD: NA _____ STD77046 (14-FEB-2017) _____
 CCV STD: STD81395 _____ LCS STD: STD81396 _____ STD81396 _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
31	I1_062217-31	L17060922-05 (SO4) 50x (NR)	2	50		06/23/17 02:02
32	I1_062217-32	L17060922-07 (SO4) 20x	2	20		06/23/17 02:20
33	I1_062217-33	L17060984-01 (SO4) 100x	2	100		06/23/17 02:39
34	I1_062217-34	L17061011-01 (CL,SO4) 20x	1	20		06/23/17 02:57
35	I1_062217-35	L17061011-01 RR CL 200x	1	200		06/23/17 03:15
36	I1_062217-36	L17061033-01 (SO4) 100x	2	100		06/23/17 03:33
37	I1_062217-37	L17061033-03 (SO4) 50x	2	50		06/23/17 03:51
38	I1_062217-38	WG619024-07 ANION CCV	1	1	STD81395	06/23/17 04:10
39	I1_062217-39	WG619024-08 ANION CCB	1	1		06/23/17 04:28
40	I1_062217-40	WG619024-09 ANION CCV	1	1	STD81395	06/23/17 09:05
41	I1_062217-41	WG619024-10 ANION CCB	1	1		06/23/17 09:23
42	I1_062217-42	L17060922-05 (SO4) 100x	2	100		06/23/17 09:41
43	I1_062217-43	WG619024-11 ANION CCV	1	1	STD81395	06/23/17 09:59
44	I1_062217-44	WG619024-12 ANION CCB	1	1		06/23/17 10:18
45	I1_062217-45	END	1	1		06/23/17 10:36

Comments

Seq.	Rerun	Dil.	Reason	Analytes

Page: 2

Approved: 23-JUN-17




Microbac Laboratories Inc.

Data Checklist

Date: 14-FEB-2017
 Analyst: JWR
 Analyst: NA
 Method: 300/9056
 Instrument: IC1
 Curve Workgroup: WG602634
 Runlog ID: 80458
 Analytical Workgroups: L17010001(LOD),0003(LOQ)WATER L17010002(LOD),0004(LOQ)SOIL

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	NA
Endrin/DDT breakdown (8081/MS)	NA
Pentachlorophenol/benzidine tailing (MS)	NA
Eluent check (IC)/system pressure (HPLC)	1588PSI
Window standard (FID)	NA
Initial Calibration	X
Average RF	NA
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	INTERNAL QC-ONLY
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	NA
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	X
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	JWR
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	MES

Primary Reviewer:
15-FEB-2017

John Richards

Secondary Reviewer:
16-FEB-2017

Mary Greene



Microbac Laboratories Inc.

Data Checklist

Date: 22-JUN-2017
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC1
 Curve Workgroup: NA
 Runlog ID: 82951
 Analytical Workgroups: L17060806,0808,0856,0888,0922,0984,1011,1033

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	NA
Endrin/DDT breakdown (8081/MS)	NA
Pentachlorophenol/benzidine tailing (MS)	NA
Eluent check (IC)/system pressure (HPLC)	1691 PSI
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	NA
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	X
Check for completeness	X
Primary Reviewer	CAS
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
23-JUN-2017



Secondary Reviewer:
23-JUN-2017



CHECKLIST1 - Modified 03/05/2008

Generated: JUN-23-2017 16:11:26



Analytical Method:9056
Login Number:L17060856

AAB#:WG619023

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6449	01	06/14/17					06/22/2017	8.1	2	*	06/22/17	8.4	2	*
LH18/24-SP650-6449	01	06/14/17					06/22/2017	8.1	2	*	06/23/17	8.4	2	*

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17060856 Work Group: WG619023
 Blank File ID: I1_062217-05 Blank Sample ID: WG619023-01
 Prep Date: 06/22/17 17:32 Instrument ID: IC1
 Analyzed Date: 06/22/17 18:09 Method: 9056
 Analyst: CAS

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG619023-02	I1_062217-06	06/22/17 18:27	01
DUP	WG619023-04	I1_062217-09	06/22/17 19:22	01
LH18/24-SP650-6449	L17060856-01	I1_062217-24	06/22/17 23:55	DL01
LH18/24-SP650-6449	L17060856-01	I1_062217-25	06/23/17 00:13	DL02
DUP	WG619023-08	I1_062217-29	06/23/17 01:26	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5351450
 Report generated 06/26/2017 11:25



Login Number: L17060856 Prep Date: 06/22/17 17:32 Sample ID: WG619023-01
 Instrument ID: IC1 Run Date: 06/22/17 18:09 Prep Method: 9056
 File ID: I1 062217-05 Analyst: CAS Method: 9056
 Workgroup (AAB#): WG619023 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: IC1-14-FEB-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Chloride	0.100	0.400	0.100	1	U
Sulfate	0.500	2.00	0.500	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5351451
 26-JUN-2017 11:25



Login Number: L17060856 Run Date: 06/22/2017 Sample ID: WG619023-02
Instrument ID: IC1 Run Time: 18:27 Prep Method: 9056
File ID: I1 062217-06 Analyst: CAS Method: 9056
Workgroup (AAB#): WG619023 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD81396 Cal ID: IC1-14-FEB-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Chloride	8.00	8.22	103	90 - 110	
Sulfate	40.0	41.2	103	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5351452
Report generated: 06/26/2017 11:25



Login Number: L17060856 Instrument ID: IC1
Analytical Method: 9056 Initial Calibration Date: 14-FEB-17 15:22
ICAL Workgroup: WG602634 Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Chloride	5.990	8.72		0.99800
Sulfate	7.877	10.2		0.99700

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 5352935
Report generated 06/26/2017 11:25



Login Number: L17060856
 Analytical Method: 9056

Instrument ID: IC1
 Initial Calibration Date: 14-FEB-17 15:22
 Column ID: F

Analyte	WG602634-01			WG602634-02			WG602634-03		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloride	0.200	0.031000000 0	6.452	1.00	0.154000000	6.494	4.00	0.648000000	6.173
Sulfate	1.00	0.116000000	8.621	5.00	0.579000000	8.636	20.0	2.44100000	8.193

INT_CAL - Modified 03/06/2008
 PDF File ID: 5352935
 Report generated 06/26/2017 11:25



Login Number: L17060856
 Analytical Method: 9056

Instrument ID: IC1
 Initial Calibration Date: 14-FEB-17 15:22
 Column ID: F

Analyte	WG602634-04			WG602634-05			WG602634-06		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloride	8.00	1.34700000	5.939	12.0	2.10700000	5.695	24.0	4.62700000	5.187
Sulfate	40.0	5.15700000	7.756	60.0	8.13200000	7.378	120	17.97500000	6.676

INT_CAL - Modified 03/06/2008
 PDF File ID: 5352935
 Report generated 06/26/2017 11:25



Login Number: L17060856 Run Date: 02/14/2017 Sample ID: WG602634-07
 Instrument ID: IC1 Run Time: 15:40 Method: 9056
 File ID: I1 021417-09 Analyst: JWR QC Key: DOD4
 ICal Workgroup: WG602634 Cal ID: IC1 - 14-FEB-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Chloride	8.00	8.12	mg/L	5.84	1.50	10	
Sulfate	40.0	40.6	mg/L	7.64	1.40	10	

* Exceeds %D Limit



Login Number: L17060856 Run Date: 06/22/2017 Sample ID: WG619024-02
 Instrument ID: IC1 Run Time: 17:51 Method: 9056
 File ID: I1 062217-04 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG619023 Cal ID: IC1 - 14-FEB-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.400	0.100	U
Sulfate	0.500	2.00	0.500	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060856 Run Date: 06/22/2017 Sample ID: WG619024-04
 Instrument ID: IC1 Run Time: 21:29 Method: 9056
 File ID: I1 062217-16 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG619023 Cal ID: IC1 - 14-FEB-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.400	0.100	U
Sulfate	0.500	2.00	0.500	U

U = Result is less than MDL.
 F = Result is between MDL and RL.
 * = Result is above RL.



Login Number: L17060856 Run Date: 06/23/2017 Sample ID: WG619024-06
Instrument ID: IC1 Run Time: 00:49 Method: 9056
File ID: I1_062217-27 Analyst: CAS Units: mg/L
Workgroup (AAB#): WG619023 Cal ID: IC1 - 14-FEB-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.400	0.100	U
Sulfate	0.500	2.00	0.500	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17060856 Run Date: 06/22/2017 Sample ID: WG619024-01
 Instrument ID: IC1 Run Time: 17:32 Method: 9056
 File ID: I1 062217-03 Analyst: CAS QC Key: DOD4
 Workgroup (AAB#): WG619023 Cal ID: IC1 - 14-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.24	mg/L	5.75	2.94	10	
Sulfate	40.0	41.1	mg/L	7.52	2.83	10	

* Exceeds %D Criteria



Login Number: L17060856 Run Date: 06/22/2017 Sample ID: WG619024-03
 Instrument ID: IC1 Run Time: 21:11 Method: 9056
 File ID: I1 062217-15 Analyst: CAS QC Key: DOD4
 Workgroup (AAB#): WG619023 Cal ID: IC1 - 14-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.33	mg/L	5.68	4.09	10	
Sulfate	40.0	41.6	mg/L	7.43	4.06	10	

* Exceeds %D Criteria



Login Number: L17060856 Run Date: 06/23/2017 Sample ID: WG619024-05
 Instrument ID: IC1 Run Time: 00:31 Method: 9056
 File ID: I1 062217-26 Analyst: CAS QC Key: DOD4
 Workgroup (AAB#): WG619023 Cal ID: IC1 - 14-FEB-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.34	mg/L	5.67	4.28	10	
Sulfate	40.0	41.7	mg/L	7.41	4.22	10	

* Exceeds %D Criteria



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
June 26, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
ALS - ADRIANE L. STEED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BLG - BRENDA L. GREENWALT	BNB - Brandi N. Bentley
BRG - BRENDA R. GREGORY	CAS - Craig A. Smith
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL	CV - Carl Volkman
DAK - DEAN A. KETELSEN	DCM - DAVID C. MERCKLE
DEV - DAVID E. VANDENBERG	DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER	DLP - DOROTHY L. PAYNE
DSM - DAVID S. MOSSOR	DTG - DOMINIC T. GEHRET
ECL - ERIC C. LAWSON	EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER	FJB - FRANCES J. BOLDEN
HRF - HEATHER R. FAIRCHILD	JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH	JKP - JACQUELINE K. PARSONS
JLD - JESSICA L. DELONG	JST - JOSHUA S. TAYLOR
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KDD - Katelyn D. Daley
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRP - KATHY R. PARSONS	LJH - Lacey J. Hendershot
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
OJE - OMOYEMWEN J. ENGLISH	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCA - SUEELLEN C. ADAMS
SCB - SARAH C. BOGOLIN	SCJ - SUE ELLEN C. JOHNSON
SDC - SHALYN D. CONLEY	TB - TODD BOYLE
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	ZTB - ZACH T. BARNES

List of Valid Qualifiers

June 26, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample receipt exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentatively identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound



List of Valid Qualifiers

June 26, 2017

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below





Chain of Custody Record

COC Number:

Laboratory: Microbac POC: Stephanie Mossburg	Project Manager: Mossburg ELEGANT SHARP
Address: 158 Starlite Drive Marietta, OH 45750	Phone/Fax Number: 210-296-2000 Sampler (print): Scott Beesinger
Phone: 1-800-373-4071	Fed Ex Airbill No:
Client: AECOM	Signature: <i>Steve Beesinger</i>
Address: 112 East Pecan Ste. 400 San Antonio, TX 78205	Program:

Site Name	Sample ID/Location ID	SBD	SED	Date	Time	Comp	Grab	Matrix	Number of Containers	ERPIMS REQUIRED FIELDS					
										Cooler ID	LOT CONTROL NUMBERS				
											ABLOT	EBLOT	TBLOT		
GWP Bi-weekly	LH1824-SP20-6449			6/14/17	1500	X	X	W	VDC						
	TRIP BLANK			6/14/17		X	X	W	PENICILLIN CHLORIDE SULFATE						

Comments: STANDARD TAI

Relinquished by: <i>Steve Beesinger</i>	Time: 1600	Time: 15:17	Relinquished by: (Signature)
Relinquished by: (Signature)	Date: 6/14/17	Date: 06/15/2017	Relinquished by: (Signature)
By: CARA STRICKLER	By: CARA STRICKLER	221000102178	Remarks:

*Homogenize all composite samples prior to analysis

Distribution: White to Laboratory, Canary to Project Manager, Pink QA/QC Manager

COOLER TEMP >6°C LOG

 Cooler ID 2178

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C

OASD 6/15/17

pH Exceptions

 pH Lot # HCL601354

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6

OASD 6/15/17

**PRESERVATIVE
EXCEPTIONS
✓ NONE
AS NOTED**

OASD 6/15/17

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17060856

Account: 2551

Project: 2551.096

Samples: 2

Due Date: 26-JUN-2017

Samplenum **Container ID** **Products**
L17060856-01 922086 826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	15-JUN-2017 15:53	CLS		
2	ANALYZ	V1	ORG4	16-JUN-2017 07:22	AWE	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	15-JUN-2017 15:53	CLS		
2	ANALYZ	V1	ORG4	16-JUN-2017 07:22	AWE	CLS	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	15-JUN-2017 15:53	CLS		
2	ANALYZ	V1	ORG4	16-JUN-2017 07:22	AWE	CLS	

Samplenum **Container ID** **Products**
L17060856-01 922087 9056

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER		15-JUN-2017 15:53	CLS		

Samplenum **Container ID** **Products**
L17060856-01 922088 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	15-JUN-2017 15:53	CLS		
2	ANALYZ	W1	SEM	19-JUN-2017 14:26	JWR	BRG	
3	STORE	SEM	A1	21-JUN-2017 11:41	CLS	JWR	

Samplenum **Container ID** **Products**
L17060856-02 922089 826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	15-JUN-2017 15:53	CLS		
2	ANALYZ	V1	ORG4	16-JUN-2017 07:22	AWE	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	15-JUN-2017 15:53	CLS		
2	ANALYZ	V1	ORG4	16-JUN-2017 07:22	AWE	CLS	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
 Total Halide by Bomb Combustion (TX)
 Particle Sizing - 200 Mesh (PS200)
 Specific Gravity/Density (SPGRAV)
 Total Residual Chlorine (CL-TRL)
 Total Volatile Solids (all forms) (TVS)
 Total Coliform Bacteria (all methods)
 Fecal Coliform Bacteria (all methods)
 Sulfite (SO₃)
 Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS

Nitrogen, Ammonia by Method 350.1
 Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
 Phenolics, Total by Method 420.1
 ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
 Acetic acid
 Butyric acid
 Lactic acid
 Propionic acid
 Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
 1-Methylnaphthalene
 1,4-Dioxane
 Atrazine
 Benzaldehyde
 Biphenyl
 Caprolactam
 Hexamethylphosphoramide (HMPA)
 Pentachlorobenzene
 Pentachloroethane

NELAP Accreditation by Laboratory SOP**NONPOTABLE WATER**OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALSOVD MSS01/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP**SOLID AND HAZARDOUS CHEMICALS**OVD MSV01/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)

Laboratory Report Number: L17061127

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on June 29 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Lab Report #: L17061127

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

There were no discrepancies.

Discrepancy	Resolution

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0017816	I	5.0		J4616881908	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	NA

**Lab Report #:** L17061127**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP650-6451	L17061127-01	06/21/2017 15:00	06/22/2017 09:38



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	6850
Prep Batch Number(s):	WG619337	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-27 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Eric Lawson		Chemist III	2017-06-27 17:25:57



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	6850
Prep Batch Number(s):	WG619337	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-27 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?					
Were surrogate percent recoveries in all samples within the laboratory QC limits?					
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	6850
Prep Batch Number(s):	WG619337	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-27 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	6850
Prep Batch Number(s):	WG619337	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-27 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	6850
Prep Batch Number(s):	WG619337	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-27 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	6850
Prep Batch Number(s):	WG619337	Reviewer Name:	Eric Lawson
LRC Date:	2017-06-27 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

There are no exceptions.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	NH3
Prep Batch Number(s):	WG619026	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-29 14:54:38



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	NH3
Prep Batch Number(s):	WG619026	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	NH3
Prep Batch Number(s):	WG619026	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	NH3
Prep Batch Number(s):	WG619026	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	NH3
Prep Batch Number(s):	WG619026	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	NH3
Prep Batch Number(s):	WG619026	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618904	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-29 14:54:07



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618904	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618904	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618904	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618904	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	PO4
Prep Batch Number(s):	WG618904	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a. if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-06-29 14:55:07



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061127
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619321	Reviewer Name:	Deanna Hesson
LRC Date:	2017-06-29 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

Lab Report #: L17061127
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061127-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6451	Prep Method: 6850	Prep Date: 06/26/2017 14:08
Matrix: Water	Analytical Method: 6850	Cal Date: 04/24/2017 15:40
Workgroup #: WG619337	Analyst: WTD	Run Date: 06/26/2017 16:01
Collect Date: 06/21/2017 15:00	Dilution: 1	File ID: 1LM.LM40006
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	1.34		0.400	0.200	0.100

Certificate of Analysis

Sample #: L17061127-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6451	Prep Method: 350.1	Prep Date: 06/23/2017 08:42
Matrix: Water	Analytical Method: 350.1	Cal Date: 06/23/2017 08:17
Workgroup #: WG619026	Analyst: DCM	Run Date: 06/23/2017 08:42
Collect Date: 06/21/2017 15:00	Dilution: 5	File ID: S2170623001.034
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	10.1		1.00	0.500	0.250

Certificate of Analysis

Sample #: L17061127-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6451	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:45
Workgroup #: WG618904	Analyst: ADG	Run Date: 06/22/2017 16:00
Collect Date: 06/21/2017 15:00	Dilution: 5	File ID: 00.1706221600-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	1.66		0.500	0.250	0.125

Certificate of Analysis

Lab Report #: L17061127
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Sample #: L17061127-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6451	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG619321	Analyst: DCM	Run Date: 06/26/2017 17:53
Collect Date: 06/21/2017 15:00	Dilution: 3	File ID: TC06262017.021
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	50.3		6.00	3.00	1.50

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17061127

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061127-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6451	Prep Method: 6850	Prep Date: 06/26/2017 14:08
Matrix: Water	Analytical Method: 6850	Cal Date: 04/24/2017 15:40
Workgroup #: WG619337	Analyst: WTD	Run Date: 06/26/2017 16:01
Collect Date: 06/21/2017 15:00	Dilution: 1	File ID: 1LM.LM40006
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	1.34		0.400	0.200	0.100

2.1.1.2 QC Summary Data

Example Calculation 6850 - Perchlorate**Concentration from Linear Regression****Step 1: Retrieve Curve Data From Plot, $y = mx + b$**

y = response ratio = response of analyte / response of internal standard (IS) = R_x/R_{istd}

x = amount ratio = concentration analyte/concentration internal standard (IS) = C_x / C_{istd}

m = slope from curve (1.45)

b = intercept from curve (-0.00242)

$y = 1.45x + -0.00242$

Step 2: Substitute the value for y

where $y = 12600/226000 = 0.055752$

Step 3: Solve for x

$x = (y - b)/m = 0.0040119$

Step 4: Solve for analyte concentration C_x

$C_x = (C_{is})(x) = (5 \text{ ug/L})(0.0040119) = 0.200594 \text{ ug/L}$

Example Calculation - Water:

Slope from curve, m :	1.45
Intercept from curve, b :	-0.00242
Response of analyte, R_x :	12600
Response of Internal Standard, R_{istd} :	226000
Concentration of IS, C_{istd} (ug/L):	5.00
Response Ratio:	0.05575
Amount Ratio:	0.04012
Analyte Concentration, C_x (ug/L) :	0.200594

Example Calculation - Soil:

Analyte Concentration, C_x (ug/L):	0.20059
Amount of soil extracted (g):	5.00
Final volume of extract (mL):	50.00
Percent solids (Pct wt.)	100
Concentration in soil (ug/kg):	2.005938

Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 042417_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG611327 (waters) Analytical WG611328 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: STD80234

Comments: ICAL WG611288 : Alternate Source STD80234
 Analytical Column : RPPX 5um (250x4.6mm)
 K'Prime S/N RPPX250-02115

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM39494	WG611288-01 CCB	1	1		04/24/17 13:27
2	1LM.LM39495	WG611288-02 STD (0.1 ug/L)	1	1	STD80232	04/24/17 13:46
3	1LM.LM39496	WG611288-03 STD (0.2 ug/L)	1	1	STD80232	04/24/17 14:05
4	1LM.LM39497	WG611288-04 STD (0.5 ug/L)	1	1	STD80232	04/24/17 14:24
5	1LM.LM39498	WG611288-05 STD (1.0 ug/L)	1	1	STD80232	04/24/17 14:43
6	1LM.LM39499	WG611288-06 STD (2.0 ug/L)	1	1	STD80232	04/24/17 15:02
7	1LM.LM39500	WG611288-07 STD (5.0 ug/L)	1	1	STD80232	04/24/17 15:21
8	1LM.LM39501	WG611288-08 STD (10 ug/L)	1	1	STD80232	04/24/17 15:40
9	1LM.LM39502	WG611288-09 SSCV (1.0 ug/L)	1	1	STD80234	04/24/17 15:59
10	1LM.LM39503	WG611330-01 CCB	1	1		04/24/17 16:18
11	1LM.LM39504	WG611330-02 CCV (1.0ug/L)	1	1	STD80232	04/24/17 16:37
12	1LM.LM39505	WG611327-07 MRL (0.2ug/L)	1	1	STD80232	04/24/17 16:56
13	1LM.LM39506	WG611327-01 MCT (0.2ug/L)	1	1	STD80234	04/24/17 17:14
14	1LM.LM39507	WG611327-02 BLANK	1	1		04/24/17 17:34
15	1LM.LM39508	WG611327-03 LCS (0.2ug/L)	1	1	STD80234	04/24/17 17:52
16	1LM.LM39509	L17040713-06 RS	1	1		04/24/17 18:11
17	1LM.LM39510	L17040713-07 MS	1	1	STD80234	04/24/17 18:30
18	1LM.LM39511	L17040713-08 MSD	1	1	STD80234	04/24/17 18:49
19	1LM.LM39512	L17040713-01	1	1		04/24/17 19:08
20	1LM.LM39513	L17040713-02	1	1		04/24/17 19:27
21	1LM.LM39514	L17040713-03	1	1		04/24/17 19:46
22	1LM.LM39515	L17040713-04	1	1		04/24/17 20:05
23	1LM.LM39516	WG611330-03 CCV (1.0ug/L)	1	1	STD80232	04/24/17 20:24
24	1LM.LM39517	WG611327-08 MRL (0.2ug/L)	1	1	STD80232	04/24/17 20:43
25	1LM.LM39518	WG611330-04 CCB	1	1		04/24/17 21:02
26	1LM.LM39519	L17040713-05	1	1		04/24/17 21:21
27	1LM.LM39520	L17040713-09	1	1		04/24/17 21:40
28	1LM.LM39521	L17040713-10	1	1		04/24/17 21:59
29	1LM.LM39522	L17040713-11	1	1		04/24/17 22:17
30	1LM.LM39523	L17040713-12	1	1		04/24/17 22:36
31	1LM.LM39524	L17040713-13	1	1		04/24/17 22:55
32	1LM.LM39525	WG611330-05 CCV (1.0ug/L)	1	1	STD80232	04/24/17 23:14
33	1LM.LM39526	WG611327-09 MRL (0.2ug/L)	1	1	STD80232	04/24/17 23:33

Page: 1

Approved: 25-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 042417_JWR.TXT
 Analyst1: JWR Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: Column 1 ID: KP-RPPX250 Column 2 ID: NA
 Analytical WG611327 (waters) Analytical WG611328 (waters)
 Internal STD: COA19471 Surrogate STD: NA STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 STD80234

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM39527	WG611328-07 MRL (0.2ug/L)	1	1	STD80232	04/24/17 23:52
35	1LM.LM39528	WG611330-06 CCB	1	1		04/25/17 00:11
36	1LM.LM39529	WG611328-01 MCT (0.2ug/L)	1	1	STD80234	04/25/17 00:30
37	1LM.LM39530	WG611328-02 BLANK	1	1		04/25/17 00:49
38	1LM.LM39531	WG611328-03 LCS (0.2ug/L)	1	1	STD80234	04/25/17 01:08
39	1LM.LM39532	L17040841-08 RS	1	1		04/25/17 01:27
40	1LM.LM39533	L17040841-09 MS	1	1	STD80234	04/25/17 01:46
41	1LM.LM39534	L17040841-10 MSD	1	1	STD80234	04/25/17 02:05
42	1LM.LM39535	L17040841-01	1	1		04/25/17 02:23
43	1LM.LM39536	L17040841-02	1	1		04/25/17 02:42
44	1LM.LM39537	L17040841-03	1	1		04/25/17 03:01
45	1LM.LM39538	L17040841-04	1	1		04/25/17 03:20
46	1LM.LM39539	WG611330-07 CCV (1.0ug/L)	1	1	STD80232	04/25/17 03:39
47	1LM.LM39540	WG611328-08 MRL (0.2ug/L)	1	1	STD80232	04/25/17 03:58
48	1LM.LM39541	WG611330-08 CCB	1	1		04/25/17 04:17
49	1LM.LM39542	L17040841-05	1	1		04/25/17 04:36
50	1LM.LM39543	L17040841-06	1	1		04/25/17 04:55
51	1LM.LM39544	L17040841-07	1	1		04/25/17 05:14
52	1LM.LM39545	L17040841-11	1	1		04/25/17 05:33
53	1LM.LM39546	L17040841-12	1	1		04/25/17 05:52
54	1LM.LM39547	L17040841-13	1	1		04/25/17 06:11
55	1LM.LM39548	WG611330-09 CCV (1.0ug/L)	1	1	STD80232	04/25/17 06:30
56	1LM.LM39549	WG611328-09 MRL (0.2ug/L)	1	1	STD80232	04/25/17 06:49
57	1LM.LM39550	WG611330-10 CCB	1	1		04/25/17 07:07

Comments

Seq.	Rerun	Dil.	Reason	Analytes
------	-------	------	--------	----------

Page: 2

Approved: 25-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 062617_WTD.TXT
 Analyst1: WTD Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: _____ Column 1 ID: KP-RPPX250 Column 2 ID: NA

Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: STD80234

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40000	WG619334-01 CCB	1	1		06/26/17 14:08
2	1LM.LM40001	WG619334-02 CCV (1.0ug/L)	1	1	STD80232	06/26/17 14:27
3	1LM.LM40002	WG619337-07 MRL (0.2ug/L)	1	1	STD80232	06/26/17 14:46
4	1LM.LM40003	WG619337-01 MCT (0.2ug/L)	1	1	STD80234	06/26/17 15:05
5	1LM.LM40004	WG619337-02 BLANK	1	1		06/26/17 15:24
6	1LM.LM40005	WG619337-03 LCS (0.2ug/L)	1	1	STD80234	06/26/17 15:43
7	1LM.LM40006	L17061127-01	1	1	STD80234	06/26/17 16:01
8	1LM.LM40007	L17061203-01	1	1	STD80234	06/26/17 16:21
9	1LM.LM40008	L17061203-03	1	1	STD80234	06/26/17 16:40
10	1LM.LM40009	L17061203-04	1	1	STD80234	06/26/17 16:58
11	1LM.LM40010	L17061203-05 REF	1	1	STD80234	06/26/17 17:17
12	1LM.LM40011	L17061203-06 MS	1	1	STD80234	06/26/17 17:36
13	1LM.LM40012	L17061203-07 MSD	1	1	STD80234	06/26/17 17:55
14	1LM.LM40013	WG619334-03 CCV (1.0ug/L)	1	1	STD80232	06/26/17 18:14
15	1LM.LM40014	WG619337-08 MRL (0.2ug/L)	1	1	STD80232	06/26/17 18:33
16	1LM.LM40015	WG619334-04 CCB	1	1		06/26/17 18:52
17	1LM.LM40016	L17061203-08	1	1		06/26/17 19:11
18	1LM.LM40017	L17061203-09	1	1		06/26/17 19:30
19	1LM.LM40018	L17061203-11	1	1		06/26/17 19:49
20	1LM.LM40019	L17061203-13 20X	1	20		06/26/17 20:08
21	1LM.LM40020	L17061203-14	1	1		06/26/17 20:27
22	1LM.LM40021	L17061203-15	1	1		06/26/17 20:46
23	1LM.LM40022	L17061203-17	1	1		06/26/17 21:05
24	1LM.LM40023	L17061203-19	1	1		06/26/17 21:24
25	1LM.LM40024	L17061203-21	1	1		06/26/17 21:43
26	1LM.LM40025	L17061203-23	1	1		06/26/17 22:02
27	1LM.LM40026	WG619334-05 CCV (1.0ug/L)	1	1	STD80232	06/26/17 22:21
28	1LM.LM40027	WG619337-09 MRL (0.2ug/L)	1	1	STD80232	06/26/17 22:40
29	1LM.LM40028	WG619334-06 CCB	1	1		06/26/17 22:59
30	1LM.LM40029	L17061203-24	1	1		06/26/17 23:18
31	1LM.LM40030	L17061203-13 200X	1	200		06/26/17 23:37
32	1LM.LM40031	L17061203-13	1	1		06/26/17 23:56
33	1LM.LM40032	WG619334-07 CCV (1.0ug/L)	1	1	STD80232	06/27/17 00:15

Page: 1

Approved: 27-JUN-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 062617_WTD.TXT
 Analyst1: WTD Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: _____

Workgroups: _____ Column 1 ID: KP-RPPX250 Column 2 ID: NA

Internal STD: COA19471 Surrogate STD: NA STD80232 (04/24/2017)
 CCV STD: STD80232 LCS STD: STD80234 STD80234

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM40033	WG619337-10 MRL (0.2ug/L)	1	1	STD80232	06/27/17 00:33
35	1LM.LM40034	WG619334-08 CCB	1	1		06/27/17 00:52

Comments

Seq.	Rerun	Dil.	Reason	Analytes
13				
			L17061203-07 Matrix spike duplicate recovery is above the upper control limit.	
20	X	200	Over Calibration Range	
			L17061203-13 Diluted based on historical results. Requires further dilution.	
32				
			L17061203-13 - Undiluted analysis not reported.	

Page: 2

Approved: 27-JUN-17




Microbac Laboratories Inc.

Data Checklist

Date: 24-APR-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: WG611288
 Runlog ID: 81726
 Analytical Workgroups: L17040713, L17040841

ANALYTICAL	
System Performance Check	NA
DFTPP (GCMS)	NA
Endrin/DDT breakdown (8081/GCMS)	NA
Pentachlorophenol/benzidine tailing (GCMS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	NA
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (GCMS)	X
Continuing calibration blank (CCB) (IC/LCMS)	X
Limit of quantitation verification (LOQV) (LCMS)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	X
Library searches (GCMS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	NA
Check for completeness	X
Primary Reviewer	JWR
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
25-APR-2017

John Richards

Secondary Reviewer:
25-APR-2017

Eri C. Zimm

CHECKLIST1 - Modified 03/05/2008

Generated: APR-25-2017 14:21:32



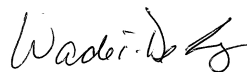
Microbac Laboratories Inc.

Data Checklist

Date: 26-JUN-2017
 Analyst: WTD
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 83003
 Analytical Workgroups: L17061127, L17061203

ANALYTICAL	
System Performance Check	NA
DFTPP (GCMS)	NA
Endrin/DDT breakdown (8081/GCMS)	NA
Pentachlorophenol/benzidine tailing (GCMS)	NA
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (GCMS)	X
Continuing calibration blank (CCB) (IC/LCMS)	X
Limit of quantitation verification (LOQV) (LCMS)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	NA
Internal standard areas (MS)	X
Library searches (GCMS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	NA
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	TRRP
Check for completeness	X
Primary Reviewer	WTD
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
27-JUN-2017



Secondary Reviewer:
27-JUN-2017




Analytical Method:6850
 Login Number:L17061127

AAB#:WG619337

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6451	01	06/21/17					06/26/2017	5	28		06/26/17	.1	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17061127 Work Group: WG619337
 Blank File ID: 1LM.LM40004 Blank Sample ID: WG619337-02
 Prep Date: 06/26/17 14:08 Instrument ID: LCMS1
 Analyzed Date: 06/26/17 15:24 Method: 6850
 Analyst: WTD

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG619337-07	1LM.LM40002	06/26/17 14:46	01
MCT	WG619337-01	1LM.LM40003	06/26/17 15:05	01
LCS	WG619337-03	1LM.LM40005	06/26/17 15:43	01
LH18/24-SP650-6451	L17061127-01	1LM.LM40006	06/26/17 16:01	01
QCMRL	WG619337-08	1LM.LM40014	06/26/17 18:33	01
QCMRL	WG619337-09	1LM.LM40027	06/26/17 22:40	01
QCMRL	WG619337-10	1LM.LM40033	06/27/17 00:33	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5354638
 Report generated 06/27/2017 13:37



Login Number: L17061127 Prep Date: 06/26/17 14:08 Sample ID: WG619337-02
 Instrument ID: LCMS1 Run Date: 06/26/17 15:24 Prep Method: 6850
 File ID: 1LM.LM40004 Analyst: WTD Method: 6850
 Workgroup (AAB#): WG619337 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Perchlorate	0.100	0.400	0.100	1	U

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5354639
 27-JUN-2017 13:37



Login Number: L17061127 Run Date: 06/26/2017 Sample ID: WG619337-03
Instrument ID: LCMS1 Run Time: 15:43 Prep Method: 6850
File ID: 1LM.LM40005 Analyst: WTD Method: 6850
Workgroup (AAB#): WG619337 Matrix: Water Units: ug/L
QC Key: DOD4 Lot#: STD80234 Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Perchlorate	0.200	0.201	101	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5354640
Report generated: 06/27/2017 13:37



Login Number: L17061127
Analytical Method: 6850
ICAL Workgroup: WG611288

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.286	4.98	1.00000	

R = Correlation coefficient; 0.995 minimum
R² = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 5354642
Report generated 06/27/2017 13:37



Login Number: L17061127
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 24-APR-17 15:40
 Column ID: F

Analyte	WG611288-02			WG611288-03			WG611288-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	21000.0000	1.332	0.200	38200.0000	1.222	0.500	104000.000	1.335

INT_CAL - Modified 03/06/2008
 PDF File ID: 5354642
 Report generated 06/27/2017 13:37



Login Number: L17061127
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 24-APR-17 15:40
 Column ID: F

Analyte	WG611288-05			WG611288-06			WG611288-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	206000.000	1.288	2.00	412000.000	1.312	5.00	955000.000	1.270

INT_CAL - Modified 03/06/2008
 PDF File ID: 5354642
 Report generated 06/27/2017 13:37



Login Number: L17061127
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 24-APR-17 15:40
Column ID: F

Analyte	WG611288-08		
	CONC	RESP	RF
Perchlorate	10.0	1860000.00	1.244

INT_CAL - Modified 03/06/2008
PDF File ID: 5354642
Report generated 06/27/2017 13:37



Login Number: L17061127 Run Date: 04/24/2017 Sample ID: WG611288-09
 Instrument ID: LCMS1 Run Time: 15:59 Method: 6850
 File ID: 1LM.LM39502 Analyst: JWR QC Key: DOD4
 ICal Workgroup: WG611288 Cal ID: LCMS1 - 24-APR-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	0.977	ug/L	1.24	2.30	15	

* Exceeds %D Limit



Login Number: L17061127 Run Date: 06/26/2017 Sample ID: WG619334-01
Instrument ID: LCMS1 Run Time: 14:08 Method: 6850
File ID: LLM.LM40000 Analyst: WTD Units: ug/L
Workgroup (AAB#): WG619337 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17061127 Run Date: 06/26/2017 Sample ID: WG619334-04
Instrument ID: LCMS1 Run Time: 18:52 Method: 6850
File ID: LLM.LM40015 Analyst: WTD Units: ug/L
Workgroup (AAB#): WG619337 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17061127 Run Date: 06/26/2017 Sample ID: WG619334-06
Instrument ID: LCMS1 Run Time: 22:59 Method: 6850
File ID: 1LM.LM40028 Analyst: WTD Units: ug/L
Workgroup (AAB#): WG619337 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 5354657
Report generated 06/27/2017 13:38



Login Number: L17061127 Run Date: 06/27/2017 Sample ID: WG619334-08
Instrument ID: LCMS1 Run Time: 00:52 Method: 6850
File ID: LLM.LM40034 Analyst: WTD Units: ug/L
Workgroup (AAB#): WG619337 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.



Login Number: L17061127 Run Date: 06/26/2017 Sample ID: WG619334-02
 Instrument ID: LCMS1 Run Time: 14:27 Method: 6850
 File ID: 1LM.LM40001 Analyst: WTD QC Key: DOD4
 Workgroup (AAB#): WG619337 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.13	ug/L	1.43	13.0	15	

* Exceeds %D Criteria



Login Number: L17061127 Run Date: 06/26/2017 Sample ID: WG619334-03
 Instrument ID: LCMS1 Run Time: 18:14 Method: 6850
 File ID: 1LM.LM40013 Analyst: WTD QC Key: DOD4
 Workgroup (AAB#): WG619337 Cal ID: LCMS1 - 24-APR-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.11	ug/L	1.41	11.0	15	

* Exceeds %D Criteria



Login Number: L17061127 Run Date: 06/26/2017 Sample ID: WG619334-05
Instrument ID: LCMS1 Run Time: 22:21 Method: 6850
File ID: 1LM.LM40026 Analyst: WTD QC Key: DOD4
Workgroup (AAB#): WG619337 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.11	ug/L	1.41	11.0	15	

* Exceeds %D Criteria



Login Number: L17061127 Run Date: 06/27/2017 Sample ID: WG619334-07
Instrument ID: LCMS1 Run Time: 00:15 Method: 6850
File ID: 1LM.LM40032 Analyst: WTD QC Key: DOD4
Workgroup (AAB#): WG619337 Cal ID: LCMS1 - 24-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.13	ug/L	1.43	13.0	15	

* Exceeds %D Criteria



Login Number: L17061127 Run Date: 06/26/2017 Sample ID: WG619337-07
 Instrument ID: LCMS1 Run Time: 14:46 Prep Method: 6850
 File ID: 1LM.LM40002 Analyst: WTD Method: 6850
 Workgroup (AAB#): WG619337 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.223	112	70 - 130	



Login Number: L17061127 Run Date: 06/26/2017 Sample ID: WG619337-08
Instrument ID: LCMS1 Run Time: 18:33 Prep Method: 6850
File ID: 1LM.LM40014 Analyst: WTD Method: 6850
Workgroup (AAB#): WG619337 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.217	109	70 - 130	



Login Number: L17061127 Run Date: 06/26/2017 Sample ID: WG619337-09
 Instrument ID: LCMS1 Run Time: 22:40 Prep Method: 6850
 File ID: 1LM.LM40027 Analyst: WTD Method: 6850
 Workgroup (AAB#): WG619337 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.214	107	70 - 130	



Login Number: L17061127 Run Date: 06/27/2017 Sample ID: WG619337-10
 Instrument ID: LCMS1 Run Time: 00:33 Prep Method: 6850
 File ID: 1LM.LM40033 Analyst: WTD Method: 6850
 Workgroup (AAB#): WG619337 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-24-APR-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.211	106	70 - 130	



Login Number: L17061127
Instrument ID: LCMS1
Workgroup (AAB#): WG619337

ICAL CCV Number: WG611288-05
CAL ID: LCMS1-24-APR-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG611288	NA	NA	777000
Upper Limit	NA	NA	1165500
Lower Limit	NA	NA	388500
<u>L17061127-01</u>	1.00	01	666000
WG619337-02	1.00	01	719000
WG619337-03	1.00	01	746000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: 6850	Samplenum: L17061127-01
Instrument: LCMS1	Prep Date: 06/26/2017 14:08	File ID: 1LM.LM40006
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 16:01	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	227000	69700	3.26	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG611288-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39495
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 04/24/2017 13:46	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	21000	6820	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG611288-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39496
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 04/24/2017 14:05	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	38200	13500	2.83	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG611288-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39497
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 04/24/2017 14:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	104000	33400	3.11	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG611288-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39498
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 04/24/2017 14:43	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	206000	65300	3.15	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG611288-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39499
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 04/24/2017 15:02	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	412000	130000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG611288-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39500
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 04/24/2017 15:21	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	955000	298000	3.20	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG611288-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39501
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 04/24/2017 15:40	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1860000	603000	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG611288-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM39502
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 04/24/2017 15:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	197000	65000	3.03	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG619334-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40000
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 14:08	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG619334-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40001
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 14:27	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	189000	59600	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG619334-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40013
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 18:14	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	220000	67500	3.26	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG619334-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40015
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 18:52	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG619334-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40026
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 22:21	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	217000	68100	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG619334-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40028
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 22:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127
Instrument: LCMS1
Analyst: WTD
Worknum: WG619337

Prep Method: _____
Prep Date: _____
Anal Method: 6850
Analysis Date: 06/27/2017 00:15

Samplenum: WG619334-07
File ID: 1LM.LM40032
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	207000	63500	3.26	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: _____	Samplenum: WG619334-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40034
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/27/2017 00:52	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: 6850	Samplenum: WG619337-01
Instrument: LCMS1	Prep Date: 06/26/2017 14:08	File ID: 1LM.LM40003
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 15:05	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	41100	12900	3.19	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: 6850	Samplenum: WG619337-02
Instrument: LCMS1	Prep Date: 06/26/2017 14:08	File ID: 1LM.LM40004
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 15:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127
Instrument: LCMS1
Analyst: WTD
Worknum: WG619337

Prep Method: 6850
Prep Date: 06/26/2017 14:08
Anal Method: 6850
Analysis Date: 06/26/2017 15:43

Samplenum: WG619337-03
File ID: 1LM.LM40005
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	39200	12500	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: 6850	Samplenum: WG619337-07
Instrument: LCMS1	Prep Date: 06/26/2017 14:08	File ID: 1LM.LM40002
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 14:46	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	41100	13000	3.16	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127
Instrument: LCMS1
Analyst: WTD
Worknum: WG619337

Prep Method: 6850
Prep Date: 06/26/2017 14:08
Anal Method: 6850
Analysis Date: 06/26/2017 18:33

Samplenum: WG619337-08
File ID: 1LM.LM40014
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	47400	14000	3.39	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: 6850	Samplenum: WG619337-09
Instrument: LCMS1	Prep Date: 06/26/2017 14:08	File ID: 1LM.LM40027
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/26/2017 22:40	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	45600	14500	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17061127	Prep Method: 6850	Samplenum: WG619337-10
Instrument: LCMS1	Prep Date: 06/26/2017 14:08	File ID: 1LM.LM40033
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG619337	Analysis Date: 06/27/2017 00:33	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	43300	14500	2.99	2.3	3.8	

2.2 General Chemistry Data

2.2.1 Ammonia Data

2.2.1.1 Summary Data

Lab Report #: L17061127

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061127-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6451	Prep Method: 350.1	Prep Date: 06/23/2017 08:42
Matrix: Water	Analytical Method: 350.1	Cal Date: 06/23/2017 08:17
Workgroup #: WG619026	Analyst: DCM	Run Date: 06/23/2017 08:42
Collect Date: 06/21/2017 15:00	Dilution: 5	File ID: S2170623001.034
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	10.1		1.00	0.500	0.250

2.2.1.2 QC Summary Data

Example Ammonia Calculations

$$(\text{absorbance} - \text{intercept}) / (\text{slope} * \text{dilution}) = \text{mg/L}$$

where:

absorbance = reading from the spectrophotometer

intercept = calculated from calibration standard absorbencies

slope = calculated from calibration standard absorbencies

dilution = dilution of the distillate in decimal form (ex. 1/5 dilution = 0.2)

Microbac Laboratories Inc.

Data Checklist

Date: 23-JUN-2017
 Analyst: DCM
 Analyst: NA
 Method: NH3
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG619028 WG619026

Calibration/Linearity	06-23-2017
Second Source Check	X
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	X
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	DCM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
23-JUN-2017



Secondary Reviewer:
28-JUN-2017




Analytical Method: 350.1
Login Number: L17061127

AAB#: WG619026

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6451	01	06/21/17					06/23/2017	1.7	28		06/23/17	1.7	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17061127 Work Group: WG619026
 Blank File ID: S2170623001.011 Blank Sample ID: WG619026-01
 Prep Date: 06/23/17 08:21 Instrument ID: SMARTCHEM2
 Analyzed Date: 06/23/17 08:21 Method: 350.1
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG619026-02	S2170623001.012	06/23/17 08:21	01
LH18/24-SP650-6451	L17061127-01	S2170623001.034	06/23/17 08:42	DL01
DUP	WG619026-04	S2170623001.035	06/23/17 08:43	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5352076
 Report generated 06/26/2017 09:11



Login Number: L17061127 Prep Date: 06/23/17 08:21 Sample ID: WG619026-01
Instrument ID: SMARTCHEM2 Run Date: 06/23/17 08:21 Prep Method: 350.1
File ID: S2170623001.011 Analyst: DCM Method: 350.1
Workgroup (AAB#): WG619026 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-23-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Nitrogen, Ammonia	0.0500	0.200	0.0500	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5352077
26-JUN-2017 09:11



LCS_LCS2 - Modified 03/06/2008
PDF File ID: 5352078
Report generated: 06/26/2017 09:11



2.2 General Chemistry Data

2.2.2 Orthophosphate Data

2.2.2.1 Summary Data

Lab Report #: L17061127

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061127-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6451	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:45
Workgroup #: WG618904	Analyst: ADG	Run Date: 06/22/2017 16:00
Collect Date: 06/21/2017 15:00	Dilution: 5	File ID: 00.1706221600-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	1.66		0.500	0.250	0.125

2.2.2.2 QC Summary Data

Example Calculations for Visible Spectrophotometric Methods

Linear Calibration Model

Step 1 - Retrieve Curve Data from ICAL

m = slope of the linear equation
 b = intercept from the linear equation
 y = instrument response as absorbance or OD
 x = concentration of analyte (mg/L)
 $y = mx + b$

Step 2: Calculate the instrument concentration, x

Where:

$$x = (y - b)/m$$

Step 3: Solve for analyte concentration in sample, Cx

$$Cx = (x) (D)$$

Example Calculation (LCS):

Value of m from plot:	7.809
Value of b from plot:	0.0004135
Absorbance of unknown from quantitation report (y):	0.31
Calculated concentration (x):	0.03964483
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	0.0396 mg/L

SmartChem Autoanalyzer - Quadratic Calibration for Chloride and Sulfate

Step 1 - Retrieve Curve Data from Smartchem ICAL

A, B, C = constants from the ICAL quadratic regression

x = instrument response as absorbance or OD

y = concentration of analyte (mg/L)

Step 2: Calculate the instrument concentration, y

Where:

$$y = Ax^2 + Bx + C$$

Step 3: Solve for analyte concentration in sample, Cy

$$Cy = (y) (D)$$

Example Calculation (LCS):

Value of A from plot:	101.2796
Value of B from plot:	318.9056
Value of C from plot:	-2.2712
Absorbance of unknown from quantitation report (x):	0.1583
Calculated concentration (y):	50.7495108
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	50.75 mg/L

Microbac Laboratories Inc.

Data Checklist

Date: 22-JUN-2017
 Analyst: ADG
 Analyst: NA
 Method: PO4
 Instrument: V-1200
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG618904

Calibration/Linearity	06/22/17
Second Source Check	
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	X
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	ADG
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
26-JUN-2017

April Greene

Secondary Reviewer:
29-JUN-2017

Dennis Johnson



Analytical Method: 365.2
Login Number: L17061127

AAB#: WG618904

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6451	01	06/21/17					06/22/2017	1	2		06/22/17	1	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17061127 Work Group: WG618904
 Blank File ID: 00.1706221600-03 Blank Sample ID: WG618904-01
 Prep Date: 06/22/17 16:00 Instrument ID: V-1200
 Analyzed Date: 06/22/17 16:00 Method: 365.2
 Analyst: ADG

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG618904-02	00.1706221600-04	06/22/17 16:00	
LCS2	WG618904-03	00.1706221600-05	06/22/17 16:00	
LH18/24-SP650-6451	L17061127-01	00.1706221600-06	06/22/17 16:00	
DUP	WG618904-05	00.1706221600-07	06/22/17 16:00	

Report Name: BLANK_SUMMARY
 PDF File ID: 5355142
 Report generated 06/27/2017 13:40



Login Number: L17061127 Prep Date: 06/22/17 16:00 Sample ID: WG618904-01
Instrument ID: V-1200 Run Date: 06/22/17 16:00 Prep Method: 365.2
File ID: 00.1706221600-03 Analyst: ADG Method: 365.2
Workgroup (AAB#): WG618904 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: V-1200-19-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Orthophosphate	0.0250	0.100	0.0250	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5355143
27-JUN-2017 13:40



Login Number: L17061127 Analyst: ADG Prep Method: 365.2
 Instrument ID: V-1200 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG618904 Units: mg/L
 QC Key: DOD4 Lot #: STD82526
 Sample ID: WG618904-02 LCS File ID: 00.1706221600-04 Run Date: 06/22/2017 16:00
 Sample ID: WG618904-03 LCS2 File ID: 00.1706221600-05 Run Date: 06/22/2017 16:00

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	1.03	103	1.00	1.02	102	0.469	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5355144
 Report generated: 06/27/2017 13:40



2.2.2.3 Raw Data

WG 616997

Curves

Parameter: P04

Spectrophotometer: V-1200

Calibration (Curve) standard stock: STD 79640

Concentration: 1000mg/L

Recipe for preparation of curve standards found in:

SOP: 3653 Revision: 17 Page: 9

Second Source Stock: 82182 (concentration: 10)

Daily Preparation: $\frac{10(10)/100 =}{1.0}$
concentration = 1.0

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
1.0	50	1cm	880	0.608 0.621
0.7				0.445
0.5				0.312
0.2				0.127
0.1				0.063
0.05				0.031
0				0.001
2nd Source (10)				0.659 0.637

Analyst: Jammy Morris

Date/Time: 6/7/17 @ 1545

DCN#126310



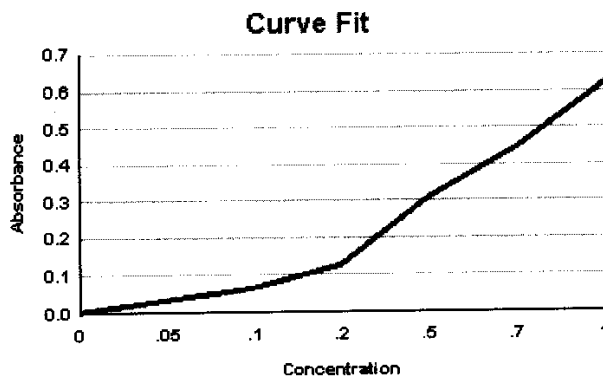
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG616997
Analytical Method: 300
Instrument ID: V-1200

Analyst: TMM
Initial Calibration Date: 06/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.624028
Y-Intercept: 0.00124690
Coef. Of Correlation (R^2): 0.999788
Coef. Of Correlation (R): 0.999894

Concentration X	Absorbance Y	X^2	$X * Y$	Y-Fitted (mX^2+B)
0.00	0.00100	0.00	0.00	0.00124690
0.0500	0.0310	0.00250	0.00155	0.0324483
0.100	0.0630	0.0100	0.00630	0.0636497
0.200	0.127	0.0400	0.0254	0.126053
0.500	0.312	0.250	0.156	0.313261
0.700	0.445	0.490	0.312	0.438067
1.00	0.621	1.00	0.621	0.625275



WG_ICAL_CAL_NET - Modified 03/06/2008
Report generated 06/07/2017 16:28

Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

Workgroup #: WG616997
File ID: 00.1706071545-08
CCV ID: WG616997-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 06/07/2017
Run Time: 15:45
Analyst: TMM
Cal ID: V-1200 - 07-JUN-17 15:45:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.02	0.637	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPPC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 06/07/2017 16:28



WORKGROUP: WG618904

Orthophosphate (orthophosphate1)

EPA 365.2 / SM4500-P E
 SOP K3653 Rev 17
 Color Reagent Chemicals
 40250
 40460
 39475
 CON 15278

CCV: 82525
 Daily Dilution: 5(5)/50
 Daily Dilution: 2.5
 Spectrophotometer: V-1200

LCS: 82524
 Daily Dilution: 10(10)/100
 Daily Dilution: 21.0
 Curve ID: 677/17

Spike: 82526
 Daily Dilution: 2(10)/50
 Daily Dilution: 2.4

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: 0.5 mg/L	50	✓		0.329
BLK/CCB:	50	✓		0.000
LCS: 1.0 ppm	50	✓		0.643
LCSD: 1.0 ppm	50	✓		0.640
06 1127-01	50	✓	1/5	0.209
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
DUP #6 (1127-01)	50	✓	1/5	0.222
MS 7 (06) 1127-01	50	✓	1/5	0.284
MSD: ()	50			
CCV: (0.5)	50	✓		0.331
CCB:	50	✓		0.331 ± 0.008

Analyst: Paul Green

Date / Time: 6/22/17 1:47:00

DCN#126611



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG618904Analyst: ADGAnalyte: ORTHOPHOSPHATEDate: 06/22/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG618904-01	50	50	0	0.6240	0.001247	-0.0019981	-0.0019981	1	mg/L
WG618904-02	50	50	0.643	0.6240	0.001247	1.0284	1.0284	1	mg/L
WG618904-03	50	50	0.640	0.6240	0.001247	1.0236	1.0236	1	mg/L
L17061127-01	50	50	0.209	0.6240	0.001247	0.33292	1.6646	5	mg/L
WG618904-04	50	50	0.209	0.6240	0.001247	0.33292	1.6646	5	mg/L
WG618904-05	50	50	0.222	0.6240	0.001247	0.35376	1.7688	5	mg/L
WG618904-06	50	50	0.284	0.6240	0.001247	0.45311	2.2655	5	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 06/26/2017 07:40

Workgroup #: WG619269 Instrument ID: V-1200
File ID: 00.1706221600-01 Run Date: 06/22/2017
CCV ID: WG619269-01 Run Time: 16:00
Units: mg/L Analyst: ADG
Analyte: ORTHOPHOSPHATE Cal ID: V-1200 - 19-JUN-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.525	0.658	5.0	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/26/2017 07:38



Workgroup #: WG619269 Instrument ID: V-1200
File ID: 00.1706221600-09 Run Date: 06/22/2017
CCV ID: WG619269-03 Run Time: 16:00
Units: mg/L Analyst: ADG
Analyte: ORTHOPHOSPHATE Cal ID: V-1200 - 19-JUN-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.528	0.662	5.6	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/26/2017 07:38



2.2 General Chemistry Data

2.2.3 Total Organic Carbon Data

2.2.3.1 Summary Data

Lab Report #: L17061127

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061127-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6451	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG619321	Analyst: DCM	Run Date: 06/26/2017 17:53
Collect Date: 06/21/2017 15:00	Dilution: 3	File ID: TC06262017.021
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	50.3		6.00	3.00	1.50

2.2.3.2 QC Summary Data

**Total Organic Carbon Example Calculations
(Direct Readout Parameter)**

$$(\text{Readout})/(\text{dilution}) = \text{mg/L}$$

where:

Readout = direct readout from the instrument

dilution = dilution in decimal form (ex. 1/5 dilution = 0.2)

Microbac Laboratories Inc.

Data Checklist

Date: 26-JUN-2017
 Analyst: DCM
 Analyst: NA
 Method: TOC
 Instrument: TOC-VWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG619321

Calibration/Linearity	02-10-2017
Second Source Check	X
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	X
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	DCM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
27-JUN-2017



Secondary Reviewer:
28-JUN-2017




Analytical Method: 415.1
Login Number: L17061127

AAB#: WG619321

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6451	01	06/21/17					06/26/2017	5.1	28		06/26/17	5.1	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17061127 Work Group: WG619321
 Blank File ID: TC06262017.004 Blank Sample ID: WG619321-01
 Prep Date: 06/26/17 11:37 Instrument ID: TOC-VWP
 Analyzed Date: 06/26/17 11:37 Method: 415.1
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG619321-02	TC06262017.005	06/26/17 11:57	01
LCS2	WG619321-03	TC06262017.006	06/26/17 12:18	01
LH18/24-SP650-6451	L17061127-01	TC06262017.021	06/26/17 17:53	DL01
DUP	WG619321-05	TC06262017.033	06/26/17 21:58	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5356260
 Report generated 06/28/2017 11:21



Login Number: L17061127 Prep Date: 06/26/17 11:37 Sample ID: WG619321-01
Instrument ID: TOC-VWP Run Date: 06/26/17 11:37 Prep Method: 415.1
File ID: TC06262017.004 Analyst: DCM Method: 415.1
Workgroup (AAB#): WG619321 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: TOC-VW-10-FEB-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Total Organic Carbon	0.500	2.00	0.500	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5356261
28-JUN-2017 11:21



Login Number: L17061127 Analyst: DCM Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG619321 Units: mg/L
 QC Key: DOD4 Lot #: STD80787
 Sample ID: WG619321-02 LCS File ID: TC06262017.005 Run Date: 06/26/2017 11:57
 Sample ID: WG619321-03 LCS2 File ID: TC06262017.006 Run Date: 06/26/2017 12:18

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	26.3	105	25.0	26.5	106	0.909	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5356262
 Report generated: 06/28/2017 11:21



2.2.3.3 Raw Data

Curve

~~WG 602411~~
~~WG 602476~~ *dm/11/13/17*
 WG 602481

Total Organic Carbon

MAKE DAILY

CCV (TOC): _____ LCS (TOC): _____
 (5/200)(1000) = 25mg/L (5/200)(1000) = 25mg/L

CCV (TIC): _____ MS (TOC): _____
 (5/200)(1000) = 25mg/L _____

Calibration Curve Date: _____ Reagent: RET 35944
RET 37673

SM5310-C : Matrix 2 WG _____
 EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K 4151 Rev. 18 *dm/11/13/17*
 Instrument: Shimadza TOC-VWP/ASI

- drain reservoir filled
 ASI water bottle full
 dilution water bottle full
- DAILY CHECK**
 3rd bottle full
 sufficient gas
 sufficient persulfate
- sufficient acid
 waste container

Position	Sample ID	Dilution	Position	Sample ID	Dilution	Position	Sample ID	Dilution
1	TC Curve		26	TC Curve		51		
2	TC ICV		27	Std 79318		52	See SOP	
3	TIC Curve		28			53	for point	
4	TIC ICV		29	TIC Curve		54	preparation	
5			30	Std 80415		55		
6			31			56		
7			32			57		
8			33	TOC (TC)		58		
9			34	ICV		59		
10			35	Std 77870		60	5/200 (1000) = 25	
11			36			61		
12			37	TIC ICV		62		
13			38	Std 80416		63		
14			39			64		
15			40			65		
16			41			66		
17			42			67		
18			43			68		
19	all points		44	analyzed in duplicate		69		
20			45			70		
21			46			71		
22			47			72		
23			48			73		
24			49			74		
25			50			75		

Analyst: David Merckel Date/Time: 2/10/17

DCN#123915



C:\TOC3201\Data\CURVES-02-10-2017.t32

	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TC	TCCURVE		Complete	2/10/2017 10:29:51 A	0, 1, 2, 3, 4, 5
2	TC	TOC ICV	TC:23.90mg/L	Complete	2/10/2017 10:47:48 A	6
3	IC	TICCURVE		Complete	2/10/2017 3:55:41 PM	0, 1, 2, 3, 4, 5
4	IC	TIC CURVE	IC:24.27mg/L	Complete	2/10/2017 4:12:07 PM	6
5	TC		TC:0.000mg/L	Complete	2/10/2017 4:31:41 PM	7
6	IC	TOC/TIC	IC:8.571mg/L	Complete	2/10/2017 4:42:05 PM	7
7	TC	TOC/TIC	TC:32.10mg/L	Complete	2/10/2017 5:01:02 PM	7

2/13/2017 7:01:58 AM

1/1

2/12/2017 11:18:36 AM

CURVES-02-10-2017.i32

Instr. Information

System
DetectorTOCVW ASI
Wet Chemical

Cal. Curve

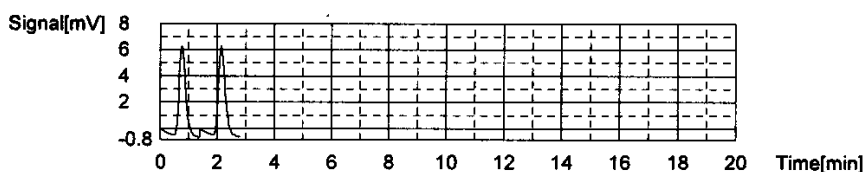
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

Type	Anal.
Standard	TC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.83	500uL	1	*****		2/10/2017 9:36:31 AM
2	10.82	500uL	1	*****		2/10/2017 9:40:05 AM

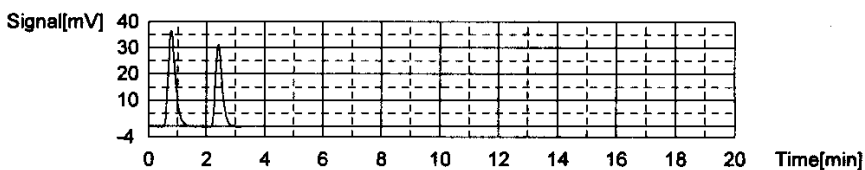
Acid Add. 0.000%
 Mean Area 10.82



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	64.31	500uL	1	*****		2/10/2017 9:45:28 AM
2	51.52	500uL	1	*****		2/10/2017 9:49:19 AM

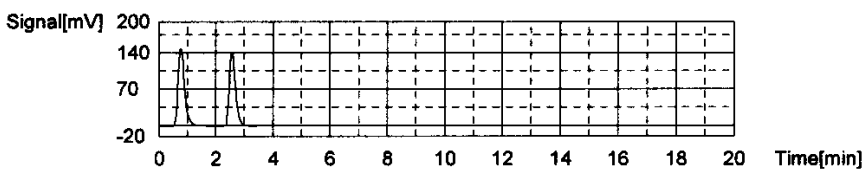
Acid Add. 0.000%
 Mean Area 57.92



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	238.4	500uL	1	*****		2/10/2017 9:55:04 AM
2	216.3	500uL	1	*****		2/10/2017 9:58:58 AM

Acid Add. 0.000%
 Mean Area 227.4

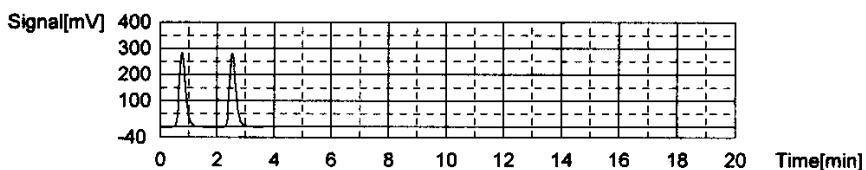


Conc: 10.00mg/L

1/6

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	442.5	500uL	1	*****		2/10/2017 10:04:41 AM
2	437.9	500uL	1	*****		2/10/2017 10:08:48 AM

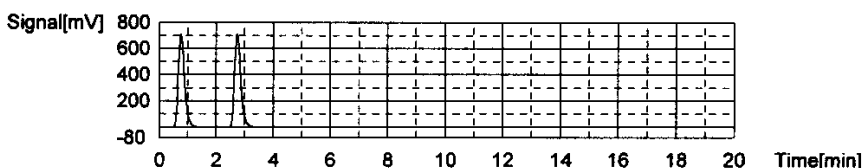
Acid Add. 0.000%
Mean Area 440.2



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1091	500uL	1	*****		2/10/2017 10:14:47 AM
2	1092	500uL	1	*****		2/10/2017 10:19:05 AM

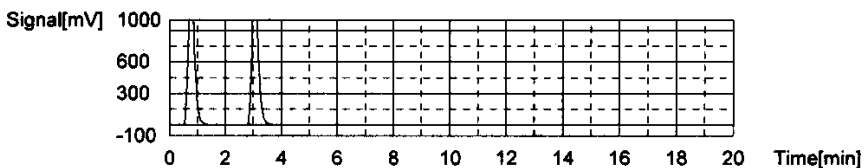
Acid Add. 0.000%
Mean Area 1092



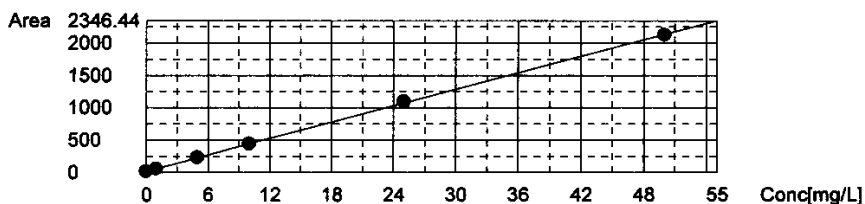
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	2132	500uL	1	*H*****		2/10/2017 10:25:19 AM
2	2118	500uL	1	*H*****		2/10/2017 10:29:51 AM

Acid Add. 0.000%
Mean Area 2125



Slope: 42.33
Intercept 16.87
r^2 0.999887
Zero Shift No



Sample

Sample Name: TOC ICV
Sample ID: Untitled
Origin: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
Status: Completed
Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:23.90mg/L

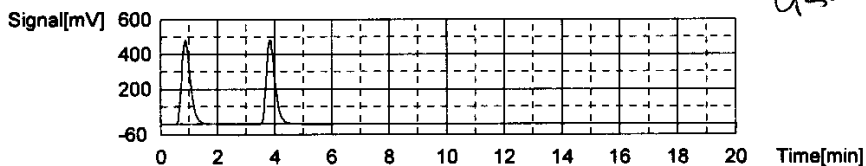
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1029	23.91mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 10:42:11 AM
2	1028	23.89mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 10:47:48 AM

95.6%

Mean Area 1029
 Mean Conc. 23.90mg/L



Cal. Curve

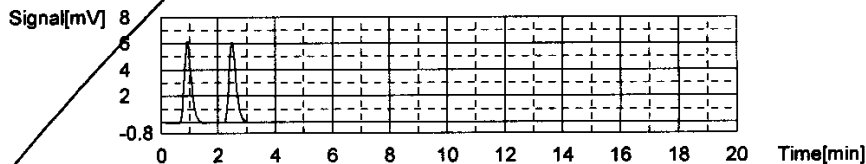
Sample Name: TICCURVE
 Sample ID: Untitled
 Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed

Type	Anal.
Standard	TC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.59	500uL	1	*****		2/10/2017 2:49:09 PM
2	10.43	500uL	1	*****		2/10/2017 2:53:06 PM

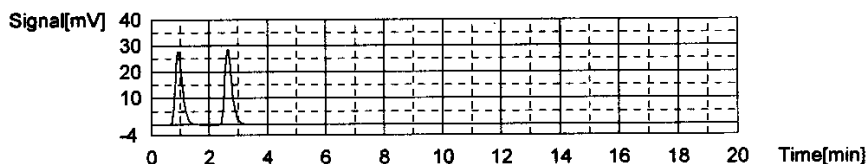
Acid Add. 3.000%
 Mean Area 10.51



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	48.13	500uL	1	*****		2/10/2017 3:00:24 PM
2	49.13	500uL	1	*****		2/10/2017 3:04:41 PM

Acid Add. 3.000%
 Mean Area 48.63

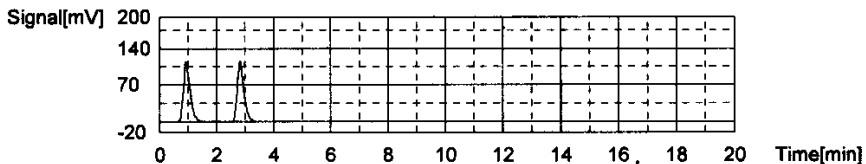


Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	189.0	500uL	1	*****		2/10/2017 3:12:24 PM
2	190.1	500uL	1	*****		2/10/2017 3:16:55 PM

dcn
3/23/17

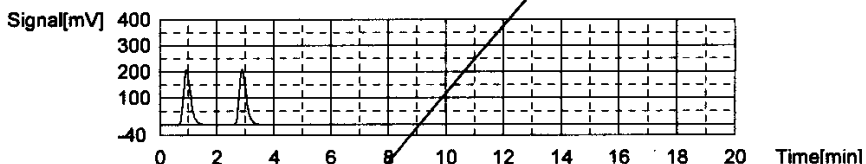
Acid Add. 3.000%
Mean Area 189.6



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	360.6	500uL	1	*****		2/10/2017 3:24:47 PM
2	362.2	500uL	1	*****		2/10/2017 3:29:24 PM

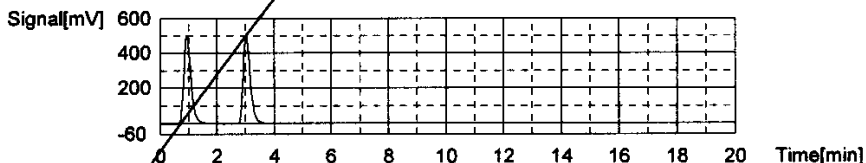
Acid Add. 3.000%
Mean Area 361.4



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	859.3	500uL	1	*****		2/10/2017 3:37:23 PM
2	856.9	500uL	1	*****		2/10/2017 3:42:16 PM

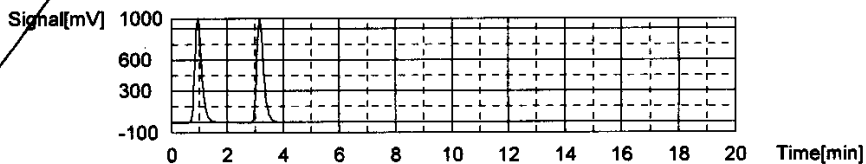
Acid Add. 3.000%
Mean Area 858.1



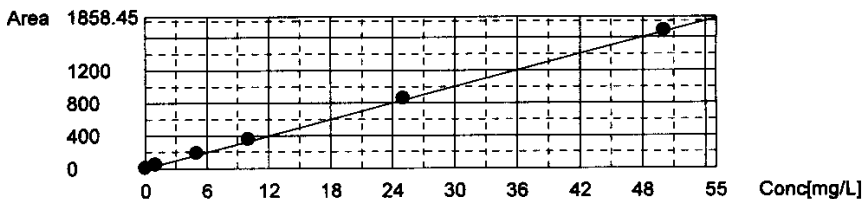
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1690	500uL	1	*****		2/10/2017 3:50:31 PM
2	1689	500uL	1	*****		2/10/2017 3:55:41 PM

Acid Add. 3.000%
Mean Area 1690



Slope: 33.49
Intercept: 0.000
r^2: 0.999919
Zero Shift: Yes



Sample

dcm

See following pages for curve, slope, intercept
and zero shift unchecked

TOC-V Cal Curve Information
TICCURVE-02-10-2017.2017_02_10_14_45_10.cal

Date of Creation 2:10:17 PM 2/10/2017
User
System TOCVW ASI

Cal. Curve

Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status Completed
Comment:

Type	Anal.
Standard	IC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.59	500uL	1	*****		2/10/2017 2:49:09 PM
2	10.43	500uL	1	*****		2/10/2017 2:53:06 PM

Acid Add. 3.000%
Mean Area 10.51
SD Area 0.1131
CV Area 1.08%
Vial 0

Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	48.13	500uL	1	*****		2/10/2017 3:00:24 PM
2	49.13	500uL	1	*****		2/10/2017 3:04:41 PM

Acid Add. 3.000%
Mean Area 48.63
SD Area 0.7071
CV Area 1.45%
Vial 1

Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	189.0	500uL	1	*****		2/10/2017 3:12:24 PM
2	190.1	500uL	1	*****		2/10/2017 3:16:55 PM

Acid Add. 3.000%
Mean Area 189.6
SD Area 0.7778
CV Area 0.41%
Vial 2

Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	360.6	500uL	1	*****		2/10/2017 3:24:47 PM
2	362.2	500uL	1	*****		2/10/2017 3:29:24 PM

Acid Add. 3.000%
 Mean Area 361.4
 SD Area 1.131
 CV Area 0.31%
 Vial 3

Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	859.3	500uL	1	*****		2/10/2017 3:37:23 PM
2	856.9	500uL	1	*****		2/10/2017 3:42:16 PM

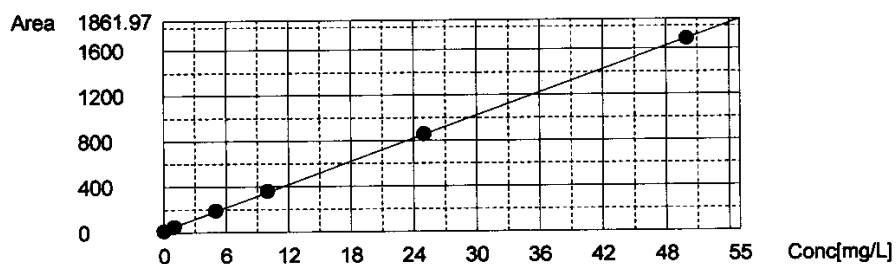
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1690	500uL	1	*****		2/10/2017 3:50:31 PM
2	1689	500uL	1	*****		2/10/2017 3:55:41 PM

Acid Add. 3.000%
 Mean Area 1690
 SD Area 0.7071
 CV Area 0.04%
 Vial 5

Slope: 33.49
 Intercept 18.41
 r^2 0.999919
 Zero Shift No



Sample Name: TIC CURVE
 Sample ID: Untitled
 Origin: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed
 Chk. Result:

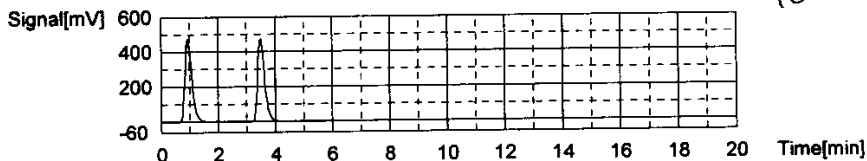
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

1. Det

Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	810.5	24.20mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 4:08:15 PM
2	814.6	24.33mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 4:12:07 PM

Mean Area 812.5
 Mean Conc. 24.27mg/L



Sample

Sample Name: Untitled
 Sample ID: TCCURVE-02-10-2017.2017_02_10_14_14_25.cal
 Origin: Completed
 Status: Completed
 Chk. Result:

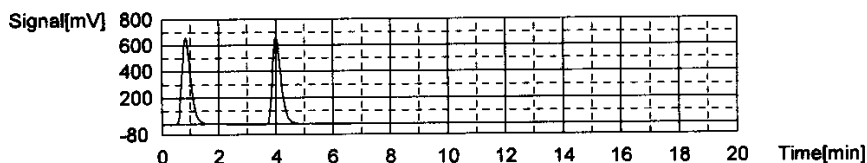
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1406	0.000mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_14_14	2/10/2017 4:25:42 PM
2	1411	0.000mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_14_14	2/10/2017 4:31:41 PM

Mean Area 1409
 Mean Conc. 0.000mg/L



Sample

Sample Name: TOC/TIC
 Sample ID: Untitled
 Origin: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed
 Chk. Result:

2/12/2017 11:18:36 AM

CURVES-02-10-2017.132

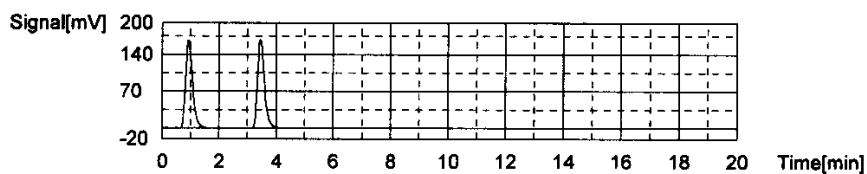
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

1. Det

Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	286.8	8.565mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	12/10/2017 4:37:09 PM
2	287.2	8.577mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	12/10/2017 4:42:05 PM

Mean Area 287.0
Mean Conc. 8.571mg/L



Sample

Sample Name: TOC/TIC
Sample ID: Untitled
Origin: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
Status: Completed
Chk. Result

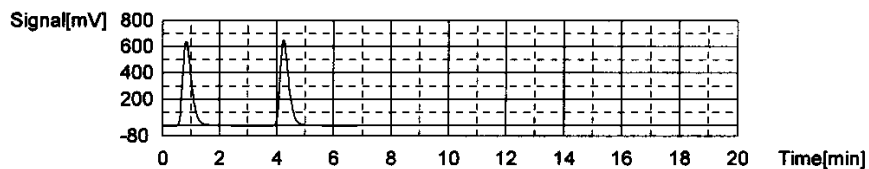
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1378	32.16mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	12/10/2017 4:55:07 PM
2	1373	32.04mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	12/10/2017 5:01:02 PM

Mean Area 1376
Mean Conc. 32.10mg/L



6/6

Total Organic Carbon

MAKE DAILY

CCV (TOC): Std 79381
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): Std 80416
 $(5/200)(1000) = 25\text{mg/L}$

Calibration Curve Date: 2/16/17

LCS (TOC): Std 80787
 $(5/200)(1000) = 25\text{mg/L}$

MS (TOC): Std 80787
 $0.4(1000) / 200 = 2$

Reagent: RCIT 40270
RCIT 38266

SM5310-C : Matrix 2 WG 619321

EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K 4151 Rev. 18

SW846 9060A (4 rep) WG _____ Instrument: Shimadza TOC-VWP/ASI

- DAILY CHECK**
- drain reservoir filled
 - ASI water bottle full
 - dilution water bottle full
 - 3rd bottle full
 - sufficient gas
 - sufficient persulfate
 - sufficient acid waste container

Position	Sample ID	Dilution	Position	Sample ID	Dilution	Position	Sample ID	Dilution
1	TIC		26	CCV		51		
2	TOC/TIC		27	CCB		52		
3	CCV		28	cl-1172-09		53		
4	Blk		29	11		54		
5	LCS		30	13	ct1	55		
6	LCS DUP		31	MS 17	ct1	56		
7	cl-1142-c1		32	MSD 19	ct1	57		
8	cl-1251-c1		33	DUP 1125	dem	58		
9	C2		34	CCV 1103-01	6/26/17	59		
10	cl-1252-c2		35	CCB 1103-05	1/2	60		
11	C4	1/25	36	1252-04	1/3	61		
12	cl-1105-c1		37	CCV		62		
13	C3		38	CCB		63		
14	CCV		39	CCB 1103-05	6/26/17	64		
15	CCB		40			65		
16	cl-1105-c5		41			66		
17	C7		42			67		
18	C9		43			68		
19	cl-1207-c2	1/4	44			69		
20	C4		45			70		
21	cl-1127-c1	1/3	46			71		
22	cl-1172-c1		47			72		
23	C3		48			73		
24	C5		49			74		
25	C7		50			75		

Analyst: David Morlock Date/Time: 6/26/17

* Sample diluted at 30x per client request

DCN#126664



	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:1.762mg/L TC:28.12mg/L IC:26.36mg/L	Complete	6/26/2017 11:01:57 AM	1
2	TOC	TOC/TIC	TOC:27.48mg/L TC:36.39mg/L IC:8.908mg/L	Complete	6/26/2017 11:20:27 AM	2
3	TOC	CCV	!!Error!! TOC:23.23mg/L TC:22.94mg/L IC:-0.2886mg/L	Complete	6/26/2017 11:32:46 AM	3
4	TOC	WG619321-01 BLK	!!Error!! TOC:0.08665mg/L TC:-0.1315mg/L IC:-0.2181mg/L	Complete	6/26/2017 11:49:26 AM	0
5	TOC	WG619321-02 LCS	!!Error!! TOC:26.27mg/L TC:25.96mg/L IC:-0.3099mg/L	Complete	6/26/2017 12:10:42 PM	5
6	TOC	WG619321-03 LCS DUF	!!Error!! TOC:26.51mg/L TC:26.21mg/L IC:-0.3095mg/L	Complete	6/26/2017 12:31:54 PM	6
7	TOC	L17061142-01	!!Error!! TOC:5.886mg/L TC:5.713mg/L IC:-0.1735mg/L	Complete	6/26/2017 12:53:28 PM	7
8	TOC	L17061251-01	TOC:6.708mg/L TC:22.36mg/L IC:15.65mg/L	Complete	6/26/2017 1:15:57 PM	8
9	TOC	L17061251-02	TOC:3.062mg/L TC:10.43mg/L IC:7.368mg/L	Complete	6/26/2017 1:37:06 PM	9
10	TOC	L17061252-02	TOC:3.268mg/L TC:10.93mg/L IC:7.666mg/L	Complete	6/26/2017 1:58:21 PM	10
11	TOC	<Untitled>	TOC:0.7277mg/L TC:2.354mg/L IC:1.626mg/L	Complete	6/26/2017 2:18:24 PM	11
12	TOC	<Untitled>	TOC:1.256mg/L TC:50.12mg/L IC:48.86mg/L	Complete	6/26/2017 2:42:30 PM	12
13	TOC	L17061103-03	TOC:3.729mg/L TC:41.26mg/L IC:37.53mg/L	Complete	6/26/2017 3:06:50 PM	13
14	TOC	CCV	!!Error!! TOC:23.02mg/L TC:22.94mg/L IC:-0.07420mg/L	Complete	6/26/2017 3:19:08 PM	14
15	TOC	CCB	!!Error!! TOC:0.05578mg/L TC:-0.1322mg/L IC:-0.1880mg/L	Complete	6/26/2017 3:28:09 PM	0
16	TOC	<Untitled>	!!Error!! TOC:-0.5089mg/L TC:53.58mg/L IC:54.09mg/L	Complete	6/26/2017 3:53:31 PM	16
17	TOC	L17061103-07	TOC:3.881mg/L TC:47.69mg/L IC:43.81mg/L	Complete	6/26/2017 4:37:51 PM	17
18	TOC	L17061103-09	TOC:2.544mg/L TC:21.84mg/L IC:19.29mg/L	Complete	6/26/2017 5:00:27 PM	18
19	TOC	L17061207-02 (4)	TOC:6.421mg/L TC:21.23mg/L IC:14.81mg/L	Complete	6/26/2017 5:22:24 PM	19
20	TOC	L17061207-04	TOC:19.26mg/L TC:34.59mg/L IC:15.34mg/L	Complete	6/26/2017 5:45:42 PM	20
21	TOC	L17061127-01 (3)	TOC:16.77mg/L TC:25.64mg/L IC:8.869mg/L	Complete	6/26/2017 6:08:21 PM	21
22	TOC	L17061172-01	TOC:3.965mg/L TC:23.67mg/L IC:19.70mg/L	Complete	6/26/2017 6:30:26 PM	22
23	TOC	L17061172-03	TOC:2.680mg/L TC:16.88mg/L IC:14.20mg/L	Complete	6/26/2017 6:52:07 PM	23
24	TOC	L17061172-05	TOC:3.788mg/L TC:21.99mg/L IC:18.20mg/L	Complete	6/26/2017 7:14:15 PM	24
25	TOC	L17061172-07	TOC:5.337mg/L TC:44.10mg/L IC:38.77mg/L	Complete	6/26/2017 7:37:31 PM	25
26	TOC	CCV	!!Error!! TOC:22.33mg/L TC:22.26mg/L IC:-0.07181mg/L	Complete	6/26/2017 7:49:49 PM	26
27	TOC	CCB	!!Error!! TOC:0.09989mg/L TC:-0.1511mg/L IC:-0.2510mg/L	Complete	6/26/2017 7:58:45 PM	0
28	TOC	L17061172-09	TOC:4.401mg/L TC:30.33mg/L IC:25.93mg/L	Complete	6/26/2017 8:22:20 PM	28
29	TOC	L17061172-11	TOC:2.726mg/L TC:17.87mg/L IC:15.14mg/L	Complete	6/26/2017 8:43:47 PM	29
30	TOC	L17061172-13	TOC:3.371mg/L TC:22.87mg/L IC:19.50mg/L	Complete	6/26/2017 9:06:15 PM	30
31	TOC	L17061172-17 MS	TOC:18.86mg/L TC:26.63mg/L IC:7.769mg/L	Complete	6/26/2017 9:28:25 PM	31
32	TOC	L17061172-19 MSD	TOC:15.50mg/L TC:27.41mg/L IC:11.91mg/L	Complete	6/26/2017 9:50:46 PM	32
33	TOC	WG619321-05 DUP	TOC:2.613mg/L TC:16.98mg/L IC:14.37mg/L	Complete	6/26/2017 10:12:24 PM	33
34	TOC	L17061103-01 (2)	TOC:1.244mg/L TC:10.94mg/L IC:9.693mg/L	Complete	6/26/2017 10:33:21 PM	34
35	TOC	L17061103-05 (2)	TOC:1.609mg/L TC:11.07mg/L IC:9.462mg/L	Complete	6/26/2017 10:54:39 PM	35
36	TOC	L17061252-04 (3)	TOC:4.001mg/L TC:11.35mg/L IC:7.353mg/L	Complete	6/26/2017 11:16:00 PM	36
37	TOC	CCV	!!Error!! TOC:23.45mg/L TC:23.20mg/L IC:-0.2408mg/L	Complete	6/26/2017 11:28:26 PM	37
38	TOC	CCB	!!Error!! TOC:0.1136mg/L TC:-0.1438mg/L IC:-0.2574mg/L	Complete	6/26/2017 11:37:23 PM	0

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

Instr. Information

System TOCVW ASI
 Detector Wet Chemical

Sample

Sample Name: TIC
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

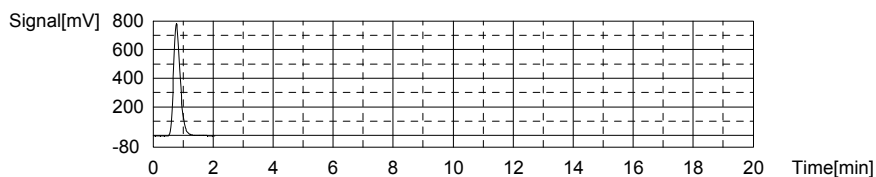
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.762mg/L TC:28.12mg/L IC:26.36mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1207	28.12mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 10:56:02 AM

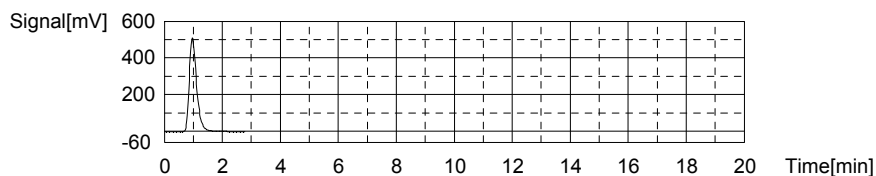
Mean Area 1207
 Mean Conc. 28.12mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	901.0	26.36mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/26/2017 11:01:57 AM

Mean Area 901.0
 Mean Conc. 26.36mg/L



Sample

Sample Name: TOC/TIC
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.48mg/L TC:36.39mg/L IC:8.908mg/L

1. Det

Anal.: TC

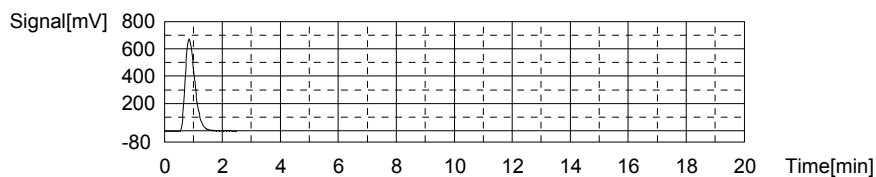
1/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1557	36.39mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 11:15:22 AM

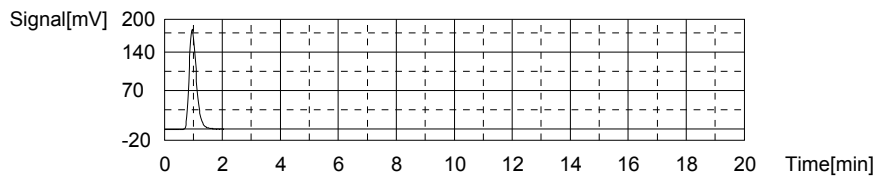
Mean Area 1557
Mean Conc. 36.39mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	316.7	8.908mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 11:20:27 AM

Mean Area 316.7
Mean Conc. 8.908mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

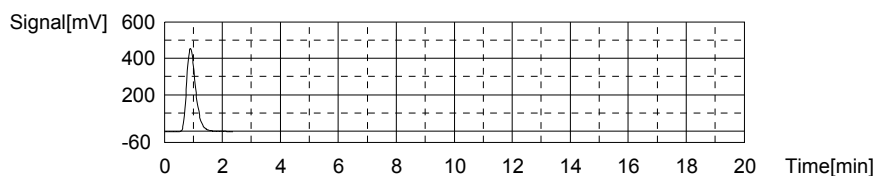
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.23mg/L TC:22.94mg/L IC:-0.2886mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	988.0	22.94mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 11:28:15 AM

Mean Area 988.0
Mean Conc. 22.94mg/L



Anal.: IC

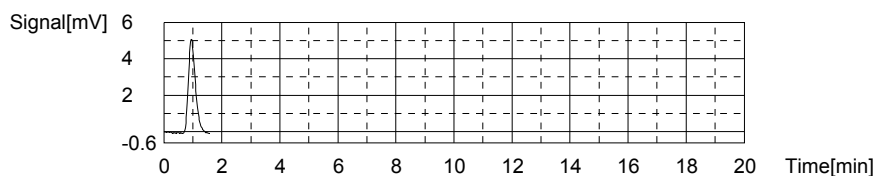
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.751	-0.2886mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 11:32:46 AM

2/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

Mean Area 8.751
Mean Conc. -0.2886mg/L



Sample

Sample Name: WG619321-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

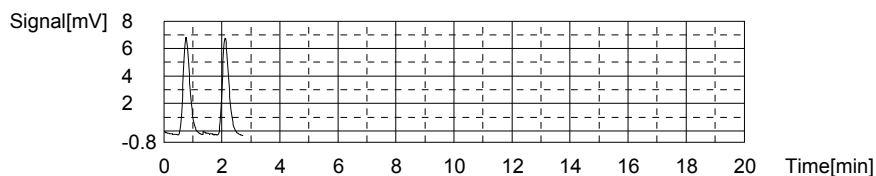
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.08665mg/L TC:-0.1315mg/L IC:-0.2181mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.36	-0.1301mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 11:37:46 AM
2	11.24	-0.1329mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 11:41:17 AM

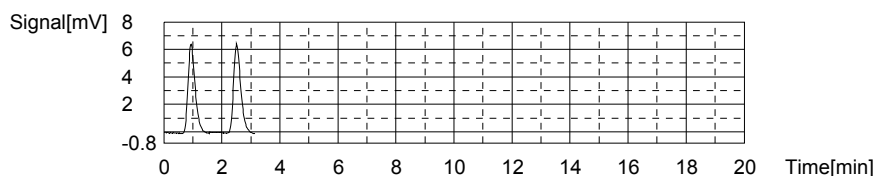
Mean Area 11.30
Mean Conc. -0.1315mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.07	-0.2193mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 11:45:21 AM
2	11.15	-0.2169mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 11:49:26 AM

Mean Area 11.11
Mean Conc. -0.2181mg/L



Sample

Sample Name: WG619321-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

3/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

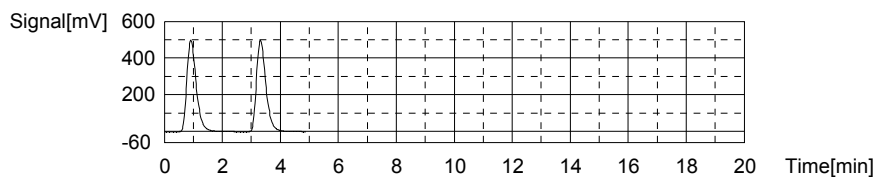
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.27mg/L TC:25.96mg/L IC:-0.3099mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1114	25.92mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 11:57:17 AM
2	1117	25.99mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 12:02:02 PM

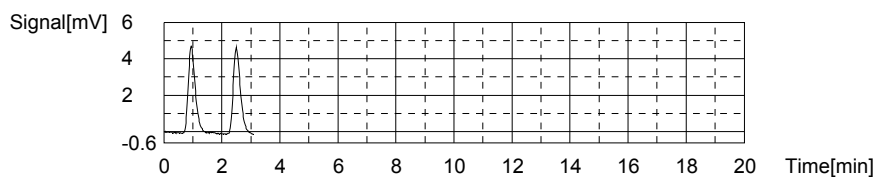
Mean Area 1116
Mean Conc. 25.96mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.008	-0.3108mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 12:06:30 PM
2	8.069	-0.3090mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 12:10:42 PM

Mean Area 8.039
Mean Conc. -0.3099mg/L



Sample

Sample Name: WG619321-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

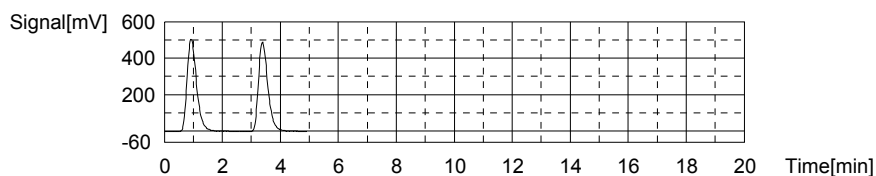
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.51mg/L TC:26.21mg/L IC:-0.3095mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1152	26.82mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 12:18:37 PM
2	1100	25.59mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 12:23:19 PM

Mean Area 1126
Mean Conc. 26.21mg/L



Anal.: IC

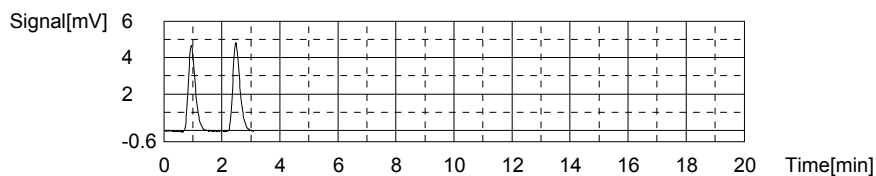
4/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.953	-0.3124mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 12:27:43 PM
2	8.151	-0.3065mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 12:31:54 PM

Mean Area 8.052
Mean Conc. -0.3095mg/L



Sample

Sample Name: L17061142-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

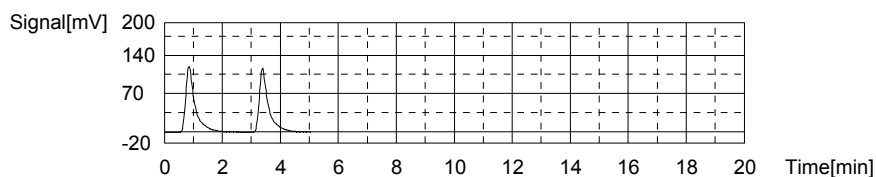
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:5.886mg/L TC:5.713mg/L IC:-0.1735mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	264.3	5.846mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 12:39:53 PM
2	253.0	5.579mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 12:44:39 PM

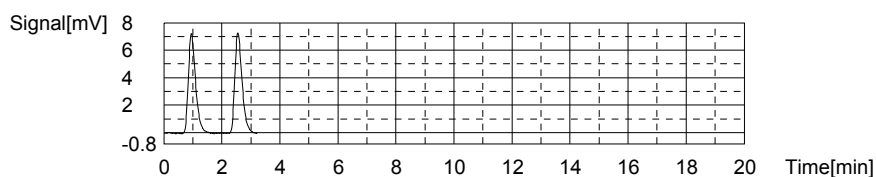
Mean Area 258.6
Mean Conc. 5.713mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.60	-0.1736mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 12:49:09 PM
2	12.61	-0.1733mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 12:53:28 PM

Mean Area 12.61
Mean Conc. -0.1735mg/L



Sample

5/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

Sample Name: L17061251-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

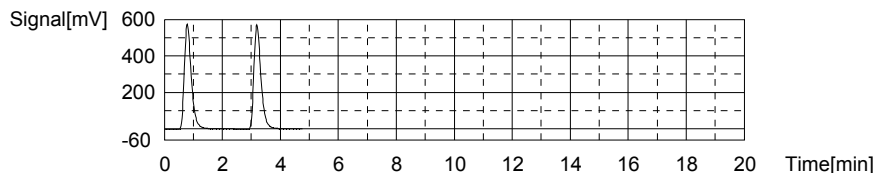
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:6.708mg/L TC:22.36mg/L IC:15.65mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	960.8	22.30mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 1:01:19 PM
2	965.5	22.41mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 1:05:56 PM

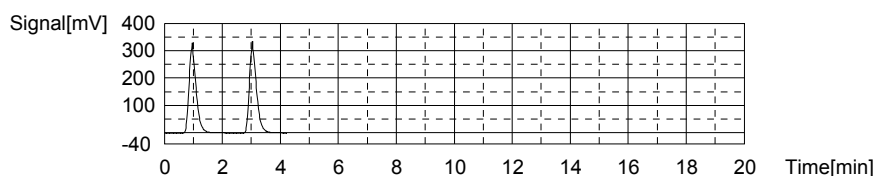
Mean Area 963.2
 Mean Conc. 22.36mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	536.7	15.48mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 1:10:59 PM
2	548.2	15.82mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 1:15:57 PM

Mean Area 542.5
 Mean Conc. 15.65mg/L



Sample

Sample Name: L17061251-02
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.062mg/L TC:10.43mg/L IC:7.368mg/L

1. Det

Anal.: TC

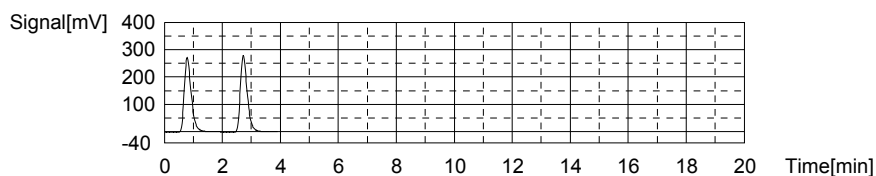
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	451.5	10.27mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 1:23:20 PM
2	465.2	10.59mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 1:27:34 PM

6/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.132

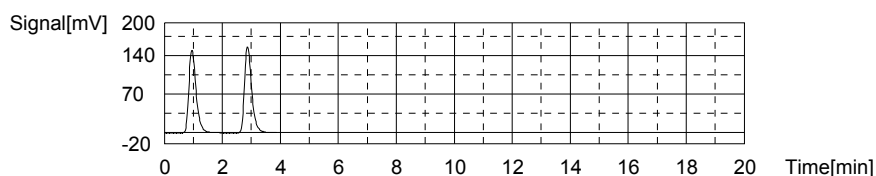
Mean Area 458.4
Mean Conc. 10.43mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	259.8	7.209mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 1:32:27 PM
2	270.5	7.528mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 1:37:06 PM

Mean Area 265.1
Mean Conc. 7.368mg/L



Sample

Sample Name: L17061252-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

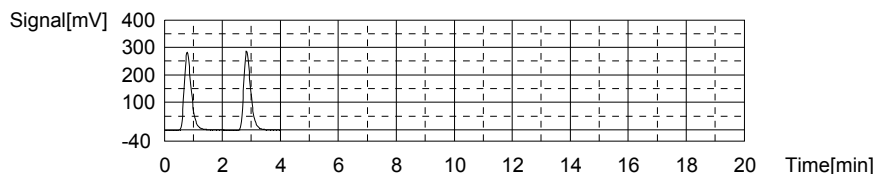
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.268mg/L TC:10.93mg/L IC:7.666mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	477.3	10.88mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 1:44:36 PM
2	482.0	10.99mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 1:48:50 PM

Mean Area 479.6
Mean Conc. 10.93mg/L



Anal.: IC

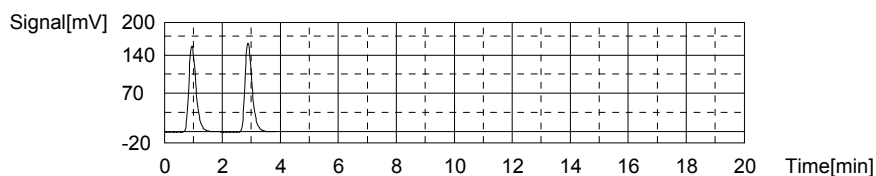
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	271.4	7.555mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 1:53:44 PM
2	278.8	7.776mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 1:58:21 PM

7/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

Mean Area 275.1
Mean Conc. 7.666mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

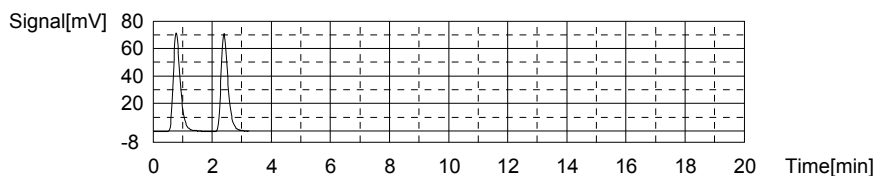
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.7277mg/L TC:2.354mg/L IC:1.626mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	116.7	2.359mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 2:05:24 PM
2	116.3	2.349mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 2:09:18 PM

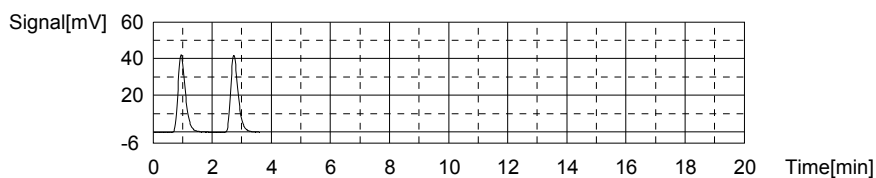
Mean Area 116.5
Mean Conc. 2.354mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	73.16	1.635mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 2:13:56 PM
2	72.59	1.618mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 2:18:24 PM

Mean Area 72.88
Mean Conc. 1.626mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

8/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

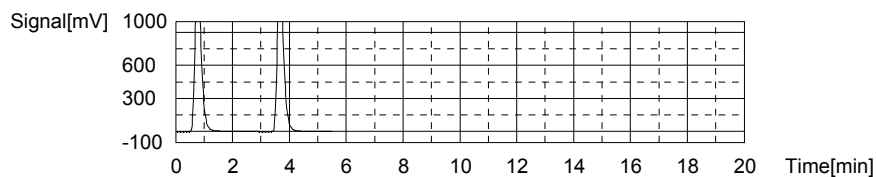
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.256mg/L TC:50.12mg/L IC:48.86mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2138	50.12mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 2:26:45 PM
2	2138	50.12mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 2:31:39 PM

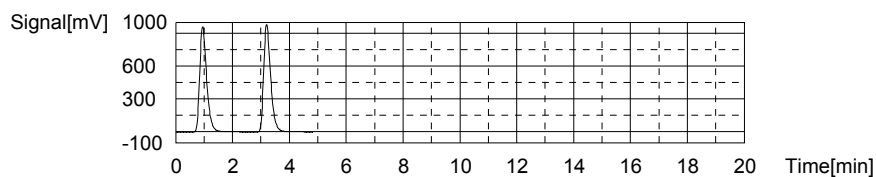
Mean Area 2138
Mean Conc. 50.12mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1639	48.40mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 2:37:02 PM
2	1670	49.32mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 2:42:30 PM

Mean Area 1655
Mean Conc. 48.86mg/L



Sample

Sample Name: L17061103-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

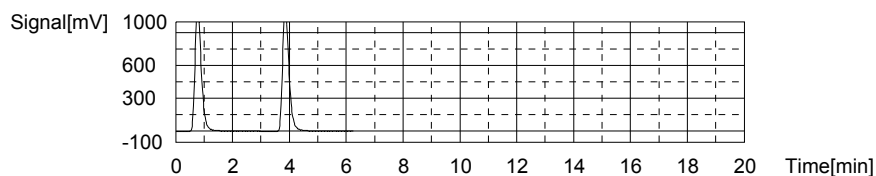
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.729mg/L TC:41.26mg/L IC:37.53mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1762	41.23mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 2:51:02 PM
2	1764	41.28mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 2:56:28 PM

Mean Area 1763
Mean Conc. 41.26mg/L



Anal.: IC

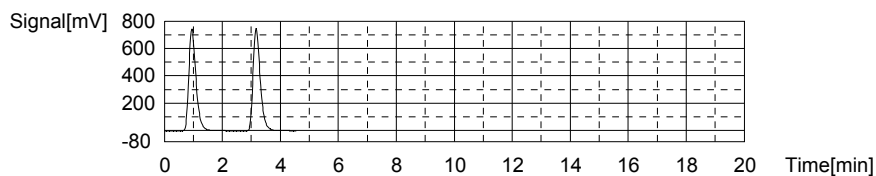
9/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1270	37.38mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 3:01:43 PM
2	1280	37.68mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 3:06:50 PM

Mean Area 1275
Mean Conc. 37.53mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

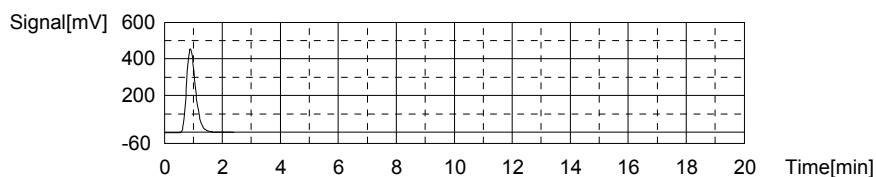
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.02mg/L TC:22.94mg/L IC:-0.07420mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	988.0	22.94mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32	16/26/2017 3:14:38 PM

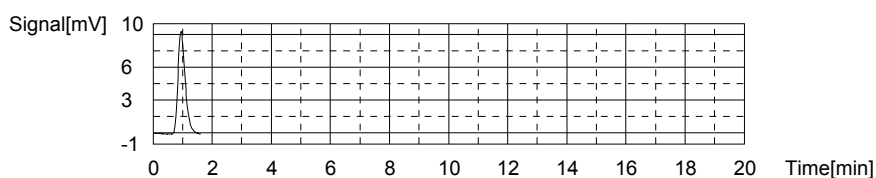
Mean Area 988.0
Mean Conc. 22.94mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	15.93	-0.07420mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 3:19:08 PM

Mean Area 15.93
Mean Conc. -0.07420mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

10/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

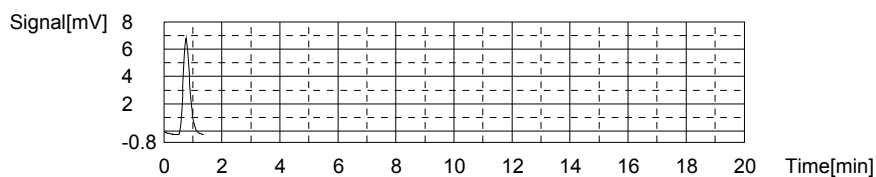
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.05578mg/L TC:-0.1322mg/L IC:-0.1880mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.27	-0.1322mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 3:24:08 PM

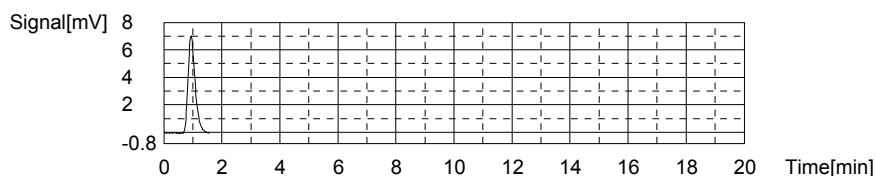
Mean Area 11.27
Mean Conc. -0.1322mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.12	-0.1880mg/L	500uL	1	1	TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 3:28:09 PM

Mean Area 12.12
Mean Conc. -0.1880mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

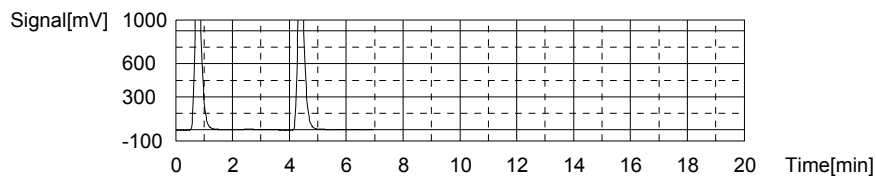
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-0.5089mg/L TC:53.58mg/L IC:54.09mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2279	53.45mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 3:37:13 PM
2	2290	53.71mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 3:42:49 PM

Mean Area 2285
Mean Conc. 53.58mg/L



Anal.: IC

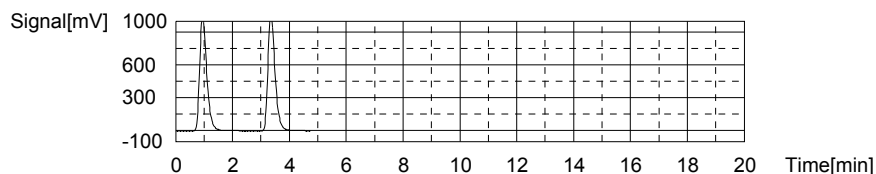
11/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1823	53.89mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 3:48:19 PM
2	1836	54.28mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 3:53:31 PM

Mean Area 1830
Mean Conc. 54.09mg/L



Sample

Sample Name: L17061103-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

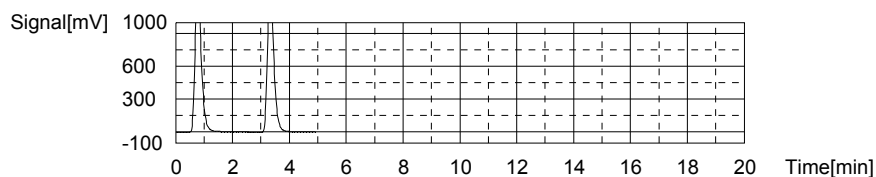
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.881mg/L TC:47.69mg/L IC:43.81mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2036	47.71mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 4:21:52 PM
2	2035	47.68mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 4:27:26 PM

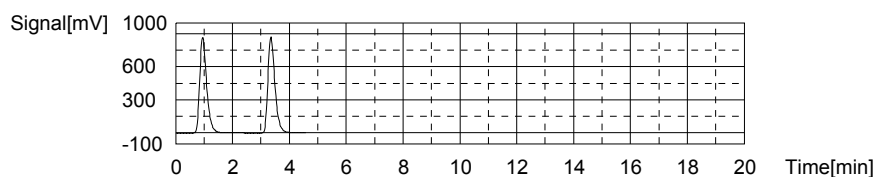
Mean Area 2036
Mean Conc. 47.69mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1482	43.71mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 4:32:53 PM
2	1489	43.92mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 4:37:51 PM

Mean Area 1486
Mean Conc. 43.81mg/L



Sample

12/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

Sample Name: L17061103-09
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

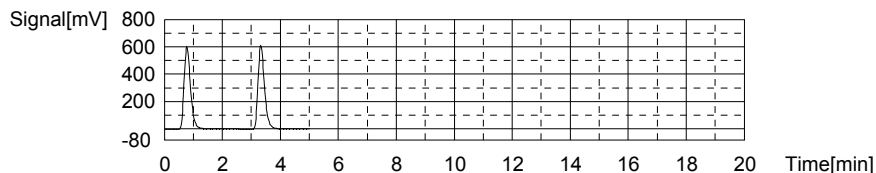
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.544mg/L TC:21.84mg/L IC:19.29mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	932.7	21.64mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 4:45:51 PM
2	949.4	22.03mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 4:50:35 PM

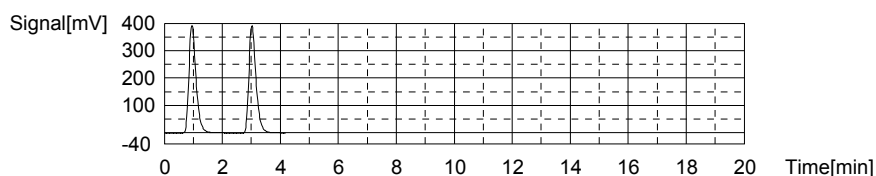
Mean Area 941.1
 Mean Conc. 21.84mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	666.8	19.36mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 4:55:39 PM
2	662.0	19.22mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 5:00:27 PM

Mean Area 664.4
 Mean Conc. 19.29mg/L



Sample

Sample Name: L17061207-02 (4)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:6.421mg/L TC:21.23mg/L IC:14.81mg/L

1. Det

Anal.: TC

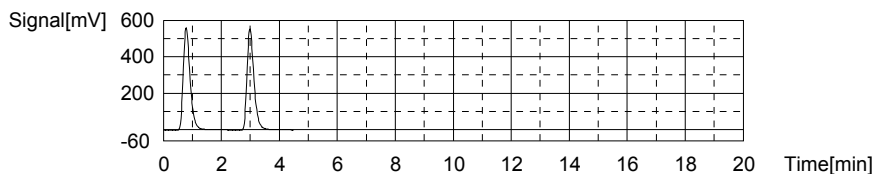
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	915.0	21.22mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 5:08:06 PM
2	915.6	21.23mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 5:12:40 PM

13/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.132

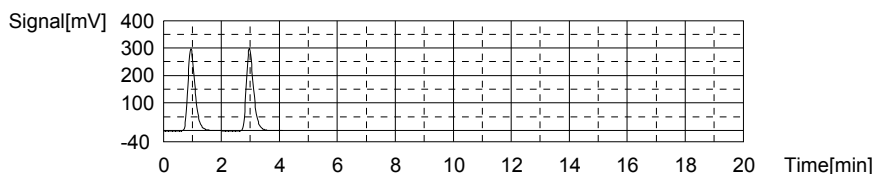
Mean Area 915.3
Mean Conc. 21.23mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	513.1	14.77mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 5:17:38 PM
2	515.3	14.84mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 5:22:24 PM

Mean Area 514.2
Mean Conc. 14.81mg/L



Sample

Sample Name: L17061207-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

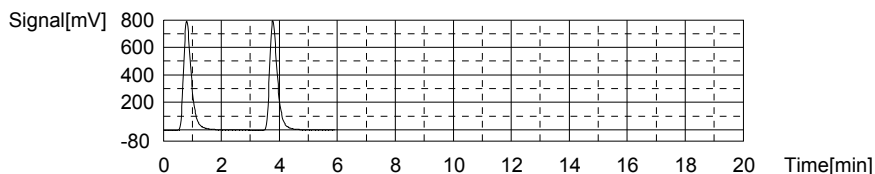
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:19.26mg/L TC:34.59mg/L IC:15.34mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1479	34.55mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 5:30:49 PM
2	1483	34.64mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 5:36:02 PM

Mean Area 1481
Mean Conc. 34.59mg/L



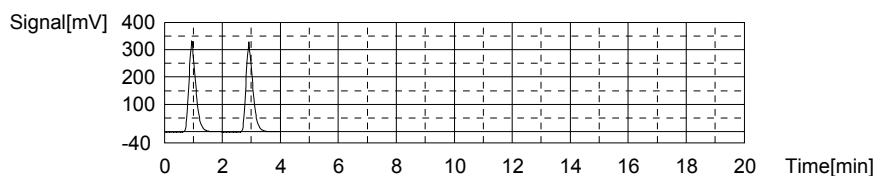
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	533.9	15.39mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 5:40:56 PM
2	530.1	15.28mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 5:45:42 PM

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

Mean Area 532.0
Mean Conc. 15.34mg/L



Sample

Sample Name: L17061127-01 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

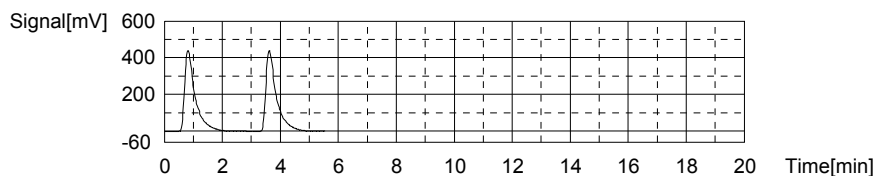
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:16.77mg/L TC:25.64mg/L IC:8.869mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1100	25.59mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 5:53:57 PM
2	1104	25.69mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 5:58:59 PM

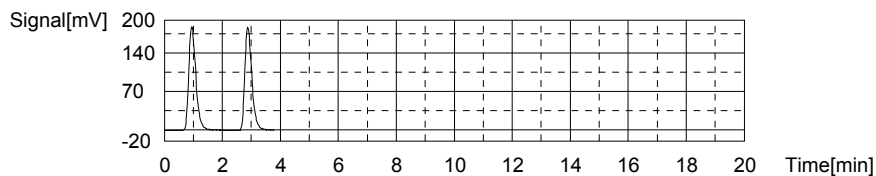
Mean Area 1102
Mean Conc. 25.64mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	317.5	8.932mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/26/2017 6:03:52 PM
2	313.3	8.806mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/26/2017 6:08:21 PM

Mean Area 315.4
Mean Conc. 8.869mg/L



Sample

Sample Name: L17061172-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

15/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

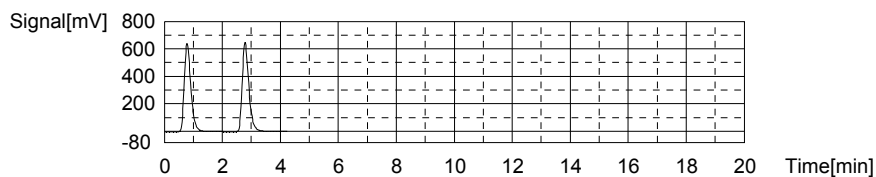
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.965mg/L TC:23.67mg/L IC:19.70mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1002	23.28mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 6:15:48 PM
2	1035	24.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 6:20:27 PM

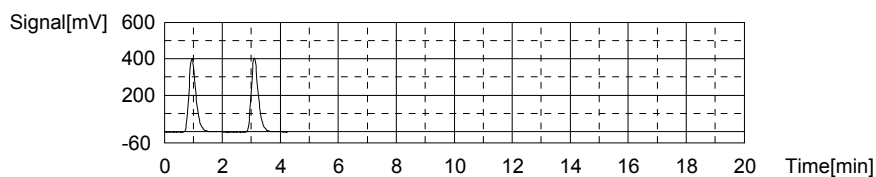
Mean Area 1019
Mean Conc. 23.67mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	674.9	19.60mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 6:25:33 PM
2	681.3	19.80mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 6:30:26 PM

Mean Area 678.1
Mean Conc. 19.70mg/L



Sample

Sample Name: L17061172-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

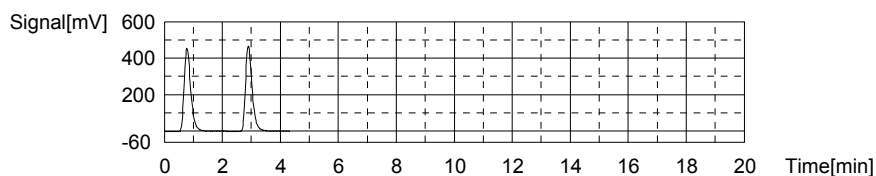
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.680mg/L TC:16.88mg/L IC:14.20mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	719.7	16.61mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 6:38:00 PM
2	743.3	17.16mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 6:42:29 PM

Mean Area 731.5
Mean Conc. 16.88mg/L



Anal.: IC

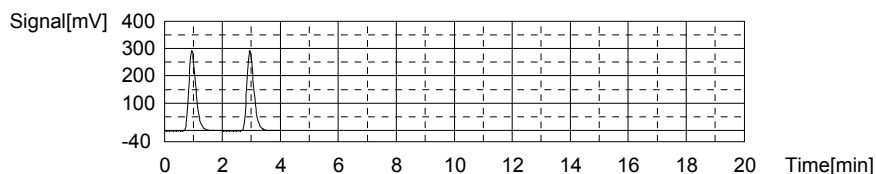
16/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	494.6	14.22mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 6:47:27 PM
2	493.5	14.19mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 6:52:07 PM

Mean Area 494.1
Mean Conc. 14.20mg/L



Sample

Sample Name: L17061172-05
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

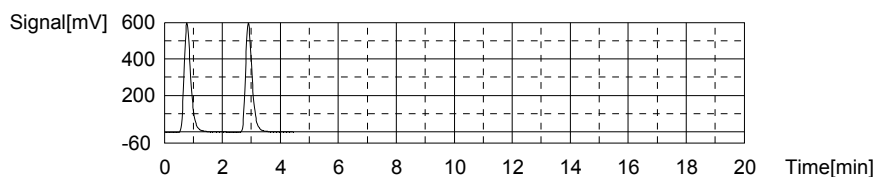
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.788mg/L TC:21.99mg/L IC:18.20mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	947.8	21.99mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 6:59:41 PM
2	947.6	21.99mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 7:04:29 PM

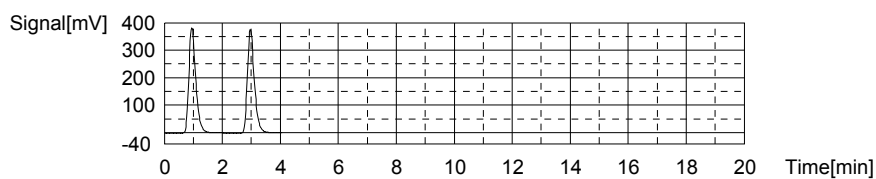
Mean Area 947.7
Mean Conc. 21.99mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	630.7	18.28mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 7:09:29 PM
2	625.3	18.12mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 7:14:15 PM

Mean Area 628.0
Mean Conc. 18.20mg/L



Sample

17/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

Sample Name: L17061172-07
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

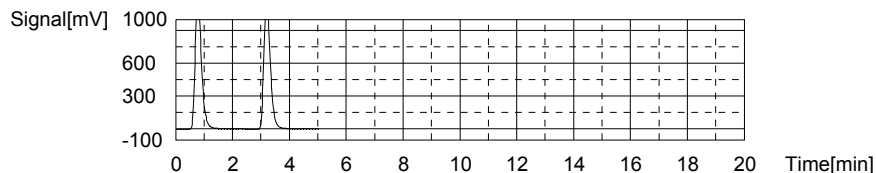
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.337mg/L TC:44.10mg/L IC:38.77mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1886	44.16mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 7:22:07 PM
2	1881	44.04mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 7:27:07 PM

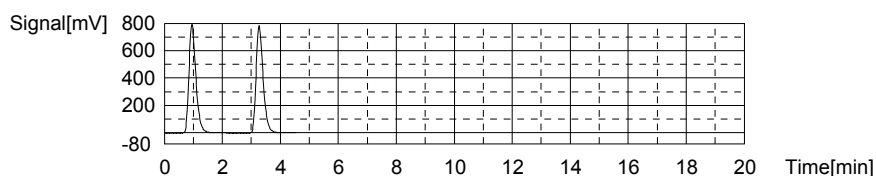
Mean Area 1884
 Mean Conc. 44.10mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1319	38.84mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 7:32:29 PM
2	1314	38.69mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 7:37:31 PM

Mean Area 1317
 Mean Conc. 38.77mg/L



Sample

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:22.33mg/L TC:22.26mg/L IC:-0.07181mg/L

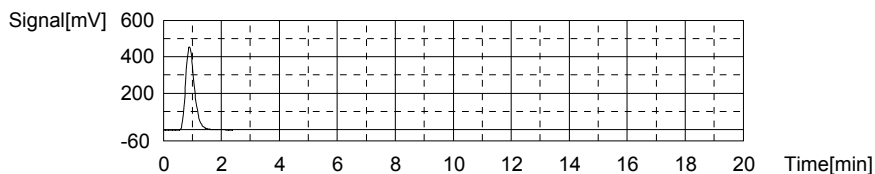
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	959.1	22.26mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 7:45:20 PM

18/27

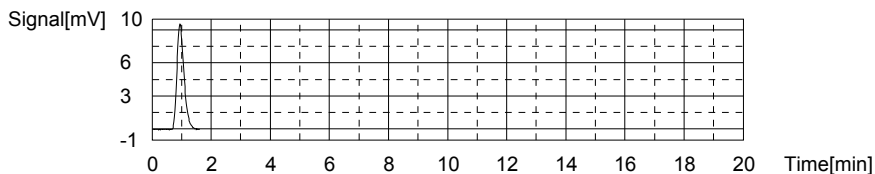
Mean Area 959.1
Mean Conc. 22.26mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	16.01	-0.07181mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 7:49:49 PM

Mean Area 16.01
Mean Conc. -0.07181mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

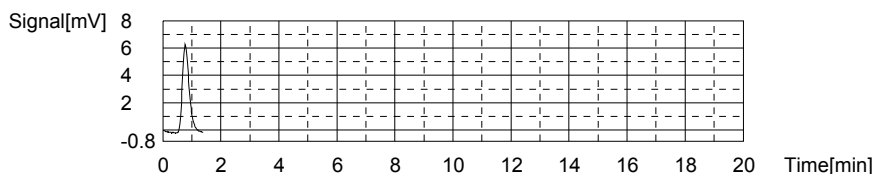
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.09989mg/L TC:-0.1511mg/L IC:-0.2510mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.47	-0.1511mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 7:54:50 PM

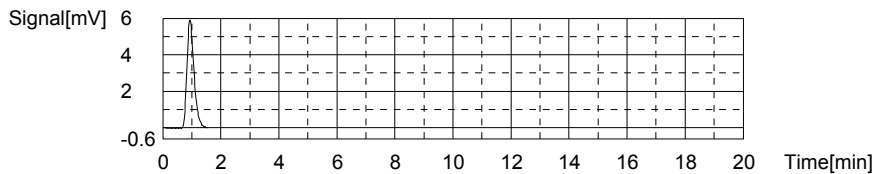
Mean Area 10.47
Mean Conc. -0.1511mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.01	-0.2510mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 7:58:45 PM

Mean Area 10.01
Mean Conc. -0.2510mg/L



6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

Sample

Sample Name: L17061172-09
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

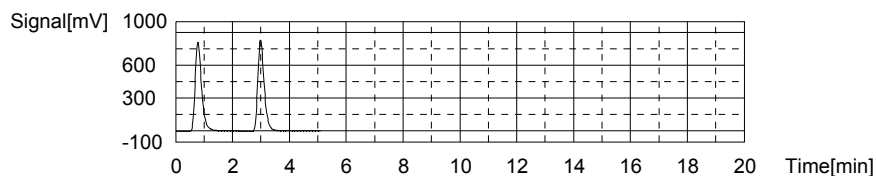
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.401mg/L TC:30.33mg/L IC:25.93mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1286	29.99mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 8:06:24 PM
2	1315	30.67mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 8:12:25 PM

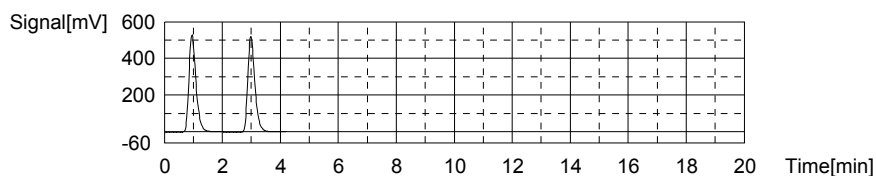
Mean Area 1301
 Mean Conc. 30.33mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	892.8	26.11mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 8:17:25 PM
2	880.4	25.74mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 8:22:20 PM

Mean Area 886.6
 Mean Conc. 25.93mg/L



Sample

Sample Name: L17061172-11
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.726mg/L TC:17.87mg/L IC:15.14mg/L

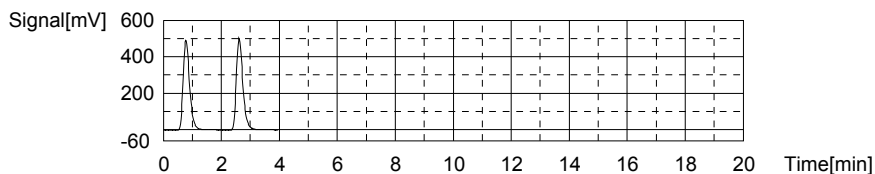
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	756.9	17.48mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 8:29:38 PM
2	789.2	18.25mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 8:34:03 PM

20/27

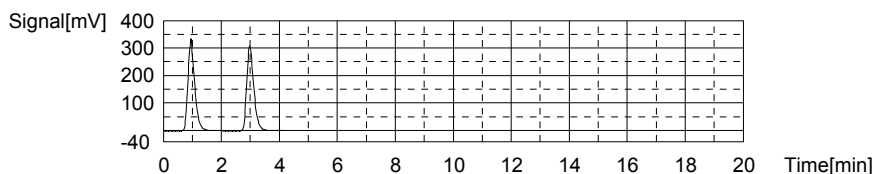
Mean Area 773.1
Mean Conc. 17.87mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	532.8	15.36mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 8:39:01 PM
2	518.0	14.92mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 8:43:47 PM

Mean Area 525.4
Mean Conc. 15.14mg/L



Sample

Sample Name: L17061172-13
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

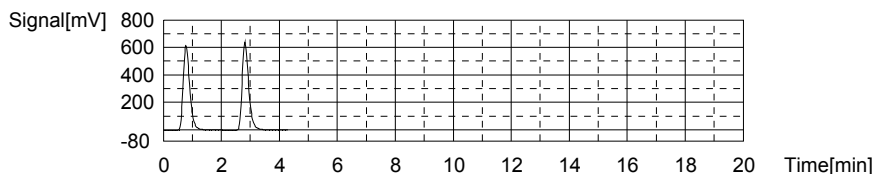
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.371mg/L TC:22.87mg/L IC:19.50mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	957.8	22.23mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 8:51:16 PM
2	1012	23.51mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 8:56:39 PM

Mean Area 984.9
Mean Conc. 22.87mg/L



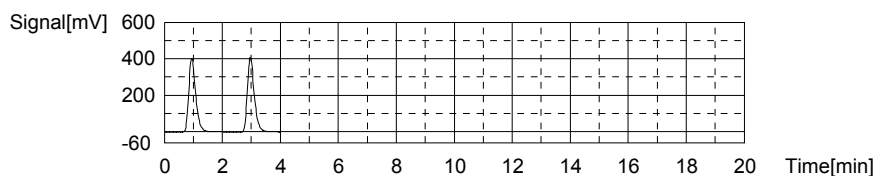
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	669.4	19.44mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 9:01:37 PM
2	673.4	19.56mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 9:06:15 PM

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

Mean Area 671.4
Mean Conc. 19.50mg/L



Sample

Sample Name: L17061172-17 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

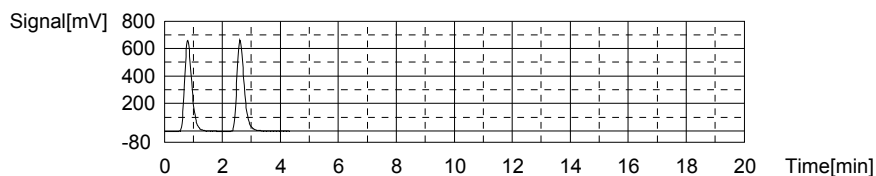
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:18.86mg/L TC:26.63mg/L IC:7.769mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1121	26.09mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 9:13:31 PM
2	1167	27.17mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 9:19:11 PM

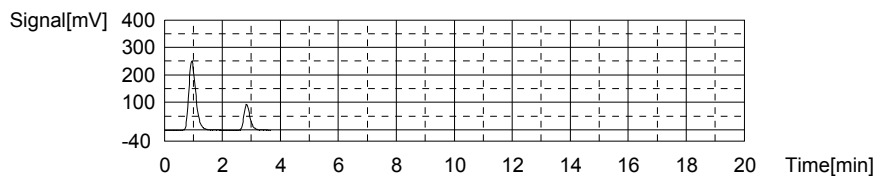
Mean Area 1144
Mean Conc. 26.63mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	419.8	11.99mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 9:24:03 PM
2	137.3	3.550mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 9:28:25 PM

Mean Area 278.6
Mean Conc. 7.769mg/L



Sample

Sample Name: L17061172-19 MSD
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

22/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

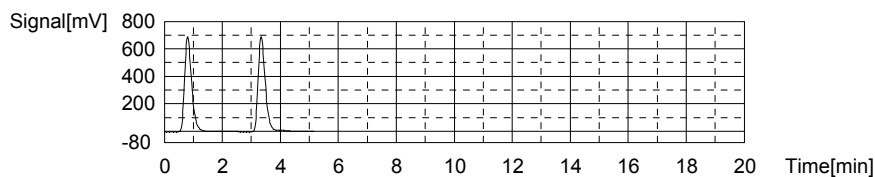
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:15.50mg/L TC:27.41mg/L IC:11.91mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1161	27.03mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 9:36:25 PM
2	1193	27.79mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 9:41:20 PM

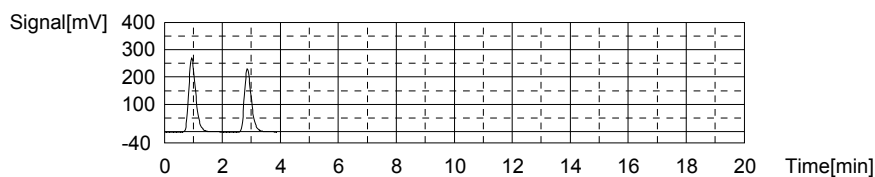
Mean Area 1177
Mean Conc. 27.41mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	448.8	12.85mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 9:46:08 PM
2	385.6	10.97mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 9:50:46 PM

Mean Area 417.2
Mean Conc. 11.91mg/L



Sample

Sample Name: WG619321-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

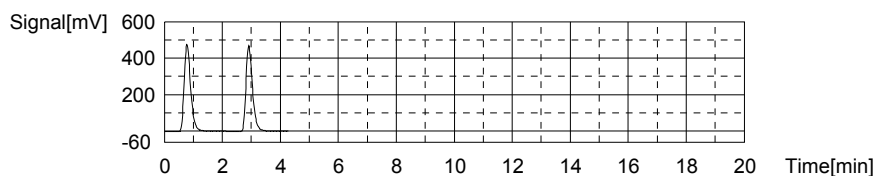
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.613mg/L TC:16.98mg/L IC:14.37mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	738.5	17.05mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 9:58:21 PM
2	732.6	16.91mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 10:02:46 PM

Mean Area 735.5
Mean Conc. 16.98mg/L



Anal.: IC

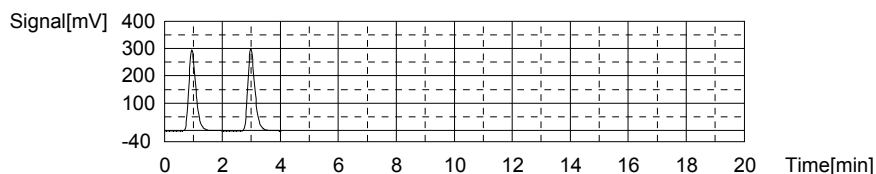
23/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	496.2	14.27mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 10:07:42 PM
2	502.8	14.47mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 10:12:24 PM

Mean Area 499.5
Mean Conc. 14.37mg/L



Sample

Sample Name: L17061103-01 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

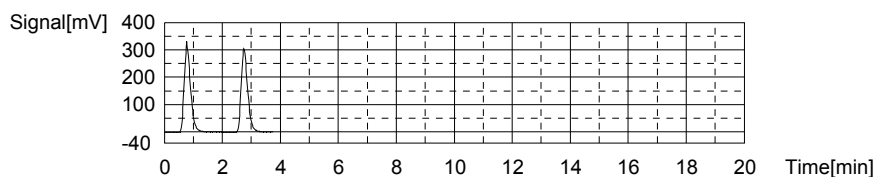
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.244mg/L TC:10.94mg/L IC:9.693mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	486.4	11.09mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 10:19:50 PM
2	473.2	10.78mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/26/2017 10:23:57 PM

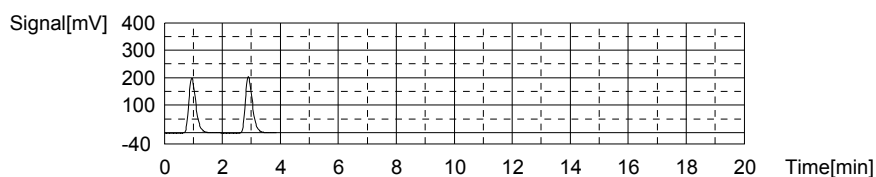
Mean Area 479.8
Mean Conc. 10.94mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	338.7	9.565mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 10:28:48 PM
2	347.3	9.822mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 10:33:21 PM

Mean Area 343.0
Mean Conc. 9.693mg/L



Sample

24/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

Sample Name: L17061103-05 (2)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

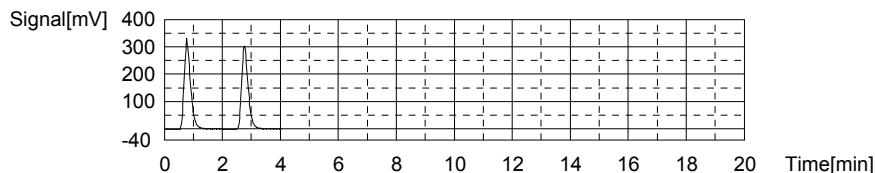
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.609mg/L TC:11.07mg/L IC:9.462mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	494.6	11.29mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 10:40:48 PM
2	476.3	10.85mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 10:45:09 PM

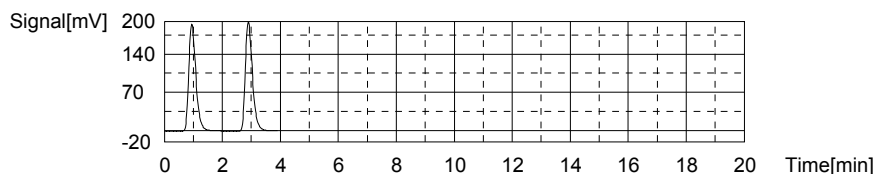
Mean Area 485.5
 Mean Conc. 11.07mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	330.5	9.320mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 10:50:01 PM
2	340.0	9.604mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 10:54:39 PM

Mean Area 335.3
 Mean Conc. 9.462mg/L



Sample

Sample Name: L17061252-04 (3)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.001mg/L TC:11.35mg/L IC:7.353mg/L

1. Det

Anal.: TC

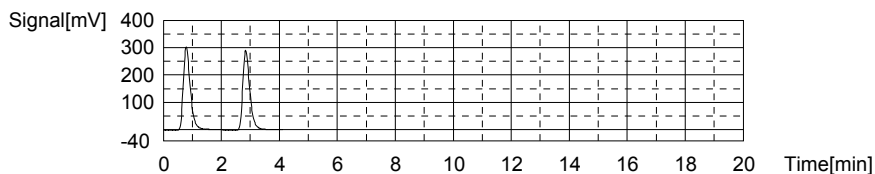
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	505.8	11.55mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 11:02:10 PM
2	489.1	11.16mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 11:06:42 PM

25/27

6/27/2017 7:15:13 AM

06-26-2017-DCM-TOC.i32

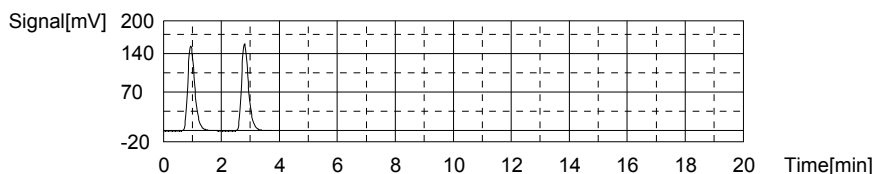
Mean Area 497.5
Mean Conc. 11.35mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	261.7	7.265mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 11:11:28 PM
2	267.6	7.442mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 11:16:00 PM

Mean Area 264.6
Mean Conc. 7.353mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

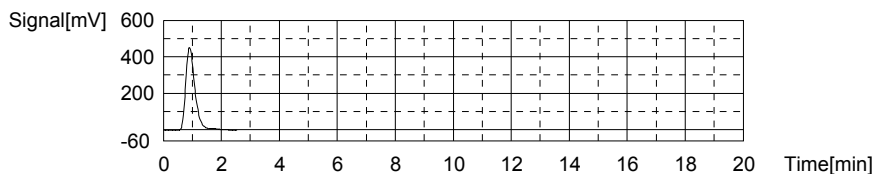
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.45mg/L TC:23.20mg/L IC:-0.2408mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	999.0	23.20mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	16/26/2017 11:24:00 PM

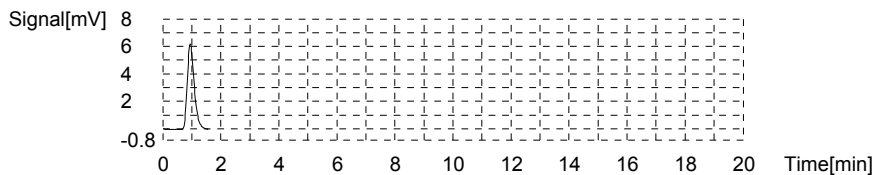
Mean Area 999.0
Mean Conc. 23.20mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.35	-0.2408mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/26/2017 11:28:26 PM

Mean Area 10.35
Mean Conc. -0.2408mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

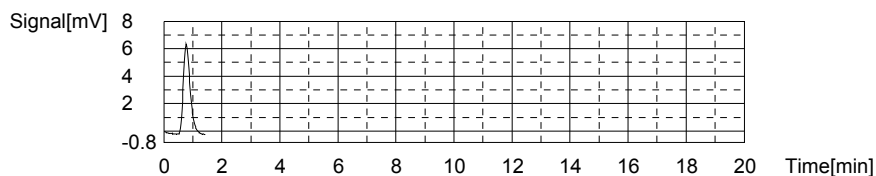
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1136mg/L TC:-0.1438mg/L IC:-0.2574mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.78	-0.1438mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/26/2017 11:33:29 PM

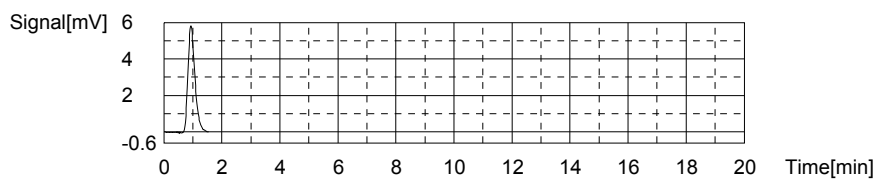
Mean Area 10.78
 Mean Conc. -0.1438mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.795	-0.2574mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/26/2017 11:37:23 PM

Mean Area 9.795
 Mean Conc. -0.2574mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
June 29, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
ALS - ADRIANE L. STEED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BLG - BRENDA L. GREENWALT	BNB - Brandi N. Bentley
BRG - BRENDA R. GREGORY	CAS - Craig A. Smith
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL	CV - Carl Volkman
DAK - DEAN A. KETELSEN	DCM - DAVID C. MERCKLE
DEV - DAVID E. VANDENBERG	DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER	DLP - DOROTHY L. PAYNE
DSM - DAVID S. MOSSOR	DTG - DOMINIC T. GEHRET
ECL - ERIC C. LAWSON	EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER	FJB - FRANCES J. BOLDEN
HRF - HEATHER R. FAIRCHILD	JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH	JKP - JACQUELINE K. PARSONS
JLD - JESSICA L. DELONG	JST - JOSHUA S. TAYLOR
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KDD - Katelyn D. Daley
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRP - KATHY R. PARSONS	LJH - Lacey J. Hendershot
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
OJE - OMOYEMWEN J. ENGLISH	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCA - SUEELLEN C. ADAMS
SCB - SARAH C. BOGOLIN	SCJ - SUE ELLEN C. JOHNSON
SDC - SHALYN D. CONLEY	TB - TODD BOYLE
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	ZTB - ZACH T. BARNES

List of Valid Qualifiers

June 29, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample receipt exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentatively identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound



List of Valid Qualifiers

June 29, 2017

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below





Chain of Custody Record

COC Number:

Project Manager: **ELSPETH STARR**
 Phone/Fax Number: 210-296-2000
 Sampler (print): Scott Beesinger
 Signature:

Laboratory: Microbac POC: Stephanie Mossburg
 Address: 158 Starlite Drive
 Marietta, OH 45750
 Phone: 1-800-373-4071
 Client: AECOM
 Address: 112 East Pecan Ste. 400
 San Antonio, TX 78205

Mail to: Linda Raabe
 112 East Pecan STE. 400
 San Antonio, TX 78205
 210-296-2000
 Fed Ex Airbill No:

Turn Around Time: **STANDARD**
 Project Name/Location: Longhorn
 Project Number: **60256135, GWRTHRUMAR16**
 pH:

Program:
 ERPIMS REQUIRED FIELDS

Site Name	Sample ID/Location ID	SBD	SED	Date	Time	Comp	Grab	Matrix	Number of Containers	LOT CONTROL NUMBERS					
										SA CODE	Cooler ID	ABLLOT	EBLLOT	TBLLOT	
GWRTP Weekly	1418/24-SP650-6451			6/21/17	1500		X	3	4	X					

Comments: **STANDARD TAT**

Reinlquished by: *Scott Beesinger* (Signature)
 Time: 1545
 Date: 6/21/17

Reinlquished by: *Anna Stinson* (Signature)
 Time: 221000102398
 Date: 06/22/2017 09:38
 By: CARA STRICKLER

Microbac OVD
 Received: 06/22/2017 09:38
 By: CARA STRICKLER

Reinlquished by: (Signature)
 Time

Remarks:

Distribution: White to Laboratory, Canary to Project Manager, Pink QA/QC Manager

COOLER TEMP >6° C LOG

Cooler ID: 2398

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C

Big 6/22/17

pH Lot # HC601354

pH Exceptions

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6

Big 6/22/17

**PRESERVATIVE
EXCEPTIONS**

NONE
 AS NOTED

Big 6/22/17

Document Control # 1957
Last 10-07-2016

Issued to: Document Master File

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17061127

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 03-JUL-2017

Samplenum Container ID Products
L17061127-01 925177 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	22-JUN-2017 10:01	CLS		

Samplenum Container ID Products
L17061127-01 925178 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	22-JUN-2017 10:01	CLS		
2	ANALYZ	W1	SEM	26-JUN-2017 10:51	WTD	CLS	
3	STORE	SEM	A1	27-JUN-2017 16:09	BRG	WTD	

Samplenum Container ID Products
L17061127-01 925179 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	22-JUN-2017 10:01	CLS		<2
2	ANALYZ	W1	WET	26-JUN-2017 10:32	DCM	CLS	

Samplenum Container ID Products
L17061127-01 925180 NH3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	22-JUN-2017 10:01	CLS		<2
2	ANALYZ	W1	WET	22-JUN-2017 10:27	EPT	BRG	
3	STORE	WET	A1	22-JUN-2017 14:23	CLS	EPT	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
Total Halide by Bomb Combustion (TX)
Particle Sizing - 200 Mesh (PS200)
Specific Gravity/Density (SPGRAV)
Total Residual Chlorine (CL-TRL)
Total Volatile Solids (all forms) (TVS)
Total Coliform Bacteria (all methods)
Fecal Coliform Bacteria (all methods)
Sulfite (SO₃)
Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS

Nitrogen, Ammonia by Method 350.1
Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
Phenolics, Total by Method 420.1
ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
Acetic acid
Butyric acid
Lactic acid
Propionic acid
Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
1-Methylnaphthalene
1,4-Dioxane
Atrazine
Benzaldehyde
Biphenyl
Caprolactam
Hexamethylphosphoramide (HMPA)
Pentachlorobenzene
Pentachloroethane

NELAP Accreditation by Laboratory SOP**NONPOTABLE WATER**OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALSOVD MSS01/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP**SOLID AND HAZARDOUS CHEMICALS**OVD MSV01/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)



Laboratory Report Number: L17061495

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on July 10 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Microbac Laboratories * Ohio Valley Division
158 Starlite Drive, Marietta, OH 45750 * T: (740) 373-4071 F: (740) 373-4835 * www.microbac.com

Lab Report #: L17061495

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

There were no discrepancies.

Discrepancy	Resolution

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0018697	I	4.0		J4616881953	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	NA

**Lab Report #:** L17061495**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP650-6453	L17061495-01	06/28/2017 15:00	06/29/2017 09:39



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	NH3
Prep Batch Number(s):	WG620546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-07-10 15:31:05



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	NH3
Prep Batch Number(s):	WG620546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	NH3
Prep Batch Number(s):	WG620546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	NH3
Prep Batch Number(s):	WG620546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	NH3
Prep Batch Number(s):	WG620546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	NH3
Prep Batch Number(s):	WG620546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	PO4
Prep Batch Number(s):	WG619895	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-07-10 15:30:29



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	PO4
Prep Batch Number(s):	WG619895	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	PO4
Prep Batch Number(s):	WG619895	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	PO4
Prep Batch Number(s):	WG619895	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	PO4
Prep Batch Number(s):	WG619895	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	PO4
Prep Batch Number(s):	WG619895	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619966	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Deanna Hesson		Conventional Lab Supervisor	2017-07-10 15:31:38



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619966	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification					
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):	X				
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619966	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619966	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)			X		
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)			X		
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions			X		
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619966	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)	X				
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061495
Project Name:		Method:	TOC
Prep Batch Number(s):	WG619966	Reviewer Name:	Deanna Hesson
LRC Date:	2017-07-10 00:00:00		

the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

Lab Report #: L17061495
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061495-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6453	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 07/06/2017 09:04
Workgroup #: WG620546	Analyst: DCM	Run Date: 07/06/2017 10:09
Collect Date: 06/28/2017 15:00	Dilution: 10	File ID: S2170706001.062
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	19.0		2.00	1.00	0.500

Certificate of Analysis

Sample #: L17061495-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6453	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:45
Workgroup #: WG619895	Analyst: DLP	Run Date: 06/29/2017 15:30
Collect Date: 06/28/2017 15:00	Dilution: 5	File ID: 00.1706291530-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	2.15		0.500	0.250	0.125

Certificate of Analysis

Sample #: L17061495-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6453	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG619966	Analyst: DCM	Run Date: 06/30/2017 09:54
Collect Date: 06/28/2017 15:00	Dilution: 10	File ID: TC06302017.007
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	185		20.0	10.0	5.00

2.1 General Chemistry Data

2.1.1 Ammonia Data

2.1.1.1 Summary Data

Lab Report #: L17061495

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061495-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6453	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 07/06/2017 09:04
Workgroup #: WG620546	Analyst: DCM	Run Date: 07/06/2017 10:09
Collect Date: 06/28/2017 15:00	Dilution: 10	File ID: S2170706001.062
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	19.0		2.00	1.00	0.500

2.1.1.2 QC Summary Data

Example Ammonia Calculations

$$(\text{absorbance} - \text{intercept}) / (\text{slope} * \text{dilution}) = \text{mg/L}$$

where:

absorbance = reading from the spectrophotometer

intercept = calculated from calibration standard absorbencies

slope = calculated from calibration standard absorbencies

dilution = dilution of the distillate in decimal form (ex. 1/5 dilution = 0.2)

Microbac Laboratories Inc.

Data Checklist

Date: 06-JUL-2017
 Analyst: DCM
 Analyst: NA
 Method: NH3
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG620546 WG620547 WG620545

Calibration/Linearity	07-06-2017
Second Source Check	X
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	X
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	DCM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
06-JUL-2017



Secondary Reviewer:
10-JUL-2017




Analytical Method: 350.1
Login Number: L17061495

AAB#: WG620546

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6453	01	06/28/17					07/06/2017	7.8	28		07/06/17	7.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17061495 Work Group: WG620546
 Blank File ID: S2170706001.059 Blank Sample ID: WG620546-01
 Prep Date: 07/06/17 09:51 Instrument ID: SMARTCHEM2
 Analyzed Date: 07/06/17 09:51 Method: 350.1
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
DUP	WG620546-04	S2170706001.030	07/06/17 09:29	DL01
LCS	WG620546-02	S2170706001.058	07/06/17 09:55	01
LH18/24-SP650-6453	L17061495-01	S2170706001.062	07/06/17 10:09	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5369789
 Report generated 07/06/2017 15:33



Login Number: L17061495 Prep Date: 07/06/17 09:51 Sample ID: WG620546-01
 Instrument ID: SMARTCHEM2 Run Date: 07/06/17 09:51 Prep Method: 350.1
 File ID: S2170706001.059 Analyst: DCM Method: 350.1
 Workgroup (AAB#): WG620546 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: SMARTC-06-JUL-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Nitrogen, Ammonia	0.0500	0.200	0.0730	1	J

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5369790
 06-JUL-2017 15:33



Login Number: L17061495 Run Date: 07/06/2017 Sample ID: WG620546-02
Instrument ID: SMARTCHEM2 Run Time: 09:55 Prep Method: 350.1
File ID: S2170706001.058 Analyst: DCM Method: 350.1
Workgroup (AAB#): WG620546 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD80299 Cal ID: SMARTC-06-JUL-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Ammonia	2.00	1.98	99.2	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5369791
Report generated: 07/06/2017 15:33



2.1 General Chemistry Data

2.1.2 Orthophosphate Data

2.1.2.1 Summary Data

Lab Report #: L17061495

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061495-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6453	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:45
Workgroup #: WG619895	Analyst: DLP	Run Date: 06/29/2017 15:30
Collect Date: 06/28/2017 15:00	Dilution: 5	File ID: 00.1706291530-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	2.15		0.500	0.250	0.125

2.1.2.2 QC Summary Data

Example Calculations for Visible Spectrophotometric Methods

Linear Calibration Model

Step 1 - Retrieve Curve Data from ICAL

m = slope of the linear equation
 b = intercept from the linear equation
 y = instrument response as absorbance or OD
 x = concentration of analyte (mg/L)
 $y = mx + b$

Step 2: Calculate the instrument concentration, x

Where:

$$x = (y - b)/m$$

Step 3: Solve for analyte concentration in sample, Cx

$$Cx = (x) (D)$$

Example Calculation (LCS):

Value of m from plot:	7.809
Value of b from plot:	0.0004135
Absorbance of unknown from quantitation report (y):	0.31
Calculated concentration (x):	0.03964483
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	0.0396 mg/L

SmartChem Autoanalyzer - Quadratic Calibration for Chloride and Sulfate

Step 1 - Retrieve Curve Data from Smartchem ICAL

A, B, C = constants from the ICAL quadratic regression

x = instrument response as absorbance or OD

y = concentration of analyte (mg/L)

Step 2: Calculate the instrument concentration, y

Where:

$$y = Ax^2 + Bx + C$$

Step 3: Solve for analyte concentration in sample, Cy

$$Cy = (y) (D)$$

Example Calculation (LCS):

Value of A from plot:	101.2796
Value of B from plot:	318.9056
Value of C from plot:	-2.2712
Absorbance of unknown from quantitation report (x):	0.1583
Calculated concentration (y):	50.7495108
Dilution factor (D):	1.00
Concentration of analyte in sample, Cy:	50.75 mg/L

Microbac Laboratories Inc.

Data Checklist

Date: 29-JUN-2017
 Analyst: DLP
 Analyst: NA
 Method: PO4
 Instrument: V-1200
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG619895

Calibration/Linearity	
Second Source Check	06-07-17
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	
QC Violation Sheet	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Primary Reviewer	DLP
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
29-JUN-2017

Secondary Reviewer:
30-JUN-2017

Dwight Payne

Denna Johnson



Analytical Method: 365.2
Login Number: L17061495

AAB#: WG619895

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6453	01	06/28/17					06/29/2017	1	2		06/29/17	1	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17061495 Work Group: WG619895
 Blank File ID: 00.1706291530-03 Blank Sample ID: WG619895-01
 Prep Date: 06/29/17 15:30 Instrument ID: V-1200
 Analyzed Date: 06/29/17 15:30 Method: 365.2
 Analyst: DLP

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG619895-02	00.1706291530-04	06/29/17 15:30	
LCS2	WG619895-03	00.1706291530-05	06/29/17 15:30	
LH18/24-SP650-6453	L17061495-01	00.1706291530-06	06/29/17 15:30	
DUP	WG619895-05	00.1706291530-07	06/29/17 15:30	

Report Name: BLANK_SUMMARY
 PDF File ID: 5360196
 Report generated 06/30/2017 08:19



Login Number: L17061495 Prep Date: 06/29/17 15:30 Sample ID: WG619895-01
Instrument ID: V-1200 Run Date: 06/29/17 15:30 Prep Method: 365.2
File ID: 00.1706291530-03 Analyst: DLP Method: 365.2
Workgroup (AAB#): WG619895 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: V-1200-19-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Orthophosphate	0.0250	0.100	0.0250	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5360197
30-JUN-2017 08:19



Login Number: L17061495 Analyst: DLP Prep Method: 365.2
 Instrument ID: V-1200 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG619895 Units: mg/L
 QC Key: DOD4 Lot #: STD82526

Sample ID: WG619895-02 LCS File ID: 00.1706291530-04 Run Date: 06/29/2017 15:30
 Sample ID: WG619895-03 LCS2 File ID: 00.1706291530-05 Run Date: 06/29/2017 15:30

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	1.01	101	1.00	1.02	102	0.948	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5360198
 Report generated: 06/30/2017 08:19



2.1.2.3 Raw Data

WG 616997

Curves

Parameter: P04

Spectrophotometer: V-1200

Calibration (Curve) standard stock: STD 79640

Concentration: 1000mg/L

Recipe for preparation of curve standards found in:

SOP: 3653 Revision: 17 Page: 9

Second Source Stock: 82182 (concentration: 10)

Daily Preparation: $\frac{10(10)/100 =}{1.0}$
concentration = 1.0

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
1.0	50	1cm	880	0.608 0.621
0.7				0.445
0.5				0.312
0.2				0.127
0.1				0.063
0.05				0.031
0				0.001
2nd Source (10)				0.659 0.637

Analyst: Jammy Morris

Date/Time: 6/7/17 @ 1545

DCN#126310



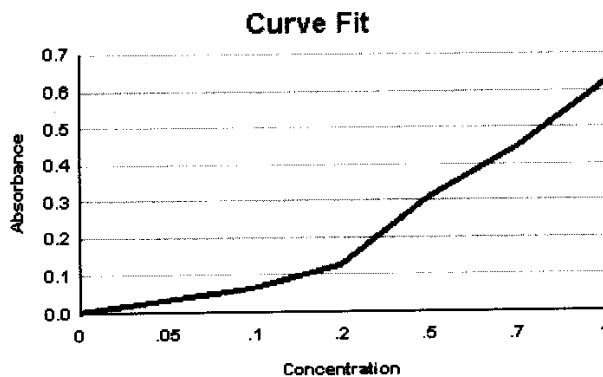
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG616997
Analytical Method: 300
Instrument ID: V-1200

Analyst: TMM
Initial Calibration Date: 06/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.624028
Y-Intercept: 0.00124690
Coef. Of Correlation (R^2): 0.999788
Coef. Of Correlation (R): 0.999894

Concentration X	Absorbance Y	X^2	$X * Y$	Y-Fitted (mX^2+B)
0.00	0.00100	0.00	0.00	0.00124690
0.0500	0.0310	0.00250	0.00155	0.0324483
0.100	0.0630	0.0100	0.00630	0.0636497
0.200	0.127	0.0400	0.0254	0.126053
0.500	0.312	0.250	0.156	0.313261
0.700	0.445	0.490	0.312	0.438067
1.00	0.621	1.00	0.621	0.625275



WG_ICAL_CAL_NET - Modified 03/06/2008
Report generated 06/07/2017 16:28

Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

Workgroup #: WG616997
File ID: 00.1706071545-08
CCV ID: WG616997-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 06/07/2017
Run Time: 15:45
Analyst: TMM
Cal ID: V-1200 - 07-JUN-17 15:45:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.02	0.637	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 06/07/2017 16:28



WORKGROUP: WG619895

Orthophosphate

(orthophosphate1)

EPA 365.2 / SM4500-P E

SOP K3653 Rev. 17

Color Reagent Chemicals

RGT 40280

RGT 40466

RGT 39475

CBA 18278

CCV: 870 82526Daily Dilution: 5(5)100Daily Dilution: 0.5Spectrophotometer: V-1200LCS: 870 82526Daily Dilution: 10(10)100Daily Dilution: 0.10Curve ID: 266997Spike: 870 82526Daily Dilution: 2(10)100Daily Dilution: 0.10

6-07-17

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: 0.5 mg/L	50	✓		0.319
BLK/CCB:	50	✓		0.001
LCS: 0.10 ppm	50	✓		0.631
LCSD: 0.10 ppm	50	✓		0.637
* 06-1495-01	50	✓	1/5	0.270
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
CCV:	50			
CCB:	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
DUP 06-1498-01	50	✓	1/5	0.270
MS: (1495-01	50	✓	1/5	0.279
MSD: ()	50			
CCV: (0.5	50			0.318
CCB: 0.00	50			0.002

Analyst: Christy PayneDate / Time: 06-29-17

1, 1530

* Sample was done at a 1/5 because the 1/2 turned cloudy.

DCN#126751



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG619895Analyst: DLPAnalyte: ORTHOPHOSPHATEDate: 06/29/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG619895-01	50	50	0.00100	0.6240	0.001247	-0.00039565	-0.00039565	1	mg/L
WG619895-02	50	50	0.631	0.6240	0.001247	1.0092	1.0092	1	mg/L
WG619895-03	50	50	0.637	0.6240	0.001247	1.0188	1.0188	1	mg/L
L17061495-01	50	50	0.270	0.6240	0.001247	0.43067	2.1534	5	mg/L
WG619895-04	50	50	0.270	0.6240	0.001247	0.43067	2.1534	5	mg/L
WG619895-05	50	50	0.270	0.6240	0.001247	0.43067	2.1534	5	mg/L
WG619895-06	50	50	0.319	0.6240	0.001247	0.50920	2.5460	5	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 06/29/2017 17:03

Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00858453

Workgroup #: WG619931
File ID: 00.1706291530-01
CCV ID: WG619931-01
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 06/29/2017
Run Time: 15:30
Analyst: DLP
Cal ID: V-1200 - 19-JUN-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.509	0.638	1.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/29/2017 17:01



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00858454

Workgroup #: WG619931 Instrument ID: V-1200
File ID: 00.1706291530-09 Run Date: 06/29/2017
CCV ID: WG619931-03 Run Time: 15:30
Units: mg/L Analyst: DLP
Analyte: ORTHOPHOSPHATE Cal ID: V-1200 - 19-JUN-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.508	0.636	1.6	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 06/29/2017 17:01



2.1 General Chemistry Data

2.1.3 Total Organic Carbon Data

2.1.3.1 Summary Data

Lab Report #: L17061495

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061495-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6453	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG619966	Analyst: DCM	Run Date: 06/30/2017 09:54
Collect Date: 06/28/2017 15:00	Dilution: 10	File ID: TC06302017.007
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	185		20.0	10.0	5.00

2.1.3.2 QC Summary Data

**Total Organic Carbon Example Calculations
(Direct Readout Parameter)**

$$(\text{Readout})/(\text{dilution}) = \text{mg/L}$$

where:

Readout = direct readout from the instrument

dilution = dilution in decimal form (ex. 1/5 dilution = 0.2)

Microbac Laboratories Inc.

Data Checklist

Date: 30-JUN-2017
 Analyst: DCM
 Analyst: NA
 Method: TOC
 Instrument: TOC-VWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG619969 WG620071 WG619966

Calibration/Linearity	06-30-2017
Second Source Check	X
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	X
Upload Results	X
Client Forms	X
QC Violation Sheet	X
Case Narratives	X
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	DCM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
03-JUL-2017



Secondary Reviewer:
05-JUL-2017




Analytical Method: 415.1
Login Number: L17061495

AAB#: WG619966

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6453	01	06/28/17					06/30/2017	1.8	28		06/30/17	1.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17061495 Work Group: WG619966
 Blank File ID: TC06302017.004 Blank Sample ID: WG619966-01
 Prep Date: 06/30/17 08:49 Instrument ID: TOC-VWP
 Analyzed Date: 06/30/17 08:49 Method: 415.1
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG619966-02	TC06302017.005	06/30/17 09:01	01
LCS2	WG619966-03	TC06302017.006	06/30/17 09:13	01
LH18/24-SP650-6453	L17061495-01	TC06302017.007	06/30/17 09:54	DL01
DUP	WG619966-08	TC06302017.020	06/30/17 12:34	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5364397
 Report generated 07/05/2017 09:35



Login Number: L17061495 Prep Date: 06/30/17 08:49 Sample ID: WG619966-01
Instrument ID: TOC-VWP Run Date: 06/30/17 08:49 Prep Method: 415.1
File ID: TC06302017.004 Analyst: DCM Method: 415.1
Workgroup (AAB#): WG619966 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: TOC-VW-10-FEB-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Total Organic Carbon	0.500	2.00	0.500	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name: BLANK
PDF ID: 5364402
05-JUL-2017 09:35



Login Number: L17061495 Analyst: DCM Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG619966 Units: mg/L
 QC Key: DOD4 Lot #: STD80787

Sample ID: WG619966-02 LCS File ID: TC06302017.005 Run Date: 06/30/2017 09:01
 Sample ID: WG619966-03 LCS2 File ID: TC06302017.006 Run Date: 06/30/2017 09:13

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	26.2	105	25.0	26.1	104	0.153	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5364407
 Report generated: 07/05/2017 09:35



2.1.3.3 Raw Data

Curve

~~WG 602411~~
~~WG 602476~~ *dm/11/13/17*
 WG 602481

Total Organic Carbon

MAKE DAILY

CCV (TOC): _____ LCS (TOC): _____
 (5/200)(1000) = 25mg/L (5/200)(1000) = 25mg/L

CCV (TIC): _____ MS (TOC): _____
 (5/200)(1000) = 25mg/L _____

Calibration Curve Date: _____ Reagent: RET 35944
RET 37673

SM5310-C : Matrix 2 WG _____
 EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K 4151 Rev. 18 *dm/11/13/17*
 Instrument: Shimadza TOC-VWP/ASI

- drain reservoir filled
 ASI water bottle full
 dilution water bottle full
- DAILY CHECK**
 3rd bottle full
 sufficient gas
 sufficient persulfate
- sufficient acid
 waste container

Position	Sample ID	Dilution	Position	Sample ID	Dilution	Position	Sample ID	Dilution
1	TC Curve		26	TC Curve		51		
2	TC ICV		27	Std 79318		52	See SOP	
3	TIC Curve		28			53	for point	
4	TIC ICV		29	TIC Curve		54	preparation	
5			30	Std 80415		55		
6			31			56		
7			32			57		
8			33	TOC (TC)		58		
9			34	ICV		59		
10			35	Std 77870		60	5/200 (1000) = 25	
11			36			61		
12			37	TIC ICV		62		
13			38	Std 80416		63		
14			39			64		
15			40			65		
16			41			66		
17			42			67		
18			43			68		
19	all points		44	analyzed in duplicate		69		
20			45			70		
21			46			71		
22			47			72		
23			48			73		
24			49			74		
25			50			75		

Analyst: David Merckli Date/Time: 2/10/17

DCN#123915



C:\TOC3201\Data\CURVES-02-10-2017.t32

	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TC	TCCURVE		Complete	2/10/2017 10:29:51 A	0, 1, 2, 3, 4, 5
2	TC	TOC ICV	TC:23.90mg/L	Complete	2/10/2017 10:47:48 A	6
3	IC	TICCURVE		Complete	2/10/2017 3:55:41 PM	0, 1, 2, 3, 4, 5
4	IC	TIC CURVE	IC:24.27mg/L	Complete	2/10/2017 4:12:07 PM	6
5	TC		TC:0.000mg/L	Complete	2/10/2017 4:31:41 PM	7
6	IC	TOC/TIC	IC:8.571mg/L	Complete	2/10/2017 4:42:05 PM	7
7	TC	TOC/TIC	TC:32.10mg/L	Complete	2/10/2017 5:01:02 PM	7

2/13/2017 7:01:58 AM

1/1

Instr. Information

System TOCVW ASI
 Detector Wet Chemical

Cal. Curve

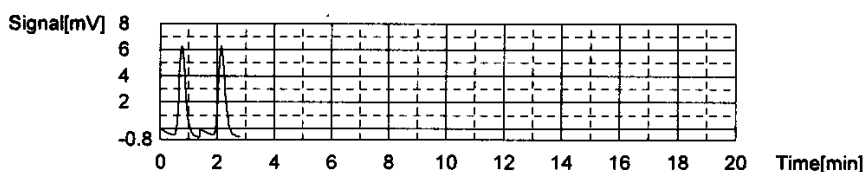
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

Type	Anal.
Standard	TC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.83	500uL	1	*****		2/10/2017 9:36:31 AM
2	10.82	500uL	1	*****		2/10/2017 9:40:05 AM

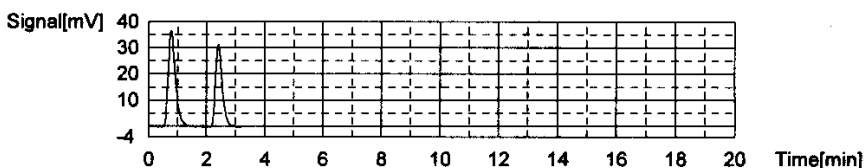
Acid Add. 0.000%
 Mean Area 10.82



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	64.31	500uL	1	*****		2/10/2017 9:45:28 AM
2	51.52	500uL	1	*****		2/10/2017 9:49:19 AM

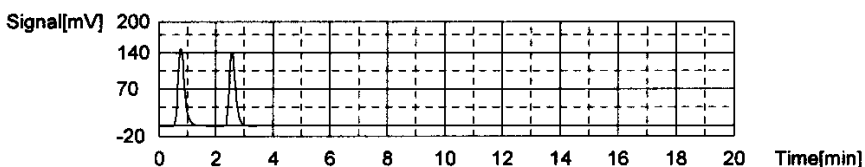
Acid Add. 0.000%
 Mean Area 57.92



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	238.4	500uL	1	*****		2/10/2017 9:55:04 AM
2	216.3	500uL	1	*****		2/10/2017 9:58:58 AM

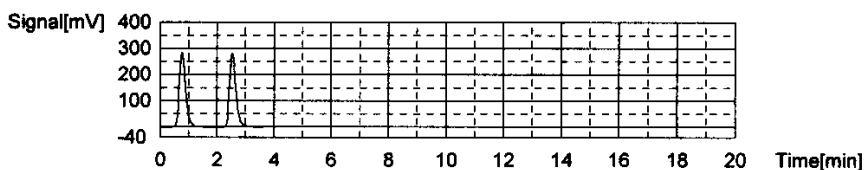
Acid Add. 0.000%
 Mean Area 227.4



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	442.5	500uL	1	*****		2/10/2017 10:04:41 AM
2	437.9	500uL	1	*****		2/10/2017 10:08:48 AM

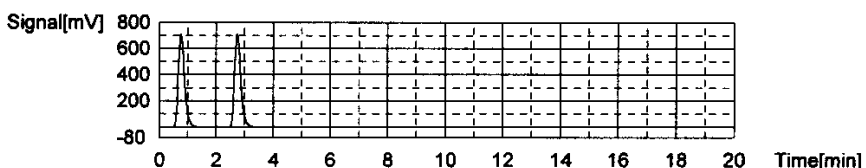
Acid Add. 0.000%
 Mean Area 440.2



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1091	500uL	1	*****		2/10/2017 10:14:47 AM
2	1092	500uL	1	*****		2/10/2017 10:19:05 AM

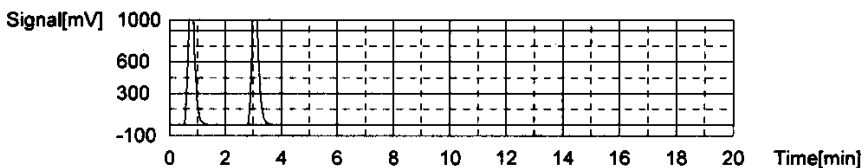
Acid Add. 0.000%
 Mean Area 1092



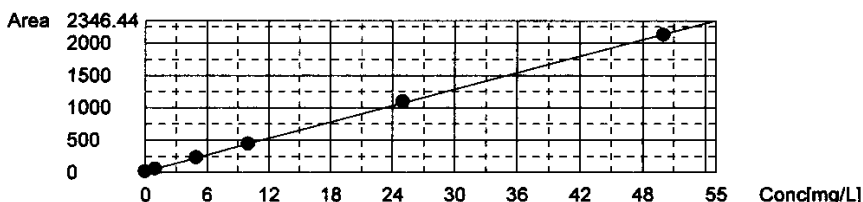
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	2132	500uL	1	*H*****		2/10/2017 10:25:19 AM
2	2118	500uL	1	*H*****		2/10/2017 10:29:51 AM

Acid Add. 0.000%
 Mean Area 2125



Slope: 42.33
 Intercept 16.87
 r^2 0.999887
 Zero Shift No



Sample

Sample Name: TOC ICV
 Sample ID: Untitled
 Origin: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:23.90mg/L

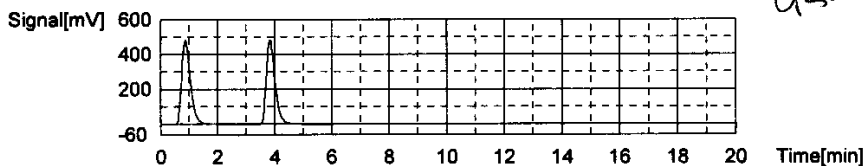
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1029	23.91mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 10:42:11 AM
2	1028	23.89mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 10:47:48 AM

95.6%

Mean Area 1029
Mean Conc. 23.90mg/L



Cal. Curve

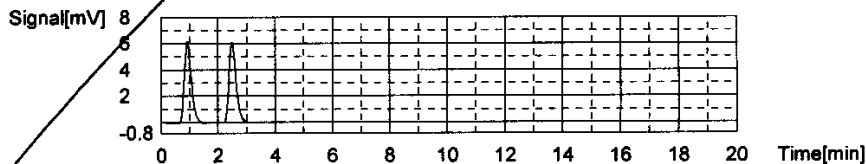
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

Type	Anal.
Standard	TC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.59	500uL	1	*****		2/10/2017 2:49:09 PM
2	10.43	500uL	1	*****		2/10/2017 2:53:06 PM

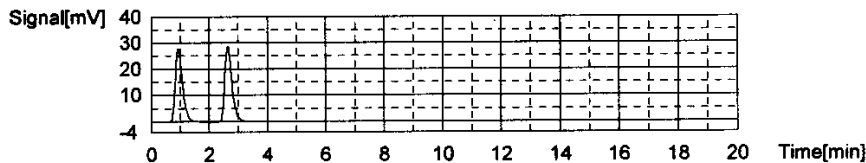
Acid Add. 3.000%
Mean Area 10.51



Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	48.13	500uL	1	*****		2/10/2017 3:00:24 PM
2	49.13	500uL	1	*****		2/10/2017 3:04:41 PM

Acid Add. 3.000%
Mean Area 48.63

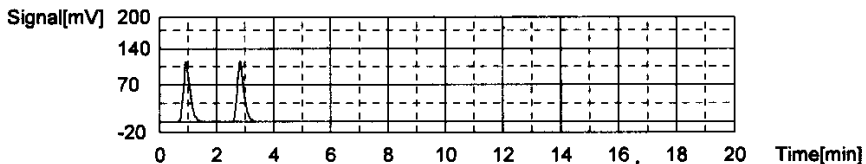


Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	189.0	500uL	1	*****		2/10/2017 3:12:24 PM
2	190.1	500uL	1	*****		2/10/2017 3:16:55 PM

dcn
3/23/17

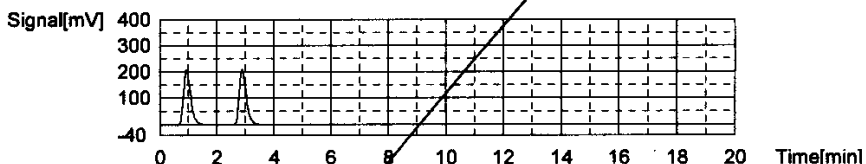
Acid Add. 3.000%
Mean Area 189.6



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	360.6	500uL	1	*****		2/10/2017 3:24:47 PM
2	362.2	500uL	1	*****		2/10/2017 3:29:24 PM

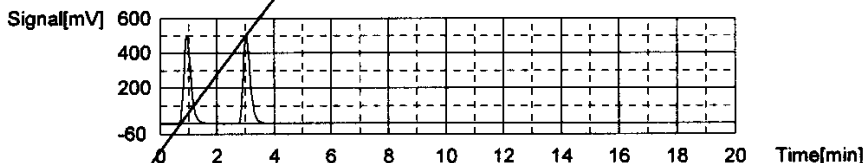
Acid Add. 3.000%
Mean Area 361.4



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	859.3	500uL	1	*****		2/10/2017 3:37:23 PM
2	856.9	500uL	1	*****		2/10/2017 3:42:16 PM

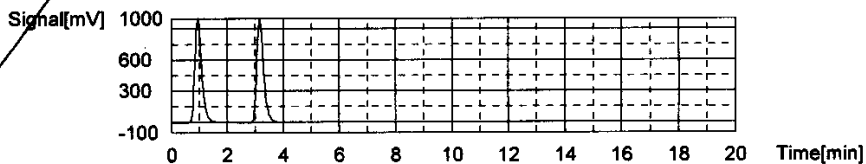
Acid Add. 3.000%
Mean Area 858.1



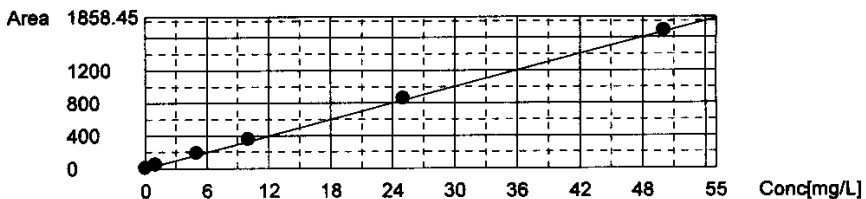
Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1690	500uL	1	*****		2/10/2017 3:50:31 PM
2	1689	500uL	1	*****		2/10/2017 3:55:41 PM

Acid Add. 3.000%
Mean Area 1690



Slope: 33.49
Intercept: 0.000
r^2: 0.999919
Zero Shift: Yes



Sample

dcm

See following pages for curve, slope, intercept
and zero shift unchecked

TOC-V Cal Curve Information
TICCURVE-02-10-2017.2017_02_10_14_45_10.cal

Date of Creation 2:10:17 PM 2/10/2017
User
System TOCVW ASI

Cal. Curve

Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status Completed
Comment:

Type	Anal.
Standard	IC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	10.59	500uL	1	*****		2/10/2017 2:49:09 PM
2	10.43	500uL	1	*****		2/10/2017 2:53:06 PM

Acid Add. 3.000%
Mean Area 10.51
SD Area 0.1131
CV Area 1.08%
Vial 0

Conc: 1.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	48.13	500uL	1	*****		2/10/2017 3:00:24 PM
2	49.13	500uL	1	*****		2/10/2017 3:04:41 PM

Acid Add. 3.000%
Mean Area 48.63
SD Area 0.7071
CV Area 1.45%
Vial 1

Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	189.0	500uL	1	*****		2/10/2017 3:12:24 PM
2	190.1	500uL	1	*****		2/10/2017 3:16:55 PM

Acid Add. 3.000%
Mean Area 189.6
SD Area 0.7778
CV Area 0.41%
Vial 2

Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	360.6	500uL	1	*****		2/10/2017 3:24:47 PM
2	362.2	500uL	1	*****		2/10/2017 3:29:24 PM

Acid Add. 3.000%
 Mean Area 361.4
 SD Area 1.131
 CV Area 0.31%
 Vial 3

Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	859.3	500uL	1	*****		2/10/2017 3:37:23 PM
2	856.9	500uL	1	*****		2/10/2017 3:42:16 PM

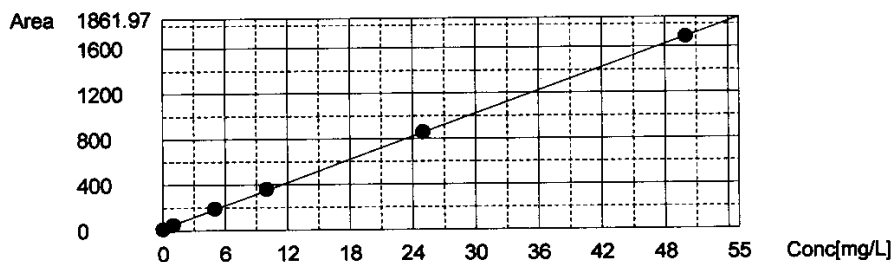
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1690	500uL	1	*****		2/10/2017 3:50:31 PM
2	1689	500uL	1	*****		2/10/2017 3:55:41 PM

Acid Add. 3.000%
 Mean Area 1690
 SD Area 0.7071
 CV Area 0.04%
 Vial 5

Slope: 33.49
 Intercept 18.41
 r² 0.999919
 Zero Shift No



Sample Name: TIC CURVE
 Sample ID: Untitled
 Origin: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed
 Chk. Result:

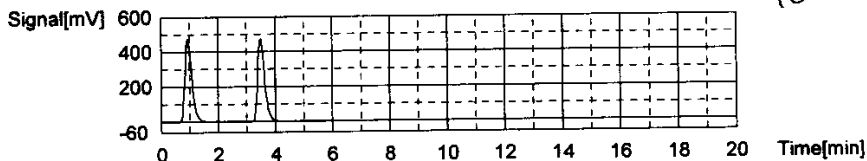
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

1. Det

Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	810.5	24.20mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 4:08:15 PM
2	814.6	24.33mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 4:12:07 PM

Mean Area 812.5
 Mean Conc. 24.27mg/L



Sample

Sample Name: Untitled
 Sample ID: TCCURVE-02-10-2017.2017_02_10_14_14_25.cal
 Origin: Completed
 Status: Completed
 Chk. Result:

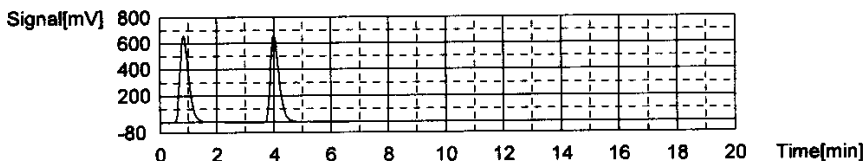
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1406	0.000mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_14_14	2/10/2017 4:25:42 PM
2	1411	0.000mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_14_14	2/10/2017 4:31:41 PM

Mean Area 1409
 Mean Conc. 0.000mg/L



Sample

Sample Name: TOC/TIC
 Sample ID: Untitled
 Origin: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
 Status: Completed
 Chk. Result:

2/12/2017 11:18:36 AM

CURVES-02-10-2017.t32

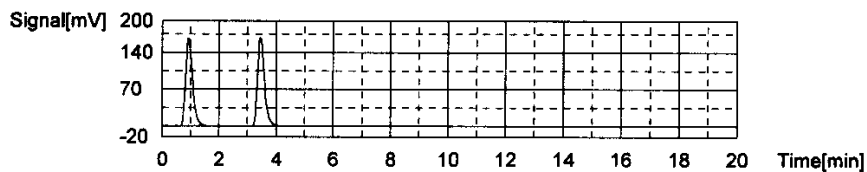
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

1. Det

Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	286.8	8.565mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	12/10/2017 4:37:09 PM
2	287.2	8.577mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	12/10/2017 4:42:05 PM

Mean Area 287.0
Mean Conc. 8.571mg/L



Sample

Sample Name: TOC/TIC
Sample ID: Untitled
Origin: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
Status Completed
Chk. Result

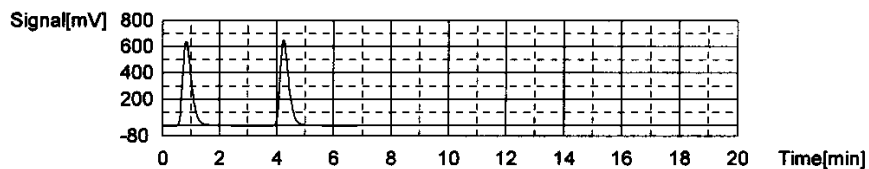
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1378	32.16mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	12/10/2017 4:55:07 PM
2	1373	32.04mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	12/10/2017 5:01:02 PM

Mean Area 1376
Mean Conc. 32.10mg/L



6/6

WORKGROUP: WG619966

619969

1620071

Total Organic Carbon

MAKE DAILY

CCV (TOC): Std 79381
(5/200)(1000) = 25mg/L

LCS (TOC): Std 80787
(5/200)(1000) = 25mg/L

CCV (TIC): Std 80416
(5/200)(1000) = 25mg/L

MS (TOC): Std 80787
0.4(1000) / 40 = 10

Calibration Curve Date: 2/14/17

Reagent: RCAT 40592
PLST 39260

- SM5310-C : Matrix 2 WG 619969
- EPA 415.1/9060A(mod): Matrix 1 WG 619969 SOP: K 4/51 Rev. 18
- SW846 9060A (4 rep) WG Instrument: Shimadza TOC-VWP/ASI

- drain reservoir filled
- ASI water bottle full
- dilution water bottle full

- DAILY CHECK
- 3rd bottle full
 - sufficient gas
 - sufficient persulfate

- sufficient acid
- waste container

Position	Sample ID	Dilution
1	TJC	
2	TCC/TIC	
3	CCV	
4	Bik	
5	LCS	
6	LCS DUP	<u>1000/100</u>
7	06-1495-c1	<u>1/3 1/10</u>
8	06-1501-c1	
9	04	
10	MS 05	
11	MSD 06	
12	13	
13	16	
14	CCV	
15	CCB	
16	06-1501-19	
17	23	
18	25	
19	28	
20	DUP 06-1501-28	
21	MS 06-1501-28	
22	Bik	
23	LCS	
24	LCS DUP	
25	06-1495-c1	

Position	Sample ID	Dilution
26	CCV	
27	CCB	
28	06-1511-c1	
29	06-1513-c1	
30	02	
31	03	
32	06-1514-c1	
33	06-1516-c1	
34	06-1517-c1	
35	02	
36	03	
37	06-1518-c1	
38	CCV	
39	CCB	
40	06-1519-c1	
41	06-1520-c1	
42	06-1521-c1	
43	06-1581-c1	
44	03	
45	05	
46	07	
47	09	
48	11	
49	DUP 06-1511-c1	
50	CCV	

Position	Sample ID	Dilution
51	CCB	
52	MS 06-1511-c1	
53	Bik	
54	LCS	
55	LCS DUP	
56	06-1581-13	
57	15	
58	17	
59	19	
60	21	
61	23	
62	CCV	
63	CCB	
64	06-1581-25	
65	27	
66	29	
67	32	
68	34	
69		
70		
71		
72		
73		
74		
75		

Analyst: David Hernandez Date/Time: 10/30/17 0819

pg. 1

DCN#126764



Total Organic Carbon

MAKE DAILY

CCV (TOC): _____ (5/200)(1000) = 25mg/L
 LCS (TOC): _____ (5/200)(1000) = 25mg/L

CCV (TIC): _____ (5/200)(1000) = 25mg/L
 MS (TOC): _____

Calibration Curve Date: _____ Reagent: _____

- SM5310-C : Matrix 2 WG _____
- EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K _____ Rev. _____
- SW846 9060A (4 rep) WG _____ Instrument: Shimadza TOC-VWP/ASI

- drain reservoir filled
- ASI water bottle full
- dilution water bottle full
- DAILY CHECK
- 3rd bottle full
- sufficient gas
- sufficient persulfate
- sufficient acid waste container

Position	Sample ID	Dilution
1	dc-1582-c1	
2	CS	
3	CS	
4	C7	
5	Q9	
6	CCV	
7	CCB	
8 ⁺	dc-1582-11	
9	13	
10	15	
11	cb-1417-c1	
12	DUP dc-1582-c5	
13	MS dc-1582-c5	
14	CCV	
15	CCB	
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

Position	Sample ID	Dilution
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		

Position	Sample ID	Dilution
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		

Analyst: dcu Date/Time: 6/30/17

129-2

DCN#126764



	Analysi	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:1.866mg/L TC:25.97mg/L IC:24.10mg/L	Completed	6/30/2017 8:19:23 AM	1
2	TOC	TOC/TIC	TOC:26.77mg/L TC:35.99mg/L IC:9.221mg/L	Completed	6/30/2017 8:32:13 AM	2
3	TOC	CCV	!!Error!! TOC:27.11mg/L TC:26.82mg/L IC:-0.2944mg/L	Completed	6/30/2017 8:44:32 AM	3
4	TOC	WG619966-01 BLK	!!Error!! TOC:0.09629mg/L TC:-0.1284mg/L IC:-0.2247	Completed	6/30/2017 8:53:33 AM	0
5	TOC	WG619966-02 LCS	!!Error!! TOC:26.16mg/L TC:25.83mg/L IC:-0.3300mg/L	Completed	6/30/2017 9:05:46 AM	5
6	TOC	WG619966-03 LCSDUP	!!Error!! TOC:26.12mg/L TC:25.80mg/L IC:-0.3203mg/L	Completed	6/30/2017 9:17:56 AM	6
7	TOC	L17061495-01 (10)	TOC:18.50mg/L TC:24.20mg/L IC:5.700mg/L	Completed	6/30/2017 9:59:25 AM	7
8	TOC	L17061501-01	TOC:2.754mg/L TC:30.46mg/L IC:27.70mg/L	Completed	6/30/2017 10:14:36 AM	8
9	TOC	L17061501-04	TOC:1.998mg/L TC:22.86mg/L IC:20.86mg/L	Completed	6/30/2017 10:27:39 AM	9
10	TOC	L17061501-05 MS	TOC:11.80mg/L TC:28.00mg/L IC:16.20mg/L	Completed	6/30/2017 10:40:26 AM	10
11	TOC	L17061501-06 MSD	TOC:12.70mg/L TC:29.02mg/L IC:16.31mg/L	Completed	6/30/2017 10:53:16 AM	11
12	TOC	L17061501-13	TOC:1.783mg/L TC:16.84mg/L IC:15.06mg/L	Completed	6/30/2017 11:05:47 AM	12
13	TOC	L17061501-16	TOC:1.606mg/L TC:15.09mg/L IC:13.48mg/L	Completed	6/30/2017 11:18:18 AM	13
14	TOC	CCV	!!Error!! TOC:26.80mg/L TC:26.56mg/L IC:-0.2438mg/L	Completed	6/30/2017 11:30:38 AM	14
15	TOC	CCB	!!Error!! TOC:0.1292mg/L TC:-0.1703mg/L IC:-0.2995m	Completed	6/30/2017 11:39:33 AM	0
16	TOC	L17061501-19	TOC:1.538mg/L TC:15.07mg/L IC:13.54mg/L	Completed	6/30/2017 11:51:43 AM	16
17	TOC	L17061501-22	TOC:1.027mg/L TC:11.24mg/L IC:10.21mg/L	Completed	6/30/2017 12:03:55 PM	17
18	TOC	L17061501-25	TOC:1.937mg/L TC:2.082mg/L IC:0.1450mg/L	Completed	6/30/2017 12:15:31 PM	18
19	TOC	L17061501-28	TOC:2.057mg/L TC:2.144mg/L IC:0.08707mg/L	Completed	6/30/2017 12:27:09 PM	19
20	TOC	WG619966-08DUP	TOC:1.959mg/L TC:2.045mg/L IC:0.08527mg/L	Completed	6/30/2017 12:38:43 PM	20
21	TOC	WG619966-09 MS	TOC:13.57mg/L TC:13.58mg/L IC:0.01569mg/L	Completed	6/30/2017 12:51:36 PM	21
22	TOC	WG619969-01 BLK	!!Error!! TOC:0.09350mg/L TC:-0.1433mg/L IC:-0.2368	Completed	6/30/2017 1:10:05 PM	22
23	TOC	WG619969-02 LCS	!!Error!! TOC:26.66mg/L TC:26.37mg/L IC:-0.2926mg/L	Completed	6/30/2017 1:31:18 PM	23
24	TOC	WG619969-03 LCSDUP	!!Error!! TOC:26.04mg/L TC:25.76mg/L IC:-0.2882mg/L	Completed	6/30/2017 1:58:18 PM	24
25	TOC	L17061493-01	!!Error!! TOC:0.4345mg/L TC:0.2558mg/L IC:-0.1787mg	Completed	6/30/2017 2:18:12 PM	25
26	TOC	CCV	!!Error!! TOC:27.42mg/L TC:27.13mg/L IC:-0.2892mg/L	Completed	6/30/2017 2:30:29 PM	26
27	TOC	CCB	!!Error!! TOC:0.1329mg/L TC:-0.1731mg/L IC:-0.3060m	Completed	6/30/2017 2:39:22 PM	0
28	TOC	L17061511-01	!!Error!! TOC:0.6267mg/L TC:0.3481mg/L IC:-0.2785mg	Completed	6/30/2017 2:58:48 PM	28
29	TOC	L17061513-01	TOC:2.284mg/L TC:2.518mg/L IC:0.2340mg/L	Completed	6/30/2017 3:19:10 PM	29
30	TOC	L17061513-02	TOC:1.285mg/L TC:2.756mg/L IC:1.470mg/L	Completed	6/30/2017 3:40:21 PM	30
31	TOC	L17061513-03	TOC:1.460mg/L TC:7.583mg/L IC:6.123mg/L	Completed	6/30/2017 4:01:08 PM	31
32	TOC	L17061514-01	TOC:2.042mg/L TC:2.075mg/L IC:0.03331mg/L	Completed	6/30/2017 4:21:33 PM	32
33	TOC	L17061516-01	TOC:2.078mg/L TC:2.251mg/L IC:0.1737mg/L	Completed	6/30/2017 4:41:57 PM	33
34	TOC	L17061517-01	TOC:3.616mg/L TC:3.769mg/L IC:0.1529mg/L	Completed	6/30/2017 5:02:42 PM	34
35	TOC	L17061517-02	!!Error!! TOC:3.797mg/L TC:3.649mg/L IC:-0.1483mg/L	Completed	6/30/2017 5:23:16 PM	35
36	TOC	L17061517-03	TOC:2.268mg/L TC:5.344mg/L IC:3.076mg/L	Completed	6/30/2017 5:58:06 PM	36
37	TOC	L17061518-01	TOC:5.290mg/L TC:5.392mg/L IC:0.1024mg/L	Completed	6/30/2017 6:05:10 PM	37
38	TOC	CCV	!!Error!! TOC:27.09mg/L TC:26.82mg/L IC:-0.2690mg/L	Completed	6/30/2017 6:17:23 PM	38
39	TOC	CCB	!!Error!! TOC:0.1226mg/L TC:-0.1825mg/L IC:-0.3051m	Completed	6/30/2017 6:26:20 PM	0
40	TOC	L17061519-01	TOC:3.312mg/L TC:3.410mg/L IC:0.09841mg/L	Completed	6/30/2017 6:46:57 PM	40
41	TOC	L17061520-01	TOC:2.624mg/L TC:2.745mg/L IC:0.1210mg/L	Completed	6/30/2017 7:07:19 PM	41
42	TOC	L17061521-01	TOC:4.904mg/L TC:5.095mg/L IC:0.1908mg/L	Completed	6/30/2017 7:28:16 PM	42
43	TOC	L17061581-01	TOC:2.566mg/L TC:14.71mg/L IC:12.14mg/L	Completed	6/30/2017 7:49:21 PM	43
44	TOC	L17061581-03	TOC:2.643mg/L TC:12.62mg/L IC:9.975mg/L	Completed	6/30/2017 8:10:43 PM	44
45	TOC	L17061581-05	TOC:2.824mg/L TC:13.71mg/L IC:10.89mg/L	Completed	6/30/2017 8:31:52 PM	45
46	TOC	L17061581-07	TOC:3.609mg/L TC:12.65mg/L IC:9.044mg/L	Completed	6/30/2017 8:53:23 PM	46
47	TOC	L17061581-09	TOC:2.599mg/L TC:10.69mg/L IC:8.087mg/L	Completed	6/30/2017 9:14:09 PM	47
48	TOC	L17061581-11	TOC:2.215mg/L TC:6.159mg/L IC:3.945mg/L	Completed	6/30/2017 9:34:39 PM	48
49	TOC	WG619969-05 DUP	!!Error!! TOC:1.136mg/L TC:0.8588mg/L IC:-0.2775mg	Completed	6/30/2017 9:54:08 PM	49
50	TOC	CCV	!!Error!! TOC:26.98mg/L TC:26.70mg/L IC:-0.2791mg/L	Completed	6/30/2017 10:06:21 PM	50
51	TOC	CCB	!!Error!! TOC:0.1165mg/L TC:-0.1719mg/L IC:-0.2883m	Completed	6/30/2017 10:15:12 PM	0
52	TOC	WG619969-06 MS	!!Error!! TOC:11.53mg/L TC:11.24mg/L IC:-0.2899mg/L	Completed	6/30/2017 10:35:32 PM	52
53	TOC	WG620071-01 BLK	!!Error!! TOC:0.08499mg/L TC:-0.1836mg/L IC:-0.2686	Completed	6/30/2017 10:54:01 PM	53
54	TOC	WG620071-02 LCS	!!Error!! TOC:26.03mg/L TC:25.74mg/L IC:-0.2875mg/L	Completed	6/30/2017 11:15:00 PM	54
55	TOC	WG620071-03 LCSDUP	!!Error!! TOC:26.41mg/L TC:26.12mg/L IC:-0.2869mg/L	Completed	6/30/2017 11:35:56 PM	55
56	TOC	L17061581-13	TOC:2.889mg/L TC:14.14mg/L IC:11.25mg/L	Completed	6/30/2017 11:57:08 PM	56
57	TOC	L17061581-15	TOC:3.005mg/L TC:18.81mg/L IC:15.80mg/L	Completed	7/1/2017 12:19:28 AM	57
58	TOC	L17061581-17	TOC:3.003mg/L TC:11.59mg/L IC:8.587mg/L	Completed	7/1/2017 12:40:51 AM	58
59	TOC	L17061581-19	TOC:2.555mg/L TC:8.721mg/L IC:6.166mg/L	Completed	7/1/2017 1:01:35 AM	59
60	TOC	L17061581-21	TOC:2.482mg/L TC:6.157mg/L IC:3.674mg/L	Completed	7/1/2017 1:22:10 AM	60
61	TOC	L17061581-23	TOC:2.496mg/L TC:5.874mg/L IC:3.379mg/L	Completed	7/1/2017 1:42:38 AM	61
62	TOC	CCV	!!Error!! TOC:26.42mg/L TC:26.16mg/L IC:-0.2640mg/L	Completed	7/1/2017 1:54:48 AM	62
63	TOC	CCB	!!Error!! TOC:0.1019mg/L TC:-0.1705mg/L IC:-0.2724m	Completed	7/1/2017 2:03:40 AM	0
64	TOC	L17061581-25	TOC:2.702mg/L TC:6.739mg/L IC:4.037mg/L	Completed	7/1/2017 2:24:24 AM	64
65	TOC	L17061581-27	TOC:2.502mg/L TC:5.081mg/L IC:2.578mg/L	Completed	7/1/2017 2:44:42 AM	65
66	TOC	L17061581-29	TOC:2.188mg/L TC:4.069mg/L IC:1.882mg/L	Completed	7/1/2017 3:04:59 AM	66
67	TOC	L17061581-32	TOC:2.203mg/L TC:2.874mg/L IC:0.6706mg/L	Completed	7/1/2017 3:25:09 AM	67

7/3/2017 6:58:30 AM

1/2

	Analysis	Sample Name	Result	Status	Date / Time	Vial
68	TOC	L17061581-34	TOC:2.158mg/L TC:3.317mg/L IC:1.159mg/L	Completed	7/1/2017 3:45:17 AM	68
69	TOC	L17061582-01	!!Error!! TOC:1.456mg/L TC:1.312mg/L IC:-0.1445mg/L	Completed	7/1/2017 4:05:03 AM	1
70	TOC	L17061582-03	!!Error!! TOC:1.737mg/L TC:1.597mg/L IC:-0.1399mg/L	Completed	7/1/2017 4:24:57 AM	2
71	TOC	L17061582-05	TOC:2.160mg/L TC:2.361mg/L IC:0.2011mg/L	Completed	7/1/2017 4:45:17 AM	3
72	TOC	L17061582-07	TOC:2.282mg/L TC:2.518mg/L IC:0.2359mg/L	Completed	7/1/2017 5:05:25 AM	4
73	TOC	L17061582-09	TOC:1.685mg/L TC:2.543mg/L IC:0.8581mg/L	Completed	7/1/2017 5:25:21 AM	5
74	TOC	CCV	!!Error!! TOC:26.86mg/L TC:26.58mg/L IC:-0.2742mg/L	Completed	7/1/2017 5:37:31 AM	6
75	TOC	CCB	!!Error!! TOC:0.1009mg/L TC:-0.1617mg/L IC:-0.2626mg/L	Completed	7/1/2017 5:46:38 AM	0
76	TOC	L17061582-11	TOC:1.445mg/L TC:2.784mg/L IC:1.339mg/L	Completed	7/1/2017 6:06:43 AM	8
77	TOC	L17061582-13	TOC:1.504mg/L TC:2.354mg/L IC:0.8501mg/L	Completed	7/1/2017 6:26:42 AM	9
78	TOC	L17061582-15	TOC:2.016mg/L TC:2.267mg/L IC:0.2503mg/L	Completed	7/1/2017 6:46:44 AM	10
79	TOC	L17061617-01	TOC:4.254mg/L TC:23.06mg/L IC:18.81mg/L	Completed	7/1/2017 7:10:10 AM	11
80	TOC	WG620071-05 DUP	TOC:2.230mg/L TC:2.360mg/L IC:0.1295mg/L	Completed	7/1/2017 7:30:20 AM	12
81	TOC	WG620071-06 MS	!!Error!! TOC:12.81mg/L TC:12.62mg/L IC:-0.1951mg/L	Completed	7/1/2017 7:51:01 AM	13
82	TOC	CCV	!!Error!! TOC:26.30mg/L TC:26.02mg/L IC:-0.2827mg/L	Completed	7/1/2017 8:03:18 AM	14
83	TOC	CCB	!!Error!! TOC:0.09691mg/L TC:-0.1638mg/L IC:-0.2607mg/L	Completed	7/1/2017 8:12:14 AM	0

7/3/2017 6:58:30 AM

2/2

Instr. Information

System TOCVW ASI
 Detector Wet Chemical

Sample

Sample Name: TIC
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

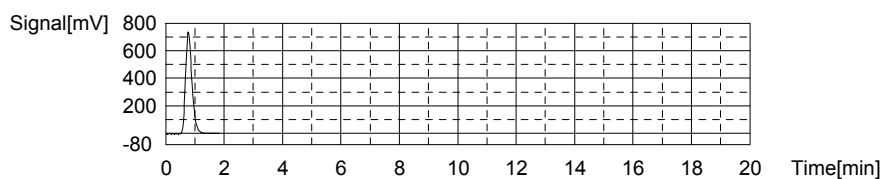
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.866mg/L TC:25.97mg/L IC:24.10mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1116	25.97mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 8:13:42 AM

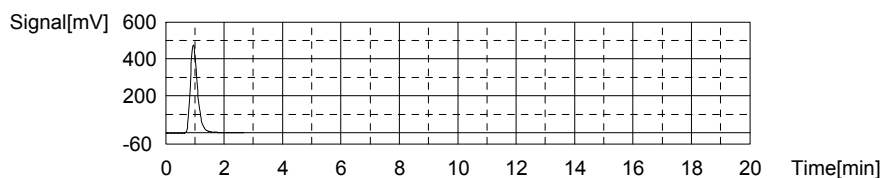
Mean Area 1116
 Mean Conc. 25.97mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	825.5	24.10mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 8:19:23 AM

Mean Area 825.5
 Mean Conc. 24.10mg/L



Sample

Sample Name: TOC/TIC
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.77mg/L TC:35.99mg/L IC:9.221mg/L

1. Det

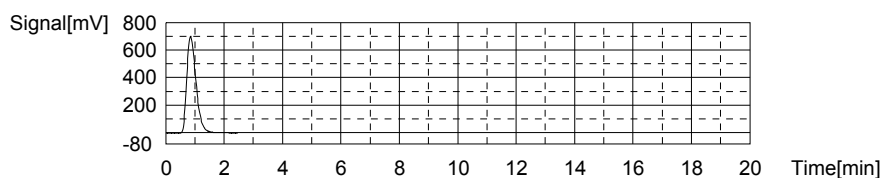
Anal.: TC

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1540	35.99mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 8:27:16 AM

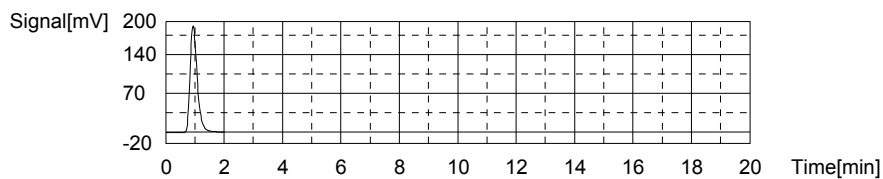
Mean Area 1540
Mean Conc. 35.99mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	327.2	9.221mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 8:32:13 AM

Mean Area 327.2
Mean Conc. 9.221mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

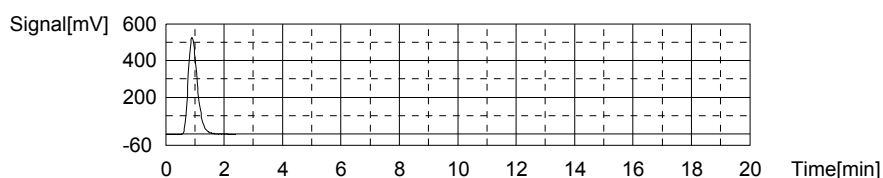
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:27.11mg/L TC:26.82mg/L IC:-0.2944mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1152	26.82mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 8:40:04 AM

Mean Area 1152
Mean Conc. 26.82mg/L



Anal.: IC

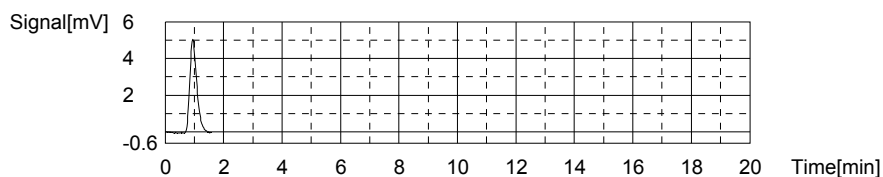
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.555	-0.2944mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 8:44:32 AM

2/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

Mean Area 8.555
Mean Conc. -0.2944mg/L



Sample

Sample Name: WG619966-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

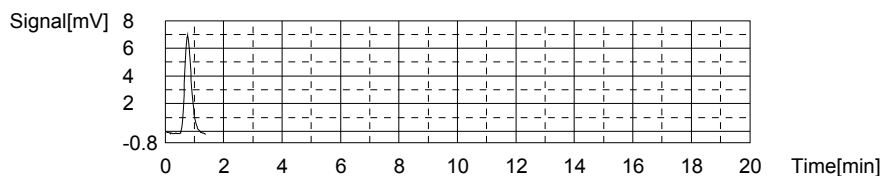
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.09629mg/L TC:-0.1284mg/L IC:-0.2247mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.43	-0.1284mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 8:49:33 AM

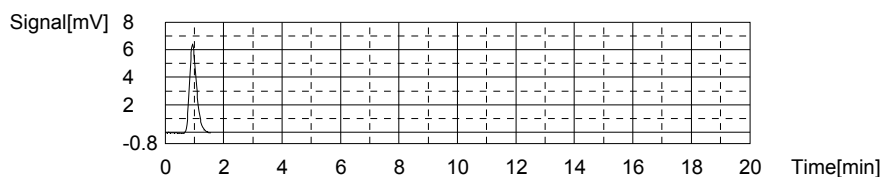
Mean Area 11.43
Mean Conc. -0.1284mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.89	-0.2247mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 8:53:33 AM

Mean Area 10.89
Mean Conc. -0.2247mg/L



Sample

Sample Name: WG619966-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.16mg/L TC:25.83mg/L IC:-0.3300mg/L

3/58

7/3/2017 6:58:23 AM

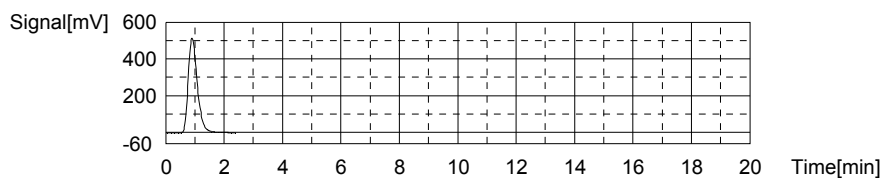
06-30-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1110	25.83mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 9:01:23 AM

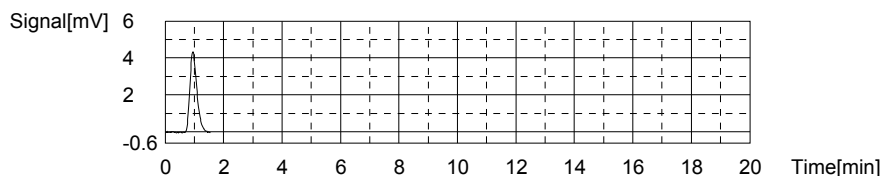
Mean Area 1110
Mean Conc. 25.83mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.364	-0.3300mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 9:05:46 AM

Mean Area 7.364
Mean Conc. -0.3300mg/L



Sample

Sample Name: WG619966-03 LCSDUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

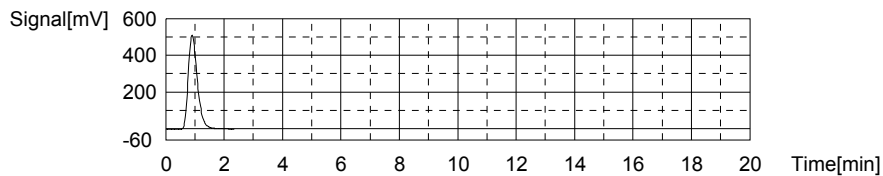
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.12mg/L TC:25.80mg/L IC:-0.3203mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1109	25.80mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 9:13:32 AM

Mean Area 1109
Mean Conc. 25.80mg/L



Anal.: IC

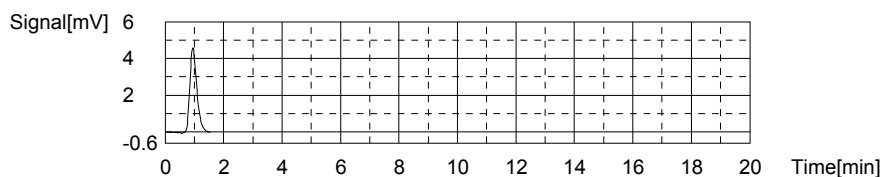
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.689	-0.3203mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 9:17:56 AM

4/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

Mean Area 7.689
Mean Conc. -0.3203mg/L



Sample

Sample Name: L17061495-01 (10)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

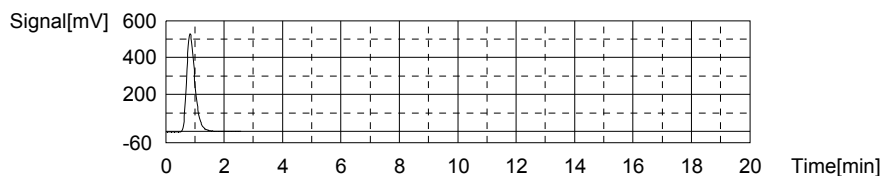
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:18.50mg/L TC:24.20mg/L IC:5.700mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1041	24.20mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 9:54:38 AM

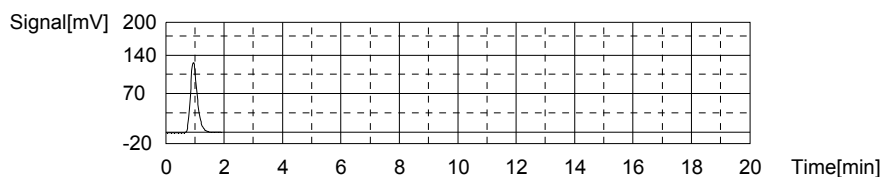
Mean Area 1041
Mean Conc. 24.20mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	209.3	5.700mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 9:59:25 AM

Mean Area 209.3
Mean Conc. 5.700mg/L



Sample

Sample Name: L17061501-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.754mg/L TC:30.46mg/L IC:27.70mg/L

5/58

7/3/2017 6:58:23 AM

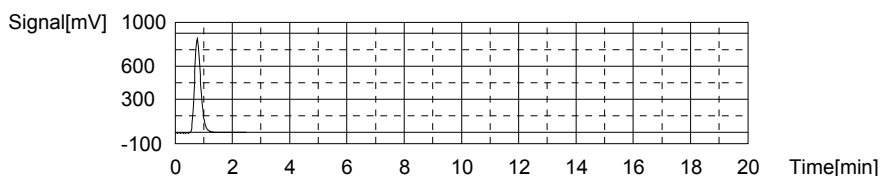
06-30-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1306	30.46mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 10:09:29 AM

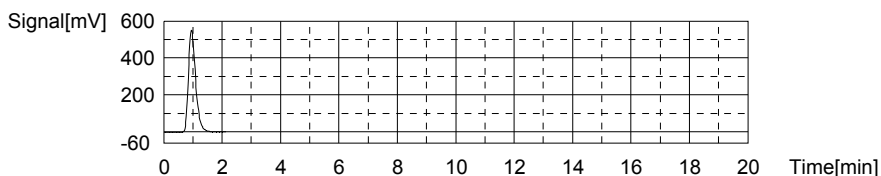
Mean Area 1306
Mean Conc. 30.46mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	946.1	27.70mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 10:14:36 AM

Mean Area 946.1
Mean Conc. 27.70mg/L



Sample

Sample Name: L17061501-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

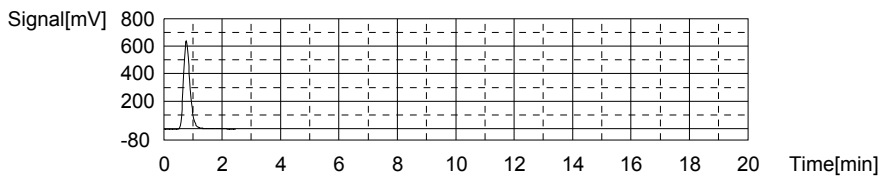
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.998mg/L TC:22.86mg/L IC:20.86mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	984.3	22.86mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 10:22:30 AM

Mean Area 984.3
Mean Conc. 22.86mg/L

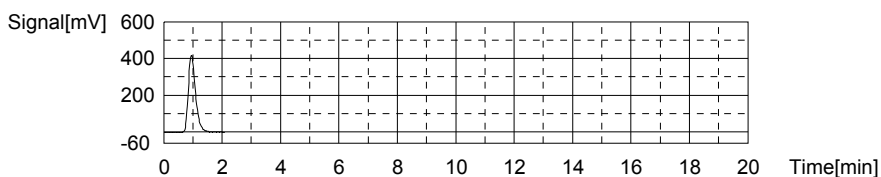


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	716.9	20.86mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 10:27:39 AM

6/58

Mean Area 716.9
Mean Conc. 20.86mg/L



Sample

Sample Name: L17061501-05 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

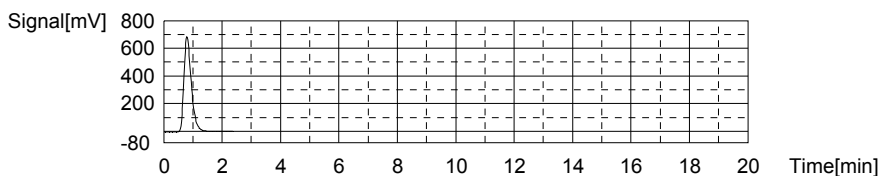
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.80mg/L TC:28.00mg/L IC:16.20mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1202	28.00mg/L	500uL	1		TC	16/30/2017 10:35:27 AM

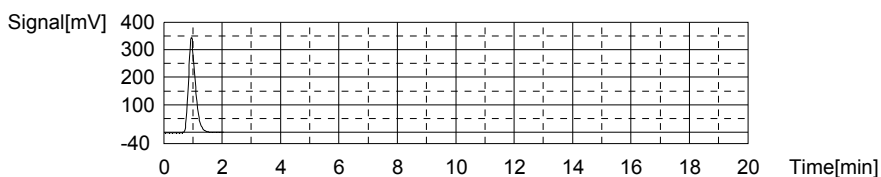
Mean Area 1202
Mean Conc. 28.00mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	561.0	16.20mg/L	500uL	1		IC	16/30/2017 10:40:26 AM

Mean Area 561.0
Mean Conc. 16.20mg/L



Sample

Sample Name: L17061501-06 MSD
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.70mg/L TC:29.02mg/L IC:16.31mg/L

7/3/2017 6:58:23 AM

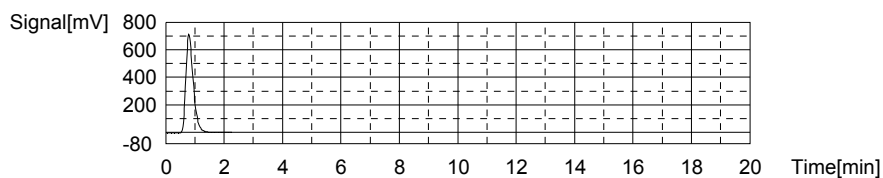
06-30-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1245	29.02mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 10:48:09 AM

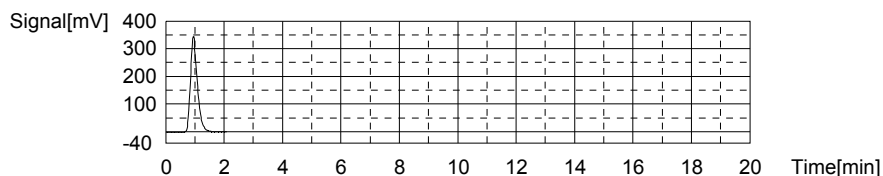
Mean Area 1245
Mean Conc. 29.02mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	564.7	16.31mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 10:53:16 AM

Mean Area 564.7
Mean Conc. 16.31mg/L



Sample

Sample Name: L17061501-13
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

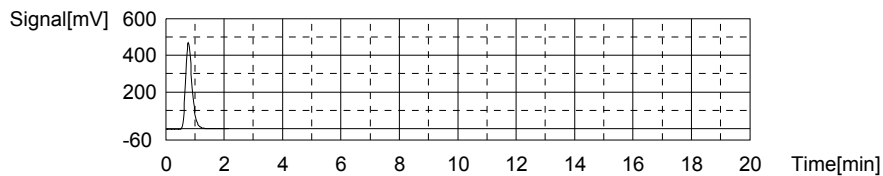
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.783mg/L TC:16.84mg/L IC:15.06mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	729.6	16.84mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 11:00:51 AM

Mean Area 729.6
Mean Conc. 16.84mg/L

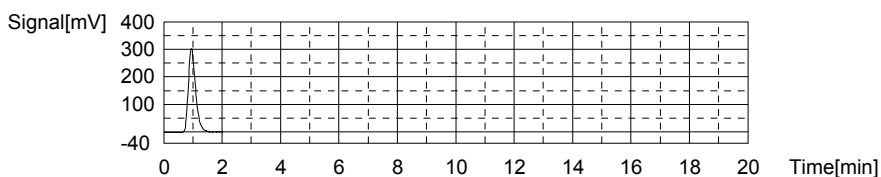


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	522.6	15.06mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 11:05:47 AM

8/58

Mean Area 522.6
Mean Conc. 15.06mg/L



Sample

Sample Name: L17061501-16
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

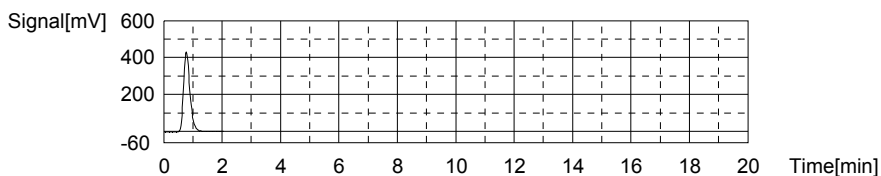
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.606mg/L TC:15.09mg/L IC:13.48mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	655.4	15.09mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 11:13:17 AM

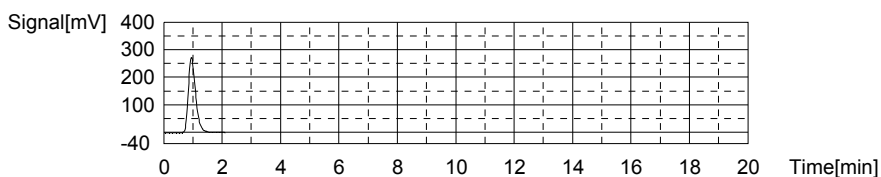
Mean Area 655.4
Mean Conc. 15.09mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	469.8	13.48mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 11:18:18 AM

Mean Area 469.8
Mean Conc. 13.48mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.80mg/L TC:26.56mg/L IC:-0.2438mg/L

7/3/2017 6:58:23 AM

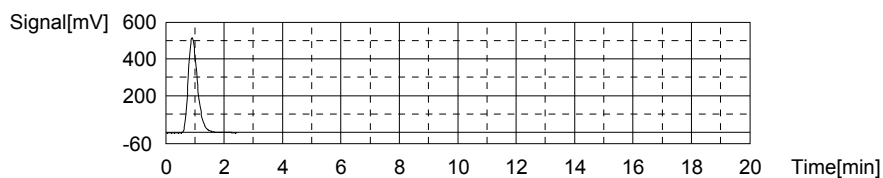
06-30-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1141	26.56mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 11:26:11 AM

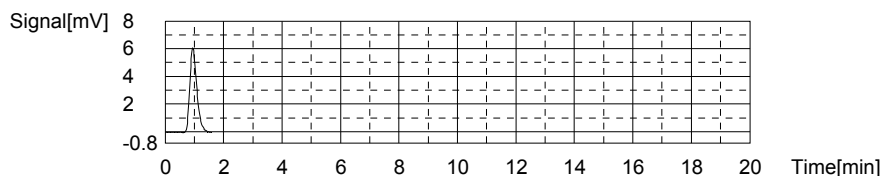
Mean Area 1141
Mean Conc. 26.56mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.25	-0.2438mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 11:30:38 AM

Mean Area 10.25
Mean Conc. -0.2438mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

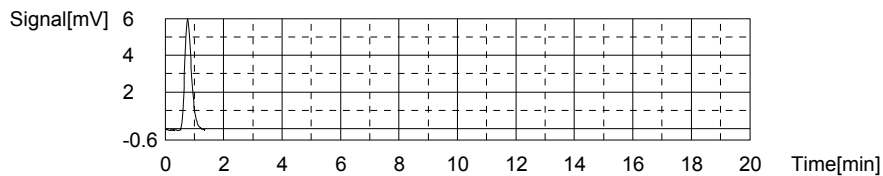
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1292mg/L TC:-0.1703mg/L IC:-0.2995mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.657	-0.1703mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 11:35:39 AM

Mean Area 9.657
Mean Conc. -0.1703mg/L



Anal.: IC

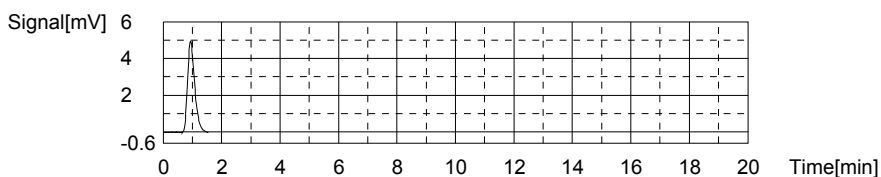
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.384	-0.2995mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 11:39:33 AM

10/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

Mean Area 8.384
Mean Conc. -0.2995mg/L



Sample

Sample Name: L17061501-19
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

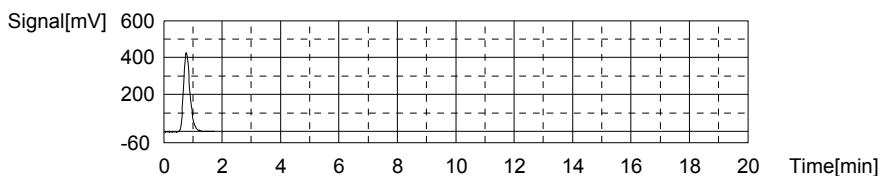
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.538mg/L TC:15.07mg/L IC:13.54mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	654.9	15.07mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 11:46:44 AM

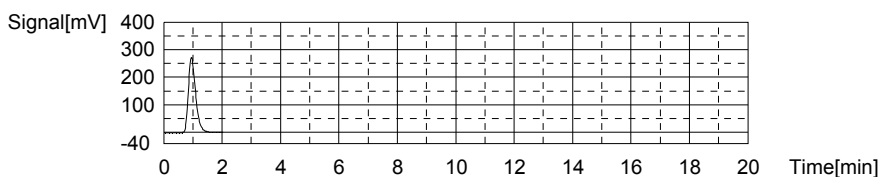
Mean Area 654.9
Mean Conc. 15.07mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	471.7	13.54mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 11:51:43 AM

Mean Area 471.7
Mean Conc. 13.54mg/L



Sample

Sample Name: L17061501-22
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.027mg/L TC:11.24mg/L IC:10.21mg/L

11/58

7/3/2017 6:58:23 AM

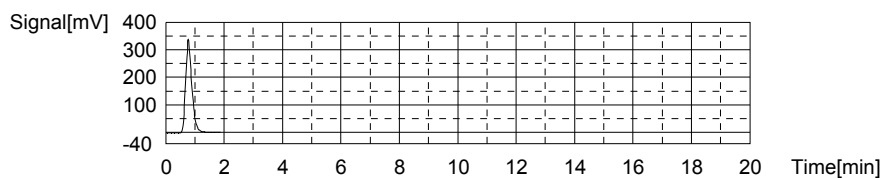
06-30-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	492.6	11.24mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 11:59:01 AM

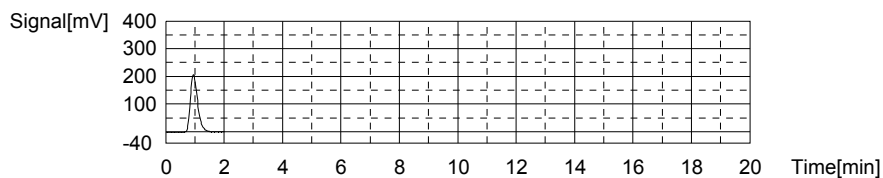
Mean Area 492.6
Mean Conc. 11.24mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	360.4	10.21mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 12:03:55 PM

Mean Area 360.4
Mean Conc. 10.21mg/L



Sample

Sample Name: L17061501-25
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

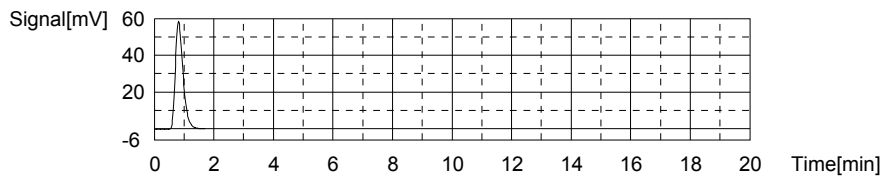
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.937mg/L TC:2.082mg/L IC:0.1450mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	105.0	2.082mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 12:11:03 PM

Mean Area 105.0
Mean Conc. 2.082mg/L



Anal.: IC

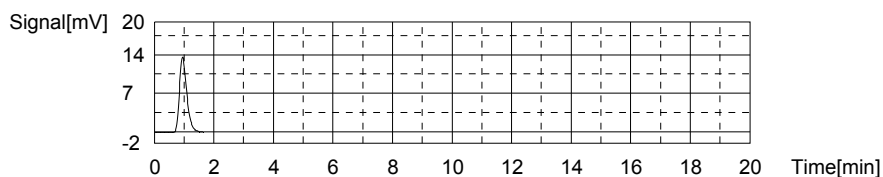
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	23.27	0.1450mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 12:15:31 PM

12/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

Mean Area 23.27
Mean Conc. 0.1450mg/L



Sample

Sample Name: L17061501-28
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

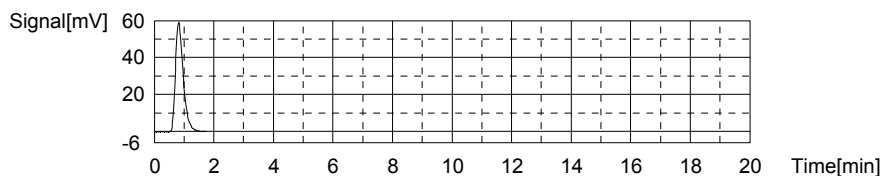
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.057mg/L TC:2.144mg/L IC:0.08707mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	107.6	2.144mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 12:22:42 PM

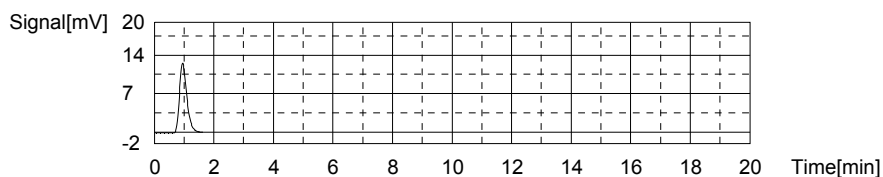
Mean Area 107.6
Mean Conc. 2.144mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	21.33	0.08707mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 12:27:09 PM

Mean Area 21.33
Mean Conc. 0.08707mg/L



Sample

Sample Name: WG619966-08DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.959mg/L TC:2.045mg/L IC:0.08527mg/L

13/58

7/3/2017 6:58:23 AM

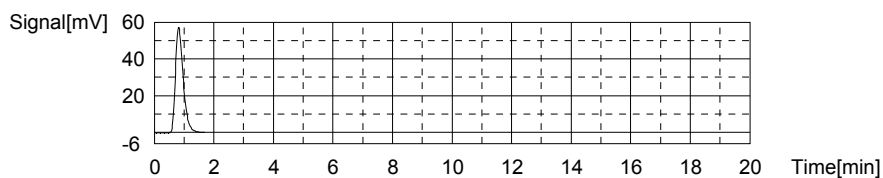
06-30-2017-DCM-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	103.4	2.045mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 12:34:17 PM

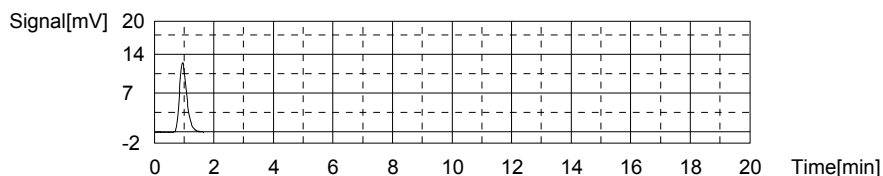
Mean Area 103.4
Mean Conc. 2.045mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	21.27	0.08527mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 12:38:43 PM

Mean Area 21.27
Mean Conc. 0.08527mg/L



Sample

Sample Name: WG619966-09 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

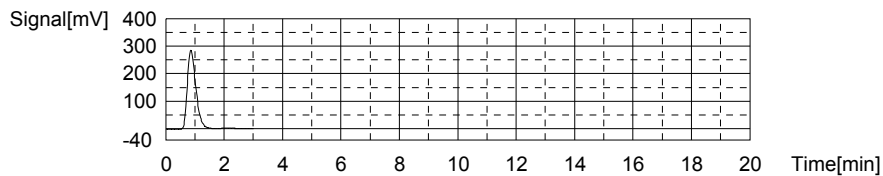
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:13.57mg/L TC:13.58mg/L IC:0.01569mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	591.7	13.58mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 12:47:09 PM

Mean Area 591.7
Mean Conc. 13.58mg/L



Anal.: IC

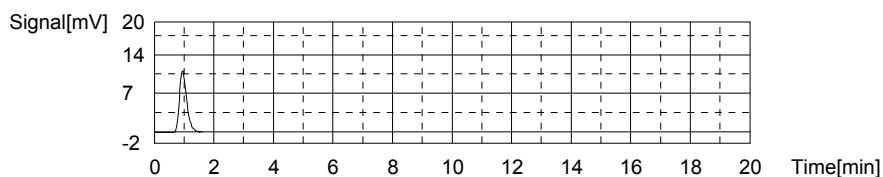
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	18.94	0.01569mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 12:51:36 PM

14/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

Mean Area 18.94
Mean Conc. 0.01569mg/L



Sample

Sample Name: WG619969-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

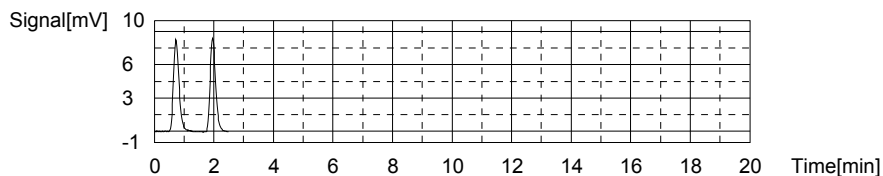
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.09350mg/L TC:-0.1433mg/L IC:-0.2368mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.71	-0.1454mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 12:58:16 PM
2	10.89	-0.1412mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 1:01:48 PM

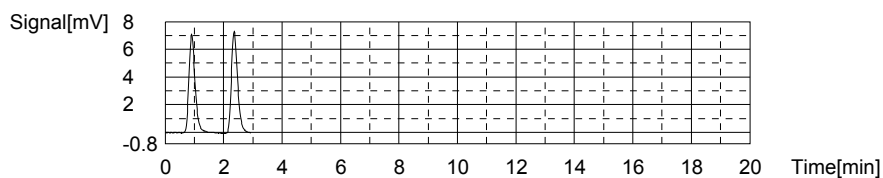
Mean Area 10.80
Mean Conc. -0.1433mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.25	-0.2438mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 1:06:03 PM
2	10.72	-0.2298mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 1:10:05 PM

Mean Area 10.48
Mean Conc. -0.2368mg/L



Sample

Sample Name: WG619969-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

15/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

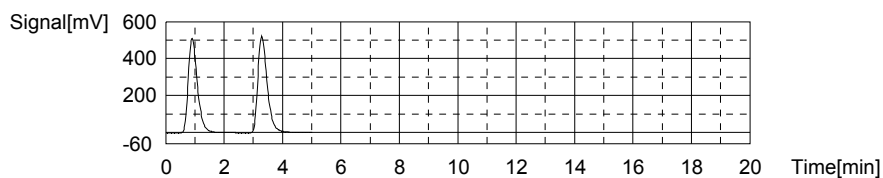
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.66mg/L TC:26.37mg/L IC:-0.2926mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1106	25.73mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 1:17:55 PM
2	1160	27.01mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 1:22:48 PM

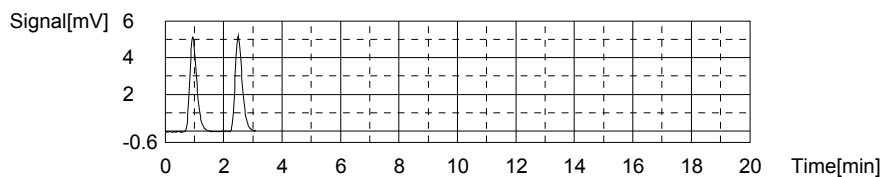
Mean Area 1133
Mean Conc. 26.37mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.568	-0.2941mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 1:27:09 PM
2	8.668	-0.2911mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 1:31:18 PM

Mean Area 8.618
Mean Conc. -0.2926mg/L



Sample

Sample Name: WG619969-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

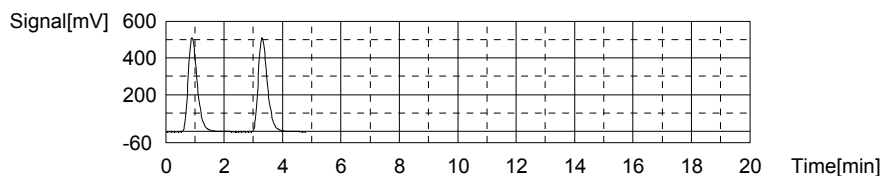
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.04mg/L TC:25.76mg/L IC:-0.2882mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1106	25.73mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 1:39:09 PM
2	1108	25.78mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 1:43:49 PM

Mean Area 1107
Mean Conc. 25.76mg/L



Anal.: IC

16/58

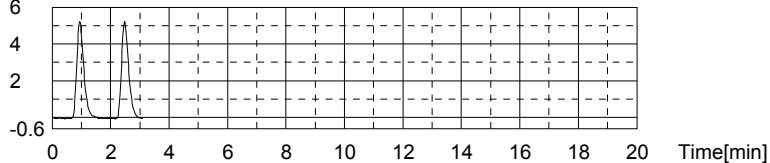
7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.715	-0.2897mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 1:48:10 PM
2	8.814	-0.2867mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 1:52:18 PM

Mean Area 8.765
Mean Conc. -0.2882mg/L

Signal[mV] 6



Sample

Sample Name: L17061493-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.4345mg/L TC:0.2558mg/L IC:-0.1787mg/L

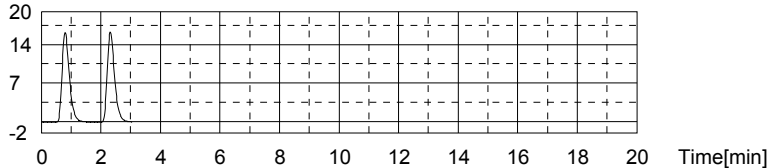
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	27.57	0.2529mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 2:05:49 PM
2	27.81	0.2586mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 2:09:37 PM

Mean Area 27.69
Mean Conc. 0.2558mg/L

Signal[mV] 20

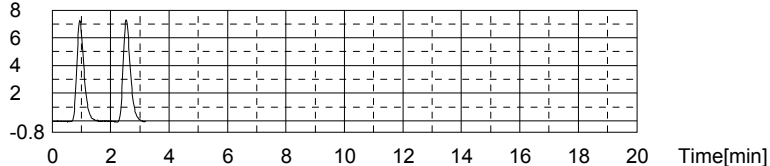


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.35	-0.1811mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 2:14:00 PM
2	12.51	-0.1763mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 2:18:12 PM

Mean Area 12.43
Mean Conc. -0.1787mg/L

Signal[mV] 8



Sample

17/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

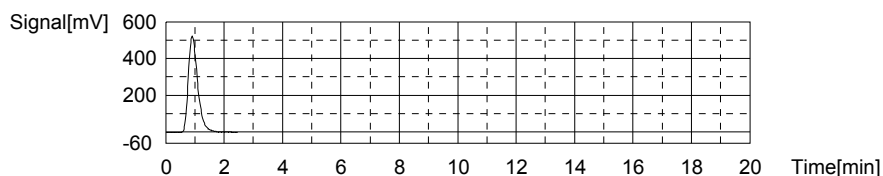
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:27.42mg/L TC:27.13mg/L IC:-0.2892mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1165	27.13mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 2:26:06 PM

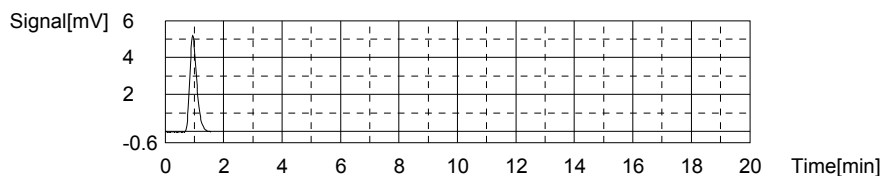
Mean Area 1165
 Mean Conc. 27.13mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.731	-0.2892mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 2:30:29 PM

Mean Area 8.731
 Mean Conc. -0.2892mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1329mg/L TC:-0.1731mg/L IC:-0.3060mg/L

1. Det

Anal.: TC

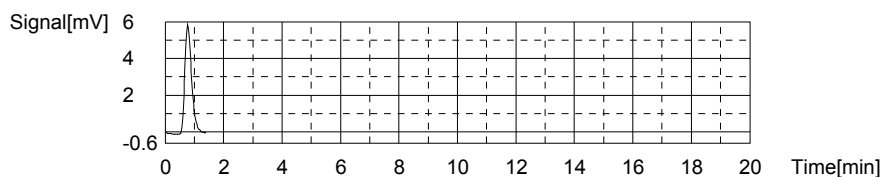
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.540	-0.1731mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 2:35:30 PM

18/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

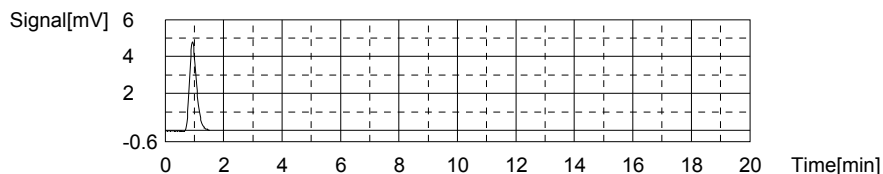
Mean Area 9.540
Mean Conc. -0.1731mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.168	-0.3060mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 2:39:22 PM

Mean Area 8.168
Mean Conc. -0.3060mg/L



Sample

Sample Name: L17061511-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

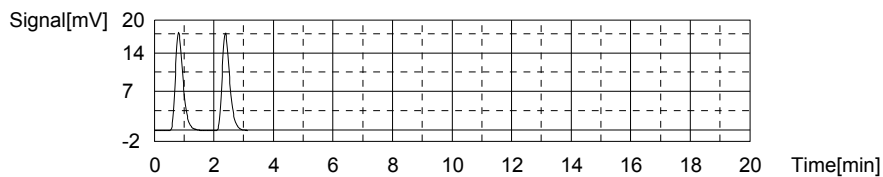
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.6267mg/L TC:0.3481mg/L IC:-0.2785mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	31.64	0.3491mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 2:46:23 PM
2	31.56	0.3472mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 2:50:14 PM

Mean Area 31.60
Mean Conc. 0.3481mg/L

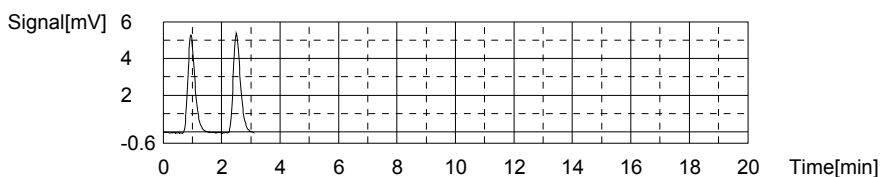


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.022	-0.2805mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 2:54:37 PM
2	9.154	-0.2766mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 2:58:48 PM

19/58

Mean Area 9.088
 Mean Conc. -0.2785mg/L



Sample

Sample Name: L17061513-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

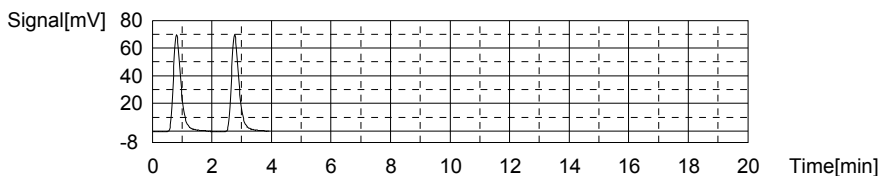
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.284mg/L TC:2.518mg/L IC:0.2340mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	123.5	2.519mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 3:06:12 PM
2	123.4	2.517mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 3:10:27 PM

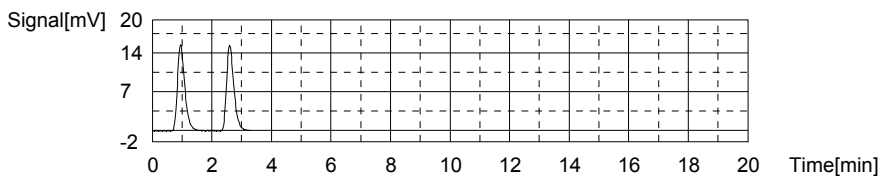
Mean Area 123.5
 Mean Conc. 2.518mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	26.30	0.2355mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 3:14:56 PM
2	26.20	0.2325mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 3:19:10 PM

Mean Area 26.25
 Mean Conc. 0.2340mg/L



Sample

Sample Name: L17061513-02
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

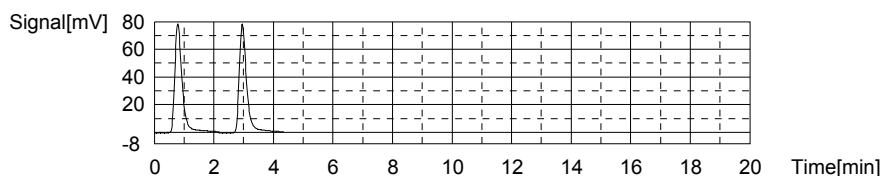
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.285mg/L TC:2.756mg/L IC:1.470mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	133.1	2.746mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 3:26:47 PM
2	133.9	2.765mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 3:31:25 PM

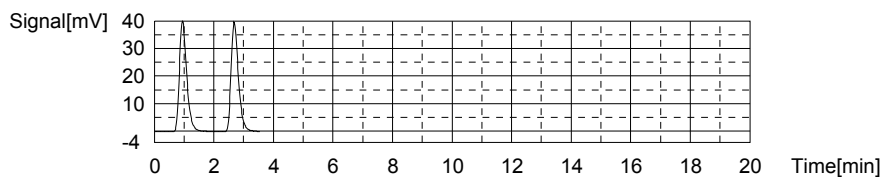
Mean Area 133.5
Mean Conc. 2.756mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	67.80	1.475mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 3:35:57 PM
2	67.49	1.466mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 3:40:21 PM

Mean Area 67.65
Mean Conc. 1.470mg/L



Sample

Sample Name: L17061513-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

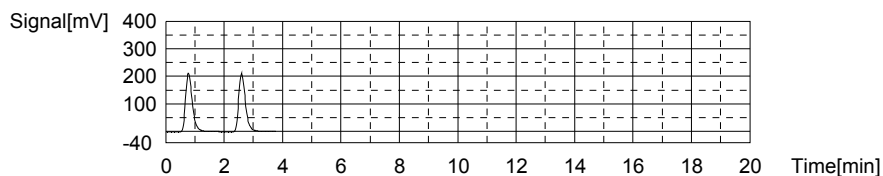
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.460mg/L TC:7.583mg/L IC:6.123mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	336.3	7.547mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 3:47:38 PM
2	339.3	7.618mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 3:51:51 PM

Mean Area 337.8
Mean Conc. 7.583mg/L



Anal.: IC

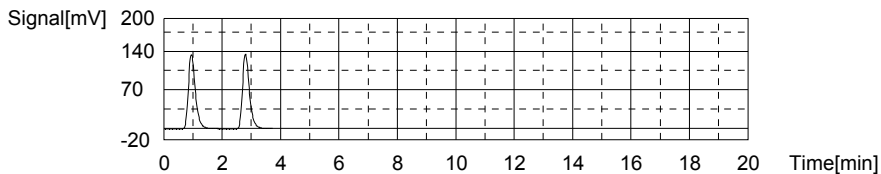
21/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	222.9	6.107mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 3:56:36 PM
2	224.0	6.139mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 4:01:08 PM

Mean Area 223.4
Mean Conc. 6.123mg/L



Sample

Sample Name: L17061514-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

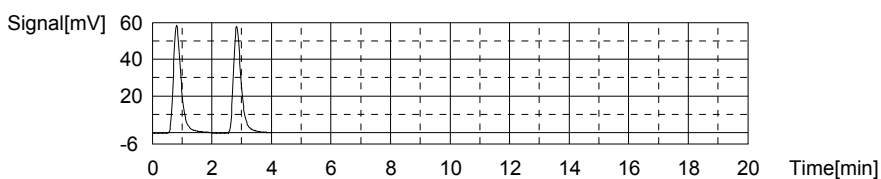
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.042mg/L TC:2.075mg/L IC:0.03331mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	104.9	2.080mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 4:08:37 PM
2	104.5	2.071mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 4:12:55 PM

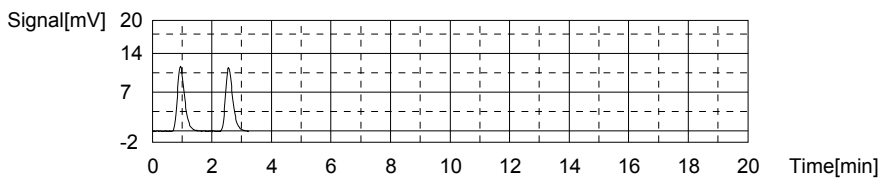
Mean Area 104.7
Mean Conc. 2.075mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	19.57	0.03451mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 4:17:21 PM
2	19.49	0.03212mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 4:21:33 PM

Mean Area 19.53
Mean Conc. 0.03331mg/L



Sample

22/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

Sample Name: L17061516-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

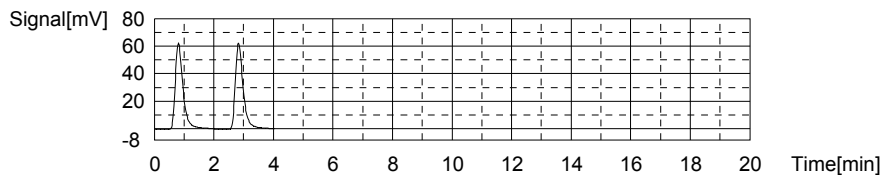
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.078mg/L TC:2.251mg/L IC:0.1737mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	111.1	2.226mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 4:29:02 PM
2	113.2	2.276mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 4:33:20 PM

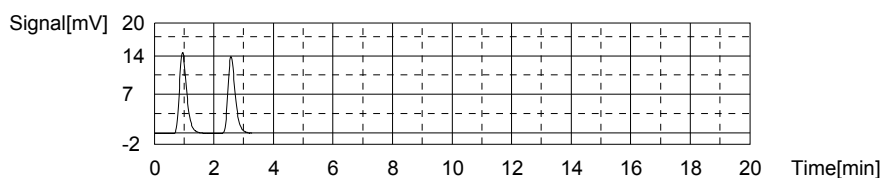
Mean Area 112.2
 Mean Conc. 2.251mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	24.84	0.1919mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 4:37:44 PM
2	23.62	0.1555mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 4:41:57 PM

Mean Area 24.23
 Mean Conc. 0.1737mg/L



Sample

Sample Name: L17061517-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.616mg/L TC:3.769mg/L IC:0.1529mg/L

1. Det

Anal.: TC

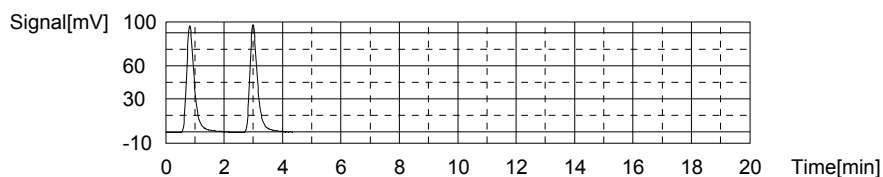
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	175.6	3.750mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 4:49:35 PM
2	177.2	3.788mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 4:54:01 PM

23/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

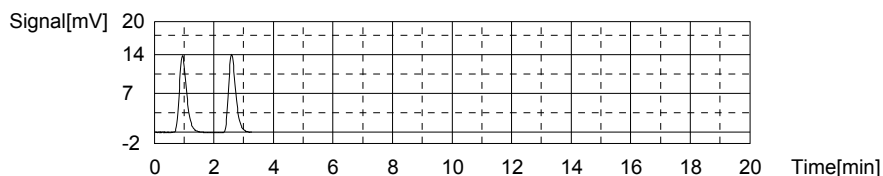
Mean Area 176.4
Mean Conc. 3.769mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	23.34	0.1471mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 4:58:29 PM
2	23.73	0.1587mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 5:02:42 PM

Mean Area 23.54
Mean Conc. 0.1529mg/L



Sample

Sample Name: L17061517-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

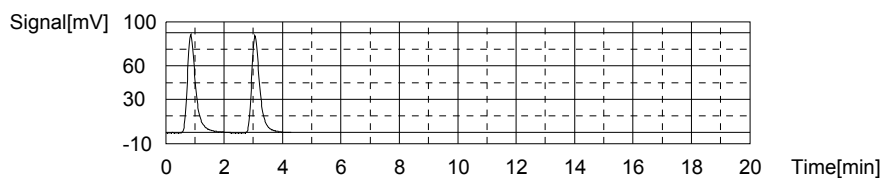
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:3.797mg/L TC:3.649mg/L IC:-0.1483mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	174.5	3.724mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 5:10:21 PM
2	168.1	3.573mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 5:14:44 PM

Mean Area 171.3
Mean Conc. 3.649mg/L

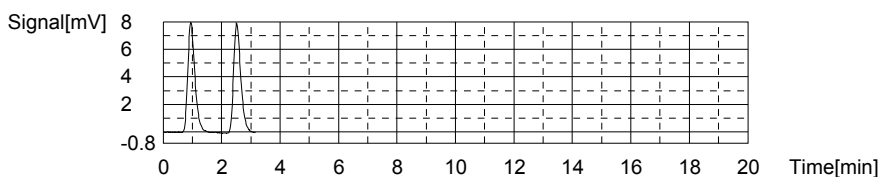


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	13.43	-0.1489mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 5:19:06 PM
2	13.47	-0.1477mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 5:23:16 PM

24/58

Mean Area 13.45
Mean Conc. -0.1483mg/L



Sample

Sample Name: L17061517-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

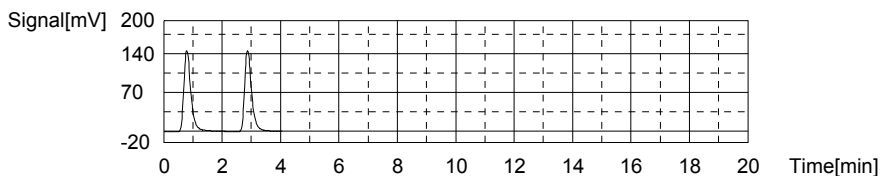
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.268mg/L TC:5.344mg/L IC:3.076mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	243.4	5.352mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 5:30:48 PM
2	242.7	5.336mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 5:35:04 PM

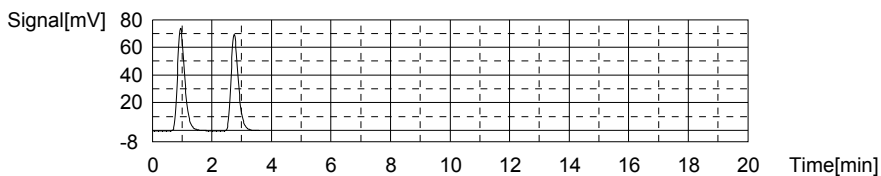
Mean Area 243.1
Mean Conc. 5.344mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	124.8	3.177mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 5:39:42 PM
2	118.0	2.974mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 5:44:06 PM

Mean Area 121.4
Mean Conc. 3.076mg/L



Sample

Sample Name: L17061518-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

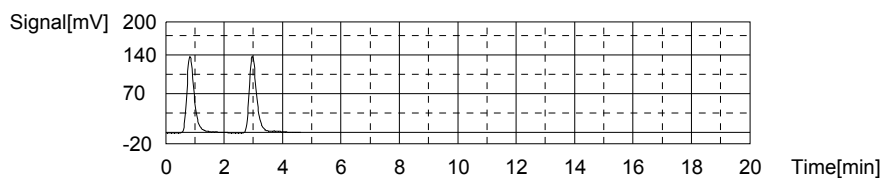
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.290mg/L TC:5.392mg/L IC:0.1024mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	241.2	5.300mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 5:51:42 PM
2	249.0	5.485mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 5:56:28 PM

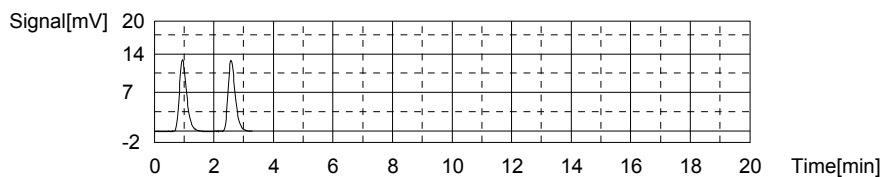
Mean Area 245.1
Mean Conc. 5.392mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	22.03	0.1080mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 6:00:55 PM
2	21.66	0.09692mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 6:05:10 PM

Mean Area 21.84
Mean Conc. 0.1024mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

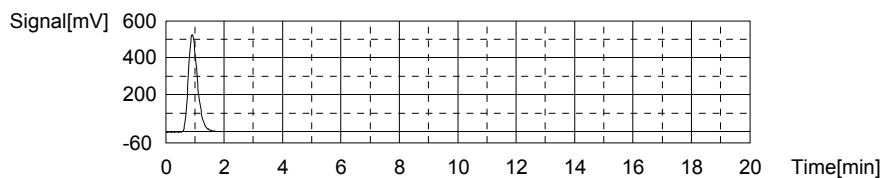
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:27.09mg/L TC:26.82mg/L IC:-0.2690mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1152	26.82mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 6:13:00 PM

Mean Area 1152
Mean Conc. 26.82mg/L



Anal.: IC

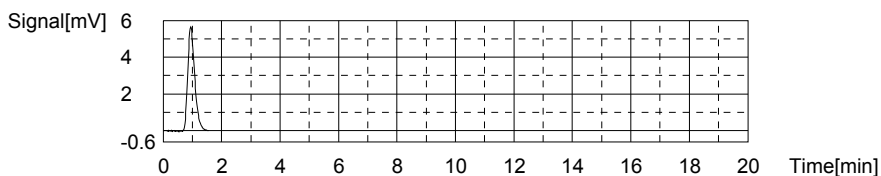
26/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.407	-0.2690mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 6:17:23 PM

Mean Area 9.407
Mean Conc. -0.2690mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

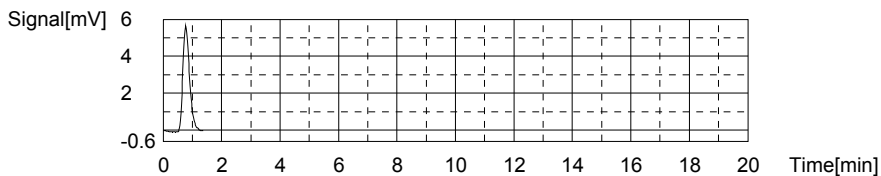
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1226mg/L TC:-0.1825mg/L IC:-0.3051mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.140	-0.1825mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 6:22:23 PM

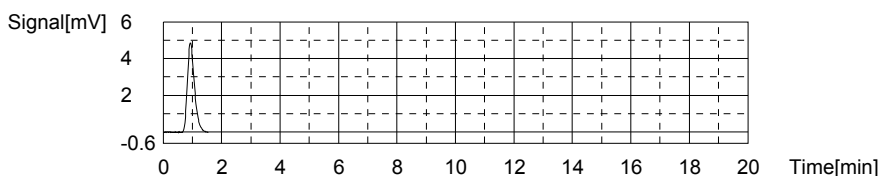
Mean Area 9.140
Mean Conc. -0.1825mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.199	-0.3051mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 6:26:20 PM

Mean Area 8.199
Mean Conc. -0.3051mg/L



Sample

Sample Name: L17061519-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

27/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

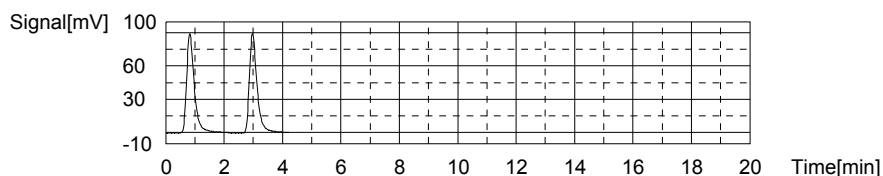
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.312mg/L TC:3.410mg/L IC:0.09841mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	161.0	3.405mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 6:33:57 PM
2	161.4	3.415mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 6:38:18 PM

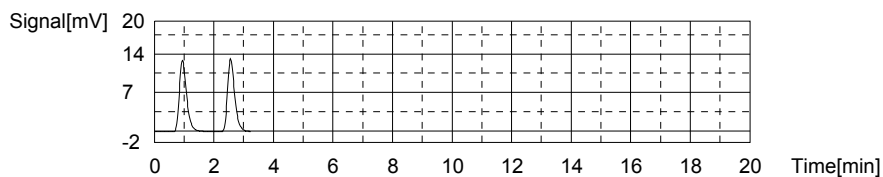
Mean Area 161.2
Mean Conc. 3.410mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	21.59	0.09483mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 6:42:43 PM
2	21.83	0.1020mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 6:46:57 PM

Mean Area 21.71
Mean Conc. 0.09841mg/L



Sample

Sample Name: L17061520-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

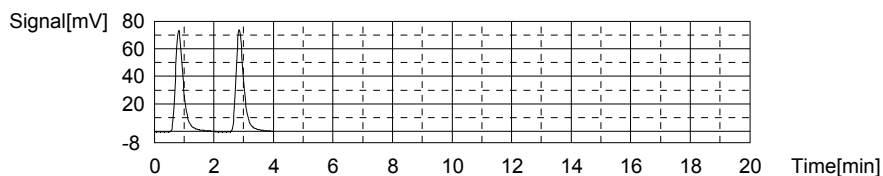
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.624mg/L TC:2.745mg/L IC:0.1210mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	133.3	2.751mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 6:54:26 PM
2	132.8	2.739mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 6:58:42 PM

Mean Area 133.1
Mean Conc. 2.745mg/L



Anal.: IC

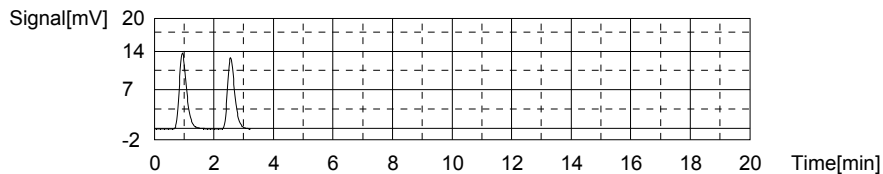
28/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	23.27	0.1450mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 7:03:07 PM
2	21.66	0.09692mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 7:07:19 PM

Mean Area 22.47
Mean Conc. 0.1210mg/L



Sample

Sample Name: L17061521-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

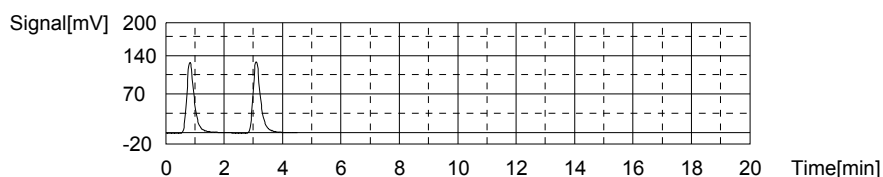
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.904mg/L TC:5.095mg/L IC:0.1908mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	230.0	5.036mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 7:15:03 PM
2	235.0	5.154mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 7:19:34 PM

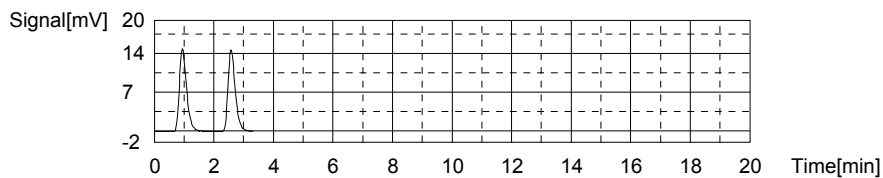
Mean Area 232.5
Mean Conc. 5.095mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	24.80	0.1907mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 7:24:00 PM
2	24.81	0.1910mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 7:28:16 PM

Mean Area 24.81
Mean Conc. 0.1908mg/L



Sample

29/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

Sample Name: L17061581-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

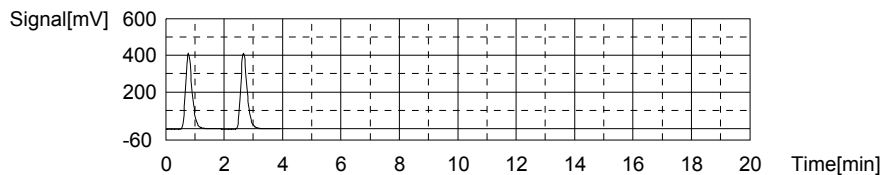
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.566mg/L TC:14.71mg/L IC:12.14mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	634.3	14.59mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 7:35:37 PM
2	644.6	14.83mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 7:39:57 PM

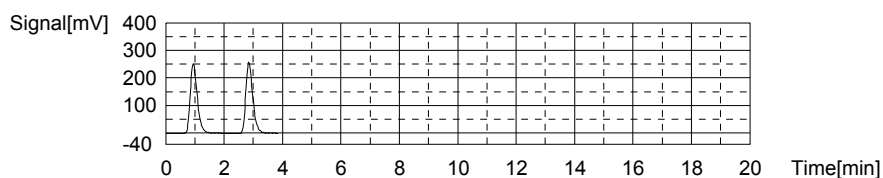
Mean Area 639.5
 Mean Conc. 14.71mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	420.7	12.01mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 7:44:44 PM
2	429.4	12.27mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_16	6/30/2017 7:49:21 PM

Mean Area 425.1
 Mean Conc. 12.14mg/L



Sample

Sample Name: L17061581-03
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.643mg/L TC:12.62mg/L IC:9.975mg/L

1. Det

Anal.: TC

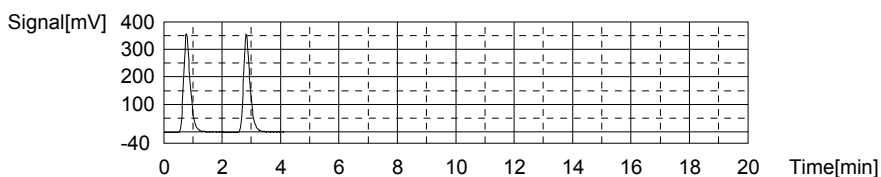
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	552.4	12.65mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 7:56:52 PM
2	549.5	12.58mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_56	6/30/2017 8:01:21 PM

30/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

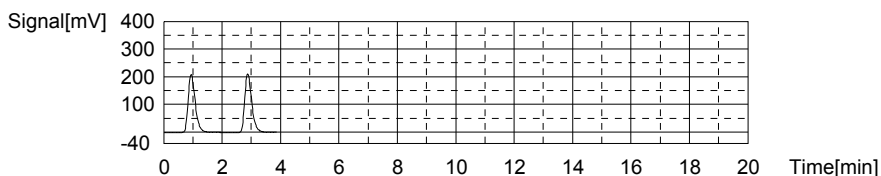
Mean Area 551.0
Mean Conc. 12.62mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	349.9	9.899mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 8:06:09 PM
2	355.0	10.05mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 8:10:43 PM

Mean Area 352.5
Mean Conc. 9.975mg/L



Sample

Sample Name: L17061581-05
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

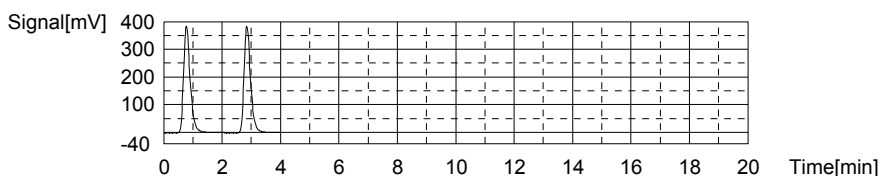
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.824mg/L TC:13.71mg/L IC:10.89mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	600.1	13.78mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 8:18:15 PM
2	594.5	13.65mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 8:22:25 PM

Mean Area 597.3
Mean Conc. 13.71mg/L



Anal.: IC

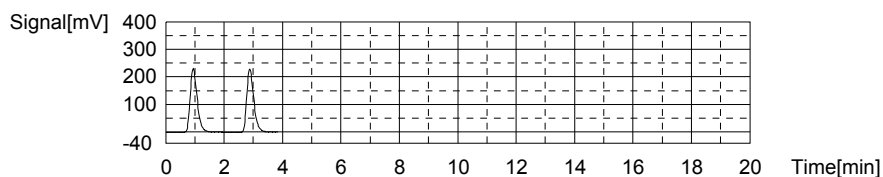
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	383.3	10.90mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 8:27:16 PM
2	382.8	10.88mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 8:31:52 PM

31/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

Mean Area 383.1
Mean Conc. 10.89mg/L



Sample

Sample Name: L17061581-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

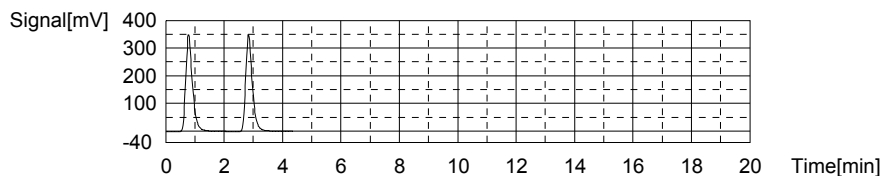
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.609mg/L TC:12.65mg/L IC:9.044mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	550.4	12.61mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 8:39:23 PM
2	554.4	12.70mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 8:44:02 PM

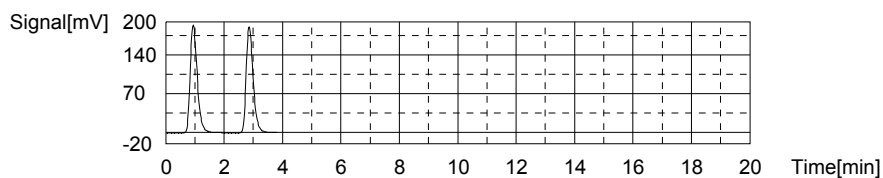
Mean Area 552.4
Mean Conc. 12.65mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	324.1	9.129mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 8:48:50 PM
2	318.4	8.959mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 8:53:23 PM

Mean Area 321.3
Mean Conc. 9.044mg/L



Sample

Sample Name: L17061581-09
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

32/58

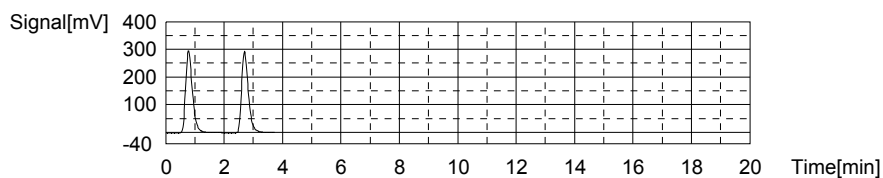
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.599mg/L TC:10.69mg/L IC:8.087mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	472.0	10.75mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 9:00:46 PM
2	466.3	10.62mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 9:04:51 PM

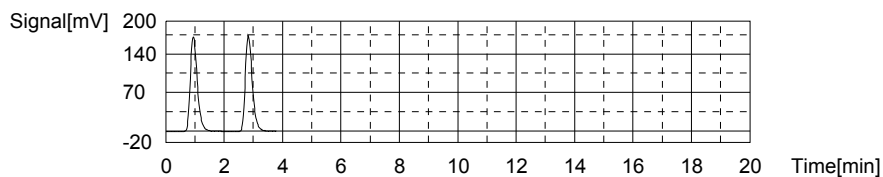
Mean Area 469.1
Mean Conc. 10.69mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	286.8	8.015mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 9:09:37 PM
2	291.6	8.158mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 9:14:09 PM

Mean Area 289.2
Mean Conc. 8.087mg/L



Sample

Sample Name: L17061581-11
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

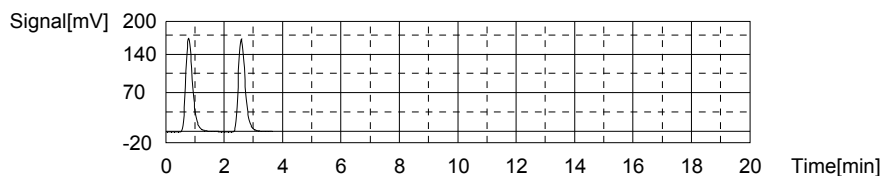
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.215mg/L TC:6.159mg/L IC:3.945mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	279.0	6.193mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 9:21:27 PM
2	276.1	6.125mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 9:25:35 PM

Mean Area 277.6
Mean Conc. 6.159mg/L



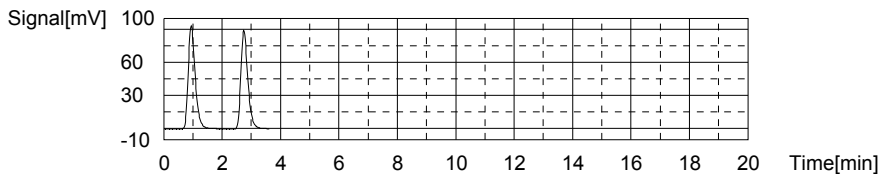
Anal.: IC

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	153.3	4.028mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 9:30:15 PM
2	147.7	3.861mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 9:34:39 PM

Mean Area 150.5
Mean Conc. 3.945mg/L



Sample

Sample Name: WG619969-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

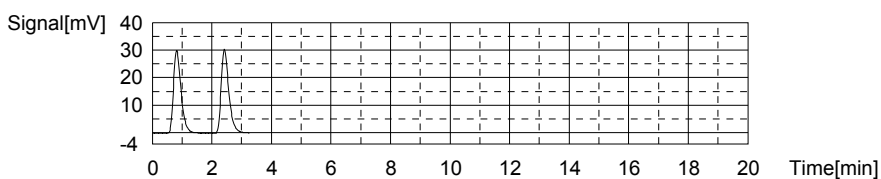
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:1.136mg/L TC:0.8588mg/L IC:-0.2775mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	52.19	0.8346mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 9:41:44 PM
2	54.24	0.8830mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 9:45:39 PM

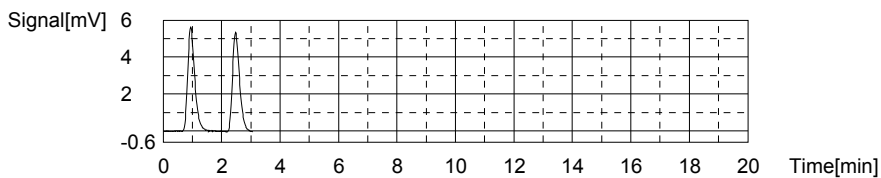
Mean Area 53.22
Mean Conc. 0.8588mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.318	-0.2717mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 9:50:01 PM
2	8.925	-0.2834mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 9:54:08 PM

Mean Area 9.122
Mean Conc. -0.2775mg/L



Sample

34/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

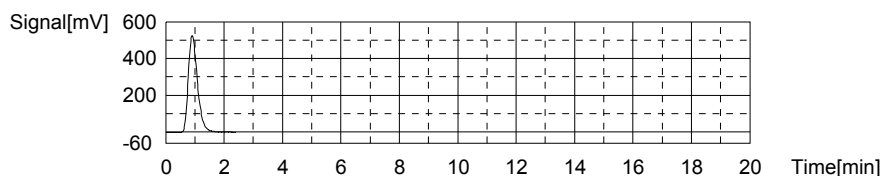
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.98mg/L TC:26.70mg/L IC:-0.2791mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1147	26.70mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 10:01:58 PM

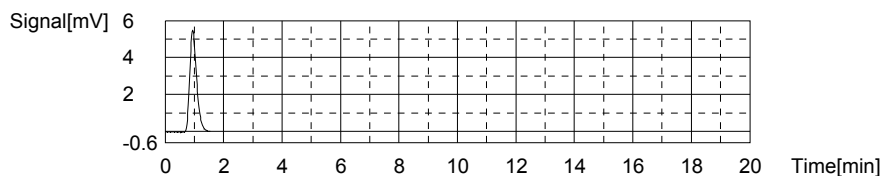
Mean Area 1147
 Mean Conc. 26.70mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.070	-0.2791mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 10:06:21 PM

Mean Area 9.070
 Mean Conc. -0.2791mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1165mg/L TC:-0.1719mg/L IC:-0.2883mg/L

1. Det

Anal.: TC

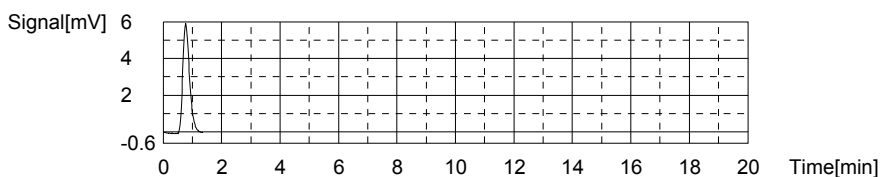
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.591	-0.1719mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 10:11:21 PM

35/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

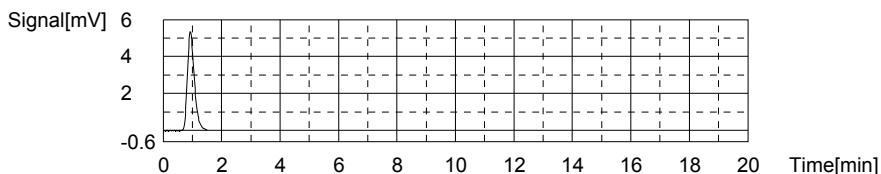
Mean Area 9.591
Mean Conc. -0.1719mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.759	-0.2883mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 10:15:12 PM

Mean Area 8.759
Mean Conc. -0.2883mg/L



Sample

Sample Name: WG619969-06 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

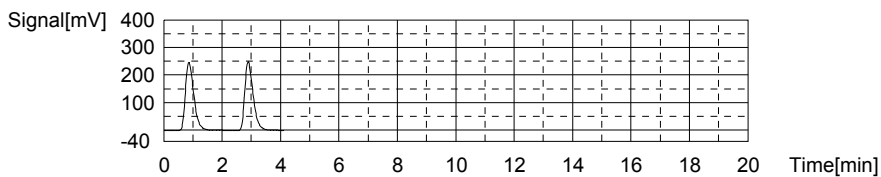
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:11.53mg/L TC:11.24mg/L IC:-0.2899mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	489.9	11.18mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 10:22:43 PM
2	495.1	11.30mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 10:27:05 PM

Mean Area 492.5
Mean Conc. 11.24mg/L



Anal.: IC

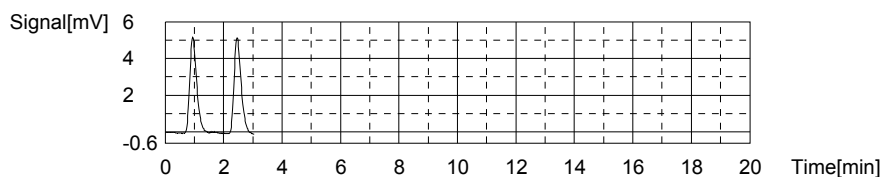
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.670	-0.2910mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 10:31:26 PM
2	8.742	-0.2889mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 10:35:32 PM

36/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

Mean Area 8.706
Mean Conc. -0.2899mg/L



Sample

Sample Name: WG620071-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

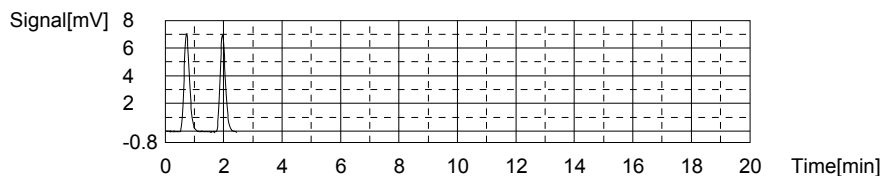
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.08499mg/L TC:-0.1836mg/L IC:-0.2686mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.154	-0.1822mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 10:42:14 PM
2	9.032	-0.1851mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 10:45:43 PM

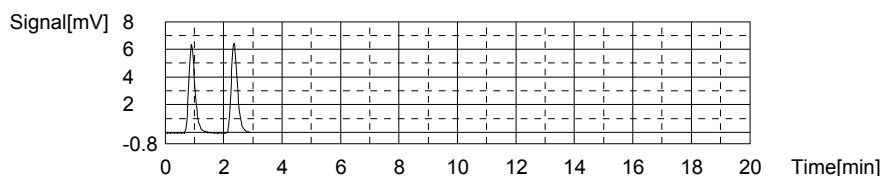
Mean Area 9.093
Mean Conc. -0.1836mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.245	-0.2738mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 10:49:59 PM
2	9.594	-0.2634mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 10:54:01 PM

Mean Area 9.420
Mean Conc. -0.2686mg/L



Sample

Sample Name: WG620071-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

37/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

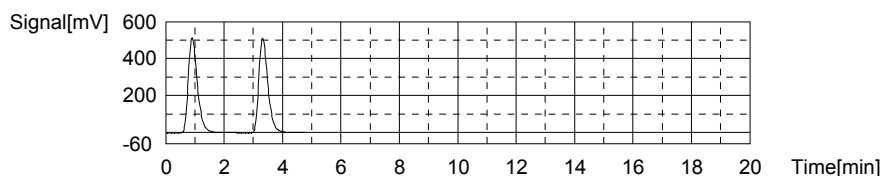
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.03mg/L TC:25.74mg/L IC:-0.2875mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1112	25.87mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 11:01:55 PM
2	1101	25.61mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 11:06:32 PM

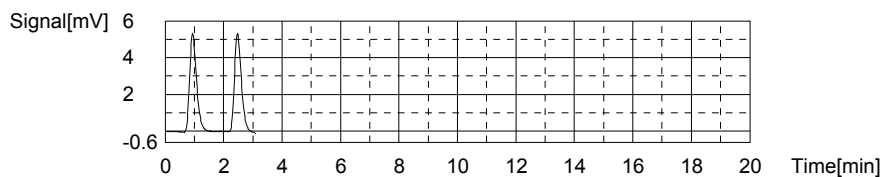
Mean Area 1107
Mean Conc. 25.74mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.809	-0.2869mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 11:10:53 PM
2	8.763	-0.2882mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_16	16/30/2017 11:15:00 PM

Mean Area 8.786
Mean Conc. -0.2875mg/L



Sample

Sample Name: WG620071-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

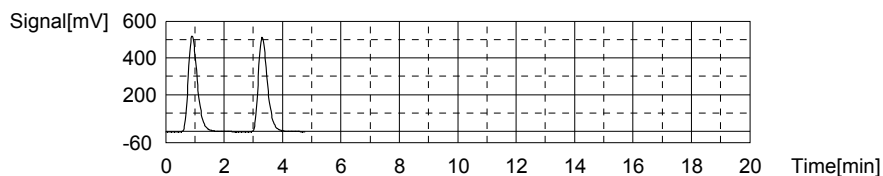
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.41mg/L TC:26.12mg/L IC:-0.2869mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1130	26.30mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 11:22:53 PM
2	1115	25.95mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 11:27:31 PM

Mean Area 1123
Mean Conc. 26.12mg/L



Anal.: IC

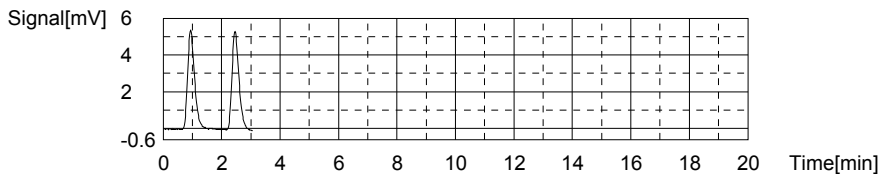
38/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.799	-0.2872mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 11:31:50 PM
2	8.816	-0.2866mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 11:35:56 PM

Mean Area 8.808
Mean Conc. -0.2869mg/L



Sample

Sample Name: L17061581-13
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

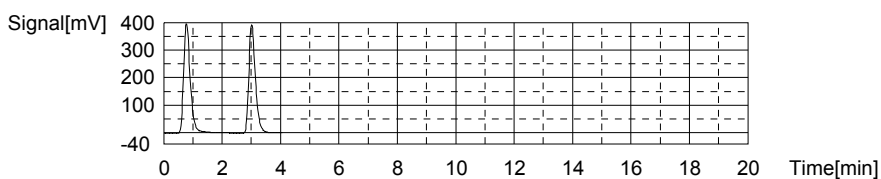
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.889mg/L TC:14.14mg/L IC:11.25mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	621.7	14.29mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 11:43:38 PM
2	608.8	13.99mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_56	16/30/2017 11:47:44 PM

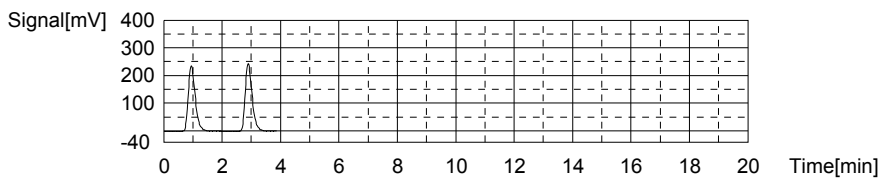
Mean Area 615.3
Mean Conc. 14.14mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	388.2	11.04mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 11:52:35 PM
2	402.0	11.46mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	16/30/2017 11:57:08 PM

Mean Area 395.1
Mean Conc. 11.25mg/L



Sample

39/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

Sample Name: L17061581-15
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

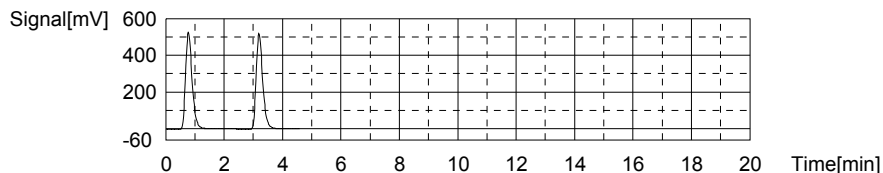
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.005mg/L TC:18.81mg/L IC:15.80mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	817.7	18.92mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 12:05:02 AM	
2	808.2	18.70mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 12:09:39 AM	

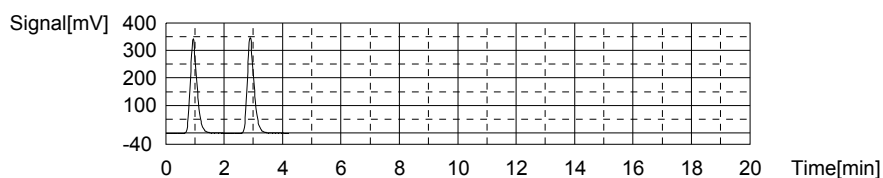
Mean Area 813.0
 Mean Conc. 18.81mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	541.7	15.63mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 12:14:31 AM	
2	553.5	15.98mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 12:19:28 AM	

Mean Area 547.6
 Mean Conc. 15.80mg/L



Sample

Sample Name: L17061581-17
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.003mg/L TC:11.59mg/L IC:8.587mg/L

1. Det

Anal.: TC

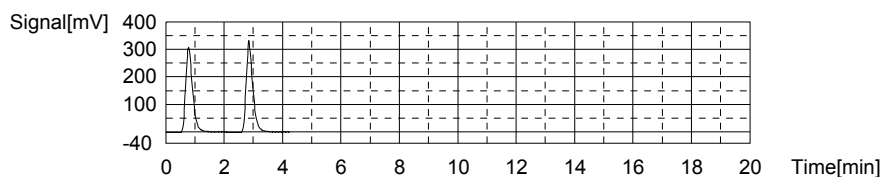
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	498.5	11.38mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 12:27:01 AM	
2	516.3	11.80mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 12:31:31 AM	

40/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

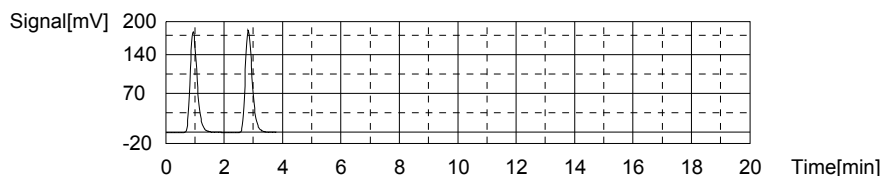
Mean Area 507.4
Mean Conc. 11.59mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	303.1	8.502mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 12:36:18 AM
2	308.8	8.672mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 12:40:51 AM

Mean Area 306.0
Mean Conc. 8.587mg/L



Sample

Sample Name: L17061581-19
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

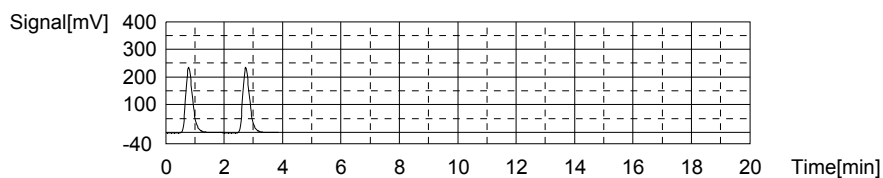
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.555mg/L TC:8.721mg/L IC:6.166mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	386.6	8.736mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/7/1/2017 12:48:17 AM
2	385.4	8.707mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/7/1/2017 12:52:28 AM

Mean Area 386.0
Mean Conc. 8.721mg/L



Anal.: IC

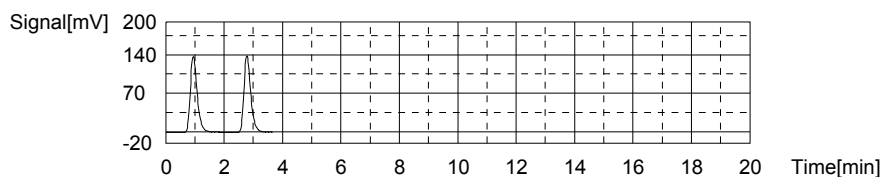
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	224.0	6.139mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 12:57:09 AM
2	225.8	6.193mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 1:01:35 AM

41/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

Mean Area 224.9
Mean Conc. 6.166mg/L



Sample

Sample Name: L17061581-21
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

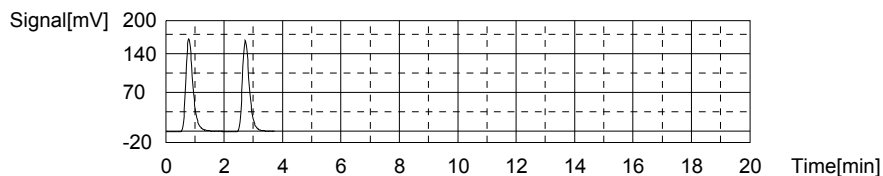
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.482mg/L TC:6.157mg/L IC:3.674mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	282.8	6.283mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 1:09:01 AM	
2	272.1	6.030mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 1:13:04 AM	

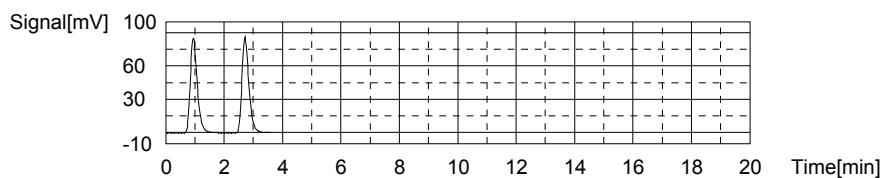
Mean Area 277.5
Mean Conc. 6.157mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	140.3	3.640mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 1:17:42 AM	
2	142.6	3.709mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 1:22:10 AM	

Mean Area 141.4
Mean Conc. 3.674mg/L



Sample

Sample Name: L17061581-23
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

42/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

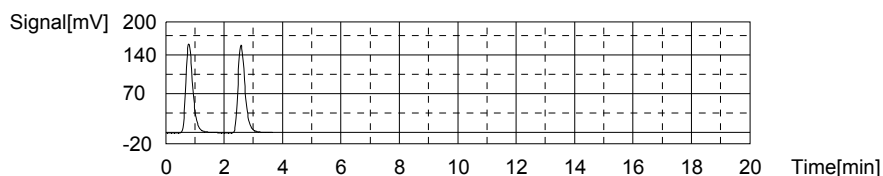
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.496mg/L TC:5.874mg/L IC:3.379mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	266.0	5.886mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 1:29:27 AM	
2	265.0	5.863mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 1:33:36 AM	

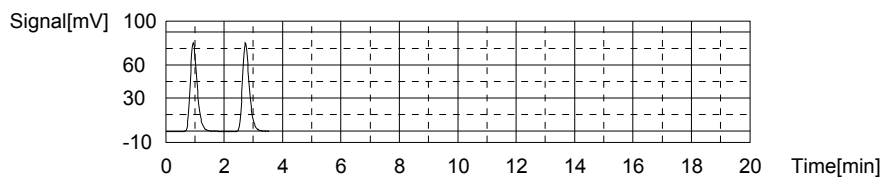
Mean Area 265.5
Mean Conc. 5.874mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	132.0	3.392mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 1:38:16 AM	
2	131.1	3.365mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 1:42:38 AM	

Mean Area 131.6
Mean Conc. 3.379mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

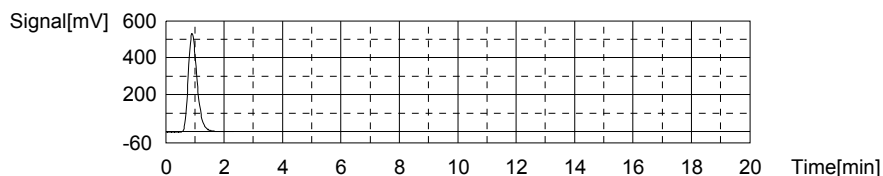
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.42mg/L TC:26.16mg/L IC:-0.2640mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1124	26.16mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 1:50:27 AM	

Mean Area 1124
Mean Conc. 26.16mg/L



Anal.: IC

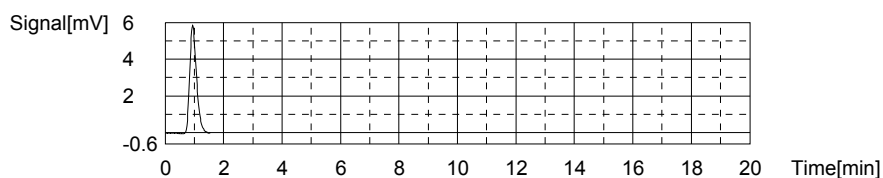
43/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.575	-0.2640mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	7/1/2017 1:54:48 AM

Mean Area 9.575
Mean Conc. -0.2640mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

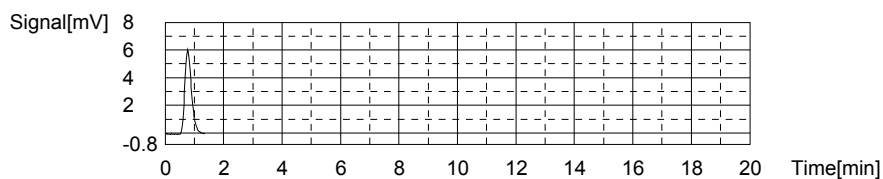
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1019mg/L TC:-0.1705mg/L IC:-0.2724mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.648	-0.1705mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_57	7/1/2017 1:59:48 AM

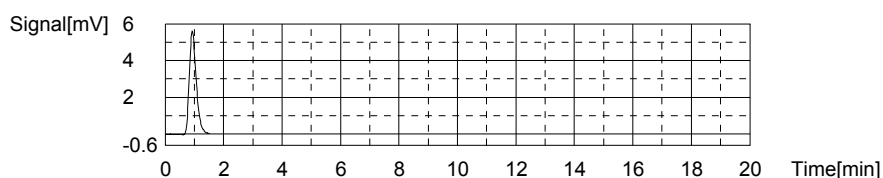
Mean Area 9.648
Mean Conc. -0.1705mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.294	-0.2724mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	7/1/2017 2:03:40 AM

Mean Area 9.294
Mean Conc. -0.2724mg/L



Sample

Sample Name: L17061581-25
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

44/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

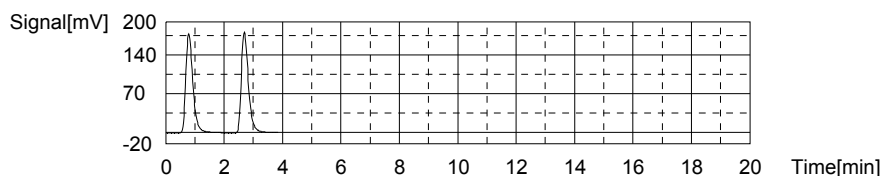
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.702mg/L TC:6.739mg/L IC:4.037mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	298.3	6.649mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 2:11:06 AM	
2	305.9	6.829mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 2:15:19 AM	

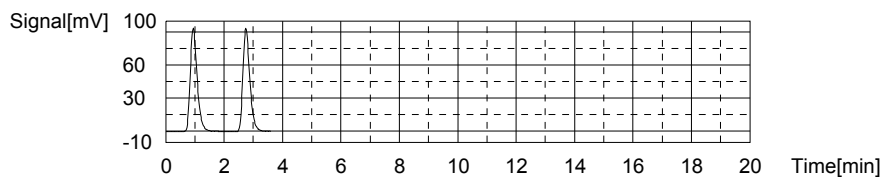
Mean Area 302.1
Mean Conc. 6.739mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	153.3	4.028mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 2:19:59 AM	
2	153.9	4.046mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 2:24:24 AM	

Mean Area 153.6
Mean Conc. 4.037mg/L



Sample

Sample Name: L17061581-27
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

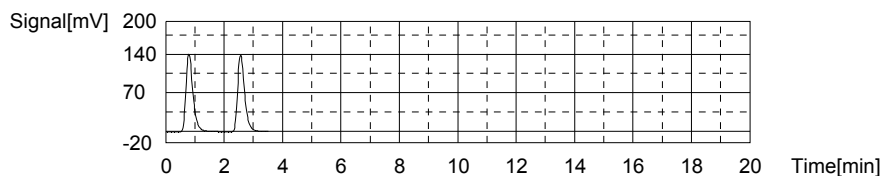
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.502mg/L TC:5.081mg/L IC:2.578mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	232.6	5.097mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 2:31:40 AM	
2	231.2	5.064mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 2:35:41 AM	

Mean Area 231.9
Mean Conc. 5.081mg/L



Anal.: IC

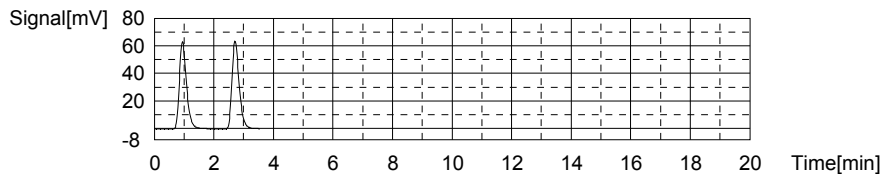
45/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	103.7	2.547mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 2:40:17 AM
2	105.8	2.610mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 2:44:42 AM

Mean Area 104.8
Mean Conc. 2.578mg/L



Sample

Sample Name: L17061581-29
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

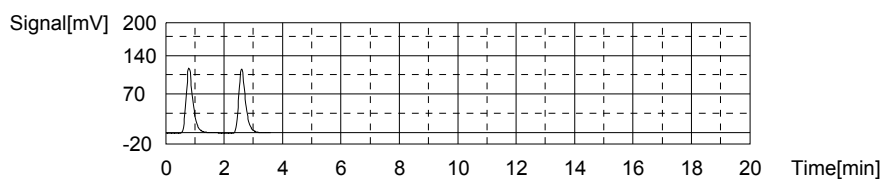
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.188mg/L TC:4.069mg/L IC:1.882mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	189.2	4.072mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 2:52:00 AM
2	189.0	4.067mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 2:56:04 AM

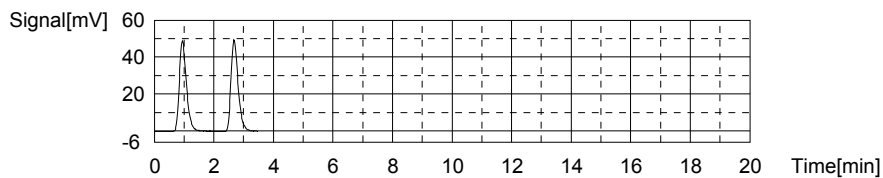
Mean Area 189.1
Mean Conc. 4.069mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	80.77	1.862mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 3:00:37 AM
2	82.08	1.901mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 3:04:59 AM

Mean Area 81.43
Mean Conc. 1.882mg/L



Sample

46/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

Sample Name: L17061581-32
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

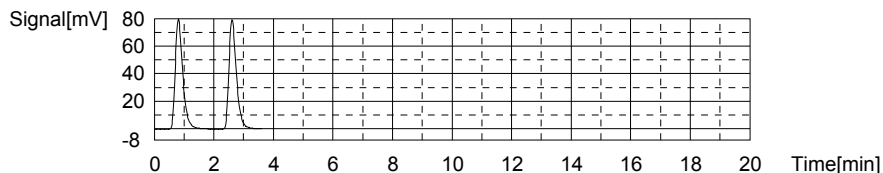
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.203mg/L TC:2.874mg/L IC:0.6706mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	139.0	2.886mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 3:12:18 AM	
2	138.0	2.862mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 3:16:23 AM	

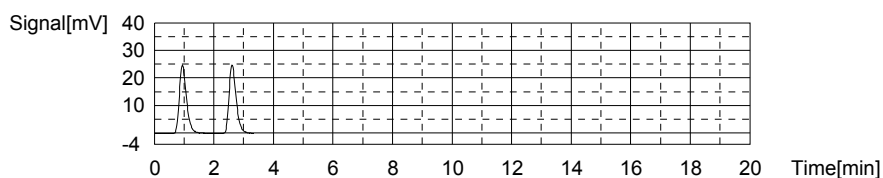
Mean Area 138.5
 Mean Conc. 2.874mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	40.69	0.6652mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 3:20:53 AM	
2	41.05	0.6760mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 3:25:09 AM	

Mean Area 40.87
 Mean Conc. 0.6706mg/L



Sample

Sample Name: L17061581-34
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.158mg/L TC:3.317mg/L IC:1.159mg/L

1. Det

Anal.: TC

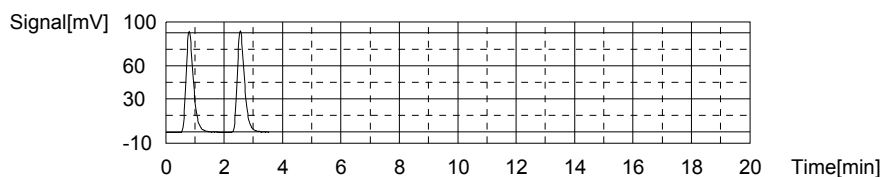
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	157.1	3.313mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 3:32:24 AM	
2	157.4	3.320mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 3:36:27 AM	

47/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

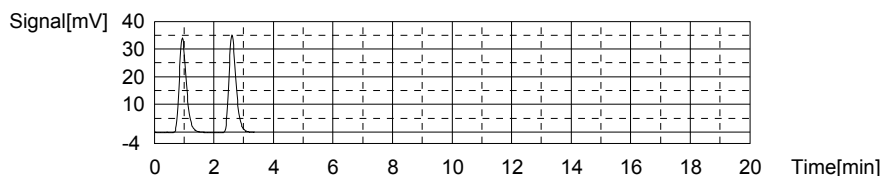
Mean Area 157.3
Mean Conc. 3.317mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	56.33	1.132mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 3:40:57 AM
2	58.11	1.185mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 3:45:17 AM

Mean Area 57.22
Mean Conc. 1.159mg/L



Sample

Sample Name: L17061582-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

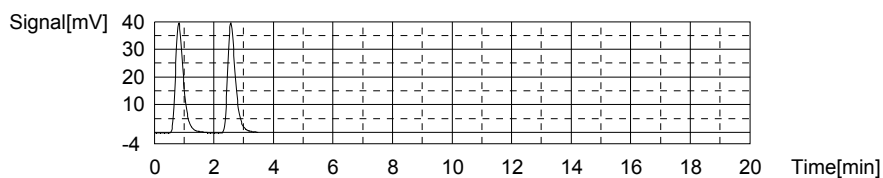
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:1.456mg/L TC:1.312mg/L IC:-0.1445mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	72.54	1.315mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/7/1/2017 3:52:31 AM
2	72.24	1.308mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/7/1/2017 3:56:32 AM

Mean Area 72.39
Mean Conc. 1.312mg/L

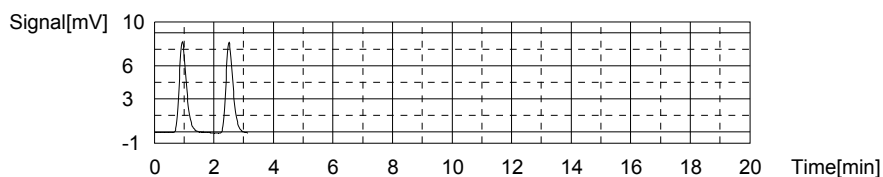


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	13.59	-0.1441mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 4:00:54 AM
2	13.56	-0.1450mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 4:05:03 AM

48/58

Mean Area 13.57
Mean Conc. -0.1445mg/L



Sample

Sample Name: L17061582-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

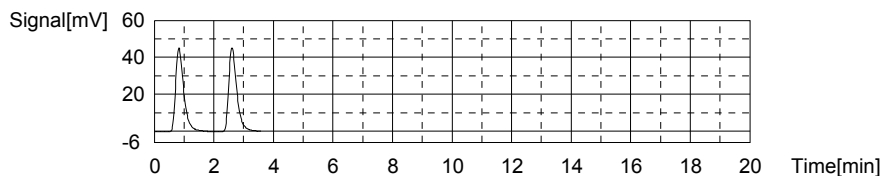
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:1.737mg/L TC:1.597mg/L IC:-0.1399mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	84.55	1.599mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 4:12:17 AM	
2	84.40	1.596mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 4:16:21 AM	

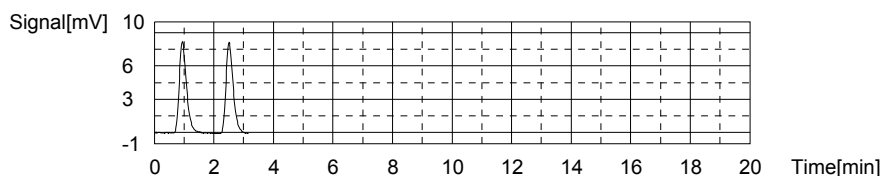
Mean Area 84.47
Mean Conc. 1.597mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	13.73	-0.1399mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 4:20:48 AM	
2	13.73	-0.1399mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 4:24:57 AM	

Mean Area 13.73
Mean Conc. -0.1399mg/L



Sample

Sample Name: L17061582-05
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

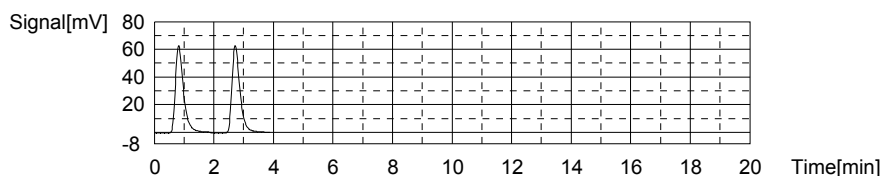
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.160mg/L TC:2.361mg/L IC:0.2011mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	117.4	2.375mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 4:32:18 AM
2	116.2	2.347mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 4:36:37 AM

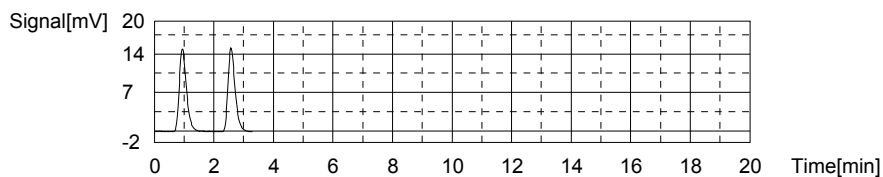
Mean Area 116.8
Mean Conc. 2.361mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	24.99	0.1964mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_17	17/1/2017 4:41:03 AM
2	25.31	0.2059mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_17	17/1/2017 4:45:17 AM

Mean Area 25.15
Mean Conc. 0.2011mg/L



Sample

Sample Name: L17061582-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

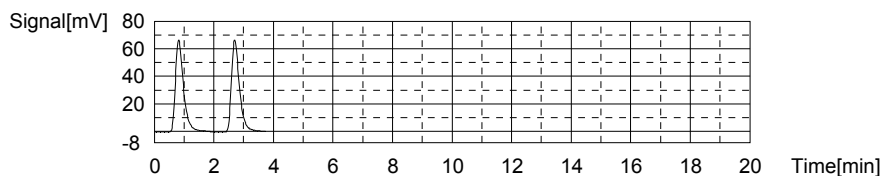
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.282mg/L TC:2.518mg/L IC:0.2359mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	123.9	2.529mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 4:52:37 AM
2	123.0	2.508mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 4:56:45 AM

Mean Area 123.5
Mean Conc. 2.518mg/L



Anal.: IC

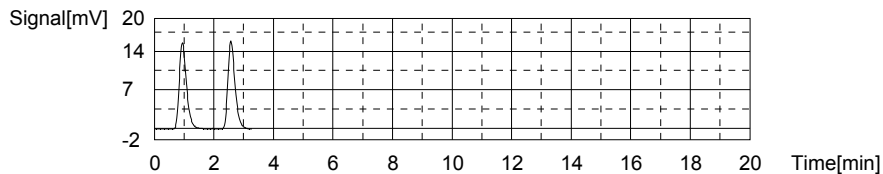
50/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	26.16	0.2313mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 5:01:13 AM
2	26.47	0.2406mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 5:05:25 AM

Mean Area 26.32
Mean Conc. 0.2359mg/L



Sample

Sample Name: L17061582-09
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

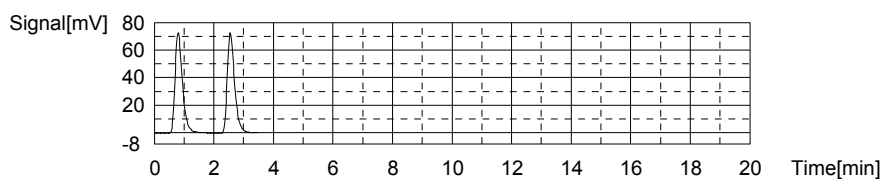
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.685mg/L TC:2.543mg/L IC:0.8581mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	124.3	2.538mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 5:12:37 AM
2	124.7	2.548mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 5:16:36 AM

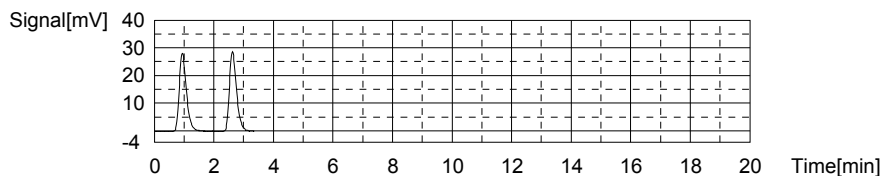
Mean Area 124.5
Mean Conc. 2.543mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	46.73	0.8456mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 5:21:06 AM
2	47.57	0.8707mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 5:25:21 AM

Mean Area 47.15
Mean Conc. 0.8581mg/L



Sample

51/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

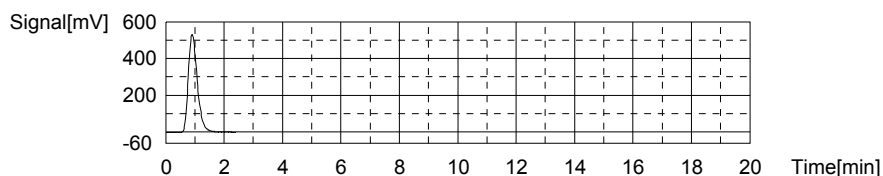
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.86mg/L TC:26.58mg/L IC:-0.2742mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1142	26.58mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 5:33:12 AM	

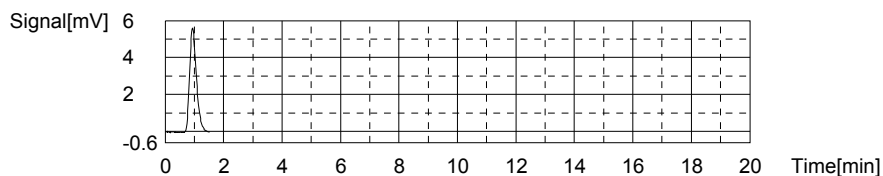
Mean Area 1142
 Mean Conc. 26.58mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.234	-0.2742mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 5:37:31 AM	

Mean Area 9.234
 Mean Conc. -0.2742mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1009mg/L TC:-0.1617mg/L IC:-0.2626mg/L

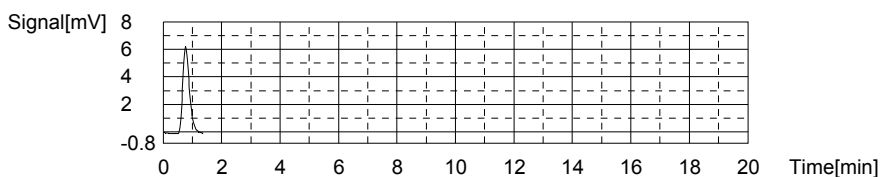
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.02	-0.1617mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 5:42:42 AM	

52/58

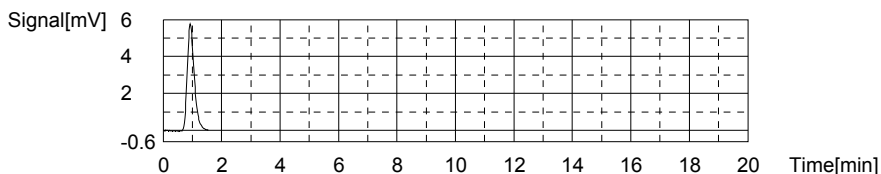
Mean Area 10.02
Mean Conc. -0.1617mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.621	-0.2626mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 5:46:38 AM

Mean Area 9.621
Mean Conc. -0.2626mg/L



Sample

Sample Name: L17061582-11
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result:

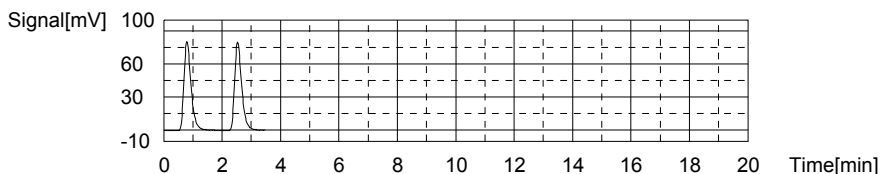
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.445mg/L TC:2.784mg/L IC:1.339mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	135.2	2.796mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_517/1/2017 5:53:48 AM	
2	134.2	2.772mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_517/1/2017 5:57:49 AM	

Mean Area 134.7
Mean Conc. 2.784mg/L



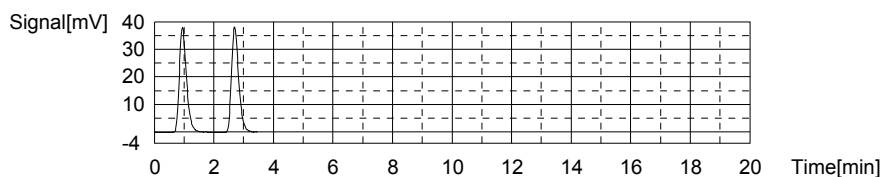
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	62.97	1.331mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 6:02:25 AM
2	63.52	1.347mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 6:06:43 AM

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.t32

Mean Area 63.25
Mean Conc. 1.339mg/L



Sample

Sample Name: L17061582-13
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

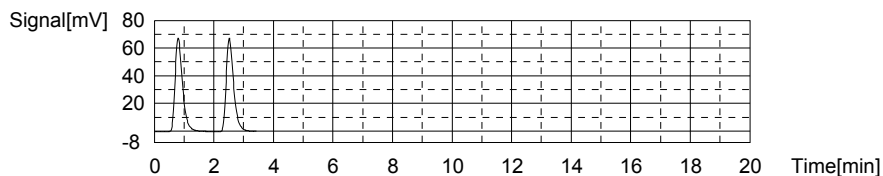
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.504mg/L TC:2.354mg/L IC:0.8501mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	116.1	2.345mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 6:13:53 AM	
2	116.9	2.363mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 6:17:52 AM	

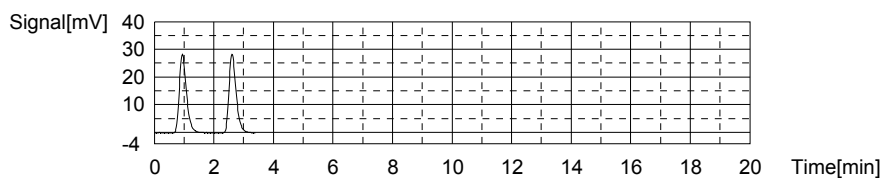
Mean Area 116.5
Mean Conc. 2.354mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	46.82	0.8483mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 6:22:23 AM	
2	46.94	0.8519mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 6:26:42 AM	

Mean Area 46.88
Mean Conc. 0.8501mg/L



Sample

Sample Name: L17061582-15
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

54/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

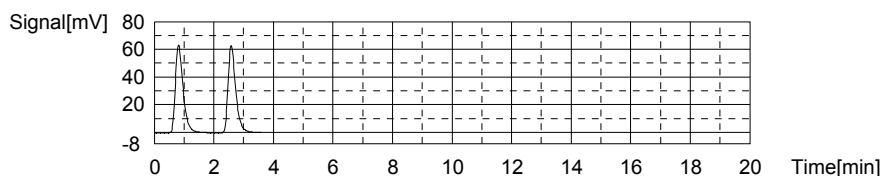
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.016mg/L TC:2.267mg/L IC:0.2503mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	113.3	2.278mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 6:33:54 AM	
2	112.3	2.255mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 6:37:59 AM	

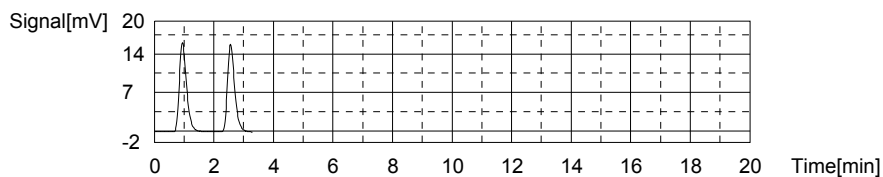
Mean Area 112.8
Mean Conc. 2.267mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	26.95	0.2549mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 6:42:27 AM	
2	26.64	0.2456mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 6:46:44 AM	

Mean Area 26.80
Mean Conc. 0.2503mg/L



Sample

Sample Name: L17061617-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

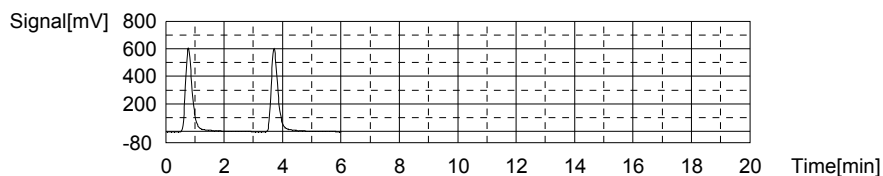
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.254mg/L TC:23.06mg/L IC:18.81mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	995.6	23.12mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 6:55:06 AM	
2	990.2	23.00mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 7:00:27 AM	

Mean Area 992.9
Mean Conc. 23.06mg/L



Anal.: IC

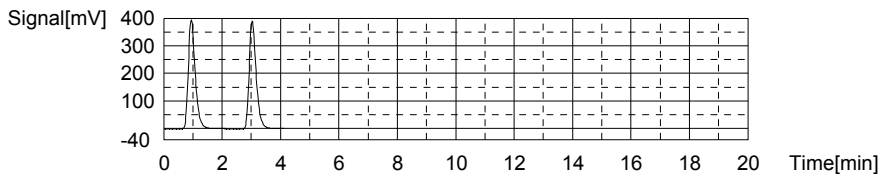
55/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	649.6	18.85mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 7:05:29 AM
2	646.7	18.76mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 7:10:10 AM

Mean Area 648.2
Mean Conc. 18.81mg/L



Sample

Sample Name: WG620071-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

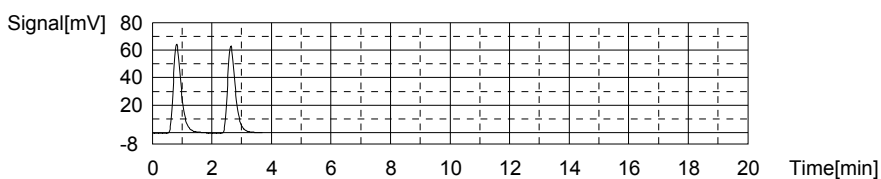
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.230mg/L TC:2.360mg/L IC:0.1295mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	118.3	2.397mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 7:17:26 AM
2	115.2	2.323mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 7:21:36 AM

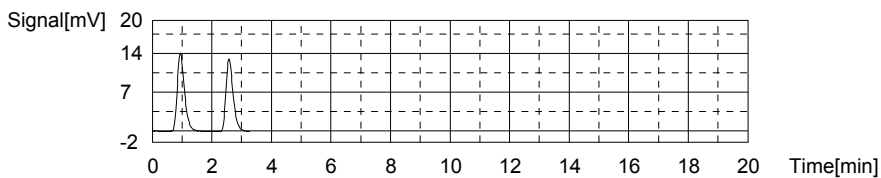
Mean Area 116.8
Mean Conc. 2.360mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	23.54	0.1531mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 7:26:05 AM
2	21.96	0.1059mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 7:30:20 AM

Mean Area 22.75
Mean Conc. 0.1295mg/L



Sample

56/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

Sample Name: WG620071-06 MS
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

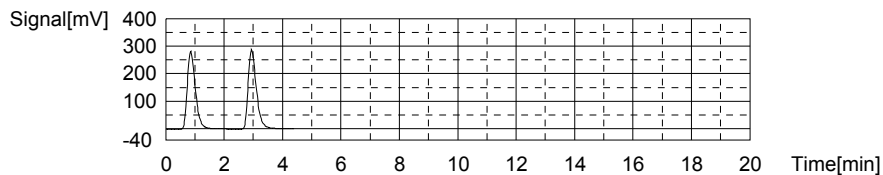
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:12.81mg/L TC:12.62mg/L IC:-0.1951mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	537.6	12.30mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 7:37:52 AM	
2	564.3	12.93mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 7:42:27 AM	

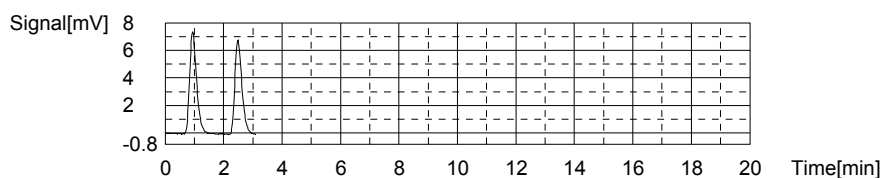
Mean Area 551.0
 Mean Conc. 12.62mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.31	-0.1823mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 7:46:51 AM	
2	11.45	-0.2080mg/L	500uL		1	TICCURVE-02-10-2017.2017_02_10_14_45_17/1/2017 7:51:01 AM	

Mean Area 11.88
 Mean Conc. -0.1951mg/L



Sample

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.30mg/L TC:26.02mg/L IC:-0.2827mg/L

1. Det

Anal.: TC

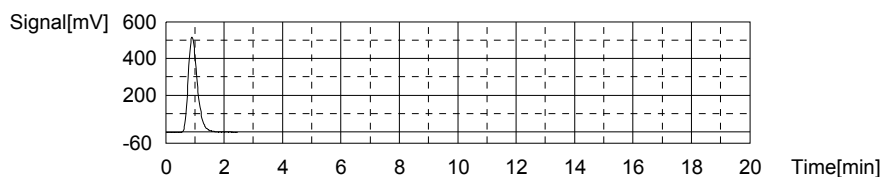
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1118	26.02mg/L	500uL		1	TCCURVE-02-10-2017.2017_02_10_09_32_57/1/2017 7:58:55 AM	

57/58

7/3/2017 6:58:23 AM

06-30-2017-DCM-TOC.i32

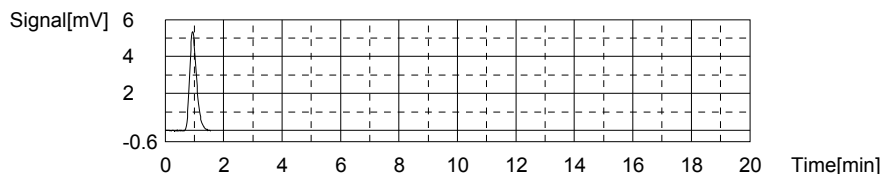
Mean Area 1118
Mean Conc. 26.02mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.949	-0.2827mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 8:03:18 AM

Mean Area 8.949
Mean Conc. -0.2827mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

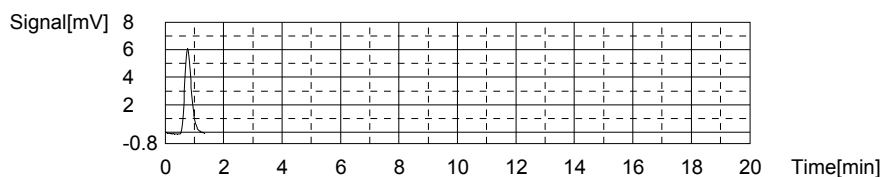
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.09691mg/L TC:-0.1638mg/L IC:-0.2607mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.933	-0.1638mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_57	17/1/2017 8:08:21 AM

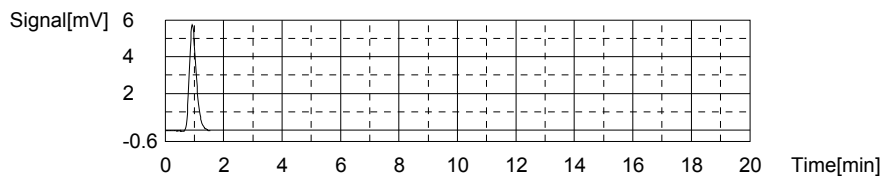
Mean Area 9.933
Mean Conc. -0.1638mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.685	-0.2607mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	17/1/2017 8:12:14 AM

Mean Area 9.685
Mean Conc. -0.2607mg/L



58/58

3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
July 10, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
ALS - ADRIANE L. STEED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BLG - BRENDA L. GREENWALT	BNB - Brandi N. Bentley
BRG - BRENDA R. GREGORY	CAS - Craig A. Smith
CEB - CHAD E. BARNES	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL	CV - Carl Volkman
DAK - DEAN A. KETELSEN	DCM - DAVID C. MERCKLE
DEV - DAVID E. VANDENBERG	DIH - DEANNA I. HESSON
DLB - DAVID L. BUMGARNER	DLP - DOROTHY L. PAYNE
DSM - DAVID S. MOSSOR	DTG - DOMINIC T. GEHRET
ECL - ERIC C. LAWSON	EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER	FJB - FRANCES J. BOLDEN
HRF - HEATHER R. FAIRCHILD	JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH	JKP - JACQUELINE K. PARSONS
JLD - JESSICA L. DELONG	JST - JOSHUA S. TAYLOR
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KDD - Katelyn D. Daley
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRP - KATHY R. PARSONS	LJH - Lacey J. Hendershot
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
OJE - OMOYEMWEN J. ENGLISH	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCA - SUEELLEN C. ADAMS
SCB - SARAH C. BOGOLIN	SCJ - SUE ELLEN C. JOHNSON
SDC - SHALYN D. CONLEY	TB - TODD BOYLE
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	ZTB - ZACH T. BARNES

List of Valid Qualifiers

July 10, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample receipt exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample receipt exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentatively identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound



List of Valid Qualifiers

July 10, 2017

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample receipt exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below



Chain of Custody Record

COC Number:



Laboratory: Microbac POC: Stephanie Mossburg Address: 158 Starlite Drive Marietta, OH 45750 Phone: 1-800-373-4071 Client: AECOM Address: 112 East Pecan Ste. 400 San Antonio, TX 78205 Turn Around Time: STANDARD Project Name/Location: Longhorn Project Number: 60256135. GWTPTRU MAR16		Project Manager: Stephanie Mossburg ELSPETH SHARP Phone/Fax Number: 210-296-2000 Sampler (print): Scott Beesinger Signature: <i>Scott Beesinger</i>		Mail to: Linda Raabe 112 East Pecan STE. 400 San Antonio, TX 78205 210-296-2000 Fed Ex Airbill No:						
Site Name GWTP WEEKLY	Sample ID/Location ID L4824-SP650-6453	SBD SED	Date 6/28/17	Time 1500	Comp. Grab Matrix	Number of Containers 3	TPC Ammonia-N Orthophosphate	SA CODE Cooler ID ABLot EBLot TBLot	Program:	ERPIMS REQUIRED FIELDS
	Comments: STANDARD TAT									
Relinquished by: <i>Scott Beesinger</i> (Signature)			Date 6/28/17	Time 1545	Relinquished by: <i>Scott Beesinger</i> (Signature)			Time 221000102702	Relinquished by: (Signature)	
Relinquished by: (Signature)			Date	Time	Relinquished by: (Signature)			Time	Remarks:	

Microbac OVD
 Received: 06/29/2017 09:39
 By: CARRA STRICKLER
 221000102702

Carra Strickler

Distribution: White to Laboratory, Canary to Project Manager, Pink QA/QC Manager

-Homogenize all composite samples prior to analysis

COOLER TEMP >6° C LOG

 Cooler ID 2702

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C

DSD 6/29/17

pH Exceptions

 pH Lot # HC601354

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6

DSD 6/29/17

**PRESERVATIVE
EXCEPTIONS**

✓ **NONE**
AS NOTED

DSD 6/29/17

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17061495

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 10-JUL-2017

Samplenum **Container ID** **Products**
L17061495-01 928702 TDS TSS PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	29-JUN-2017 12:55	BRG		
2	ANALYZ	W1	WET	29-JUN-2017 13:44	DLP	CLS	
3	STORE	WET	A1	30-JUN-2017 08:03	CLS	DLP	

Samplenum **Container ID** **Products**
L17061495-01 928703 AS-MSD BA-D FE-D NA-D TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	WET	29-JUN-2017 12:55	BRG		<2
2	STORE	WET	A1	05-JUL-2017 16:35	BRG	EPT	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	29-JUN-2017 12:55	BRG		<2

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login



NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
 Total Halide by Bomb Combustion (TX)
 Particle Sizing - 200 Mesh (PS200)
 Specific Gravity/Density (SPGRAV)
 Total Residual Chlorine (CL-TRL)
 Total Volatile Solids (all forms) (TVS)
 Total Coliform Bacteria (all methods)
 Fecal Coliform Bacteria (all methods)
 Sulfite (SO₃)
 Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS

Nitrogen, Ammonia by Method 350.1
 Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
 Phenolics, Total by Method 420.1
 ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
 Acetic acid
 Butyric acid
 Lactic acid
 Propionic acid
 Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
 1-Methylnaphthalene
 1,4-Dioxane
 Atrazine
 Benzaldehyde
 Biphenyl
 Caprolactam
 Hexamethylphosphoramide (HMPA)
 Pentachlorobenzene
 Pentachloroethane

NELAP Accreditation by Laboratory SOP**NONPOTABLE WATER**OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALSOVD MSS01/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP**SOLID AND HAZARDOUS CHEMICALS**OVD MSV01/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)



Laboratory Report Number: L17061531

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on July 11 2017



Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1



Microbac Laboratories * Ohio Valley Division
158 Starlite Drive, Marietta, OH 45750 * T: (740) 373-4071 F: (740) 373-4835 * www.microbac.com

Lab Report #: L17061531

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

The following discrepancies were noted:

Discrepancy	Resolution
Sample ID: Trip Blank. Both voa vials received w/headspace >6mm. BRG	Client notified, please proceed. ALS

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0018697	I	4.0		J4616881953	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	No

**Lab Report #:** L17061531**Lab Project #:** 2551.096**Project Name:** Longhorn Army Ammunition**Lab Contact:** Adriane Steed**Samples Received**

Client ID	Laboratory ID	Date Collected	Date Received
LH18/24-SP650-6452	L17061531-01	06/28/2017 15:00	06/29/2017 09:39
TRIP BLANK	L17061531-02	06/28/2017 00:01	06/29/2017 09:39



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-07-07 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Anthony Canter		Analyst I	2017-07-07 15:31:59



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-07-07 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?	X				
Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-07-07 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?	X				
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?			X		
Were MS/MSD analyzed at the appropriate frequency?			X		
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
Were MS/MSD RPDs within laboratory QC limits?			X		
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-07-07 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-07-07 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-07-07 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

No exceptions.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	6850
Prep Batch Number(s):	WG620000	Reviewer Name:	Eric Lawson
LRC Date:	2017-07-03 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Eric Lawson		Chemist III	2017-07-03 13:51:04



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	6850
Prep Batch Number(s):	WG620000	Reviewer Name:	Eric Lawson
LRC Date:	2017-07-03 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	6850
Prep Batch Number(s):	WG620000	Reviewer Name:	Eric Lawson
LRC Date:	2017-07-03 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	6850
Prep Batch Number(s):	WG620000	Reviewer Name:	Eric Lawson
LRC Date:	2017-07-03 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?	X				
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	6850
Prep Batch Number(s):	WG620000	Reviewer Name:	Eric Lawson
LRC Date:	2017-07-03 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	6850
Prep Batch Number(s):	WG620000	Reviewer Name:	Eric Lawson
LRC Date:	2017-07-03 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

1. The laboratory selected fraction 01 for and MS/MSD. Perchlorate failed low in both the MS/MSD due to the presence of perchlorate in the reference sample.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	9056
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-07-11 00:00:00		

Laboratory Data Package Cover Page

R1	Field chain-of-custody documentation;
R2	Sample identification cross-reference;
R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
R5	Test reports/summary forms for blank samples;
R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Mary Schilling		Anaylst III	2017-07-11 13:08:51



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	9056
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-07-11 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports					
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?			X		
Were % moisture (or solids) reported for all soil and sediment samples?			X		
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples	X				
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	9056
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-07-11 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				1
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?	X				
Were analytical duplicates analyzed at the appropriate frequency?	X				2
Were RPDs or relative standard deviations within the laboratory QC limits?	X				
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?			X		
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	9056
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-07-11 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?	X				
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?			X		
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?			X		
Were ion abundance data within the method-required QC limits?			X		
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?			X		
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?			X		
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
Method detection limit (MDL) studies					



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	9056
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-07-11 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period;
2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
3. NA = Not applicable;
4. NR = Not reviewed;
5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17061531
Project Name:		Method:	9056
Prep Batch Number(s):		Reviewer Name:	Mary Schilling
LRC Date:	2017-07-11 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on **(enter date of last inspection)**. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

1. The MS/MSD were not associated with this sample delivery group.
2. The sample/sample duplicate were not associated with this sample delivery group.

Lab Report #: L17061531

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061531-01	PrePrep Method: N/A	Instrument: HPMS11
Client ID: LH18/24-SP650-6452	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 06/20/2017 18:14
Workgroup #: WG620295	Analyst: ADC	Run Date: 07/03/2017 20:25
Collect Date: 06/28/2017 15:00	Dilution: 1	File ID: 11M19545
Sample Tag: 02	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	27.6		10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.452	J	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	102	70	120	
4-Bromofluorobenzene	116	75	120	
Dibromofluoromethane	97.1	85	115	
Toluene-d8	102	85	120	
J	Estimated value ; the analyte concentration was less than the LOQ.			
U	Analyte was not detected. The concentration is below the reported LOD.			

Lab Report #: L17061531
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061531-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6452	Prep Method: 6850	Prep Date: 06/30/2017 10:22
Matrix: Water	Analytical Method: 6850	Cal Date: 06/29/2017 15:26
Workgroup #: WG620000	Analyst: WTD	Run Date: 06/30/2017 12:16
Collect Date: 06/28/2017 15:00	Dilution: 1	File ID: 1LM.LM40116
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	1.13		0.400	0.200	0.100

Certificate of Analysis

Sample #: L17061531-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6452	Prep Method: 9056	Prep Date: 07/07/2017 17:00
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG620930	Analyst: JWR	Run Date: 07/07/2017 19:41
Collect Date: 06/28/2017 15:00	Dilution: 5	File ID: I2_070717-07
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Sulfate	14808-79-8	22.8		10.0	5.00	2.50
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17061531
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061531-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6452	Prep Method: 9056	Prep Date: 07/07/2017 17:00
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG620930	Analyst: JWR	Run Date: 07/07/2017 20:00
Collect Date: 06/28/2017 15:00	Dilution: 50	File ID: I2_070717-08
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chloride	16887-00-6	533		20.0	10.0	5.00
J	Estimated value ; the analyte concentration was less than the LOQ.					

Lab Report #: L17061531

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17061531-02	PrePrep Method: N/A	Instrument: HPMS11
Client ID: TRIP BLANK	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 06/20/2017 18:14
Workgroup #: WG620295	Analyst: ADC	Run Date: 07/03/2017 19:56
Collect Date: 06/28/2017 00:01	Dilution: 1	File ID: 11M19544
Sample Tag: 02	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	13.1		10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	100	70	120	
4-Bromofluorobenzene	111	75	120	
Dibromofluoromethane	96.8	85	115	
Toluene-d8	100	85	120	
U	Analyte was not detected. The concentration is below the reported LOD.			

Lab Report #: L17061531

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

2.1 Volatiles Data

2.1.1 Volatiles GCMS Data (8260)

2.1.1.1 Summary Data

Certificate of Analysis

Certificate of Analysis

Sample #: L17061531-01	PrePrep Method: N/A	Instrument: HPMS11
Client ID: LH18/24-SP650-6452	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 06/20/2017 18:14
Workgroup #: WG620295	Analyst: ADC	Run Date: 07/03/2017 20:25
Collect Date: 06/28/2017 15:00	Dilution: 1	File ID: 11M19545
Sample Tag: 02	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	27.6		10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.452	J	1.00	0.500	0.250

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	102	70	120	
4-Bromofluorobenzene	116	75	120	
Dibromofluoromethane	97.1	85	115	
Toluene-d8	102	85	120	

J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #: L17061531-02

PrePrep Method: N/A

Instrument: HPMS11

Client ID: TRIP BLANK

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 06/20/2017 18:14

Workgroup #: WG620295

Analyst: ADC

Run Date: 07/03/2017 19:56

Collect Date: 06/28/2017 00:01

Dilution: 1

File ID: 11M19544

Sample Tag: 02

Units: ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,1,1-Trichloroethane	71-55-6	0.500	U	1.00	0.500	0.250
1,1,2-Trichloroethane	79-00-5	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	0.500	0.250	0.125
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
Acetone	67-64-1	13.1		10.0	5.00	2.50
Benzene	71-43-2	0.250	U	0.500	0.250	0.125
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chloroform	67-66-3	0.250	U	0.500	0.250	0.125
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
m,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
Styrene	100-42-5	0.250	U	0.500	0.250	0.125
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
1,2-Dichloroethane-d4	100	70	120			
4-Bromofluorobenzene	111	75	120			
Dibromofluoromethane	96.8	85	115			
Toluene-d8	100	85	120			
U	Analyte was not detected. The concentration is below the reported LOD.					

2.1.1.2 QC Summary Data

Example 8260 Calculations

1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:

$$RF = [(Ax) (Cis)] / [(Ais) (Cx)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured:	3399156
Cis = Concentration of the specific internal standard (ug/mL)	25
Ais = Area of the characteristic ion of the specific internal standard	846471
Cx = Concentration of the compound in the standard being measured (ug/mL)	100
RF = Calculated Response Factor	1.0039

2.0 Calculating the concentration (C) of a compound in water using the average RF: *

$$Cx = [(Ax) (Cis) (Vn)(D)] / [(Ais) (RF) (Vs)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured	3122498
Cis = Concentration of the specific internal standard (ug/L)	25
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	611048
RF = Average RF from the ICAL	1.004
Vs = Purge volume of sample (mL)	10
Vn = Nominal purge volume of sample (mL) (10.0 mL)	10
Cx = Concentration of the compound in the sample being measured (ug/L)	127.2428

3.0 Calculating the concentration (C) of a compound in soil using the average RF: *

$$Cx = [(Ax) (Cis) (Wn)(D)] / [(Ais) (RF) (Ws)]$$

Example

where:

Ax = Area of the characteristic ion for the compound being measured	3122498
Cis = Concentration of the specific internal standard (ug/L)	25
D = Dilution factor for sample as a multiplier (10x = 10)	1
Ais = Area of the characteristic ion of the specific internal standard	611048
RF = Average RF from the ICAL	1.004
Ws = Weight of sample purged (g)	5
Wn = Nominal purge weight (g) (5.0 g)	5
Cx = Concentration of the compound in the sample being measured (ug/L)	127.2428

Dry weight correction:

Percent solids (PCT_S)	50
Cd = (Cx) (100)/PCT_S	254.4856

* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

4.0 Concentration from Linear Regression

Step 1: Retrieve Curve Data From Plot, $y = mx + b$

y = response ratio = response of analyte / response of IS = Ax/Ais

x = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

m = slope from curve = 0.213

b = intercept from curve = - 0.00642

Step 2: Calculate y from Quantitation Report

$$y = 86550/593147 = 0.1459$$

Step 3: Solve for x

$$x = (y - b)/m = [(0.1459 - (-0.00642))/0.213] = 0.7152$$

Step 4: Solve for analyte concentration Cx

$$Cx = Cis (x) = (25.0)(0.7152) = 17.88$$

Example Spreadsheet Calculation:

Slope from curve, m:	0.213
Intercept from curve, b:	-0.00642
Area of analyte, Ax:	86550
Area of Internal Standard, Ais:	593147
Concentration of IS, Cis	25.00
Response Ratio:	0.145917
Amount Ratio:	0.715195
Concentration:	17.87988
Units of Internal Standard:	ug/L

5.0 Concentration from Quadratic Regression**Step 1 - Retrieve Curve Data from Plot, $y = Ax^2 + Bx + C$**

Where:

$$Ax^2 + Bx + (C - y) = 0$$

A, B, C = constants from the ICAL quadratic regression

y = Response ratio = Area of analyte/Area of internal standard (IS)

x = Amount ratio = Concentration of analyte/concentration of IS

Step 2: Calculate y from Quantitation Report

$$y = Ax/Ais$$

Step 3: Solve for x using the quadratic formula

$$Ax^2 + Bx + C - y = 0$$

$$x = \frac{b \pm \sqrt{(b^2 - 4a(c - y))}}{2a} \quad (\text{Two possible solutions})$$

Step 4: Solve for analyte concentration Cx

$$Cx = (Cis)(\text{Amount ratio})$$

Example Spreadsheet Calculation:

Value of A from plot:	-0.00629
Value of B from plot:	0.511
Value of C from plot:	-0.0276
Area of unknown from quantitation report:	293821
Area of IS from quantitation report:	784848
Response ratio, y:	0.374367
C - y:	-0.40197
Root 1 - Computed amount ratio, X1:	80.44567
Root 2 - Computed amount ratio, X2:	0.794396 use this solution
Concentration of IS, Cis:	25.00
Concentration of analyte, Cx:	19.86 ug/L

Analyst(s): BUB
 Date: 6-29-17
 Filter Lot #: 9803210
 Agitator Speed 30 ± 2 rpm

Balance ID: BAL020
 pH Probe ID: T5
 Temp probe ID: 1025 1023

Analyst / Date		Analyst / Date	
BUB	6-29-17	BUB	6-30-17
Time	Temp	Time	Temp
On	On °C	Off	Off °C
1553	23.5	813	23.0

ZHE	Sample #	Pressure ✓	PSI ON	PSI OFF	Method	Fluid #	Matrix*	%Solid	Size Reduction		Int. Wt. (g)	Fluid Vol. (mL)
									Yes	No		
A												
B												
C												
D												
E	D16-1461-01	✓	10	10	1311	F1-248	S	100	✓		25.00	500
F	D16-1461-02	✓	I	I	I	I	I	I	✓		25.02	500
G	D16-1461-03	✓	I	I	I	I	I	I	✓		25.00	500
H	D16-1461-04	✓	I	I	I	I	I	I	✓		25.01	500
I												
J												
K												
L												
M												
N												
O												
P												
Q												
R												
S												
NA	FB1K-1	NA	NA	NA	1311	F1-248	NA	NA	NA	NA	40	40

*Matrix Code = (S-solid) (SS-sand, soil or sludge) (P-paint) (O-organic) (W-water or waste)

Comments: NA

Peer Review By: *[Signature]*

Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS11 Dataset: 062017
 Analyst1: JDS Analyst2: NA
 Method: 8260 SOP: MSV01, OVAP MSV01 Rev: 25.0
 Method: 5035, 5030B, 5030C SOP: PAT01, OVAP PAT01 Rev: 19.0

Maintenance Log ID: 54227

Internal Standard: STD82340 Surrogate Standard: STD82339
 CCV: STD82436 LCS: STD82448 MS/MSD: STD82448
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG618216 WG618672

Comments: Alt. Src. failed high for DCDFM. All reported samples were ND for DCDFM.

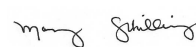
File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
11M19156	WG618216-01 BFB 50ng 8260	NA	1	1	STD82467	06/20/17 12:19
11M19157	RINSE	NA	1	1		06/20/17 12:44
11M19158	RINSE	NA	1	1		06/20/17 13:13
11M19159	WG618216-02 0.3 ug/L ICAL 8260	NA	1	1	STD82307	06/20/17 13:42
11M19160	WG618216-03 0.4 ug/L ICAL 8260	NA	1	1	STD82436	06/20/17 14:12
11M19161	WG618216-04 1 ug/L ICAL 8260	NA	1	1	STD82436	06/20/17 14:47
11M19162	WG618216-05 2 ug/L ICAL 8260	NA	1	1	STD82436	06/20/17 15:17
11M19163	WG618216-06 5 ug/L ICAL 8260	NA	1	1	STD82436	06/20/17 15:46
11M19164	WG618216-07 20 ug/L ICAL 8260	NA	1	1	STD82436	06/20/17 16:16
11M19165	WG618216-08 50 ug/L ICAL 8260	NA	1	1	STD82436	06/20/17 16:45
11M19166	WG618216-09 100 ug/L ICAL 8260	NA	1	1	STD82436	06/20/17 17:15
11M19167	WG618216-10 200 ug/L ICAL 8260	NA	1	1	STD82436	06/20/17 17:44
11M19168	WG618216-11 300 ug/L ICAL 8260	NA	1	1	STD82436	06/20/17 18:14
11M19169	RINSE	NA	1	1		06/20/17 18:43
11M19170	WG618216-12 50 ug/L ICV/ALT 8260	NA	1	1	STD82448	06/20/17 19:12
11M19171	RINSE	NA	1	1		06/20/17 19:41
11M19172	WGXXXXXX-01 100ug/L CCV 826-A9	NA	1	1	STDXXXXXX	06/20/17 20:11
11M19173	WG618672-01 BLANK 8260	NA	1	1		06/20/17 20:40
11M19174	L17060898-02 A 826-SPE	<2	1	1		06/20/17 21:09
11M19175	L17060898-09 A REF 2X 826-SPE	NA	1	2		06/20/17 21:38
11M19176	L17060898-01 A 2X 826-SPE	<2	1	2		06/20/17 22:07
11M19177	L17060898-03 A 826-SPE	<2	1	1		06/20/17 22:36
11M19178	WG618672-02 20ug/L LCS 8260	NA	1	1	STD82448	06/20/17 23:05
11M19179	L17060898-10 A MS 2X 826-SPE	NA	1	2	STD82448	06/20/17 23:34
11M19180	L17060898-11 A MSD 2X 826-SPE	NA	1	2	STD82448	06/21/17 00:03
11M19181	50 ICAL PT	NA	1	1		06/21/17 00:32
11M19182	RINSE	NA	1	1		06/21/17 01:02
11M19183	RINSE	NA	1	1		06/21/17 01:31

Comments

Seq.	Rerun	Dil.	Reason	Analytes
15				
File ID: 11M19170				

Approved: June 21, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS11 Dataset: 062017
 Analyst1: JDS Analyst2: NA
 Method: 8260 SOP: MSV01, OVAP MSV01 Rev: 25.0
 Method: 5035, 5030B, 5030C SOP: PAT01, OVAP PAT01 Rev: 19.0

Maintenance Log ID: 54227

Internal Standard: STD82340 Surrogate Standard: STD82339
 CCV: STD82436 LCS: STD82448 MS/MSD: STD82448

Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG618216 WG618672

Comments: Alt. Src. failed high for DCDFM. All reported samples were ND for DCDFM.

Comments

Seq.	Rerun	Dil.	Reason	Analytes
WG618216-12 Alt. Src. failed high for DCDFM, iodomethane, 1-BP, and failed low for 1,3-but.				
35	X	1	Analyzed too dilute	
File ID: 11M19175				
L17060898-09 ref				
21	X	1	Analyzed too dilute	
File ID: 11M19176				
L17060898-01				
36	X	1	Analyzed too dilute	
File ID: 11M19179				
L17060898-10 MS				
37	X	1	Analyzed too dilute	
File ID: 11M19180				
L17060898-11 MSD				

Approved: June 21, 2017

Page: 2

Mary Schilling



Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS11 Dataset: 062217
 Analyst1: JDS Analyst2: NA
 Method: 8260 SOP: MSV01, OVAP MSV01 Rev: 25.0
 Method: 5035, 5030B, 5030C SOP: PAT01, OVAP PAT01 Rev: 19.0
 Method: 624 SOP: MSV10 Rev: 15

Maintenance Log ID: _____

Internal Standard: STD82340 Surrogate Standard: STD82339
 CCV: STD82436 LCS: STD82448 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NAWorkgroups: WG618911 WG618912Comments: Alt. Src. failed high for Acrolein. All reported samples requiring Acrolein were ND.

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
11M19216	WG618910-01 BFB 50ng 8260	NA	1	1	STD82467	06/22/17 11:03
11M19217	WG618910-02 50ug/L CCV 8260	NA	1	1	STD82436	06/22/17 11:27
11M19218	WG618910-02 50ug/L CCV 8260	NA	1	1	STD82436	06/22/17 12:03
11M19219	WG618912-01 5ug/L ICAL 826-A9	NA	1	1	STD82519	06/22/17 12:32
11M19220	WG618912-02 20ug/L ICAL 826-A9	NA	1	1	STD82519	06/22/17 13:02
11M19221	WG618912-03 50ug/L ICAL 826-A9	NA	1	1	STD82519	06/22/17 13:31
11M19222	WG618912-04 100ug/L ICAL 826-A9	NA	1	1	STD82519	06/22/17 14:01
11M19223	WG618912-05 200ug/L ICAL 826-A9	NA	1	1	STD82519	06/22/17 14:31
11M19224	WG618912-06 300ug/L ICAL 826-A9	NA	1	1	STD82519	06/22/17 14:59
11M19225	WG618912-07 400ug/L ICAL 826-A9	NA	1	1	STD82519	06/22/17 15:29
11M19226	WG618912-08 500ug/L ICAL 826-A9	NA	1	1	STD82519	06/22/17 15:58
11M19227	RINSE	NA	1	1		06/22/17 16:27
11M19228	WG618912-09 100ug/L ICV/ALT 826-A9	NA	1	1	STD82415	06/22/17 16:57
11M19229	WG618911-01 BLANK 8260	NA	1	1		06/22/17 17:27
11M19230	WG618911-02 20ug/L LCS 8260	NA	1	1	STD82448	06/22/17 17:56
11M19231	WG618911-03 20ug/L LCS2 8260	NA	1	1	STD82448	06/22/17 18:26
11M19232	L17061104-01 A 826-BETX	<2	1	1		06/22/17 18:55
11M19233	L17061103-12 A TB 826-SPE	<2	1	1		06/22/17 19:25
11M19234	L17061103-01 A 826-SPE	<2	1	1		06/22/17 19:54
11M19235	L17061103-03 A 826-SPE	<2	1	1		06/22/17 20:23
11M19236	L17061103-05 A 826-SPE	<2	1	1		06/22/17 20:53
11M19237	L17061103-07 A 826-SPE	<2	1	1		06/22/17 21:22
11M19238	L17061103-09 A 826-SPE	<2	1	1		06/22/17 21:51
11M19239	L17061103-11 A 826-SPE	<2	1	1		06/22/17 22:20
11M19240	RINSE	NA	1	1		06/22/17 22:49
11M19241	WG618911-04 BLANK2 624	NA	2	1		06/22/17 23:18
11M19242	L17061150-01 A 624	<2	2	1		06/22/17 23:48
11M19243	L17061154-01 A 624-SPE	7	2	1		06/23/17 00:17
11M19244	L17061152-01 A 624-SPE2	6	2	1		06/23/17 00:46
11M19245	CCV	NA	2	1		06/23/17 01:15
11M19246	RINSE	NA	2	1		06/23/17 01:45
11M19247	RINSE	NA	2	1		06/23/17 02:14

Approved: June 23, 2017

Page: 1

Sarah Vandenberg

Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS11 Dataset: 062217
 Analyst1: JDS Analyst2: NA
 Method: 8260 SOP: MSV01, OVAP MSV01 Rev: 25.0
 Method: 5035, 5030B, 5030C SOP: PAT01, OVAP PAT01 Rev: 19.0
 Method: 624 SOP: MSV10 Rev: 15
 Maintenance Log ID: _____

Internal Standard: STD82340 Surrogate Standard: STD82339
 CCV: STD82436 LCS: STD82448 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG618911 WG618912

Comments: Alt. Src. failed high for Acrolein. All reported samples requiring Acrolein were ND.

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2	X		Check Standard Failure	
File ID: 11M19217				
WG618910-02 CCV multiple cmpds. failed low. RR				

Approved: June 23, 2017

Page: 2




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS11 Dataset: 070317
 Analyst1: ADC Analyst2: NA
 Method: 8260 SOP: MSV01, OVAP MSV01 Rev: 25.0
 Method: 5035, 5030B, 5030C SOP: PAT01, OVAP PAT01 Rev: 19,1

Maintenance Log ID: _____

Internal Standard: STD82340 Surrogate Standard: STD82339
 CCV: STD82667 LCS: STD82697 MS/MSD: STD82697

Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG620295

Comments: Alt. Src. failed high for DCDFM.

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
11M19533	WG620293-01 50ng BFB	NA	1	1	STD824678	07/03/17 14:47
11M19534	WG620293-01 50ng BFB	NA	1	1	STD824678	07/03/17 15:04
11M19535	WG620293-02 50ug/kg CCV 8260	NA	1	1	STD82667	07/03/17 15:30
11M19536	WG620293-02 50ug/kg CCV 8260	NA	1	1	STD82667	07/03/17 16:03
11M19537	WG000000-01 100ug/L CCV 826-A9	NA	1	1	STD00000	07/03/17 16:33
11M19538	WG620295-01 BLANK 8260	NA	1	1		07/03/17 17:01
11M19539	WG620295-02 20ug/kg LCS 8260	NA	1	1	STD82697	07/03/17 17:30
11M19540	L17061525-02 A 5X MS 826-SPE	<2	1	5	STD82697	07/03/17 17:59
11M19541	L17061525-03 A 5X MSD 826-SPE	<2	1	5	STD82697	07/03/17 18:28
11M19542	L17061390-03 B 10X 826-SPE	<2	1	10		07/03/17 18:57
11M19543	L17061525-04 A 826-SPE	<2	1	1		07/03/17 19:26
11M19544	L17061531-02 B 826-SPE	<2	1	1		07/03/17 19:56
11M19545	L17061531-01 B 826-SPE	<2	1	1		07/03/17 20:25
11M19546	L17061527-06 A 826-SPE	<2	1	1		07/03/17 20:54
11M19547	L17061390-02 B 826-SPE	<2	1	1		07/03/17 21:23
11M19548	L17061390-04 B 826-SPE	<2	1	1		07/03/17 21:52
11M19549	L17061448-02 B 826-SPE	<2	1	1		07/03/17 22:21
11M19550	L17061448-03 B 826-SPE	<2	1	1		07/03/17 22:50
11M19551	L17061172-22 C 826-SPE	<2	1	1		07/03/17 23:19
11M19552	L17061461-01 A 10X 826-SPE	NA	17	10		07/03/17 23:49
11M19553	L17061461-02 A 10X 826-SPE	NA	17	10		07/04/17 00:18
11M19554	L17061461-03 A 10X 826-SPE	NA	17	10		07/04/17 00:47
11M19555	L17061461-04 A 10X 826-SPE	NA	17	10		07/04/17 01:17
11M19556	L17061525-01 A 5X RS 826-SPE	<2	1	5		07/04/17 01:46
11M19557	L17061527-05 A 826-SPE	<2	1	1		07/04/17 02:15
11M19558	L17061621-01 A 8260	<2	1	1		07/04/17 02:44
11M19559	RINSE	NA	1	1		07/04/17 03:13
11M19560	WG619825-01 FBLK	NA	17	10		07/04/17 03:43
11M19561	RINSE	NA	17	10		07/04/17 04:12
11M19562	RINSE	NA	17	10		07/04/17 04:40

Comments

Seq.	Rerun	Dil.	Reason	Analytes
------	-------	------	--------	----------

Approved: July 05, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS11 Dataset: 070317
 Analyst1: ADC Analyst2: NA
 Method: 8260 SOP: MSV01, OVAP MSV01 Rev: 25.0
 Method: 5035, 5030B, 5030C SOP: PAT01, OVAP PAT01 Rev: 19.1

Maintenance Log ID: _____

Internal Standard: STD82340 Surrogate Standard: STD82339
 CCV: STD82667 LCS: STD82697 MS/MSD: STD82697
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG620295

Comments: Alt. Src. failed high for DCDFM.**Comments**

Seq.	Rerun	Dil.	Reason	Analytes
4			Check Standard Failure	
File ID: 11M19536				
WG620293-02 CCV failed low for VC				
6			Surrogate standard failure	
File ID: 11M19538				
WG620295-01 p-bfb failed high in blank				
8	X	1	Analyzed too dilute	
File ID: 11M19540				
L17061525-02 MS				
9	X	1	Analyzed too dilute	
File ID: 11M19541				
L17061525-03 MSD				
11	X	1	Carry-over contamination	
File ID: 11M19543				
L17061525-04 C/O DNR.				
17	X		Surrogate standard failure	
File ID: 11M19549				
L17061448-02 high failing surr. RR for conf.				
23			Surrogate standard failure	
File ID: 11M19555				
L17061461-04 surrogate failed high in sample				
24	X	1	Analyzed too dilute	
File ID: 11M19556				
L17061525-01 REF				
28			Surrogate standard failure	
File ID: 11M19560				
WG619825-01 surrogate failed high				

Approved: July 05, 2017

Page: 2



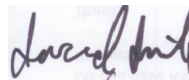

Microbac Laboratories Inc.

Data Checklist

Date: 20-JUN-2017
 Analyst: JDS
 Analyst: NA
 Method: 8260/624
 Instrument: HPMS11
 Curve Workgroup: NA
 Runlog ID: 82893
 Analytical Workgroups: WG618216 WG618672

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	JDS
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	NA
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	JDS
Secondary Reviewer	MES
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
21-JUN-2017



Secondary Reviewer:
21-JUN-2017



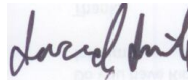

Microbac Laboratories Inc.

Data Checklist

Date: 22-JUN-2017
 Analyst: JDS
 Analyst: NA
 Method: 8260/624
 Instrument: HPMS11
 Curve Workgroup: NA
 Runlog ID: 82939
 Analytical Workgroups: WG618911

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	NA
Samples	X
TCL Hits	X
Spectra of TCL Hits	JDS
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	NA
Reruns	NA
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	JDS
Secondary Reviewer	SAV
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
23-JUN-2017



Secondary Reviewer:
23-JUN-2017



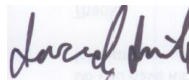

Microbac Laboratories Inc.

Data Checklist

Date: 03-JUL-2017
 Analyst: ADC
 Analyst: NA
 Method: 8260
 Instrument: HPMS11
 Curve Workgroup: NA
 Runlog ID: 83140
 Analytical Workgroups: WG620295

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	JDS
Surrogates	X
Internal Standards Criteria	X
Library Searches	NA
Calculations & Correct Factors	X
Dilutions Run	X
Reruns	X
Manual Integrations	NA
Case Narrative	X
Results Reporting/Data Qualifiers	X
KOBRA Workgroup Data	X
Check for Completeness	X
Primary Reviewer	JDS
Secondary Reviewer	ADC
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
05-JUL-2017



Secondary Reviewer:
05-JUL-2017




Analytical Method:8260B
Login Number:L17061531

AAB#:WG620295

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
LH18/24-SP650-6452	01	06/28/17					07/03/2017	5.2	14		07/03/17	5.2	14	
TRIP BLANK	02	06/28/17					07/03/2017	5.8	14		07/03/17	5.8	14	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5361476
Report generated 07/05/2017 10:11



Login Number: L17061531
 Instrument Id: HPMS11
 Workgroup (AAB#): WG620295

Method: 8260
 CAL ID: HPMS11-20-JUN-17
 Matrix: Water

Sample Number	Dilution	Tag	1	2	3	4
L17061531-01	1.00	02	102	97.1	116	102
L17061531-02	1.00	02	100	96.8	111	100
WG620295-01	1.00	01	101	96.8	116	102
WG620295-02	1.00	01	102	96.6	108	99.0

Surrogates	Surrogate Limits		
1 - 1,2-Dichloroethane-d4	70	-	120
2 - Dibromofluoromethane	85	-	115
3 - 4-Bromofluorobenzene	75	-	120
4 - Toluene-d8	85	-	120

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



METHOD BLANK SUMMARY

Login Number: L17061531 Work Group: WG620295
 Blank File ID: 11M19538 Blank Sample ID: WG620295-01
 Prep Date: 07/03/17 17:01 Instrument ID: HPMS11
 Analyzed Date: 07/03/17 17:01 Method: 8260B
 Analyst: ADC

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG620295-02	11M19539	07/03/17 17:30	01
TRIP BLANK	L17061531-02	11M19544	07/03/17 19:56	02
LH18/24-SP650-6452	L17061531-01	11M19545	07/03/17 20:25	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5361477
 Report generated 07/05/2017 10:11



Login Number: L17061531 Prep Date: 07/03/17 17:01 Sample ID: WG620295-01
 Instrument ID: HPMS11 Run Date: 07/03/17 17:01 Prep Method: 5030B/5030C/503
 File ID: 11M19538 Analyst: ADC Method: 8260B
 Workgroup (AAB#): WG620295 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS11-20-JUN-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
1,1,1-Trichloroethane	0.250	1.00	0.250	1	U
1,1,2-Trichloroethane	0.250	1.00	0.250	1	U
1,1-Dichloroethane	0.125	0.500	0.125	1	U
1,1-Dichloroethene	0.500	2.00	0.500	1	U
1,2-Dichloroethane	0.250	1.00	0.250	1	U
Acetone	2.50	10.0	2.50	1	U
Benzene	0.125	0.500	0.125	1	U
Carbon tetrachloride	0.250	1.00	0.250	1	U
Chloroform	0.125	0.500	0.125	1	U
Ethylbenzene	0.250	1.00	0.250	1	U
Methylene chloride	0.250	1.00	0.250	1	U
m,p-Xylene	0.500	2.00	0.500	1	U
o-Xylene	0.250	1.00	0.250	1	U
Styrene	0.125	0.500	0.125	1	U
Tetrachloroethene	0.250	1.00	0.250	1	U
Trichloroethene	0.250	1.00	0.250	1	U
Toluene	0.250	1.00	0.250	1	U
Vinyl chloride	0.250	1.00	0.250	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	101	70 - 120	PASS
4-Bromofluorobenzene	116	75 - 120	PASS
Dibromofluoromethane	96.8	85 - 115	PASS
Toluene-d8	102	85 - 120	PASS

DL Method Detection Limit
 LOQ Reporting/Practical Quantitation Limit
 ND Analyte Not detected at or above reporting limit
 * |Analyte concentration| > 1/2 RL

Report Name: BLANK
 PDF ID: 5361478
 05-JUL-2017 10:11



Login Number: L17061531 Run Date: 07/03/2017 Sample ID: WG620295-02
 Instrument ID: HPMS11 Run Time: 17:30 Prep Method: 5030B/5030C/503
 File ID: 11M19539 Analyst: ADC Method: 8260B
 Workgroup (AAB#): WG620295 Matrix: Water Units: ug/L
 QC Key: DOD4 Lot#: STD82697 Cal ID: HPMS11-20-JUN-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
1,1,1-Trichloroethane	20.0	22.8	114	65 - 130	
1,1,2-Trichloroethane	20.0	22.0	110	75 - 125	
1,1-Dichloroethane	20.0	22.1	110	70 - 135	
1,1-Dichloroethene	20.0	22.9	114	70 - 130	
1,2-Dichloroethane	20.0	23.5	118	70 - 130	
Acetone	20.0	20.8	104	40 - 140	
Benzene	20.0	21.9	110	80 - 120	
Carbon tetrachloride	20.0	22.0	110	65 - 140	
Chloroform	20.0	22.1	111	65 - 135	
Ethylbenzene	20.0	21.8	109	75 - 125	
Methylene chloride	20.0	22.1	111	55 - 140	
m,p-Xylene	40.0	39.9	99.7	75 - 130	
o-Xylene	20.0	21.5	108	80 - 120	
Styrene	20.0	21.9	109	65 - 135	
Tetrachloroethene	20.0	19.5	97.4	45 - 150	
Trichloroethene	20.0	21.6	108	70 - 125	
Toluene	20.0	21.0	105	75 - 120	
Vinyl chloride	20.0	24.3	121	50 - 145	

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	102	70 - 120	PASS
4-Bromofluorobenzene	108	75 - 120	PASS
Dibromofluoromethane	96.6	85 - 115	PASS
Toluene-d8	99.0	85 - 120	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
 PDF File ID: 5364892
 Report generated: 07/05/2017 10:11



Login Number: L17061531 Analyst: JDS Prep Method: 5030B/5030C/503
 Instrument ID: HPMS6 Matrix: Water Method: 8260B
 Workgroup (AAB#): WG619886 Units: ug/L
 QC Key: DOD4 Lot #: STD82678

Sample ID: WG619886-02 LCS File ID: 6M148296 Run Date: 06/29/2017 18:45
 Sample ID: WG619886-03 LCS2 File ID: 6M148297 Run Date: 06/29/2017 19:15

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
1,1,1-Trichloroethane	20.0	17.2	86.1	20.0	17.6	88.1	2.38	65 - 130	30	
1,1,2-Trichloroethane	20.0	19.4	96.8	20.0	19.9	99.6	2.83	75 - 125	30	
1,1-Dichloroethane	20.0	16.4	82.1	20.0	16.6	83.0	1.18	70 - 135	30	
1,1-Dichloroethene	20.0	13.3	66.6	20.0	13.9	69.5	4.15	70 - 130	30	*
1,2-Dichloroethane	20.0	18.3	91.5	20.0	18.3	91.5	0.0771	70 - 130	30	
Acetone	20.0	24.3	121	20.0	26.5	132	8.75	40 - 140	30	
Benzene	20.0	17.0	84.9	20.0	17.2	85.9	1.15	80 - 120	30	
Carbon tetrachloride	20.0	16.0	80.0	20.0	16.4	81.8	2.14	65 - 140	30	
Chloroform	20.0	19.1	95.6	20.0	19.4	97.2	1.58	65 - 135	30	
Ethylbenzene	20.0	20.5	102	20.0	20.7	104	1.20	75 - 125	30	
m,p-Xylene	40.0	40.0	99.9	40.0	41.2	103	2.95	75 - 130	30	
Methylene chloride	20.0	15.5	77.5	20.0	15.6	78.1	0.751	55 - 140	30	
o-Xylene	20.0	21.1	105	20.0	21.7	108	2.92	80 - 120	30	
Styrene	20.0	20.8	104	20.0	21.3	106	2.24	65 - 135	30	
Tetrachloroethene	20.0	18.7	93.7	20.0	19.2	95.8	2.27	45 - 150	30	
Toluene	20.0	18.5	92.7	20.0	19.1	95.5	2.95	75 - 120	30	
Trichloroethene	20.0	19.6	98.0	20.0	20.4	102	3.95	70 - 125	30	
Vinyl chloride	20.0	21.7	108	20.0	22.2	111	2.30	50 - 145	30	

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
1,2-Dichloroethane-d4	95.0	95.1	70 - 120	PASS
Dibromofluoromethane	83.9	83.2	85 - 115	FAIL
4-Bromofluorobenzene	97.8	98.8	75 - 120	PASS
Toluene-d8	99.4	101	85 - 120	PASS

* EXCEEDS %REC LIMIT
 # EXCEEDS RPD LIMIT



Loginnum: L17061531 Cal ID: HPMS11 - Worknum: WG620295
 Instrument ID: HPMS11 Contract #: _____ Method: 8260B
 Parent ID: WG620295-03 File ID: 11M19556 Dil: 5 Matrix: WATER
 Sample ID: WG620295-04 MS File ID: 11M19540 Dil: 5 Units: ug/L
 Sample ID: WG620295-05 MSD File ID: 11M19541 Dil: 5

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
1,1,1-Trichloroethane	ND	100	109	109	100	116	116	5.76	65 - 130	30	
1,1,2-Trichloroethane	ND	100	105	105	100	109	109	4.24	75 - 125	30	
1,1-Dichloroethane	ND	100	105	105	100	110	110	4.55	70 - 135	30	
1,1-Dichloroethene	ND	100	111	111	100	115	115	3.91	70 - 130	30	
1,2-Dichloroethane	ND	100	111	111	100	117	117	5.61	70 - 130	30	
Acetone	3.92	100	89.9	85.9	100	89.6	85.7	0.231	40 - 140	30	
Benzene	ND	100	104	104	100	110	110	5.10	80 - 120	30	
Carbon tetrachloride	ND	100	106	106	100	112	112	5.35	65 - 140	30	
Chloroform	ND	100	106	106	100	112	112	6.07	65 - 135	30	
Ethylbenzene	ND	100	107	107	100	110	110	2.91	75 - 125	30	
Methylene chloride	ND	100	105	105	100	112	112	5.82	55 - 140	30	
Styrene	ND	100	108	108	100	112	112	3.47	65 - 135	30	
Tetrachloroethene	ND	100	95.7	95.7	100	97.1	97.1	1.53	45 - 150	30	
Toluene	ND	100	104	104	100	107	107	3.37	75 - 120	30	
Trichloroethene	ND	100	97.3	97.3	100	99.9	99.9	2.59	70 - 125	30	
Vinyl chloride	0.673	100	123	123	100	127	127	3.31	50 - 145	30	
m,p-Xylene	ND	200	198	99.2	200	204	102	2.71	75 - 130	30	
o-Xylene	ND	100	108	108	100	111	111	2.25	80 - 120	30	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

BFB

Login Number: L17061531 Tune ID: WG618216-01
 Instrument: HPMS11 Run Date: 06/20/2017
 Analyst: JDS Run Time: 12:19
 Workgroup: WG618216 File ID: 11M19156
 Cal ID: HPMS11-20-JUN-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	18.1	11670	PASS
75.0	95.0	30.0	60.0	50.9	32776	PASS
95.0	95.0	100	100	100	64450	PASS
96.0	95.0	5.00	9.00	6.47	4172	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	76.4	49261	PASS
175	174	5.00	9.00	8.39	4131	PASS
176	174	95.0	101	97.6	48077	PASS
177	176	5.00	9.00	7.14	3431	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG618216-02	STD	01	06/20/2017 13:42	
WG618216-03	STD	01	06/20/2017 14:12	
WG618216-04	STD	01	06/20/2017 14:47	
WG618216-05	STD	01	06/20/2017 15:17	
WG618216-06	STD	01	06/20/2017 15:46	
WG618216-07	STD	01	06/20/2017 16:16	
WG618216-08	STD-CCV	01	06/20/2017 16:45	
WG618216-09	STD	01	06/20/2017 17:15	
WG618216-10	STD	01	06/20/2017 17:44	
WG618216-11	STD	01	06/20/2017 18:14	
WG618216-12	SSCV	01	06/20/2017 19:12	

* Sample past 12 hour tune limit



BFB

Login Number: L17061531 Tune ID: WG618910-01
 Instrument: HPMS11 Run Date: 06/22/2017
 Analyst: JDS Run Time: 11:03
 Workgroup: WG618910 File ID: 11M19216
 Cal ID: HPMS11-20-JUN-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	18.6	11528	PASS
75.0	95.0	30.0	60.0	50.7	31472	PASS
95.0	95.0	100	100	100	62029	PASS
96.0	95.0	5.00	9.00	6.75	4187	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	76.9	47690	PASS
175	174	5.00	9.00	7.92	3778	PASS
176	174	95.0	101	96.2	45858	PASS
177	176	5.00	9.00	6.64	3043	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG618912-01	STD	01	06/22/2017 12:32	
WG618912-02	STD	01	06/22/2017 13:02	
WG618912-03	STD	01	06/22/2017 13:31	
WG618912-04	STD-CCV	01	06/22/2017 14:01	
WG618912-05	STD	01	06/22/2017 14:31	
WG618912-06	STD	01	06/22/2017 14:59	
WG618912-07	STD	01	06/22/2017 15:29	
WG618912-08	STD	01	06/22/2017 15:58	
WG618912-09	STD	01	06/22/2017 16:57	

* Sample past 12 hour tune limit



BFB

Login Number: L17061531 Tune ID: WG620293-01
 Instrument: HPMS11 Run Date: 07/03/2017
 Analyst: ADC Run Time: 15:04
 Workgroup: WG620293 File ID: 11M19534
 Cal ID: HPMS11-20-JUN-17

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	19.1	7099	PASS
75.0	95.0	30.0	60.0	50.8	18836	PASS
95.0	95.0	100	100	100	37072	PASS
96.0	95.0	5.00	9.00	6.73	2495	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	67.5	25035	PASS
175	174	5.00	9.00	8.66	2168	PASS
176	174	95.0	101	95.2	23830	PASS
177	176	5.00	9.00	6.54	1558	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG620293-02	CCV	01	07/03/2017 16:03	
WG620295-01	BLANK	01	07/03/2017 17:01	
WG620295-02	LCS	01	07/03/2017 17:30	
L17061531-02	TRIP BLANK	02	07/03/2017 19:56	
L17061531-01	LH18/24-SP650-6452	02	07/03/2017 20:25	
WG619825-01	FBLK1	DL01	07/04/2017 03:43	*

* Sample past 12 hour tune limit



Calibration Table Report

Method: 8260WT.M

Title: 8260B/624 (SOP: OVL MSV01) Water 062017 HPMS11

Last Calibration: Wed Jun 21 09:55:47 2017

Curve:WG618216

Calibration Files

Compound	0.3 0.4 1 2 5 20 50 100 200 300											Avg	%RSD	Linear	Quadratic
	11M19159.D	11M19160.D	11M19161.D	11M19162.D	11M19163.D	11M19164.D	11M19165.D	11M19166.D	11M19167.D	11M19168.D					
I Fluorobenzene	ISTD														
T Dichlorodifluoromethane			0.305	0.347	0.320	0.400	0.380	0.379	0.327			0.351	10.128		
P Chloromethane			0.311	0.312	0.287	0.291	0.278	0.267	0.246			0.285	8.300		
C Vinyl Chloride		0.327	0.312	0.337	0.273	0.287	0.272	0.275	0.241			0.290	11.110		
T 1,3-Butadiene				0.246	0.209	0.195	0.179	0.175				0.201	14.322		
T Bromomethane			0.215	0.212	0.196	0.189	0.199	0.220	0.212			0.206	5.475		
T Chloroethane			0.204	0.250	0.239	0.239	0.236	0.240	0.221			0.233	6.546		
T Trichlorofluoromethane		0.480	0.413	0.442	0.425	0.443	0.427	0.445	0.401			0.435	5.568		
T Diethyl ether			0.231	0.257	0.256	0.243	0.235	0.236		0.218		0.239	5.783		
T Isoprene		0.407	0.412	0.439	0.417	0.422	0.431	0.430	0.387			0.418	3.930		
T Acrolein			0.030	0.038	0.039	0.039	0.037	0.039		0.037		0.037	8.438		
T 1,1,2-Trichloro-1,2,2-Trifluoroet			0.216	0.237	0.217	0.234	0.232	0.244	0.233			0.230	4.520		
T Acetone				0.097	0.079	0.078	0.073	0.073	0.071	0.067		0.077	12.558		
C 1,1-Dichloroethene		0.414	0.398	0.468	0.448	0.445	0.436	0.447	0.397			0.432	6.010		
T Tert-Butyl Alcohol			0.021	0.024	0.027	0.027	0.027	0.028		0.029		0.026	10.370		
T Dimethyl Sulfide		0.309	0.297	0.344	0.323	0.325	0.324	0.311	0.286			0.315	5.779		
T Iodomethane			0.073	0.099	0.118	0.217	0.250	0.265	0.249			0.181	44.978	0.999	
T Methyl acetate				0.229	0.225	0.230	0.222	0.220	0.203			0.222	4.423		
T Methylene Chloride			0.277	0.326	0.309	0.306	0.300	0.298	0.272			0.298	6.259		
T Carbon Disulfide			0.863	0.927	0.834	0.829	0.789	0.738	0.610			0.799	12.751		
T Acrylonitrile			0.094	0.099	0.103	0.104	0.107	0.110		0.098		0.102	5.447		
T Methyl Tert Butyl Ether		0.779	0.774	0.860	0.868	0.853	0.832	0.800	0.700			0.808	7.032		
T trans-1,2-Dichloroethene		0.285	0.264	0.294	0.278	0.277	0.279	0.281	0.256			0.277	4.257		
T n-Hexane				0.372	0.350	0.363	0.374	0.368	0.345			0.362	3.261		
T Diisopropyl ether			1.033	1.056	1.020	0.941	0.883	0.808		0.704		0.921	14.189		
T Vinyl Acetate				0.547	0.501	0.507	0.511	0.441	0.397			0.484	11.303		
P 1,1-Dichloroethane		0.554	0.547	0.606	0.572	0.576	0.555	0.538	0.467			0.552	7.297		
T Ethyl-Tert-Butyl ether			0.891	0.948	0.931	0.867	0.821	0.756		0.665		0.840	12.035		
T 2-Butanone				0.131	0.131	0.133	0.125	0.125	0.118	0.117		0.126	5.110		
T Propionitrile			0.033	0.037	0.038	0.039	0.039	0.040		0.039		0.038	6.558		
T 2,2-Dichloropropane		0.440	0.435	0.470	0.441	0.445	0.423	0.425	0.380			0.432	5.951		
T cis-1,2-Dichloroethene		0.342	0.293	0.340	0.323	0.323	0.318	0.289				0.319	6.000		
C Chloroform		0.621	0.527	0.480	0.554	0.507	0.514	0.505	0.490	0.425		0.513	10.444		
T 1-Bromopropane				0.046	0.052	0.057	0.057	0.059	0.057	0.055		0.055	8.392		
T Bromochloromethane		0.172	0.170	0.196	0.184	0.188	0.190	0.190	0.176			0.183	5.160		
T Tetrahydrofuran			0.076	0.086	0.090	0.088	0.087	0.089		0.085		0.086	5.236		
S Dibromofluoromethane				0.295	0.278	0.297	0.278	0.281	0.268	0.258		0.279	4.913		
T 1,1,1-Trichloroethane		0.425	0.437	0.472	0.456	0.452	0.448	0.456	0.407			0.444	4.636		
T Cyclohexane		0.527	0.487	0.522	0.495	0.491	0.492	0.487	0.438			0.492	5.446		
T 1,1-Dichloropropene		0.359	0.382	0.409	0.391	0.403	0.396	0.398	0.352			0.386	5.373		
T Carbon Tetrachloride		0.410	0.333	0.387	0.371	0.392	0.384	0.397	0.361			0.379	6.353		
T Tert-Amyl-Methyl ether			0.827	0.902	0.885	0.820	0.780	0.713		0.621		0.793	12.456		
S 1,2-Dichloroethane-d4				0.346	0.369	0.357	0.338	0.341	0.320	0.305		0.339	6.389		
T 1,2-Dichloroethane		0.356	0.363	0.438	0.426	0.416	0.407	0.397	0.350			0.394	8.584		
T Benzene		1.278	1.161	1.268	1.198	1.161	1.074	0.976				1.159	9.192		
T Trichloroethene		0.324	0.267	0.305	0.307	0.293	0.292	0.302	0.268			0.295	6.656		
T Methylcyclohexane		0.528	0.502	0.505	0.480	0.489	0.483	0.473	0.426			0.486	6.136		
C 1,2-Dichloropropane		0.352	0.288	0.368	0.340	0.336	0.331	0.327	0.296			0.330	8.141		
T 1,4-Dioxane				0.002	0.002	0.003	0.003	0.003		0.003		0.003	16.632	0.997	
T Bromodichloromethane		0.396	0.381	0.400	0.385	0.400	0.399	0.394	0.351			0.388	4.293		
T Dibromomethane		0.157	0.160	0.179	0.182	0.179	0.183	0.182	0.169			0.174	6.100		
T 2-Chloroethyl Vinyl Ether			0.183	0.187	0.190	0.211	0.203	0.203	0.188	0.176		0.193	6.144		
T 4-Methyl-2-Pentanone					0.102	0.108	0.110	0.111	0.107	0.104		0.107	3.173		
T cis-1,3-Dichloropropene		0.449	0.464	0.504	0.491	0.501	0.497	0.471	0.404			0.472	7.190		
T Dimethyl Disulfide				0.272	0.265	0.289	0.298	0.295	0.271	0.250		0.277	6.326		

I	Chlorobenzene-d5	ISTD										
S	Toluene-d8		1.669	1.614	1.613	1.451	1.405	1.169		1.487	12.562	
C	Toluene	2.055	1.833	1.987	1.809	1.713	1.566	1.398		1.766	13.022	
T	Ethyl Methacrylate		0.452	0.512	0.521	0.556	0.546	0.526	0.457	0.434	0.501	9.233
T	trans-1,3-Dichloropropene		0.554	0.597	0.600	0.611	0.613	0.596	0.502		0.582	6.897
T	1,1,2-Trichloroethane	0.346	0.329	0.363	0.353	0.370	0.364	0.362	0.323		0.351	4.914
T	2-Hexanone				0.267	0.279	0.277	0.282	0.254	0.256	0.269	4.428
T	1,3-Dichloropropane	0.663	0.630	0.683	0.665	0.655	0.629	0.603	0.508		0.629	8.801
T	Tetrachloroethene	0.343	0.351	0.320	0.322	0.330	0.331	0.338	0.303		0.330	4.529
T	Dibromochloromethane	0.321	0.382	0.393	0.394	0.416	0.429	0.429	0.383		0.393	8.820
T	1,2-Dibromoethane	0.341	0.308	0.343	0.325	0.336	0.343	0.341	0.305		0.330	4.818
T	1-Chlorohexane	0.604	0.493	0.553	0.529	0.530	0.549	0.532	0.465	0.421	0.519	10.323
P	Chlorobenzene	1.388	1.093	1.224	1.133	1.092	1.024	0.948			1.129	12.677
T	1,1,1,2-Tetrachloroethane	0.416	0.346	0.431	0.407	0.410	0.413	0.412	0.365		0.400	7.218
C	Ethylbenzene		0.593	0.651	0.615	0.600	0.598	0.586	0.494		0.591	8.084
T	m-,p-Xylene	0.788	0.758	0.781	0.752	0.708	0.666	0.603	0.921		0.747	12.602
T	o-Xylene	0.747	0.715	0.770	0.747	0.736	0.721	0.695	0.578		0.714	8.344
T	Styrene	1.213	1.104	1.270	1.229	1.212	1.154	1.071	0.842		1.137	11.987
P	Bromoform		0.207	0.236	0.244	0.263	0.284	0.298	0.276		0.258	12.134
T	Isopropylbenzene	1.977	1.789	2.041	1.873	1.793	1.625	1.464			1.794	11.097
I	1,4-Dichlorobenzene-d4	ISTD										
P	1,1,2,2-Tetrachloroethane	1.014	0.739	0.903	0.854	0.852	0.823	0.828	0.721		0.842	10.940
S	p-Bromofluorobenzene			1.133	1.168	1.177	1.076	1.104	0.993	0.930	1.083	8.465
T	1,2,3-Trichloropropane		0.193	0.239	0.239	0.251	0.246	0.257	0.234		0.237	8.878
T	trans-1,4-Dichloro-2-Butene		0.148	0.202	0.234	0.237	0.233	0.245	0.235	0.213	0.218	14.591
T	n-Propylbenzene	4.844	4.169	4.689	4.263	4.115	3.510	3.117			4.101	14.923
T	Bromobenzene	0.910	0.891	0.959	0.919	0.961	0.932	0.900	0.891	0.767	0.903	6.356
T	1,3,5-Trimethylbenzene	3.298	2.807	3.200	3.082	2.896	2.600	2.408			2.899	11.108
T	2-Chlorotoluene	3.398	2.951	3.252	3.011	2.833	2.495	2.274			2.888	13.749
T	4-Chlorotoluene	2.877	2.423	2.585	2.443	2.334	2.083	1.921			2.381	13.235
T	a-Methylstyrene				1.530	1.599	1.501	1.442	1.153		1.445	11.961
T	tert-Butylbenzene		0.561	0.662	0.641	0.647	0.614	0.644	0.562		0.619	6.725
T	1,2,4-Trimethylbenzene		2.930	3.305	3.147	3.016	2.650	2.418			2.911	11.232
T	sec-Butylbenzene		3.680	3.969	3.751	3.616	3.161	2.868			3.508	11.707
T	p-Isopropyltoluene		3.047	3.258	3.147	3.094	2.715	2.495			2.960	9.857
T	1,3-Dichlorobenzene	2.055	1.661	1.804	1.728	1.674	1.592	1.543	1.218		1.659	14.321
T	1,4-Dichlorobenzene	2.144	1.747	1.855	1.716	1.682	1.582	1.537			1.752	11.555
T	n-Butylbenzene		2.673	2.829	2.805	2.823	2.585	2.407			2.687	6.261
T	1,2-Dichlorobenzene	2.127	1.960	1.653	1.807	1.735	1.681	1.573	1.515		1.756	11.591
T	1,2-Dibromo-3-Chloropropane				0.149	0.169	0.175	0.183	0.193	0.173	0.174	8.385
T	1,2,4-Trichlorobenzene		1.458	1.091	1.185	1.170	1.201	1.184	1.155	0.959	1.175	11.808
T	Hexachlorobutadiene		0.561	0.442	0.552	0.555	0.567	0.568	0.614	0.552	0.551	8.790
T	Naphthalene		3.212	2.632	3.050	2.964	2.879	2.601	2.307		2.807	11.039
T	1,2,3-Trichlorobenzene	1.367	1.306	1.077	1.177	1.152	1.169	1.150	1.124	0.952	1.164	10.359

Wed Jun 21 11:28:03 2017

Calibration Table Report

Method: A9FOOWT.M

Title: Appendix IX (SOP:OVL MSV01) Water 062217 HPMS11

Last Calibration: Fri Jun 23 09:50:47 2017

Curve: WG618912

Calibration Files

Compound	5 20 50 100 200 300 400 500								Avg	%RSD	Linear	Quadratic
	11M19219.D	11M19220.D	11M19221.D	11M19222.D	11M19223.D	11M19224.D	11M19225.D	11M19226.D				
I Fluorobenzene	ISTD											
T Acetonitrile	0.036	0.036	0.034	0.036	0.037	0.037	0.035	0.035	0.036	3.083		
T 3-Chloro-1-propene	0.486	0.499	0.493	0.472	0.427	0.395	0.358		0.447	12.268		
T 2-Chloro-1,3-butadiene	0.394	0.417	0.416	0.399	0.375	0.350	0.322	0.294	0.371	12.213		
T Methacrylonitrile	0.171	0.182	0.179	0.183	0.177	0.170	0.155	0.149	0.171	7.403		
T Isobutyl Alcohol		0.006	0.006	0.008	0.010	0.011	0.011	0.012	0.009	25.809	0.993	
T 1-Butanol			0.001	0.003	0.004	0.005	0.005	0.005	0.004	42.424	0.996	
T Cyclohexanone			0.009	0.010	0.011	0.011	0.010	0.010	0.010	6.640		
T 2-Nitropropane			0.074	0.078	0.081	0.080	0.075	0.075	0.077	3.841		
T Ethyl Acetate	0.239	0.260	0.249	0.254	0.242	0.225	0.203	0.193	0.233	10.353		
T Methyl methacrylate	0.230	0.251	0.246	0.247	0.236	0.221	0.200	0.188	0.227	10.105		
I Chlorobenzene-d5	ISTD											
I 1,4-Dichlorobenzene-d4	ISTD											

Fri Jun 23 10:01:47 2017

Login Number: L17061531 Run Date: 06/20/2017 Sample ID: WG618216-12
 Instrument ID: HPMS11 Run Time: 19:12 Method: 8260B
 File ID: 11M19170 Analyst: JDS QC Key: DOD4
 ICal Workgroup: WG618216 Cal ID: HPMS11 - 20-JUN-17

Analyte		Expected	Found	Units	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	50.0	47.8	ug/L	0.412	4.40	20	
Chloroform	CCC	50.0	48.3	ug/L	0.496	3.40	20	
Ethylbenzene	CCC	50.0	51.9	ug/L	0.614	3.80	20	
Toluene	CCC	50.0	44.7	ug/L	1.58	10.7	20	
Vinyl Chloride	CCC	50.0	51.6	ug/L	0.300	3.20	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	50.7	ug/L	0.853	1.30	20	
Chloromethane	SPCC	50.0	56.7	ug/L	0.323	13.4	20	
Bromoform	SPCC	50.0	53.1	ug/L	0.274	6.20	20	
Chlorobenzene	SPCC	50.0	47.9	ug/L	1.08	4.20	20	
1,1-Dichloroethane	SPCC	50.0	47.1	ug/L	0.520	5.70	20	
1,1,1-Trichloroethane		50.0	50.1	ug/L	0.445	0.100	20	
1,1,2-Trichloroethane		50.0	52.2	ug/L	0.367	4.50	20	
1,2-Dichloroethane		50.0	50.0	ug/L	0.394	0	20	
Acetone		50.0	45.7	ug/L	0.0702	8.60	20	
Benzene		50.0	46.0	ug/L	1.07	8.00	20	
Carbon Tetrachloride		50.0	49.3	ug/L	0.374	1.50	20	
Methylene Chloride		50.0	47.4	ug/L	0.283	5.20	20	
m-,p-Xylene		100	92.7	ug/L	0.693	7.30	20	
o-Xylene		50.0	52.8	ug/L	0.754	5.70	20	
Styrene		50.0	53.2	ug/L	1.21	6.50	20	
Tetrachloroethene		50.0	50.2	ug/L	0.331	0.400	20	
Trichloroethene		50.0	48.9	ug/L	0.288	2.20	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17061531 Run Date: 07/03/2017 Sample ID: WG620293-02
Instrument ID: HPMS11 Run Time: 16:03 Method: 8260B
File ID: 11M19536 Analyst: ADC QC Key: DOD4
Workgroup (AAB#): WG620295 Cal ID: HPMS11 - 20-JUN-17
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,2-Dichloropropane	CCC	50.0	49.4	ug/L	0.326	1.14	20	
1,1-Dichloroethene	CCC	50.0	52.3	ug/L	0.452	4.65	20	
Chloroform	CCC	50.0	49.2	ug/L	0.506	1.56	20	
Ethylbenzene	CCC	50.0	49.8	ug/L	0.588	0.429	20	
Toluene	CCC	50.0	44.3	ug/L	1.56	11.4	20	
Vinyl Chloride	CCC	50.0	54.7	ug/L	0.318	9.30	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	50.8	ug/L	0.855	1.54	20	
Bromoform	SPCC	50.0	47.5	ug/L	0.246	4.94	20	
Chlorobenzene	SPCC	50.0	44.0	ug/L	0.994	11.9	20	
Chloromethane	SPCC	50.0	47.2	ug/L	0.269	5.64	20	
1,1-Dichloroethane	SPCC	50.0	50.2	ug/L	0.554	0.354	20	
Xylenes		150	135	ug/L	0.668	10.0	20	
1,1,1-Trichloroethane		50.0	51.1	ug/L	0.454	2.19	20	
1,1,2-Trichloroethane		50.0	50.4	ug/L	0.354	0.852	20	
1,2-Dichloroethane		50.0	52.0	ug/L	0.410	3.93	20	
Acetone		50.0	44.3	ug/L	0.0682	11.3	20	
Benzene		50.0	45.7	ug/L	1.06	8.65	20	
Carbon Tetrachloride		50.0	51.5	ug/L	0.391	3.02	20	
Methylene Chloride		50.0	50.2	ug/L	0.300	0.483	20	
m-,p-Xylene		100	86.8	ug/L	0.649	13.2	20	
o-Xylene		50.0	48.1	ug/L	0.687	3.75	20	
Styrene		50.0	49.4	ug/L	1.12	1.29	20	
Tetrachloroethene		50.0	45.9	ug/L	0.303	8.18	20	
Trichloroethene		50.0	46.3	ug/L	0.273	7.43	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

CCV - Modified 03/05/2008

PDF File ID: 5361482

Report generated 07/05/2017 10:11



Login Number: L17061531
Instrument ID: HPMS6
Workgroup (AAB#): WG619886

CCV Number: WG619885-02
CAL ID: HPMS6-19-JUN-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG619885-02	NA	NA	313680	617864	909764
Upper Limit	NA	NA	627360	1235728	1819528
Lower Limit	NA	NA	156840	308932	454882
<u>L17061531-01</u>	1.00	01	266840	520087	770069
<u>L17061531-02</u>	1.00	01	282240	554176	817446
WG619886-01	1.00	01	310297	610744	912682
WG619886-02	1.00	01	316877	619639	895116
WG619886-03	1.00	01	315787	620147	907445

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



Login Number: L17061531
Instrument ID: HPMS11
Workgroup (AAB#): WG620295

ICAL CCV Number: WG618216-08
CAL ID: HPMS11-20-JUN-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG618216-08	NA	NA	192803	348286	493119
Upper Limit	NA	NA	385606	696572	986238
Lower Limit	NA	NA	96402	174143	246560
<u>L17061531-01</u>	1.00	02	151955	329724	486010
<u>L17061531-02</u>	1.00	02	164066	346739	509748
WG620295-01	1.00	01	159166	347781	523302
WG620295-02	1.00	01	171723	347443	500737

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits

