

**LONGHORN ARMY
AMMUNITION PLANT
KARNACK, TEXAS**

**ADMINISTRATIVE
RECORD**

Volume 17

2018

Bate Stamp Numbers

00860460 - 00862310

Prepared for

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

1976 – 2018

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

VOLUME 17

2018

- A. Title: Report (cont'd) – Quarterly Evaluation Report, 3rd Quarter (July-September) 2017, Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas
- Author(s): AECOM Technical Services
- Recipient: U.S. Army Corps of Engineers
- Date: November 2017
- Bate Stamp: 00860460 – 00862310

Laboratory Report Number: L17080163

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 August 17 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 #: L17080163

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?
00114647	I	4.0		1ZW056F52210009882	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 #:** L17080163**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-SP140-7461-GRAB	L17080163-01	08/02/2017 15:00	08/03/2017 09:53



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080163
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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	2017-08-08 19:52:09



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080163
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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:	L17080163
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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:	L17080163
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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:	L17080163
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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:	L17080163
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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:	L17080163
Project Name:		Method:	6010
Prep Batch Number(s):	WG624529	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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
Kerri Buck	<i>Kerri Buck</i>		2017-08-17 15:46:01



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080163
Project Name:		Method:	6010
Prep Batch Number(s):	WG624529	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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:	L17080163
Project Name:		Method:	6010
Prep Batch Number(s):	WG624529	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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:	L17080163
Project Name:		Method:	6010
Prep Batch Number(s):	WG624529	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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):					ER#1
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:	L17080163
Project Name:		Method:	6010
Prep Batch Number(s):	WG624529	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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:	L17080163
Project Name:		Method:	6010
Prep Batch Number(s):	WG624529	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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 continuing calibration blank failure for selenium on 09-Aug-2017 at 11:06, client sample 01 along with the batch QA/QC samples was reanalyzed on a later calibration which was compliant for selenium.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080163
Project Name:		Method:	6020
Prep Batch Number(s):	WG624914	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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
Kerri Buck			2017-08-17 15:48:20



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080163
Project Name:		Method:	6020
Prep Batch Number(s):	WG624914	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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:	L17080163
Project Name:		Method:	6020
Prep Batch Number(s):	WG624914	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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:	L17080163
Project Name:		Method:	6020
Prep Batch Number(s):	WG624914	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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:	L17080163
Project Name:		Method:	6020
Prep Batch Number(s):	WG624914	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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:	L17080163
Project Name:		Method:	6020
Prep Batch Number(s):	WG624914	Reviewer Name:	Kerri Buck
LRC Date:	2017-08-17 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:	L17080163
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG624404	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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	2017-08-09 18:38:53



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080163
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG624404	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080163
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG624404	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080163
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG624404	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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				
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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:	L17080163
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG624404	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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				

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3. NA = Not applicable;
4. NR = Not reviewed;
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Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080163
Project Name:		Method:	CR-6
Prep Batch Number(s):	WG624404	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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 #: L17080163
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080163-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP140-7461-GRAB	Prep Method: 6850	Prep Date: 08/07/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 06/29/2017 15:26
Workgroup #: WG624895	Analyst: JWR	Run Date: 08/07/2017 19:45
Collect Date: 08/02/2017 15:00	Dilution: 10000	File ID: 1LM.LM40326
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	13800		4000	2000	1000

Certificate of Analysis

Sample #: L17080163-01	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: LH18/24-SP140-7461-GRAB	Prep Method: 3015A	Prep Date: 08/04/2017 08:54
Matrix: Water	Analytical Method: 6010C	Cal Date: 08/09/2017 14:56
Workgroup #: WG625078	Analyst: JYH	Run Date: 08/09/2017 17:05
Collect Date: 08/02/2017 15:00	Dilution: 1	File ID: T3.080917.170534
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Selenium, Total	7782-49-2	0.0100	U	0.0200	0.0100	0.00500
U	Analyte was not detected. The concentration is below the reported LOD.					

Lab Report #: L17080163
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080163-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP140-7461-GRAB	Prep Method: 3015A	Prep Date: 08/08/2017 07:50
Matrix: Water	Analytical Method: 6020A	Cal Date: 08/10/2017 13:52
Workgroup #: WG624996	Analyst: JYH	Run Date: 08/10/2017 14:38
Collect Date: 08/02/2017 15:00	Dilution: 1	File ID: NI.081017.143832
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 #: L17080163
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080163-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP140-7461-GRAB	Prep Method: 7196A	Prep Date: N/A
Matrix: Water	Analytical Method: 7196A	Cal Date: 06/05/2017 10:10
Workgroup #: WG624404	Analyst: SDC	Run Date: 08/03/2017 12:45
Collect Date: 08/02/2017 15:00	Dilution: 1	File ID: 00.1708031245-07
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chromium, Hexavalent	18540-29-9	0.0100	U	0.0200	0.0100	0.00500
U	Analyte was not detected. The concentration is below the reported LOD.					

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17080163

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080163-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP140-7461-GRAB	Prep Method: 6850	Prep Date: 08/07/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 06/29/2017 15:26
Workgroup #: WG624895	Analyst: JWR	Run Date: 08/07/2017 19:45
Collect Date: 08/02/2017 15:00	Dilution: 10000	File ID: 1LM.LM40326
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	13800		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: 062917_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
WG619865 ICAL, WG619615
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (062917)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40075	WG619865-01 CCB	1	1		06/29/17 13:13
2	1LM.LM40076	WG619865-02 STD (0.1 ug/L)	1	1	STD80232	06/29/17 13:32
3	1LM.LM40077	WG619865-03 STD (0.2 ug/L)	1	1	STD80232	06/29/17 13:51
4	1LM.LM40078	WG619865-04 STD (0.5 ug/L)	1	1	STD80232	06/29/17 14:10
5	1LM.LM40079	WG619865-05 STD (1.0 ug/L)	1	1	STD80232	06/29/17 14:29
6	1LM.LM40080	WG619865-06 STD (2.0 ug/L)	1	1	STD80232	06/29/17 14:48
7	1LM.LM40081	WG619865-07 STD (5.0 ug/L)	1	1	STD80232	06/29/17 15:07
8	1LM.LM40082	WG619865-08 STD (10 ug/L)	1	1	STD80232	06/29/17 15:26
9	1LM.LM40083	WG619865-09 SSCV (1.0 ug/L)	1	1	STD80234	06/29/17 15:45
10	1LM.LM40084	WG619609-01 CCB	1	1		06/29/17 16:04
11	1LM.LM40085	WG619609-02 CCV (1.0ug/L)	1	1	STD80232	06/29/17 16:23
12	1LM.LM40086	WG619615-05 MRL (0.2ug/L)	1	1	STD80232	06/29/17 16:42
13	1LM.LM40087	WG619615-01 MCT (0.2ug/L)	1	1	STD80234	06/29/17 17:01
14	1LM.LM40088	WG619615-02 BLANK	1	1		06/29/17 17:20
15	1LM.LM40089	WG619615-03 LCS (0.2ug/L)	1	1	STD80234	06/29/17 17:39
16	1LM.LM40090	WG619615-04 LCS2 (0.2ug/L)	1	1	STD80234	06/29/17 17:57
17	1LM.LM40091	L17061390-01 10,000X	1	10000	STD80234	06/29/17 18:16
18	1LM.LM40092	L17061390-02	1	1	STD80234	06/29/17 18:35
19	1LM.LM40093	L17061390-03 100X	1	100	STD80234	06/29/17 18:54
20	1LM.LM40094	L17061390-04	1	1	STD80234	06/29/17 19:13
21	1LM.LM40095	L17061390-05 10X	1	10		06/29/17 19:32
22	1LM.LM40096	L17061390-06	1	1		06/29/17 19:51
23	1LM.LM40097	WG619609-03 CCV (1.0ug/L)	1	1	STD80232	06/29/17 20:10
24	1LM.LM40098	WG619615-06 MRL (0.2ug/L)	1	1	STD80232	06/29/17 20:29
25	1LM.LM40099	WG619609-04 CCB	1	1		06/29/17 20:48
26	1LM.LM40100	L17061390-07	1	1		06/29/17 21:07
27	1LM.LM40101	L17061390-09 100,000X	1	100000		06/29/17 21:26
28	1LM.LM40102	L17061390-10	1	1		06/29/17 21:45
29	1LM.LM40103	L17061390-12	1	1		06/29/17 22:04
30	1LM.LM40104	L17061390-13	1	1		06/29/17 22:23
31	1LM.LM40105	L17061390-15	1	1		06/29/17 22:42
32	1LM.LM40106	L17061390-16 2X	1	2		06/29/17 23:01
33	1LM.LM40107	WG619609-05 CCV (1.0ug/L)	1	1	STD80232	06/29/17 23:20

Page: 1

Approved: 30-JUN-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 062917_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
WG619865 ICAL, WG619615
 Internal STD: COA19471 Surrogate STD: NA STD80232 (062917)
 CCV STD: STD80232 LCS STD: STD80234 NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM40108	WG619615-07 MRL (0.2ug/L)	1	1	STD80232	06/29/17 23:39
35	1LM.LM40109	WG619609-06 CCB	1	1		06/29/17 23:57

Comments

Seq.	Rerun	Dil.	Reason	Analytes
17				
			L17061390-01 Analyzed at a dilution based on historical data.	
19				
			L17061390-03 Analyzed at a dilution based on historical data.	
21				
			L17061390-05 Analyzed at a dilution based on historical data.	
27				
			L17061390-09 Analyzed at a dilution based on historical data.	
32				
			L17061390-16 Analyzed at a dilution based on historical data.	

Eri C. Zimm



Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 080717_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 WG624895 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (06/29/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: Sample L17080163-01 was analyzed at a dilution only based on its historical results.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40318	WG624896-01 CCB	1	1		08/07/17 17:13
2	1LM.LM40319	WG624896-02 CCV (1.0ug/L)	1	1	STD80232	08/07/17 17:32
3	1LM.LM40320	WG624895-05 MRL (0.2ug/L)	1	1	STD80232	08/07/17 17:51
4	1LM.LM40321	WG624895-01 MCT (0.2ug/L)	1	1	STD80234	08/07/17 18:10
5	1LM.LM40322	WG624895-02 BLANK	1	1		08/07/17 18:29
6	1LM.LM40323	WG624895-03 LCS (0.2ug/L)	1	1	STD80234	08/07/17 18:48
7	1LM.LM40324	WG624895-04 LCS2 (0.2ug/L)	1	1	STD80234	08/07/17 19:07
8	1LM.LM40325	L17071280-01	1	1		08/07/17 19:26
9	1LM.LM40326	L17080163-01 (10,000x)	1	10000		08/07/17 19:45
10	1LM.LM40327	L17080164-02 (NR)	1	1		08/07/17 20:04
11	1LM.LM40328	L17080164-03	1	1		08/07/17 20:23
12	1LM.LM40329	WG624896-03 CCV (1.0ug/L)	1	1	STD80232	08/07/17 20:42
13	1LM.LM40330	WG624895-06 MRL (0.2ug/L)	1	1	STD80232	08/07/17 21:01
14	1LM.LM40331	WG624896-04 CCB	1	1		08/07/17 21:19
15	1LM.LM40332	WG624896-05 CCV (1.0ug/L)	1	1	STD80232	08/08/17 12:01
16	1LM.LM40333	WG624895-07 MRL (0.2ug/L)	1	1	STD80232	08/08/17 12:20
17	1LM.LM40334	WG624896-06 CCB	1	1		08/08/17 12:38
18	1LM.LM40335	L17080164-02 RR 10x	1	10		08/08/17 12:57
19	1LM.LM40336	WG624896-07 CCV (1.0ug/L)	1	1	STD80232	08/08/17 13:16
20	1LM.LM40337	WG624895-08 MRL (0.2ug/L)	1	1	STD80232	08/08/17 13:35
21	1LM.LM40338	WG624896-08 CCB	1	1		08/08/17 13:54

Comments

Seq.	Rerun	Dil.	Reason	Analytes
10	X	10	Over Calibration Range	perchlorate
			L17080164-02	




Microbac Laboratories Inc.

Data Checklist

Date: 29-JUN-2017
 Analyst: WTD
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 83086
 Analytical Workgroups: L17061390

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	X
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:



Secondary Reviewer:
30-JUN-2017




Microbac Laboratories Inc.

Data Checklist

Date: 07-AUG-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 83844
 Analytical Workgroups: L17071280 L17080163, L17080164

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:
08-AUG-2017

John Richards

Secondary Reviewer:
08-AUG-2017

Eri C. Zimm

CHECKLIST1 - Modified 03/05/2008

Generated: AUG-08-2017 15:48:06



Analytical Method:6850
Login Number:L17080163

AAB#:WG624895

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-SP140-7461-GRAB	01	08/02/17					08/07/2017	5.1	28		08/07/17	.1	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080163
 Blank File ID: 1LM.LM40322
 Prep Date: 08/07/17 16:30
 Analyzed Date: 08/07/17 18:29
 Analyst: JWR

Work Group: WG624895
 Blank Sample ID: WG624895-02
 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	WG624895-05	1LM.LM40320	08/07/17 17:51	01
MCT	WG624895-01	1LM.LM40321	08/07/17 18:10	01
LCS	WG624895-03	1LM.LM40323	08/07/17 18:48	01
LCS2	WG624895-04	1LM.LM40324	08/07/17 19:07	01
LH18/24-SP140-7461-GRAB	L17080163-01	1LM.LM40326	08/07/17 19:45	DL01
QCMRL	WG624895-06	1LM.LM40330	08/07/17 21:01	01
QCMRL	WG624895-07	1LM.LM40333	08/08/17 12:20	01
QCMRL	WG624895-08	1LM.LM40337	08/08/17 13:35	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5422259
 Report generated 08/08/2017 16:03



Login Number: L17080163 Prep Date: 08/07/17 16:30 Sample ID: WG624895-02
 Instrument ID: LCMS1 Run Date: 08/07/17 18:29 Prep Method: 6850
 File ID: 1LM.LM40322 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG624895 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-29-JUN-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: 5422260
 08-AUG-2017 16:03



Login Number: L17080163 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG624895 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG624895-03 LCS File ID: 1LM.LM40323 Run Date: 08/07/2017 18:48
 Sample ID: WG624895-04 LCS2 File ID: 1LM.LM40324 Run Date: 08/07/2017 19:07

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.177	88.5	0.200	0.186	93.0	4.96	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5422261
 Report generated: 08/08/2017 16:03



Login Number: L17080163
Analytical Method: 6850
ICAL Workgroup: WG619865

Instrument ID: LCMS1
Initial Calibration Date: 29-JUN-17 15:26
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.454	6.38	1.00000	

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5422413
Report generated 08/08/2017 16:03



Login Number: L17080163
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 29-JUN-17 15:26
 Column ID: F

Analyte	WG619865-02			WG619865-03			WG619865-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	20800.0000	1.476	0.200	44600.0000	1.521	0.500	102000.000	1.433

INT_CAL - Modified 03/06/2008
 PDF File ID: 5422413
 Report generated 08/08/2017 16:03



Login Number: L17080163
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 29-JUN-17 15:26
Column ID: F

Analyte	WG619865-05			WG619865-06			WG619865-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	214000.000	1.464	2.00	408000.000	1.442	5.00	981000.000	1.437

INT_CAL - Modified 03/06/2008
PDF File ID: 5422413
Report generated 08/08/2017 16:03



Login Number: L17080163
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 29-JUN-17 15:26
Column ID: F

Analyte	WG619865-08		
	CONC	RESP	RF
Perchlorate	10.0	1820000.00	1.407

INT_CAL - Modified 03/06/2008
PDF File ID: 5422413
Report generated 08/08/2017 16:03



Login Number: L17080163 Run Date: 06/29/2017 Sample ID: WG619865-09
 Instrument ID: LCMS1 Run Time: 15:45 Method: 6850
 File ID: 1LM.LM40083 Analyst: WTD QC Key: DOD4
 ICal Workgroup: WG619865 Cal ID: LCMS1 - 29-JUN-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	0.980	ug/L	1.40	2.00	15	

* Exceeds %D Limit



Login Number: L17080163 Run Date: 08/07/2017 Sample ID: WG624896-01
Instrument ID: LCMS1 Run Time: 17:13 Method: 6850
File ID: 1LM.LM40318 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-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: L17080163 Run Date: 08/07/2017 Sample ID: WG624896-04
Instrument ID: LCMS1 Run Time: 21:19 Method: 6850
File ID: LLM.LM40331 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-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: L17080163 Run Date: 08/08/2017 Sample ID: WG624896-06
Instrument ID: LCMS1 Run Time: 12:38 Method: 6850
File ID: LLM.LM40334 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-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: L17080163 Run Date: 08/08/2017 Sample ID: WG624896-08
Instrument ID: LCMS1 Run Time: 13:54 Method: 6850
File ID: LLM.LM40338 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-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: L17080163 Run Date: 08/07/2017 Sample ID: WG624896-02
Instrument ID: LCMS1 Run Time: 17:32 Method: 6850
File ID: 1LM.LM40319 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	0.920	ug/L	1.32	8.00	15	

* Exceeds %D Criteria



Login Number: L17080163 Run Date: 08/07/2017 Sample ID: WG624896-03
 Instrument ID: LCMS1 Run Time: 20:42 Method: 6850
 File ID: 1LM.LM40329 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	0.950	ug/L	1.36	5.00	15	

* Exceeds %D Criteria



Login Number: L17080163 Run Date: 08/08/2017 Sample ID: WG624896-05
 Instrument ID: LCMS1 Run Time: 12:01 Method: 6850
 File ID: 1LM.LM40332 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	0.977	ug/L	1.40	2.30	15	

* Exceeds %D Criteria



Login Number: L17080163 Run Date: 08/08/2017 Sample ID: WG624896-07
 Instrument ID: LCMS1 Run Time: 13:16 Method: 6850
 File ID: 1LM.LM40336 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	0.940	ug/L	1.35	6.00	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5422263
 Report generated 08/08/2017 16:03



Login Number: L17080163 Run Date: 08/07/2017 Sample ID: WG624895-05
 Instrument ID: LCMS1 Run Time: 17:51 Prep Method: 6850
 File ID: 1LM.LM40320 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG624895 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-29-JUN-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.173	86.5	70 - 130	



Login Number: L17080163 Run Date: 08/07/2017 Sample ID: WG624895-06
Instrument ID: LCMS1 Run Time: 21:01 Prep Method: 6850
File ID: 1LM.LM40330 Analyst: JWR Method: 6850
Workgroup (AAB#): WG624895 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-29-JUN-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.193	96.5	70 - 130	



Login Number: L17080163 Run Date: 08/08/2017 Sample ID: WG624895-07
Instrument ID: LCMS1 Run Time: 12:20 Prep Method: 6850
File ID: 1LM.LM40333 Analyst: JWR Method: 6850
Workgroup (AAB#): WG624895 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-29-JUN-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.184	92.0	70 - 130	



Login Number: L17080163 Run Date: 08/08/2017 Sample ID: WG624895-08
 Instrument ID: LCMS1 Run Time: 13:35 Prep Method: 6850
 File ID: 1LM.LM40337 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG624895 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-29-JUN-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.185	92.5	70 - 130	



Login Number: L17080163
Instrument ID: LCMS1
Workgroup (AAB#): WG624895

ICAL CCV Number: WG619865-05
CAL ID: LCMS1-29-JUN-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG619865	NA	NA	703000
Upper Limit	NA	NA	1054500
Lower Limit	NA	NA	351500
<u>L17080163-01</u>	10000	DL01	590000
WG624895-02	1.00	01	512000
WG624895-03	1.00	01	545000
WG624895-04	1.00	01	554000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: 6850	Samplenum: L17080163-01
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40326
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 19:45	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	233000	70900	3.29	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG619865-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40076
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 13:32	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	20800	6780	3.07	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG619865-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40077
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 13:51	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	44600	13700	3.26	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG619865-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40078
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 14:10	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	102000	31100	3.28	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG619865-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40079
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 14:29	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	214000	65900	3.25	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG619865-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40080
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 14:48	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	408000	126000	3.24	2.3	3.8	

Perchlorate Ion Ratios
 Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG619865-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40081
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 15:07	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	981000	306000	3.21	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG619865-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40082
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 15:26	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1820000	577000	3.15	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG619865-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40083
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 15:45	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	200000	61800	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: 6850	Samplenum: WG624895-01
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40321
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 18:10	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	27500	9350	2.94	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163
Instrument: LCMS1
Analyst: JWR
Worknum: WG624895

Prep Method: 6850
Prep Date: 08/07/2017 16:30
Anal Method: 6850
Analysis Date: 08/07/2017 18:29

Samplenum: WG624895-02
File ID: 1LM.LM40322
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 #: L17080163	Prep Method: 6850	Samplenum: WG624895-03
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40323
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 18:48	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	28800	8540	3.37	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: 6850	Samplenum: WG624895-04
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40324
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 19:07	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	30700	9560	3.21	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: 6850	Samplenum: WG624895-05
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40320
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 17:51	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	24600	9260	2.66	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: 6850	Samplenum: WG624895-06
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40330
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 21:01	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	35900	11100	3.23	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163
Instrument: LCMS1
Analyst: JWR
Worknum: WG624895

Prep Method: 6850
Prep Date: 08/07/2017 16:30
Anal Method: 6850
Analysis Date: 08/08/2017 12:20

Samplenum: WG624895-07
File ID: 1LM.LM40333
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	30800	10100	3.05	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163
Instrument: LCMS1
Analyst: JWR
Worknum: WG624895

Prep Method: 6850
Prep Date: 08/07/2017 16:30
Anal Method: 6850
Analysis Date: 08/08/2017 13:35

Samplenum: WG624895-08
File ID: 1LM.LM40337
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	33600	10300	3.26	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG624896-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40318
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 17:13	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 #: L17080163	Prep Method: _____	Samplenum: WG624896-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40319
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 17:32	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	118000	37600	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG624896-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40329
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 20:42	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	158000	48000	3.29	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG624896-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40331
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 21:19	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 #: L17080163	Prep Method: _____	Samplenum: WG624896-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40332
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/08/2017 12:01	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	146000	45100	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG624896-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40334
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/08/2017 12:38	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	516	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG624896-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40336
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/08/2017 13:16	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	162000	50500	3.21	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080163	Prep Method: _____	Samplenum: WG624896-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40338
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/08/2017 13:54	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 #: L17080163

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080163-01	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: LH18/24-SP140-7461-GRAB	Prep Method: 3015A	Prep Date: 08/04/2017 08:54
Matrix: Water	Analytical Method: 6010C	Cal Date: 08/09/2017 14:56
Workgroup #: WG625078	Analyst: JYH	Run Date: 08/09/2017 17:05
Collect Date: 08/02/2017 15:00	Dilution: 1	File ID: T3.080917.170534
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Selenium, Total	7782-49-2	0.0100	U	0.0200	0.0100	0.00500
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: WG624529
 Analyst: ERP
 Spike Analyst: ERP
 Run Date: 08/04/2017 08:54
 Method: 3015A
 Balance: BAL019
 Instrument: MW-4
 Instrument Start: 08/04/2017 09:24

SOP: ME407 Revision 19
 Spike Solution: STD83126
 Spike Witness: VC
 HNO3 Lot #: COA19798
 HCL Lot #: COA19849
 40 & 50 ML. DIGESTION TUCOA19886
 ICP FILTERS LOT#r7ha2443RGT40684

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG624529-02	BLANK	1	40 mL	50 mL	205.539 g	205.533 g	
2	WG624437-01	FBLK1	17	5 mL	50 mL	205.543 g	205.525 g	
3	WG624529-03	LCS	1	40 mL	50 mL	211.375 g	211.366 g	5 mL
4	L17080132-01	SAMP	1	40 mL	50 mL	205.565 g	205.554 g	08/11/17
5	L17080132-02	SAMP	1	40 mL	50 mL	207.307 g	207.291 g	08/11/17
6	L17080132-03	SAMP	1	40 mL	50 mL	205.12 g	205.107 g	08/11/17
7	L17080132-04	SAMP	1	40 mL	50 mL	206.736 g	206.722 g	08/11/17
8	L17080142-01	SAMP	1	40 mL	50 mL	204.19 g	204.175 g	08/10/17
9	L17080142-02	SAMP	1	40 mL	50 mL	202.823 g	202.817 g	08/10/17
10	L17080142-03	SAMP	1	40 mL	50 mL	203.642 g	203.635 g	08/10/17
11	L17080142-04	SAMP	1	40 mL	50 mL	206.159 g	206.147 g	08/10/17
12	L17080142-05	SAMP	1	40 mL	50 mL	203.608 g	203.596 g	08/10/17
13	L17080142-06	SAMP	1	40 mL	50 mL	205.739 g	205.719 g	08/10/17
14	L17080142-07	SAMP	1	40 mL	50 mL	203.56 g	203.551 g	08/10/17
15	L17080142-08	SAMP	1	40 mL	50 mL	206.038 g	206.014 g	08/10/17
16	L17080145-02	SAMP	17	5 mL	50 mL	205.289 g	205.262 g	08/09/17
17	L17080146-02	SAMP	1	40 mL	50 mL	204.974 g	204.96 g	08/10/17
18	L17080153-01	SAMP	1	40 mL	50 mL	205.368 g	205.35 g	08/10/17
19	L17080153-02	SAMP	1	40 mL	50 mL	204.03 g	204.017 g	08/10/17
20	WG624529-01	REF	1	40 mL	50 mL	206.229 g	206.216 g	
21	L17080161-01	RS01	1	40 mL	50 mL	206.229 g	206.216 g	08/14/17
22	WG624529-04	MS	1	40 mL	50 mL	211.489 g	211.479 g	5 mL
23	L17080161-02	MS01	1	40 mL	50 mL	211.489 g	211.479 g	5 mL 08/14/17
24	WG624529-05	MSD	1	40 mL	50 mL	209.919 g	209.907 g	5 mL
25	L17080161-03	SD01	1	40 mL	50 mL	209.919 g	209.907 g	5 mL 08/14/17
26	L17080162-01	SAMP	1	40 mL	50 mL	204.981 g	204.971 g	08/14/17
27	L17080163-01	SAMP	1	40 mL	50 mL	205.242 g	205.226 g	08/14/17

L17080132-01	filtered digestate
L17080132-02	filtered digestate
L17080132-03	filtered digestate
L17080132-04	filtered digestate
L17080142-02	filtered digestate
L17080142-05	filtered digestate
L17080142-07	filtered digestate



Analyst: Evan Poston

SOP:
Spike Solution: Apple Cider
Reviewer: Apple Cider
Spike Witness:

Method:
Balance:
Instrument:
Instrument Start:



Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO3 Dataset: 080917T3.1R.TXT
 Analyst1: JYH Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD82800 ICV Std: STD82799 Post Spike: STD80131
 ICSA: STD82633 ICSAB: STD82371 Int. Std: RGT37691
 CCV: STD82801 LLCCV: _____ Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 625298,624177,625080,625078,625088

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T3.080917.144043	WG625299-01	Calibration Point		1		08/09/17 14:40
2	T3.080917.144440	WG625299-02	Calibration Point		1		08/09/17 14:44
3	T3.080917.144837	WG625299-03	Calibration Point		1		08/09/17 14:48
4	T3.080917.145234	WG625299-04	Calibration Point		1		08/09/17 14:52
5	T3.080917.145611	WG625299-05	Calibration Point		1		08/09/17 14:56
6	T3.080917.145947	WG625299-06	Initial Calibration Verification		1		08/09/17 14:59
7	T3.080917.150324	WG625299-07	Initial Calib Blank		1		08/09/17 15:03
8	T3.080917.150723	WG625299-08	Low Level Initial Calibration V		1		08/09/17 15:07
9	T3.080917.151119	WG625299-09	Interference Check		1		08/09/17 15:11
10	T3.080917.151512	WG625299-10	Interference Check		1		08/09/17 15:15
11	T3.080917.151853	WG625299-11	CCV		1		08/09/17 15:18
12	T3.080917.152229	WG625299-12	CCB		1		08/09/17 15:22
13	T3.080917.152627	WG625067-01	Method/Prep Blank	40/50	1		08/09/17 15:26
14	T3.080917.153024	L17080002-29	VICKI / JI	40/50	1		08/09/17 15:30
15	T3.080917.153403	L17080002-30	VICKI / JI	40/50	1		08/09/17 15:34
16	T3.080917.153743	L17080002-31	VICKI / JI	40/50	1		08/09/17 15:37
17	T3.080917.154123	L17080002-32	VICKI / JI	40/50	1		08/09/17 15:41
18	T3.080917.154504	WG623970-02	Method/Prep Blank	40/50	1		08/09/17 15:45
19	T3.080917.154901	WG625299-13	CCV		1		08/09/17 15:49
20	T3.080917.155239	WG625299-14	CCB		1		08/09/17 15:52
21	T3.080917.155636	WG623970-03	Laboratory Control S	40/50	1		08/09/17 15:56
22	T3.080917.160017	WG623816-01	Fluid Blank 1		1		08/09/17 16:00
23	T3.080917.160415	WG623816-02	Fluid Blank 2		1		08/09/17 16:04
24	T3.080917.160813	L17071282-14	D099-544	5/50	1		08/09/17 16:08
25	T3.080917.161203	WG624177-03	Serial Dilution		5	L17071282-14	08/09/17 16:12
26	T3.080917.161559	WG624547-02	Method/Prep Blank	40/50	1		08/09/17 16:15
27	T3.080917.161956	WG624547-03	Laboratory Control S	40/50	1		08/09/17 16:19
28	T3.080917.162336	L17070948-07	P270-775	40/50	2		08/09/17 16:23
29	T3.080917.162732	WG625080-03	Serial Dilution		10	L17070948-07	08/09/17 16:27
30	T3.080917.163127	WG625080-03	Serial Dilution		50	L17070948-07	08/09/17 16:31
31	T3.080917.163523	WG625299-15	CCV		1		08/09/17 16:35
32	T3.080917.163858	WG625299-16	CCB		1		08/09/17 16:38
33	T3.080917.164245	WG624529-02	Method/Prep Blank	40/50	1		08/09/17 16:42
34	T3.080917.164642	WG624529-03	Laboratory Control S	40/50	1		08/09/17 16:46

Page: 1 Approved: August 11, 2017

K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO3 Dataset: 080917T3.1R.TXT

Analyst1: JYH Analyst2: N/A

Method: 200.7/6010B/6010C SOP: ME600G Rev: 8

Maintenance Log ID: _____

Calibration Std: STD82800 ICV Std: STD82799 Post Spike: STD80131

ICSA: STD82633 ICSAB: STD82371 Int. Std: RGT37691

CCV: STD82801 LLCCV: _____ Tuning Sol: _____

Stannous: _____ Hydroxylamine: _____

Workgroups: 625298,624177,625080,625078,625088

Comments:

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Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T3.080917.165022	WG624529-01	Reference Sample		1	L17080161-01	08/09/17 16:50
36	T3.080917.165414	WG624529-04	Matrix Spike	40/50	1	L17080161-01	08/09/17 16:54
37	T3.080917.165754	WG624529-05	Matrix Spike Duplica	40/50	1	L17080161-01	08/09/17 16:57
38	T3.080917.170132	L17080162-01	LH18/24-SP650-6461-GRAB	40/50	1		08/09/17 17:01
39	T3.080917.170534	L17080163-01	LH18/24-SP140-7461-GRAB	40/50	1		08/09/17 17:05
40	T3.080917.170927	WG625078-01	Post Digestion Spike		1	L17080163-01	08/09/17 17:09
41	T3.080917.171307	WG625078-02	Serial Dilution		5	L17080163-01	08/09/17 17:13
42	T3.080917.171701	WG625299-17	CCV		1		08/09/17 17:17
43	T3.080917.172036	WG625299-18	CCB		1		08/09/17 17:20
44	T3.080917.172435	WG625299-19	Low Level Continuing Calibra		1		08/09/17 17:24
45	T3.080917.172832	WG624814-02	Method/Prep Blank	40/50	1		08/09/17 17:28
46	T3.080917.173228	WG624814-03	Laboratory Control S	40/50	1		08/09/17 17:32
47	T3.080917.173608	L17080332-02	1802-134 W1		1	WG624814-01	08/09/17 17:36
48	T3.080917.174002	WG624814-04	Matrix Spike	40/50	1	L17080332-02	08/09/17 17:40
49	T3.080917.174340	WG624814-05	Matrix Spike Duplica	40/50	1	L17080332-02	08/09/17 17:43
50	T3.080917.174720	L17080285-01	41512-B01-WQ-W0004	40/50	1		08/09/17 17:47
51	T3.080917.175118	L17080285-02	44201-R01-WQ-W0012	40/50	1		08/09/17 17:51
52	T3.080917.175516	WG625088-01	Post Digestion Spike		1	L17080285-02	08/09/17 17:55
53	T3.080917.175858	WG625088-02	Serial Dilution		5	L17080285-02	08/09/17 17:58
54	T3.080917.180255	WG625299-20	CCV		1		08/09/17 18:02
55	T3.080917.180632	WG625299-21	CCB		1		08/09/17 18:06
56	T3.080917.181031	L17080285-03	44302-F01-WQ-W0009	40/50	1		08/09/17 18:10
57	T3.080917.181429	L17080285-04	81304-W04-WQ-W0016	40/50	1		08/09/17 18:14
58	T3.080917.181826	WG625299-22	Low Level Continuing Calibra		1		08/09/17 18:18
59	T3.080917.182221	WG624177-03	Serial Dilution		5	L17071282-14	08/09/17 18:22
60	T3.080917.182616	WG625299-23	CCV		1		08/09/17 18:26
61	T3.080917.182951	WG625299-24	CCB		1		08/09/17 18:29

Page: 2 Approved: August 11, 2017

K: K Buck



Microbac Laboratories Inc.

Data Checklist

Date: 09-AUG-2017
 Analyst: JYH
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO3
 Curve Workgroup: 625299
 Runlog ID: 83883
 Analytical Workgroups: 625298,624177,625080,625078,625088

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	002,1282,948,162,163,285
Client Forms	X
Level X	
Level 3	
Level 4	002,1282,948,162,163,285
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	KKB
Comments	

Primary Reviewer:
10-AUG-2017

Secondary Reviewer:
11-AUG-2017



Analytical Method:6010C
Login Number:L17080163

AAB#:WG625078

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-SP140-7461-GRAB	01	08/02/17					08/04/2017	1.7	180		08/09/17	7.1	180	

* = SEE PROJECT QAPP REQUIREMENTS



Analytical Method:6010C
Login Number:L17080163

AAB#:WG625078

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-SP140-7461-GRAB	01	08/02/17					08/04/2017	1.7	180		08/09/17	6.8	180	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080163 Work Group: WG625078
 Blank File ID: T3.080917.164245 Blank Sample ID: WG624529-02
 Prep Date: 08/04/17 08:54 Instrument ID: ICP-THERMO3
 Analyzed Date: 08/09/17 16:42 Method: 6010C
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG624529-03	T3.080917.164642	08/09/17 16:46	01
LH18/24-SP140-7461-GRAB	L17080163-01	T3.080917.170534	08/09/17 17:05	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5425752
 Report generated 08/10/2017 12:02



METHOD BLANK SUMMARY

Login Number: L17080163 Work Group: WG625078
 Blank File ID: T4.080917.102609 Blank Sample ID: WG624529-02
 Prep Date: 08/04/17 08:54 Instrument ID: ICP-THERMO4
 Analyzed Date: 08/09/17 10:26 Method: 6010C
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG624529-03	T4.080917.102955	08/09/17 10:29	01
LH18/24-SP140-7461-GRAB	L17080163-01	T4.080917.105147	08/09/17 10:51	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5424300
 Report generated 08/09/2017 13:57



Login Number: L17080163 Prep Date: 08/04/17 08:54 Sample ID: WG624529-02
Instrument ID: ICP-THERMO3 Run Date: 08/09/17 16:42 Prep Method: 3015A
File ID: T3.080917.164245 Analyst: JYH Method: 6010C
Workgroup (AAB#): WG625078 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-TH-09-AUG-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Selenium, Total	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: 5425753
10-AUG-2017 12:02



Login Number: L17080163 Prep Date: 08/04/17 08:54 Sample ID: WG624529-02
Instrument ID: ICP-THERMO4 Run Date: 08/09/17 10:26 Prep Method: 3015A
File ID: T4.080917.102609 Analyst: JYH Method: 6010C
Workgroup (AAB#): WG625078 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-TH-09-AUG-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: 5424301
09-AUG-2017 13:57



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG624529-03
Instrument ID: ICP-THERMO3 Run Time: 16:46 Prep Method: 3015A
File ID: T3.080917.164642 Analyst: JYH Method: 6010C
Workgroup (AAB#): WG625078 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD83126 Cal ID: ICP-TH-09-AUG-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Selenium, Total	0.250	0.270	108	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5425754
Report generated: 08/10/2017 12:02



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG624529-03
Instrument ID: ICP-THERMO4 Run Time: 10:29 Prep Method: 3015A
File ID: T4.080917.102955 Analyst: JYH Method: 6010C
Workgroup (AAB#): WG625078 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD83126 Cal ID: ICP-TH-09-AUG-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Selenium, Total	0.250	0.227	90.9	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5424302
Report generated: 08/09/2017 13:57



Loginnum: L17080163 Cal ID: ICP-THERMO3- Worknum: WG625078
 Instrument ID: ICP-THERMO3 Contract #: _____ Method: 6010C
 Parent ID: WG624529-01 File ID: T3.080917.165022 Dil: 1 Matrix: WATER
 Sample ID: WG624529-04 MS File ID: T3.080917.165414 Dil: 1 Units: mg/L
 Sample ID: WG624529-05 MSD File ID: T3.080917.165754 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Selenium	ND	0.250	0.274	110	0.250	0.269	108	1.83	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Loginnum: L17080163 Cal ID: ICP-THERMO4- Worknum: WG625078
 Instrument ID: ICP-THERMO4 Contract #: _____ Method: 6010C
 Parent ID: WG624529-01 File ID: T4.080917.103714 Dil: 1 Matrix: WATER
 Sample ID: WG624529-04 MS File ID: T4.080917.104055 Dil: 1 Units: mg/L
 Sample ID: WG624529-05 MSD File ID: T4.080917.104426 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Selenium	ND	0.250	0.237	94.9	0.250	0.248	99.3	4.51	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L17080163 **Worknum:** WG625078
Instrument: ICP-THERMO3 **Method:** 6010C
Serial Dil: WG625078-02 **File ID:** T3.080917.171307 **Dil:** 5 **Units:** ug/L
Sample: L17080163-01 **File ID:** T3.080917.170534 **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: 5425749

08/10/2017 12:02



Microbac Laboratories Inc.
Serial Dilution Report

Login: L17080163 **Worknum:** WG625078
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG625078-02 **File ID:** T4.080917.105858 **Dil:** 5 **Units:** ug/L
Sample: L17080163-01 **File ID:** T4.080917.105147 **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: 5424297

08/09/2017 13:57



Sample Login ID: L17080163 Worknum: WG625078
 Instrument ID: ICP-THERMO3 Method: 6010C
 Post Spike ID: WG625078-01 File ID: T3.080917.170927 Dil: 1 Units: ug/L
 Sample ID: L17080163-01 File ID: T3.080917.170534 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
SELENIUM	220		0	U	200	110.1	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: L17080163 Worknum: WG625078
 Instrument ID: ICP-THERMO4 Method: 6010C
 Post Spike ID: WG625078-01 File ID: T4.080917.105529 Dil: 1 Units: ug/L
 Sample ID: L17080163-01 File ID: T4.080917.105147 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
SELENIUM	197		0	U	200	98.3	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



Login: L17080163 Workgroup (AAB#): WG625078
 Analytical Method: 6010C Instrument ID: ICP-THERMO3
 ICAL Worknum: WG625299 Initial Calibration Date: 09-AUG-2017 14:56

	WG625299-01		WG625299-02		WG625299-03		WG625299-04		WG625299-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
SELENIUM	0	-0.000140	NA	NA	.008	-0.0000600	.4	0.00452	.8	0.00915	.999997	

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



Login: L17080163 Workgroup (AAB#): WG625078
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG625195 Initial Calibration Date: 09-AUG-2017 09:53

	WG625195-01		WG625195-02		WG625195-03		WG625195-04		WG625195-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
SELENIUM	0	0.0000400	NA	NA	.008	0.000100	.4	0.00632	.8	0.0125	.999571	

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



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625299-07
Instrument ID: ICP-THERMO3 Run Time: 15:03 Method: 6010C
File ID: T3.080917.150324 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG625078 Cal ID: ICP-THERI - 09-AUG-17
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
SELENIUM	.004	.016	.004	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: L17080163 Run Date: 08/09/2017 Sample ID: WG625195-07
Instrument ID: ICP-THERMO4 Run Time: 10:00 Method: 6010C
File ID: T4.080917.100004 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG625078 Cal ID: ICP-THERI - 09-AUG-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: L17080163 Run Date: 08/09/2017 Sample ID: WG625299-12
 Instrument ID: ICP-THERMO3 Run Time: 15:22 Method: 6010C
 File ID: T3.080917.152229 Analyst: JYH Units: mg/L
 Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.00400	0.0160	0.00400	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: 5425763
 Report generated 08/10/2017 11:55



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625299-16
 Instrument ID: ICP-THERMO3 Run Time: 16:38 Method: 6010C
 File ID: T3.080917.163858 Analyst: JYH Units: mg/L
 Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.00400	0.0160	0.00400	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: 5425763
 Report generated 08/10/2017 11:55



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625299-18
 Instrument ID: ICP-THERMO3 Run Time: 17:20 Method: 6010C
 File ID: T3.080917.172036 Analyst: JYH Units: mg/L
 Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
 Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.00400	0.0160	0.00400	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: 5425763
 Report generated 08/10/2017 11:55



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625195-13
Instrument ID: ICP-THERMO4 Run Time: 10:22 Method: 6010C
File ID: T4.080917.102220 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-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: L17080163 Run Date: 08/09/2017 Sample ID: WG625195-15
Instrument ID: ICP-THERMO4 Run Time: 11:06 Method: 6010C
File ID: T4.080917.110610 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Selenium	0.00800	0.0160	-0.00902	F

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



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625299-06
Instrument ID: ICP-THERMO3 Run Time: 14:59 Method: 6010C
File ID: T3.080917.145947 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Selenium	.4	0.413	103	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625195-06
Instrument ID: ICP-THERMO4 Run Time: 09:56 Method: 6010C
File ID: T4.080917.095636 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Selenium	.4	0.408	102	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625299-11
 Instrument ID: ICP-THERMO3 Run Time: 15:18 Method: 6010C
 File ID: T3.080917.151853 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.407	mg/L	102	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625299-15
 Instrument ID: ICP-THERMO3 Run Time: 16:35 Method: 6010C
 File ID: T3.080917.163523 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.434	mg/L	109	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625299-17
Instrument ID: ICP-THERMO3 Run Time: 17:17 Method: 6010C
File ID: T3.080917.171701 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.423	mg/L	106	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625195-12
 Instrument ID: ICP-THERMO4 Run Time: 10:18 Method: 6010C
 File ID: T4.080917.101852 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.400	0.394	mg/L	98.6	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625195-14
 Instrument ID: ICP-THERMO4 Run Time: 11:02 Method: 6010C
 File ID: T4.080917.110242 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-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: L17080163 Run Date: 08/09/2017 Sample ID: WG625299-08
 Instrument ID: ICP-THERMO3 Run Time: 15:07 Method: 6010C
 File ID: T3.080917.150723 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0145	mg/L	90.5	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625299-19
Instrument ID: ICP-THERMO3 Run Time: 17:24 Method: 6010C
File ID: T3.080917.172435 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0162	mg/L	101	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625195-08
 Instrument ID: ICP-THERMO4 Run Time: 10:03 Method: 6010C
 File ID: T4.080917.100351 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0130	mg/L	81.4	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/09/2017 Sample ID: WG625195-18
 Instrument ID: ICP-THERMO4 Run Time: 11:32 Method: 6010C
 File ID: T4.080917.113218 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG625078 Cal ID: ICP-TH - 09-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Selenium	0.0160	0.0130	mg/L	81.3	70 - 130	

* Exceeds LIMITS Criteria



Login number: L17080163
Instrument ID: ICP-THERMO3
Sol. A: WG625299-09
Sol. AB: WG625299-10

File ID: T3.080917.151119
File ID: T3.080917.151512

Workgroup (AAB#): WG625078
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Selenium	NS	0.00694	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: L17080163
 Instrument ID: ICP-THERMO4
 Sol. A: WG625195-10
 Sol. AB: WG625195-11

File ID: T4.080917.101118
 File ID: T4.080917.101510

Workgroup (AAB#): WG625078
 Method: 6010C
 Units: mg/L
 Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Selenium	NS	0.00251	NS	0.250	0.249	99.6	

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: L17080163
 Instrument ID: ICP-THERMO3

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	0.0000310	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	0.000250	0	0	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.00	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	196.00	0	-0.0000400	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.00	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	0.00000700	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5425757
 Report generated: 08/10/2017 11:55



Login Number: L17080163
 Instrument ID: ICP-THERMO3

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	279.00	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	196.00	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.00	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: 5425757
 Report generated: 08/10/2017 11:55



Login Number: L17080163
 Instrument ID: ICP-THERMO3

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	-0.0000210	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	-0.000220	0	0	0
CADMIUM	228.80	0	-0.0000100	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	0.000650	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	279.00	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	0.0000420	0	0	0
PHOSPHORUS	214.90	0.0390	0.000900	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.00	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.00	0	-0.000150	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	-0.000300	0	0	0
VANADIUM	292.40	0	0.0000100	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	-0.0000300	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5425757
 Report generated: 08/10/2017 11:55



Login Number: L17080163
 Instrument ID: ICP-THERMO3

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	0.00120	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	279.00	-0.00290	-0.0230	0	0	0
MANGANESE	257.60	0	0.0000300	0	0	0
MOLYBDENUM	202.00	0	0	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	196.00	0.000600	0.000580	0	0	0
SILICON	212.40	0	0.0187	0	0	0
SILVER	328.00	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: 5425757
 Report generated: 08/10/2017 11:55



Login Number: L17080163
 Instrument ID: ICP-THERMO3

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	279.00	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	196.00	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.00	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: 5425757
 Report generated: 08/10/2017 11:55



Login Number: L17080163
 Instrument ID: ICP-THERMO3

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	279.00	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	196.00	0	0	0	0	0
SILICON	212.40	0	0	0	0	0
SILVER	328.00	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: 5425757
 Report generated: 08/10/2017 11:55



Login Number: L17080163
 Instrument ID: ICP-THERMO3

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	279.00	0
MANGANESE	257.60	0
MOLYBDENUM	202.00	0
NICKEL	231.60	0
PHOSPHORUS	214.90	0
POTASSIUM	766.40	0
SELENIUM	196.00	0
SILICON	212.40	0
SILVER	328.00	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: 5425757
 Report generated: 08/10/2017 11:55



Login Number: L17080163
 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: 5424305
 Report generated: 08/09/2017 13:54



Login Number: L17080163
 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: 5424305
 Report generated: 08/09/2017 13:54



Login Number: L17080163
 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: 5424305
 Report generated: 08/09/2017 13:54



Login Number: L17080163
 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: 5424305
 Report generated: 08/09/2017 13:54



Login Number: L17080163
 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: 5424305
 Report generated: 08/09/2017 13:54



Login Number: L17080163
 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: 5424305
 Report generated: 08/09/2017 13:54



Login Number: L17080163

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: 5424305
 Report generated: 08/09/2017 13:54



Login Number: L17080163 Date: 07/10/2017
 Instrument ID: ICP-THERMO3 Method: 6010C

Analyte	Integration Time (Sec.)	Concentration (mg/L)
Aluminum	10.00	900.0
Antimony	20.00	45.0
Arsenic	10.00	45.0
Barium	10.00	45.0
Beryllium	10.00	4.5
Boron	20.00	45.0
Cadmium	20.00	4.5
Calcium	5.00	270.0
Chromium	20.00	36.0
Cobalt	20.00	45.0
Copper	20.00	90.0
Iron	5.00	630.0
Lead	20.00	180.0
Lithium	5.00	36.0
Magnesium	5.00	900.0
Manganese	10.00	36.0
Molybdenum	20.00	27.0
Nickel	20.00	90.0
Phosphorus	20.00	180.0
Potassium	5.00	360.0
Selenium	20.00	90.0
Silicon	20.00	36.0
Silver	10.00	9.0
Sodium	5.00	360.0
Strontium	5.00	9.0
Thallium	20.00	18.0
Tin	20.00	45.0
Titanium	5.00	45.0
Vanadium	20.00	36.0
Zinc	20.00	45.0
Zirconium	10.00	45.0

Comments:

All analytes passed acceptance criteria at the specified concentration.



Login Number: L17080163 Date: 07/17/2017
 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	3.6
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 #: L17080163

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080163-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: LH18/24-SP140-7461-GRAB	Prep Method: 3015A	Prep Date: 08/08/2017 07:50
Matrix: Water	Analytical Method: 6020A	Cal Date: 08/10/2017 13:52
Workgroup #: WG624996	Analyst: JYH	Run Date: 08/10/2017 14:38
Collect Date: 08/02/2017 15:00	Dilution: 1	File ID: NI.081017.143832
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 #: L17080163

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

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: WG624914
 Analyst: VC
 Spike Analyst: VC
 Run Date: 08/08/2017 07:50
 Method: 3015A
 Balance: BAL016
 Instrument: MW-3
 Instrument Start: 08/08/2017 07:54

SOP: ME407 Revision 19
 Spike Solution: STD80296
 Spike Witness: ERP
 40 & 50 ML. DIGESTION TU COA19886
 HNO3 Lot #: COA19798
 MS Filters- fisher-Lot# rrRGT40686

	SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG624914-02	BLANK	1	20 mL	50 mL	183.22 g	183.202 g		
2	WG624914-03	LCS	1	20 mL	50 mL	186.125 g	186.118 g	.25 mL	
3	L17070948-01	SAMP	1	20 mL	50 mL	184.931 g	184.908 g		08/17/17
4	L17080162-01	SAMP	1	20 mL	50 mL	183.743 g	183.735 g		08/14/17
5	WG624914-01	REF	1	20 mL	50 mL	182.12 g	182.088 g		
6	L17080163-01	SAMP	1	20 mL	50 mL	182.12 g	182.088 g		08/14/17
7	WG624914-04	MS	1	20 mL	50 mL	182.487 g	182.472 g	.25 mL	
8	WG624914-05	MSD	1	20 mL	50 mL	184.87 g	184.863 g	.25 mL	

Analyst: Vicki Collier

Reviewer: Evan Pottin



Microbac Laboratories Inc.

Instrument Run Log

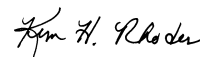
Instrument: ICP-MS2 Dataset: 081017A.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD82933 ICV Std: STD83299 Post Spike: STD83027
 ICSA: STD83297 ICSAB: STD83298 Int. Std: RGT39300
 CCV: STD82932 LLCCV: STD83301 Tuning Sol : STD83302
 Stannous : _____ Hydroxylamine : _____

Workgroups: 624996,625296,625344,625346

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.081017.133940	Blank	Blank		1		08/10/17 13:39
2	NI.081017.134246	WG625463-01	Calibration Point		1		08/10/17 13:42
3	NI.081017.134552	WG625463-02	Calibration Point		1		08/10/17 13:45
4	NI.081017.134858	WG625463-03	Calibration Point		1		08/10/17 13:48
5	NI.081017.135203	WG625463-04	Calibration Point		1		08/10/17 13:52
6	NI.081017.135510	WG625463-05	Initial Calibration Verification		1		08/10/17 13:55
7	NI.081017.135816	WG625463-06	Initial Calib Blank		1		08/10/17 13:58
8	NI.081017.140123	WG625463-07	Low Level Initial Calibration V		1		08/10/17 14:01
9	NI.081017.140428	WG625463-08	Interference Check		1		08/10/17 14:04
10	NI.081017.140734	WG625463-09	Interference Check		1		08/10/17 14:07
11	NI.081017.141041	WG625463-10	CCV		1		08/10/17 14:10
12	NI.081017.141346	WG625463-11	CCB		1		08/10/17 14:13
13	NI.081017.141652	WG624914-02	Method/Prep Blank	20/50	1		08/10/17 14:16
14	NI.081017.141957	WG624914-03	Laboratory Control S	20/50	1		08/10/17 14:19
15	NI.081017.142303	L17070948-01	P270-4402	20/50	1		08/10/17 14:23
16	NI.081017.142608	WG624996-03	Serial Dilution		5	L17070948-01	08/10/17 14:26
17	NI.081017.142913	WG624996-03	Serial Dilution		25	L17070948-01	08/10/17 14:29
18	NI.081017.143220	WG625463-12	CCV		1		08/10/17 14:32
19	NI.081017.143526	WG625463-13	CCB		1		08/10/17 14:35
20	NI.081017.143832	WG624914-01	Reference Sample		1	L17080163-01	08/10/17 14:38
21	NI.081017.144137	WG624914-04	Matrix Spike	20/50	1	L17080163-01	08/10/17 14:41
22	NI.081017.144443	WG624914-05	Matrix Spike Duplica	20/50	1	L17080163-01	08/10/17 14:44
23	NI.081017.144748	L17080162-01	LH18/24-SP650-6461-GRAB	20/50	1		08/10/17 14:47
24	NI.081017.145054	WG624996-01	Post Digestion Spike		1	L17080162-01	08/10/17 14:50
25	NI.081017.145359	WG624996-02	Serial Dilution		5	L17080162-01	08/10/17 14:53
26	NI.081017.145704	WG624996-02	Serial Dilution		25	L17080162-01	08/10/17 14:57
27	NI.081017.150010	WG625463-14	CCV		1		08/10/17 15:00
28	NI.081017.150316	WG625463-15	CCB		1		08/10/17 15:03
29	NI.081017.150623	WG625463-16	Low Level Continuing Calibra		1		08/10/17 15:06
30	NI.081017.151354	WG625256-02	Method/Prep Blank	40/50	50		08/10/17 15:13
31	NI.081017.151659	WG625256-03	Laboratory Control S	40/50	50		08/10/17 15:16
32	NI.081017.152004	WG625110-02	Fluid Blank 2		50		08/10/17 15:20
33	NI.081017.152309	WG625256-01	Reference Sample		50	L17080423-01	08/10/17 15:23
34	NI.081017.152615	WG625256-04	Matrix Spike	5/50	50	L17080423-01	08/10/17 15:26

Page: 1 Approved: August 14, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 081017A.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD82933 ICV Std: STD83299 Post Spike: STD83027
 ICSA: STD83297 ICSAB: STD83298 Int. Std: RGT39300
 CCV: STD82932 LLCCV: STD83301 Tuning Sol : STD83302
 Stannous : _____ Hydroxylamine : _____

Workgroups: 624996,625296,625344,625346

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.081017.152920	WG625256-05	Matrix Spike Duplica	5/50	50	L17080423-01	08/10/17 15:29
36	NI.081017.153226	L17080431-01	10 ALAN BAGS	5/50	50		08/10/17 15:32
37	NI.081017.153531	WG625296-01	Post Digestion Spike		50	L17080431-01	08/10/17 15:35
38	NI.081017.153836	WG625296-02	Serial Dilution		50	L17080431-01	08/10/17 15:38
39	NI.081017.154141	WG624363-02	Serial Dilution		250	L17071493-01	08/10/17 15:41
40	NI.081017.154449	WG625463-17	CCV		1		08/10/17 15:44
41	NI.081017.154754	WG625463-18	CCB		1		08/10/17 15:47
42	NI.081017.155809	WG625314-01	Method/Prep Blank	10/100	1		08/10/17 15:58
43	NI.081017.160115	WG625314-02	Laboratory Control S	10/100	1		08/10/17 16:01
44	NI.081017.160421	WG625314-03	Laboratory Control S	10/100	1		08/10/17 16:04
45	NI.081017.160727	L17080535-01	BFB-17-078	0.143/100	1		08/10/17 16:07
46	NI.081017.161032	L17080535-03	BFB-17-079	0.163/100	1		08/10/17 16:10
47	NI.081017.161338	L17080535-05	BFB-17-080	0.202/100	1		08/10/17 16:13
48	NI.081017.161643	L17080535-07	BFB-17-081	0.174/100	1		08/10/17 16:16
49	NI.081017.161948	L17080535-09	BFB-17-082	0.337/100	1		08/10/17 16:19
50	NI.081017.162253	L17080535-11	BFB-17-083	0.417/100	1		08/10/17 16:22
51	NI.081017.162558	L17080535-13	BFB-17-084	0.439/100	1		08/10/17 16:25
52	NI.081017.162906	WG625463-19	CCV		1		08/10/17 16:29
53	NI.081017.163211	WG625463-20	CCB		1		08/10/17 16:32
54	NI.081017.163518	L17080535-15	BFB-17-085	0.108/100	1		08/10/17 16:35
55	NI.081017.163823	L17080535-17	BFB-17-086	0.412/100	1		08/10/17 16:38
56	NI.081017.164129	L17080535-19	BFB-17-087	0.446/100	1		08/10/17 16:41
57	NI.081017.164434	L17080535-21	BFB-17-088	0.339/100	1		08/10/17 16:44
58	NI.081017.164740	L17080535-23	BFB-17-089	0.211/100	1		08/10/17 16:47
59	NI.081017.165045	L17080535-25	BFB-17-090	0.128/100	1		08/10/17 16:50
60	NI.081017.165350	L17080535-27	BFB-17-091	0.287/100	1		08/10/17 16:53
61	NI.081017.165656	WG625344-01	Post Digestion Spike		1	L17080535-01	08/10/17 16:56
62	NI.081017.170001	WG625344-02	Serial Dilution		5	L17080535-01	08/10/17 17:00
63	NI.081017.170308	WG625463-21	CCV		1		08/10/17 17:03
64	NI.081017.170613	WG625463-22	CCB		1		08/10/17 17:06
65	NI.081017.170920	WG625319-02	Method/Prep Blank	.25/100	1		08/10/17 17:09
66	NI.081017.171225	WG625319-03	Laboratory Control S	.25/100	1		08/10/17 17:12
67	NI.081017.171531	L17080087-23	SS-21		1	WG625319-01	08/10/17 17:15
68	NI.081017.171836	WG625319-04	Matrix Spike	.255/100	1	L17080087-23	08/10/17 17:18

Page: 2 Approved: August 14, 2017

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 081017A.REP

Analyst1: JYH Analyst2: N/A

Method: 6020/6020A/200.8 SOP: ME700A Rev: 3

Maintenance Log ID: _____

Calibration Std: STD82933 ICV Std: STD83299 Post Spike: STD83027

ICSA: STD83297 IC SAB: STD83298 Int. Std: RGT39300

CCV: STD82932 LLCCV: STD83301 Tuning Sol : STD83302

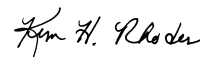
Stannous : _____ Hydroxylamine : _____

Workgroups: 624996,625296,625344,625346

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	NI.081017.172141	WG625319-05	Matrix Spike Duplica	.251/100	1	L17080087-23	08/10/17 17:21
70	NI.081017.172446	L17080535-02	BFB-17-078	.259/100	1		08/10/17 17:24
71	NI.081017.172752	L17080535-04	BFB-17-079	.251/100	1		08/10/17 17:27
72	NI.081017.173057	L17080535-06	BFB-17-080	.258/100	1		08/10/17 17:30
73	NI.081017.173403	L17080535-08	BFB-17-081	.251/100	1		08/10/17 17:34
74	NI.081017.173707	L17080535-10	BFB-17-082	.257/100	1		08/10/17 17:37
75	NI.081017.174014	WG625463-23	CCV		1		08/10/17 17:40
76	NI.081017.174320	WG625463-24	CCB		1		08/10/17 17:43
77	NI.081017.174626	L17080535-12	BFB-17-083	.251/100	1		08/10/17 17:46
78	NI.081017.174932	L17080535-14	BFB-17-084	.254/100	1		08/10/17 17:49
79	NI.081017.175237	L17080535-16	BFB-17-085	.255/100	1		08/10/17 17:52
80	NI.081017.175542	L17080535-18	BFB-17-086	.251/100	1		08/10/17 17:55
81	NI.081017.175848	L17080535-20	BFB-17-087	.259/100	1		08/10/17 17:58
82	NI.081017.180152	L17080535-22	BFB-17-088	.256/100	1		08/10/17 18:01
83	NI.081017.180458	L17080535-24	BFB-17-089	.25/100	1		08/10/17 18:04
84	NI.081017.180803	L17080535-26	BFB-17-090	.252/100	1		08/10/17 18:08
85	NI.081017.181109	WG625463-25	CCV		1		08/10/17 18:11
86	NI.081017.181415	WG625463-26	CCB		1		08/10/17 18:14
87	NI.081017.181721	L17080535-28	BFB-17-091	.259/100	1		08/10/17 18:17
88	NI.081017.182026	WG625346-01	Post Digestion Spike		1	L17080535-28	08/10/17 18:20
89	NI.081017.182331	WG625346-02	Serial Dilution		5	L17080535-28	08/10/17 18:23
90	NI.081017.182637	WG625346-02	Serial Dilution		25	L17080535-28	08/10/17 18:26
91	NI.081017.182944	WG625463-27	CCV		1		08/10/17 18:29
92	NI.081017.183249	WG625463-28	CCB		1		08/10/17 18:32

Page: 3 Approved: August 14, 2017




Microbac Laboratories Inc.

Data Checklist

Date: 10-AUG-2017
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A/200.8
 Instrument: ICP-MS
 Curve Workgroup: 625463
 Runlog ID: 83862
 Analytical Workgroups: 624996,625296,625344,625346

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	948,162,163,535
Client Forms	X
Level X	
Level 3	535
Level 4	948,162,163
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:
14-AUG-2017



Analytical Method:6020A
Login Number:L17080163

AAB#:WG624996

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-SP140-7461-GRAB	01	08/02/17					08/08/2017	5.7	180		08/10/17	8	180	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080163 Work Group: WG624996
 Blank File ID: NI.081017.141652 Blank Sample ID: WG624914-02
 Prep Date: 08/08/17 07:50 Instrument ID: ICP-MS2
 Analyzed Date: 08/10/17 14:16 Method: 6020A
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG624914-03	NI.081017.141957	08/10/17 14:19	01
LH18/24-SP140-7461-GRAB	L17080163-01	NI.081017.143832	08/10/17 14:38	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5428295
 Report generated 08/11/2017 12:25



Login Number: L17080163 Prep Date: 08/08/17 07:50 Sample ID: WG624914-02
 Instrument ID: ICP-MS2 Run Date: 08/10/17 14:16 Prep Method: 3015A
 File ID: NI.081017.141652 Analyst: JYH Method: 6020A
 Workgroup (AAB#): WG624996 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-MS - 10-AUG-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: 5428296
 11-AUG-2017 12:25



Login Number: L17080163 Run Date: 08/10/2017 Sample ID: WG624914-03
Instrument ID: ICP-MS2 Run Time: 14:19 Prep Method: 3015A
File ID: NI.081017.141957 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG624996 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD80296 Cal ID: ICP-MS - 10-AUG-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Silver, Total	0.125	0.117	93.3	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5428297
Report generated: 08/11/2017 12:25



Loginnum: L17080163 Cal ID: ICP-MS2- Worknum: WG624996
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG624914-01 File ID: NI.081017.143832 Dil: 1 Matrix: WATER
 Sample ID: WG624914-04 MS File ID: NI.081017.144137 Dil: 1 Units: mg/L
 Sample ID: WG624914-05 MSD File ID: NI.081017.144443 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Silver, Total	ND	0.125	0.109	87.4	0.125	0.111	88.7	1.51	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L17080163 **Worknum:** WG624996
Instrument: ICP-MS2 **Method:** 6020A
Serial Dil: WG624996-02 **File ID:** NI.081017.145359 **Dil:** 5 **Units:** ug/L
Sample: L17080162-01 **File ID:** NI.081017.144748 **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: 5428292

08/11/2017 12:25



Sample Login ID: L17080163 Worknum: WG624996
 Instrument ID: ICP-MS2 Method: 6020A
 Post Spike ID: WG624996-01 File ID: NI.081017.145054 Dil: 1 Units: ug/L
 Sample ID: L17080162-01 File ID: NI.081017.144748 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
SILVER	45.9		0	U	50	91.9	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: L17080163 Workgroup (AAB#): WG624996
 Analytical Method: 6020A Instrument ID: ICP-MS2
 ICAL Worknum: WG625463 Initial Calibration Date: 10-AUG-2017 13:52

	WG625463-01		WG625463-02		WG625463-03		WG625463-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
SILVER	0	98.3	.4	346	50	229000	100	460000	1	

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



Login Number: L17080163 Run Date: 08/10/2017 Sample ID: WG625463-06
Instrument ID: ICP-MS2 Run Time: 13:58 Method: 6020A
File ID: NI.081017.135816 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG624996 Cal ID: ICP-MS2 - 10-AUG-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: L17080163 Run Date: 08/10/2017 Sample ID: WG625463-11
Instrument ID: ICP-MS2 Run Time: 14:13 Method: 6020A
File ID: NI.081017.141346 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG624996 Cal ID: ICP-MS - 10-AUG-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: L17080163 Run Date: 08/10/2017 Sample ID: WG625463-13
 Instrument ID: ICP-MS2 Run Time: 14:35 Method: 6020A
 File ID: NI.081017.143526 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG624996 Cal ID: ICP-MS - 10-AUG-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: 5428306
 Report generated 08/11/2017 12:19



Login Number: L17080163 Run Date: 08/10/2017 Sample ID: WG625463-15
Instrument ID: ICP-MS2 Run Time: 15:03 Method: 6020A
File ID: NI.081017.150316 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG624996 Cal ID: ICP-MS - 10-AUG-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: L17080163 Run Date: 08/10/2017 Sample ID: WG625463-05
Instrument ID: ICP-MS2 Run Time: 13:55 Method: 6020A
File ID: NI.081017.135510 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG624996 Cal ID: ICP-MS - 10-AUG-17
QC Key: DOD4

Analyte	Expected	Found	%REC	LIMITS	Q
Silver	50	49.6	99.1	90 - 110	

* Exceeds LIMITS Limit



Login Number: L17080163 Run Date: 08/10/2017 Sample ID: WG625463-10
Instrument ID: ICP-MS2 Run Time: 14:10 Method: 6020A
File ID: NI.081017.141041 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG624996 Cal ID: ICP-MS - 10-AUG-17
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Silver	0.0500	0.0487	mg/L	97.5	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/10/2017 Sample ID: WG625463-12
 Instrument ID: ICP-MS2 Run Time: 14:32 Method: 6020A
 File ID: NI.081017.143220 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG624996 Cal ID: ICP-MS - 10-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Silver	0.0500	0.0486	mg/L	97.3	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/10/2017 Sample ID: WG625463-14
 Instrument ID: ICP-MS2 Run Time: 15:00 Method: 6020A
 File ID: NI.081017.150010 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG624996 Cal ID: ICP-MS - 10-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Silver	0.0500	0.0486	mg/L	97.1	90 - 110	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/10/2017 Sample ID: WG625463-07
 Instrument ID: ICP-MS2 Run Time: 14:01 Method: 6020A
 File ID: NI.081017.140123 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG624996 Cal ID: ICP-MS - 10-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Silver	0.400	0.386	ug/L	96.4	70 - 130	

* Exceeds LIMITS Criteria



Login Number: L17080163 Run Date: 08/10/2017 Sample ID: WG625463-16
 Instrument ID: ICP-MS2 Run Time: 15:06 Method: 6020A
 File ID: NI.081017.150623 Analyst: JYH QC Key: DOD4
 Workgroup (AAB#): WG624996 Cal ID: ICP-MS - 10-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Silver	0.400	0.359	ug/L	89.7	70 - 130	

* Exceeds LIMITS Criteria



Login number: L17080163
 Instrument ID: ICP-MS2
 Sol. A: WG625463-08
 Sol. AB: WG625463-09

File ID: NI.081017.140428
 File ID: NI.081017.140734

Workgroup (AAB#): WG624996
 Method: 6020A
 Units: ug/L
 Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Silver	NS	0.000600	NS	100	81.6	81.6	

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: L17080163 Analytical Method: 6020
 Analytical Workgroup: WG624996 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 10-AUG-2017 13:42

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L17070948-01	SAMP	10-AUG-2017 14:23	103.417	99.627	105.606
L17080162-01	SAMP	10-AUG-2017 14:47	91.887	97.497	105.867
L17080163-01	SAMP	10-AUG-2017 14:38	92.961	97.365	103.037
WG624914-02	BLANK	10-AUG-2017 14:16	102.628	98.549	103.996
WG624914-03	LCS	10-AUG-2017 14:19	102.333	99.808	105.561
WG624914-04	MS	10-AUG-2017 14:41	92.894	97.6	104.19
WG624914-05	MSD	10-AUG-2017 14:44	90.992	95.363	103.33
WG624996-01	PSPK	10-AUG-2017 14:50	91.601	97.609	106.112
WG624996-02	SERIAL	10-AUG-2017 14:53	93.045	94.839	99.899
WG624996-03	SERIAL	10-AUG-2017 14:26	101.086	100.111	104.962
WG625463-05	ICV	10-AUG-2017 13:55	97.43	96.803	100.62
WG625463-06	ICB	10-AUG-2017 13:58	100.188	96.585	100.882
WG625463-07	LLICV	10-AUG-2017 14:01	99.814	97.356	100.792
WG625463-08	ICS	10-AUG-2017 14:04	93.81	91.857	96.768
WG625463-09	ICS	10-AUG-2017 14:07	96.889	93.73	100.627
WG625463-10	CCV	10-AUG-2017 14:10	101.913	99.527	106.163
WG625463-11	CCB	10-AUG-2017 14:13	102.748	98.501	104.982
WG625463-12	CCV	10-AUG-2017 14:32	99.802	98.782	104.176
WG625463-13	CCB	10-AUG-2017 14:35	102.061	98.86	104.578
WG625463-14	CCV	10-AUG-2017 15:00	100.884	102.343	107.06
WG625463-15	CCB	10-AUG-2017 15:03	101.385	99.014	105.658
WG625463-16	LLCCV	10-AUG-2017 15:06	100.915	100.063	105.174

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: 5428300
 Report generated: 08/11/2017 12:25



Login Number: L17080163 Date: 04/12/2017
Insturment 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

Lab Report #: L17080163

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080163-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP140-7461-GRAB	Prep Method: 7196A	Prep Date: N/A
Matrix: Water	Analytical Method: 7196A	Cal Date: 06/05/2017 10:10
Workgroup #: WG624404	Analyst: SDC	Run Date: 08/03/2017 12:45
Collect Date: 08/02/2017 15:00	Dilution: 1	File ID: 00.1708031245-07
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chromium, Hexavalent	18540-29-9	0.0100	U	0.0200	0.0100	0.00500
U	Analyte was not detected. The concentration is below the reported LOD.					

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

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

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: 03-AUG-2017
 Analyst: SDC
 Analyst: NA
 Method: CR-6
 Instrument: UV-2600
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG624404

Calibration/Linearity	06/05/17
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	
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	SDC
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
07-AUG-2017

Zhalyn Culy

Secondary Reviewer:
07-AUG-2017

Drenna Johnson



Analytical Method: 7196A
Login Number: L17080163

AAB#: WG624404

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-SP140-7461-GRAB	01	08/02/17					08/03/2017	.9	1		08/03/17	.9	1	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080163 Work Group: WG624404
 Blank File ID: 00.1708031245-03 Blank Sample ID: WG624404-01
 Prep Date: 08/03/17 12:45 Instrument ID: UV-2600
 Analyzed Date: 08/03/17 12:45 Method: 7196A
 Analyst: SDC

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG624404-02	00.1708031245-04	08/03/17 12:45	
LCS2	WG624404-03	00.1708031245-05	08/03/17 12:45	
LH18/24-SP140-7461-GRAB	L17080163-01	00.1708031245-07	08/03/17 12:45	
DUP	WG624404-06	00.1708031245-08	08/03/17 12:45	

Report Name: BLANK_SUMMARY
 PDF File ID: 5419559
 Report generated 08/07/2017 13:07



Login Number: L17080163 Prep Date: 08/03/17 12:45 Sample ID: WG624404-01
Instrument ID: UV-2600 Run Date: 08/03/17 12:45 Prep Method: 7196A
File ID: 00.1708031245-03 Analyst: SDC Method: 7196A
Workgroup (AAB#): WG624404 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: UV-260-11-JUL-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: 5419560
07-AUG-2017 13:07



Login Number: L17080163 Analyst: SDC Prep Method: 7196A
 Instrument ID: UV-2600 Matrix: Water Method: 7196A
 Workgroup (AAB#): WG624404 Units: mg/L
 QC Key: DOD4 Lot #: STD81994
 Sample ID: WG624404-02 LCS File ID: 00.1708031245-04 Run Date: 08/03/2017 12:45
 Sample ID: WG624404-03 LCS2 File ID: 00.1708031245-05 Run Date: 08/03/2017 12:45

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Chromium, Hexavalent	0.100	0.101	101	0.100	0.101	101	0.481	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5419561
 Report generated: 08/07/2017 13:07



2.3.1.3 Raw Data

Curves

Parameter: CR-10 Low

Spectrophotometer: UV-2400

Calibration (Curve) standard stock: 20872, 82188

Concentration: 5mg/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



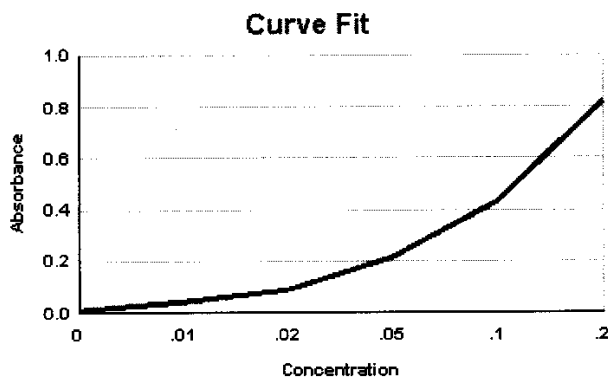
Microbac Laboratories Inc.
INITIAL CALIBRATION

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: WG624404

CHROMIUM (6)
(Cr6)

Standard Methods 3500 Cr-D (18th, 19th), 3500Cr-B(20th)

SPEC: UV-2600

SOP K2186 Rev. # 22

SW846 7196A

Curve ID: 6-5-17

SOP OVAP K3500-Cr Rev. # _____

CCV: 82188

LCS: 81994

Spike: 80872

RGT 19852

Matrix: Liquid (mg/L)

Daily dilution: 1(5)/100

Daily dilution: 1(2)/200

Daily dilution: 0.2(50)/100 RGT _____

Soil (mg/Kg)

Daily dilution: =0.05

Daily dilution: 0.1

Daily dilution: =0.1

Sample	Volume (mL)	pH adj. to 2 ± 0.5	Dilution	Cell size (cm)	Absorbance @ 540 nm
CCV: mg/L(1 cm)	100				
CCV: mg/L(5 cm)	100	✓		5cm	0.206
Blank/CCB:	100	✓		5cm	0.000
LCS: ppm	100	✓		5cm	0.419
LCSDUP: ppm	100	✓		5cm	0.421
08-162-01	100	✓		5cm	0.002
08-163-01	100	✓		5cm	0.000
	100				
	100				
	100				
	100				
	100				
	100				
	100				
CCV: (1 cm)	100				
CCV: (5 cm)	100				
CCB:	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
	100				
DUP: 08-162-01	100	✓		5cm	0.002
MS: () 08-163-01	100	✓		5cm	0.012
MSD: ()	100				
CCV: (1 cm)	100				
CCV: (5 cm)	100	✓		5cm	0.000 0.206
CCB:	100	✓		5cm	0.000

Analyst: Shelton Craley
SW846 7196 (Dup and/or MS every 10 samples)

Date / Time: 8-3-17 1 1245
SM3500 Cr (Dup and MS/MSD every 20 samples)

DCN#127428



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG624404Analyst: SDCAnalyte: CHROMIUM, HEXAVALENTDate: 08/03/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG624404-01	100	100	0	4.125	0.003902	-0.00094590	-0.00094590	1	mg/L
WG624404-02	100	100	0.419	4.125	0.003902	0.10062	0.10062	1	mg/L
WG624404-03	100	100	0.421	4.125	0.003902	0.10111	0.10111	1	mg/L
L17080162-01	100	100	0.00200	4.125	0.003902	-0.00046108	ND	1	mg/L
WG624404-04	100	100	0.00200	4.125	0.003902	-0.00046108	-0.00046108	1	mg/L
WG624404-05	100	100	0	4.125	0.003902	-0.00094590	-0.00094590	1	mg/L
L17080163-01	100	100	0	4.125	0.003902	-0.00094590	ND	1	mg/L
WG624404-06	100	100	0.00200	4.125	0.003902	-0.00046108	-0.00046108	1	mg/L
WG624404-07	100	100	0.0120	4.125	0.003902	0.0019630	0.0019630	1	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 08/04/2017 13:59



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00860666

Workgroup #: WG624632 Instrument ID: UV-2600
File ID: 00.1708031245-01 Run Date: 08/03/2017
CCV ID: WG624632-01 Run Time: 12:45
Units: mg/L Analyst: SDC
Analyte: CHROMIUM, HEXAVALENT Cal ID: UV-260 - 11-JUL-17

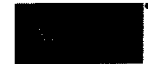
Analyte	Expected	Found	RF	%D	Q
Chromium, Hexavalent	.05	0.0490	4.12	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 08/04/2017 13:57



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00860667

Workgroup #: WG624632 Instrument ID: UV-2600
File ID: 00.1708031245-10 Run Date: 08/03/2017
CCV ID: WG624632-03 Run Time: 12:45
Units: mg/L Analyst: SDC
Analyte: CHROMIUM, HEXAVALENT Cal ID: UV-260 - 11-JUL-17

Analyte	Expected	Found	RF	%D	Q
Chromium, Hexavalent	.05	0.0490	4.12	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 08/04/2017 13:57



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
August 17, 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	BLR - BRANDON L. RICHARDS
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

August 17, 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

August 17, 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		Analyses SILVER & SELENIUM HEXAVALENT CHROMIUM PERCHLORATE	Remarks (Preservatives, etc.) HNO3 NONE	Lab I.D.#
Job: GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES		Prepared By: Scott Beesinger				
Field Sample I.D.		Sample Matrix	Date / Time	NO. OF CONTAINERS	MS / MSD	
LH18/24-SP140-7461-Grab	Water	08/02/17 / 15:00	1	X		
LH18/24-SP140-7461-Grab	Water	08/02/17 / 15:00	2	X	X	

STANDARD TURN AROUND TIME

Additional Remarks:		Relinquished By:	Date: 08/02/17	Time: 15:30	Received By:	Date:	Time:	Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By: <i>Scott Beesinger</i>													

Received At Lab By:				Date:				Time:				Airbill No.				Date:				Time:				Temp of Container:				Seal No.				Condition:			
Remarks:																																			



Microbac OVD
 Received: 08/03/2017 09:53
 By: BRENDA GREGORY

Brenda Gregory

221000104104

Cooler ID 4104

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

big 8/3/17

pH Exceptions

pH Lot # He601354

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

**PRESERVATIVE
EXCEPTIONS**

 NONE
 AS NOTED

big 8/3/17

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17080163

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 14-AUG-2017

Samplenum **Container ID** **Products**
L17080163-01 **944984** **826-SPE2 6850**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-AUG-2017 10:26	BRG		
2	ANALYZ	W1	SEM	07-AUG-2017 15:48	JWR	BRG	
3	STORE	SEM	A1	08-AUG-2017 14:56	BRG	JWR	

Samplenum **Container ID** **Products**
L17080163-01 **944985** **826-SPE2 AG-MS SE-AX**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-AUG-2017 10:26	BRG		
2	PREP	W1	DIG	03-AUG-2017 13:40	ERP	BRG	
3	STORE	DIG	A1	08-AUG-2017 10:19	BRG	ERP	
4	ANALYZ*	DIG	METALS	08-AUG-2017 12:48	JYH	ERP	

*Sample extract/digestate/leachate

Samplenum **Container ID** **Products**
L17080163-01 **944986** **826-SPE2 CR-6**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-AUG-2017 10:26	BRG		
2	ANALYZ	W1	WET	03-AUG-2017 10:46	EPT	BRG	
3	STORE	WET	A1	03-AUG-2017 16:54	BRG	SDC	

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: L17080164

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 August 09 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 #: L17080164

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?
00114647	I	4.0		1ZW056F52210009882	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 #:** L17080164**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-SP650-6462	L17080164-01	08/02/2017 15:00	08/03/2017 09:53
LH18/24-SP650-6462-BEFORE ION	L17080164-02	08/02/2017 15:00	08/03/2017 09:53
LH18/24-SP650-6462-AFTER ION	L17080164-03	08/02/2017 15:00	08/03/2017 09:53



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080164
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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	2017-08-08 19:53:24



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080164
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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:	L17080164
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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:	L17080164
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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:	L17080164
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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:	L17080164
Project Name:		Method:	6850
Prep Batch Number(s):	WG624895	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-08 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:	L17080164
Project Name:		Method:	NH3
Prep Batch Number(s):	WG624749	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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	2017-08-09 18:50:07



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080164
Project Name:		Method:	NH3
Prep Batch Number(s):	WG624749	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	NH3
Prep Batch Number(s):	WG624749	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	NH3
Prep Batch Number(s):	WG624749	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	NH3
Prep Batch Number(s):	WG624749	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	NH3
Prep Batch Number(s):	WG624749	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	PO4
Prep Batch Number(s):	WG624427	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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	2017-08-09 18:51:41



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080164
Project Name:		Method:	PO4
Prep Batch Number(s):	WG624427	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	PO4
Prep Batch Number(s):	WG624427	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	PO4
Prep Batch Number(s):	WG624427	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	PO4
Prep Batch Number(s):	WG624427	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	PO4
Prep Batch Number(s):	WG624427	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	TOC
Prep Batch Number(s):	WG624513	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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	2017-08-09 18:52:11



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080164
Project Name:		Method:	TOC
Prep Batch Number(s):	WG624513	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	TOC
Prep Batch Number(s):	WG624513	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	TOC
Prep Batch Number(s):	WG624513	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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:	L17080164
Project Name:		Method:	TOC
Prep Batch Number(s):	WG624513	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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				

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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.

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Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080164
Project Name:		Method:	TOC
Prep Batch Number(s):	WG624513	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-09 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 #: L17080164
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080164-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6462	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 08/07/2017 10:19
Workgroup #: WG624749	Analyst: TB	Run Date: 08/07/2017 11:07
Collect Date: 08/02/2017 15:00	Dilution: 4	File ID: S2170807001.046
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	9.56		0.800	0.400	0.200

Certificate of Analysis

Sample #: L17080164-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6462	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:40
Workgroup #: WG624427	Analyst: SDC	Run Date: 08/03/2017 16:20
Collect Date: 08/02/2017 15:00	Dilution: 5	File ID: 00.1708031620-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.34		0.500	0.250	0.125

Certificate of Analysis

Sample #: L17080164-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6462	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG624513	Analyst: DCM	Run Date: 08/04/2017 18:06
Collect Date: 08/02/2017 15:00	Dilution: 5	File ID: TC08042017.029
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	67.9		10.0	5.00	2.50

Certificate of Analysis

Lab Report #: L17080164
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Sample #: L17080164-02 PrePrep Method: N/A Instrument: LCMS1
 Client ID: LH18/24-SP650-6462-
 BEFORE ION Prep Method: 6850 Prep Date: 08/07/2017 16:30
 Matrix: Water Analytical Method: 6850 Cal Date: 06/29/2017 15:26
 Workgroup #: WG624895 Analyst: JWR Run Date: 08/08/2017 12:57
 Collect Date: 08/02/2017 15:00 Dilution: 10 File ID: 1LM.LM40335
 Sample Tag: DL01 Units: ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	24.3		4.00	2.00	1.00

Certificate of Analysis

Sample #: L17080164-03 PrePrep Method: N/A Instrument: LCMS1
 Client ID: LH18/24-SP650-6462-
 AFTER ION Prep Method: 6850 Prep Date: 08/07/2017 16:30
 Matrix: Water Analytical Method: 6850 Cal Date: 06/29/2017 15:26
 Workgroup #: WG624895 Analyst: JWR Run Date: 08/07/2017 20:23
 Collect Date: 08/02/2017 15:00 Dilution: 1 File ID: 1LM.LM40328
 Sample Tag: 01 Units: ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.900		0.400	0.200	0.100

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17080164

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080164-02	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6462-BEFORE ION	Prep Method: 6850	Prep Date: 08/07/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 06/29/2017 15:26
Workgroup #: WG624895	Analyst: JWR	Run Date: 08/08/2017 12:57
Collect Date: 08/02/2017 15:00	Dilution: 10	File ID: 1LM.LM40335
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	24.3		4.00	2.00	1.00

Certificate of Analysis

Sample #: L17080164-03	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6462-AFTER ION	Prep Method: 6850	Prep Date: 08/07/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 06/29/2017 15:26
Workgroup #: WG624895	Analyst: JWR	Run Date: 08/07/2017 20:23
Collect Date: 08/02/2017 15:00	Dilution: 1	File ID: 1LM.LM40328
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.900		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: 062917_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
WG619865 ICAL, WG619615
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (062917)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40075	WG619865-01 CCB	1	1		06/29/17 13:13
2	1LM.LM40076	WG619865-02 STD (0.1 ug/L)	1	1	STD80232	06/29/17 13:32
3	1LM.LM40077	WG619865-03 STD (0.2 ug/L)	1	1	STD80232	06/29/17 13:51
4	1LM.LM40078	WG619865-04 STD (0.5 ug/L)	1	1	STD80232	06/29/17 14:10
5	1LM.LM40079	WG619865-05 STD (1.0 ug/L)	1	1	STD80232	06/29/17 14:29
6	1LM.LM40080	WG619865-06 STD (2.0 ug/L)	1	1	STD80232	06/29/17 14:48
7	1LM.LM40081	WG619865-07 STD (5.0 ug/L)	1	1	STD80232	06/29/17 15:07
8	1LM.LM40082	WG619865-08 STD (10 ug/L)	1	1	STD80232	06/29/17 15:26
9	1LM.LM40083	WG619865-09 SSCV (1.0 ug/L)	1	1	STD80234	06/29/17 15:45
10	1LM.LM40084	WG619609-01 CCB	1	1		06/29/17 16:04
11	1LM.LM40085	WG619609-02 CCV (1.0ug/L)	1	1	STD80232	06/29/17 16:23
12	1LM.LM40086	WG619615-05 MRL (0.2ug/L)	1	1	STD80232	06/29/17 16:42
13	1LM.LM40087	WG619615-01 MCT (0.2ug/L)	1	1	STD80234	06/29/17 17:01
14	1LM.LM40088	WG619615-02 BLANK	1	1		06/29/17 17:20
15	1LM.LM40089	WG619615-03 LCS (0.2ug/L)	1	1	STD80234	06/29/17 17:39
16	1LM.LM40090	WG619615-04 LCS2 (0.2ug/L)	1	1	STD80234	06/29/17 17:57
17	1LM.LM40091	L17061390-01 10,000X	1	10000	STD80234	06/29/17 18:16
18	1LM.LM40092	L17061390-02	1	1	STD80234	06/29/17 18:35
19	1LM.LM40093	L17061390-03 100X	1	100	STD80234	06/29/17 18:54
20	1LM.LM40094	L17061390-04	1	1	STD80234	06/29/17 19:13
21	1LM.LM40095	L17061390-05 10X	1	10		06/29/17 19:32
22	1LM.LM40096	L17061390-06	1	1		06/29/17 19:51
23	1LM.LM40097	WG619609-03 CCV (1.0ug/L)	1	1	STD80232	06/29/17 20:10
24	1LM.LM40098	WG619615-06 MRL (0.2ug/L)	1	1	STD80232	06/29/17 20:29
25	1LM.LM40099	WG619609-04 CCB	1	1		06/29/17 20:48
26	1LM.LM40100	L17061390-07	1	1		06/29/17 21:07
27	1LM.LM40101	L17061390-09 100,000X	1	100000		06/29/17 21:26
28	1LM.LM40102	L17061390-10	1	1		06/29/17 21:45
29	1LM.LM40103	L17061390-12	1	1		06/29/17 22:04
30	1LM.LM40104	L17061390-13	1	1		06/29/17 22:23
31	1LM.LM40105	L17061390-15	1	1		06/29/17 22:42
32	1LM.LM40106	L17061390-16 2X	1	2		06/29/17 23:01
33	1LM.LM40107	WG619609-05 CCV (1.0ug/L)	1	1	STD80232	06/29/17 23:20

Page: 1

Approved: 30-JUN-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 062917_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
WG619865 ICAL, WG619615
 Internal STD: COA19471 Surrogate STD: NA STD80232 (062917)
 CCV STD: STD80232 LCS STD: STD80234 NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	1LM.LM40108	WG619615-07 MRL (0.2ug/L)	1	1	STD80232	06/29/17 23:39
35	1LM.LM40109	WG619609-06 CCB	1	1		06/29/17 23:57

Comments

Seq.	Rerun	Dil.	Reason	Analytes
17				
			L17061390-01 Analyzed at a dilution based on historical data.	
19				
			L17061390-03 Analyzed at a dilution based on historical data.	
21				
			L17061390-05 Analyzed at a dilution based on historical data.	
27				
			L17061390-09 Analyzed at a dilution based on historical data.	
32				
			L17061390-16 Analyzed at a dilution based on historical data.	

Eri C. Zimm



Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 080717_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 WG624895 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (06/29/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: Sample L17080163-01 was analyzed at a dilution only based on its historical results.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40318	WG624896-01 CCB	1	1		08/07/17 17:13
2	1LM.LM40319	WG624896-02 CCV (1.0ug/L)	1	1	STD80232	08/07/17 17:32
3	1LM.LM40320	WG624895-05 MRL (0.2ug/L)	1	1	STD80232	08/07/17 17:51
4	1LM.LM40321	WG624895-01 MCT (0.2ug/L)	1	1	STD80234	08/07/17 18:10
5	1LM.LM40322	WG624895-02 BLANK	1	1		08/07/17 18:29
6	1LM.LM40323	WG624895-03 LCS (0.2ug/L)	1	1	STD80234	08/07/17 18:48
7	1LM.LM40324	WG624895-04 LCS2 (0.2ug/L)	1	1	STD80234	08/07/17 19:07
8	1LM.LM40325	L17071280-01	1	1		08/07/17 19:26
9	1LM.LM40326	L17080163-01 (10,000x)	1	10000		08/07/17 19:45
10	1LM.LM40327	L17080164-02 (NR)	1	1		08/07/17 20:04
11	1LM.LM40328	L17080164-03	1	1		08/07/17 20:23
12	1LM.LM40329	WG624896-03 CCV (1.0ug/L)	1	1	STD80232	08/07/17 20:42
13	1LM.LM40330	WG624895-06 MRL (0.2ug/L)	1	1	STD80232	08/07/17 21:01
14	1LM.LM40331	WG624896-04 CCB	1	1		08/07/17 21:19
15	1LM.LM40332	WG624896-05 CCV (1.0ug/L)	1	1	STD80232	08/08/17 12:01
16	1LM.LM40333	WG624895-07 MRL (0.2ug/L)	1	1	STD80232	08/08/17 12:20
17	1LM.LM40334	WG624896-06 CCB	1	1		08/08/17 12:38
18	1LM.LM40335	L17080164-02 RR 10x	1	10		08/08/17 12:57
19	1LM.LM40336	WG624896-07 CCV (1.0ug/L)	1	1	STD80232	08/08/17 13:16
20	1LM.LM40337	WG624895-08 MRL (0.2ug/L)	1	1	STD80232	08/08/17 13:35
21	1LM.LM40338	WG624896-08 CCB	1	1		08/08/17 13:54

Comments

Seq.	Rerun	Dil.	Reason	Analytes
10	X	10	Over Calibration Range	perchlorate
			L17080164-02	




Microbac Laboratories Inc.

Data Checklist

Date: 29-JUN-2017
 Analyst: WTD
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 83086
 Analytical Workgroups: L17061390

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	X
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:

Secondary Reviewer:
30-JUN-2017



Microbac Laboratories Inc.

Data Checklist

Date: 07-AUG-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 83844
 Analytical Workgroups: L17071280 L17080163, L17080164

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:
08-AUG-2017



Secondary Reviewer:
08-AUG-2017




Analytical Method:6850
Login Number:L17080164

AAB#:WG624895

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-SP650-6462-BEFOR	02	08/02/17					08/07/2017	5.1	28		08/08/17	.9	28	
LH18/24-SP650-6462-AFTER	03	08/02/17					08/07/2017	5.1	28		08/07/17	.2	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080164 Work Group: WG624895
 Blank File ID: 1LM.LM40322 Blank Sample ID: WG624895-02
 Prep Date: 08/07/17 16:30 Instrument ID: LCMS1
 Analyzed Date: 08/07/17 18:29 Method: 6850
 Analyst: JWR

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG624895-05	1LM.LM40320	08/07/17 17:51	01
MCT	WG624895-01	1LM.LM40321	08/07/17 18:10	01
LCS	WG624895-03	1LM.LM40323	08/07/17 18:48	01
LCS2	WG624895-04	1LM.LM40324	08/07/17 19:07	01
LH18/24-SP650-6462-AFTER ION	L17080164-03	1LM.LM40328	08/07/17 20:23	01
QCMRL	WG624895-06	1LM.LM40330	08/07/17 21:01	01
QCMRL	WG624895-07	1LM.LM40333	08/08/17 12:20	01
LH18/24-SP650-6462-BEFORE ION	L17080164-02	1LM.LM40335	08/08/17 12:57	DL01
QCMRL	WG624895-08	1LM.LM40337	08/08/17 13:35	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5422267
 Report generated 08/08/2017 16:04



Login Number: L17080164 Prep Date: 08/07/17 16:30 Sample ID: WG624895-02
Instrument ID: LCMS1 Run Date: 08/07/17 18:29 Prep Method: 6850
File ID: 1LM.LM40322 Analyst: JWR Method: 6850
Workgroup (AAB#): WG624895 Matrix: Water Units: ug/L
Contract #: Cal ID: LCMS1-29-JUN-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: 5422268
08-AUG-2017 16:04



Login Number: L17080164 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG624895 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG624895-03 LCS File ID: 1LM.LM40323 Run Date: 08/07/2017 18:48
 Sample ID: WG624895-04 LCS2 File ID: 1LM.LM40324 Run Date: 08/07/2017 19:07

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.177	88.5	0.200	0.186	93.0	4.96	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5422269
 Report generated: 08/08/2017 16:04



Login Number: L17080164
Analytical Method: 6850
ICAL Workgroup: WG619865

Instrument ID: LCMS1
Initial Calibration Date: 29-JUN-17 15:26
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.454	6.38	1.00000	

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5422444
Report generated 08/08/2017 16:04



Login Number: L17080164
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 29-JUN-17 15:26
Column ID: F

Analyte	WG619865-02			WG619865-03			WG619865-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	20800.0000	1.476	0.200	44600.0000	1.521	0.500	102000.000	1.433

INT_CAL - Modified 03/06/2008
PDF File ID: 5422444
Report generated 08/08/2017 16:04



Login Number: L17080164
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 29-JUN-17 15:26
Column ID: F

Analyte	WG619865-05			WG619865-06			WG619865-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	214000.000	1.464	2.00	408000.000	1.442	5.00	981000.000	1.437

INT_CAL - Modified 03/06/2008
PDF File ID: 5422444
Report generated 08/08/2017 16:04



Login Number: L17080164
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 29-JUN-17 15:26
Column ID: F

Analyte	WG619865-08		
	CONC	RESP	RF
Perchlorate	10.0	1820000.00	1.407

INT_CAL - Modified 03/06/2008
PDF File ID: 5422444
Report generated 08/08/2017 16:04



Login Number: L17080164 Run Date: 06/29/2017 Sample ID: WG619865-09
 Instrument ID: LCMS1 Run Time: 15:45 Method: 6850
 File ID: 1LM.LM40083 Analyst: WTD QC Key: DOD4
 ICal Workgroup: WG619865 Cal ID: LCMS1 - 29-JUN-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	0.980	ug/L	1.40	2.00	15	

* Exceeds %D Limit



Login Number: L17080164 Run Date: 08/07/2017 Sample ID: WG624896-01
 Instrument ID: LCMS1 Run Time: 17:13 Method: 6850
 File ID: LLM.LM40318 Analyst: JWR Units: ug/L
 Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-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: L17080164 Run Date: 08/07/2017 Sample ID: WG624896-04
Instrument ID: LCMS1 Run Time: 21:19 Method: 6850
File ID: LLM.LM40331 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-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: L17080164 Run Date: 08/08/2017 Sample ID: WG624896-06
 Instrument ID: LCMS1 Run Time: 12:38 Method: 6850
 File ID: LLM.LM40334 Analyst: JWR Units: ug/L
 Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-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: L17080164 Run Date: 08/08/2017 Sample ID: WG624896-08
 Instrument ID: LCMS1 Run Time: 13:54 Method: 6850
 File ID: LLM.LM40338 Analyst: JWR Units: ug/L
 Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-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: L17080164 Run Date: 08/07/2017 Sample ID: WG624896-02
 Instrument ID: LCMS1 Run Time: 17:32 Method: 6850
 File ID: 1LM.LM40319 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	0.920	ug/L	1.32	8.00	15	

* Exceeds %D Criteria



Login Number: L17080164 Run Date: 08/07/2017 Sample ID: WG624896-03
 Instrument ID: LCMS1 Run Time: 20:42 Method: 6850
 File ID: 1LM.LM40329 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	0.950	ug/L	1.36	5.00	15	

* Exceeds %D Criteria



Login Number: L17080164 Run Date: 08/08/2017 Sample ID: WG624896-05
Instrument ID: LCMS1 Run Time: 12:01 Method: 6850
File ID: 1LM.LM40332 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	0.977	ug/L	1.40	2.30	15	

* Exceeds %D Criteria



Login Number: L17080164 Run Date: 08/08/2017 Sample ID: WG624896-07
Instrument ID: LCMS1 Run Time: 13:16 Method: 6850
File ID: 1LM.LM40336 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG624895 Cal ID: LCMS1 - 29-JUN-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	0.940	ug/L	1.35	6.00	15	

* Exceeds %D Criteria



Login Number: L17080164 Run Date: 08/07/2017 Sample ID: WG624895-05
 Instrument ID: LCMS1 Run Time: 17:51 Prep Method: 6850
 File ID: 1LM.LM40320 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG624895 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-29-JUN-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.173	86.5	70 - 130	



Login Number: L17080164 Run Date: 08/07/2017 Sample ID: WG624895-06
Instrument ID: LCMS1 Run Time: 21:01 Prep Method: 6850
File ID: 1LM.LM40330 Analyst: JWR Method: 6850
Workgroup (AAB#): WG624895 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-29-JUN-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.193	96.5	70 - 130	



Login Number: L17080164 Run Date: 08/08/2017 Sample ID: WG624895-07
 Instrument ID: LCMS1 Run Time: 12:20 Prep Method: 6850
 File ID: 1LM.LM40333 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG624895 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-29-JUN-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.184	92.0	70 - 130	



Login Number: L17080164 Run Date: 08/08/2017 Sample ID: WG624895-08
Instrument ID: LCMS1 Run Time: 13:35 Prep Method: 6850
File ID: 1LM.LM40337 Analyst: JWR Method: 6850
Workgroup (AAB#): WG624895 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-29-JUN-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.185	92.5	70 - 130	



Login Number: L17080164
Instrument ID: LCMS1
Workgroup (AAB#): WG624895

ICAL CCV Number: WG619865-05
CAL ID: LCMS1-29-JUN-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG619865	NA	NA	703000
Upper Limit	NA	NA	1054500
Lower Limit	NA	NA	351500
<u>L17080164-02</u>	10.0	DL01	607000
L17080164-03	1.00	01	516000
WG624895-02	1.00	01	512000
WG624895-03	1.00	01	545000
WG624895-04	1.00	01	554000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164
Instrument: LCMS1
Analyst: JWR
Worknum: WG624895

Prep Method: 6850
Prep Date: 08/07/2017 16:30
Anal Method: 6850
Analysis Date: 08/08/2017 12:57

Samplenum: L17080164-02
File ID: 1LM.LM40335
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	419000	134000	3.13	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: 6850	Samplenum: L17080164-03
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40328
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 20:23	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	133000	42800	3.11	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG619865-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40076
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 13:32	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	20800	6780	3.07	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG619865-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40077
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 13:51	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	44600	13700	3.26	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG619865-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40078
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 14:10	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	102000	31100	3.28	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG619865-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40079
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 14:29	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	214000	65900	3.25	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG619865-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40080
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 14:48	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	408000	126000	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG619865-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40081
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 15:07	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	981000	306000	3.21	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG619865-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40082
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 15:26	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1820000	577000	3.15	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG619865-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40083
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 06/29/2017 15:45	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	200000	61800	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164
Instrument: LCMS1
Analyst: JWR
Worknum: WG624895

Prep Method: 6850
Prep Date: 08/07/2017 16:30
Anal Method: 6850
Analysis Date: 08/07/2017 18:10

Samplenum: WG624895-01
File ID: 1LM.LM40321
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	27500	9350	2.94	2.3	3.8	

Perchlorate Ion Ratios
 Microbac Laboratories Inc.



Login #: L17080164	Prep Method: 6850	Samplenum: WG624895-02
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40322
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 18:29	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 #: L17080164	Prep Method: 6850	Samplenum: WG624895-03
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40323
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 18:48	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	28800	8540	3.37	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: 6850	Samplenum: WG624895-04
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40324
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 19:07	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	30700	9560	3.21	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: 6850	Samplenum: WG624895-05
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40320
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 17:51	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	24600	9260	2.66	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: 6850	Samplenum: WG624895-06
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40330
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 21:01	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	35900	11100	3.23	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164
Instrument: LCMS1
Analyst: JWR
Worknum: WG624895

Prep Method: 6850
Prep Date: 08/07/2017 16:30
Anal Method: 6850
Analysis Date: 08/08/2017 12:20

Samplenum: WG624895-07
File ID: 1LM.LM40333
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	30800	10100	3.05	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: 6850	Samplenum: WG624895-08
Instrument: LCMS1	Prep Date: 08/07/2017 16:30	File ID: 1LM.LM40337
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/08/2017 13:35	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	33600	10300	3.26	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG624896-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40318
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 17:13	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 #: L17080164
Instrument: LCMS1
Analyst: JWR
Worknum: WG624895

Prep Method: _____
Prep Date: _____
Anal Method: 6850
Analysis Date: 08/07/2017 17:32

Samplenum: WG624896-02
File ID: 1LM.LM40319
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	118000	37600	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG624896-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40329
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 20:42	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	158000	48000	3.29	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG624896-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40331
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/07/2017 21:19	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 #: L17080164	Prep Method: _____	Samplenum: WG624896-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40332
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/08/2017 12:01	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	146000	45100	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG624896-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40334
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/08/2017 12:38	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	516	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG624896-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40336
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/08/2017 13:16	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	162000	50500	3.21	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080164	Prep Method: _____	Samplenum: WG624896-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40338
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG624895	Analysis Date: 08/08/2017 13:54	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 General Chemistry Data

2.2.1 Ammonia Data

2.2.1.1 Summary Data

Lab Report #: L17080164

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080164-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6462	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 08/07/2017 10:19
Workgroup #: WG624749	Analyst: TB	Run Date: 08/07/2017 11:07
Collect Date: 08/02/2017 15:00	Dilution: 4	File ID: S2170807001.046
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	9.56		0.800	0.400	0.200

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: 07-AUG-2017
 Analyst: TB
 Analyst: NA
 Method: NH3
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG624749

Calibration/Linearity	08/07/2017
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	TB
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
07-AUG-2017

Todd Boyle

Secondary Reviewer:
07-AUG-2017

Denna Johnson



Analytical Method: 350.1
Login Number: L17080164

AAB#: WG624749

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-SP650-6462	01	08/02/17					08/07/2017	4.8	28		08/07/17	4.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080164 Work Group: WG624749
 Blank File ID: S2170807001.011 Blank Sample ID: WG624749-01
 Prep Date: 08/07/17 10:23 Instrument ID: SMARTCHEM2
 Analyzed Date: 08/07/17 10:23 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	WG624749-02	S2170807001.012	08/07/17 10:24	01
DUP	WG624749-06	S2170807001.038	08/07/17 10:48	01
LCS2	WG624749-03	S2170807001.041	08/07/17 10:50	01
LH18/24-SP650-6462	L17080164-01	S2170807001.046	08/07/17 11:07	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5419309
 Report generated 08/07/2017 12:42



Login Number: L17080164 Prep Date: 08/07/17 10:23 Sample ID: WG624749-01
 Instrument ID: SMARTCHEM2 Run Date: 08/07/17 10:23 Prep Method: 350.1
 File ID: S2170807001.011 Analyst: TB Method: 350.1
 Workgroup (AAB#): WG624749 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: SMARTC-07-AUG-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: 5419310
 07-AUG-2017 12:42



Login Number: L17080164 Analyst: TB Prep Method: 350.1
 Instrument ID: SMARTCHEM2 Matrix: Water Method: 350.1
 Workgroup (AAB#): WG624749 Units: mg/L
 QC Key: DOD4 Lot #: STD83234
 Sample ID: WG624749-02 LCS File ID: S2170807001.012 Run Date: 08/07/2017 10:24
 Sample ID: WG624749-03 LCS2 File ID: S2170807001.041 Run Date: 08/07/2017 10:50

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Nitrogen, Ammonia	2.00	2.14	107	2.00	1.95	97.4	9.58	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5419311
 Report generated: 08/07/2017 12:42



2.2 General Chemistry Data

2.2.2 Orthophosphate Data

2.2.2.1 Summary Data

Lab Report #: L17080164

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080164-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6462	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:40
Workgroup #: WG624427	Analyst: SDC	Run Date: 08/03/2017 16:20
Collect Date: 08/02/2017 15:00	Dilution: 5	File ID: 00.1708031620-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.34		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

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

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

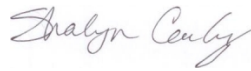
Microbac Laboratories Inc.

Data Checklist

Date: 03-AUG-2017
 Analyst: SDC
 Analyst: NA
 Method: PO4
 Instrument: UV-2600
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG624427

Calibration/Linearity	06/07/17
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	
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	SDC
Secondary Reviewer	
Comments	

Primary Reviewer:
08-AUG-2017



Secondary Reviewer:



Analytical Method: 365.2
Login Number: L17080164

AAB#: WG624427

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-SP650-6462	01	08/02/17					08/03/2017	1.1	2		08/03/17	1.1	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080164
 Blank File ID: 00.1708031620-03
 Prep Date: 08/03/17 16:20
 Analyzed Date: 08/03/17 16:20
 Analyst: SDC

Work Group: WG624427
 Blank Sample ID: WG624427-01
 Instrument ID: UV-2600
 Method: 365.2

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG624427-02	00.1708031620-04	08/03/17 16:20	
LCS2	WG624427-03	00.1708031620-05	08/03/17 16:20	
LH18/24-SP650-6462	L17080164-01	00.1708031620-06	08/03/17 16:20	
DUP	WG624427-05	00.1708031620-07	08/03/17 16:20	

Report Name: BLANK_SUMMARY
 PDF File ID: 5422458
 Report generated 08/08/2017 16:05



Login Number: L17080164 Prep Date: 08/03/17 16:20 Sample ID: WG624427-01
Instrument ID: UV-2600 Run Date: 08/03/17 16:20 Prep Method: 365.2
File ID: 00.1708031620-03 Analyst: SDC Method: 365.2
Workgroup (AAB#): WG624427 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: UV-260-11-JUL-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: 5422459
08-AUG-2017 16:05



Login Number: L17080164 Analyst: SDC Prep Method: 365.2
 Instrument ID: UV-2600 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG624427 Units: mg/L
 QC Key: DOD4 Lot #: STD83217
 Sample ID: WG624427-02 LCS File ID: 00.1708031620-04 Run Date: 08/03/2017 16:20
 Sample ID: WG624427-03 LCS2 File ID: 00.1708031620-05 Run Date: 08/03/2017 16:20

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	0.995	99.5	1.00	1.02	102	2.54	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5422460
 Report generated: 08/08/2017 16:06



2.2.2.3 Raw Data

WG616995

Curves

Parameter: PO4

Spectrophotometer: UV-2600

Calibration (Curve) standard stock: STD 79640

Concentration: 1000 mg/L

Recipe for preparation of curve standards found in:

SOP: 3653 Revision: 17 Page: 09

Second Source Stock: STD 82182 (concentration: 10)

Daily Preparation: 10/100/100

concentration = 1.0

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
1.0	50	1cm	880	0.623
0.7				0.442
0.5				0.311
0.2				0.127
0.1				0.063
0.05				0.031
0				0
2nd Source (1.0)	50	1cm	880	0.630

Analyst: Jammy Morris

Date/Time: 6/7/17 @ 1540

DCN#126309



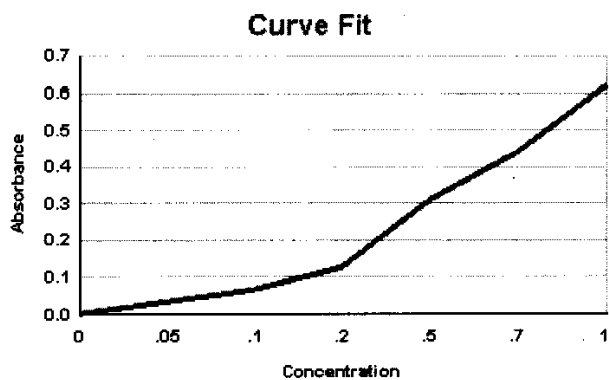
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG616995
Analytical Method: 300
Instrument ID: UV-2600

Analyst: TMM
Initial Calibration Date: 06/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.624599
Y-Intercept: 0.000610422
Coef. Of Correlation (R^2): 0.999913
Coef. Of Correlation (R): 0.999957

Concentration X	Absorbance Y	X^2	X * Y	Y-Fitted (mX^2+B)
0.00	0.00	0.00	0.00	0.000610422
0.0500	0.0310	0.00250	0.00155	0.0318404
0.100	0.0630	0.0100	0.00630	0.0630703
0.200	0.127	0.0400	0.0254	0.125530
0.500	0.311	0.250	0.156	0.312910
0.700	0.442	0.490	0.309	0.437830
1.00	0.623	1.00	0.623	0.625209



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 06/07/2017 16:24



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

00860791

Workgroup #: WG616995
File ID: 00.1706071540-08
CCV ID: WG616995-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 06/07/2017
Run Time: 15:40
Analyst: TMM
Cal ID: UV-260 - 07-JUN-17 15:40:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.01	0.630	1.0	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 06/07/2017 16:25



WORKGROUP: WG624427

Orthophosphate
(orthophosphate1)

EPA 365.2 / SM4500-P E

SOP K3653 Rev. 17

Color Reagent Chemicals

40722

40466

39475

608 18278

CCV: 83218

LCS: 83217

Spike: 83217

Daily Dilution: 5(5)/50

Daily Dilution: 10(10)/100

Daily Dilution: 2(10)/50

Daily Dilution: =0.5

Daily Dilution: =1

Daily Dilution: =0.4

Spectrophotometer: uv-2602 Curve ID: 6-7-17

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: mg/L	50	✓		0.318
BLK/CCB:	50	✓		0.001
LCS: ppm	50	✓		0.622
LCS D: ppm	50	✓		0.638
08-164-01	50	✓	1/5	0.418
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
DUP: 164-01	50	✓	1/5	0.411
MS: (0.4)/164-01	50	✓	1/5	0.407
MSD: ()	50			
CCV: (0.5)	50	✓		0.317
CCB:	50	✓		0.004

Analyst: Chalyn Coney

Date / Time: 8-3-17 1620

DCN#127432



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG624427
Analyte: ORTHOPHOSPHATE

Analyst: SDC
Date: 08/03/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG624427-01	50	50	0.00100	0.6246	0.0006104	0.00062373	0.00062373	1	mg/L
WG624427-02	50	50	0.622	0.6246	0.0006104	0.99486	0.99486	1	mg/L
WG624427-03	50	50	0.638	0.6246	0.0006104	1.0205	1.0205	1	mg/L
L17080164-01	50	50	0.418	0.6246	0.0006104	0.66825	3.3413	5	mg/L
WG624427-04	50	50	0.418	0.6246	0.0006104	0.66825	3.3413	5	mg/L
WG624427-05	50	50	0.411	0.6246	0.0006104	0.65705	3.2852	5	mg/L
WG624427-06	50	50	0.407	0.6246	0.0006104	0.65064	3.2532	5	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 08/08/2017 11:18

Workgroup #: WG624979
File ID: 00.1708031620-01
CCV ID: WG624979-01
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 08/03/2017
Run Time: 16:20
Analyst: SDC
Cal ID: UV-260 - 11-JUL-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 08/08/2017 11:20



Workgroup #: WG624979 Instrument ID: UV-2600
File ID: 00.1708031620-09 Run Date: 08/03/2017
CCV ID: WG624979-03 Run Time: 16:20
Units: mg/L Analyst: SDC
Analyte: ORTHOPHOSPHATE Cal ID: UV-260 - 11-JUL-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.507	0.634	1.4	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 08/08/2017 11:20



2.2 General Chemistry Data

2.2.3 Total Organic Carbon Data

2.2.3.1 Summary Data

Lab Report #: L17080164

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080164-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6462	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG624513	Analyst: DCM	Run Date: 08/04/2017 18:06
Collect Date: 08/02/2017 15:00	Dilution: 5	File ID: TC08042017.029
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	67.9		10.0	5.00	2.50

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: 04-AUG-2017
 Analyst: DCM
 Analyst: NA
 Method: TOC
 Instrument: TOC-VWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG624513

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:
07-AUG-2017



Secondary Reviewer:
07-AUG-2017




Analytical Method: 415.1
Login Number: L17080164

AAB#: WG624513

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-SP650-6462	01	08/02/17					08/04/2017	2.1	28		08/04/17	2.1	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080164 Work Group: WG624513
 Blank File ID: TC08042017.004 Blank Sample ID: WG624513-01
 Prep Date: 08/04/17 09:19 Instrument ID: TOC-VWP
 Analyzed Date: 08/04/17 09:19 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	WG624513-02	TC08042017.005	08/04/17 09:39	01
LCS2	WG624513-03	TC08042017.006	08/04/17 10:00	01
DUP	WG624513-08	TC08042017.021	08/04/17 15:27	01
LH18/24-SP650-6462	L17080164-01	TC08042017.029	08/04/17 18:06	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5418630
 Report generated 08/07/2017 08:55



Login Number: L17080164 Prep Date: 08/04/17 09:19 Sample ID: WG624513-01
 Instrument ID: TOC-VWP Run Date: 08/04/17 09:19 Prep Method: 415.1
 File ID: TC08042017.004 Analyst: DCM Method: 415.1
 Workgroup (AAB#): WG624513 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: 5418631
 07-AUG-2017 08:55



Login Number: L17080164 Analyst: DCM Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG624513 Units: mg/L
 QC Key: DOD4 Lot #: STD80787
 Sample ID: WG624513-02 LCS File ID: TC08042017.005 Run Date: 08/04/2017 09:39
 Sample ID: WG624513-03 LCS2 File ID: TC08042017.006 Run Date: 08/04/2017 10:00

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	27.0	108	25.0	27.2	109	0.811	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5418632
 Report generated: 08/07/2017 08:55



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 Merckli Date/Time: 2/10/17

DCN#123915



	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

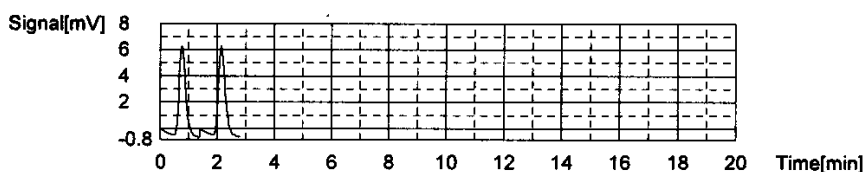
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

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

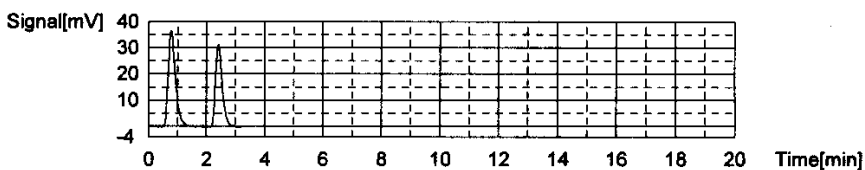
Acid Add. 0.000%
 Mean Area 10.82



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

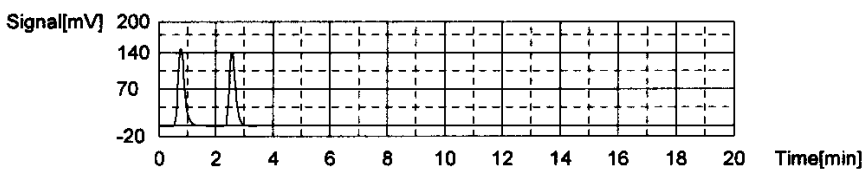
Acid Add. 0.000%
 Mean Area 57.92



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

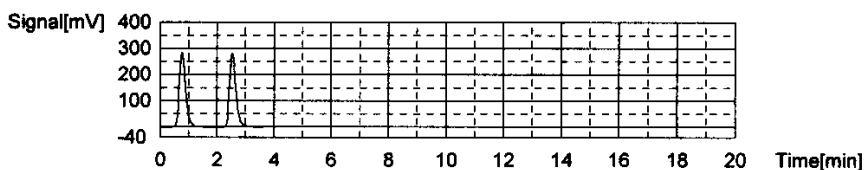


Conc: 10.00mg/L

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

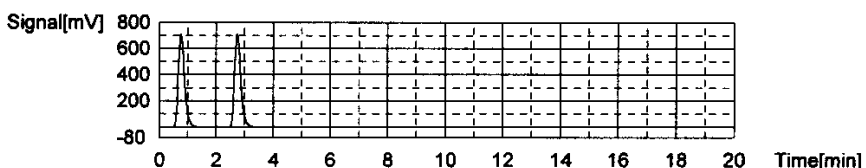
Acid Add. 0.000%
 Mean Area 440.2



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

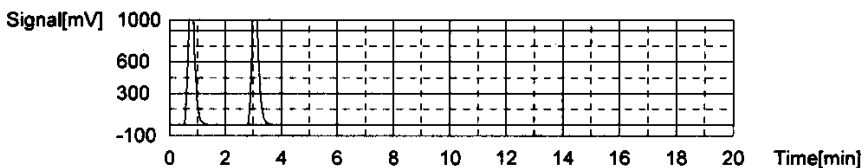
Acid Add. 0.000%
 Mean Area 1092



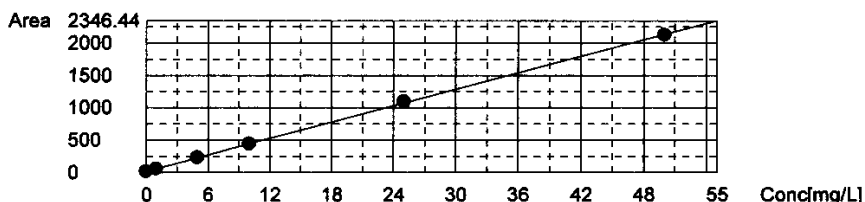
Conc: 50.00mg/L

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

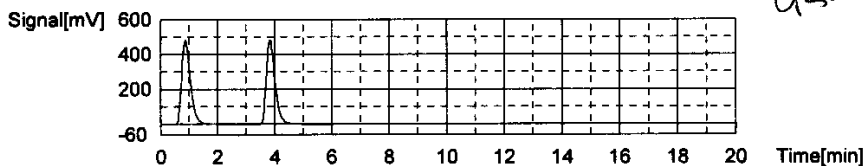
1. Det

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

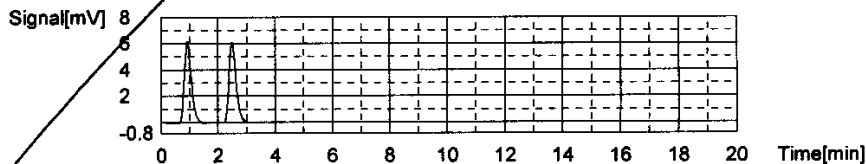
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

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

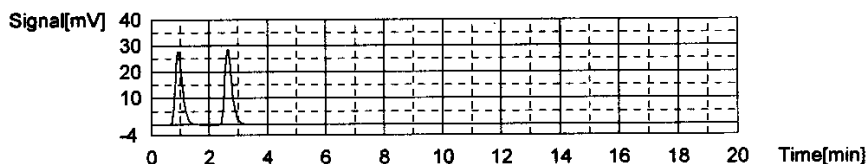
Acid Add. 3.000%
Mean Area 10.51



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

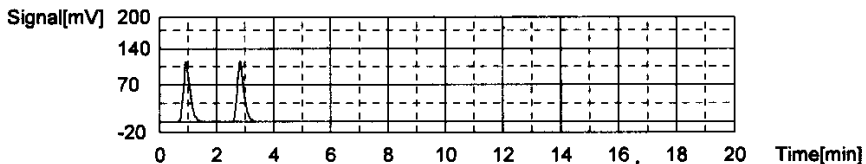


Conc: 5.000mg/L

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

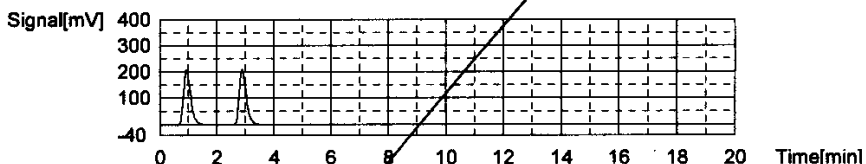
Acid Add. 3.000%
Mean Area 189.6



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

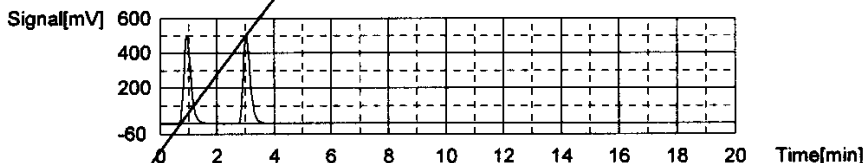
Acid Add. 3.000%
Mean Area 361.4



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

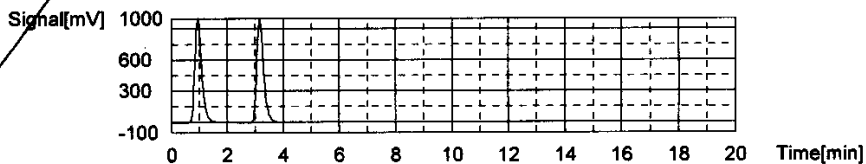
Acid Add. 3.000%
Mean Area 858.1



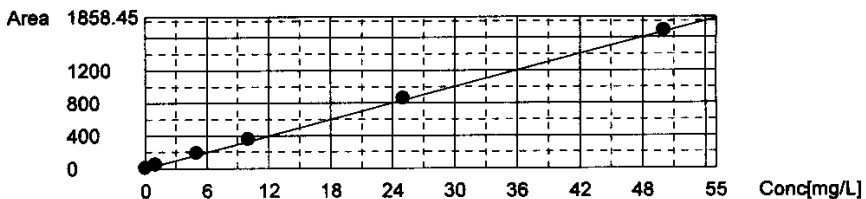
Conc: 50.00mg/L

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

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

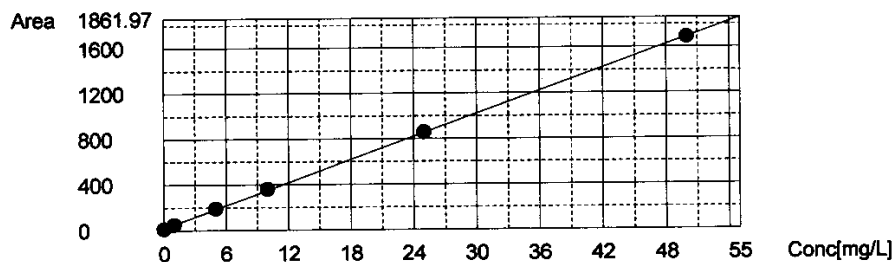
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

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:

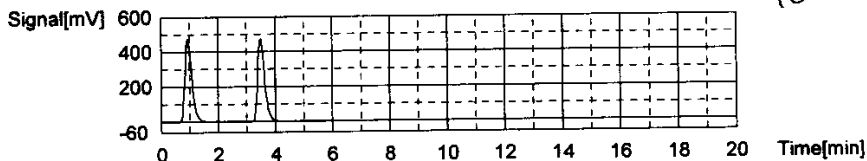
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

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:

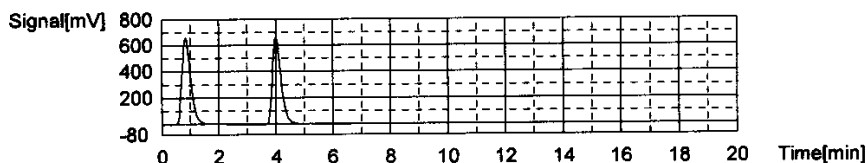
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

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-02-10-2017.132

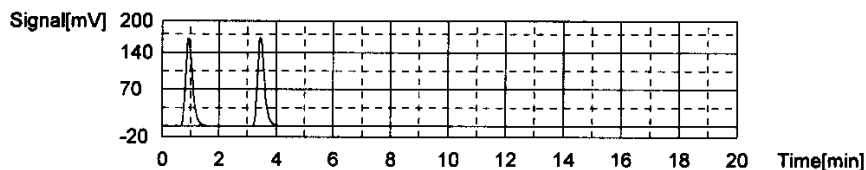
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

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

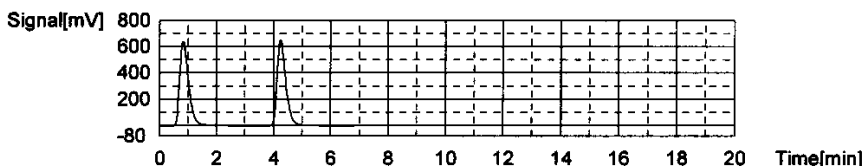
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

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



WORKGROUP: WG624513

Total Organic Carbon

MAKE DAILY

CCV (TOC): Std 79381
 $(5/200)(1000) = 25\text{mg/L}$

LCS (TOC): Std 80787
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): Std 82416
 $(5/200)(1000) = 25\text{mg/L}$

MS (TOC): Std 80787
 $0.4(\text{mg})/20 = 10$

Calibration Curve Date: 2/16/17

Reagent: RGT 40592
RGT 39266

SM5310-C : Matrix 2 WG 624513

EPA 415.1/9060A(mod): Matrix 1 WG _____

SW846 9060A (4 rep) WG _____

SOP: K 4/51 Rev. 18

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	TIC		26	CCV		51		
2	TOC/TIC		27	CCB		52		
3	CCV		28	MSD 08-161-03	1/5	53		
4	Blk		29	08-164-01	1/5	54		
5	LCS		30	CCV		55		
6	LCS/D		31	CCB		56		
7	08-001-07		32			57		
8	08-112-07		33			58		
9	08-135-01		34			59		
10	MS 02		35			60		
11	MSD 03		36			61		
12	04		37			62		
13	08-184-02		38			63		
14	CCV		39			64		
15	CCB		40			65		
16	08-184-04		41			66		
17	08-185-01		42			67		
18	03		43			68		
19	05		44			69		
20	07		45			70		
21	Dup 08-185-07		46			71		
22	08-156-01		47			72		
23	03	1/3	48			73		
24	08-161-01	1/5	49			74		
25	MS 02	1/5	50			75		

Analyst: David Merrill Date/Time: 8/4/17 0835

MSL $\frac{5(1000)}{200} = 25$

$\frac{1(25)}{25} = 1$

DCN#127449



	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:1.256mg/L TC:26.87mg/L IC:25.61mg/L	Complete	8/4/2017 8:35:09 AM	1
2	TOC	TOC/TIC	TOC:28.21mg/L TC:36.86mg/L IC:8.648mg/L	Complete	8/4/2017 9:02:25 AM	2
3	TOC	CCV	!!Error!! TOC:27.27mg/L TC:27.01mg/L IC:-0.2622mg/L	Complete	8/4/2017 9:14:46 AM	3
4	TOC	WG624513-01 BLK	!!Error!! TOC:0.02806mg/L TC:-0.1647mg/L IC:-0.1928mg/L	Complete	8/4/2017 9:31:41 AM	0
5	TOC	WG624513-02 LCS	!!Error!! TOC:27.02mg/L TC:26.72mg/L IC:-0.2961mg/L	Complete	8/4/2017 9:53:03 AM	5
6	TOC	WG624513-03 LCSDUP	!!Error!! TOC:27.24mg/L TC:26.95mg/L IC:-0.2865mg/L	Complete	8/4/2017 10:14:17 AM	6
7	TOC	L17080001-07	!!Error!! TOC:1.461mg/L TC:1.286mg/L IC:-0.1754mg/L	Complete	8/4/2017 10:50:00 AM	7
8	TOC	L17080112-07	TOC:3.910mg/L TC:13.08mg/L IC:9.172mg/L	Complete	8/4/2017 11:11:43 AM	8
9	TOC	L17080135-01	TOC:7.159mg/L TC:39.52mg/L IC:32.36mg/L	Complete	8/4/2017 11:35:22 AM	9
10	TOC	L17080135-02 MS	TOC:23.09mg/L TC:43.82mg/L IC:20.73mg/L	Complete	8/4/2017 11:58:07 AM	10
11	TOC	L17080135-03 MSD	TOC:20.51mg/L TC:42.58mg/L IC:22.07mg/L	Complete	8/4/2017 12:22:00 PM	11
12	TOC	L17080135-04	TOC:7.906mg/L TC:38.95mg/L IC:31.05mg/L	Complete	8/4/2017 12:45:43 PM	12
13	TOC	L17080184-02	TOC:1.666mg/L TC:2.512mg/L IC:0.8463mg/L	Complete	8/4/2017 1:06:38 PM	13
14	TOC	CCV	!!Error!! TOC:26.68mg/L TC:26.44mg/L IC:-0.2393mg/L	Complete	8/4/2017 1:18:59 PM	14
15	TOC	CCB	!!Error!! TOC:0.03867mg/L TC:-0.1645mg/L IC:-0.2032mg/L	Complete	8/4/2017 1:28:10 PM	0
16	TOC	L17080184-04	TOC:2.708mg/L TC:3.718mg/L IC:1.011mg/L	Complete	8/4/2017 1:49:14 PM	16
17	TOC	L17080185-01	TOC:3.295mg/L TC:33.06mg/L IC:29.76mg/L	Complete	8/4/2017 2:12:46 PM	17
18	TOC	L17080185-03	TOC:2.548mg/L TC:22.55mg/L IC:20.01mg/L	Complete	8/4/2017 2:35:20 PM	18
19	TOC	L17080185-05	TOC:2.977mg/L TC:27.07mg/L IC:24.09mg/L	Complete	8/4/2017 2:57:50 PM	19
20	TOC	L17080185-07	TOC:3.879mg/L TC:21.81mg/L IC:17.93mg/L	Complete	8/4/2017 3:20:04 PM	20
21	TOC	WG624513-04 DUP	TOC:3.891mg/L TC:19.40mg/L IC:15.51mg/L	Complete	8/4/2017 3:42:07 PM	21
22	TOC	L17080156-01	TOC:16.95mg/L TC:24.47mg/L IC:7.515mg/L	Complete	8/4/2017 4:05:21 PM	22
23	TOC	L17080156-03 (3)	TOC:14.20mg/L TC:23.28mg/L IC:9.074mg/L	Complete	8/4/2017 4:29:55 PM	23
24	TOC	L17080161-01 (5)	TOC:12.18mg/L TC:25.53mg/L IC:13.35mg/L	Complete	8/4/2017 4:52:38 PM	24
25	TOC	L17080161-02 (5) MS	TOC:14.49mg/L TC:26.62mg/L IC:12.13mg/L	Complete	8/4/2017 5:15:01 PM	25
26	TOC	CCV	!!Error!! TOC:27.66mg/L TC:27.46mg/L IC:-0.2002mg/L	Complete	8/4/2017 5:27:33 PM	26
27	TOC	CCB	!!Error!! TOC:0.07887mg/L TC:-0.2202mg/L IC:-0.2991mg/L	Complete	8/4/2017 5:36:31 PM	0
28	TOC	L17080161-03 (5) MSD	TOC:13.50mg/L TC:23.11mg/L IC:9.610mg/L	Complete	8/4/2017 5:58:30 PM	28
29	TOC	L17080164-01 (5)	TOC:13.58mg/L TC:17.85mg/L IC:4.264mg/L	Complete	8/4/2017 6:21:14 PM	29
30	TOC	CCV	!!Error!! TOC:26.99mg/L TC:26.75mg/L IC:-0.2444mg/L	Complete	8/4/2017 6:33:36 PM	30
31	TOC	CCB	!!Error!! TOC:0.06508mg/L TC:-0.2320mg/L IC:-0.2971mg/L	Complete	8/4/2017 6:42:33 PM	0

okam
8/7/17

8/7/2017 7:18:13 AM

1/1

8/7/2017 7:18:22 AM

08-04-2017-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

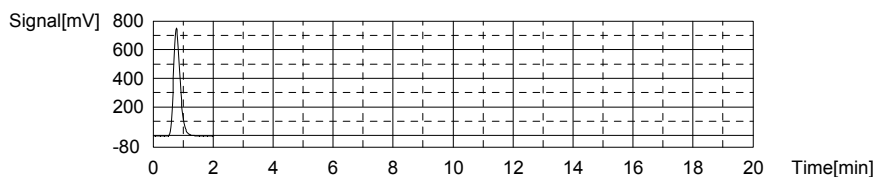
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.256mg/L TC:26.87mg/L IC:25.61mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1154	26.87mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 8:29:52 AM

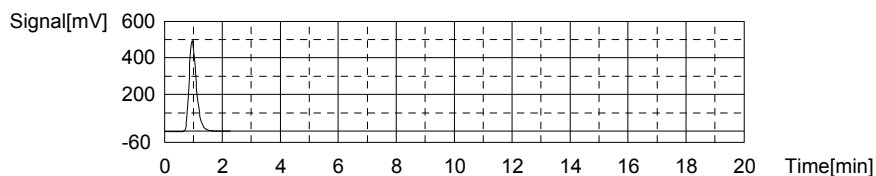
Mean Area 1154
 Mean Conc. 26.87mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	876.0	25.61mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 8:35:09 AM

Mean Area 876.0
 Mean Conc. 25.61mg/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:28.21mg/L TC:36.86mg/L IC:8.648mg/L

1. Det

Anal.: TC

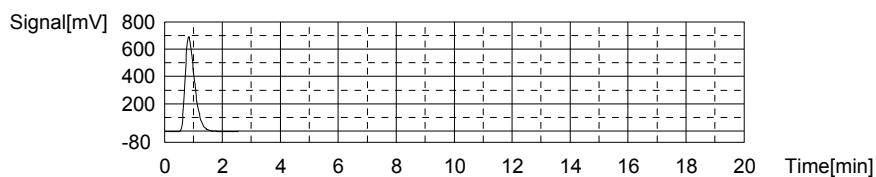
1/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1577	36.86mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 8:57:33 AM

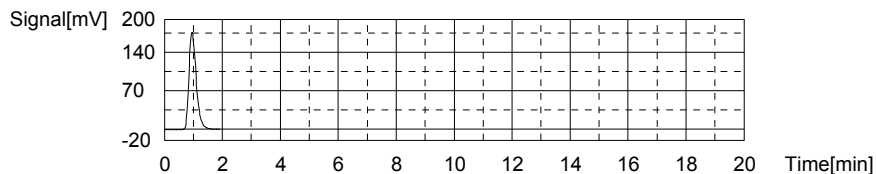
Mean Area 1577
Mean Conc. 36.86mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	308.0	8.648mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 9:02:25 AM

Mean Area 308.0
Mean Conc. 8.648mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

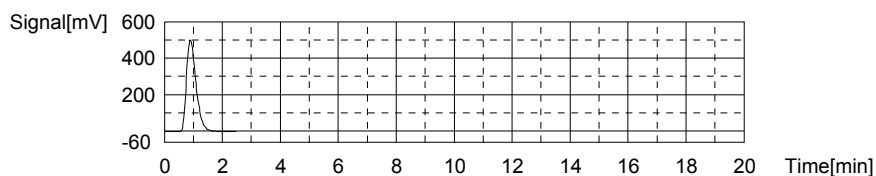
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:27.27mg/L TC:27.01mg/L IC:-0.2622mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1160	27.01mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 9:10:19 AM

Mean Area 1160
Mean Conc. 27.01mg/L



Anal.: IC

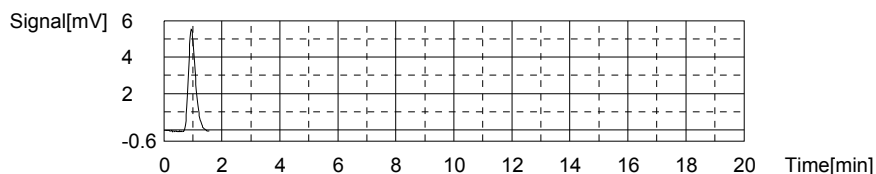
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.633	-0.2622mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 9:14:46 AM

2/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

Mean Area 9.633
Mean Conc. -0.2622mg/L



Sample

Sample Name: WG624513-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

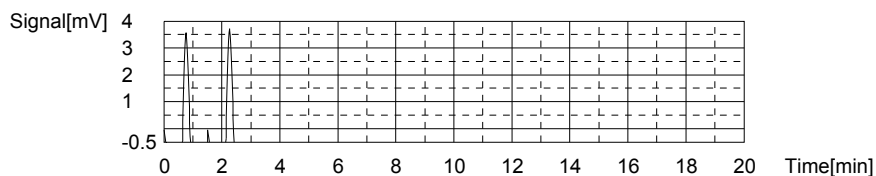
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.02806mg/L TC:-0.1647mg/L IC:-0.1928mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.908	-0.1644mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 9:19:55 AM
2	9.881	-0.1650mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 9:23:34 AM

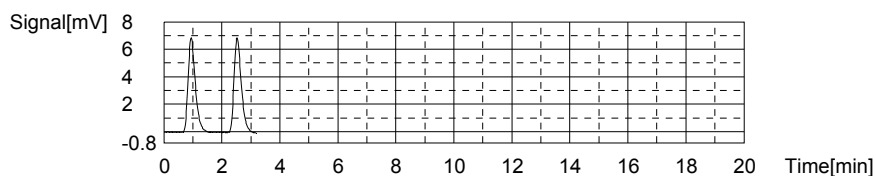
Mean Area 9.895
Mean Conc. -0.1647mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.99	-0.1919mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 9:27:37 AM
2	11.93	-0.1937mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 9:31:41 AM

Mean Area 11.96
Mean Conc. -0.1928mg/L



Sample

Sample Name: WG624513-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

3/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.t32

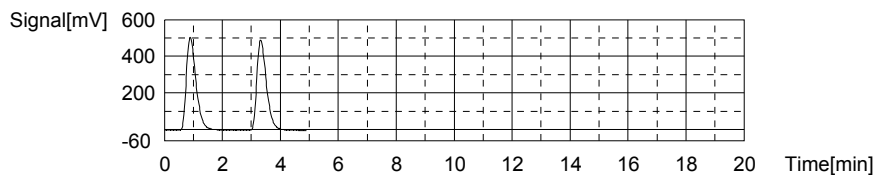
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:27.02mg/L TC:26.72mg/L IC:-0.2961mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1169	27.22mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 9:39:35 AM	
2	1127	26.23mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 9:44:18 AM	

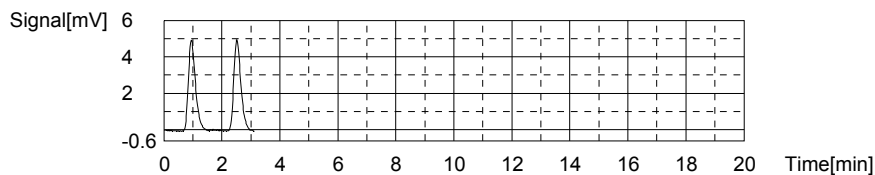
Mean Area 1148
Mean Conc. 26.72mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.531	-0.2952mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 9:48:45 AM	
2	8.467	-0.2971mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 9:53:03 AM	

Mean Area 8.499
Mean Conc. -0.2961mg/L



Sample

Sample Name: WG624513-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

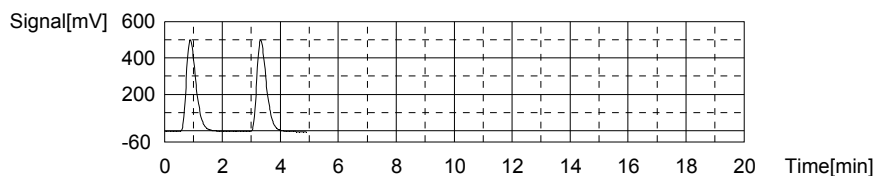
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:27.24mg/L TC:26.95mg/L IC:-0.2865mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1162	27.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 10:00:56 AM	
2	1153	26.84mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 10:05:40 AM	

Mean Area 1158
Mean Conc. 26.95mg/L



Anal.: IC

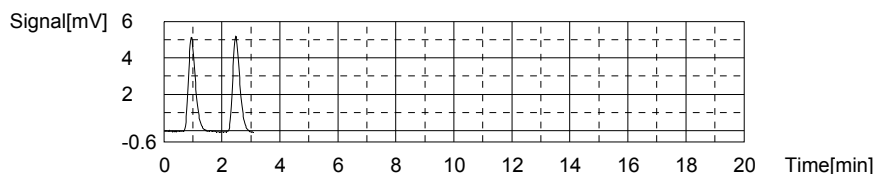
4/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.737	-0.2890mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 10:10:06 AM
2	8.908	-0.2839mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 10:14:17 AM

Mean Area 8.823
Mean Conc. -0.2865mg/L



Sample

Sample Name: L17080001-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

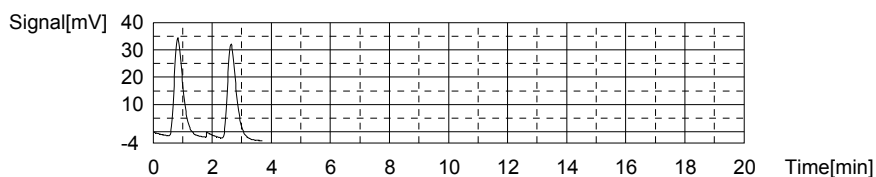
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:1.461mg/L TC:1.286mg/L IC:-0.1754mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	72.34	1.311mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 10:37:05 AM
2	70.24	1.261mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 10:41:15 AM

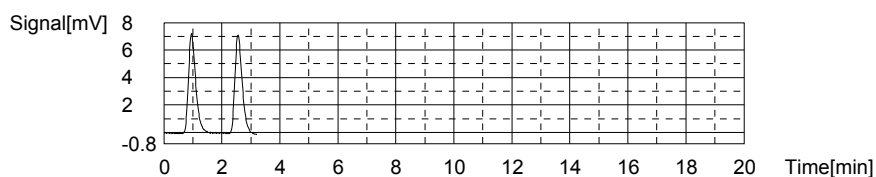
Mean Area 71.29
Mean Conc. 1.286mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.57	-0.1745mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 10:45:43 AM
2	12.51	-0.1763mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 10:50:00 AM

Mean Area 12.54
Mean Conc. -0.1754mg/L



Sample

5/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

Sample Name: L17080112-07
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

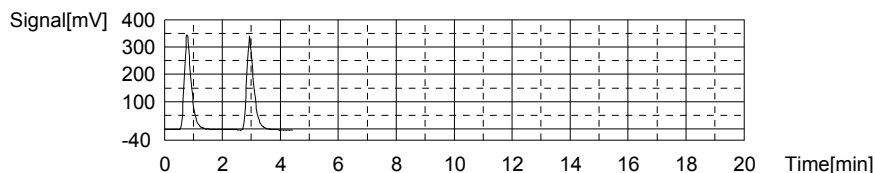
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.910mg/L TC:13.08mg/L IC:9.172mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	571.5	13.10mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 10:57:35 AM	
2	569.6	13.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 11:02:08 AM	

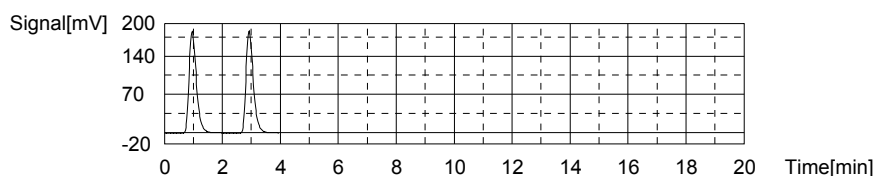
Mean Area 570.5
 Mean Conc. 13.08mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	325.5	9.171mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 11:07:02 AM	
2	325.6	9.174mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 11:11:43 AM	

Mean Area 325.6
 Mean Conc. 9.172mg/L



Sample

Sample Name: L17080135-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.159mg/L TC:39.52mg/L IC:32.36mg/L

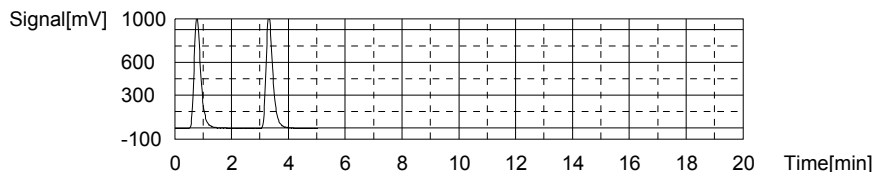
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1681	39.32mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 11:19:42 AM	
2	1698	39.72mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 11:24:31 AM	

6/22

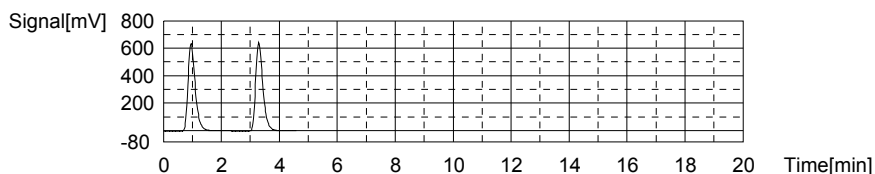
Mean Area 1690
Mean Conc. 39.52mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1093	32.09mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 11:30:10 AM
2	1111	32.63mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 11:35:22 AM

Mean Area 1102
Mean Conc. 32.36mg/L



Sample

Sample Name: L17080135-02 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

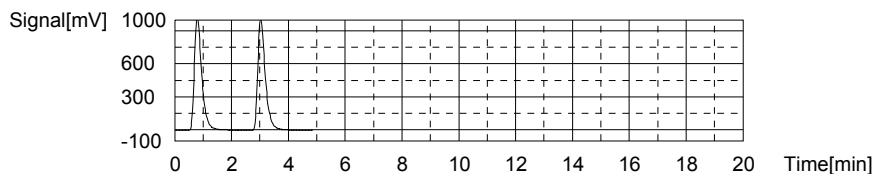
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:23.09mg/L TC:43.82mg/L IC:20.73mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1862	43.59mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 11:43:02 AM
2	1881	44.04mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 11:47:56 AM

Mean Area 1872
Mean Conc. 43.82mg/L



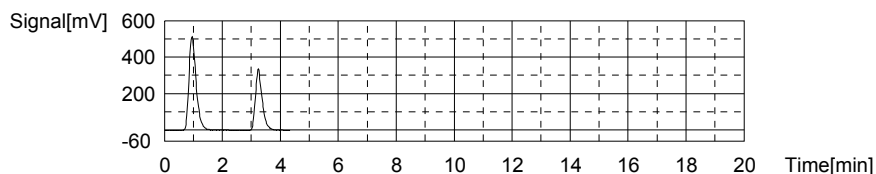
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	885.9	25.91mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 11:53:17 AM
2	539.2	15.55mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 11:58:07 AM

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

Mean Area 712.6
Mean Conc. 20.73mg/L



Sample

Sample Name: L17080135-03 MSD
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

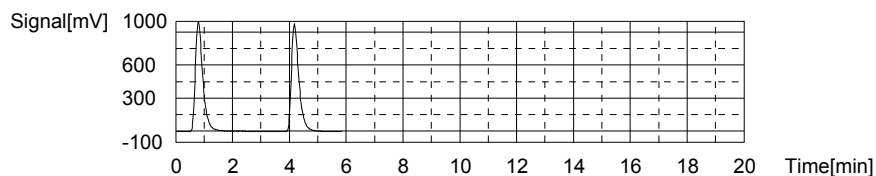
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:20.51mg/L TC:42.58mg/L IC:22.07mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1841	43.10mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 12:06:56 PM
2	1797	42.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 12:11:40 PM

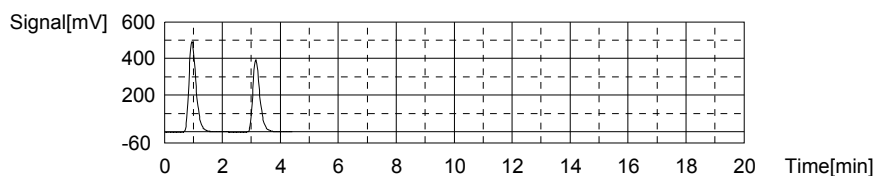
Mean Area 1819
Mean Conc. 42.58mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	848.4	24.79mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 12:16:59 PM
2	666.2	19.35mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 12:22:00 PM

Mean Area 757.3
Mean Conc. 22.07mg/L



Sample

Sample Name: L17080135-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

8/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.t32

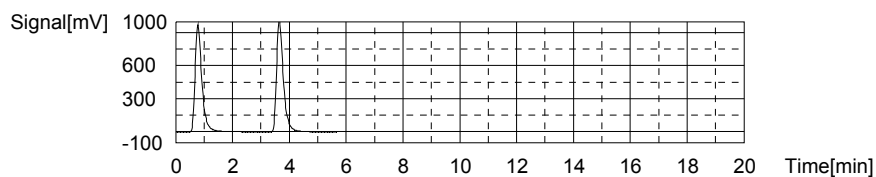
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.906mg/L TC:38.95mg/L IC:31.05mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1630	38.11mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 12:30:18 PM
2	1701	39.79mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 12:35:21 PM

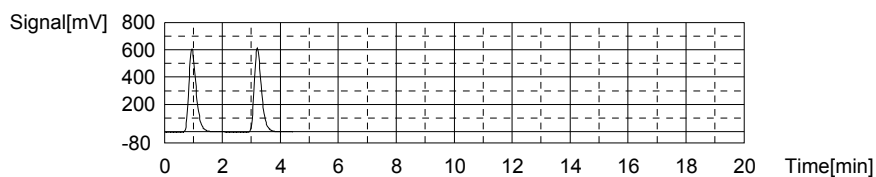
Mean Area 1666
Mean Conc. 38.95mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1059	31.08mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 12:40:41 PM
2	1057	31.02mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 12:45:43 PM

Mean Area 1058
Mean Conc. 31.05mg/L



Sample

Sample Name: L17080184-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

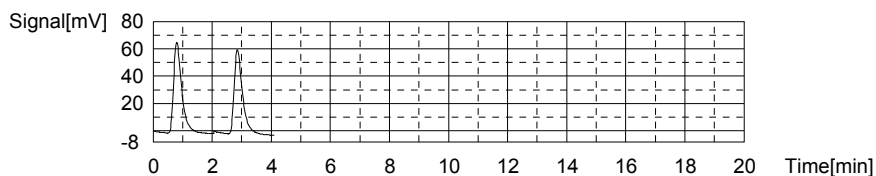
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.666mg/L TC:2.512mg/L IC:0.8463mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	126.3	2.586mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 12:53:13 PM
2	120.1	2.439mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 12:57:32 PM

Mean Area 123.2
Mean Conc. 2.512mg/L



Anal.: IC

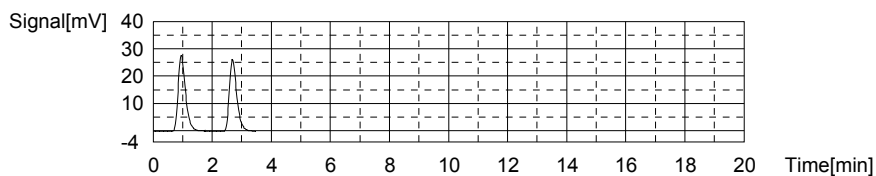
9/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	47.86	0.8793mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 1:02:12 PM
2	45.65	0.8133mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 1:06:38 PM

Mean Area 46.76
Mean Conc. 0.8463mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

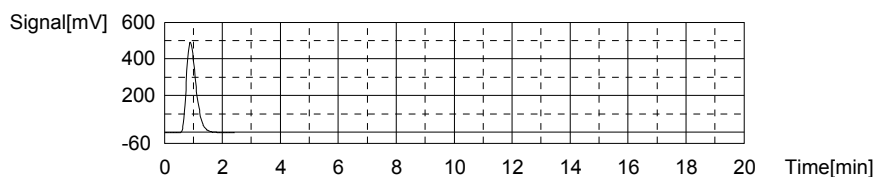
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.68mg/L TC:26.44mg/L IC:-0.2393mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1136	26.44mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32	18/4/2017 1:14:30 PM

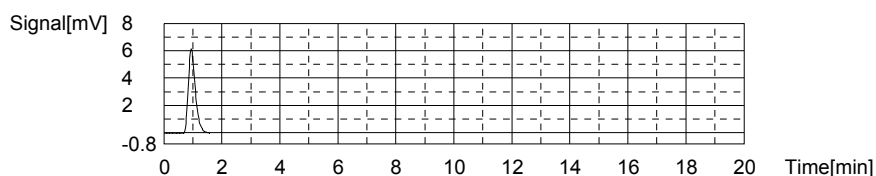
Mean Area 1136
Mean Conc. 26.44mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.40	-0.2393mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 1:18:59 PM

Mean Area 10.40
Mean Conc. -0.2393mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

10/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

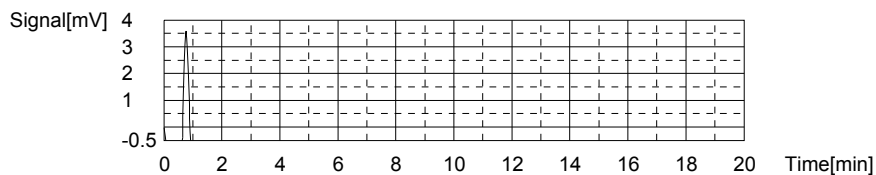
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.03867mg/L TC:-0.1645mg/L IC:-0.2032mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.901	-0.1645mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 1:24:08 PM	

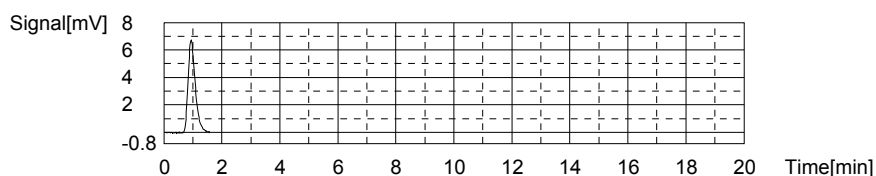
Mean Area 9.901
Mean Conc. -0.1645mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.61	-0.2032mg/L	500uL	1	1	TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 1:28:10 PM	

Mean Area 11.61
Mean Conc. -0.2032mg/L



Sample

Sample Name: L17080184-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

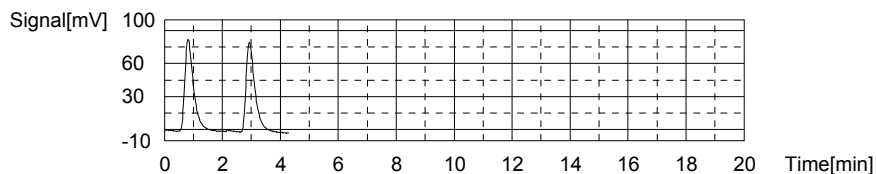
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.708mg/L TC:3.718mg/L IC:1.011mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	175.0	3.736mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 1:35:44 PM	
2	173.5	3.701mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 1:40:11 PM	

Mean Area 174.3
Mean Conc. 3.718mg/L



Anal.: IC

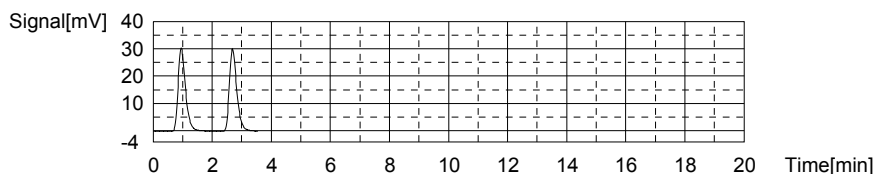
11/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	52.16	1.008mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 1:44:47 PM
2	52.35	1.013mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 1:49:14 PM

Mean Area 52.26
Mean Conc. 1.011mg/L



Sample

Sample Name: L17080185-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

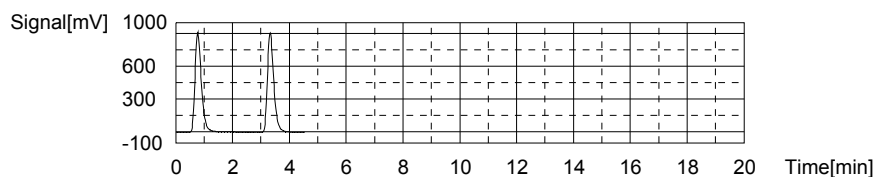
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.295mg/L TC:33.06mg/L IC:29.76mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1430	33.39mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 1:57:14 PM
2	1402	32.73mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 2:02:23 PM

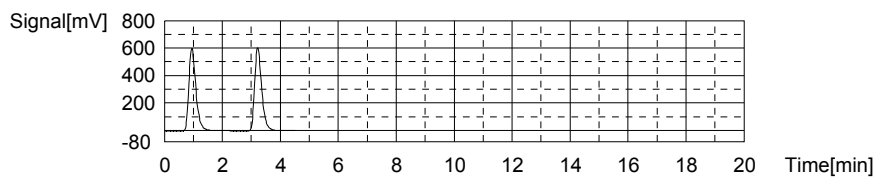
Mean Area 1416
Mean Conc. 33.06mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1008	29.55mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 2:07:42 PM
2	1022	29.97mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 2:12:46 PM

Mean Area 1015
Mean Conc. 29.76mg/L



Sample

12/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

Sample Name: L17080185-03
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

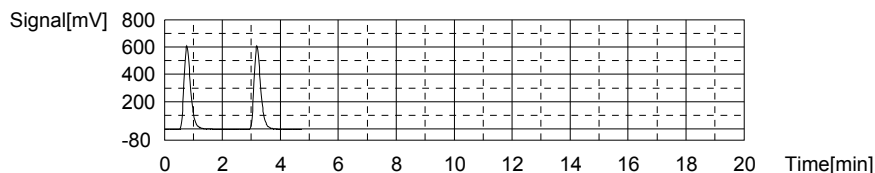
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.548mg/L TC:22.55mg/L IC:20.01mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	967.4	22.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 2:20:37 PM	
2	975.6	22.65mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 2:25:16 PM	

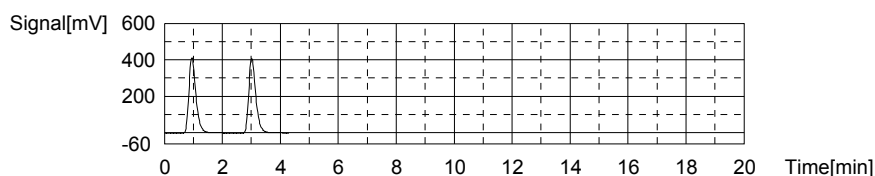
Mean Area 971.5
 Mean Conc. 22.55mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	691.2	20.09mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 2:30:18 PM	
2	685.5	19.92mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 2:35:20 PM	

Mean Area 688.4
 Mean Conc. 20.01mg/L



Sample

Sample Name: L17080185-05
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.977mg/L TC:27.07mg/L IC:24.09mg/L

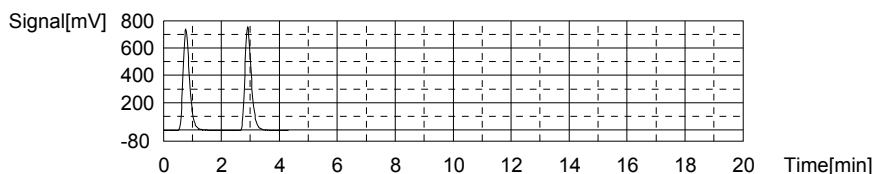
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1146	26.68mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 2:42:54 PM	
2	1179	27.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 2:47:28 PM	

13/22

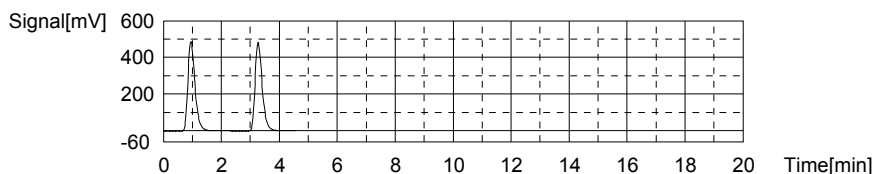
Mean Area 1163
Mean Conc. 27.07mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	828.5	24.19mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 2:52:48 PM
2	821.7	23.99mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 2:57:50 PM

Mean Area 825.1
Mean Conc. 24.09mg/L



Sample

Sample Name: L17080185-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

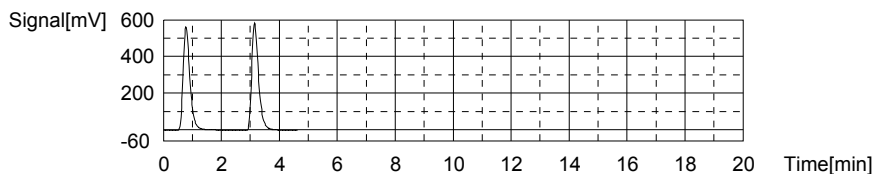
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.879mg/L TC:21.81mg/L IC:17.93mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	918.5	21.30mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 3:05:39 PM
2	961.7	22.32mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 3:10:17 PM

Mean Area 940.1
Mean Conc. 21.81mg/L



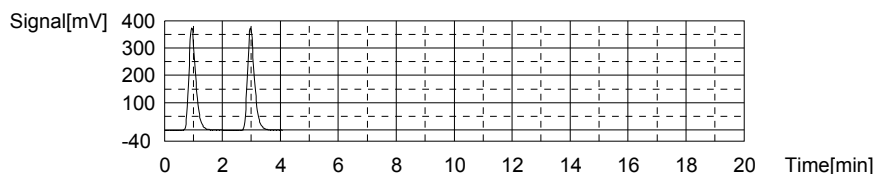
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	618.7	17.93mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 3:15:18 PM
2	619.2	17.94mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 3:20:04 PM

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

Mean Area 619.0
Mean Conc. 17.93mg/L



Sample

Sample Name: WG624513-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

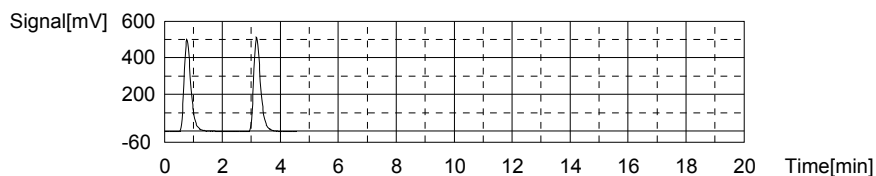
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.891mg/L TC:19.40mg/L IC:15.51mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	821.7	19.02mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 3:27:54 PM
2	854.5	19.79mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 3:32:20 PM

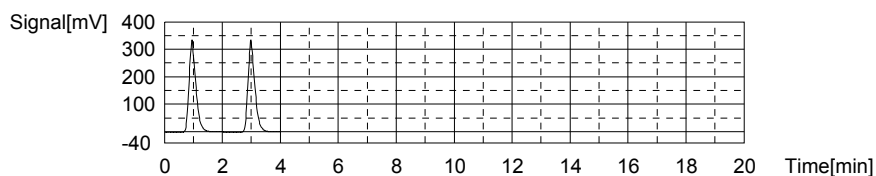
Mean Area 838.1
Mean Conc. 19.40mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	537.9	15.51mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 3:37:22 PM
2	537.8	15.51mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 3:42:07 PM

Mean Area 537.9
Mean Conc. 15.51mg/L



Sample

Sample Name: L17080156-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

15/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

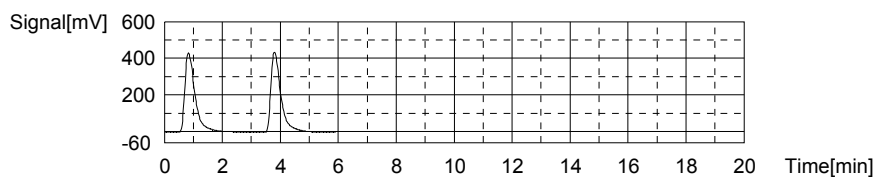
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:16.95mg/L TC:24.47mg/L IC:7.515mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1051	24.43mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 3:50:31 PM	
2	1054	24.50mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 3:55:44 PM	

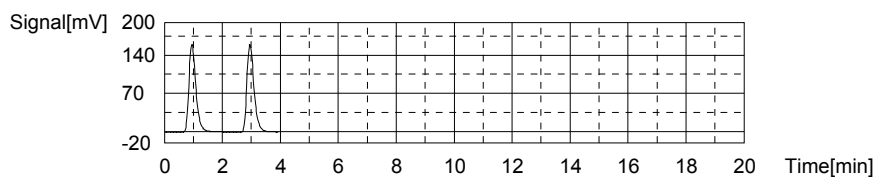
Mean Area 1053
Mean Conc. 24.47mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	267.2	7.430mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 4:00:42 PM	
2	272.9	7.600mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 4:05:21 PM	

Mean Area 270.1
Mean Conc. 7.515mg/L



Sample

Sample Name: L17080156-03 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

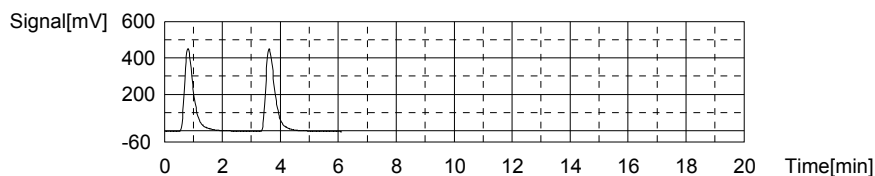
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.20mg/L TC:23.28mg/L IC:9.074mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	993.0	23.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 4:13:35 PM	
2	1011	23.49mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 4:20:05 PM	

Mean Area 1002
Mean Conc. 23.28mg/L



Anal.: IC

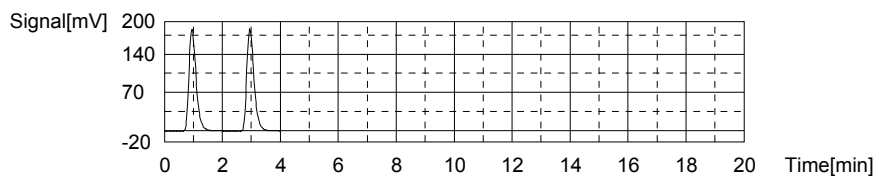
16/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	319.8	9.000mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 4:25:13 PM
2	324.7	9.147mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 4:29:55 PM

Mean Area 322.3
Mean Conc. 9.074mg/L



Sample

Sample Name: L17080161-01 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

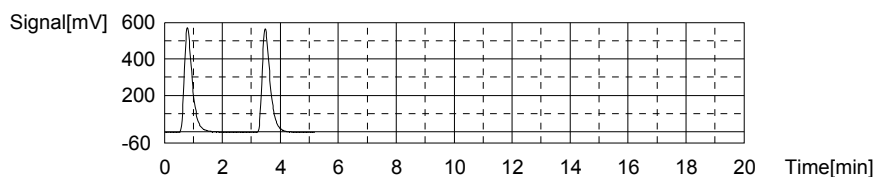
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.18mg/L TC:25.53mg/L IC:13.35mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1098	25.54mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 4:38:02 PM
2	1097	25.52mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 4:42:49 PM

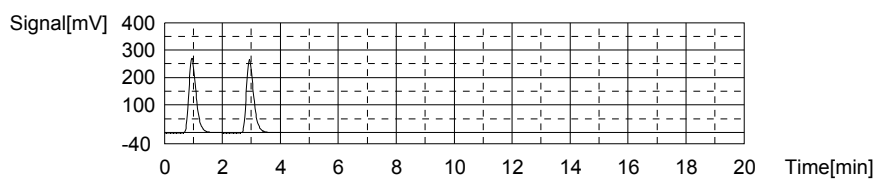
Mean Area 1098
Mean Conc. 25.53mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	468.6	13.44mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 4:47:48 PM
2	462.5	13.26mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 4:52:38 PM

Mean Area 465.6
Mean Conc. 13.35mg/L



Sample

17/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

Sample Name: L17080161-02 (5) MS
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

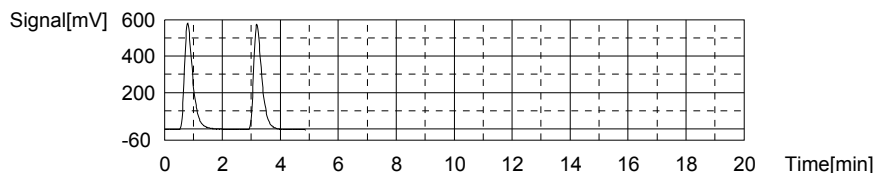
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.49mg/L TC:26.62mg/L IC:12.13mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1157	26.94mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 5:00:27 PM	
2	1130	26.30mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 5:05:13 PM	

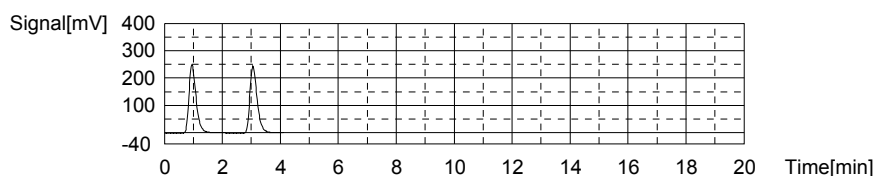
Mean Area 1144
 Mean Conc. 26.62mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	424.7	12.13mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 5:10:16 PM	
2	424.4	12.12mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 5:15:01 PM	

Mean Area 424.6
 Mean Conc. 12.13mg/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:27.66mg/L TC:27.46mg/L IC:-0.2002mg/L

1. Det

Anal.: TC

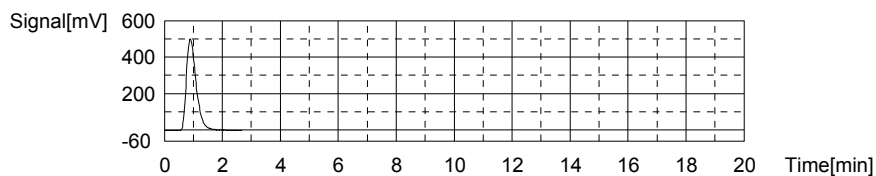
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1179	27.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 5:23:08 PM	

18/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

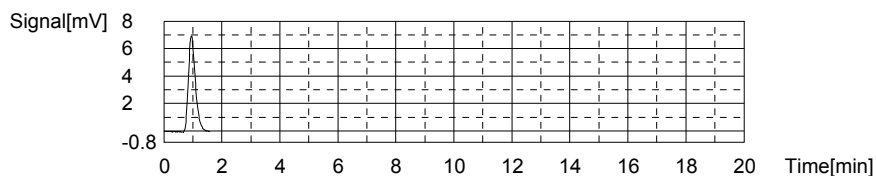
Mean Area 1179
Mean Conc. 27.46mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.71	-0.2002mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 5:27:33 PM

Mean Area 11.71
Mean Conc. -0.2002mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

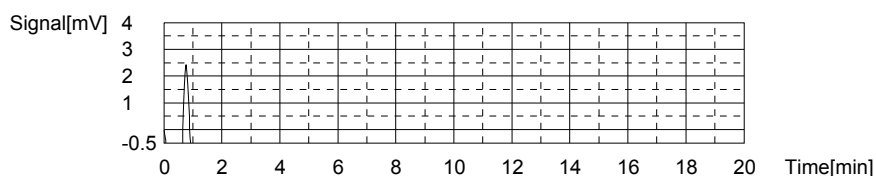
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.07887mg/L TC:-0.2202mg/L IC:-0.2991mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.545	-0.2202mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/4/2017 5:32:36 PM

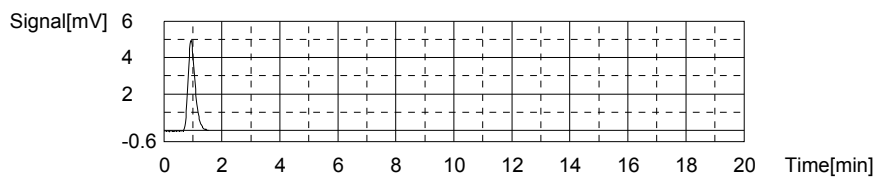
Mean Area 7.545
Mean Conc. -0.2202mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.400	-0.2991mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 5:36:31 PM

Mean Area 8.400
Mean Conc. -0.2991mg/L



19/22

8/7/2017 7:18:22 AM

08-04-2017-DCM-TOC.132

Sample

Sample Name: L17080161-03 (5) MSD
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

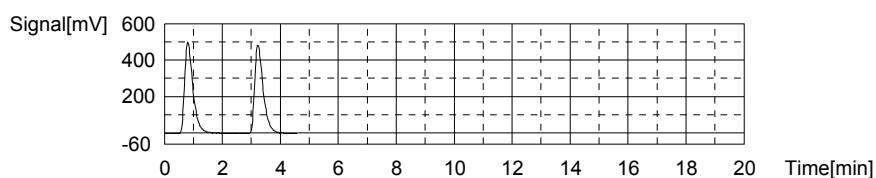
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:13.50mg/L TC:23.11mg/L IC:9.610mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	998.9	23.20mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 5:44:23 PM	
2	991.1	23.02mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 5:48:48 PM	

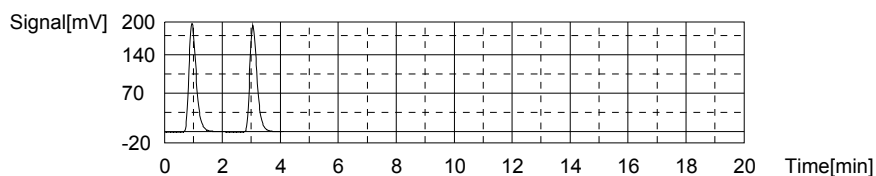
Mean Area 995.0
 Mean Conc. 23.11mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	344.4	9.735mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 5:53:50 PM	
2	336.0	9.484mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18/4/2017 5:58:30 PM	

Mean Area 340.2
 Mean Conc. 9.610mg/L



Sample

Sample Name: L17080164-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:13.58mg/L TC:17.85mg/L IC:4.264mg/L

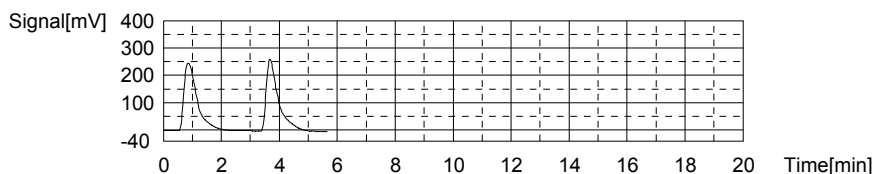
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	774.2	17.89mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 6:06:47 PM	
2	770.2	17.80mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58/4/2017 6:11:53 PM	

20/22

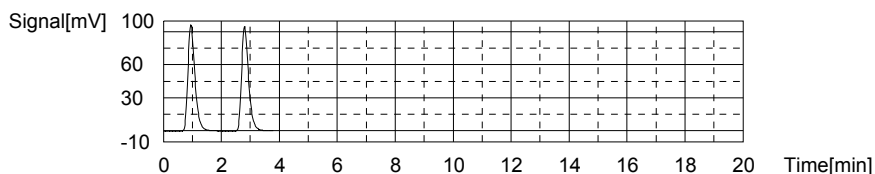
Mean Area 772.2
Mean Conc. 17.85mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	161.9	4.285mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 6:16:39 PM
2	160.5	4.243mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 6:21:14 PM

Mean Area 161.2
Mean Conc. 4.264mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

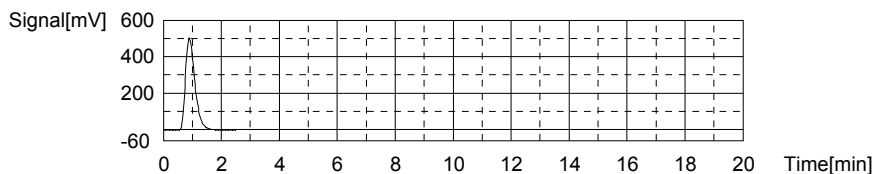
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.99mg/L TC:26.75mg/L IC:-0.2444mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1149	26.75mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	18/4/2017 6:29:12 PM

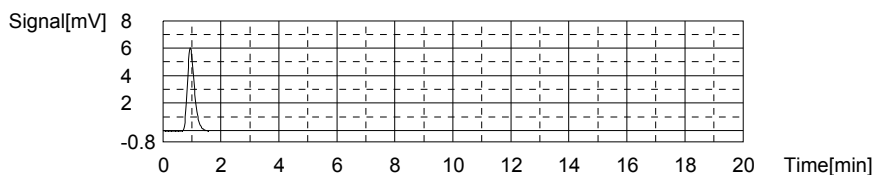
Mean Area 1149
Mean Conc. 26.75mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.23	-0.2444mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/4/2017 6:33:36 PM

Mean Area 10.23
Mean Conc. -0.2444mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

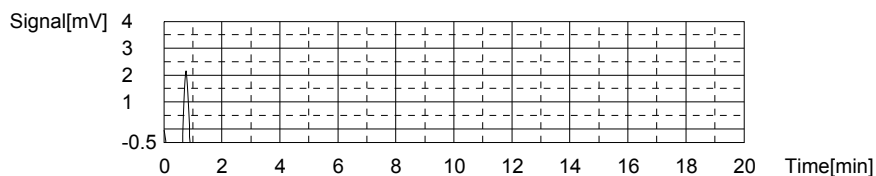
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06508mg/L TC:-0.2320mg/L IC:-0.2971mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.046	-0.2320mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/4/2017 6:38:38 PM

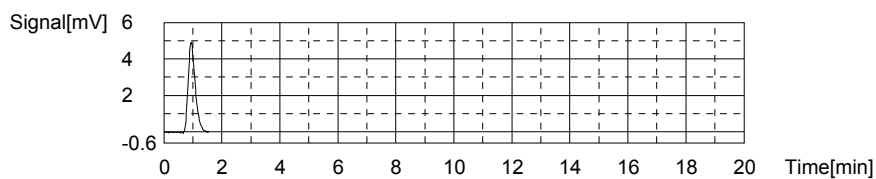
Mean Area 7.046
 Mean Conc. -0.2320mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.467	-0.2971mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/4/2017 6:42:33 PM

Mean Area 8.467
 Mean Conc. -0.2971mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
August 9, 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	BLR - BRANDON L. RICHARDS
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

August 09, 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

August 09, 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: ~~Stephanie Mossburg~~ **ELSPETH SHARP**
 Phone/Fax Number: 210-296-2000
 Sampler (print): Scott Beesinger
 Signature: *Scott Beesinger*
 Fed Ex Airbill No: _____
 Mail to: Linda Raabe
 112 East Pecan STE. 400
 San Antonio, TX 78205
 210-296-2000

Project Name/Location: Longhorn
 Turn Around Time: **STANDARD**
 Project Number: **6025635. GUTP TRU MAR 16**
 Laboratory: Microbac POC: Stephanie Mossburg
 Address: 158 Starlife Drive
 Marietta, OH 45750
 Phone: 1-800-373-4071
 Client: AECOM
 Address: 112 East Pecan Ste. 400
 San Antonio, TX 78205

Program: _____
 SA CODE _____
 Cooler ID _____
 EBLLOT _____
 TBLLOT _____

Site Name	Sample ID/Location ID	SBD	SED	Date	Time	Comp	Grab	Matrix	Number of Containers	ERPIIMS REQUIRED FIELDS		
										Ammonia-N	Orthophosphate	Phosphate
GUTP Weekly	LH1824-SP650-6462			8/2/17	1500	X	M	M	3	X	X	X
	LH1824-SP650-6462-Before Ion			8/2/17	1500	X	M	M	1	X	X	X
	LH1824-SP650-6462-After Ion			8/2/17	1500	X	M	M	1	X	X	X

Comments: **STANDARD TAT**
 Relinquished by: *Scott Beesinger* Date: **8/2/17** Time: **1530**
 Relinquished by: _____ Date: _____ Time: _____
 Received by: *Brenda Gregory* Date: _____ Time: _____
 Received by: (Signature) _____ Date: _____ Time: _____

Microbac OVD
 Received: 08/03/2017 09:53
 BY: BRENDA GREGORY
 221000104103



led by: (Signature)

Received by: (Signature)

Date

Time

Received for Laboratory by:

(Signature)

Date

Received for Laboratory by:

(Signature)

Date

Homogenize all composite samples prior to analysis

Distribution: White to Laboratory, Canary to Project Manager, Pink QA/QC Manager

Cooler ID 4103

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

B-9 8/3/17

pH Lot # H601354

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

B-9 8/3/17

PRESERVATIVE
EXCEPTIONS
NONE

AS NOTED

B-9 8/3/17

Document Control # 1957
Last 10-07-2016

Issued to: Document Master File

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17080164

Account: 2551

Project: 2551.096

Samples: 3

Due Date: 14-AUG-2017

Samplenum **Container ID** **Products**
L17080164-01 944987 826-SPE2 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-AUG-2017 10:29	BRG		
2	ANALYZ	W1	WET	03-AUG-2017 10:46	EPT	BRG	
3	STORE	WET	A1	03-AUG-2017 16:54	BRG	SDC	

Samplenum **Container ID** **Products**
L17080164-01 944988 826-SPE2 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-AUG-2017 10:29	BRG		<2
2	ANALYZ	W1	WET	04-AUG-2017 08:10	DCM	BRG	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-AUG-2017 10:29	BRG		<2

Samplenum **Container ID** **Products**
L17080164-02 944989 826-SPE2 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-AUG-2017 10:29	BRG		
2	ANALYZ	W1	SEM	07-AUG-2017 15:48	JWR	BRG	
3	STORE	SEM	A1	08-AUG-2017 14:56	BRG	JWR	

Samplenum **Container ID** **Products**
L17080164-03 944990 826-SPE2 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-AUG-2017 10:29	BRG		
2	ANALYZ	W1	SEM	07-AUG-2017 15:48	JWR	BRG	
3	STORE	SEM	A1	08-AUG-2017 14:56	BRG	JWR	

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: L17080534

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 August 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 #: L17080534

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?
0018527	I	3.0		1ZW056F52210009864	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 #: L17080534

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-SP650-6464	L17080534-01	08/09/2017 15:00	08/10/2017 10:10
LH18/24-SP650-6464 BEFORE ION	L17080534-02	08/09/2017 15:00	08/10/2017 10:10
LH18/24-SP650-6464 AFTER ION	L17080534-03	08/09/2017 15:00	08/10/2017 10:10



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080534
Project Name:		Method:	6850
Prep Batch Number(s):	WG625583	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-14 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	2017-08-14 18:08:21



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080534
Project Name:		Method:	6850
Prep Batch Number(s):	WG625583	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-14 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:	L17080534
Project Name:		Method:	6850
Prep Batch Number(s):	WG625583	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-14 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:	L17080534
Project Name:		Method:	6850
Prep Batch Number(s):	WG625583	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-14 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:	L17080534
Project Name:		Method:	6850
Prep Batch Number(s):	WG625583	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-14 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:	L17080534
Project Name:		Method:	6850
Prep Batch Number(s):	WG625583	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-14 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:	L17080534
Project Name:		Method:	NH3
Prep Batch Number(s):	WG625546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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	2017-08-21 12:59:44



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080534
Project Name:		Method:	NH3
Prep Batch Number(s):	WG625546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	NH3
Prep Batch Number(s):	WG625546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	NH3
Prep Batch Number(s):	WG625546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	NH3
Prep Batch Number(s):	WG625546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	NH3
Prep Batch Number(s):	WG625546	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	PO4
Prep Batch Number(s):	WG625310	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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	2017-08-21 12:58:19



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080534
Project Name:		Method:	PO4
Prep Batch Number(s):	WG625310	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	PO4
Prep Batch Number(s):	WG625310	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	PO4
Prep Batch Number(s):	WG625310	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	PO4
Prep Batch Number(s):	WG625310	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	PO4
Prep Batch Number(s):	WG625310	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	TOC
Prep Batch Number(s):	WG625665	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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	2017-08-21 13:00:11



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080534
Project Name:		Method:	TOC
Prep Batch Number(s):	WG625665	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	TOC
Prep Batch Number(s):	WG625665	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	TOC
Prep Batch Number(s):	WG625665	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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:	L17080534
Project Name:		Method:	TOC
Prep Batch Number(s):	WG625665	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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				

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2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
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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:	L17080534
Project Name:		Method:	TOC
Prep Batch Number(s):	WG625665	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-21 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 #: L17080534
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080534-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6464	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 08/11/2017 14:35
Workgroup #: WG625546	Analyst: TB	Run Date: 08/11/2017 14:46
Collect Date: 08/09/2017 15:00	Dilution: 5	File ID: S2170811001.018
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	5.36		1.00	0.500	0.250

Certificate of Analysis

Sample #: L17080534-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6464	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:40
Workgroup #: WG625310	Analyst: ADG	Run Date: 08/10/2017 15:35
Collect Date: 08/09/2017 15:00	Dilution: 5	File ID: 00.1708101535-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	2.55		0.500	0.250	0.125

Certificate of Analysis

Sample #: L17080534-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6464	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG625665	Analyst: EPT	Run Date: 08/14/2017 14:14
Collect Date: 08/09/2017 15:00	Dilution: 5	File ID: TC08142017.011
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

Certificate of Analysis

Lab Report #: L17080534
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Sample #: L17080534-02	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6464 BEFORE ION	Prep Method: 6850	Prep Date: 08/11/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 08/11/2017 23:37
Workgroup #: WG625583	Analyst: WTD	Run Date: 08/12/2017 01:50
Collect Date: 08/09/2017 15:00	Dilution: 10	File ID: 1LM.LM40399
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	68.9		4.00	2.00	1.00

Certificate of Analysis

Sample #: L17080534-03	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6464 AFTER ION	Prep Method: 6850	Prep Date: 08/11/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 08/11/2017 23:37
Workgroup #: WG625583	Analyst: WTD	Run Date: 08/12/2017 02:09
Collect Date: 08/09/2017 15:00	Dilution: 1	File ID: 1LM.LM40400
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.762		0.400	0.200	0.100

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17080534

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080534-02	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6464 BEFORE ION	Prep Method: 6850	Prep Date: 08/11/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 08/11/2017 23:37
Workgroup #: WG625583	Analyst: WTD	Run Date: 08/12/2017 01:50
Collect Date: 08/09/2017 15:00	Dilution: 10	File ID: 1LM.LM40399
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	68.9		4.00	2.00	1.00

Certificate of Analysis

Sample #: L17080534-03	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6464 AFTER ION	Prep Method: 6850	Prep Date: 08/11/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 08/11/2017 23:37
Workgroup #: WG625583	Analyst: WTD	Run Date: 08/12/2017 02:09
Collect Date: 08/09/2017 15:00	Dilution: 1	File ID: 1LM.LM40400
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.762		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: 081217_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 (08/12/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments:

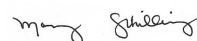
Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40385	WG625568-01 CCB	1	1		08/11/17 21:25
2	1LM.LM40386	WG625568-02 STD (0.1 ug/L)	1	1	STD80232	08/11/17 21:44
3	1LM.LM40387	WG625568-03 STD (0.2 ug/L)	1	1	STD80232	08/11/17 22:03
4	1LM.LM40388	WG625568-04 STD (0.5 ug/L)	1	1	STD80232	08/11/17 22:22
5	1LM.LM40389	WG625568-05 STD (1.0 ug/L)	1	1	STD80232	08/11/17 22:41
6	1LM.LM40390	WG625568-06 STD (2.0 ug/L)	1	1	STD80232	08/11/17 22:59
7	1LM.LM40391	WG625568-07 STD (5.0 ug/L)	1	1	STD80232	08/11/17 23:18
8	1LM.LM40392	WG625568-08 STD (10 ug/L)	1	1	STD80232	08/11/17 23:37
9	1LM.LM40393	WG625568-09 SSCV (1.0 ug/L)	1	1	STD80234	08/11/17 23:56
10	1LM.LM40394	WG625583-01 MCT (0.2ug/L)	1	1	STD80234	08/12/17 00:15
11	1LM.LM40395	WG625583-02 BLANK	1	1		08/12/17 00:34
12	1LM.LM40396	WG625583-03 LCS (0.2ug/L)	1	1	STD80234	08/12/17 00:53
13	1LM.LM40397	WG625583-04 LCS2 (0.2ug/L)	1	1	STD80234	08/12/17 01:12
14	1LM.LM40398	L17080534-02	1	1		08/12/17 01:31
15	1LM.LM40399	L17080534-02 RR (10x)	1	10		08/12/17 01:50
16	1LM.LM40400	L17080534-03	1	1		08/12/17 02:09
17	1LM.LM40401	L17080534-03 RR (10x)	1	10		08/12/17 02:28
18	1LM.LM40402	WG625585-01 CCV (1.0ug/L)	1	1	STD80232	08/12/17 02:47
19	1LM.LM40403	WG625583-05 MRL (0.2ug/L)	1	1	STD80232	08/12/17 03:06
20	1LM.LM40404	WG625585-02 CCB	1	1		08/12/17 03:25

Comments

Seq.	Rerun	Dil.	Reason	Analytes
14	X	10	Over Calibration Range	
			L17080534-02	
17				
			L17080534-03 Dilution not needed. DNR	

Page: 1

Approved: 14-AUG-17




Microbac Laboratories Inc.

Data Checklist

Date: 11-AUG-2017
 Analyst: JWR
 Analyst: WTD
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 83932
 Analytical Workgroups: L17080534

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	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	MES

Primary Reviewer:
14-AUG-2017

Wade D. [Signature]

Secondary Reviewer:
14-AUG-2017

Mary Sheehy [Signature]

CHECKLIST1 - Modified 03/05/2008

Generated: AUG-14-2017 11:28:19



Analytical Method:6850
 Login Number:L17080534

AAB#:WG625583

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-SP650-6464 BEFOR	02	08/09/17					08/11/2017	2.1	28		08/12/17	.4	28	
LH18/24-SP650-6464 AFTEF	03	08/09/17					08/11/2017	2.1	28		08/12/17	.4	28	

* = SEE PROJECT QAPP REQUIREMENTS



Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

SURROGATES - Modified 03/06/2008
PDF File ID: 5430644
Report generated: 08/14/2017 14:08



METHOD BLANK SUMMARY

Login Number: L17080534 Work Group: WG625583
 Blank File ID: 1LM.LM40395 Blank Sample ID: WG625583-02
 Prep Date: 08/11/17 16:30 Instrument ID: LCMS1
 Analyzed Date: 08/12/17 00:34 Method: 6850
 Analyst: WTD

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
MCT	WG625583-01	1LM.LM40394	08/12/17 00:15	01
LCS	WG625583-03	1LM.LM40396	08/12/17 00:53	01
LCS2	WG625583-04	1LM.LM40397	08/12/17 01:12	01
LH18/24-SP650-6464 BEFORE ION	L17080534-02	1LM.LM40399	08/12/17 01:50	DL01
LH18/24-SP650-6464 AFTER ION	L17080534-03	1LM.LM40400	08/12/17 02:09	01
QCMRL	WG625583-05	1LM.LM40403	08/12/17 03:06	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5429893
 Report generated 08/14/2017 14:08



Login Number: L17080534 Prep Date: 08/11/17 16:30 Sample ID: WG625583-02
Instrument ID: LCMS1 Run Date: 08/12/17 00:34 Prep Method: 6850
File ID: 1LM.LM40395 Analyst: WTD Method: 6850
Workgroup (AAB#): WG625583 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-11-AUG-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: 5429894
14-AUG-2017 14:08



Login Number: L17080534 Analyst: WTD Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG625583 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG625583-03 LCS File ID: 1LM.LM40396 Run Date: 08/12/2017 00:53
 Sample ID: WG625583-04 LCS2 File ID: 1LM.LM40397 Run Date: 08/12/2017 01:12

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.183	91.5	0.200	0.190	95.0	3.75	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5429895
 Report generated: 08/14/2017 14:08



Login Number: L17080534
Analytical Method: 6850
ICAL Workgroup: WG625568

Instrument ID: LCMS1
Initial Calibration Date: 11-AUG-17 23:37
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.354	7.21	1.00000	

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5429897
Report generated 08/14/2017 14:08



Login Number: L17080534
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 11-AUG-17 23:37
 Column ID: F

Analyte	WG625568-02			WG625568-03			WG625568-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	15500.0000	1.504	0.200	29300.0000	1.408	0.500	69400.0000	1.341

INT_CAL - Modified 03/06/2008
 PDF File ID: 5429897
 Report generated 08/14/2017 14:08



Login Number: L17080534
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 11-AUG-17 23:37
 Column ID: F

Analyte	WG625568-05			WG625568-06			WG625568-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	135000.000	1.308	2.00	276000.000	1.336	5.00	652000.000	1.309

INT_CAL - Modified 03/06/2008
 PDF File ID: 5429897
 Report generated 08/14/2017 14:08



Login Number: L17080534
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 11-AUG-17 23:37
Column ID: F

Analyte	WG625568-08		
	CONC	RESP	RF
Perchlorate	10.0	1250000.00	1.273

INT_CAL - Modified 03/06/2008
PDF File ID: 5429897
Report generated 08/14/2017 14:08



Login Number: L17080534 Run Date: 08/11/2017 Sample ID: WG625568-09
 Instrument ID: LCMS1 Run Time: 23:56 Method: 6850
 File ID: 1LM.LM40393 Analyst: WTD QC Key: DOD4
 ICal Workgroup: WG625568 Cal ID: LCMS1 - 11-AUG-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	1.00	ug/L	1.31	0	15	

* Exceeds %D Limit



Login Number: L17080534 Run Date: 08/11/2017 Sample ID: WG625568-01
Instrument ID: LCMS1 Run Time: 21:25 Method: 6850
File ID: LLM.LM40385 Analyst: WTD Units: ug/L
Workgroup (AAB#): WG625583 Cal ID: LCMS1 - 29-JUN-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: L17080534 Run Date: 08/12/2017 Sample ID: WG625585-02
 Instrument ID: LCMS1 Run Time: 03:25 Method: 6850
 File ID: LLM.LM40404 Analyst: WTD Units: ug/L
 Workgroup (AAB#): WG625583 Cal ID: LCMS1 - 11-AUG-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: L17080534 Run Date: 08/12/2017 Sample ID: WG625585-01
Instrument ID: LCMS1 Run Time: 02:47 Method: 6850
File ID: 1LM.LM40402 Analyst: WTD QC Key: DOD4
Workgroup (AAB#): WG625583 Cal ID: LCMS1 - 11-AUG-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.01	ug/L	1.33	1.00	15	

* Exceeds %D Criteria



Login Number: L17080534 Run Date: 08/12/2017 Sample ID: WG625583-05
Instrument ID: LCMS1 Run Time: 03:06 Prep Method: 6850
File ID: 1LM.LM40403 Analyst: WTD Method: 6850
Workgroup (AAB#): WG625583 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-11-AUG-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.186	93.0	70 - 130	



Login Number: L17080534
Instrument ID: LCMS1
Workgroup (AAB#): WG625583

ICAL CCV Number: WG625568-05
CAL ID: LCMS1-11-AUG-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG625568	NA	NA	511000
Upper Limit	NA	NA	766500
Lower Limit	NA	NA	255500
<u>L17080534-02</u>	10.0	DL01	511000
L17080534-03	1.00	01	452000
WG625583-02	1.00	01	522000
WG625583-03	1.00	01	525000
WG625583-04	1.00	01	522000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: 6850	Samplenum: L17080534-02
Instrument: LCMS1	Prep Date: 08/11/2017 16:30	File ID: 1LM.LM40399
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/12/2017 01:50	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	909000	291000	3.12	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534
Instrument: LCMS1
Analyst: WTD
Worknum: WG625583

Prep Method: 6850
Prep Date: 08/11/2017 16:30
Anal Method: 6850
Analysis Date: 08/12/2017 02:09

Samplenum: L17080534-03
File ID: 1LM.LM40400
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	91000	30600	2.97	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: _____	Samplenum: WG625568-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40385
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/11/2017 21:25	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 #: L17080534	Prep Method: _____	Samplenum: WG625568-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40386
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/11/2017 21:44	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	15500	5020	3.09	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: _____	Samplenum: WG625568-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40387
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/11/2017 22:03	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	29300	8050	3.64	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: _____	Samplenum: WG625568-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40388
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/11/2017 22:22	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	69400	21400	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: _____	Samplenum: WG625568-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40389
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/11/2017 22:41	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	135000	41600	3.25	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: _____	Samplenum: WG625568-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40390
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/11/2017 22:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	276000	85300	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: _____	Samplenum: WG625568-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40391
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/11/2017 23:18	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	652000	206000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534
Instrument: LCMS1
Analyst: WTD
Worknum: WG625583

Prep Method:
Prep Date:
Anal Method: 6850
Analysis Date: 08/11/2017 23:37

Samplenum: WG625568-08
File ID: 1LM.LM40392
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1250000	391000	3.20	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: _____	Samplenum: WG625568-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40393
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/11/2017 23:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	135000	43800	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: 6850	Samplenum: WG625583-01
Instrument: LCMS1	Prep Date: 08/11/2017 16:30	File ID: 1LM.LM40394
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/12/2017 00:15	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	28200	8280	3.41	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: 6850	Samplenum: WG625583-02
Instrument: LCMS1	Prep Date: 08/11/2017 16:30	File ID: 1LM.LM40395
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/12/2017 00:34	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 #: L17080534	Prep Method: 6850	Samplenum: WG625583-03
Instrument: LCMS1	Prep Date: 08/11/2017 16:30	File ID: 1LM.LM40396
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/12/2017 00:53	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	27400	9030	3.03	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: 6850	Samplenum: WG625583-04
Instrument: LCMS1	Prep Date: 08/11/2017 16:30	File ID: 1LM.LM40397
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/12/2017 01:12	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	28100	9040	3.11	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: 6850	Samplenum: WG625583-05
Instrument: LCMS1	Prep Date: 08/11/2017 16:30	File ID: 1LM.LM40403
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/12/2017 03:06	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	28800	9450	3.05	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: _____	Samplenum: WG625585-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40402
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/12/2017 02:47	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	136000	42900	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17080534	Prep Method: _____	Samplenum: WG625585-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40404
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG625583	Analysis Date: 08/12/2017 03:25	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 General Chemistry Data

2.2.1 Ammonia Data

2.2.1.1 Summary Data

Lab Report #: L17080534

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080534-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6464	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 08/11/2017 14:35
Workgroup #: WG625546	Analyst: TB	Run Date: 08/11/2017 14:46
Collect Date: 08/09/2017 15:00	Dilution: 5	File ID: S2170811001.018
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	5.36		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: 11-AUG-2017
 Analyst: TB
 Analyst: NA
 Method: NH3
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG625546

Calibration/Linearity	08/11/2017
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:
11-AUG-2017

Todd Boyle

Secondary Reviewer:
11-AUG-2017

Denna Johnson



Analytical Method: 350.1
Login Number: L17080534

AAB#: WG625546

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-SP650-6464	01	08/09/17					08/11/2017	2	28		08/11/17	2	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080534 Work Group: WG625546
 Blank File ID: S2170811001.035 Blank Sample ID: WG625546-01
 Prep Date: 08/11/17 15:00 Instrument ID: SMARTCHEM2
 Analyzed Date: 08/11/17 15:00 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	WG625546-02	S2170811001.012	08/11/17 14:40	01
LH18/24-SP650-6464	L17080534-01	S2170811001.018	08/11/17 14:46	DL01
DUP	WG625546-06	S2170811001.030	08/11/17 14:56	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5429501
 Report generated 08/11/2017 17:00



Login Number: L17080534 Prep Date: 08/11/17 15:00 Sample ID: WG625546-01
 Instrument ID: SMARTCHEM2 Run Date: 08/11/17 15:00 Prep Method: 350.1
 File ID: S2170811001.035 Analyst: TB Method: 350.1
 Workgroup (AAB#): WG625546 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: SMARTC-11-AUG-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: 5429502
 11-AUG-2017 17:00



Login Number: L17080534 Run Date: 08/11/2017 Sample ID: WG625546-02
Instrument ID: SMARTCHEM2 Run Time: 14:40 Prep Method: 350.1
File ID: S2170811001.012 Analyst: TB Method: 350.1
Workgroup (AAB#): WG625546 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD83234 Cal ID: SMARTC-11-AUG-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Ammonia	2.00	2.00	100	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5429503
Report generated: 08/11/2017 17:00



2.2 General Chemistry Data

2.2.2 Orthophosphate Data

2.2.2.1 Summary Data

Lab Report #: L17080534

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080534-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6464	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:40
Workgroup #: WG625310	Analyst: ADG	Run Date: 08/10/2017 15:35
Collect Date: 08/09/2017 15:00	Dilution: 5	File ID: 00.1708101535-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	2.55		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

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

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: 10-AUG-2017
 Analyst: ADG
 Analyst: NA
 Method: PO4
 Instrument: UV-2600
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG625310

Calibration/Linearity	08/10/17
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	DIH
Comments	

Primary Reviewer:
17-AUG-2017

April Greene

Secondary Reviewer:
21-AUG-2017

Dennis Johnson



Analytical Method: 365.2
Login Number: L17080534

AAB#: WG625310

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-SP650-6464	01	08/09/17					08/10/2017	1	2		08/10/17	1	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080534 Work Group: WG625310
Blank File ID: 00.1708101535-03 Blank Sample ID: WG625310-01
Prep Date: 08/10/17 15:35 Instrument ID: UV-2600
Analyzed Date: 08/10/17 15:35 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	WG625310-02	00.1708101535-04	08/10/17 15:35	
LCS2	WG625310-03	00.1708101535-05	08/10/17 15:35	
LH18/24-SP650-6464	L17080534-01	00.1708101535-06	08/10/17 15:35	
DUP	WG625310-05	00.1708101535-07	08/10/17 15:35	

Report Name: BLANK_SUMMARY
PDF File ID: 5439752
Report generated 08/21/2017 08:33



Login Number: L17080534 Prep Date: 08/10/17 15:35 Sample ID: WG625310-01
Instrument ID: UV-2600 Run Date: 08/10/17 15:35 Prep Method: 365.2
File ID: 00.1708101535-03 Analyst: ADG Method: 365.2
Workgroup (AAB#): WG625310 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: UV-260-10-AUG-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: 5439753
21-AUG-2017 08:33



Login Number: L17080534 Analyst: ADG Prep Method: 365.2
 Instrument ID: UV-2600 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG625310 Units: mg/L
 QC Key: DOD4 Lot #: STD83217
 Sample ID: WG625310-02 LCS File ID: 00.1708101535-04 Run Date: 08/10/2017 15:35
 Sample ID: WG625310-03 LCS2 File ID: 00.1708101535-05 Run Date: 08/10/2017 15:35

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	1.04	104	1.00	1.03	103	0.924	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5439754
 Report generated: 08/21/2017 08:33



2.2.2.3 Raw Data

WG616995

Curves

Parameter: PO4

Spectrophotometer: UV-2600

Calibration (Curve) standard stock: STD 79640

Concentration: 1000 mg/L

Recipe for preparation of curve standards found in:

SOP: 3653 Revision: 17 Page: 09

Second Source Stock: STD 82182 (concentration: 10)

Daily Preparation: 10/100/100

concentration = 1.0

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
1.0	50	1cm	880	0.623
0.7				0.442
0.5				0.311
0.2				0.127
0.1				0.063
0.05				0.031
0				0
2nd Source (1.0)	50	1cm	880	0.630

Analyst: Jammy Morris

Date/Time: 6/7/17 @ 1540

DCN#126309



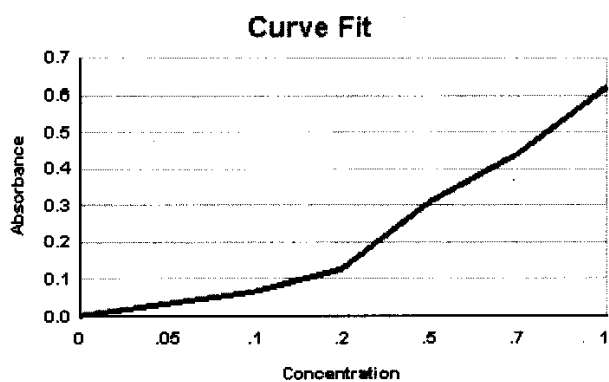
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG616995
Analytical Method: 300
Instrument ID: UV-2600

Analyst: TMM
Initial Calibration Date: 06/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.624599
Y-Intercept: 0.000610422
Coef. Of Correlation (R^2): 0.999913
Coef. Of Correlation (R): 0.999957

Concentration X	Absorbance Y	X^2	X * Y	Y-Fitted (mX^2+B)
0.00	0.00	0.00	0.00	0.000610422
0.0500	0.0310	0.00250	0.00155	0.0318404
0.100	0.0630	0.0100	0.00630	0.0630703
0.200	0.127	0.0400	0.0254	0.125530
0.500	0.311	0.250	0.156	0.312910
0.700	0.442	0.490	0.309	0.437830
1.00	0.623	1.00	0.623	0.625209



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 06/07/2017 16:24



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

00860947

Workgroup #: WG616995
File ID: 00.1706071540-08
CCV ID: WG616995-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 06/07/2017
Run Time: 15:40
Analyst: TMM
Cal ID: UV-260 - 07-JUN-17 15:40:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.01	0.630	1.0	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 06/07/2017 16:25



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG625310Analyst: ADGAnalyte: ORTHOPHOSPHATEDate: 08/10/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG625310-01	50	50	0	0.6246	0.0006104	-0.00097730	-0.00097730	1	mg/L
WG625310-02	50	50	0.653	0.6246	0.0006104	1.0445	1.0445	1	mg/L
WG625310-03	50	50	0.647	0.6246	0.0006104	1.0349	1.0349	1	mg/L
L17080534-01	50	50	0.319	0.6246	0.0006104	0.50975	2.5488	5	mg/L
WG625310-04	50	50	0.319	0.6246	0.0006104	0.50975	2.5488	5	mg/L
WG625310-05	50	50	0.326	0.6246	0.0006104	0.52096	2.6048	5	mg/L
WG625310-06	50	50	0.366	0.6246	0.0006104	0.58500	2.9250	5	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 08/15/2017 16:18



Workgroup #: WG625937
File ID: 00.1708101535-01
CCV ID: WG625937-01
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 08/10/2017
Run Time: 15:35
Analyst: ADG
Cal ID: UV-260 - 10-AUG-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.503	0.630	0.6	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCY - Modified 03/06/2008

Report generated 08/18/2017 15:36



Workgroup #: WG625937
File ID: 00.1708101535-09
CCV ID: WG625937-03
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 08/10/2017
Run Time: 15:35
Analyst: ADG
Cal ID: UV-260 - 10-AUG-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.527	0.660	5.4	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 08/18/2017 15:36



2.2 General Chemistry Data

2.2.3 Total Organic Carbon Data

2.2.3.1 Summary Data

Lab Report #: L17080534

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080534-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6464	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG625665	Analyst: EPT	Run Date: 08/14/2017 14:14
Collect Date: 08/09/2017 15:00	Dilution: 5	File ID: TC08142017.011
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

2.2.3.2 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: 14-AUG-2017
 Analyst: EPT
 Analyst: NA
 Method: TOC
 Instrument: TOC-VWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG625665

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	
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	EPT
Secondary Reviewer	SAV
Comments	

Primary Reviewer:
15-AUG-2017

Edham Tidd

Secondary Reviewer:
15-AUG-2017

Sarah Vandenberg



Analytical Method: 415.1
Login Number: L17080534

AAB#: WG625665

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-SP650-6464	01	08/09/17					08/14/2017	5	28		08/14/17	5	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17080534 Work Group: WG625665
 Blank File ID: TC08142017.004 Blank Sample ID: WG625665-01
 Prep Date: 08/14/17 11:24 Instrument ID: TOC-VWP
 Analyzed Date: 08/14/17 11:24 Method: 415.1
 Analyst: EPT

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG625665-02	TC08142017.005	08/14/17 11:51	01
LCS2	WG625665-03	TC08142017.006	08/14/17 12:12	01
LH18/24-SP650-6464	L17080534-01	TC08142017.011	08/14/17 14:14	DL01
DUP	WG625665-05	TC08142017.030	08/14/17 21:02	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5432333
 Report generated 08/15/2017 14:58



Login Number: L17080534 Prep Date: 08/14/17 11:24 Sample ID: WG625665-01
 Instrument ID: TOC-VWP Run Date: 08/14/17 11:24 Prep Method: 415.1
 File ID: TC08142017.004 Analyst: EPT Method: 415.1
 Workgroup (AAB#): WG625665 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: 5432334
 15-AUG-2017 14:58



Login Number: L17080534 Run Date: 08/14/2017 Sample ID: WG625665-02
Instrument ID: TOC-VWP Run Time: 11:51 Prep Method: 415.1
File ID: TC08142017.005 Analyst: EPT Method: 415.1
Workgroup (AAB#): WG625665 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD80787 Cal ID: TOC-VW-10-FEB-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Total Organic Carbon	25.0	27.7	111	85 - 115	

LCS - Modified 03/06/2008
PDF File ID: 5432335
Report generated: 08/15/2017 14:58



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 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

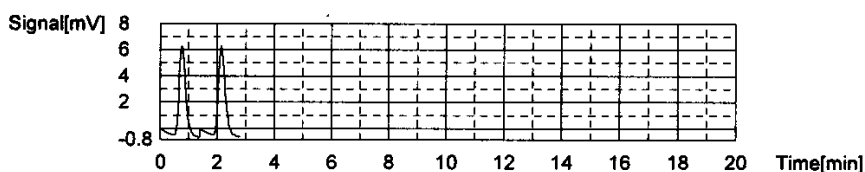
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

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

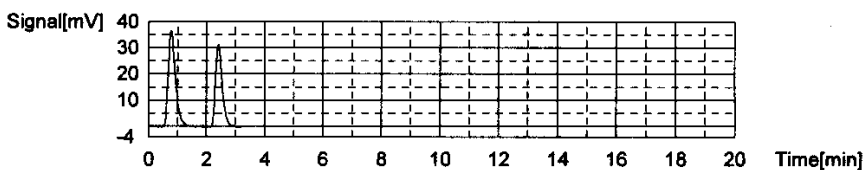
Acid Add. 0.000%
 Mean Area 10.82



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

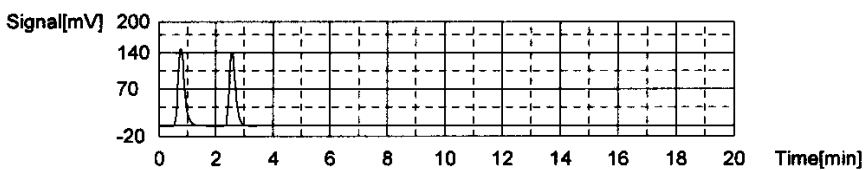
Acid Add. 0.000%
 Mean Area 57.92



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

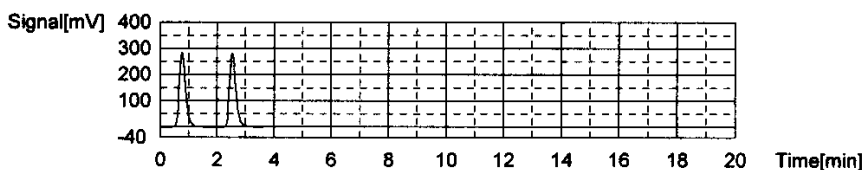


Conc: 10.00mg/L

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

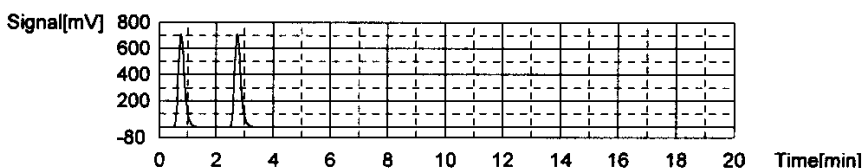
Acid Add. 0.000%
 Mean Area 440.2



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

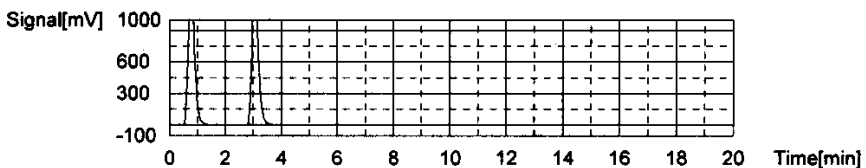
Acid Add. 0.000%
 Mean Area 1092



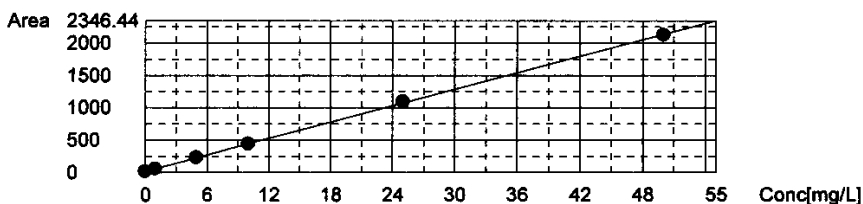
Conc: 50.00mg/L

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

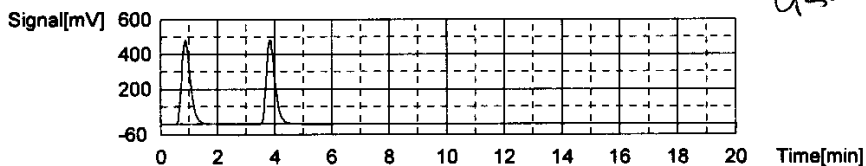
1. Det

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

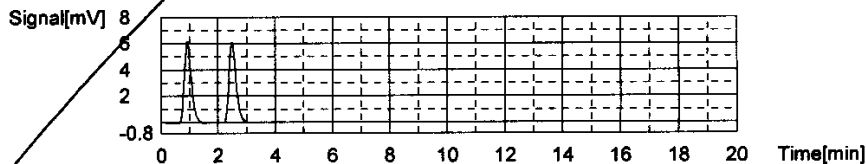
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

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

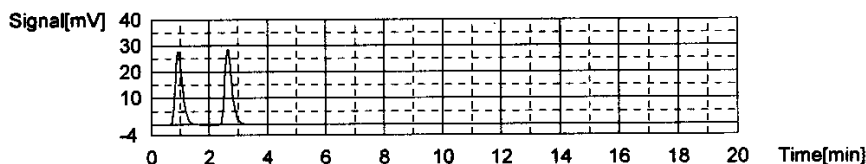
Acid Add. 3.000%
Mean Area 10.51



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

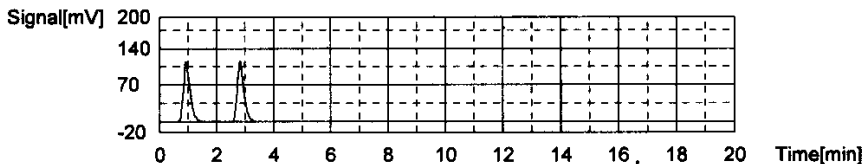


Conc: 5.000mg/L

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

dem
3/23/17

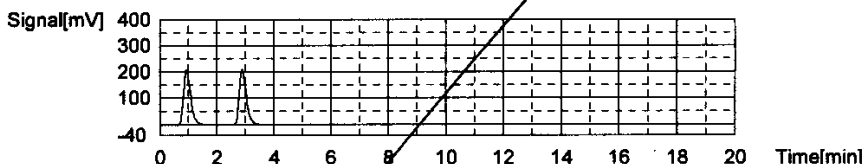
Acid Add. 3.000%
Mean Area 189.6



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

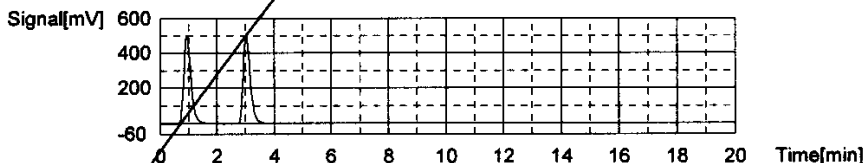
Acid Add. 3.000%
Mean Area 361.4



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

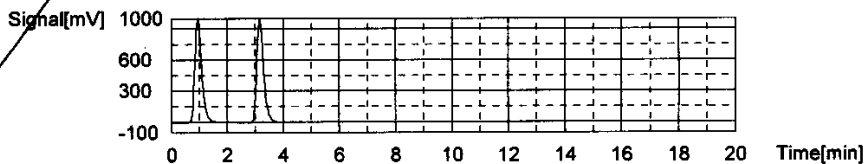
Acid Add. 3.000%
Mean Area 858.1



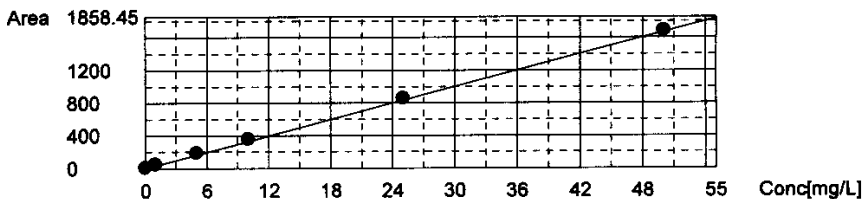
Conc: 50.00mg/L

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

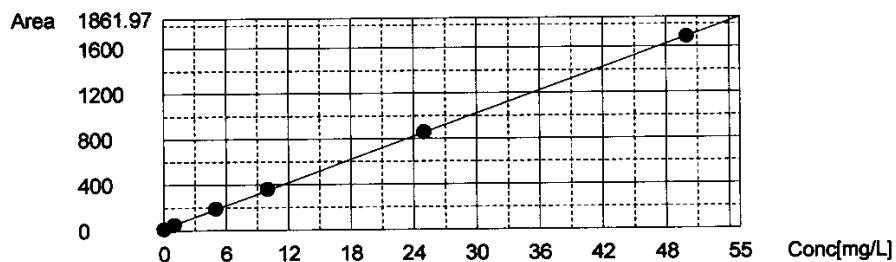
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

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:

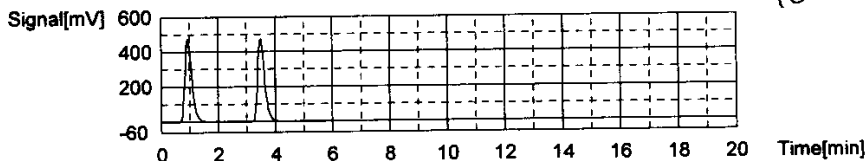
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

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:

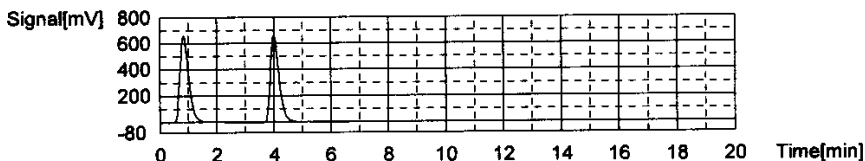
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

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:

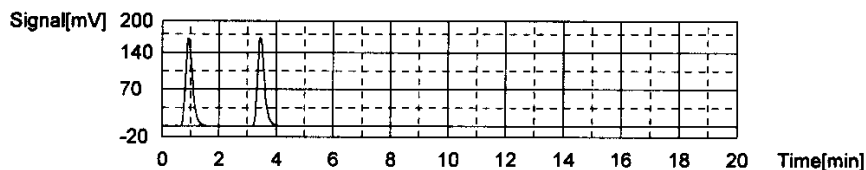
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

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

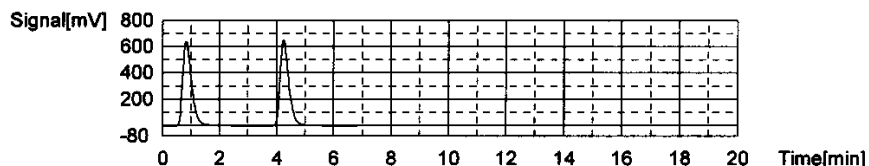
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

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



Total Organic Carbon

MAKE DAILY

CCV (TOC): Std 79381
 $(5/200)(1000) = 25\text{mg/L}$

LCS (TOC): Std 80787
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): Std 83359
 $(5/200)(1000) = 25\text{mg/L}$

MS (TOC): Std 80787
 $.4(1000)/140 = 10$

Calibration Curve Date: 2/10/17

Reagent: 39246
40983

SM5310-C : Matrix 2 WG 625665

EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K 4151 Rev. 18

SW846 9060A (4 rep) WG _____ Instrument: Shimadza TOC-VWP/ASI

- | | | | | | |
|-------------------------------------|----------------------------|-------------------------------------|-----------------------------|-------------------------------------|-----------------|
| <input checked="" type="checkbox"/> | drain reservoir filled | <input checked="" type="checkbox"/> | DAILY CHECK | <input checked="" type="checkbox"/> | sufficient acid |
| <input checked="" type="checkbox"/> | ASI water bottle full | <input checked="" type="checkbox"/> | 3 rd bottle full | | waste container |
| <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	TIC		26	CCV		51		
2	TOC/TIC		27	CCB		52		
3	CCV		28	08-0680-01		53		
4	BK		29	08-0746-01		54		
5	LCS		30	DUP 402-01		55		
6	LCS/VIP		31	MS 402-01		56		
7	08-0402-01		32	CCV		57		
8	-03		33	CCB		58		
9	08-0518-01		34	CCV		59		
10	-02		35	CCB		60		
11	08-0534-01	1/5	36	08-0672-02	1/3	61		
12	08-0537-01		37	08-0678-01	1/50	62		
13	08-0556-01		38	08-0680-01	1/50	63		
14	CCV		39	CCV		64		
15	CCB		40	CCB		65		
16	08-0556-02		41			66		
17	-04		42			67		
18	08-0570-01		43			68		
19	08-0594-01		44			69		
20	-03		45			70		
21	08-0672-01		46			71		
22	-02		47			72		
23	-03		48			73		
24	-04		49			74		
25	08-0678-01	1/5	50			75		

Analyst: Gabe Tuckel Date/Time: 8/14/17 1045

DCN#127632



	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:1.294mg/L TC:28.78mg/L IC:27.49mg/L	Complete	8/14/2017 10:46:04 AM	1
2	TOC	TOC/TIC	TOC:27.61mg/L TC:36.44mg/L IC:8.821mg/L	Complete	8/14/2017 11:07:12 AM	2
3	TOC	CCV	!!Error!! TOC:26.63mg/L TC:26.32mg/L IC:-0.3074mg/L	Complete	8/14/2017 11:19:34 AM	3
4	TOC	WG625665-01 BLK	!!Error!! TOC:0.1365mg/L TC:-0.1337mg/L IC:-0.2703mg/L	Complete	8/14/2017 11:36:37 AM	0
5	TOC	WG625665-02 LCS	!!Error!! TOC:27.74mg/L TC:27.42mg/L IC:-0.3171mg/L	Complete	8/14/2017 12:04:30 PM	5
6	TOC	WG625665-03 LCS/DUF	!!Error!! TOC:27.87mg/L TC:27.56mg/L IC:-0.3100mg/L	Complete	8/14/2017 12:25:53 PM	6
7	TOC	L17080402-01	TOC:2.681mg/L TC:29.24mg/L IC:26.56mg/L	Complete	8/14/2017 12:52:56 PM	7
8	TOC	L17080402-03	TOC:1.527mg/L TC:28.24mg/L IC:26.71mg/L	Complete	8/14/2017 1:18:52 PM	8
9	TOC	L17080518-01	TOC:5.966mg/L TC:32.56mg/L IC:26.59mg/L	Complete	8/14/2017 1:42:44 PM	9
10	TOC	L17080518-02	TOC:8.560mg/L TC:32.31mg/L IC:23.75mg/L	Complete	8/14/2017 2:06:44 PM	10
11	TOC	L17080534-01 (5)	TOC:11.52mg/L TC:20.44mg/L IC:8.917mg/L	Complete	8/14/2017 2:29:37 PM	11
12	TOC	L17080537-01	!!Error!! TOC:0.5614mg/L TC:0.4584mg/L IC:-0.1030mg/L	Complete	8/14/2017 2:49:18 PM	12
13	TOC	L17080556-01	TOC:4.013mg/L TC:24.66mg/L IC:20.64mg/L	Complete	8/14/2017 3:12:54 PM	13
14	TOC	CCV	!!Error!! TOC:28.02mg/L TC:27.84mg/L IC:-0.1823mg/L	Complete	8/14/2017 3:25:20 PM	14
15	TOC	CCB	!!Error!! TOC:0.09048mg/L TC:-0.1645mg/L IC:-0.2550mg/L	Complete	8/14/2017 3:34:28 PM	0
16	TOC	L17080556-02	TOC:4.616mg/L TC:13.49mg/L IC:8.876mg/L	Complete	8/14/2017 3:56:45 PM	16
17	TOC	L17080556-04	TOC:4.564mg/L TC:11.32mg/L IC:6.759mg/L	Complete	8/14/2017 4:31:33 PM	17
18	TOC	L17080570-01	TOC:8.804mg/L TC:14.04mg/L IC:5.235mg/L	Complete	8/14/2017 4:56:29 PM	18
19	TOC	L17080594-01	TOC:3.682mg/L TC:6.625mg/L IC:2.943mg/L	Complete	8/14/2017 5:17:55 PM	19
20	TOC	L17080594-03	TOC:3.614mg/L TC:6.270mg/L IC:2.656mg/L	Complete	8/14/2017 5:39:19 PM	20
21	TOC	L17080672-01	TOC:5.620mg/L TC:8.209mg/L IC:2.589mg/L	Complete	8/14/2017 6:01:24 PM	21
22	TOC		TOC:35.04mg/L TC:79.15mg/L IC:44.11mg/L	Complete	8/14/2017 6:27:43 PM	22
23	TOC	L17080672-03	TOC:18.64mg/L TC:42.61mg/L IC:23.97mg/L	Complete	8/14/2017 6:52:00 PM	23
24	TOC	L17080672-04	TOC:7.718mg/L TC:20.83mg/L IC:13.11mg/L	Complete	8/14/2017 7:14:44 PM	24
25	TOC		TOC:164.0mg/L TC:165.0mg/L IC:0.9447mg/L	Complete	8/14/2017 7:43:00 PM	25
26	TOC	CCV	!!Error!! TOC:27.54mg/L TC:27.27mg/L IC:-0.2669mg/L	Complete	8/14/2017 7:55:23 PM	26
27	TOC	CCB	!!Error!! TOC:0.07765mg/L TC:-0.1827mg/L IC:-0.2603mg/L	Complete	8/14/2017 8:04:26 PM	0
28	TOC		TOC:173.8mg/L TC:176.2mg/L IC:2.455mg/L	Complete	8/14/2017 8:32:45 PM	28
29	TOC	L17080746-01	TOC:2.552mg/L TC:3.391mg/L IC:0.8390mg/L	Complete	8/14/2017 8:53:33 PM	29
30	TOC	WG625665-05 DUP	TOC:2.714mg/L TC:14.79mg/L IC:12.08mg/L	Complete	8/14/2017 9:18:57 PM	30
31	TOC	WG625665-06 MS	TOC:12.82mg/L TC:24.10mg/L IC:11.28mg/L	Complete	8/14/2017 9:45:14 PM	31
32	TOC	CCV	!!Error!! TOC:27.55mg/L TC:27.32mg/L IC:-0.2367mg/L	Complete	8/14/2017 9:57:40 PM	32
33	TOC	CCB	!!Error!! TOC:0.08760mg/L TC:-0.1661mg/L IC:-0.2537mg/L	Complete	8/14/2017 10:06:48 PM	0
34	TOC	CCV	!!Error!! TOC:27.94mg/L TC:27.62mg/L IC:-0.3170mg/L	Complete	8/15/2017 8:35:45 AM	34
35	TOC	CCB	!!Error!! TOC:0.06303mg/L TC:-0.1847mg/L IC:-0.2477mg/L	Complete	8/15/2017 8:44:53 AM	0
36	TOC	L17080672-02 (3)	TOC:16.66mg/L TC:32.79mg/L IC:16.13mg/L	Complete	8/15/2017 9:08:24 AM	36
37	TOC	L17080678-01 (50)	TOC:28.92mg/L TC:28.93mg/L IC:0.01838mg/L	Complete	8/15/2017 9:31:51 AM	37
38	TOC	L17080680-01 (50)	TOC:30.12mg/L TC:30.36mg/L IC:0.2403mg/L	Complete	8/15/2017 10:06:40 AM	38
39	TOC	CCV	!!Error!! TOC:27.17mg/L TC:26.89mg/L IC:-0.2789mg/L	Complete	8/15/2017 10:18:58 AM	39
40	TOC	CCB	!!Error!! TOC:0.06401mg/L TC:-0.1744mg/L IC:-0.2384mg/L	Complete	8/15/2017 10:28:04 AM	0

8/15/2017 10:58:46 AM

1/1

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

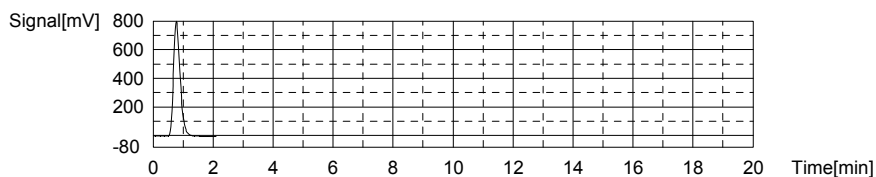
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.294mg/L TC:28.78mg/L IC:27.49mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1235	28.78mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 10:39:47 AM

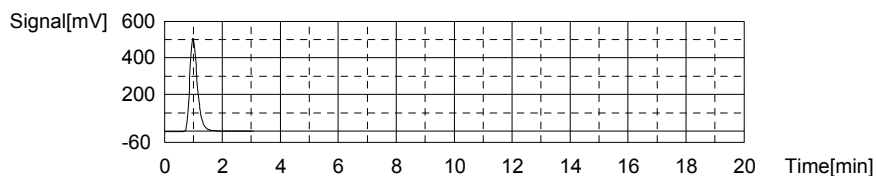
Mean Area 1235
 Mean Conc. 28.78mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	938.8	27.49mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 10:46:04 AM

Mean Area 938.8
 Mean Conc. 27.49mg/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:27.61mg/L TC:36.44mg/L IC:8.821mg/L

1. Det

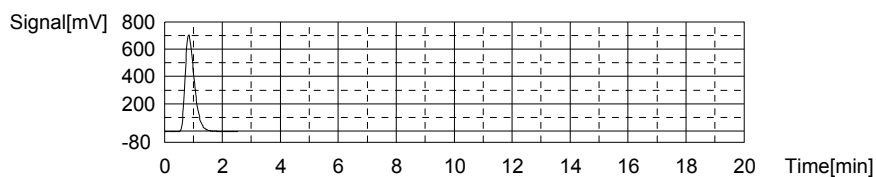
Anal.: TC

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1559	36.44mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 11:00:13 AM

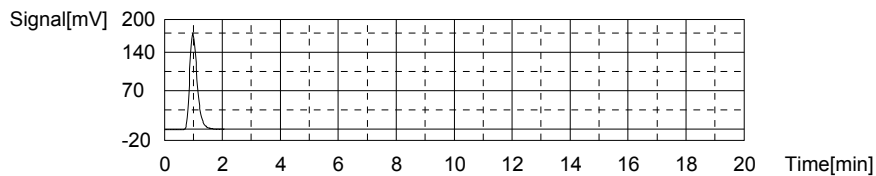
Mean Area 1559
Mean Conc. 36.44mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	313.8	8.821mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 11:07:12 AM

Mean Area 313.8
Mean Conc. 8.821mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

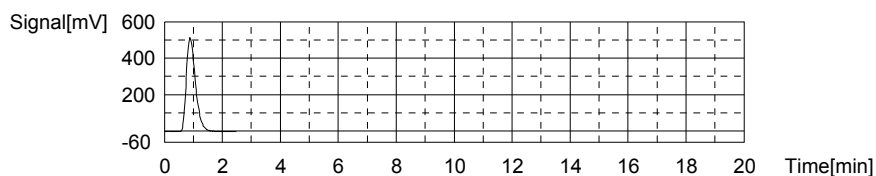
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.63mg/L TC:26.32mg/L IC:-0.3074mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1131	26.32mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 11:15:07 AM

Mean Area 1131
Mean Conc. 26.32mg/L



Anal.: IC

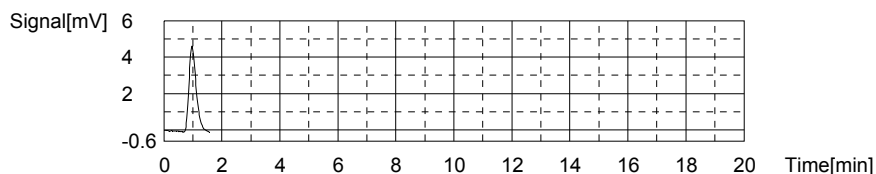
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.121	-0.3074mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 11:19:34 AM

2/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.132

Mean Area 8.121
Mean Conc. -0.3074mg/L



Sample

Sample Name: WG625665-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

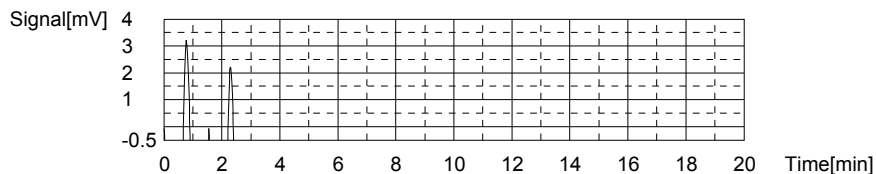
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1365mg/L TC:-0.1337mg/L IC:-0.2703mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.66	-0.09935mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 11:24:48 AM
2	9.750	-0.1681mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 11:28:24 AM

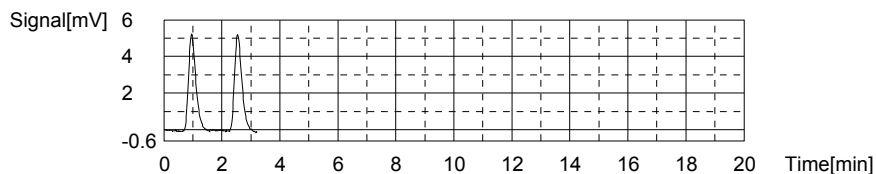
Mean Area 11.21
Mean Conc. -0.1337mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.392	-0.2694mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_18	18/14/2017 11:32:27 AM
2	9.338	-0.2711mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_18	18/14/2017 11:36:37 AM

Mean Area 9.365
Mean Conc. -0.2703mg/L



Sample

Sample Name: WG625665-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

3/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

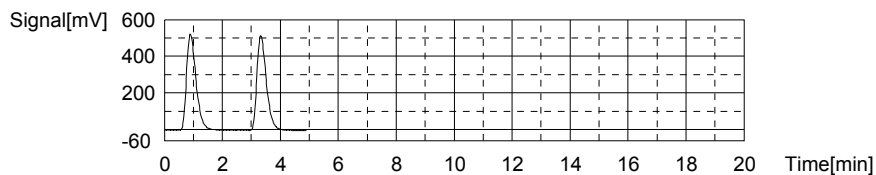
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:27.74mg/L TC:27.42mg/L IC:-0.3171mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1188	27.67mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 11:51:06 AM
2	1167	27.17mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 11:55:50 AM

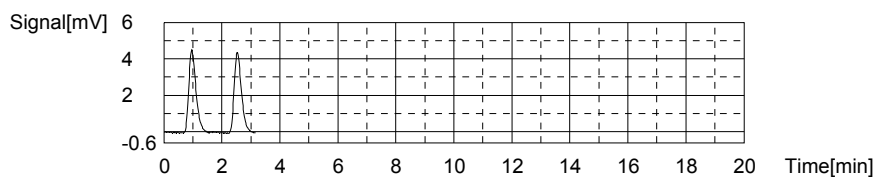
Mean Area 1178
Mean Conc. 27.42mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.925	-0.3133mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 12:00:16 PM
2	7.666	-0.3210mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 12:04:30 PM

Mean Area 7.796
Mean Conc. -0.3171mg/L



Sample

Sample Name: WG625665-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

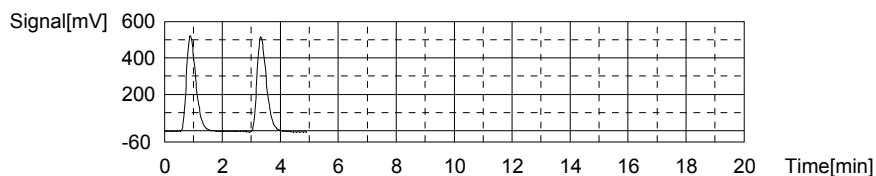
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:27.87mg/L TC:27.56mg/L IC:-0.3100mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1188	27.67mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 12:12:23 PM
2	1179	27.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 12:17:09 PM

Mean Area 1184
Mean Conc. 27.56mg/L



Anal.: IC

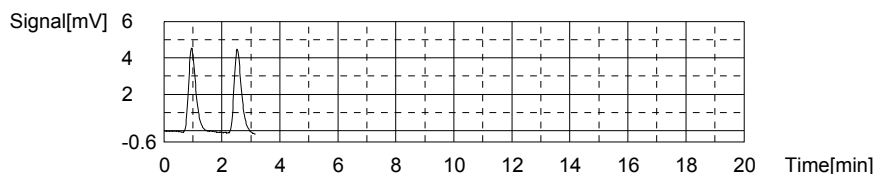
4/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.132

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.940	-0.3128mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 12:21:38 PM
2	8.128	-0.3072mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 12:25:53 PM

Mean Area 8.034
Mean Conc. -0.3100mg/L



Sample

Sample Name: L17080402-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

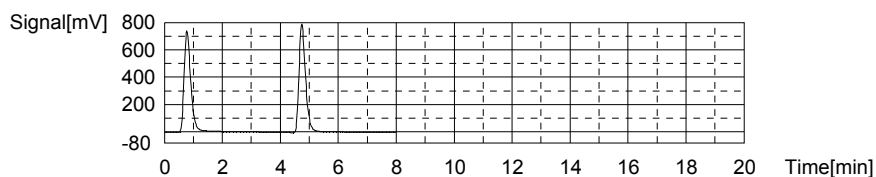
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.681mg/L TC:29.24mg/L IC:26.56mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1228	28.61mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 12:35:19 PM
2	1281	29.87mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 12:41:48 PM

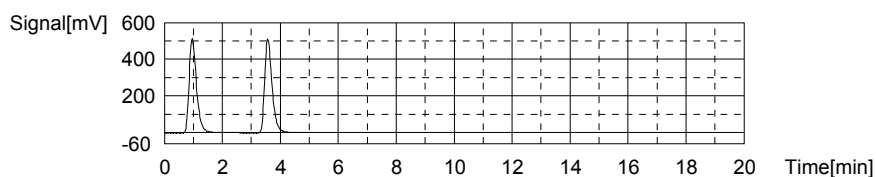
Mean Area 1255
Mean Conc. 29.24mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	907.1	26.54mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 12:47:32 PM
2	908.5	26.58mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 12:52:56 PM

Mean Area 907.8
Mean Conc. 26.56mg/L



Sample

5/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.132

Sample Name: L17080402-03
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

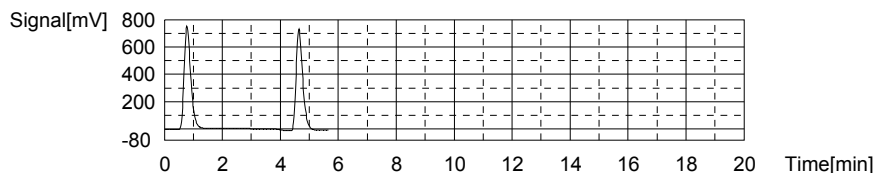
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.527mg/L TC:28.24mg/L IC:26.71mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1251	29.16mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 1:02:15 PM
2	1173	27.32mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 1:07:56 PM

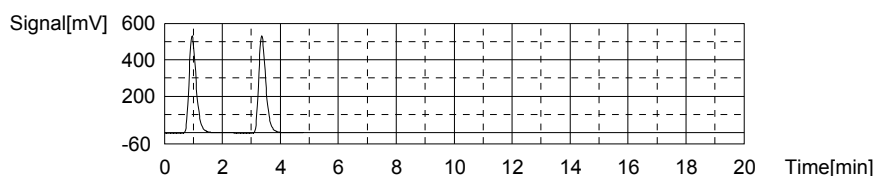
Mean Area 1212
 Mean Conc. 28.24mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	911.7	26.68mg/L	500uL	1	1	TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 1:13:28 PM
2	913.9	26.74mg/L	500uL	1	1	TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 1:18:52 PM

Mean Area 912.8
 Mean Conc. 26.71mg/L



Sample

Sample Name: L17080518-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.966mg/L TC:32.56mg/L IC:26.59mg/L

1. Det

Anal.: TC

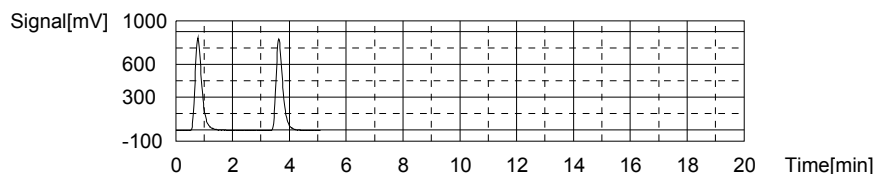
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1413	32.99mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 1:27:10 PM
2	1377	32.14mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 1:31:41 PM

6/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.132

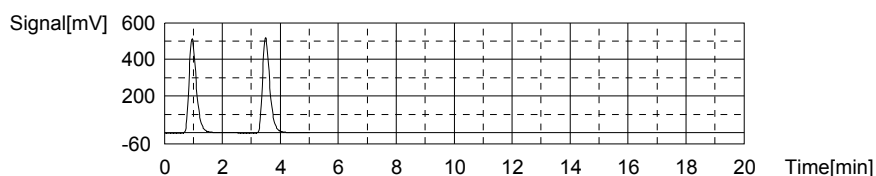
Mean Area 1395
Mean Conc. 32.56mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	906.5	26.52mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 1:37:24 PM
2	911.4	26.67mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 1:42:44 PM

Mean Area 909.0
Mean Conc. 26.59mg/L



Sample

Sample Name: L17080518-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

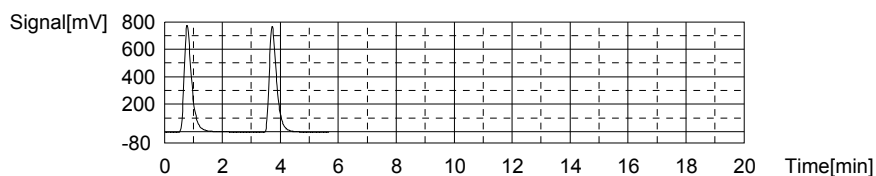
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:8.560mg/L TC:32.31mg/L IC:23.75mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1391	32.47mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 1:51:06 PM
2	1378	32.16mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 1:56:06 PM

Mean Area 1385
Mean Conc. 32.31mg/L



Anal.: IC

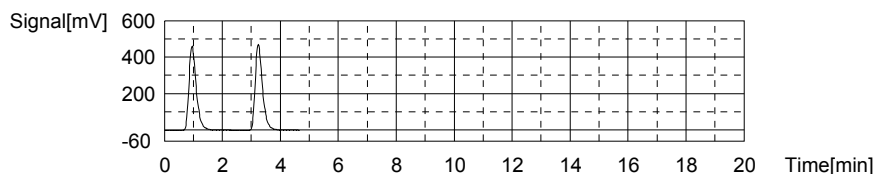
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	805.2	23.50mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 2:01:33 PM
2	822.4	24.01mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 2:06:44 PM

7/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.132

Mean Area 813.8
Mean Conc. 23.75mg/L



Sample

Sample Name: L17080534-01 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

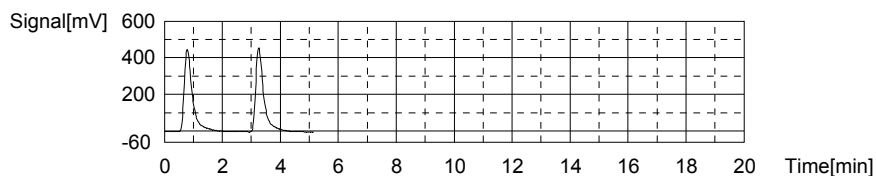
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.52mg/L TC:20.44mg/L IC:8.917mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	881.4	20.43mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 2:14:40 PM
2	882.4	20.45mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 2:19:38 PM

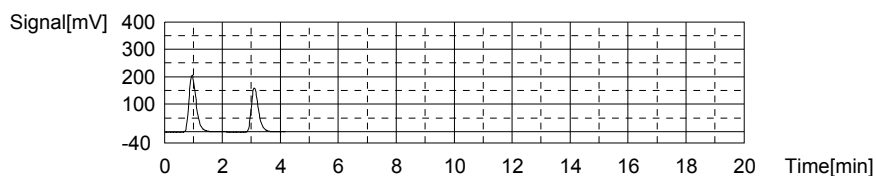
Mean Area 881.9
Mean Conc. 20.44mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	357.8	10.14mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	18/14/2017 2:24:48 PM
2	276.2	7.698mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	18/14/2017 2:29:37 PM

Mean Area 317.0
Mean Conc. 8.917mg/L



Sample

Sample Name: L17080537-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

8/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

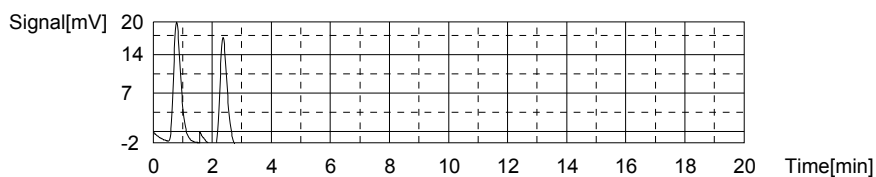
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.5614mg/L TC:0.4584mg/L IC:-0.1030mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	37.27	0.4821mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 2:36:37 PM
2	35.26	0.4346mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 2:40:32 PM

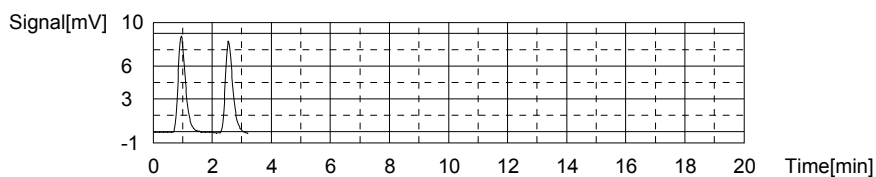
Mean Area 36.27
Mean Conc. 0.4584mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	15.21	-0.09570mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 2:45:01 PM
2	14.72	-0.1103mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 2:49:18 PM

Mean Area 14.97
Mean Conc. -0.1030mg/L



Sample

Sample Name: L17080556-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

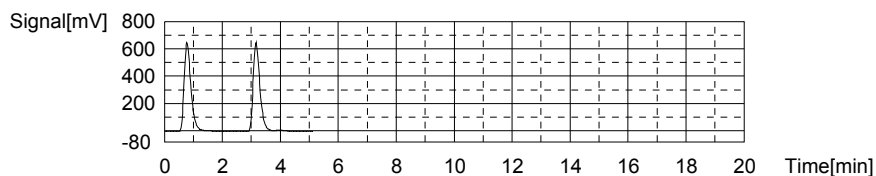
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.013mg/L TC:24.66mg/L IC:20.64mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1052	24.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 2:57:07 PM
2	1069	24.86mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 3:02:07 PM

Mean Area 1061
Mean Conc. 24.66mg/L



Anal.: IC

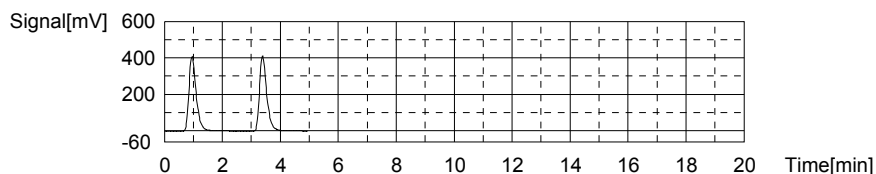
9/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	706.7	20.55mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 3:07:34 PM
2	712.7	20.73mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 3:12:54 PM

Mean Area 709.7
Mean Conc. 20.64mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

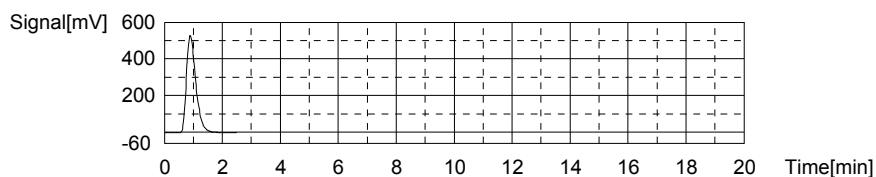
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:28.02mg/L TC:27.84mg/L IC:-0.1823mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1195	27.84mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 3:20:50 PM

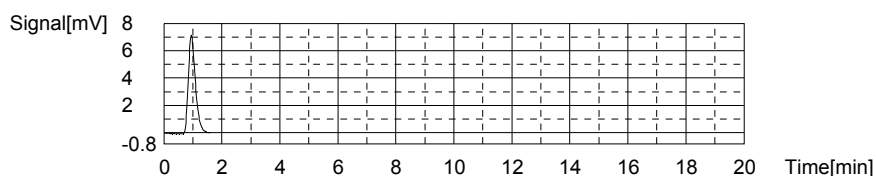
Mean Area 1195
Mean Conc. 27.84mg/L



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	18/14/2017 3:25:20 PM

Mean Area 12.31
Mean Conc. -0.1823mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

10/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.132

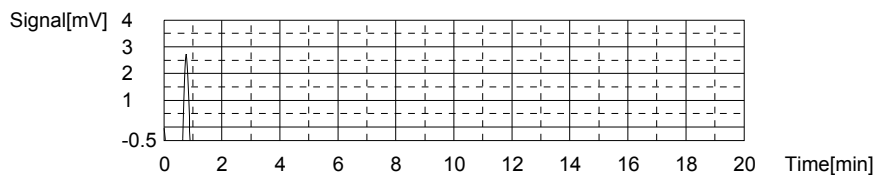
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.09048mg/L TC:-0.1645mg/L IC:-0.2550mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.901	-0.1645mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 3:30:25 PM

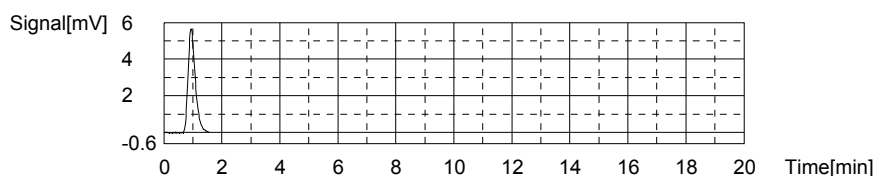
Mean Area 9.901
Mean Conc. -0.1645mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.875	-0.2550mg/L	500uL	1	1	TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 3:34:28 PM

Mean Area 9.875
Mean Conc. -0.2550mg/L



Sample

Sample Name: L17080556-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

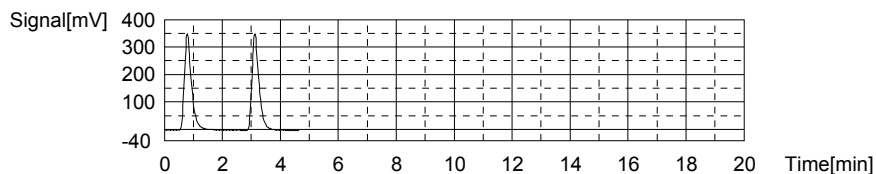
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.616mg/L TC:13.49mg/L IC:8.876mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	590.1	13.54mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 3:42:14 PM
2	585.8	13.44mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 3:46:49 PM

Mean Area 588.0
Mean Conc. 13.49mg/L



Anal.: IC

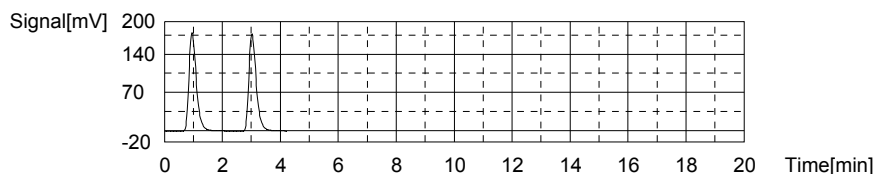
11/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	317.2	8.923mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 3:51:53 PM
2	314.1	8.830mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 3:56:45 PM

Mean Area 315.6
Mean Conc. 8.876mg/L



Sample

Sample Name: L17080556-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

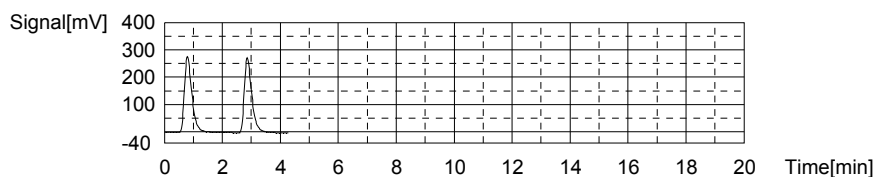
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.564mg/L TC:11.32mg/L IC:6.759mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	495.8	11.32mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 4:17:30 PM
2	496.4	11.33mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 4:21:58 PM

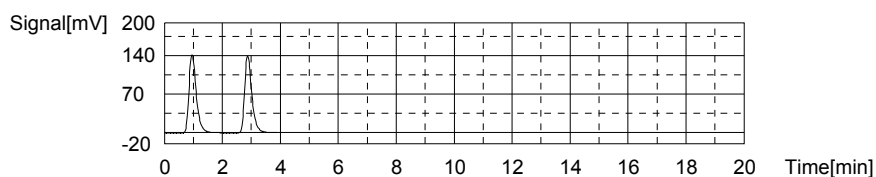
Mean Area 496.1
Mean Conc. 11.32mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	246.7	6.817mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 4:26:48 PM
2	242.8	6.701mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 4:31:33 PM

Mean Area 244.8
Mean Conc. 6.759mg/L



Sample

12/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.132

Sample Name: L17080570-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

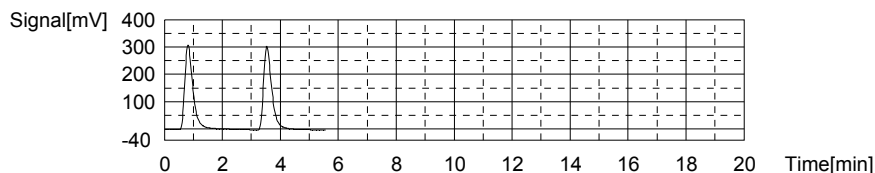
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:8.804mg/L TC:14.04mg/L IC:5.235mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	611.3	14.04mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 4:41:42 PM
2	610.8	14.03mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 4:47:00 PM

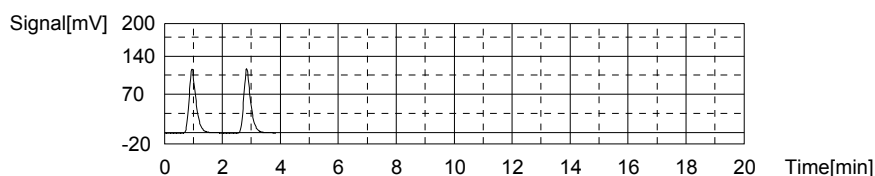
Mean Area 611.1
 Mean Conc. 14.04mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	193.3	5.223mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 4:51:49 PM
2	194.1	5.247mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 4:56:29 PM

Mean Area 193.7
 Mean Conc. 5.235mg/L



Sample

Sample Name: L17080594-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.682mg/L TC:6.625mg/L IC:2.943mg/L

1. Det

Anal.: TC

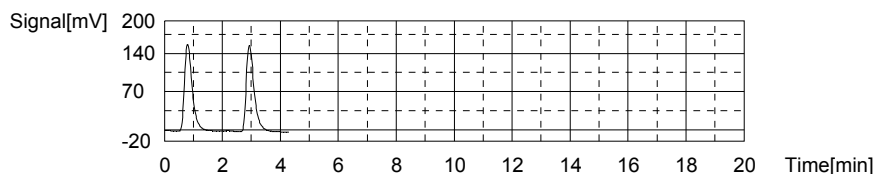
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	294.9	6.569mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 5:04:04 PM
2	299.6	6.680mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 5:08:30 PM

13/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.132

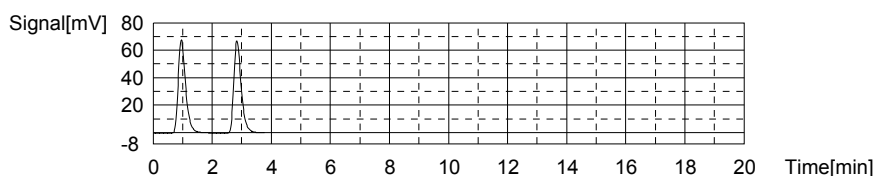
Mean Area 297.3
Mean Conc. 6.625mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	117.4	2.956mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 5:13:20 PM
2	116.5	2.929mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 5:17:55 PM

Mean Area 117.0
Mean Conc. 2.943mg/L



Sample

Sample Name: L17080594-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

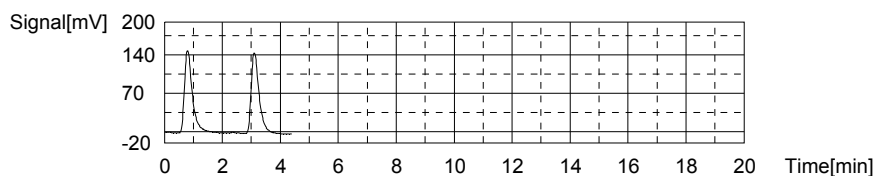
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.614mg/L TC:6.270mg/L IC:2.656mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	286.8	6.378mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 5:25:40 PM
2	277.7	6.163mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 5:30:02 PM

Mean Area 282.3
Mean Conc. 6.270mg/L

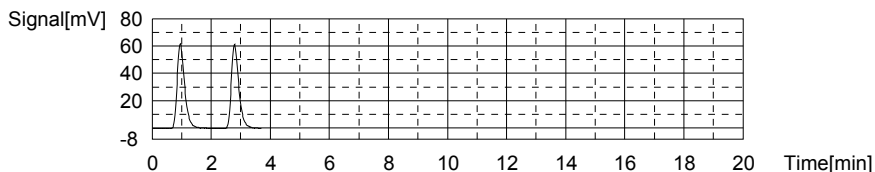


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	107.7	2.666mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 5:34:46 PM
2	107.0	2.645mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 5:39:19 PM

14/28

Mean Area 107.3
Mean Conc. 2.656mg/L



Sample

Sample Name: L17080672-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

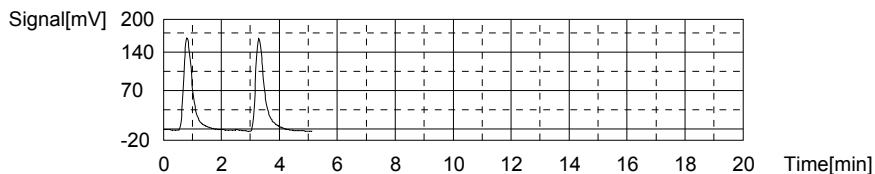
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.620mg/L TC:8.209mg/L IC:2.589mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	357.5	8.048mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 5:47:15 PM
2	371.1	8.369mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 5:52:11 PM

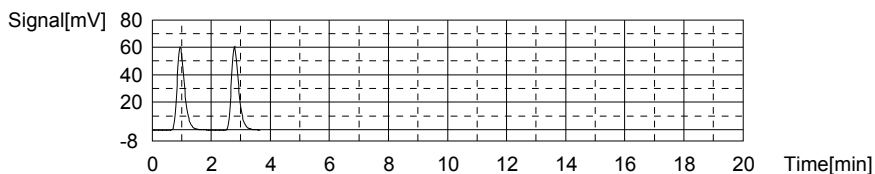
Mean Area 364.3
Mean Conc. 8.209mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	105.6	2.604mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	18/14/2017 5:56:54 PM
2	104.6	2.574mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	18/14/2017 6:01:24 PM

Mean Area 105.1
Mean Conc. 2.589mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

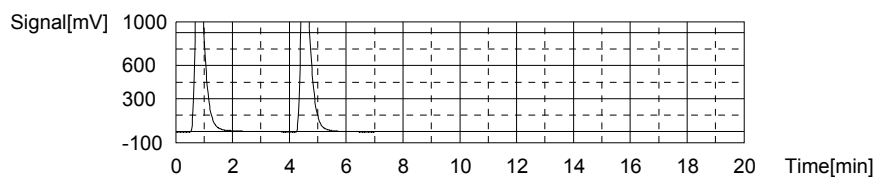
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:35.04mg/L TC:79.15mg/L IC:44.11mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	3351	78.77mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 6:10:34 PM
2	3383	79.53mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 6:17:15 PM

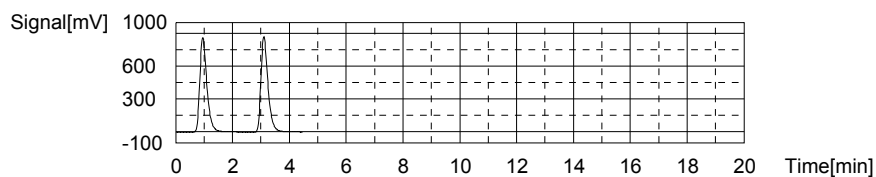
Mean Area 3367
Mean Conc. 79.15mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1492	44.01mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 6:22:28 PM
2	1499	44.22mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 6:27:43 PM

Mean Area 1496
Mean Conc. 44.11mg/L



Sample

Sample Name: L17080672-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

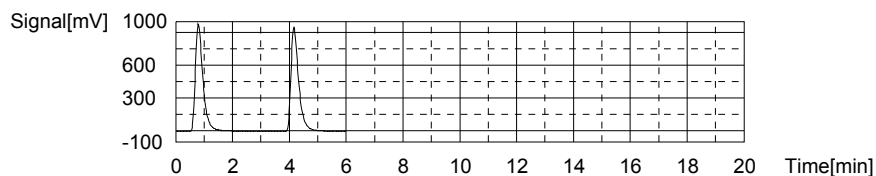
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:18.64mg/L TC:42.61mg/L IC:23.97mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1836	42.98mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 6:36:32 PM
2	1805	42.25mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 6:41:36 PM

Mean Area 1821
Mean Conc. 42.61mg/L



Anal.: IC

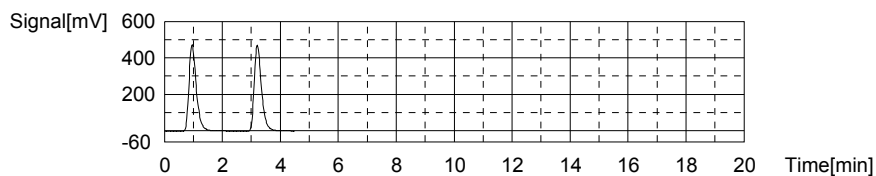
16/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	824.1	24.06mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 6:46:57 PM
2	818.1	23.88mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 6:52:00 PM

Mean Area 821.1
Mean Conc. 23.97mg/L



Sample

Sample Name: L17080672-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

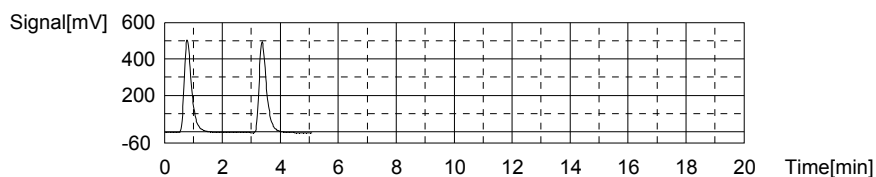
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.718mg/L TC:20.83mg/L IC:13.11mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	905.5	21.00mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 7:00:01 PM
2	891.7	20.67mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 7:04:48 PM

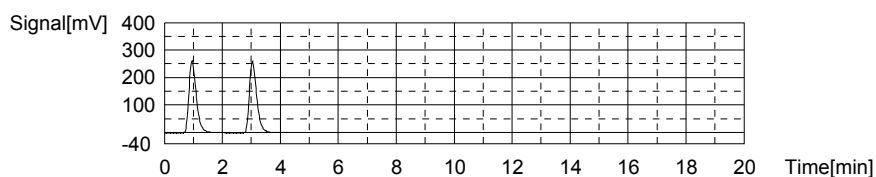
Mean Area 898.6
Mean Conc. 20.83mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	460.0	13.19mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 7:09:52 PM
2	455.1	13.04mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 7:14:44 PM

Mean Area 457.6
Mean Conc. 13.11mg/L



Sample

17/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

Sample Name:
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

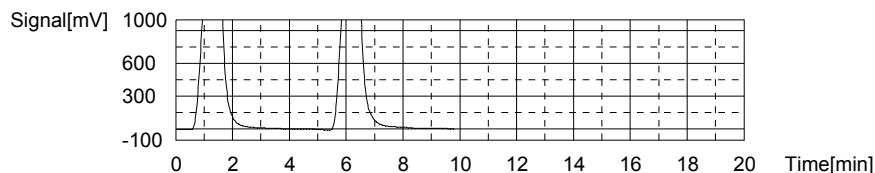
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:164.0mg/L TC:165.0mg/L IC:0.9447mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6989	164.7mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 7:25:05 PM
2	7009	165.2mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 7:33:49 PM

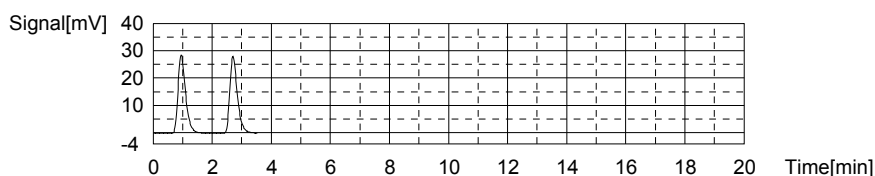
Mean Area 6999
 Mean Conc. 165.0mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	50.70	0.9642mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 7:38:33 PM
2	49.40	0.9253mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 7:43:00 PM

Mean Area 50.05
 Mean Conc. 0.9447mg/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:27.54mg/L TC:27.27mg/L IC:-0.2669mg/L

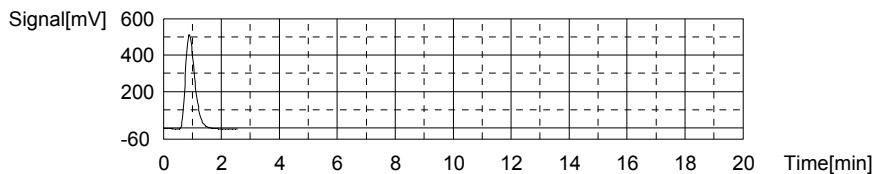
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1171	27.27mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 7:51:00 PM

18/28

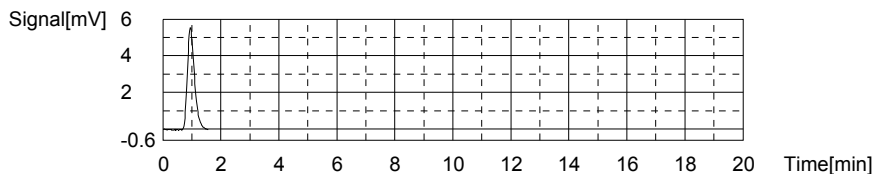
Mean Area 1171
Mean Conc. 27.27mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.478	-0.2669mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 7:55:23 PM

Mean Area 9.478
Mean Conc. -0.2669mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

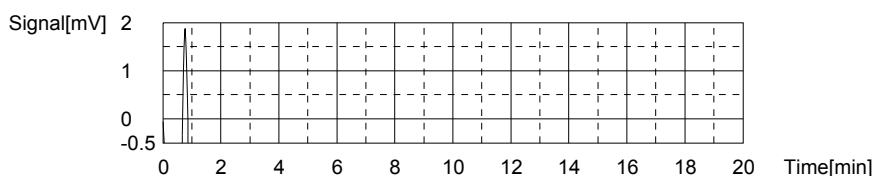
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.07765mg/L TC:-0.1827mg/L IC:-0.2603mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.134	-0.1827mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 8:00:28 PM

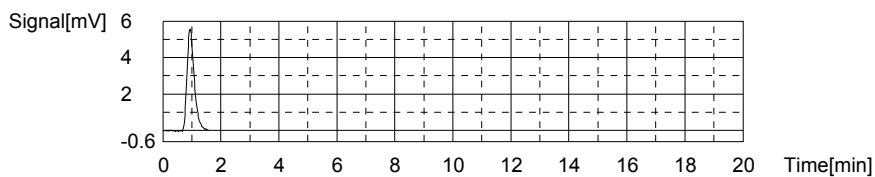
Mean Area 9.134
Mean Conc. -0.1827mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.698	-0.2603mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 8:04:26 PM

Mean Area 9.698
Mean Conc. -0.2603mg/L



Sample

Sample Name: <Untitled>
 Sample ID: TOC-02-10-2017A.met
 Origin: Completed
 Status: Completed
 Chk. Result:

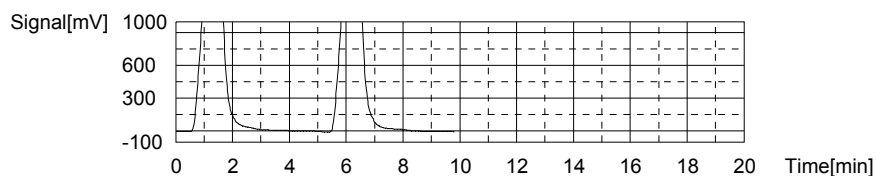
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:173.8mg/L TC:176.2mg/L IC:2.455mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7509	177.0mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 8:14:46 PM
2	7443	175.5mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 8:23:30 PM

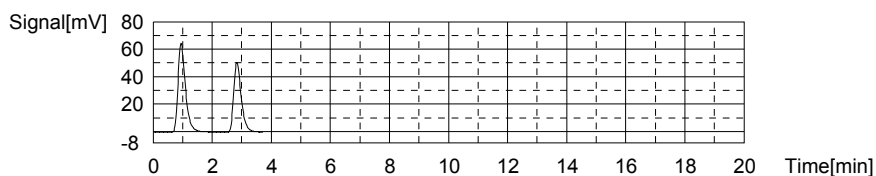
Mean Area 7476
 Mean Conc. 176.2mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	111.8	2.789mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 8:28:15 PM
2	89.46	2.122mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 8:32:45 PM

Mean Area 100.6
 Mean Conc. 2.455mg/L



Sample

Sample Name: L17080746-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.552mg/L TC:3.391mg/L IC:0.8390mg/L

1. Det

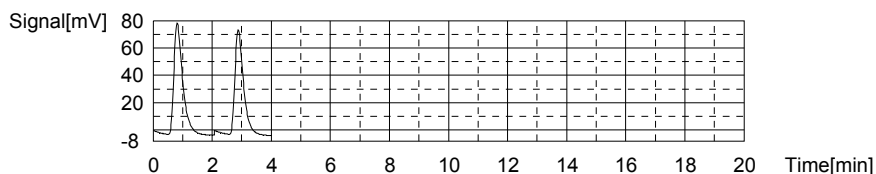
Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	168.0	3.571mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 8:40:16 PM
2	152.8	3.212mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 8:44:30 PM

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.132

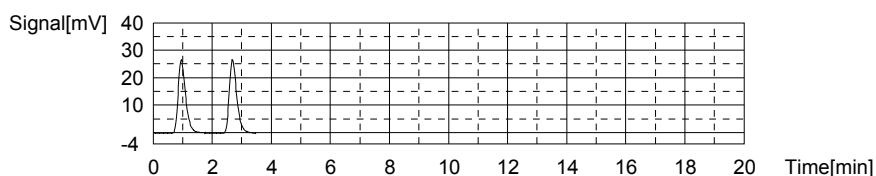
Mean Area 160.4
Mean Conc. 3.391mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	46.27	0.8319mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 8:49:07 PM
2	46.75	0.8462mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 8:53:33 PM

Mean Area 46.51
Mean Conc. 0.8390mg/L



Sample

Sample Name: WG625665-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

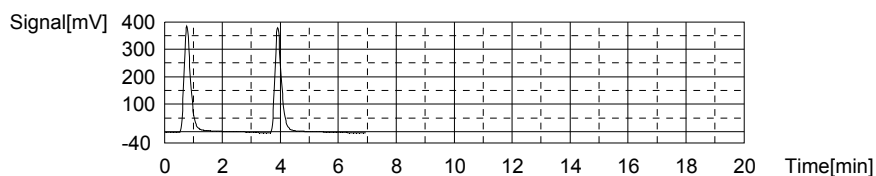
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.714mg/L TC:14.79mg/L IC:12.08mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	631.7	14.53mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 9:02:09 PM
2	654.0	15.05mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 9:09:11 PM

Mean Area 642.9
Mean Conc. 14.79mg/L



Anal.: IC

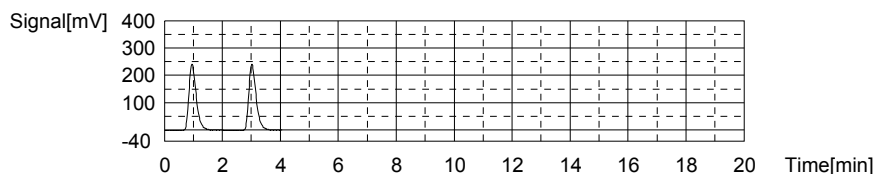
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	423.8	12.11mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 9:14:15 PM
2	421.8	12.05mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 9:18:57 PM

21/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

Mean Area 422.8
Mean Conc. 12.08mg/L



Sample

Sample Name: WG625665-06 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

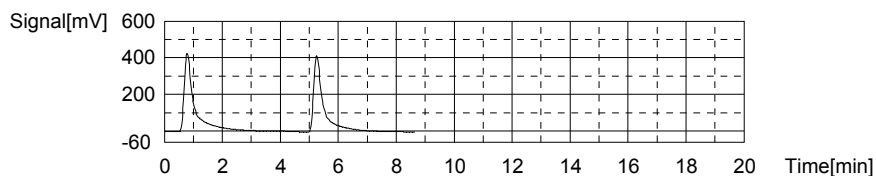
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.82mg/L TC:24.10mg/L IC:11.28mg/L

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_58	18/14/2017 9:28:52 PM
2	1006	23.37mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/14/2017 9:35:27 PM

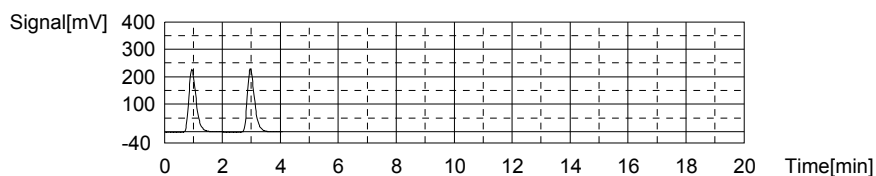
Mean Area 1037
Mean Conc. 24.10mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	395.6	11.26mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	18/14/2017 9:40:28 PM
2	396.9	11.30mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	18/14/2017 9:45:14 PM

Mean Area 396.3
Mean Conc. 11.28mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

22/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.i32

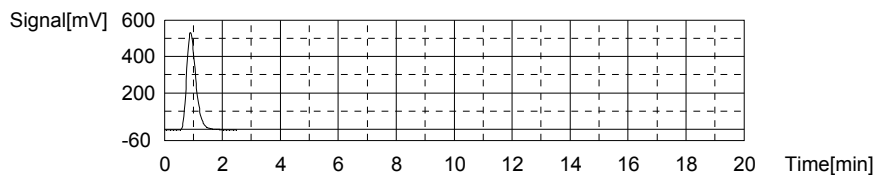
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:27.55mg/L TC:27.32mg/L IC:-0.2367mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1173	27.32mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 9:53:12 PM

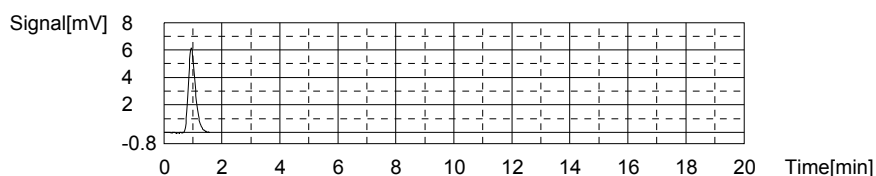
Mean Area 1173
Mean Conc. 27.32mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.49	-0.2367mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/14/2017 9:57:40 PM

Mean Area 10.49
Mean Conc. -0.2367mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

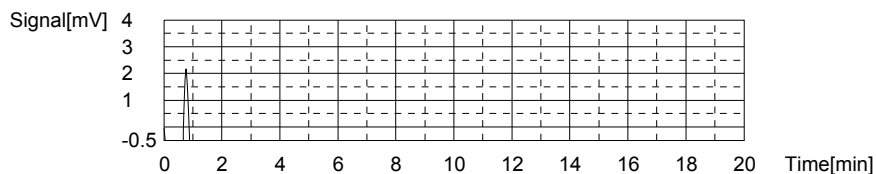
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.08760mg/L TC:-0.1661mg/L IC:-0.2537mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.836	-0.1661mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/14/2017 10:02:48 PM

Mean Area 9.836
Mean Conc. -0.1661mg/L



Anal.: IC

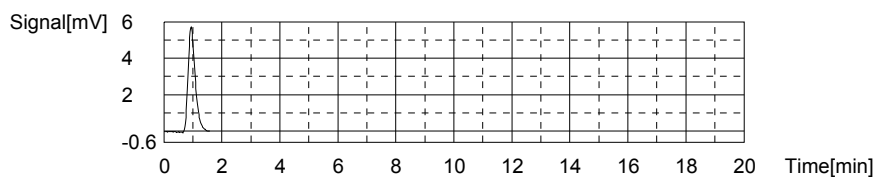
23/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.920	-0.2537mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/14/2017 10:06:48 PM

Mean Area 9.920
Mean Conc. -0.2537mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

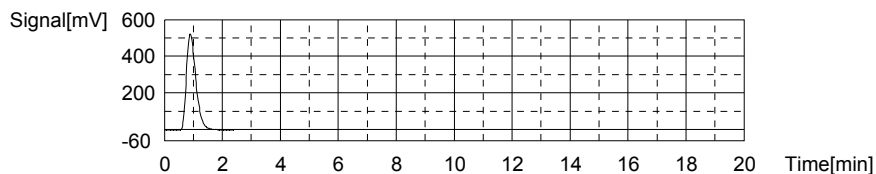
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:27.94mg/L TC:27.62mg/L IC:-0.3170mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1186	27.62mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32	18/15/2017 8:31:23 AM

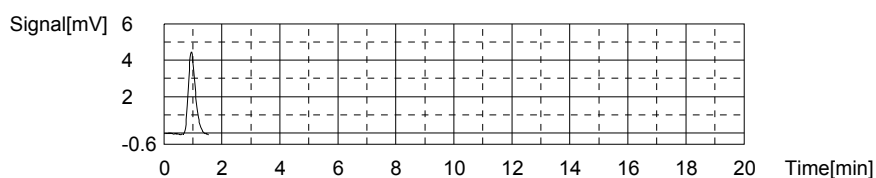
Mean Area 1186
Mean Conc. 27.62mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.800	-0.3170mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/15/2017 8:35:45 AM

Mean Area 7.800
Mean Conc. -0.3170mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

24/28

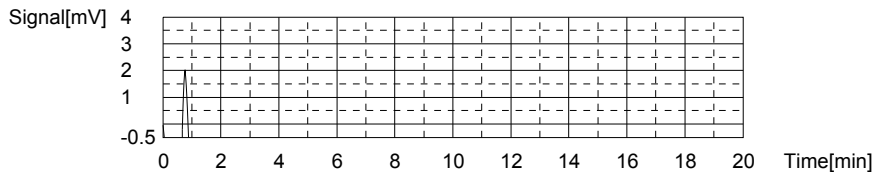
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06303mg/L TC:-0.1847mg/L IC:-0.2477mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.049	-0.1847mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	8/15/2017 8:40:52 AM

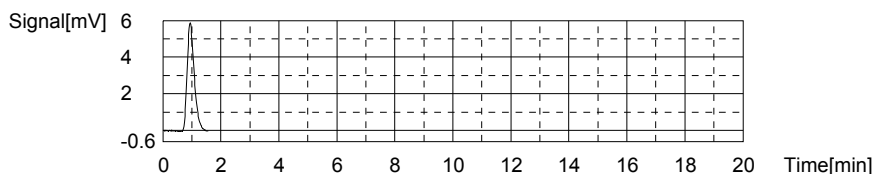
Mean Area 9.049
Mean Conc. -0.1847mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.12	-0.2477mg/L	500uL	1	1	TICURVE-02-10-2017.2017_02_10_14_45_18	8/15/2017 8:44:53 AM

Mean Area 10.12
Mean Conc. -0.2477mg/L



Sample

Sample Name: L17080672-02 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

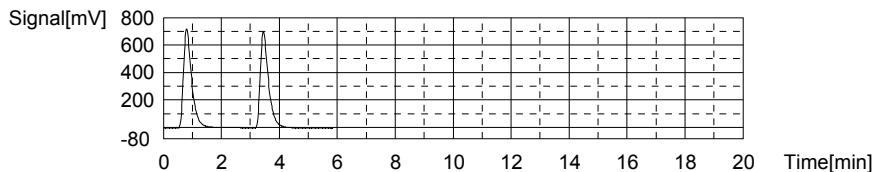
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:16.66mg/L TC:32.79mg/L IC:16.13mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1416	33.06mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	8/15/2017 8:52:59 AM
2	1393	32.51mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_58	8/15/2017 8:58:31 AM

Mean Area 1405
Mean Conc. 32.79mg/L



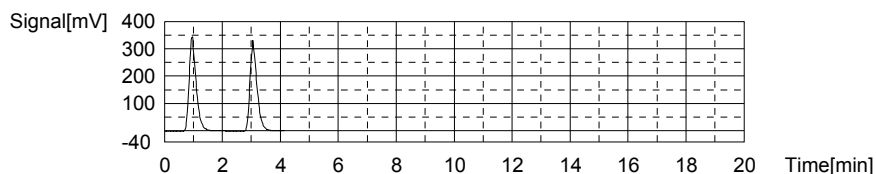
Anal.: IC

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.132

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	574.7	16.61mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/15/2017 9:03:36 AM
2	542.2	15.64mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/15/2017 9:08:24 AM

Mean Area 558.5
Mean Conc. 16.13mg/L



Sample

Sample Name: L17080678-01 (50)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

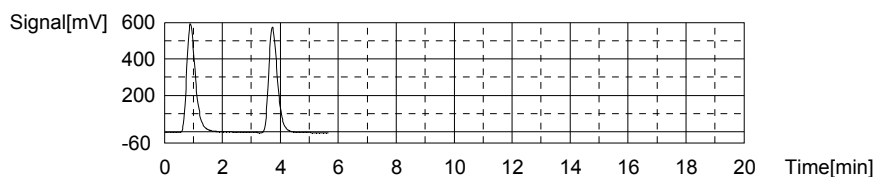
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:28.92mg/L TC:28.93mg/L IC:0.01838mg/L

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_58	18/15/2017 9:16:40 AM
2	1222	28.47mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/15/2017 9:22:59 AM

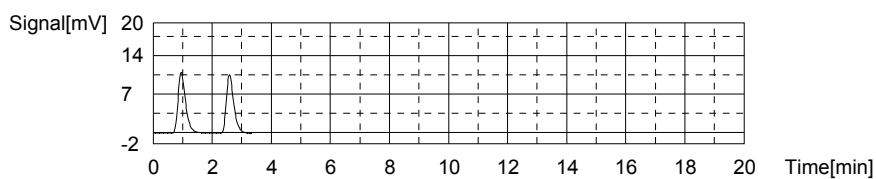
Mean Area 1242
Mean Conc. 28.93mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	19.40	0.02943mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/15/2017 9:27:32 AM
2	18.66	0.00733mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/15/2017 9:31:51 AM

Mean Area 19.03
Mean Conc. 0.01838mg/L



Sample

26/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

Sample Name: L17080680-01 (50)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

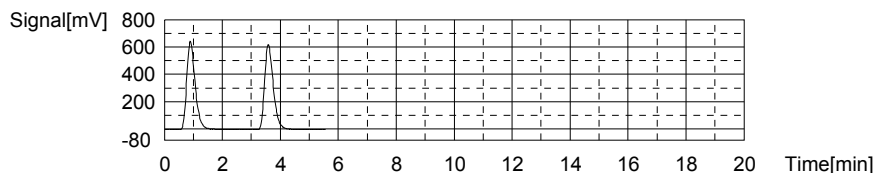
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:30.12mg/L TC:30.36mg/L IC:0.2403mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1304	30.41mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/15/2017 9:51:34 AM
2	1300	30.32mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/15/2017 9:57:45 AM

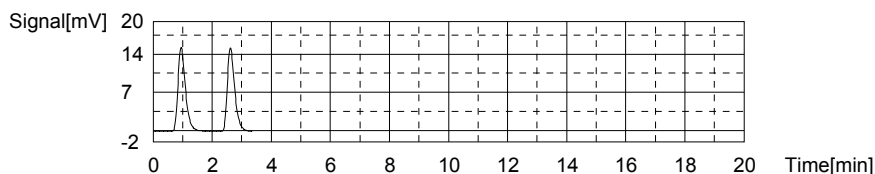
Mean Area 1302
 Mean Conc. 30.36mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	26.66	0.2462mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/15/2017 10:02:17 AM
2	26.26	0.2343mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/15/2017 10:06:40 AM

Mean Area 26.46
 Mean Conc. 0.2403mg/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:27.17mg/L TC:26.89mg/L IC:-0.2789mg/L

1. Det

Anal.: TC

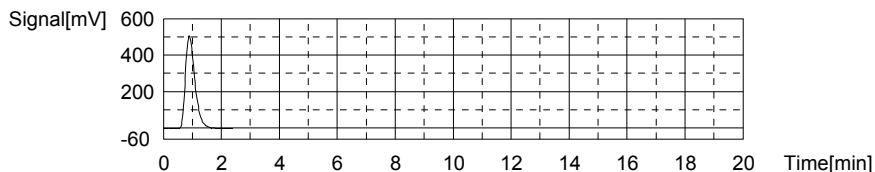
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1155	26.89mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/15/2017 10:14:30 AM

27/28

8/15/2017 10:58:50 AM

08-14-2017-EPT-TOC.t32

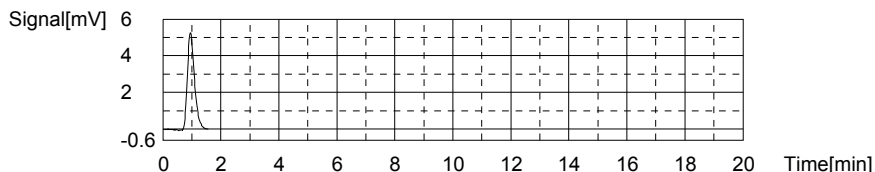
Mean Area 1155
Mean Conc. 26.89mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.077	-0.2789mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/15/2017 10:18:58 AM

Mean Area 9.077
Mean Conc. -0.2789mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

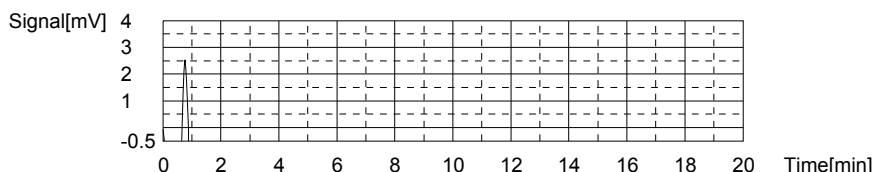
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06401mg/L TC:-0.1744mg/L IC:-0.2384mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.482	-0.1744mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	18/15/2017 10:24:06 AM

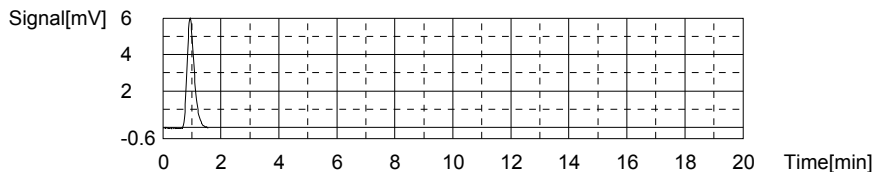
Mean Area 9.482
Mean Conc. -0.1744mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.43	-0.2384mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/15/2017 10:28:04 AM

Mean Area 10.43
Mean Conc. -0.2384mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
August 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	BLR - BRANDON L. RICHARDS
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

August 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

August 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 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

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	NO. OF CONTAINERS				AMMONIA-N	ORTHO-PHOSPHATE	PERCHLORATE	Analyses	Remarks (Preservatives, etc.)	Lab I.D.#
				2	1	1	1						
LH18/24-SP650-6464	Water	08/09/17 / 15:00		2	X			X				H2SO4	
LH18/24-SP650-6464	Water	08/09/17 / 15:00		1	X			X				NONE	
LH18/24-SP650-6464 Before Ion	Water	08/09/17 / 15:00		1					X			NONE	
LH18/24-SP650-6464 After Ion	Water	08/09/17 / 15:00		1					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>[Signature]</i>	08/09/17	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: 08/10/2017 10:10
 By: BRENDA GREGORY
 221000104429

[Signature]

COOLER TEMP >6° C LOG

Cooler ID 4429

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

CSD 8/10/17

pH Exceptions

pH Lot # AC601354

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

CSD 8/10/17

**PRESERVATIVE
EXCEPTIONS**
✓ **NONE**
AS NOTED

CSD 8/10/17

Document Control # 1957
Last 10-07-2016

Issued to: Document Master File

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17080534

Account: 2551

Project: 2551.096

Samples: 3

Due Date: 21-AUG-2017

Samplenum **Container ID** **Products**
L17080534-01 948074 PCT-S PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	10-AUG-2017 11:49	BRG		
2	ANALYZ	W1	WET	10-AUG-2017 12:18	ADG	CLS	
3	STORE	WET	A1	16-AUG-2017 09:02	BRG	ADG	

Samplenum **Container ID** **Products**
L17080534-01 948075 PCT-S TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	10-AUG-2017 11:49	BRG		<2
2	ANALYZ	W1	WET	11-AUG-2017 09:08	TB	BRG	
3	STORE	WET	A1	15-AUG-2017 16:28	BRG	EPT	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	10-AUG-2017 11:49	BRG		<2

Samplenum **Container ID** **Products**
L17080534-02 948076 PCT-S 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	10-AUG-2017 11:49	BRG		
2	ANALYZ	W1	SEM	11-AUG-2017 16:06	JWR	BRG	
3	STORE	SEM	A1	14-AUG-2017 11:06	BRG	WTD	

Samplenum **Container ID** **Products**
L17080534-03 948077 PCT-S 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	10-AUG-2017 11:49	BRG		
2	ANALYZ	W1	SEM	11-AUG-2017 16:06	JWR	BRG	
3	STORE	SEM	A1	14-AUG-2017 11:06	BRG	WTD	

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: L17080580

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 August 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 #: L17080580

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?
0018527	I	3.0		1ZW056F52210009864	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 #:** L17080580**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-SP650-6463	L17080580-01	08/09/2017 15:00	08/10/2017 10:10
TRIP BLANK	L17080580-02	08/09/2017 00:01	08/10/2017 10:10



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080580
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-08-16 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
Anthony Canter		Analyst I	2017-08-16 16:56:18



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080580
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-08-16 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	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:	L17080580
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-08-16 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			1
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:	L17080580
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-08-16 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			3
Was the ICAL curve verified for each analyte?		X			2
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:	L17080580
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-08-16 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)					
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:	L17080580
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-08-16 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

- 1) Chloroethane and bromomethane exceeded the UCL in the LCS analyzed 08/15/17 on HPMS6.
- 2) Dichlorodifluoromethane and bromomethane exceeded the UCL in the ICV analyzed 08/14/17 on HPMS6.
- 3) Chloroethane and bromomethane exceeded the UCL and chloromethane exceeded the UCL in the CCV analyzed 08/15/17 on HPMS6.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080580
Project Name:		Method:	9056
Prep Batch Number(s):	WG625730	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-15 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	2017-08-15 15:51:36



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17080580
Project Name:		Method:	9056
Prep Batch Number(s):	WG625730	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-15 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:	L17080580
Project Name:		Method:	9056
Prep Batch Number(s):	WG625730	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-15 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:	L17080580
Project Name:		Method:	9056
Prep Batch Number(s):	WG625730	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-15 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:	L17080580
Project Name:		Method:	9056
Prep Batch Number(s):	WG625730	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-15 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:	L17080580
Project Name:		Method:	9056
Prep Batch Number(s):	WG625730	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-15 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 #: L17080580

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080580-01	PrePrep Method: N/A	Instrument: HPMS6
Client ID: LH18/24-SP650-6463	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 08/14/2017 17:00
Workgroup #: WG625855	Analyst: TMB	Run Date: 08/15/2017 16:55
Collect Date: 08/09/2017 15:00	Dilution: 1	File ID: 6M149522
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Acetone	67-64-1	4.10	J	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	1.00	0.250	0.125
Bromobenzene	108-86-1	0.250	U	1.00	0.250	0.125
Bromochloromethane	74-97-5	0.400	U	1.00	0.400	0.200
Bromodichloromethane	75-27-4	0.500	U	1.00	0.500	0.250
Bromoform	75-25-2	1.00	U	2.00	1.00	0.500
Bromomethane	74-83-9	1.00	Q	2.00	1.00	0.500
2-Butanone	78-93-3	4.17	J	10.0	5.00	2.50
n-Butylbenzene	104-51-8	0.500	U	1.00	0.500	0.250
sec-Butylbenzene	135-98-8	0.500	U	1.00	0.500	0.250
tert-Butylbenzene	98-06-6	0.500	U	1.00	0.500	0.250
Carbon disulfide	75-15-0	1.00	U	2.00	1.00	0.500
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chlorobenzene	108-90-7	0.250	U	1.00	0.250	0.125
Chlorodibromomethane	124-48-1	0.500	U	1.00	0.500	0.250
Chloroethane	75-00-3	1.00	Q	2.00	1.00	0.500
Chloroform	67-66-3	0.250	U	1.00	0.250	0.125
Chloromethane	74-87-3	1.00	Q	2.00	1.00	0.500
2-Chlorotoluene	95-49-8	0.250	U	1.00	0.250	0.125
4-Chlorotoluene	106-43-4	0.500	U	1.00	0.500	0.250
1,2-Dibromo-3-chloropropane	96-12-8	2.00	U	5.00	2.00	1.00
1,2-Dibromoethane	106-93-4	0.500	U	1.00	0.500	0.250
Dibromomethane	74-95-3	0.500	U	1.00	0.500	0.250
1,2-Dichlorobenzene	95-50-1	0.250	U	1.00	0.250	0.125
1,3-Dichlorobenzene	541-73-1	0.500	U	1.00	0.500	0.250
1,4-Dichlorobenzene	106-46-7	0.250	U	1.00	0.250	0.125
Dichlorodifluoromethane	75-71-8	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	1.00	0.250	0.125
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
cis-1,2-Dichloroethene	156-59-2	5.88		1.00	0.500	0.250
trans-1,2-Dichloroethene	156-60-5	0.500	U	1.00	0.500	0.250

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,2-Dichloropropane	78-87-5	0.400	U	1.00	0.400	0.200
1,3-Dichloropropane	142-28-9	0.400	U	1.00	0.400	0.200
2,2-Dichloropropane	594-20-7	0.500	U	1.00	0.500	0.250
cis-1,3-Dichloropropene	10061-01-5	0.500	U	1.00	0.500	0.250
trans-1,3-Dichloropropene	10061-02-6	1.00	U	2.00	1.00	0.500
1,1-Dichloropropene	563-58-6	0.500	U	1.00	0.500	0.250
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
2-Hexanone	591-78-6	5.00	U	10.0	5.00	2.50
Hexachlorobutadiene	87-68-3	0.500	U	1.00	0.500	0.250
Isopropylbenzene	98-82-8	0.500	U	1.00	0.500	0.250
p-Isopropyltoluene	99-87-6	0.500	U	1.00	0.500	0.250
4-Methyl-2-pentanone	108-10-1	5.00	U	10.0	5.00	2.50
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
Naphthalene	91-20-3	0.400	U	1.00	0.400	0.200
n-Propylbenzene	103-65-1	0.250	U	1.00	0.250	0.125
Styrene	100-42-5	0.250	U	1.00	0.250	0.125
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	1.00	0.500	0.250
1,1,2,2-Tetrachloroethane	79-34-5	0.400	U	1.00	0.400	0.200
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
1,2,3-Trichlorobenzene	87-61-6	0.300	U	1.00	0.300	0.150
1,2,4-Trichlorobenzene	120-82-1	0.400	U	1.00	0.400	0.200
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
Trichloroethene	79-01-6	0.675	J	1.00	0.500	0.250
Trichlorofluoromethane	75-69-4	0.500	U	1.00	0.500	0.250
1,2,3-Trichloropropane	96-18-4	1.00	U	2.00	1.00	0.500
1,2,4-Trimethylbenzene	95-63-6	0.500	U	1.00	0.500	0.250
1,3,5-Trimethylbenzene	108-67-8	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
m-,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500

Surrogate	Recovery	Lower Limit	Upper Limit	Q
Dibromofluoromethane	102	85	115	
1,2-Dichloroethane-d4	94.5	70	120	
Toluene-d8	98.7	85	120	
4-Bromofluorobenzene	96.5	75	120	

J	Estimated value ; the analyte concentration was less than the LOQ.
Q	One or more quality control criteria failed. See narrative.



Lab Report #: L17080580
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

U	Analyte was not detected. The concentration is below the reported LOD.
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Lab Report #: L17080580
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080580-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6463	Prep Method: 9056	Prep Date: 08/14/2017 17:42
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG625730	Analyst: CAS	Run Date: 08/14/2017 23:10
Collect Date: 08/09/2017 15:00	Dilution: 5	File ID: I2_081417-20
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Sulfate	14808-79-8	76.0		10.0	5.00	2.50
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17080580
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080580-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6463	Prep Method: 9056	Prep Date: 08/14/2017 17:42
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG625730	Analyst: CAS	Run Date: 08/14/2017 23:29
Collect Date: 08/09/2017 15:00	Dilution: 50	File ID: I2_081417-21
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chloride	16887-00-6	663		20.0	10.0	5.00
J	Estimated value ; the analyte concentration was less than the LOQ.					

Lab Report #: L17080580

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080580-02	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: 08/14/2017 17:00
Workgroup #: WG625855	Analyst: TMB	Run Date: 08/15/2017 16:25
Collect Date: 08/09/2017 00:01	Dilution: 1	File ID: 6M149521
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Acetone	67-64-1	5.00	U	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	1.00	0.250	0.125
Bromobenzene	108-86-1	0.250	U	1.00	0.250	0.125
Bromochloromethane	74-97-5	0.400	U	1.00	0.400	0.200
Bromodichloromethane	75-27-4	0.500	U	1.00	0.500	0.250
Bromoform	75-25-2	1.00	U	2.00	1.00	0.500
Bromomethane	74-83-9	1.00	Q	2.00	1.00	0.500
2-Butanone	78-93-3	5.00	U	10.0	5.00	2.50
n-Butylbenzene	104-51-8	0.500	U	1.00	0.500	0.250
sec-Butylbenzene	135-98-8	0.500	U	1.00	0.500	0.250
tert-Butylbenzene	98-06-6	0.500	U	1.00	0.500	0.250
Carbon disulfide	75-15-0	1.00	U	2.00	1.00	0.500
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chlorobenzene	108-90-7	0.250	U	1.00	0.250	0.125
Chlorodibromomethane	124-48-1	0.500	U	1.00	0.500	0.250
Chloroethane	75-00-3	1.00	Q	2.00	1.00	0.500
Chloroform	67-66-3	0.250	U	1.00	0.250	0.125
Chloromethane	74-87-3	1.00	Q	2.00	1.00	0.500
2-Chlorotoluene	95-49-8	0.250	U	1.00	0.250	0.125
4-Chlorotoluene	106-43-4	0.500	U	1.00	0.500	0.250
1,2-Dibromo-3-chloropropane	96-12-8	2.00	U	5.00	2.00	1.00
1,2-Dibromoethane	106-93-4	0.500	U	1.00	0.500	0.250
Dibromomethane	74-95-3	0.500	U	1.00	0.500	0.250
1,2-Dichlorobenzene	95-50-1	0.250	U	1.00	0.250	0.125
1,3-Dichlorobenzene	541-73-1	0.500	U	1.00	0.500	0.250
1,4-Dichlorobenzene	106-46-7	0.250	U	1.00	0.250	0.125
Dichlorodifluoromethane	75-71-8	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	1.00	0.250	0.125
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
cis-1,2-Dichloroethene	156-59-2	0.500	U	1.00	0.500	0.250

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
trans-1,2-Dichloroethene	156-60-5	0.500	U	1.00	0.500	0.250
1,2-Dichloropropane	78-87-5	0.400	U	1.00	0.400	0.200
1,3-Dichloropropane	142-28-9	0.400	U	1.00	0.400	0.200
2,2-Dichloropropane	594-20-7	0.500	U	1.00	0.500	0.250
cis-1,3-Dichloropropene	10061-01-5	0.500	U	1.00	0.500	0.250
trans-1,3-Dichloropropene	10061-02-6	1.00	U	2.00	1.00	0.500
1,1-Dichloropropene	563-58-6	0.500	U	1.00	0.500	0.250
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
2-Hexanone	591-78-6	5.00	U	10.0	5.00	2.50
Hexachlorobutadiene	87-68-3	0.500	U	1.00	0.500	0.250
Isopropylbenzene	98-82-8	0.500	U	1.00	0.500	0.250
p-Isopropyltoluene	99-87-6	0.500	U	1.00	0.500	0.250
4-Methyl-2-pentanone	108-10-1	5.00	U	10.0	5.00	2.50
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
Naphthalene	91-20-3	0.400	U	1.00	0.400	0.200
n-Propylbenzene	103-65-1	0.250	U	1.00	0.250	0.125
Styrene	100-42-5	0.250	U	1.00	0.250	0.125
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	1.00	0.500	0.250
1,1,2,2-Tetrachloroethane	79-34-5	0.400	U	1.00	0.400	0.200
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
1,2,3-Trichlorobenzene	87-61-6	0.300	U	1.00	0.300	0.150
1,2,4-Trichlorobenzene	120-82-1	0.400	U	1.00	0.400	0.200
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
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Trichlorofluoromethane	75-69-4	0.500	U	1.00	0.500	0.250
1,2,3-Trichloropropane	96-18-4	1.00	U	2.00	1.00	0.500
1,2,4-Trimethylbenzene	95-63-6	0.500	U	1.00	0.500	0.250
1,3,5-Trimethylbenzene	108-67-8	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
m-,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500
Surrogate	Recovery	Lower Limit	Upper Limit	Q		
Dibromofluoromethane	101	85	115			
1,2-Dichloroethane-d4	94.0	70	120			
Toluene-d8	99.2	85	120			
4-Bromofluorobenzene	95.5	75	120			
Q	One or more quality control criteria failed. See narrative.					



Lab Report #: L17080580
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

U	Analyte was not detected. The concentration is below the reported LOD.
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2.1 Volatiles Data

2.1.1 Volatiles GCMS Data (8260)

2.1.1.1 Summary Data

Certificate of Analysis

Sample #: L17080580-01	PrePrep Method: N/A	Instrument: HPMS6
Client ID: LH18/24-SP650-6463	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 08/14/2017 17:00
Workgroup #: WG625855	Analyst: TMB	Run Date: 08/15/2017 16:55
Collect Date: 08/09/2017 15:00	Dilution: 1	File ID: 6M149522
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Acetone	67-64-1	4.10	J	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	1.00	0.250	0.125
Bromobenzene	108-86-1	0.250	U	1.00	0.250	0.125
Bromochloromethane	74-97-5	0.400	U	1.00	0.400	0.200
Bromodichloromethane	75-27-4	0.500	U	1.00	0.500	0.250
Bromoform	75-25-2	1.00	U	2.00	1.00	0.500
Bromomethane	74-83-9	1.00	Q	2.00	1.00	0.500
2-Butanone	78-93-3	4.17	J	10.0	5.00	2.50
n-Butylbenzene	104-51-8	0.500	U	1.00	0.500	0.250
sec-Butylbenzene	135-98-8	0.500	U	1.00	0.500	0.250
tert-Butylbenzene	98-06-6	0.500	U	1.00	0.500	0.250
Carbon disulfide	75-15-0	1.00	U	2.00	1.00	0.500
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chlorobenzene	108-90-7	0.250	U	1.00	0.250	0.125
Chlorodibromomethane	124-48-1	0.500	U	1.00	0.500	0.250
Chloroethane	75-00-3	1.00	Q	2.00	1.00	0.500
Chloroform	67-66-3	0.250	U	1.00	0.250	0.125
Chloromethane	74-87-3	1.00	Q	2.00	1.00	0.500
2-Chlorotoluene	95-49-8	0.250	U	1.00	0.250	0.125
4-Chlorotoluene	106-43-4	0.500	U	1.00	0.500	0.250
1,2-Dibromo-3-chloropropane	96-12-8	2.00	U	5.00	2.00	1.00
1,2-Dibromoethane	106-93-4	0.500	U	1.00	0.500	0.250
Dibromomethane	74-95-3	0.500	U	1.00	0.500	0.250
1,2-Dichlorobenzene	95-50-1	0.250	U	1.00	0.250	0.125
1,3-Dichlorobenzene	541-73-1	0.500	U	1.00	0.500	0.250
1,4-Dichlorobenzene	106-46-7	0.250	U	1.00	0.250	0.125
Dichlorodifluoromethane	75-71-8	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	1.00	0.250	0.125
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
cis-1,2-Dichloroethene	156-59-2	5.88		1.00	0.500	0.250
trans-1,2-Dichloroethene	156-60-5	0.500	U	1.00	0.500	0.250

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
1,2-Dichloropropane	78-87-5	0.400	U	1.00	0.400	0.200
1,3-Dichloropropane	142-28-9	0.400	U	1.00	0.400	0.200
2,2-Dichloropropane	594-20-7	0.500	U	1.00	0.500	0.250
cis-1,3-Dichloropropene	10061-01-5	0.500	U	1.00	0.500	0.250
trans-1,3-Dichloropropene	10061-02-6	1.00	U	2.00	1.00	0.500
1,1-Dichloropropene	563-58-6	0.500	U	1.00	0.500	0.250
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
2-Hexanone	591-78-6	5.00	U	10.0	5.00	2.50
Hexachlorobutadiene	87-68-3	0.500	U	1.00	0.500	0.250
Isopropylbenzene	98-82-8	0.500	U	1.00	0.500	0.250
p-Isopropyltoluene	99-87-6	0.500	U	1.00	0.500	0.250
4-Methyl-2-pentanone	108-10-1	5.00	U	10.0	5.00	2.50
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
Naphthalene	91-20-3	0.400	U	1.00	0.400	0.200
n-Propylbenzene	103-65-1	0.250	U	1.00	0.250	0.125
Styrene	100-42-5	0.250	U	1.00	0.250	0.125
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	1.00	0.500	0.250
1,1,1,2-Tetrachloroethane	79-34-5	0.400	U	1.00	0.400	0.200
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
1,2,3-Trichlorobenzene	87-61-6	0.300	U	1.00	0.300	0.150
1,2,4-Trichlorobenzene	120-82-1	0.400	U	1.00	0.400	0.200
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
Trichloroethene	79-01-6	0.675	J	1.00	0.500	0.250
Trichlorofluoromethane	75-69-4	0.500	U	1.00	0.500	0.250
1,2,3-Trichloropropane	96-18-4	1.00	U	2.00	1.00	0.500
1,2,4-Trimethylbenzene	95-63-6	0.500	U	1.00	0.500	0.250
1,3,5-Trimethylbenzene	108-67-8	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
m-,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500

Surrogate	Recovery	Lower Limit	Upper Limit	Q
Dibromofluoromethane	102	85	115	
1,2-Dichloroethane-d4	94.5	70	120	
Toluene-d8	98.7	85	120	
4-Bromofluorobenzene	96.5	75	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.
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Certificate of Analysis

Sample #: L17080580-02

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: 08/14/2017 17:00

Workgroup #: WG625855

Analyst: TMB

Run Date: 08/15/2017 16:25

Collect Date: 08/09/2017 00:01

Dilution: 1

File ID: 6M149521

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Acetone	67-64-1	5.00	U	10.0	5.00	2.50
Benzene	71-43-2	0.250	U	1.00	0.250	0.125
Bromobenzene	108-86-1	0.250	U	1.00	0.250	0.125
Bromochloromethane	74-97-5	0.400	U	1.00	0.400	0.200
Bromodichloromethane	75-27-4	0.500	U	1.00	0.500	0.250
Bromoform	75-25-2	1.00	U	2.00	1.00	0.500
Bromomethane	74-83-9	1.00	Q	2.00	1.00	0.500
2-Butanone	78-93-3	5.00	U	10.0	5.00	2.50
n-Butylbenzene	104-51-8	0.500	U	1.00	0.500	0.250
sec-Butylbenzene	135-98-8	0.500	U	1.00	0.500	0.250
tert-Butylbenzene	98-06-6	0.500	U	1.00	0.500	0.250
Carbon disulfide	75-15-0	1.00	U	2.00	1.00	0.500
Carbon tetrachloride	56-23-5	0.500	U	1.00	0.500	0.250
Chlorobenzene	108-90-7	0.250	U	1.00	0.250	0.125
Chlorodibromomethane	124-48-1	0.500	U	1.00	0.500	0.250
Chloroethane	75-00-3	1.00	Q	2.00	1.00	0.500
Chloroform	67-66-3	0.250	U	1.00	0.250	0.125
Chloromethane	74-87-3	1.00	Q	2.00	1.00	0.500
2-Chlorotoluene	95-49-8	0.250	U	1.00	0.250	0.125
4-Chlorotoluene	106-43-4	0.500	U	1.00	0.500	0.250
1,2-Dibromo-3-chloropropane	96-12-8	2.00	U	5.00	2.00	1.00
1,2-Dibromoethane	106-93-4	0.500	U	1.00	0.500	0.250
Dibromomethane	74-95-3	0.500	U	1.00	0.500	0.250
1,2-Dichlorobenzene	95-50-1	0.250	U	1.00	0.250	0.125
1,3-Dichlorobenzene	541-73-1	0.500	U	1.00	0.500	0.250
1,4-Dichlorobenzene	106-46-7	0.250	U	1.00	0.250	0.125
Dichlorodifluoromethane	75-71-8	0.500	U	1.00	0.500	0.250
1,1-Dichloroethane	75-34-3	0.250	U	1.00	0.250	0.125
1,2-Dichloroethane	107-06-2	0.500	U	1.00	0.500	0.250
1,1-Dichloroethene	75-35-4	1.00	U	2.00	1.00	0.500
cis-1,2-Dichloroethene	156-59-2	0.500	U	1.00	0.500	0.250

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
trans-1,2-Dichloroethene	156-60-5	0.500	U	1.00	0.500	0.250
1,2-Dichloropropane	78-87-5	0.400	U	1.00	0.400	0.200
1,3-Dichloropropane	142-28-9	0.400	U	1.00	0.400	0.200
2,2-Dichloropropane	594-20-7	0.500	U	1.00	0.500	0.250
cis-1,3-Dichloropropene	10061-01-5	0.500	U	1.00	0.500	0.250
trans-1,3-Dichloropropene	10061-02-6	1.00	U	2.00	1.00	0.500
1,1-Dichloropropene	563-58-6	0.500	U	1.00	0.500	0.250
Ethylbenzene	100-41-4	0.500	U	1.00	0.500	0.250
2-Hexanone	591-78-6	5.00	U	10.0	5.00	2.50
Hexachlorobutadiene	87-68-3	0.500	U	1.00	0.500	0.250
Isopropylbenzene	98-82-8	0.500	U	1.00	0.500	0.250
p-Isopropyltoluene	99-87-6	0.500	U	1.00	0.500	0.250
4-Methyl-2-pentanone	108-10-1	5.00	U	10.0	5.00	2.50
Methylene chloride	75-09-2	0.500	U	1.00	0.500	0.250
Naphthalene	91-20-3	0.400	U	1.00	0.400	0.200
n-Propylbenzene	103-65-1	0.250	U	1.00	0.250	0.125
Styrene	100-42-5	0.250	U	1.00	0.250	0.125
1,1,1,2-Tetrachloroethane	630-20-6	0.500	U	1.00	0.500	0.250
1,1,1,2-Tetrachloroethane	79-34-5	0.400	U	1.00	0.400	0.200
Tetrachloroethene	127-18-4	0.500	U	1.00	0.500	0.250
Toluene	108-88-3	0.500	U	1.00	0.500	0.250
1,2,3-Trichlorobenzene	87-61-6	0.300	U	1.00	0.300	0.150
1,2,4-Trichlorobenzene	120-82-1	0.400	U	1.00	0.400	0.200
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
Trichloroethene	79-01-6	0.500	U	1.00	0.500	0.250
Trichlorofluoromethane	75-69-4	0.500	U	1.00	0.500	0.250
1,2,3-Trichloropropane	96-18-4	1.00	U	2.00	1.00	0.500
1,2,4-Trimethylbenzene	95-63-6	0.500	U	1.00	0.500	0.250
1,3,5-Trimethylbenzene	108-67-8	0.500	U	1.00	0.500	0.250
Vinyl chloride	75-01-4	0.500	U	1.00	0.500	0.250
o-Xylene	95-47-6	0.500	U	1.00	0.500	0.250
m-,p-Xylene	179601-23-1	1.00	U	2.00	1.00	0.500

Surrogate	Recovery	Lower Limit	Upper Limit	Q
Dibromofluoromethane	101	85	115	
1,2-Dichloroethane-d4	94.0	70	120	
Toluene-d8	99.2	85	120	
4-Bromofluorobenzene	95.5	75	120	
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: 061617
 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: 54224

Internal Standard: STD82231 Surrogate Standard: STD82231
 CCV: STD82307; STD8199 LCS: STD82370; STD82415 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG618225; WG618258

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M148029	WG618224-01 50ng BFB STD 8260	NA	1	1	STD81972	06/16/17 11:55
6M148030	WG618224-02 50ug/L CCV STD 8260	NA	1	1	STD88307	06/16/17 12:20
6M148031	WG618224-02 50ug/L CCV STD 8260	NA	1	1	STD88307	06/16/17 12:51
6M148032	WG618224-01 50ng BFB STD 8260	NA	1	1	STD81972	06/16/17 13:42
6M148033	WG618224-02 50ug/L CCV STD 8260	NA	1	1	STD82307	06/16/17 14:06
6M148034	BFB CHECK FIL \#2	NA	1	1	STD81972	06/16/17 14:36
6M148035	BFB CHECK FIL \#2	NA	1	1	STD81972	06/16/17 14:49
6M148036	WG618258-01 50ng BFB STD 8260	NA	1	1	STD81972	06/16/17 15:02
6M148037	WG618258-02 5ug/L STD A9/FOO	NA	1	1	STD82199	06/16/17 15:28
6M148038	WG618258-03 20ug/L STD A9/FOO	NA	1	1	STD82199	06/16/17 15:58
6M148039	WG618258-04 50ug/L STD A9/FOO	NA	1	1	STD82199	06/16/17 16:28
6M148040	WG618258-05 100ug/L STD A9/FOO	NA	1	1	STD82199	06/16/17 16:57
6M148041	WG618258-06 200ug/L STD A9/FOO	NA	1	1	STD82199	06/16/17 17:27
6M148042	WG618258-07 300ug/L STD A9/FOO	NA	1	1	STD82199	06/16/17 17:57
6M148043	WG618258-08 400ug/L STD A9/FOO	NA	1	1	STD82199	06/16/17 18:27
6M148044	WG618258-09 500ug/L STD A9/FOO	NA	1	1	STD82199	06/16/17 18:57
6M148045	RINSE	NA	1	1		06/16/17 19:27
6M148046	RINSE	NA	1	1		06/16/17 19:58
6M148047	WG618258-10 100ug/L ALT SRC STD A9/F	NA	1	1	STD82415	06/16/17 20:29
6M148048	WG618224-02 50ug/L CCV STD	NA	1	1	STD82307	06/16/17 20:59
6M148049	WG618225-02 20ug/L LCS STD 624	NA	2	1	STD82370	06/16/17 21:30
6M148050	WG618225-03 20ug/L LCS STD 624	NA	2	1	STD82370	06/16/17 22:00
6M148051	RINSE	NA	2	1		06/16/17 22:31
6M148052	WG618225-01 VBLK0616 STD 624	NA	2	1		06/16/17 23:01
6M148053	L17060815-04 B 624-SPE	6	2	1		06/16/17 23:32
6M148054	L17060815-08 B 624-SPE	7	2	1		06/17/17 00:02
6M148055	RINSE	NA	2	1		06/17/17 00:32
6M148056	L17060911-01 A 624-SPE5	6	2	1		06/17/17 01:02
6M148057	L17060918-01 A 624-SPE	6	2	1		06/17/17 01:33
6M148058	L17060919-01 A 624-SPE	6	2	1		06/17/17 02:02
6M148059	L17060920-01 A 624-SPE	6	2	1		06/17/17 02:33
6M148060	L17060921-01 A 624-SPE	<2	2	1		06/17/17 03:03
6M148061	L17060924-01 A 624-SPE	6	2	1		06/17/17 03:33
6M148062	CCV	NA	1	1		06/17/17 04:04

Approved: June 19, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 061617
 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: 54224

Internal Standard: STD82231 Surrogate Standard: STD82231
 CCV: STD82307; STD8199 LCS: STD82370; STD82415 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG618225; WG618258

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M148063	RINSE	NA	1	1		06/17/17 04:35
6M148064	RINSE	NA	1	1		06/17/17 05:05
6M148065	RINSE	NA	1	1		06/17/17 05:36

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2	X			
File ID: 6M148030				
11-dce was high, DNR.				
3	X			
File ID: 6M148031				
11-dce was high, DNR.				
5	X			
File ID: 6M148033				
11-dce was high, DNR.				

Approved: June 19, 2017

Page: 2

Sarah Vandenberg



Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 081417
 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: 54290

Internal Standard: STD83284 Surrogate Standard: STD83284
 CCV: STD83378 LCS: STD83388; STD83193 MS/MSD: STD83237
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG625704; WG625761

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M149464	BFB CHECK	NA	1	1	STD83010	08/14/17 08:31
6M149465	BFB CHECK	NA	1	1	STD83010	08/14/17 08:47
6M149466	BFB CHECK	NA	1	1	STD83010	08/14/17 09:01
6M149467	RINSE	NA	1	1		08/14/17 09:27
6M149468	RINSE	NA	1	1		08/14/17 10:16
6M149469	RINSE	NA	1	1		08/14/17 10:56
6M149470	RINSE	NA	1	1		08/14/17 11:37
6M149471	WG625704-01 50ng BFB STD 8260	NA	1	1	STD83010	08/14/17 12:07
6M149472	WG625704-02 0.3ug/L STD 8260	NA	1	1	STD83378	08/14/17 12:32
6M149473	WG625704-03 0.4ug/L STD 8260	NA	1	1	STD83378	08/14/17 13:02
6M149474	WG625704-04 1ug/L STD 8260	NA	1	1	STD83378	08/14/17 13:31
6M149475	WG625704-05 2ug/L STD 8260	NA	1	1	STD83378	08/14/17 14:01
6M149476	WG625704-06 5ug/L STD 8260	NA	1	1	STD83378	08/14/17 14:31
6M149477	WG625704-07 20ug/L STD 8260	NA	1	1	STD83378	08/14/17 15:01
6M149478	WG625704-08 50ug/L STD 8260	NA	1	1	STD83378	08/14/17 15:30
6M149479	WG625704-09 100ug/L STD 8260	NA	1	1	STD83378	08/14/17 16:00
6M149480	WG625704-10 200ug/L STD 8260	NA	1	1	STD83378	08/14/17 16:30
6M149481	WG625704-11 300ug/L STD 8260	NA	1	1	STD83378	08/14/17 17:00
6M149482	RINSE	NA	1	1		08/14/17 17:30
6M149483	RINSE	NA	1	1		08/14/17 18:00
6M149484	WG625704-12 20ug/L ALT SRC STD 8260	NA	1	1	STD83388	08/14/17 18:29
6M149485	WG625761-02 20ug/L LCS STD 8260	NA	2	1	STD83388	08/14/17 18:59
6M149486	WG625761-03 100ug/L A9 LCS STD 8260	NA	2	1	STD83193	08/14/17 19:28
6M149487	RINSE	NA	1	1		08/14/17 19:58
6M149488	WG625761-01 0814 BLANK STD 624	NA	2	1		08/14/17 20:28
6M149489	L17080745-15 A TB 624-SPE1	6	2	1		08/14/17 20:57
6M149490	L17080745-13 A EB 624-SPE1	7	2	1		08/14/17 21:27
6M149491	L17080667-03 B 624-SPE	7	2	1		08/14/17 21:57
6M149492	L17080703-01 B 200X 624-SPE1	7	2	200		08/14/17 22:26
6M149493	L17080703-07 B 10X 624-SPE1	7	2	10		08/14/17 22:56
6M149494	L17080733-01 A 624-SPE2	<2	2	1		08/14/17 23:25
6M149495	L17080732-01 A 624-SPE	<2	2	1		08/14/17 23:55
6M149496	L17080738-01 A 624-SPE	7	2	1		08/15/17 00:24
6M149497	L17080745-01 A 624-SPE1	7	2	1		08/15/17 00:54

Approved: August 15, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 081417
 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: 54290

Internal Standard: STD83284 Surrogate Standard: STD83284
 CCV: STD83378 LCS: STD83388; STD83193 MS/MSD: STD83237
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG625704; WG625761

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M149498	L17080745-03 A 624-SPE1	7	2	1		08/15/17 01:24
6M149499	L17080745-05 A 624-SPE1	7	2	1		08/15/17 01:54
6M149500	L17080745-07 A RS 624-SPE1	7	2	1		08/15/17 02:24
6M149501	L17080745-09 A MS 624-SPE1	7	2	1	STD83237	08/15/17 02:53
6M149502	L17080745-11 A MSD 624-SPE1	7	2	1	STD83237	08/15/17 03:23
6M149503	L17080645-02 A 624-SPE	9	2	1		08/15/17 03:53
6M149504	L17080645-03 A 624-SPE	9	2	1		08/15/17 04:23
6M149505	L17080645-04 A 624-SPE	7	2	1		08/15/17 04:53
6M149506	L17080645-05 A 624-SPE	8	2	1		08/15/17 05:23
6M149507	CCV	NA	1	1		08/15/17 05:53
6M149508	RINSE	NA	1	1		08/15/17 06:23
6M149509	RINSE	NA	1	1		08/15/17 06:53

Approved: August 15, 2017

Page: 2

Cathy Carter



Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 081517
 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: _____

Internal Standard: STD83284 Surrogate Standard: STD83284
 CCV: STD83378 LCS: STD83388 MS/MSD: STD83237

Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG625855; WG625943

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M149510	WG625854-01 50ng BFB STD 8260	NA	1	1	STD83010	08/15/17 11:02
6M149511	WG625854-02 50ug/L CCV STD 8260	NA	1	1	STD83378	08/15/17 11:27
6M149512	WG625854-02 50ug/L CCV STD 8260	NA	1	1	STD83378	08/15/17 11:59
6M149513	WG000000-01 100ug/L A9 CCV STD 8260	NA	1	1	STD83151	08/15/17 12:29
6M149514	WG625855-01 0815 BLANK STD 8260	NA	1	1		08/15/17 12:59
6M149515	WG625855-02 20ug/L LCS STD 8260	NA	1	1	STD83388	08/15/17 13:29
6M149516	L17080676-03 A RS 826-SPE	<2	1	1		08/15/17 13:59
6M149517	L17080676-04 A MS 826-SPE	<2	1	1	STD83237	08/15/17 14:27
6M149518	L17080676-05 A MSD 826-SPE	<2	1	1	STD83237	08/15/17 14:57
6M149519	L17080676-06 A TB 826-SPE	<2	1	1		08/15/17 15:26
6M149520	L17080676-02 A EB 826-SPE	<2	1	1		08/15/17 15:56
6M149521	L17080580-02 A TB 826-LOW	<2	1	1		08/15/17 16:25
6M149522	L17080580-01 A 826-LOW	<2	1	1		08/15/17 16:55
6M149523	L17080739-06 A TB 826-SPE	<2	1	1		08/15/17 17:25
6M149524	L17080739-05 A FB 826-SPE	<2	1	1		08/15/17 17:55
6M149525	L17080783-03 A TB 826-BETX	<2	1	1		08/15/17 18:25
6M149526	L17080783-01 A 826-BETX	<2	1	1		08/15/17 18:55
6M149527	L17080784-01 A 826-BETX	<2	1	1		08/15/17 19:25
6M149528	L17080676-01 A 2X 826-SPE	<2	1	2		08/15/17 19:55
6M149529	L17080739-01 A 826-SPE	<2	1	1		08/15/17 20:25
6M149530	L17080739-07 A 826-SPE	<2	1	1		08/15/17 20:54
6M149531	L17080739-02 A 2X 826-SPE	<2	1	2		08/15/17 21:24
6M149532	L17080739-03 A 2.5X 826-SPE	<2	1	2.5		08/15/17 21:54
6M149533	L17080739-04 A 2.5X 826-SPE	<2	1	2.5		08/15/17 22:23
6M149534	RINSE	NA	1	1		08/15/17 22:53
6M149535	WG625943-02 20ug/L LCS STD 624	NA	2	1	STD83388	08/15/17 23:23
6M149536	WG625943-03 20ug/L LCS2 STD 624	NA	2	1	STD83388	08/15/17 23:53
6M149537	RINSE	NA	2	1		08/16/17 00:22
6M149538	WG625943-01 0815 BLANK STD 624	NA	2	1		08/16/17 00:52
6M149539	L17080805-02 A TB 624-SPE	6	2	1		08/16/17 01:22
6M149540	L17080805-01 A 624-SPE	6	2	1		08/16/17 01:51
6M149541	L17080815-01 A 624-SPE	<2	2	1		08/16/17 02:21
6M149542	L17080816-01 A 624-SPE	<2	2	1		08/16/17 02:51
6M149543	CCV	NA	1	1		08/16/17 03:20

Approved: August 16, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 081517
 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: _____

Internal Standard: STD83284 Surrogate Standard: STD83284
 CCV: STD83378 LCS: STD83388 MS/MSD: STD83237
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG625855; WG625943

Comments: _____

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M149544	RINSE	NA	1	1		08/16/17 03:50
6M149545	RINSE	NA	1	1		08/16/17 04:19

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2	X			
File ID: 6M149511				
2-butanone was low, DNR.				
4				
File ID: 6M149513				
Not needed, DNR.				
7	X	5	Over Calibration Range	Benzene, EB
File ID: 6M149516				
L17080676-03				
19	X	1	Analyzed too dilute	
File ID: 6M149528				
L17080676-01				
24	X	1	Analyzed too dilute	
File ID: 6M149533				
L17080739-04				
30	X	1		
File ID: 6M149539				
L17080805-02 Compounds were low in the lcs.				
31	X	1		
File ID: 6M149540				
L17080805-01 Compounds low in the lcs.				

Approved: August 16, 2017

Page: 2

Cathy Carter



Microbac Laboratories Inc.

Data Checklist

Date: 16-JUN-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 82832
 Analytical Workgroups: WG618225

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	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:
19-JUN-2017

Tiffany Bailey

Secondary Reviewer:
19-JUN-2017

Sarah Vandenberg



Microbac Laboratories Inc.

Data Checklist

Date: 14-AUG-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 83955
 Analytical Workgroups: WG625704; WG605761

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	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	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:
15-AUG-2017

Tiffany Bailey

Secondary Reviewer:
15-AUG-2017

Aditya Carter



Analytical Method:8260B
Login Number:L17080580

AAB#:WG625855

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-SP650-6463	01	08/09/17					08/15/2017	6.1	14		08/15/17	6.1	14	
TRIP BLANK	02	08/09/17					08/15/2017	6.7	14		08/15/17	6.7	14	

* = SEE PROJECT QAPP REQUIREMENTS



Login Number:L17080580
 Instrument Id:HPMS6
 Workgroup (AAB#):WG625855

Method:8260
 CAL ID: HPMS6-14-AUG-17
 Matrix:Water

Sample Number	Dilution	Tag	1	2	3	4
L17080580-01	1.00	01	94.5	102	96.5	98.7
L17080580-02	1.00	01	94.0	101	95.5	99.2
WG625855-01	1.00	01	93.0	102	96.1	99.1
WG625855-02	1.00	01	93.2	101	94.1	97.5

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: L17080580 Work Group: WG625855
 Blank File ID: 6M149514 Blank Sample ID: WG625855-01
 Prep Date: 08/15/17 12:59 Instrument ID: HPMS6
 Analyzed Date: 08/15/17 12:59 Method: 8260B
 Analyst: TMB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG625855-02	6M149515	08/15/17 13:29	01
TRIP BLANK	L17080580-02	6M149521	08/15/17 16:25	01
LH18/24-SP650-6463	L17080580-01	6M149522	08/15/17 16:55	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5434741
 Report generated 08/16/2017 12:29



Login Number: L17080580 Prep Date: 08/15/17 12:59 Sample ID: WG625855-01
 Instrument ID: HPMS6 Run Date: 08/15/17 12:59 Prep Method: 5030B/5030C/503
 File ID: 6M149514 Analyst: TMB Method: 8260B
 Workgroup (AAB#): WG625855 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS6-14-AUG-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Acetone	2.50	10.0	2.50	1	U
Benzene	0.125	1.00	0.125	1	U
Bromobenzene	0.125	1.00	0.125	1	U
Bromochloromethane	0.200	1.00	0.200	1	U
Bromodichloromethane	0.250	1.00	0.250	1	U
Bromoform	0.500	2.00	0.500	1	U
Bromomethane	0.500	2.00	0.760	1	J
2-Butanone	2.50	10.0	2.50	1	U
n-Butylbenzene	0.250	1.00	0.250	1	U
sec-Butylbenzene	0.250	1.00	0.250	1	U
tert-Butylbenzene	0.250	1.00	0.250	1	U
Carbon disulfide	0.500	2.00	0.500	1	U
Carbon tetrachloride	0.250	1.00	0.250	1	U
Chlorobenzene	0.125	1.00	0.125	1	U
Chlorodibromomethane	0.250	1.00	0.250	1	U
Chloroethane	0.500	2.00	0.500	1	U
Chloroform	0.125	1.00	0.125	1	U
Chloromethane	0.500	2.00	0.500	1	U
2-Chlorotoluene	0.125	1.00	0.125	1	U
4-Chlorotoluene	0.250	1.00	0.250	1	U
1,2-Dibromo-3-chloropropane	1.00	5.00	1.00	1	U
1,2-Dibromoethane	0.250	1.00	0.250	1	U
Dibromomethane	0.250	1.00	0.250	1	U
1,2-Dichlorobenzene	0.125	1.00	0.125	1	U
1,3-Dichlorobenzene	0.250	1.00	0.250	1	U
1,4-Dichlorobenzene	0.125	1.00	0.125	1	U
Dichlorodifluoromethane	0.250	1.00	0.250	1	U
1,1-Dichloroethane	0.125	1.00	0.125	1	U
1,2-Dichloroethane	0.250	1.00	0.250	1	U
1,1-Dichloroethene	0.500	2.00	0.500	1	U
cis-1,2-Dichloroethene	0.250	1.00	0.250	1	U
trans-1,2-Dichloroethene	0.250	1.00	0.250	1	U
1,2-Dichloropropane	0.200	1.00	0.200	1	U
1,3-Dichloropropane	0.200	1.00	0.200	1	U
2,2-Dichloropropane	0.250	1.00	0.250	1	U
cis-1,3-Dichloropropene	0.250	1.00	0.250	1	U
trans-1,3-Dichloropropene	0.500	2.00	0.500	1	U
1,1-Dichloropropene	0.250	1.00	0.250	1	U
Ethylbenzene	0.250	1.00	0.250	1	U
2-Hexanone	2.50	10.0	2.50	1	U
Hexachlorobutadiene	0.250	1.00	0.250	1	U
Isopropylbenzene	0.250	1.00	0.250	1	U

Report Name: BLANK
 PDF ID: 5433577
 16-AUG-2017 12:29



Login Number: L17080580 Prep Date: 08/15/17 12:59 Sample ID: WG625855-01
 Instrument ID: HPMS6 Run Date: 08/15/17 12:59 Prep Method: 5030B/5030C/503
 File ID: 6M149514 Analyst: TMB Method: 8260B
 Workgroup (AAB#): WG625855 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS6-14-AUG-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
p-Isopropyltoluene	0.250	1.00	0.250	1	U
4-Methyl-2-pentanone	2.50	10.0	2.50	1	U
Methylene chloride	0.250	1.00	0.250	1	U
Naphthalene	0.200	1.00	0.200	1	U
n-Propylbenzene	0.125	1.00	0.125	1	U
Styrene	0.125	1.00	0.125	1	U
1,1,1,2-Tetrachloroethane	0.250	1.00	0.250	1	U
1,1,2,2-Tetrachloroethane	0.200	1.00	0.200	1	U
Tetrachloroethene	0.250	1.00	0.250	1	U
Toluene	0.250	1.00	0.250	1	U
1,2,3-Trichlorobenzene	0.150	1.00	0.150	1	U
1,2,4-Trichlorobenzene	0.200	1.00	0.200	1	U
1,1,1-Trichloroethane	0.250	1.00	0.250	1	U
1,1,2-Trichloroethane	0.250	1.00	0.250	1	U
Trichloroethene	0.250	1.00	0.250	1	U
Trichlorofluoromethane	0.250	1.00	0.250	1	U
1,2,3-Trichloropropane	0.500	2.00	0.500	1	U
1,2,4-Trimethylbenzene	0.250	1.00	0.250	1	U
1,3,5-Trimethylbenzene	0.250	1.00	0.250	1	U
Vinyl chloride	0.250	1.00	0.250	1	U
o-Xylene	0.250	1.00	0.250	1	U
m-,p-Xylene	0.500	2.00	0.500	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
Dibromofluoromethane	102	85 - 115	PASS
1,2-Dichloroethane-d4	93.0	70 - 120	PASS
Toluene-d8	99.1	85 - 120	PASS
4-Bromofluorobenzene	96.1	75 - 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: 5433577
 16-AUG-2017 12:29



Login Number: L17080580 Run Date: 08/15/2017 Sample ID: WG625855-02
 Instrument ID: HPMS6 Run Time: 13:29 Prep Method: 5030B/5030C/503
 File ID: 6M149515 Analyst: TMB Method: 8260B
 Workgroup (AAB#): WG625855 Matrix: Water Units: ug/L
 QC Key: DOD4 Lot#: STD83388 Cal ID: HPMS6-14-AUG-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Acetone	20.0	19.0	95.0	40 - 140	
Benzene	20.0	18.9	94.3	80 - 120	
Bromobenzene	20.0	19.5	97.6	75 - 125	
Bromochloromethane	20.0	20.2	101	65 - 130	
Bromodichloromethane	20.0	18.7	93.3	75 - 120	
Bromoform	20.0	20.2	101	70 - 130	
Bromomethane	20.0	35.2	176	30 - 145	*
2-Butanone	20.0	18.4	92.1	30 - 150	
n-Butylbenzene	20.0	18.8	94.2	70 - 135	
sec-Butylbenzene	20.0	19.5	97.5	70 - 125	
tert-Butylbenzene	20.0	20.3	102	70 - 130	
Carbon disulfide	20.0	17.8	88.9	35 - 160	
Carbon tetrachloride	20.0	19.1	95.5	65 - 140	
Chlorobenzene	20.0	20.2	101	80 - 120	
Chlorodibromomethane	20.0	19.4	97.1	60 - 135	
Chloroethane	20.0	28.7	143	60 - 135	*
Chloroform	20.0	19.2	95.9	65 - 135	
Chloromethane	20.0	18.7	93.6	40 - 125	
2-Chlorotoluene	20.0	18.9	94.6	75 - 125	
4-Chlorotoluene	20.0	18.9	94.4	75 - 130	
1,2-Dibromo-3-chloropropane	20.0	18.5	92.6	50 - 130	
1,2-Dibromoethane	20.0	18.7	93.5	80 - 120	
Dibromomethane	20.0	19.4	97.0	75 - 125	
1,2-Dichlorobenzene	20.0	20.1	101	70 - 120	
1,3-Dichlorobenzene	20.0	19.6	98.2	75 - 125	
1,4-Dichlorobenzene	20.0	20.0	100	75 - 125	
Dichlorodifluoromethane	20.0	27.0	135	30 - 155	
1,1-Dichloroethane	20.0	18.2	91.0	70 - 135	
1,2-Dichloroethane	20.0	18.3	91.4	70 - 130	
1,1-Dichloroethene	20.0	18.0	90.2	70 - 130	
cis-1,2-Dichloroethene	20.0	19.4	97.2	70 - 125	
trans-1,2-Dichloroethene	20.0	19.4	97.1	60 - 140	
1,2-Dichloropropane	20.0	18.9	94.7	75 - 125	
1,3-Dichloropropane	20.0	19.2	96.0	75 - 125	
2,2-Dichloropropane	20.0	16.4	81.9	70 - 135	
cis-1,3-Dichloropropene	20.0	19.7	98.6	70 - 130	
trans-1,3-Dichloropropene	20.0	18.5	92.5	55 - 140	
1,1-Dichloropropene	20.0	19.3	96.6	75 - 130	
Ethylbenzene	20.0	19.8	98.8	75 - 125	
2-Hexanone	20.0	17.9	89.3	55 - 130	
Hexachlorobutadiene	20.0	19.5	97.5	50 - 140	

LCS - Modified 03/06/2008
 PDF File ID: 5433578
 Report generated: 08/16/2017 12:29



Login Number: L17080580 Run Date: 08/15/2017 Sample ID: WG625855-02
 Instrument ID: HPMS6 Run Time: 13:29 Prep Method: 5030B/5030C/503
 File ID: 6M149515 Analyst: TMB Method: 8260B
 Workgroup (AAB#): WG625855 Matrix: Water Units: ug/L
 QC Key: DOD4 Lot#: STD83388 Cal ID: HPMS6-14-AUG-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Isopropylbenzene	20.0	19.0	95.1	75 - 125	
p-Isopropyltoluene	20.0	19.6	97.9	75 - 130	
4-Methyl-2-pentanone	20.0	19.4	96.8	60 - 135	
Methylene chloride	20.0	18.9	94.4	55 - 140	
Naphthalene	20.0	19.7	98.3	55 - 140	
n-Propylbenzene	20.0	19.1	95.5	70 - 130	
Styrene	20.0	20.0	99.8	65 - 135	
1,1,1,2-Tetrachloroethane	20.0	20.1	100	80 - 130	
1,1,2,2-Tetrachloroethane	20.0	18.2	90.9	65 - 130	
Tetrachloroethene	20.0	19.8	99.2	45 - 150	
Toluene	20.0	18.9	94.4	75 - 120	
1,2,3-Trichlorobenzene	20.0	19.6	98.1	55 - 140	
1,2,4-Trichlorobenzene	20.0	20.4	102	65 - 135	
1,1,1-Trichloroethane	20.0	19.2	95.8	65 - 130	
1,1,2-Trichloroethane	20.0	19.4	96.9	75 - 125	
Trichloroethene	20.0	20.0	99.8	70 - 125	
Trichlorofluoromethane	20.0	20.7	104	60 - 145	
1,2,3-Trichloropropane	20.0	19.6	98.0	75 - 125	
1,2,4-Trimethylbenzene	20.0	19.9	99.6	75 - 130	
1,3,5-Trimethylbenzene	20.0	18.9	94.7	75 - 130	
Vinyl chloride	20.0	24.2	121	50 - 145	
o-Xylene	20.0	20.4	102	80 - 120	
m-,p-Xylene	40.0	39.8	99.5	75 - 130	

Surrogates	% Recovery	Surrogate Limits	Qualifier
Dibromofluoromethane	101	85 - 115	PASS
1,2-Dichloroethane-d4	93.2	70 - 120	PASS
Toluene-d8	97.5	85 - 120	PASS
4-Bromofluorobenzene	94.1	75 - 120	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
 PDF File ID: 5433578
 Report generated: 08/16/2017 12:29



BFB

Login Number: L17080580 Tune ID: WG618258-01
 Instrument: HPMS6 Run Date: 06/16/2017
 Analyst: TMB Run Time: 15:02
 Workgroup: WG618258 File ID: 6M148036
 Cal ID: HPMS6-16-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	20.7	7716	PASS
75.0	95.0	30.0	60.0	52.8	19672	PASS
95.0	95.0	100	100	100	37261	PASS
96.0	95.0	5.00	9.00	6.84	2550	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	66.2	24674	PASS
175	174	5.00	9.00	7.35	1813	PASS
176	174	95.0	101	96.6	23826	PASS
177	176	5.00	9.00	7.21	1717	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG618258-02	STD	01	06/16/2017 15:28	
WG618258-03	STD	01	06/16/2017 15:58	
WG618258-04	STD	01	06/16/2017 16:28	
WG618258-05	STD-CCV	01	06/16/2017 16:57	
WG618258-06	STD	01	06/16/2017 17:27	
WG618258-07	STD	01	06/16/2017 17:57	
WG618258-08	STD	01	06/16/2017 18:27	
WG618258-09	STD	01	06/16/2017 18:57	
WG618258-10	SSCV	01	06/16/2017 20:29	

* Sample past 12 hour tune limit



BFB

Login Number: L17080580

Tune ID: WG625704-01

Instrument: HPMS6

Run Date: 08/14/2017

Analyst: TMB

Run Time: 12:07

Workgroup: WG625704

File ID: 6M149471

Cal ID: HPMS6-14-AUG-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	17.7	6648	PASS
75.0	95.0	30.0	60.0	44.8	16855	PASS
95.0	95.0	100	100	100	37634	PASS
96.0	95.0	5.00	9.00	6.39	2405	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	81.5	30666	PASS
175	174	5.00	9.00	7.36	2257	PASS
176	174	95.0	101	99.7	30589	PASS
177	176	5.00	9.00	7.25	2217	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG625704-02	STD	01	08/14/2017 12:32	
WG625704-03	STD	01	08/14/2017 13:02	
WG625704-04	STD	01	08/14/2017 13:31	
WG625704-05	STD	01	08/14/2017 14:01	
WG625704-06	STD	01	08/14/2017 14:31	
WG625704-07	STD	01	08/14/2017 15:01	
WG625704-08	STD-CCV	01	08/14/2017 15:30	
WG625704-09	STD	01	08/14/2017 16:00	
WG625704-10	STD	01	08/14/2017 16:30	
WG625704-11	STD	01	08/14/2017 17:00	
WG625704-12	SSCV	01	08/14/2017 18:29	

* Sample past 12 hour tune limit



BFB

Login Number: L17080580 Tune ID: WG625854-01
 Instrument: HPMS6 Run Date: 08/15/2017
 Analyst: TMB Run Time: 11:02
 Workgroup: WG625854 File ID: 6M149510
 Cal ID: HPMS6-14-AUG-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	17.1	6864	PASS
75.0	95.0	30.0	60.0	43.9	17648	PASS
95.0	95.0	100	100	100	40232	PASS
96.0	95.0	5.00	9.00	7.09	2853	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	76.9	30949	PASS
175	174	5.00	9.00	6.98	2160	PASS
176	174	95.0	101	98.4	30462	PASS
177	176	5.00	9.00	7.23	2201	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG625854-02	CCV	01	08/15/2017 11:59	
WG625855-01	BLANK	01	08/15/2017 12:59	
WG625855-02	LCS	01	08/15/2017 13:29	
L17080580-02	TRIP BLANK	01	08/15/2017 16:25	
L17080580-01	LH18/24-SP650-6463	01	08/15/2017 16:55	

* Sample past 12 hour tune limit



Calibration Table Report

Method: A9FOOWTR.M

Title: A9-FOO Water - IC: 061617 - HPMS6

Last Calibration: Mon Jun 19 16:17:47 2017

Curve: WG618258

Calibration Files

Compound	Concentration (ppm)										Avg	%RSD
	5	20	50	100	200	300	400	500				
Fluorobenzene	ISTD											
Acetonitrile	0.039	0.039	0.040	0.041	0.038	0.036	0.035	0.035	0.038		6.559	
3-Chloro-1-propene	0.640	0.643	0.616	0.596	0.582	0.531	0.518	0.493	0.577		9.876	
2-Chloro-1,3-butadiene	0.503	0.509	0.508	0.502	0.495	0.456	0.456	0.440	0.484		5.785	
Ethyl Acetate	0.230	0.258	0.271	0.270	0.249	0.229	0.231	0.230	0.246		7.504	
Methacrylonitrile	0.096	0.109	0.113	0.113	0.105	0.097	0.099	0.098	0.104		6.784	
Isobutyl Alcohol	0.008	0.010	0.012	0.012	0.011	0.010	0.010	0.010	0.011		10.551	
Methyl methacrylate	0.218	0.253	0.265	0.267	0.250	0.232	0.233	0.230	0.244		7.343	
2-Nitropropane	0.058	0.068	0.076	0.078	0.076	0.072	0.073	0.073	0.072		8.738	
Chlorobenzene-d5	ISTD											
1,4-Dichlorobenzene-d4	ISTD											
Cyclohexanone	0.020	0.023	0.024	0.022	0.021	0.023	0.024	0.022	0.022		7.113	

Mon Jun 19 16:30:37 2017

T	1,2,3-Trichloropropane		0.168	0.189	0.192	0.185	0.186	0.18	0.182		0.1832	4.253	
T	trans-1,4-Dichloro-2-Butene			0.14	0.158	0.15	0.136	0.135	0.136	0.156	0.14	0.1438	6.4093
T	n-Propylbenzene	4.202	4.094	3.818	3.888	3.727	3.636	3.236	2.929			3.6912	11.542
T	Bromobenzene	0.918	0.939	0.884	0.849	0.873	0.862	0.85	0.796	0.8		0.8634	5.508
T	1,3,5-Trimethylbenzene		2.941	2.853	2.727	2.751	2.685	2.636	2.413	2.276		2.6602	8.2704
T	2-Chlorotoluene		2.791	2.506	2.374	2.417	2.408	2.282	2.051	1.97		2.3496	10.982
T	4-Chlorotoluene		2.495	2.478	2.354	2.426	2.241	2.265	2.126	2.016		2.3001	7.4239
T	a-Methylstyrene					1.574	1.585	1.538	1.421	1.403	1.254	1.4623	8.7678
T	tert-Butylbenzene		0.572	0.56	0.593	0.575	0.569	0.525	0.531			0.5608	4.4112
T	1,2,4-Trimethylbenzene		2.937	2.741	2.825	2.741	2.684	2.491	2.29			2.6725	8.1053
T	sec-Butylbenzene		3.563	3.297	3.353	3.216	3.144	2.862	2.636			3.153	9.9018
T	p-Isopropyltoluene			3.091	2.923	2.979	2.875	2.803	2.591	2.383		2.8064	8.6654
T	1,3-Dichlorobenzene	1.806	1.735	1.64	1.701	1.645	1.62	1.53	1.458			1.6422	6.7611
T	1,4-Dichlorobenzene	1.895	1.803	1.691	1.659	1.695	1.639	1.615	1.521	1.445		1.6627	8.1234
T	n-Butylbenzene			2.82	2.567	2.635	2.515	2.467	2.287	2.1		2.4845	9.4401
T	1,2-Dichlorobenzene	1.697	1.671	1.621	1.56	1.573	1.54	1.514	1.428	1.351		1.5505	7.1413
T	1,2-Dibromo-3-Chloropropane				0.119	0.116	0.115	0.115	0.112	0.105		0.1136	4.4498
T	1,2,4-Trichlorobenzene		1.221	1.227	1.174	1.21	1.156	1.144	1.078	1.011		1.1527	6.5369
T	Hexachlorobutadiene		0.495	0.493	0.463	0.464	0.456	0.451	0.431	0.414		0.4584	6.0827
T	Naphthalene		2.514	2.555	2.475	2.475	2.395	2.363	2.195	1.946		2.3646	8.5744
T	1,2,3-Trichlorobenzene	1.184	1.216	1.125	1.049	1.091	1.061	1.045	0.979	0.921		1.0745	8.6508

Tue Aug 15 08:39:05 2017

Login Number: L17080580 Run Date: 08/14/2017 Sample ID: WG625704-12
 Instrument ID: HPMS6 Run Time: 18:29 Method: 8260B
 File ID: 6M149484 Analyst: TMB QC Key: DOD4
 ICal Workgroup: WG625704 Cal ID: HPMS6 - 14-AUG-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Chloroform	CCC	20.0	19.4	ug/L	0.457	2.80	20
1,1-Dichloroethene	CCC	20.0	18.7	ug/L	0.384	6.40	20
1,2-Dichloropropane	CCC	20.0	19.5	ug/L	0.297	2.40	20
Ethylbenzene	CCC	20.0	19.9	ug/L	0.541	0.400	20
Toluene	CCC	20.0	19.3	ug/L	1.49	3.40	20
Vinyl Chloride	CCC	20.0	23.2	ug/L	0.259	16.2	20
Bromoform	SPCC	20.0	19.4	ug/L	0.215	2.80	20
Chlorobenzene	SPCC	20.0	20.2	ug/L	1.02	1.10	20
Chloromethane	SPCC	20.0	23.1	ug/L	0.395	15.3	20
1,1-Dichloroethane	SPCC	20.0	18.7	ug/L	0.477	6.60	20
1,1,2,2-Tetrachloroethane	SPCC	20.0	19.7	ug/L	0.621	1.40	20
Acetone		20.0	20.5	ug/L	0.0684	2.40	20
Benzene		20.0	19.1	ug/L	1.06	4.60	20
Bromobenzene		20.0	19.4	ug/L	0.839	2.80	20
Bromochloromethane		20.0	19.6	ug/L	0.167	2.00	20
Bromodichloromethane		20.0	18.9	ug/L	0.348	5.30	20
Bromomethane		20.0	24.7	ug/L	0.127	23.4	20 *
2-Butanone		20.0	20.2	ug/L	0.0966	1.20	20
n-Butylbenzene		20.0	19.4	ug/L	2.41	3.10	20
sec-Butylbenzene		20.0	19.7	ug/L	3.11	1.30	20
tert-Butylbenzene		20.0	20.2	ug/L	0.566	0.800	20
Carbon Disulfide		20.0	17.8	ug/L	0.766	10.9	20
Carbon Tetrachloride		20.0	19.2	ug/L	0.349	4.00	20
Dibromochloromethane		20.0	19.7	ug/L	0.355	1.40	20
Chloroethane		20.0	21.2	ug/L	0.167	5.80	20
2-Chlorotoluene		20.0	19.1	ug/L	2.25	4.50	20
4-Chlorotoluene		20.0	19.7	ug/L	2.27	1.50	20
1,2-Dibromo-3-Chloropropane		20.0	20.5	ug/L	0.116	2.50	20
1,2-Dibromoethane		20.0	19.1	ug/L	0.264	4.40	20
Dibromomethane		20.0	19.4	ug/L	0.139	3.00	20
1,2-Dichlorobenzene		20.0	20.3	ug/L	1.57	1.60	20
1,3-Dichlorobenzene		20.0	19.6	ug/L	1.61	1.90	20
1,4-Dichlorobenzene		20.0	20.0	ug/L	1.66	0.200	20
Dichlorodifluoromethane		20.0	26.1	ug/L	0.448	30.4	20 *
1,2-Dichloroethane		20.0	19.2	ug/L	0.314	3.80	20
cis-1,2-Dichloroethene		20.0	19.6	ug/L	0.296	1.90	20
trans-1,2-Dichloroethene		20.0	19.3	ug/L	0.262	3.50	20
1,3-Dichloropropane		20.0	20.2	ug/L	0.512	0.900	20
2,2-Dichloropropane		20.0	18.1	ug/L	0.346	9.30	20
cis-1,3-Dichloropropene		20.0	20.1	ug/L	0.444	0.600	20
trans-1,3-Dichloropropene		20.0	19.5	ug/L	0.466	2.60	20
1,1-Dichloropropene		20.0	19.5	ug/L	0.354	2.60	20

ALT - Modified 09/06/2007
 Version 1.5 PDF File ID: 5433579
 Report generated 08/16/2017 12:29



Login Number: L17080580 Run Date: 08/14/2017 Sample ID: WG625704-12
 Instrument ID: HPMS6 Run Time: 18:29 Method: 8260B
 File ID: 6M149484 Analyst: TMB QC Key: DOD4
 ICal Workgroup: WG625704 Cal ID: HPMS6 - 14-AUG-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
2-Hexanone	20.0	20.3	ug/L	0.196	1.70	20	
Hexachlorobutadiene	20.0	20.6	ug/L	0.471	2.90	20	
Isopropylbenzene	20.0	19.2	ug/L	1.61	3.80	20	
p-Isopropyltoluene	20.0	19.7	ug/L	2.76	1.70	20	
4-Methyl-2-Pentanone	20.0	20.2	ug/L	0.0872	0.800	20	
Methylene Chloride	20.0	18.7	ug/L	0.268	6.60	20	
Naphthalene	20.0	20.8	ug/L	2.45	3.80	20	
n-Propylbenzene	20.0	19.7	ug/L	3.63	1.60	20	
Styrene	20.0	20.1	ug/L	1.16	0.600	20	
1,1,1,2-Tetrachloroethane	20.0	20.1	ug/L	0.371	0.700	20	
Tetrachloroethene	20.0	19.3	ug/L	0.395	3.30	20	
1,2,3-Trichlorobenzene	20.0	20.4	ug/L	1.10	2.10	20	
1,2,4-Trichlorobenzene	20.0	20.7	ug/L	1.19	3.60	20	
1,1,1-Trichloroethane	20.0	19.4	ug/L	0.401	2.80	20	
1,1,2-Trichloroethane	20.0	19.9	ug/L	0.288	0.300	20	
Trichloroethene	20.0	19.4	ug/L	0.296	3.20	20	
Trichlorofluoromethane	20.0	20.7	ug/L	0.423	3.30	20	
1,2,3-Trichloropropane	20.0	20.3	ug/L	0.186	1.70	20	
1,2,4-Trimethylbenzene	20.0	20.1	ug/L	2.69	0.500	20	
1,3,5-Trimethylbenzene	20.0	19.3	ug/L	2.56	3.70	20	
o-Xylene	20.0	20.3	ug/L	0.673	1.70	20	
m-,p-Xylene	40.0	40.0	ug/L	0.660	0.100	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17080580 Run Date: 08/15/2017 Sample ID: WG625854-02
Instrument ID: HPMS6 Run Time: 11:59 Method: 8260B
File ID: 6M149512 Analyst: TMB QC Key: DOD4
Workgroup (AAB#): WG625855 Cal ID: HPMS6 - 14-AUG-17
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Chloroform	CCC	50.0	50.4	ug/L	0.474	0.815	20	
1,1-Dichloroethene	CCC	50.0	49.9	ug/L	0.409	0.263	20	
1,2-Dichloropropane	CCC	50.0	50.1	ug/L	0.305	0.195	20	
Ethylbenzene	CCC	50.0	51.1	ug/L	0.556	2.23	20	
Toluene	CCC	50.0	49.5	ug/L	1.52	0.934	20	
Vinyl Chloride	CCC	50.0	51.9	ug/L	0.231	3.74	20	
Bromoform	SPCC	50.0	57.8	ug/L	0.255	15.5	20	
Chlorobenzene	SPCC	50.0	51.4	ug/L	1.04	2.78	20	
Chloromethane	SPCC	50.0	38.5	ug/L	0.264	23.0	20	*
1,1-Dichloroethane	SPCC	50.0	49.5	ug/L	0.505	1.02	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	51.8	ug/L	0.652	3.59	20	
Xylenes		150	154	ug/L	0.680	2.44	20	
Acetone		50.0	48.2	ug/L	0.0558	3.58	20	
Benzene		50.0	49.7	ug/L	1.10	0.658	20	
Bromobenzene		50.0	51.8	ug/L	0.895	3.62	20	
Bromochloromethane		50.0	54.8	ug/L	0.187	9.66	20	
Bromodichloromethane		50.0	50.9	ug/L	0.375	1.83	20	
Bromomethane		50.0	80.2	ug/L	0.182	60.3	20	*
2-Butanone		50.0	44.9	ug/L	0.0846	10.3	20	
n-Butylbenzene		50.0	49.2	ug/L	2.45	1.55	20	
sec-Butylbenzene		50.0	49.5	ug/L	3.12	1.02	20	
tert-Butylbenzene		50.0	51.4	ug/L	0.577	2.81	20	
Carbon Disulfide		50.0	53.2	ug/L	0.898	6.30	20	
Carbon Tetrachloride		50.0	52.0	ug/L	0.379	4.07	20	
Dibromochloromethane		50.0	54.6	ug/L	0.393	9.16	20	
Chloroethane		50.0	69.7	ug/L	0.220	39.5	20	*
2-Chlorotoluene		50.0	48.2	ug/L	2.26	3.69	20	
4-Chlorotoluene		50.0	49.8	ug/L	2.29	0.371	20	
1,2-Dibromo-3-Chloropropane		50.0	50.4	ug/L	0.115	0.836	20	
1,2-Dibromoethane		50.0	51.5	ug/L	0.285	2.91	20	
Dibromomethane		50.0	52.5	ug/L	0.151	4.99	20	
1,2-Dichlorobenzene		50.0	51.5	ug/L	1.60	3.03	20	
1,3-Dichlorobenzene		50.0	51.8	ug/L	1.70	3.57	20	
1,4-Dichlorobenzene		50.0	51.1	ug/L	1.70	2.26	20	
Dichlorodifluoromethane		50.0	54.1	ug/L	0.375	8.18	20	
1,2-Dichloroethane		50.0	49.0	ug/L	0.320	2.00	20	
cis-1,2-Dichloroethene		50.0	52.7	ug/L	0.318	5.41	20	
trans-1,2-Dichloroethene		50.0	52.8	ug/L	0.287	5.68	20	
1,3-Dichloropropane		50.0	49.2	ug/L	0.500	1.53	20	
2,2-Dichloropropane		50.0	49.9	ug/L	0.380	0.205	20	
cis-1,3-Dichloropropene		50.0	51.4	ug/L	0.454	2.78	20	
trans-1,3-Dichloropropene		50.0	51.8	ug/L	0.495	3.69	20	

CCV - Modified 03/05/2008
PDF File ID: 5433581
Report generated 08/16/2017 12:30



Login Number: L17080580 Run Date: 08/15/2017 Sample ID: WG625854-02
Instrument ID: HPMS6 Run Time: 11:59 Method: 8260B
File ID: 6M149512 Analyst: TMB QC Key: DOD4
Workgroup (AAB#): WG625855 Cal ID: HPMS6 - 14-AUG-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
1,1-Dichloropropene	50.0	51.3	ug/L	0.373	2.58	20	
2-Hexanone	50.0	45.0	ug/L	0.171	9.92	20	
Hexachlorobutadiene	50.0	52.1	ug/L	0.478	4.28	20	
Isopropylbenzene	50.0	49.8	ug/L	1.66	0.457	20	
p-Isopropyltoluene	50.0	50.4	ug/L	2.83	0.808	20	
4-Methyl-2-Pentanone	50.0	48.7	ug/L	0.0834	2.57	20	
Methylene Chloride	50.0	50.4	ug/L	0.290	0.854	20	
Naphthalene	50.0	52.5	ug/L	2.48	4.97	20	
n-Propylbenzene	50.0	48.9	ug/L	3.61	2.24	20	
Styrene	50.0	51.8	ug/L	1.19	3.58	20	
1,1,1,2-Tetrachloroethane	50.0	53.5	ug/L	0.394	7.08	20	
Tetrachloroethene	50.0	52.1	ug/L	0.426	4.29	20	
1,2,3-Trichlorobenzene	50.0	52.1	ug/L	1.12	4.11	20	
1,2,4-Trichlorobenzene	50.0	53.0	ug/L	1.22	5.96	20	
1,1,1-Trichloroethane	50.0	51.1	ug/L	0.422	2.18	20	
1,1,2-Trichloroethane	50.0	52.3	ug/L	0.303	4.65	20	
Trichloroethene	50.0	51.7	ug/L	0.317	3.48	20	
Trichlorofluoromethane	50.0	53.6	ug/L	0.440	7.18	20	
1,2,3-Trichloropropane	50.0	51.7	ug/L	0.189	3.36	20	
1,2,4-Trimethylbenzene	50.0	50.4	ug/L	2.69	0.705	20	
1,3,5-Trimethylbenzene	50.0	49.3	ug/L	2.62	1.38	20	
o-Xylene	50.0	52.0	ug/L	0.688	3.94	20	
m-,p-Xylene	100	102	ug/L	0.671	1.70	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
PDF File ID: 5433581
Report generated 08/16/2017 12:30



Login Number: L17080580
Instrument ID: HPMS6
Workgroup (AAB#): WG625855

ICAL CCV Number: WG625704-08
CAL ID: HPMS6-14-AUG-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG625704-08	NA	NA	331097	615962	829663
Upper Limit	NA	NA	662194	1231924	1659326
Lower Limit	NA	NA	165549	307981	414832
<u>L17080580-01</u>	1.00	01	340647	622772	829852
<u>L17080580-02</u>	1.00	01	332385	602247	804359
WG625855-01	1.00	01	330895	607242	811448
WG625855-02	1.00	01	339723	610469	801747

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)

00861077

Login Number: L17080580
Instrument ID: HPMS6
Workgroup (AAB#): WG625855

ICAL CCV Number: WG625704-08
CAL ID: HPMS6-14-AUG-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG625704-08	NA	NA	18.15	15.12	11.24
Upper Limit	NA	NA	18.65	15.62	11.74
Lower Limit	NA	NA	17.65	14.62	10.74
<u>L17080580-01</u>	1.00	01	18.15	15.12	11.24
<u>L17080580-02</u>	1.00	01	18.15	15.12	11.24
<u>WG625855-01</u>	1.00	01	18.15	15.12	11.24
<u>WG625855-02</u>	1.00	01	18.15	15.12	11.24

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



2.2 General Chemistry Data

2.2.1 Method 9056

2.2.1.1 Summary Data

Lab Report #: L17080580

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080580-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6463	Prep Method: 9056	Prep Date: 08/14/2017 17:42
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG625730	Analyst: CAS	Run Date: 08/14/2017 23:10
Collect Date: 08/09/2017 15:00	Dilution: 5	File ID: I2_081417-20
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Sulfate	14808-79-8	76.0		10.0	5.00	2.50
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17080580

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17080580-01	PrePrep Method: N/A	Instrument: IC2
Client ID: LH18/24-SP650-6463	Prep Method: 9056	Prep Date: 08/14/2017 17:42
Matrix: Water	Analytical Method: 9056	Cal Date: 04/11/2017 18:31
Workgroup #: WG625730	Analyst: CAS	Run Date: 08/14/2017 23:29
Collect Date: 08/09/2017 15:00	Dilution: 50	File ID: I2_081417-21
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chloride	16887-00-6	663		20.0	10.0	5.00
J	Estimated value ; the analyte concentration was less than the LOQ.					

2.2.1.2 QC Summary Data

9056/300 Calculations

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
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Page: 1

Approved: 12-APR-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC2 Dataset: 081417 IC2.SEQ
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 161205254
 Eluent ID#: RGT40989

Workgroups: Column 1 ID: AG14A 4MM Column 2 ID: AS14A 4MM
 Analytical WG625730 (Waters)
 Internal STD: NA Surrogate STD: NA Calibration STD STD77046 (04-11-2017)
 CCV STD: STD81395 LCS STD: STD81396 MS/MSD STD: STD81396

Comments: System Backpressure: 1784 psi

Sample L17080476-03 was analyzed at a dilution only due to its pre-run screen result for sulfate, which was greater than 200 ppm.

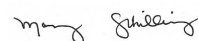
Sample L17080578-01 was analyzed at a dilution only due to its pre-run screen result for sulfate, which was greater than the calibration maximum.

Sample L17080580-01 was analyzed at dilutions only due to its pre-run screen result for chloride, which was greater than 200 ppm.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I2_081417-01	ELUENT	1	1		08/14/17 17:04
2	I2_081417-02	DI WATER	1	1		08/14/17 17:23
3	I2_081417-03	WG625731-01 ANION CCV	1	1	STD81395	08/14/17 17:42
4	I2_081417-04	WG625731-02 ANION CCB	1	1		08/14/17 18:02
5	I2_081417-05	WG625730-01 ANION BLANK	1	1		08/14/17 18:21
6	I2_081417-06	WG625730-02 ANION LCS	1	1	STD81396	08/14/17 18:40
7	I2_081417-07	L17080444-01 (CL,SO4) REF	1	1		08/14/17 18:59
8	I2_081417-08	WG625730-04 DUP 0444-01	1	1		08/14/17 19:19
9	I2_081417-09	L17080444-02 (CL,SO4)	1	1		08/14/17 19:38
10	I2_081417-10	L17080444-03 (CL,SO4)	1	1		08/14/17 19:57
11	I2_081417-11	L17080444-03 RR CL 5x	1	5		08/14/17 20:16
12	I2_081417-12	L17080444-04 (CL,SO4)	1	1		08/14/17 20:35
13	I2_081417-13	L17080444-05 (CL,SO4)	1	1		08/14/17 20:55
14	I2_081417-14	L17080444-06 (CL,SO4)	1	1		08/14/17 21:14
15	I2_081417-15	WG625731-03 ANION CCV	1	1	STD81395	08/14/17 21:33
16	I2_081417-16	WG625731-04 ANION CCB	1	1		08/14/17 21:53
17	I2_081417-17	L17080476-03 (CL,SO4) 10x	2	10		08/14/17 22:12
18	I2_081417-18	L17080476-03 RR SO4 50x (NR)	2	50		08/14/17 22:31
19	I2_081417-19	L17080578-01 (SO4) 50x	2	50		08/14/17 22:50
20	I2_081417-20	L17080580-01 (CL,SO4) 5x	1	5		08/14/17 23:10
21	I2_081417-21	L17080580-01 RR CL 50x	1	50		08/14/17 23:29
22	I2_081417-22	L17080600-01 (CL,SO4)	2	1		08/14/17 23:48
23	I2_081417-23	L17080600-01 RR CL 5x	2	5		08/15/17 00:07
24	I2_081417-24	L17080607-01 (CL,SO4)	2	1		08/15/17 00:27
25	I2_081417-25	L17080607-01 RR CL 10x	2	10		08/15/17 00:46
26	I2_081417-26	L17080607-02 (CL,SO4)	2	1		08/15/17 01:05
27	I2_081417-27	WG625731-05 ANION CCV	1	1	STD81395	08/15/17 01:24
28	I2_081417-28	WG625731-06 ANION CCB	1	1		08/15/17 01:44

Page: 1

Approved: 15-AUG-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC2 Dataset: 081417 IC2.SEQ
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 161205254
 Eluent ID#: RGT40989

Workgroups: Column 1 ID: AG14A 4MM Column 2 ID: AS14A 4MM
 Analytical WG625730 (Waters)
 Internal STD: NA Surrogate STD: NA STD77046 (04-11-2017)
 CCV STD: STD81395 LCS STD: STD81396 STD81396

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
29	I2_081417-29	L17080607-03 (F,CL,SO4) REF	1	1		08/15/17 02:03
30	I2_081417-30	WG625730-06 DUP 0607-03	2	1		08/15/17 02:22
31	I2_081417-31	WG625730-07 MS 0607-03	2	1	STD81396	08/15/17 02:41
32	I2_081417-32	WG625730-08 MSD 0607-03	2	1	STD81396	08/15/17 03:01
33	I2_081417-33	WG625731-07 ANION CCV	1	1	STD81395	08/15/17 03:20
34	I2_081417-34	WG625731-08 ANION CCB	1	1		08/15/17 03:39
35	I2_081417-35	END	1	1		08/15/17 03:58

Comments

Seq.	Rerun	Dil.	Reason	Analytes
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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: 14-AUG-2017
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC2
 Curve Workgroup: NA
 Runlog ID: 83954
 Analytical Workgroups: L17080444,0476,0578,0580,0600,0607

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)	1784 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	X
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	MES

Primary Reviewer:
15-AUG-2017



Secondary Reviewer:
15-AUG-2017




Analytical Method:9056
Login Number:L17080580

AAB#:WG625730

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-SP650-6463	01	08/09/17					08/14/2017	5.1	2	*	08/14/17	5.3	2	*
LH18/24-SP650-6463	01	08/09/17					08/14/2017	5.1	2	*	08/14/17	5.4	2	*

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5431020
Report generated 08/15/2017 11:41



METHOD BLANK SUMMARY

Login Number: L17080580 Work Group: WG625730
 Blank File ID: I2_081417-05 Blank Sample ID: WG625730-01
 Prep Date: 08/14/17 17:42 Instrument ID: IC2
 Analyzed Date: 08/14/17 18:21 Method: 9056
 Analyst: CAS

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG625730-02	I2_081417-06	08/14/17 18:40	01
DUP	WG625730-04	I2_081417-08	08/14/17 19:19	01
LH18/24-SP650-6463	L17080580-01	I2_081417-20	08/14/17 23:10	DL01
LH18/24-SP650-6463	L17080580-01	I2_081417-21	08/14/17 23:29	DL02
DUP	WG625730-06	I2_081417-30	08/15/17 02:22	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5431021
 Report generated 08/15/2017 11:41



Login Number: L17080580 Prep Date: 08/14/17 17:42 Sample ID: WG625730-01
Instrument ID: IC2 Run Date: 08/14/17 18:21 Prep Method: 9056
File ID: I2 081417-05 Analyst: CAS Method: 9056
Workgroup (AAB#): WG625730 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: 5431022
15-AUG-2017 11:41



Login Number: L17080580 Run Date: 08/14/2017 Sample ID: WG625730-02
Instrument ID: IC2 Run Time: 18:40 Prep Method: 9056
File ID: I2_081417-06 Analyst: CAS Method: 9056
Workgroup (AAB#): WG625730 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	8.08	101	90 - 110	
Sulfate	40.0	40.9	102	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5431023
Report generated: 08/15/2017 11:41



Login Number: L17080580
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

INT_CAL - Modified 03/06/2008
PDF File ID: 5431250
Report generated 08/15/2017 11:41



Login Number: L17080580
 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: 5431250
 Report generated 08/15/2017 11:41



Login Number: L17080580
 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: 5431250
 Report generated 08/15/2017 11:41



Login Number: L17080580 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: L17080580 Run Date: 08/14/2017 Sample ID: WG625731-02
 Instrument ID: IC2 Run Time: 18:02 Method: 9056
 File ID: I2 081417-04 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG625730 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: L17080580 Run Date: 08/14/2017 Sample ID: WG625731-04
 Instrument ID: IC2 Run Time: 21:53 Method: 9056
 File ID: I2 081417-16 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG625730 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.

CCB - Modified 03/05/2008
 PDF File ID: 5431025
 Report generated 08/15/2017 11:41



Login Number: L17080580 Run Date: 08/15/2017 Sample ID: WG625731-06
 Instrument ID: IC2 Run Time: 01:44 Method: 9056
 File ID: I2 081417-28 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG625730 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: L17080580 Run Date: 08/14/2017 Sample ID: WG625731-01
Instrument ID: IC2 Run Time: 17:42 Method: 9056
File ID: I2 081417-03 Analyst: CAS QC Key: DOD4
Workgroup (AAB#): WG625730 Cal ID: IC2 - 11-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.13	mg/L	4.67	1.58	10	
Sulfate	40.0	40.9	mg/L	5.98	2.15	10	

* Exceeds %D Criteria



Login Number: L17080580 Run Date: 08/14/2017 Sample ID: WG625731-03
Instrument ID: IC2 Run Time: 21:33 Method: 9056
File ID: I2 081417-15 Analyst: CAS QC Key: DOD4
Workgroup (AAB#): WG625730 Cal ID: IC2 - 11-APR-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.15	mg/L	4.66	1.89	10	
Sulfate	40.0	41.5	mg/L	5.88	3.68	10	

* Exceeds %D Criteria



Login Number: L17080580 Run Date: 08/15/2017 Sample ID: WG625731-05
 Instrument ID: IC2 Run Time: 01:24 Method: 9056
 File ID: I2 081417-27 Analyst: CAS QC Key: DOD4
 Workgroup (AAB#): WG625730 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	3.28	10	
Sulfate	40.0	41.6	mg/L	5.85	4.10	10	

* Exceeds %D Criteria



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
August 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	BLR - BRANDON L. RICHARDS
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

August 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

August 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 AMMN. PLANT (LHAAP)
 GROUNDWATER TREATMENT PLANT (GWTP)
 KARNACK, TEXAS

Project No.
60256135.GWTP
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	NO. OF CONTAINERS	Analyses		Remarks (Preservatives, etc.)	Lab I.D.#
					VOCL	SULFATE		
LH18/24-SP650-6463	Water	08/09/17 / 15:00	3	3			HCL	
LH18/24-SP650-6463	Water	08/09/17 / 15:00	1	1			NONE	
Trip Blank	Water	08/09/17	2	2			HCL	

Additional Remarks: STANDARD TAT ON ALL PARAMETERS. EMAIL RESULTS TO linda.raab@aecom.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>[Signature]</i>	08/09/17	15:30									

For Lab Use Only
 Received At Lab By:

Date: _____ Time: _____ Date: _____ Time: _____
 Airbill No. _____ Seal No. _____ Condition _____

Microbac OVD
 Received: 08/10/2017 10:10
 By: BRENDA GREGORY

221000104428

Brenda Gregory

(Word) S:\1-ccsl\Forms\Chain of Custody - BiWeekly

COOLER TEMP >6° C LOG

Cooler ID 4428

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

OKD 8/10/17

pH Exceptions

pH Lot # *AC601354*

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

OKD 8/10/17

**PRESERVATIVE
EXCEPTIONS**

NONE
 AS NOTED

OKD 8/10/17

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17080580

Account: 2551

Project: 2551.096

Samples: 2

Due Date: 21-AUG-2017

Samplenum **Container ID** **Products**
L17080580-01 **948408** **8082 826-LOW**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	10-AUG-2017 15:15	BRG		
2	ANALYZ	V1	ORG4	11-AUG-2017 07:24	AWE	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	10-AUG-2017 15:15	BRG		
2	ANALYZ	V1	ORG4	11-AUG-2017 07:24	AWE	CLS	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	10-AUG-2017 15:15	BRG		
2	ANALYZ	V1	ORG4	11-AUG-2017 07:24	AWE	CLS	

Samplenum **Container ID** **Products**
L17080580-01 **948409** **8082 9056**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	10-AUG-2017 15:15	BRG		
2	PREP	W1	SEM	14-AUG-2017 11:12	CAS	BRG	

Samplenum **Container ID** **Products**
L17080580-02 **948410** **8082 826-LOW**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	10-AUG-2017 15:15	BRG		
2	ANALYZ	V1	ORG4	11-AUG-2017 07:24	AWE	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	10-AUG-2017 15:15	BRG		
2	ANALYZ	V1	ORG4	11-AUG-2017 07:24	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: L17081328

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 August 28 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 #: L17081328

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?
8455	I	2.0		1ZW056F52210009846	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 #:** L17081328**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-SP650-6465	L17081328-01	08/24/2017 15:00	08/25/2017 09:53



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081328
Project Name:		Method:	6850
Prep Batch Number(s):	WG627281	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-28 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	2017-08-28 15:18:08



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081328
Project Name:		Method:	6850
Prep Batch Number(s):	WG627281	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-28 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:	L17081328
Project Name:		Method:	6850
Prep Batch Number(s):	WG627281	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-28 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:	L17081328
Project Name:		Method:	6850
Prep Batch Number(s):	WG627281	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-28 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:	L17081328
Project Name:		Method:	6850
Prep Batch Number(s):	WG627281	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-28 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:	L17081328
Project Name:		Method:	6850
Prep Batch Number(s):	WG627281	Reviewer Name:	Eric Lawson
LRC Date:	2017-08-28 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 #: L17081328
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081328-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6465	Prep Method: 6850	Prep Date: 08/25/2017 11:30
Matrix: Water	Analytical Method: 6850	Cal Date: 08/11/2017 23:37
Workgroup #: WG627281	Analyst: JWR	Run Date: 08/25/2017 18:18
Collect Date: 08/24/2017 15:00	Dilution: 10	File ID: 1LM.LM40427
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	34.9		4.00	2.00	1.00

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17081328

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081328-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6465	Prep Method: 6850	Prep Date: 08/25/2017 11:30
Matrix: Water	Analytical Method: 6850	Cal Date: 08/11/2017 23:37
Workgroup #: WG627281	Analyst: JWR	Run Date: 08/25/2017 18:18
Collect Date: 08/24/2017 15:00	Dilution: 10	File ID: 1LM.LM40427
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	34.9		4.00	2.00	1.00

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: 081217_WTD.TXT
 Analyst1: WTD Analyst2: NA
 Method: 6850 SOP: HPLC06 Rev: 8

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254

Eluent ID#: _____

Column 1 ID: KP-RPPX250 Column 2 ID: NA

Workgroups: _____

Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (08/12/2017)

CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40385	WG625568-01 CCB	1	1		08/11/17 21:25
2	1LM.LM40386	WG625568-02 STD (0.1 ug/L)	1	1	STD80232	08/11/17 21:44
3	1LM.LM40387	WG625568-03 STD (0.2 ug/L)	1	1	STD80232	08/11/17 22:03
4	1LM.LM40388	WG625568-04 STD (0.5 ug/L)	1	1	STD80232	08/11/17 22:22
5	1LM.LM40389	WG625568-05 STD (1.0 ug/L)	1	1	STD80232	08/11/17 22:41
6	1LM.LM40390	WG625568-06 STD (2.0 ug/L)	1	1	STD80232	08/11/17 22:59
7	1LM.LM40391	WG625568-07 STD (5.0 ug/L)	1	1	STD80232	08/11/17 23:18
8	1LM.LM40392	WG625568-08 STD (10 ug/L)	1	1	STD80232	08/11/17 23:37
9	1LM.LM40393	WG625568-09 SSCV (1.0 ug/L)	1	1	STD80234	08/11/17 23:56
10	1LM.LM40394	WG625583-01 MCT (0.2ug/L)	1	1	STD80234	08/12/17 00:15
11	1LM.LM40395	WG625583-02 BLANK	1	1		08/12/17 00:34
12	1LM.LM40396	WG625583-03 LCS (0.2ug/L)	1	1	STD80234	08/12/17 00:53
13	1LM.LM40397	WG625583-04 LCS2 (0.2ug/L)	1	1	STD80234	08/12/17 01:12
14	1LM.LM40398	L17080534-02	1	1		08/12/17 01:31
15	1LM.LM40399	L17080534-02 RR (10x)	1	10		08/12/17 01:50
16	1LM.LM40400	L17080534-03	1	1		08/12/17 02:09
17	1LM.LM40401	L17080534-03 RR (10x)	1	10		08/12/17 02:28
18	1LM.LM40402	WG625585-01 CCV (1.0ug/L)	1	1	STD80232	08/12/17 02:47
19	1LM.LM40403	WG625583-05 MRL (0.2ug/L)	1	1	STD80232	08/12/17 03:06
20	1LM.LM40404	WG625585-02 CCB	1	1		08/12/17 03:25

Comments

Seq.	Rerun	Dil.	Reason	Analytes
14	X	10	Over Calibration Range	
			L17080534-02	
17				
			L17080534-03 Dilution not needed. DNR	

Page: 1

Approved: 14-AUG-17

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 082517_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 WG627281 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (08/11/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: Sample L17081328-01 was analyzed neat and at multiple dilutions based on its historical range of results.

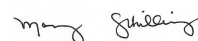
Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40419	WG627282-01 CCB	1	1		08/25/17 15:47
2	1LM.LM40420	WG627282-02 CCV (1.0ug/L)	1	1	STD80232	08/25/17 16:06
3	1LM.LM40421	WG627281-05 MRL (0.2ug/L)	1	1	STD80232	08/25/17 16:24
4	1LM.LM40422	WG627281-01 MCT (0.2ug/L)	1	1	STD80234	08/25/17 16:43
5	1LM.LM40423	WG627281-02 BLANK	1	1		08/25/17 17:02
6	1LM.LM40424	WG627281-03 LCS (0.2ug/L)	1	1	STD80234	08/25/17 17:22
7	1LM.LM40425	WG627281-04 LCS2 (0.2ug/L)	1	1	STD80234	08/25/17 17:40
8	1LM.LM40426	L17081328-01 (NR)	1	1		08/25/17 17:59
9	1LM.LM40427	L17081328-01 (10x)	1	10		08/25/17 18:18
10	1LM.LM40428	L17081328-01 (100x) (NR)	1	100		08/25/17 18:37
11	1LM.LM40429	WG627282-03 CCV (1.0ug/L)	1	1	STD80232	08/25/17 18:56
12	1LM.LM40430	WG627281-06 MRL (0.2ug/L)	1	1	STD80232	08/25/17 19:15
13	1LM.LM40431	WG627282-04 CCB	1	1		08/25/17 19:34

Comments

Seq.	Rerun	Dil.	Reason	Analytes
8	X	10	Over Calibration Range	
			L17081328-01 (NR) : The result for this sample analyzed as neat is greater than that of the calibration range and will not be reported.	
10				
			L17081328-01 (100x) (NR) : The result for this sample analyzed at a 100x dilution is below the DOD4-RDL and will not be reported.	

Page: 1

Approved: 28-AUG-17




Microbac Laboratories Inc.

Data Checklist

Date: 11-AUG-2017
 Analyst: JWR
 Analyst: WTD
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 83932
 Analytical Workgroups: L17080534

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	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	MES

Primary Reviewer:
14-AUG-2017

Secondary Reviewer:
14-AUG-2017



Microbac Laboratories Inc.

Data Checklist

Date: 25-AUG-2017
Analyst: JWR
Analyst: NA
Method: 6850
Instrument: LCMS1
Curve Workgroup: NA
Runlog ID: 84207
Analytical Workgroups: L17081328-01

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	
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:
28-AUG-2017

John Richards

Secondary Reviewer:
28-AUG-2017

Mary Sweeney

CHECKLIST1 - Modified 03/05/2008

Generated: AUG-28-2017 10:56:44



Analytical Method:6850
Login Number:L17081328

AAB#:WG627281

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-SP650-6465	01	08/24/17					08/25/2017	.9	28		08/25/17	.3	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17081328 Work Group: WG627281
 Blank File ID: 1LM.LM40423 Blank Sample ID: WG627281-02
 Prep Date: 08/25/17 11:30 Instrument ID: LCMS1
 Analyzed Date: 08/25/17 17:02 Method: 6850
 Analyst: JWR

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG627281-05	1LM.LM40421	08/25/17 16:24	01
MCT	WG627281-01	1LM.LM40422	08/25/17 16:43	01
LCS	WG627281-03	1LM.LM40424	08/25/17 17:22	01
LCS2	WG627281-04	1LM.LM40425	08/25/17 17:40	01
LH18/24-SP650-6465	L17081328-01	1LM.LM40427	08/25/17 18:18	DL01
QCMRL	WG627281-06	1LM.LM40430	08/25/17 19:15	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5450718
 Report generated 08/28/2017 11:00



Login Number: L17081328 Prep Date: 08/25/17 11:30 Sample ID: WG627281-02
 Instrument ID: LCMS1 Run Date: 08/25/17 17:02 Prep Method: 6850
 File ID: 1LM.LM40423 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG627281 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-11-AUG-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: 5450719
 28-AUG-2017 11:00



Login Number: L17081328 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG627281 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG627281-03 LCS File ID: 1LM.LM40424 Run Date: 08/25/2017 17:22
 Sample ID: WG627281-04 LCS2 File ID: 1LM.LM40425 Run Date: 08/25/2017 17:40

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.194	97.0	0.200	0.198	99.0	2.04	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5450720
 Report generated: 08/28/2017 11:00



Login Number: L17081328
Analytical Method: 6850
ICAL Workgroup: WG625568

Instrument ID: LCMS1
Initial Calibration Date: 11-AUG-17 23:37
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.354	7.21	1.00000	

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5450787
Report generated 08/28/2017 11:00



Login Number: L17081328
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 11-AUG-17 23:37
Column ID: F

Analyte	WG625568-02			WG625568-03			WG625568-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	15500.0000	1.504	0.200	29300.0000	1.408	0.500	69400.0000	1.341

INT_CAL - Modified 03/06/2008
PDF File ID: 5450787
Report generated 08/28/2017 11:00



Login Number: L17081328
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 11-AUG-17 23:37
Column ID: F

Analyte	WG625568-05			WG625568-06			WG625568-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	135000.000	1.308	2.00	276000.000	1.336	5.00	652000.000	1.309

INT_CAL - Modified 03/06/2008
PDF File ID: 5450787
Report generated 08/28/2017 11:00



Login Number: L17081328
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 11-AUG-17 23:37
Column ID: F

Analyte	WG625568-08		
	CONC	RESP	RF
Perchlorate	10.0	1250000.00	1.273

INT_CAL - Modified 03/06/2008
PDF File ID: 5450787
Report generated 08/28/2017 11:00



Login Number: L17081328 Run Date: 08/11/2017 Sample ID: WG625568-09
Instrument ID: LCMS1 Run Time: 23:56 Method: 6850
File ID: 1LM.LM40393 Analyst: WTD QC Key: DOD4
ICal Workgroup: WG625568 Cal ID: LCMS1 - 11-AUG-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	1.00	ug/L	1.31	0	15	

* Exceeds %D Limit



Login Number: L17081328 Run Date: 08/25/2017 Sample ID: WG627282-01
Instrument ID: LCMS1 Run Time: 15:47 Method: 6850
File ID: LLM.LM40419 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG627281 Cal ID: LCMS1 - 11-AUG-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: L17081328 Run Date: 08/25/2017 Sample ID: WG627282-04
Instrument ID: LCMS1 Run Time: 19:34 Method: 6850
File ID: LLM.LM40431 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG627281 Cal ID: LCMS1 - 11-AUG-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: L17081328 Run Date: 08/25/2017 Sample ID: WG627282-02
 Instrument ID: LCMS1 Run Time: 16:06 Method: 6850
 File ID: 1LM.LM40420 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG627281 Cal ID: LCMS1 - 11-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.04	ug/L	1.36	4.00	15	

* Exceeds %D Criteria



Login Number: L17081328 Run Date: 08/25/2017 Sample ID: WG627282-03
 Instrument ID: LCMS1 Run Time: 18:56 Method: 6850
 File ID: 1LM.LM40429 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG627281 Cal ID: LCMS1 - 11-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.04	ug/L	1.36	4.00	15	

* Exceeds %D Criteria



Login Number: L17081328 Run Date: 08/25/2017 Sample ID: WG627281-05
Instrument ID: LCMS1 Run Time: 16:24 Prep Method: 6850
File ID: 1LM.LM40421 Analyst: JWR Method: 6850
Workgroup (AAB#): WG627281 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-11-AUG-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.198	99.0	70 - 130	



Login Number: L17081328 Run Date: 08/25/2017 Sample ID: WG627281-06
Instrument ID: LCMS1 Run Time: 19:15 Prep Method: 6850
File ID: 1LM.LM40430 Analyst: JWR Method: 6850
Workgroup (AAB#): WG627281 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-11-AUG-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.198	99.0	70 - 130	



Login Number: L17081328
Instrument ID: LCMS1
Workgroup (AAB#): WG627281

ICAL CCV Number: WG625568-05
CAL ID: LCMS1-11-AUG-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG625568	NA	NA	511000
Upper Limit	NA	NA	766500
Lower Limit	NA	NA	255500
<u>L17081328-01</u>	10.0	DL01	596000
WG627281-02	1.00	01	550000
WG627281-03	1.00	01	565000
WG627281-04	1.00	01	571000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: 6850	Samplenum: L17081328-01
Instrument: LCMS1	Prep Date: 08/25/2017 11:30	File ID: 1LM.LM40427
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/25/2017 18:18	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	538000	168000	3.20	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: _____	Samplenum: WG625568-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40386
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/11/2017 21:44	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	15500	5020	3.09	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328
Instrument: LCMS1
Analyst: WTD
Worknum: WG627281

Prep Method:
Prep Date:
Anal Method: 6850
Analysis Date: 08/11/2017 22:03

Samplenum: WG625568-03
File ID: 1LM.LM40387
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	29300	8050	3.64	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: _____	Samplenum: WG625568-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40388
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/11/2017 22:22	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	69400	21400	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: _____	Samplenum: WG625568-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40389
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/11/2017 22:41	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	135000	41600	3.25	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: _____	Samplenum: WG625568-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40390
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/11/2017 22:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	276000	85300	3.24	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: _____	Samplenum: WG625568-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40391
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/11/2017 23:18	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	652000	206000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: _____	Samplenum: WG625568-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40392
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/11/2017 23:37	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1250000	391000	3.20	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: _____	Samplenum: WG625568-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40393
Analyst: WTD	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/11/2017 23:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	135000	43800	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: 6850	Samplenum: WG627281-01
Instrument: LCMS1	Prep Date: 08/25/2017 11:30	File ID: 1LM.LM40422
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/25/2017 16:43	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	30200	9610	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: 6850	Samplenum: WG627281-02
Instrument: LCMS1	Prep Date: 08/25/2017 11:30	File ID: 1LM.LM40423
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/25/2017 17:02	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1940	548	3.54	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328
Instrument: LCMS1
Analyst: JWR
Worknum: WG627281

Prep Method: 6850
Prep Date: 08/25/2017 11:30
Anal Method: 6850
Analysis Date: 08/25/2017 17:22

Samplenum: WG627281-03
File ID: 1LM.LM40424
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	31100	10400	2.99	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: 6850	Samplenum: WG627281-04
Instrument: LCMS1	Prep Date: 08/25/2017 11:30	File ID: 1LM.LM40425
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/25/2017 17:40	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	32000	10100	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: 6850	Samplenum: WG627281-05
Instrument: LCMS1	Prep Date: 08/25/2017 11:30	File ID: 1LM.LM40421
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/25/2017 16:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	28800	8940	3.22	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: 6850	Samplenum: WG627281-06
Instrument: LCMS1	Prep Date: 08/25/2017 11:30	File ID: 1LM.LM40430
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/25/2017 19:15	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	34600	10600	3.26	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: _____	Samplenum: WG627282-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40419
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/25/2017 15:47	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 #: L17081328	Prep Method: _____	Samplenum: WG627282-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40420
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/25/2017 16:06	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	132000	42200	3.13	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: _____	Samplenum: WG627282-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40429
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/25/2017 18:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	165000	51400	3.21	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081328	Prep Method: _____	Samplenum: WG627282-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40431
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG627281	Analysis Date: 08/25/2017 19:34	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	0.000	0.000	2.3	3.8	*

3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
August 28, 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	BLR - BRANDON L. RICHARDS
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

August 28, 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

August 28, 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 (800) 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 WEEKLY SAMPLES			
Prepared By: Scott Beesinger		P.O. Number	
Field Sample I.D.: LH18/24-SP650-6465		Sample Matrix Water	Date / Time 08/24/17 / 15:00
MS / MSD		No. OF CONTAINERS	
1		PERCHLORATE	
Analyses		Remarks (Preservatives, etc.)	
(Empty grid for analyses)		(Empty grid for remarks)	
Lab I.D.#		(Empty grid for Lab I.D.#)	

Additional Remarks: 24 HOUR TAT

Send results to Linda Raabe at linda.raabe@aecom.com or call at 210-253-7518

Reinquired By:	Date	Time	Received By:	Date	Time	Reinquired By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	08/24/17	15:30									

Received At Lab By:		For Lab Use Only	
Date	Time	Albill No.	Opened By:
Remarks:		Microbac OVD Received: 08/25/2017 09:53 BY: CARA STRICKLER	
(Empty space for remarks)		221000105094	

Anna Strickler

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17081328**Account:** 2551**Project:** 2551.096**Samples:** 1**Due Date:** 28-AUG-2017

<u>Samplenum</u>	<u>Container ID</u>	<u>Products</u>
L17081328-01	954957	TOC 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	25-AUG-2017 10:35	CLS		
2	ANALYZ	W1	SEM	25-AUG-2017 11:01	JWR	CLS	
3	STORE	SEM	A1	28-AUG-2017 11:08	BRG	JWR	

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: L17081329

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 August 30 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 #: L17081329

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?
8455	I	2.0		1ZW056F52210009846	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 #:** L17081329**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-SP650-6465	L17081329-01	08/24/2017 15:00	08/25/2017 09:53



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081329
Project Name:		Method:	NH3
Prep Batch Number(s):	WG627554	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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	2017-08-30 18:10:06



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081329
Project Name:		Method:	NH3
Prep Batch Number(s):	WG627554	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	NH3
Prep Batch Number(s):	WG627554	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	NH3
Prep Batch Number(s):	WG627554	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	NH3
Prep Batch Number(s):	WG627554	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	NH3
Prep Batch Number(s):	WG627554	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	PO4
Prep Batch Number(s):	WG627239	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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	2017-08-30 18:09:11



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081329
Project Name:		Method:	PO4
Prep Batch Number(s):	WG627239	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	PO4
Prep Batch Number(s):	WG627239	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	PO4
Prep Batch Number(s):	WG627239	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	PO4
Prep Batch Number(s):	WG627239	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	PO4
Prep Batch Number(s):	WG627239	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	TOC
Prep Batch Number(s):	WG627555	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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	2017-08-30 18:10:38



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081329
Project Name:		Method:	TOC
Prep Batch Number(s):	WG627555	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	TOC
Prep Batch Number(s):	WG627555	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	TOC
Prep Batch Number(s):	WG627555	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	TOC
Prep Batch Number(s):	WG627555	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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:	L17081329
Project Name:		Method:	TOC
Prep Batch Number(s):	WG627555	Reviewer Name:	Deanna Hesson
LRC Date:	2017-08-30 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 #: L17081329
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081329-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6465	Prep Method: 350.1	Prep Date: 08/29/2017 11:10
Matrix: Water	Analytical Method: 350.1	Cal Date: 08/30/2017 09:56
Workgroup #: WG627554	Analyst: TMM	Run Date: 08/30/2017 10:12
Collect Date: 08/24/2017 15:00	Dilution: 10	File ID: S2170830002.024
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	20.9		2.00	1.00	0.500

Certificate of Analysis

Sample #: L17081329-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6465	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:40
Workgroup #: WG627239	Analyst: DLP	Run Date: 08/25/2017 11:50
Collect Date: 08/24/2017 15:00	Dilution: 5	File ID: 00.1708251150-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	2.95		0.500	0.250	0.125

Certificate of Analysis

Sample #: L17081329-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6465	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG627555	Analyst: ADG	Run Date: 08/29/2017 13:22
Collect Date: 08/24/2017 15:00	Dilution: 5	File ID: TC08292017.013
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	74.9		10.0	5.00	2.50

2.1 General Chemistry Data

2.1.1 Ammonia Data

2.1.1.1 Summary Data

Lab Report #: L17081329

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081329-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6465	Prep Method: 350.1	Prep Date: 08/29/2017 11:10
Matrix: Water	Analytical Method: 350.1	Cal Date: 08/30/2017 09:56
Workgroup #: WG627554	Analyst: TMM	Run Date: 08/30/2017 10:12
Collect Date: 08/24/2017 15:00	Dilution: 10	File ID: S2170830002.024
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	20.9		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)

Analytical Method: 350.1
Login Number: L17081329

AAB#: WG627554

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-SP650-6465	01	08/24/17					08/29/2017	4.8	28		08/30/17	5.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17081329 Work Group: WG627554
 Blank File ID: S2170830002.011 Blank Sample ID: WG627554-01
 Prep Date: 08/29/17 10:39 Instrument ID: SMARTCHEM2
 Analyzed Date: 08/30/17 10:00 Method: 350.1
 Analyst: TMM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG627554-02	S2170830002.012	08/30/17 10:01	02
LH18/24-SP650-6465	L17081329-01	S2170830002.024	08/30/17 10:12	DL02
DUP	WG627554-04	S2170830002.030	08/30/17 10:17	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5455200
 Report generated 08/30/2017 13:25



Login Number: L17081329 Prep Date: 08/29/17 10:39 Sample ID: WG627554-01
Instrument ID: SMARTCHEM2 Run Date: 08/30/17 10:00 Prep Method: 350.1
File ID: S2170830002.011 Analyst: TMM Method: 350.1
Workgroup (AAB#): WG627554 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-30-AUG-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Nitrogen, Ammonia	0.0500	0.200	0.0660	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: 5455201
30-AUG-2017 13:25



Login Number: L17081329 Run Date: 08/30/2017 Sample ID: WG627554-02
 Instrument ID: SMARTCHEM2 Run Time: 10:01 Prep Method: 350.1
 File ID: S2170830002.012 Analyst: TMM Method: 350.1
 Workgroup (AAB#): WG627554 Matrix: Water Units: mg/L
 QC Key: DOD4 Lot#: STD83234 Cal ID: SMARTC - 30-AUG-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Ammonia	2.00	2.00	100	90 - 110	

LCS - Modified 03/06/2008
 PDF File ID: 5455202
 Report generated: 08/30/2017 13:25



2.1 General Chemistry Data

2.1.2 Orthophosphate Data

2.1.2.1 Summary Data

Lab Report #: L17081329

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081329-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6465	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:40
Workgroup #: WG627239	Analyst: DLP	Run Date: 08/25/2017 11:50
Collect Date: 08/24/2017 15:00	Dilution: 5	File ID: 00.1708251150-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	2.95		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: 25-AUG-2017
 Analyst: DLP
 Analyst: NA
 Method: PO4
 Instrument: UV-2600
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG627239

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	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	
Primary Reviewer	DLP
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
25-AUG-2017

Secondary Reviewer:
25-AUG-2017

Dwight Payne

Denna Johnson



Analytical Method: 365.2
Login Number: L17081329

AAB#: WG627239

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-SP650-6465	01	08/24/17					08/25/2017	.9	2		08/25/17	.9	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17081329
Blank File ID: 00.1708251150-03
Prep Date: 08/25/17 11:50
Analyzed Date: 08/25/17 11:50
Analyst: DLP

Work Group: WG627239
Blank Sample ID: WG627239-01
Instrument ID: UV-2600
Method: 365.2

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG627239-02	00.1708251150-04	08/25/17 11:50	
LCS2	WG627239-03	00.1708251150-05	08/25/17 11:50	
LH18/24-SP650-6465	L17081329-01	00.1708251150-06	08/25/17 11:50	
DUP	WG627239-05	00.1708251150-07	08/25/17 11:50	

Report Name: BLANK_SUMMARY
PDF File ID: 5449782
Report generated 08/25/2017 15:35



Login Number: L17081329 Prep Date: 08/25/17 11:50 Sample ID: WG627239-01
Instrument ID: UV-2600 Run Date: 08/25/17 11:50 Prep Method: 365.2
File ID: 00.1708251150-03 Analyst: DLP Method: 365.2
Workgroup (AAB#): WG627239 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: UV-260-23-AUG-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: 5449783
25-AUG-2017 15:35



Login Number: L17081329 Analyst: DLP Prep Method: 365.2
 Instrument ID: UV-2600 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG627239 Units: mg/L
 QC Key: DOD4 Lot #: STD83556
 Sample ID: WG627239-02 LCS File ID: 00.1708251150-04 Run Date: 08/25/2017 11:50
 Sample ID: WG627239-03 LCS2 File ID: 00.1708251150-05 Run Date: 08/25/2017 11:50

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	1.00	100	1.00	1.00	100	0.160	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5449784
 Report generated: 08/25/2017 15:35



2.1.2.3 Raw Data

WG6616995

Curves

Parameter: PO4

Spectrophotometer: UV-2600

Calibration (Curve) standard stock: STD 79640

Concentration: 1000 mg/L

Recipe for preparation of curve standards found in:

SOP: 3653 Revision: 17 Page: 09

Second Source Stock: STD 82182 (concentration: 10)

Daily Preparation: 10/100/100

concentration = 1.0

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
1.0	50	1cm	880	0.623
0.7				0.442
0.5				0.311
0.2				0.127
0.1				0.063
0.05				0.031
0				0
2nd Source (1.0)	50	1cm	880	0.630

Analyst: Jammy Morris

Date/Time: 6/7/17 @ 1540

DCN#126309



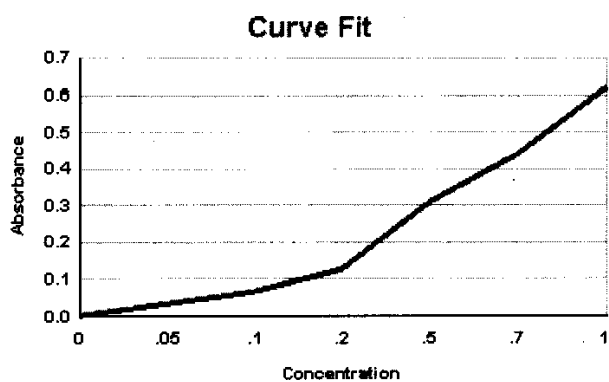
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG616995
Analytical Method: 300
Instrument ID: UV-2600

Analyst: TMM
Initial Calibration Date: 06/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.624599
Y-Intercept: 0.000610422
Coef. Of Correlation (R^2): 0.999913
Coef. Of Correlation (R): 0.999957

Concentration X	Absorbance Y	X^2	X * Y	Y-Fitted (mX^2+B)
0.00	0.00	0.00	0.00	0.000610422
0.0500	0.0310	0.00250	0.00155	0.0318404
0.100	0.0630	0.0100	0.00630	0.0630703
0.200	0.127	0.0400	0.0254	0.125530
0.500	0.311	0.250	0.156	0.312910
0.700	0.442	0.490	0.309	0.437830
1.00	0.623	1.00	0.623	0.625209



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 06/07/2017 16:24



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

00861226

Workgroup #: WG616995
File ID: 00.1706071540-08
CCV ID: WG616995-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 06/07/2017
Run Time: 15:40
Analyst: TMM
Cal ID: UV-260 - 07-JUN-17 15:40:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.01	0.630	1.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 06/07/2017 16:25



WORKGROUP: WG627239

Orthophosphate

(orthophosphate1)

EPA 365.2 / SM4500-P E

SOP K3653 Rev 17

Color Reagent Chemicals

RGT 40722

RGT 40466

RGT 41073

COA 18278

CCV: 81083555

Daily Dilution: 5(5)/502

Daily Dilution: 0.5

Spectrophotometer: 4426
wv 2600

LCS: 51083556

Daily Dilution: 10(10)/1002

Daily Dilution: 1

Curve ID: 676995

6-07-17

Spike: 81083556

Daily Dilution: 2(10)/1002

Daily Dilution: 0.4

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: 0.5 mg/L	50	✓		0.316
BLK/CCB:	50	✓		0.000
LCS: 1.0 ppm	50	✓		0.628
LCSD: 1.0 ppm	50	✓		0.627
08-1329-U)	50	✓	Y5	0.269
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
CCV:	50			
CCB:	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
DUP 08-1329-01	50	✓	Y5	0.263
MS: (1329-0)	50	✓	Y5	0.400
MSD: ()	50			
CCV: (0.5	50			0.316
CCB:	50			0.000

Analyst: *Quetta Payne*

Date / Time: 08-25-17 / 11:50

DCN#127887



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG627239Analyst: DLPAnalyte: ORTHOPHOSPHATEDate: 08/25/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG627239-01	50	50	0	0.6246	0.0006104	-0.00097730	-0.00097730	1	mg/L
WG627239-02	50	50	0.628	0.6246	0.0006104	1.0045	1.0045	1	mg/L
WG627239-03	50	50	0.627	0.6246	0.0006104	1.0029	1.0029	1	mg/L
L17081329-01	50	50	0.369	0.6246	0.0006104	0.58980	2.9490	5	mg/L
WG627239-04	50	50	0.369	0.6246	0.0006104	0.58980	2.9490	5	mg/L
WG627239-05	50	50	0.363	0.6246	0.0006104	0.58020	2.9010	5	mg/L
WG627239-06	50	50	0.400	0.6246	0.0006104	0.63943	3.1972	5	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 08/25/2017 14:42



Workgroup #: WG627325 Instrument ID: UV-2600
File ID: 00.1708251150-01 Run Date: 08/25/2017
CCV ID: WG627325-01 Run Time: 11:50
Units: mg/L Analyst: DLP
Analyte: ORTHOPHOSPHATE Cal ID: UV-260 - 23-AUG-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.505	0.632	1.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 08/25/2017 14:41



Workgroup #: WG627325
File ID: 00.1708251150-09
CCV ID: WG627325-03
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 08/25/2017
Run Time: 11:50
Analyst: DLP
Cal ID: UV-260 - 23-AUG-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.505	0.632	1.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 08/25/2017 14:41



2.1 General Chemistry Data

2.1.3 Total Organic Carbon Data

2.1.3.1 Summary Data

Lab Report #: L17081329

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081329-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6465	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG627555	Analyst: ADG	Run Date: 08/29/2017 13:22
Collect Date: 08/24/2017 15:00	Dilution: 5	File ID: TC08292017.013
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	74.9		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: 29-AUG-2017
 Analyst: ADG
 Analyst: NA
 Method: TOC
 Instrument: TOCVWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG627555

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	DIH
Comments	

Primary Reviewer:
30-AUG-2017

April Greene

Secondary Reviewer:
30-AUG-2017

Dennis Johnson



Analytical Method: 415.1
Login Number: L17081329

AAB#: WG627555

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-SP650-6465	01	08/24/17					08/29/2017	4.9	28		08/29/17	4.9	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number:L17081329
 Blank File ID:TC08292017.004
 Prep Date:08/29/17 10:04
 Analyzed Date:08/29/17 10:04
 Analyst:ADG

Work Group:WG627555
 Blank Sample ID:WG627555-01
 Instrument ID:TOC-VWP
 Method:415.1

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG627555-02	TC08292017.005	08/29/17 10:24	01
LCS2	WG627555-03	TC08292017.006	08/29/17 10:44	01
LH18/24-SP650-6465	L17081329-01	TC08292017.013	08/29/17 13:22	DL01
DUP	WG627555-05	TC08292017.021	08/29/17 15:57	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5455012
 Report generated 08/30/2017 11:32



Login Number: L17081329 Prep Date: 08/29/17 10:04 Sample ID: WG627555-01
Instrument ID: TOC-VWP Run Date: 08/29/17 10:04 Prep Method: 415.1
File ID: TC08292017.004 Analyst: ADG Method: 415.1
Workgroup (AAB#): WG627555 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: 5455013
30-AUG-2017 11:32



Login Number: L17081329 Analyst: ADG Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG627555 Units: mg/L
 QC Key: DOD4 Lot #: STD80787

Sample ID: WG627555-02 LCS File ID: TC08292017.005 Run Date: 08/29/2017 10:24
 Sample ID: WG627555-03 LCS2 File ID: TC08292017.006 Run Date: 08/29/2017 10:44

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	25.5	102	25.0	25.9	103	1.48	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5455014
 Report generated: 08/30/2017 11:32



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 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

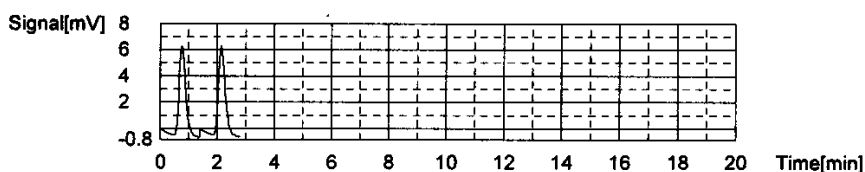
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

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

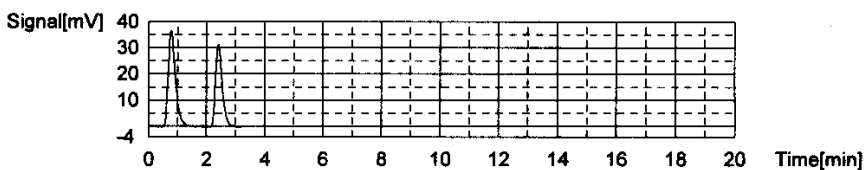
Acid Add. 0.000%
 Mean Area 10.82



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

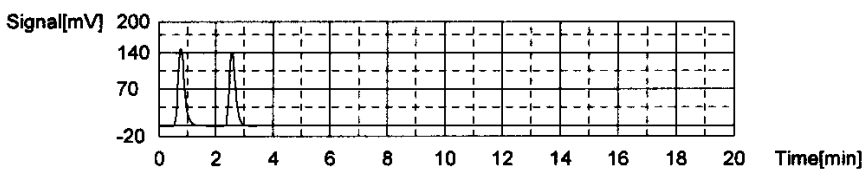
Acid Add. 0.000%
 Mean Area 57.92



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

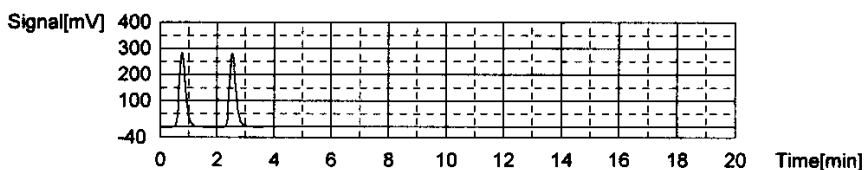


Conc: 10.00mg/L

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

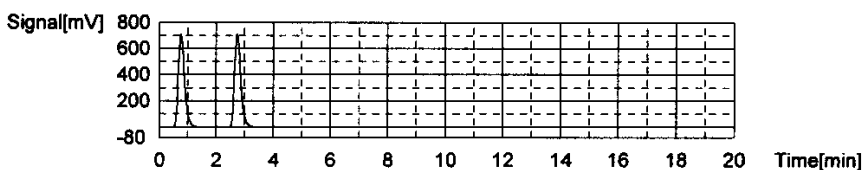
Acid Add. 0.000%
Mean Area 440.2



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

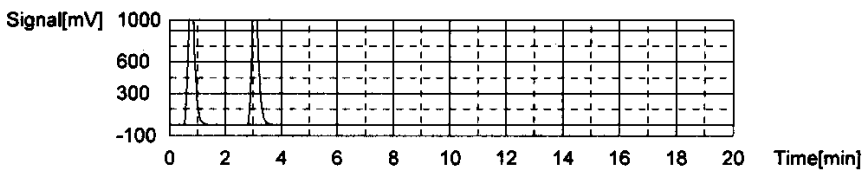
Acid Add. 0.000%
Mean Area 1092



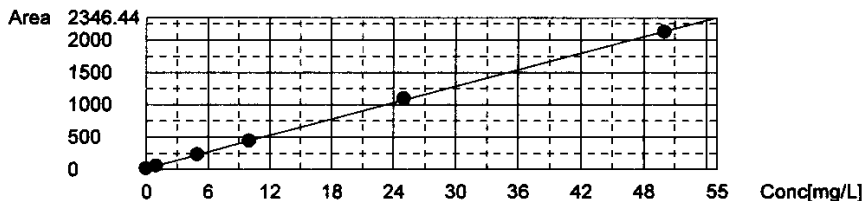
Conc: 50.00mg/L

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

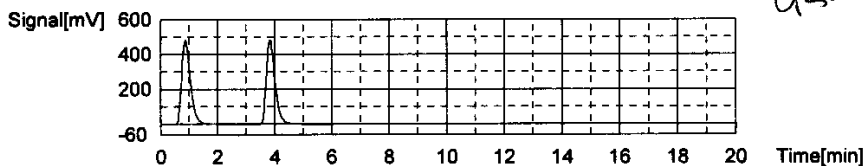
1. Det

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

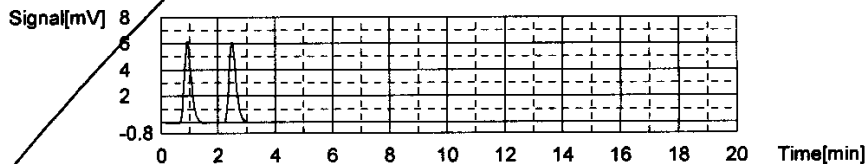
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

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

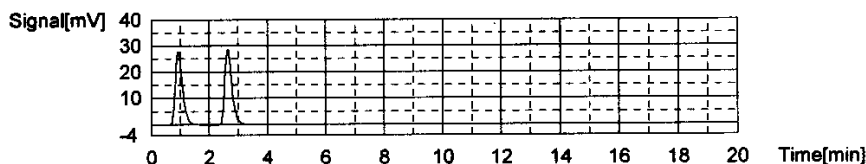
Acid Add. 3.000%
Mean Area 10.51



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

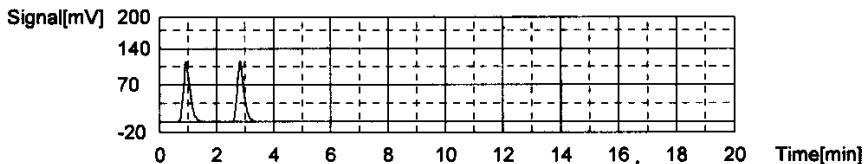


Conc: 5.000mg/L

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*

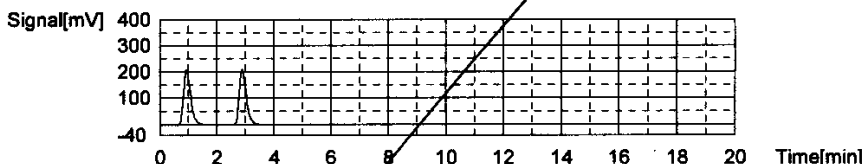
Acid Add. 3.000%
Mean Area 189.6



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

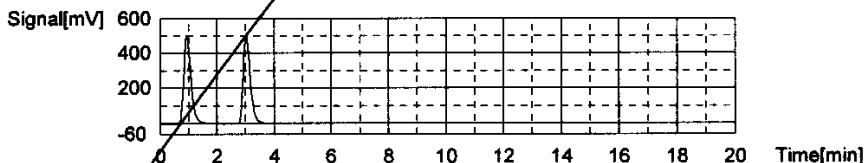
Acid Add. 3.000%
Mean Area 361.4



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

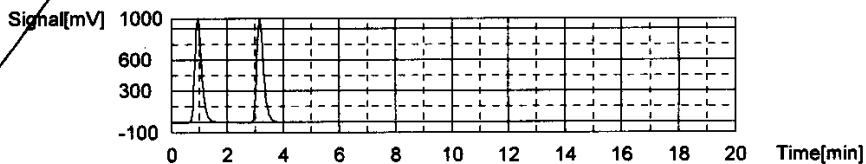
Acid Add. 3.000%
Mean Area 858.1



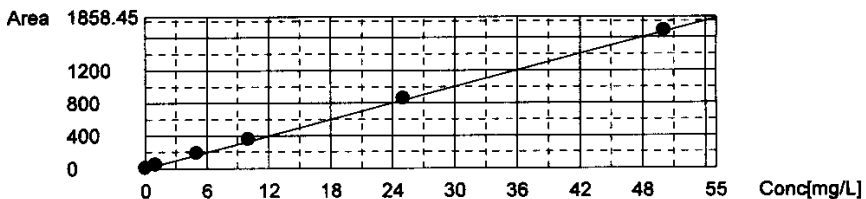
Conc: 50.00mg/L

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

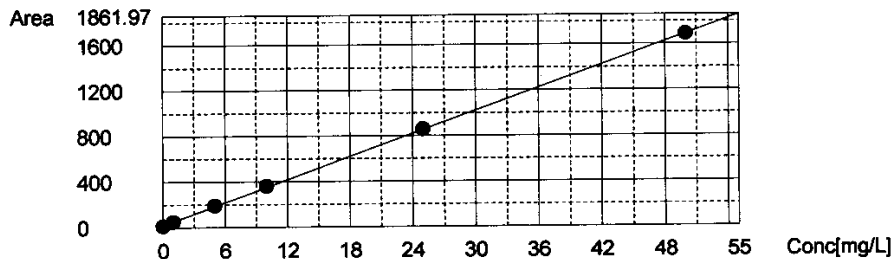
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

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
 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:

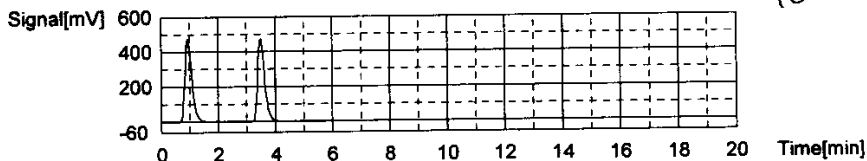
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

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:

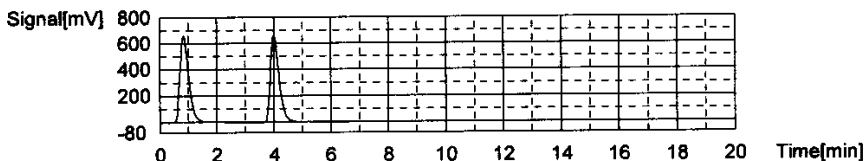
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

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:

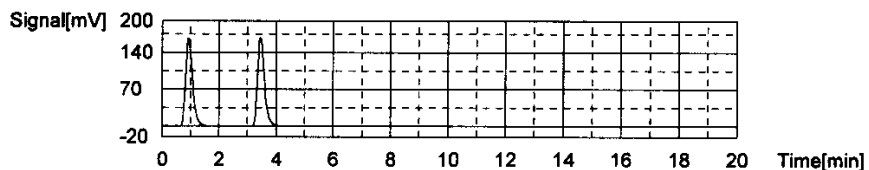
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

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

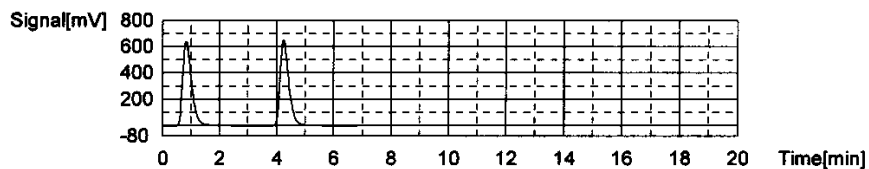
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

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



Total Organic Carbon

MAKE DAILY

CCV (TOC): 79387
 $(5/200)(1000) = 25\text{mg/L}$

LCS (TOC): 80787
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): 73359
 $(5/200)(1000) = 25\text{mg/L}$

MS (TOC): 80787
 $0.4(1000)/40 = 10$

Calibration Curve Date: 2/10/17

Reagent: 41061

- SM5310-C : Matrix 2 WG 627555
- EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K 1451 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	TIC	
2	TOC/TIC	
3	CCV	
4	BLK	
5	LCS	
6	LCS Dup	
7	1300-01	
8	1305-01	
9	03	1/3
10	05	1/25
11	10	
12	12	
13	1329-01	1/5
14	CLV	
15	CLB	
16	1302-01	
17	1408-01	
18	03	
19	05	
20	07	
21	1300-01 Dup	
22	1300-01 MS	
23	CCV 1484-01	
24	CLB	02
25		03

Position	Sample ID	Dilution
26	CCV	
27	CLB	
28	1484-04	
29	1493-01	
30	CCV	
31	CLB	
32	CCV	
33	CLB	
34	1484-02	1/3
35	03	1/3
36	1493-01	1/3
37	CLV	
38	CLB	
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		
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61		
62		
63		
64		
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71		
72		
73		
74		
75		

Analyst: Paul Greene

Date/Time: 8/29/17 @ 0915

DCN#127936



	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:1.316mg/L TC:26.04mg/L IC:24.72mg/L	Complete	8/29/2017 9:34:48 AM	1
2	TOC	TOC/TIC	TOC:25.68mg/L TC:34.10mg/L IC:8.421mg/L	Complete	8/29/2017 9:47:32 AM	2
3	TOC	CCV	!!Error!! TOC:25.23mg/L TC:24.93mg/L IC:-0.3047mg/L	Complete	8/29/2017 9:59:45 AM	3
4	TOC	WG627555-01 BLK	!!Error!! TOC:0.1534mg/L TC:-0.1260mg/L IC:-0.2793mg/L	Complete	8/29/2017 10:16:12 AM	0
5	TOC	WG627555-02 LCS	!!Error!! TOC:25.49mg/L TC:25.21mg/L IC:-0.2819mg/L	Complete	8/29/2017 10:37:05 AM	5
6	TOC	WG627555-03 LCSDUP	!!Error!! TOC:25.87mg/L TC:25.59mg/L IC:-0.2818mg/L	Complete	8/29/2017 10:58:03 AM	6
7	TOC	L17081300-01	!!Error!! TOC:0.1617mg/L TC:-0.02540mg/L IC:-0.1871mg/L	Complete	8/29/2017 11:17:17 AM	7
8	TOC	L17081305-01	TOC:8.518mg/L TC:12.17mg/L IC:3.656mg/L	Complete	8/29/2017 11:38:39 AM	8
9	TOC	L17081305-03 (3)	TOC:7.647mg/L TC:30.23mg/L IC:22.59mg/L	Complete	8/29/2017 12:01:42 PM	9
10	TOC	L17081305-08 (25)	TOC:11.09mg/L TC:20.17mg/L IC:9.075mg/L	Complete	8/29/2017 12:23:56 PM	10
11	TOC	L17081305-10	TOC:7.505mg/L TC:45.39mg/L IC:37.88mg/L	Complete	8/29/2017 1:13:59 PM	12
12	TOC	L17081305-12	TOC:3.030mg/L TC:26.64mg/L IC:23.61mg/L	Complete	8/29/2017 1:36:50 PM	13
13	TOC	L17081329-01 (5)	TOC:14.97mg/L TC:27.85mg/L IC:12.88mg/L	Complete	8/29/2017 1:49:01 PM	14
14	TOC	CCV	!!Error!! TOC:24.24mg/L TC:24.01mg/L IC:-0.2289mg/L	Complete	8/29/2017 1:58:03 PM	0
15	TOC	CCB	!!Error!! TOC:0.1222mg/L TC:-0.1527mg/L IC:-0.3086mg/L	Complete	8/29/2017 2:17:12 PM	16
16	TOC	L17081362-01	!!Error!! TOC:0.4553mg/L TC:0.1467mg/L IC:-0.3086mg/L	Complete	8/29/2017 2:40:06 PM	17
17	TOC	L17081468-01	TOC:2.872mg/L TC:25.91mg/L IC:23.04mg/L	Complete	8/29/2017 3:02:32 PM	18
18	TOC	L17081468-03	TOC:3.061mg/L TC:28.06mg/L IC:25.00mg/L	Complete	8/29/2017 3:24:33 PM	19
19	TOC	L17081468-05	TOC:2.649mg/L TC:26.75mg/L IC:24.10mg/L	Complete	8/29/2017 3:50:42 PM	20
20	TOC	L17081468-07	TOC:3.490mg/L TC:22.15mg/L IC:18.66mg/L	Complete	8/29/2017 4:10:00 PM	21
21	TOC	WG627555-05 DUP	!!Error!! TOC:0.2049mg/L TC:0.03532mg/L IC:-0.1696mg/L	Complete	8/29/2017 4:30:25 PM	22
22	TOC	WG627555-06 MS	!!Error!! TOC:9.936mg/L TC:9.710mg/L IC:-0.2261mg/L	Complete	8/29/2017 4:52:17 PM	23
23	TOC	L17081484-01	TOC:5.088mg/L TC:18.03mg/L IC:12.95mg/L	Complete	8/29/2017 5:18:39 PM	24
24	TOC	<Untitled>	!!Error!! TOC:-0.8188mg/L TC:59.39mg/L IC:60.21mg/L	Complete	8/29/2017 5:43:01 PM	25
25	TOC	<Untitled>	TOC:10.42mg/L TC:50.29mg/L IC:39.87mg/L	Complete	8/29/2017 5:55:20 PM	26
26	TOC	CCV	!!Error!! TOC:25.01mg/L TC:24.95mg/L IC:-0.06195mg/L	Complete	8/29/2017 6:04:16 PM	0
27	TOC	CCB	!!Error!! TOC:0.06992mg/L TC:-0.1938mg/L IC:-0.2637mg/L	Complete	8/29/2017 6:26:44 PM	28
28	TOC	L17081484-04	TOC:5.444mg/L TC:26.12mg/L IC:20.68mg/L	Complete	8/29/2017 6:51:46 PM	29
29	TOC	<Untitled>	!!Error!! TOC:-12.98mg/L TC:66.19mg/L IC:79.17mg/L	Complete	8/29/2017 7:04:15 PM	30
30	TOC	CCV	TOC:24.30mg/L TC:24.48mg/L IC:0.1758mg/L	Complete	8/29/2017 7:13:18 PM	0
31	TOC	CCB	!!Error!! TOC:0.1210mg/L TC:-0.09888mg/L IC:-0.2199mg/L	Complete	8/29/2017 7:24:36 AM	32
32	TOC	CCV	!!Error!! TOC:24.87mg/L TC:24.67mg/L IC:-0.2047mg/L	Complete	8/30/2017 7:33:36 AM	0
33	TOC	CCB	!!Error!! TOC:0.09451mg/L TC:-0.1647mg/L IC:-0.2592mg/L	Complete	8/30/2017 7:55:36 AM	34
34	TOC	L17081484-02 (3)	TOC:4.368mg/L TC:27.82mg/L IC:23.46mg/L	Complete	8/30/2017 8:17:07 AM	35
35	TOC	L17081484-03 (3)	TOC:4.246mg/L TC:21.21mg/L IC:16.96mg/L	Complete	8/30/2017 8:39:41 AM	36
36	TOC	L17081493-01 (3)	TOC:3.585mg/L TC:39.48mg/L IC:35.90mg/L	Complete	8/30/2017 8:51:59 AM	37
37	TOC	CCV	!!Error!! TOC:24.62mg/L TC:24.57mg/L IC:-0.04254mg/L	Complete	8/30/2017 9:01:05 AM	0
38	TOC	CCB	!!Error!! TOC:0.1669mg/L TC:-0.06911mg/L IC:-0.2361mg/L	Complete		

8/30/2017 9:51:58 AM

1/1

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

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

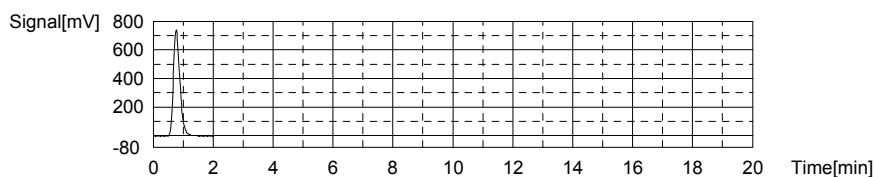
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.316mg/L TC:26.04mg/L IC:24.72mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1119	26.04mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 9:29:42 AM

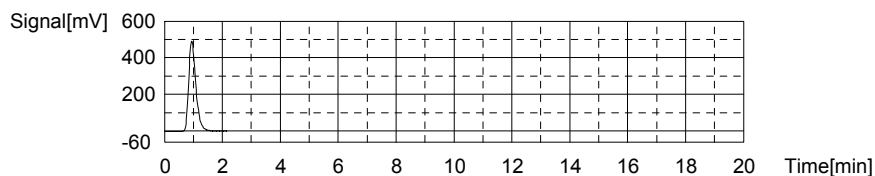
Mean Area 1119
 Mean Conc. 26.04mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	846.3	24.72mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 9:34:48 AM

Mean Area 846.3
 Mean Conc. 24.72mg/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:25.68mg/L TC:34.10mg/L IC:8.421mg/L

1. Det

Anal.: TC

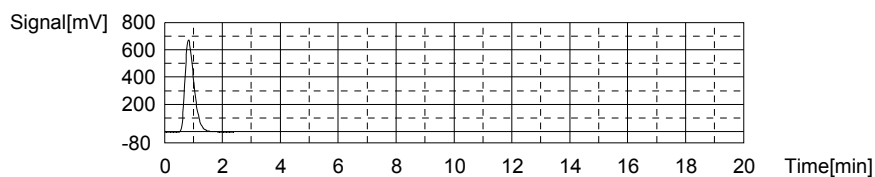
1/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1460	34.10mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 9:42:38 AM

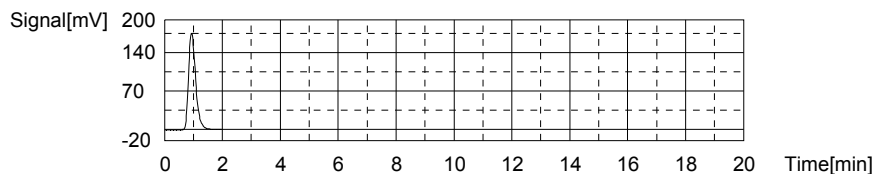
Mean Area 1460
Mean Conc. 34.10mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	300.4	8.421mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 9:47:32 AM

Mean Area 300.4
Mean Conc. 8.421mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

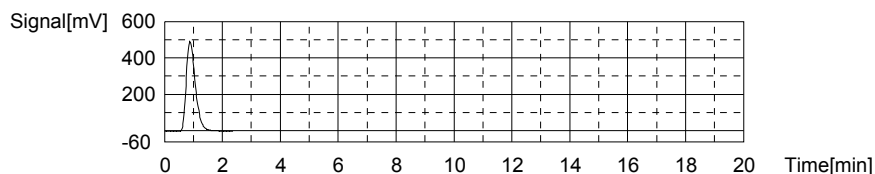
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.23mg/L TC:24.93mg/L IC:-0.3047mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1072	24.93mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 9:55:20 AM

Mean Area 1072
Mean Conc. 24.93mg/L

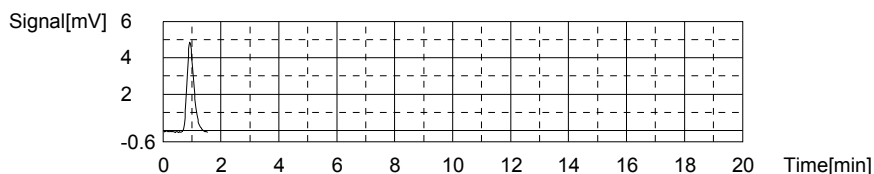


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.213	-0.3047mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 9:59:45 AM

2/27

Mean Area 8.213
 Mean Conc. -0.3047mg/L



Sample

Sample Name: WG627555-01 BLK
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

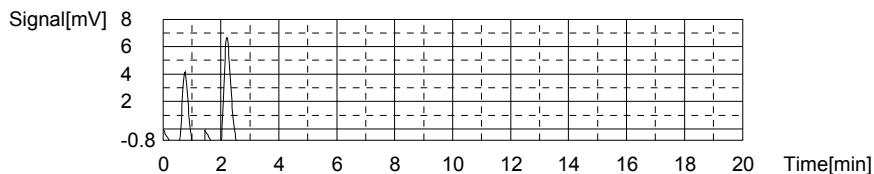
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1534mg/L TC:-0.1260mg/L IC:-0.2793mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.927	-0.1876mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 10:04:50 AM
2	14.14	-0.06439mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 10:08:26 AM

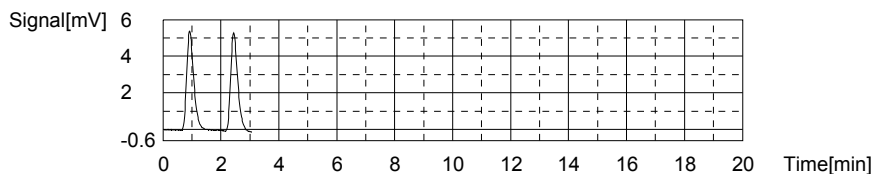
Mean Area 11.53
 Mean Conc. -0.1260mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.108	-0.2779mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 10:12:18 AM
2	9.014	-0.2807mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 10:16:12 AM

Mean Area 9.061
 Mean Conc. -0.2793mg/L



Sample

Sample Name: WG627555-02 LCS
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

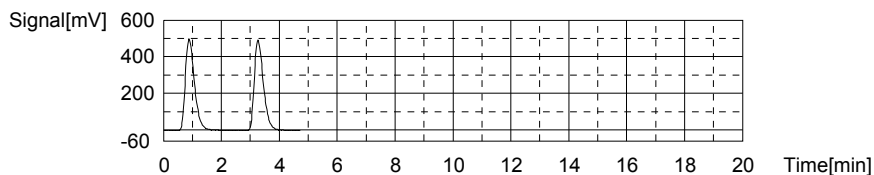
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.49mg/L TC:25.21mg/L IC:-0.2819mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1091	25.38mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 10:24:02 AM
2	1077	25.05mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 10:28:39 AM

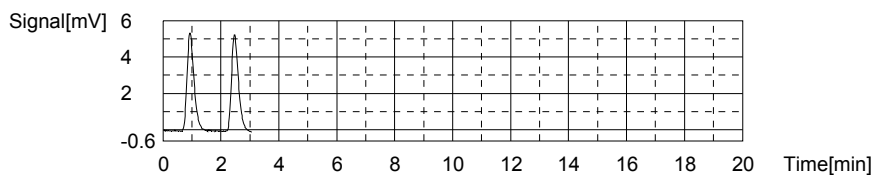
Mean Area 1084
Mean Conc. 25.21mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.086	-0.2786mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 10:33:00 AM
2	8.861	-0.2853mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 10:37:05 AM

Mean Area 8.974
Mean Conc. -0.2819mg/L



Sample

Sample Name: WG627555-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result: Completed

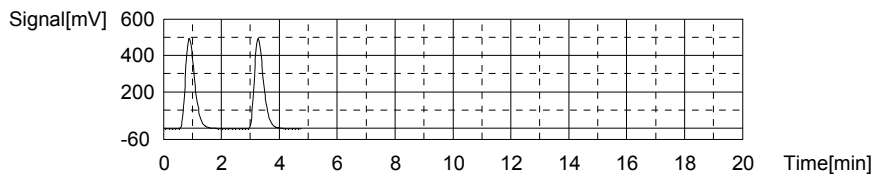
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.87mg/L TC:25.59mg/L IC:-0.2818mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1104	25.69mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 10:44:54 AM
2	1096	25.50mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 10:49:33 AM

Mean Area 1100
Mean Conc. 25.59mg/L



Anal.: IC

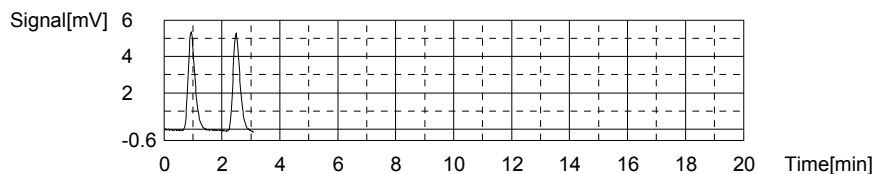
4/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.931	-0.2832mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 10:53:54 AM
2	9.023	-0.2805mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 10:58:03 AM

Mean Area 8.977
Mean Conc. -0.2818mg/L



Sample

Sample Name: L17081300-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

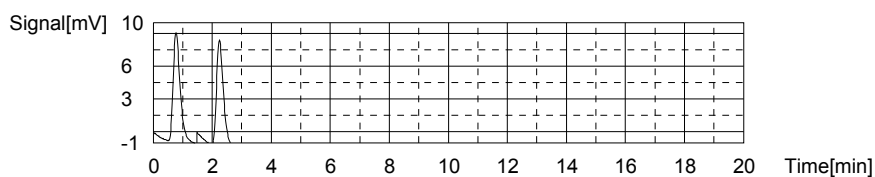
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1617mg/L TC:-0.02540mg/L IC:-0.1871mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	16.11	-0.01784mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 11:04:58 AM
2	15.47	-0.03296mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 11:08:42 AM

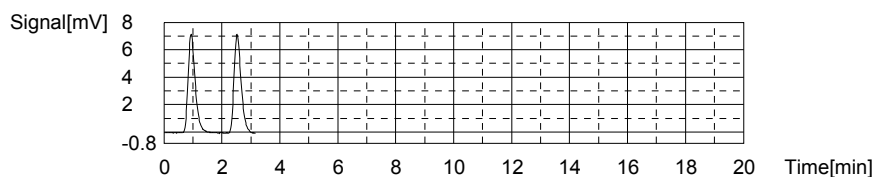
Mean Area 15.79
Mean Conc. -0.02540mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.14	-0.1874mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 11:13:08 AM
2	12.16	-0.1868mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 11:17:17 AM

Mean Area 12.15
Mean Conc. -0.1871mg/L



Sample

5/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

Sample Name: L17081305-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

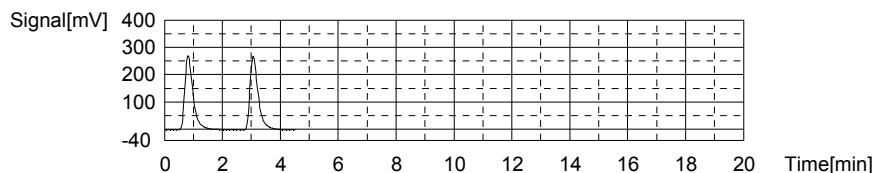
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:8.518mg/L TC:12.17mg/L IC:3.656mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	532.3	12.18mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 11:24:58 AM
2	532.0	12.17mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 11:29:30 AM

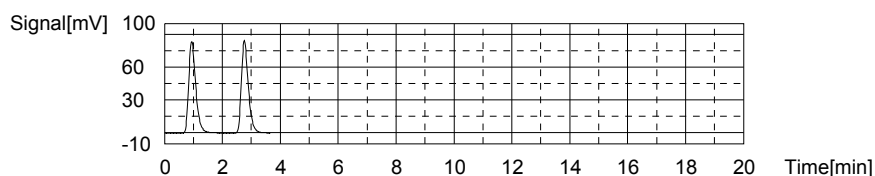
Mean Area 532.2
 Mean Conc. 12.17mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	140.6	3.649mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 11:34:11 AM
2	141.1	3.664mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 11:38:39 AM

Mean Area 140.8
 Mean Conc. 3.656mg/L



Sample

Sample Name: L17081305-03 (3)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.647mg/L TC:30.23mg/L IC:22.59mg/L

1. Det

Anal.: TC

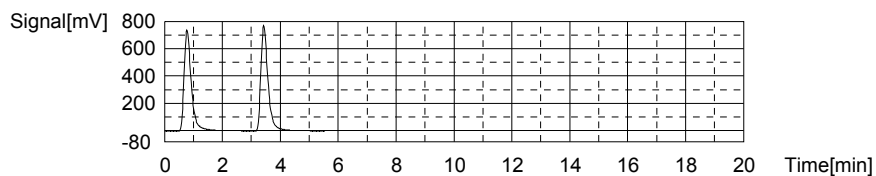
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1272	29.65mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 11:46:45 AM
2	1321	30.81mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 11:51:55 AM

6/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

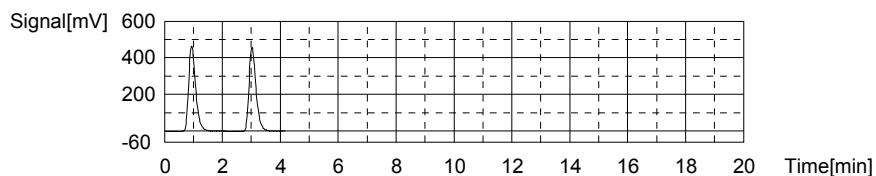
Mean Area 1297
Mean Conc. 30.23mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	781.3	22.78mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 11:56:54 AM
2	768.2	22.39mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 12:01:42 PM

Mean Area 774.8
Mean Conc. 22.59mg/L



Sample

Sample Name: L17081305-08 (25)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

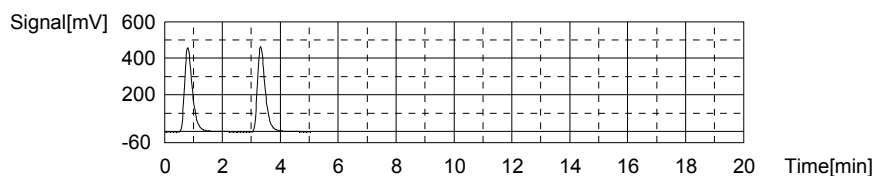
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.09mg/L TC:20.17mg/L IC:9.075mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	864.5	20.03mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 12:09:40 PM
2	876.5	20.31mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 12:14:29 PM

Mean Area 870.5
Mean Conc. 20.17mg/L



Anal.: IC

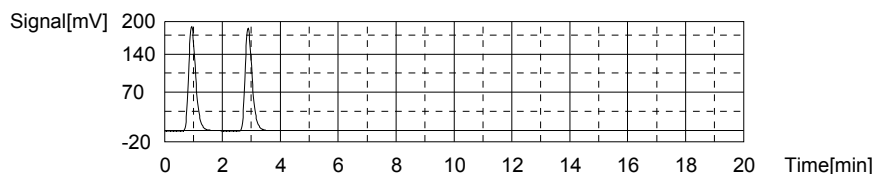
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	325.0	9.156mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 12:19:21 PM
2	319.6	8.994mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 12:23:56 PM

7/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

Mean Area 322.3
Mean Conc. 9.075mg/L



Sample

Sample Name: L17081305-10
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

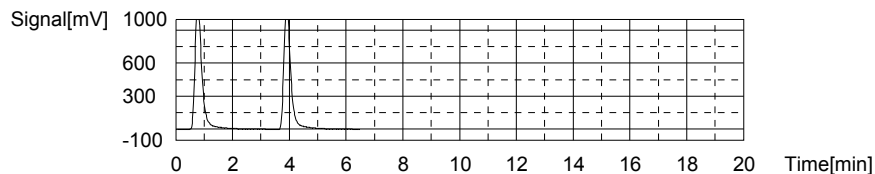
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.505mg/L TC:45.39mg/L IC:37.88mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1952	45.72mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 12:32:30 PM
2	1924	45.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 12:39:23 PM

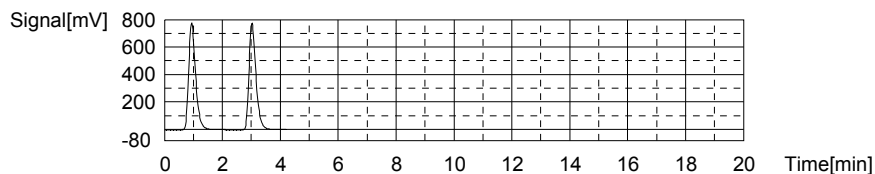
Mean Area 1938
Mean Conc. 45.39mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1285	37.82mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 12:44:26 PM
2	1289	37.94mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 12:49:21 PM

Mean Area 1287
Mean Conc. 37.88mg/L



Sample

Sample Name: L17081305-12
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

8/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

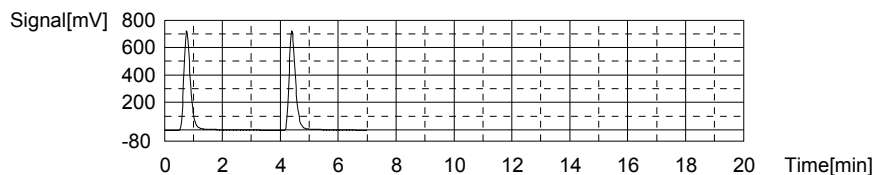
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.030mg/L TC:26.64mg/L IC:23.61mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1148	26.72mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 12:58:26 PM
2	1141	26.56mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 1:04:04 PM

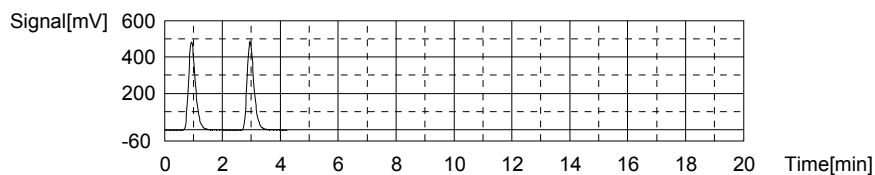
Mean Area 1145
Mean Conc. 26.64mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	809.5	23.62mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 1:09:04 PM
2	808.7	23.60mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 1:13:59 PM

Mean Area 809.1
Mean Conc. 23.61mg/L



Sample

Sample Name: L17081329-01 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

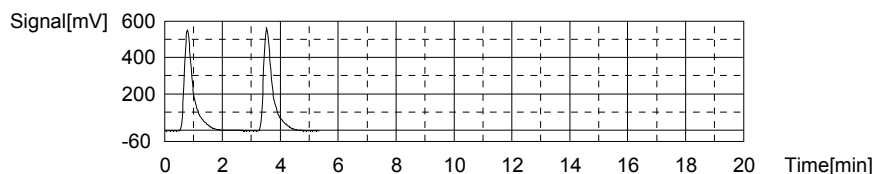
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.97mg/L TC:27.85mg/L IC:12.88mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1179	27.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 1:22:10 PM
2	1212	28.24mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 1:27:10 PM

Mean Area 1196
Mean Conc. 27.85mg/L



Anal.: IC

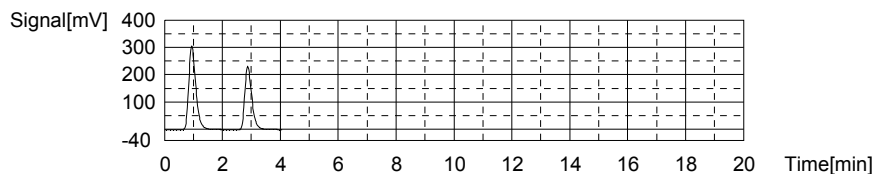
9/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	512.4	14.75mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 1:32:01 PM
2	386.9	11.00mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 1:36:50 PM

Mean Area 449.6
Mean Conc. 12.88mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

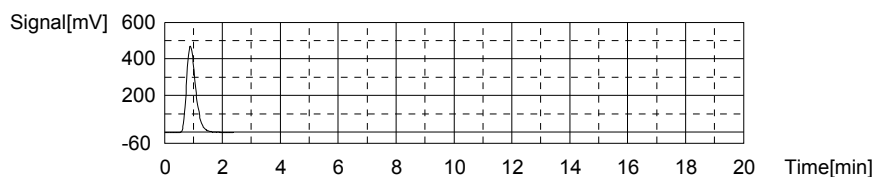
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.24mg/L TC:24.01mg/L IC:-0.2289mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1033	24.01mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 1:44:39 PM

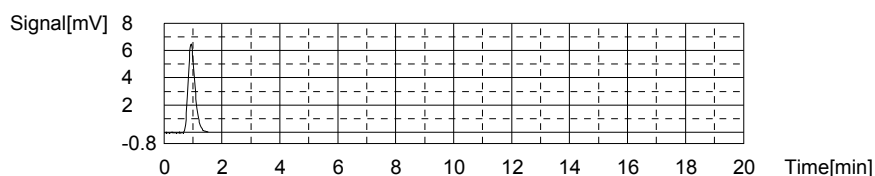
Mean Area 1033
Mean Conc. 24.01mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.75	-0.2289mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 1:49:01 PM

Mean Area 10.75
Mean Conc. -0.2289mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

10/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

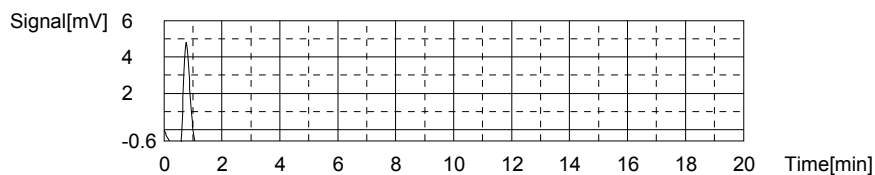
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1222mg/L TC:-0.1527mg/L IC:-0.2749mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.40	-0.1527mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 1:54:09 PM

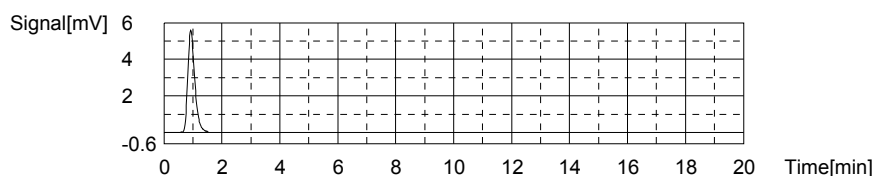
Mean Area 10.40
Mean Conc. -0.1527mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.209	-0.2749mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 1:58:03 PM

Mean Area 9.209
Mean Conc. -0.2749mg/L



Sample

Sample Name: L17081362-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

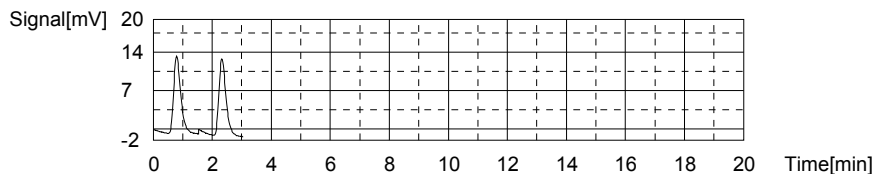
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.4553mg/L TC:0.1467mg/L IC:-0.3086mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	23.22	0.1501mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 2:05:02 PM
2	22.93	0.1433mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 2:08:49 PM

Mean Area 23.08
Mean Conc. 0.1467mg/L



Anal.: IC

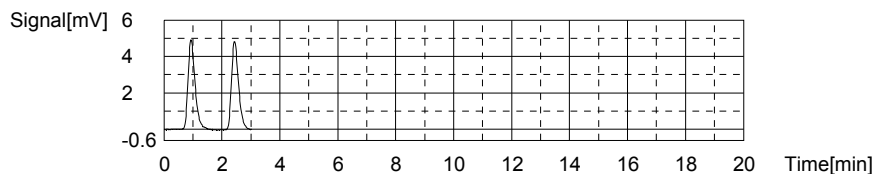
11/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.101	-0.3080mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 2:13:07 PM
2	8.064	-0.3091mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 2:17:12 PM

Mean Area 8.082
Mean Conc. -0.3086mg/L



Sample

Sample Name: L17081468-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

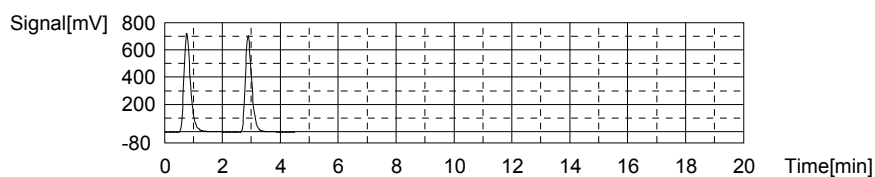
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.872mg/L TC:25.91mg/L IC:23.04mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1135	26.42mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 2:24:46 PM
2	1092	25.40mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 2:30:18 PM

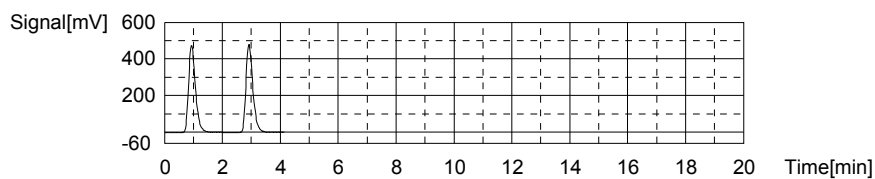
Mean Area 1114
Mean Conc. 25.91mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	781.7	22.79mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 2:35:15 PM
2	798.0	23.28mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 2:40:06 PM

Mean Area 789.9
Mean Conc. 23.04mg/L



Sample

12/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

Sample Name: L17081468-03
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

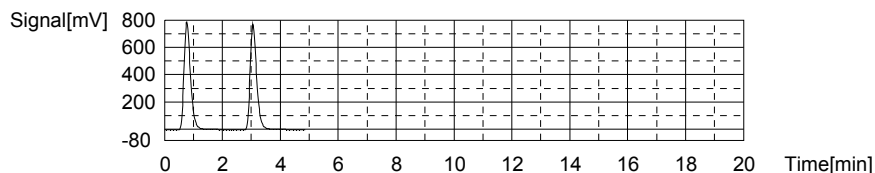
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.061mg/L TC:28.06mg/L IC:25.00mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1215	28.31mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 2:47:49 PM
2	1194	27.81mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 2:52:39 PM

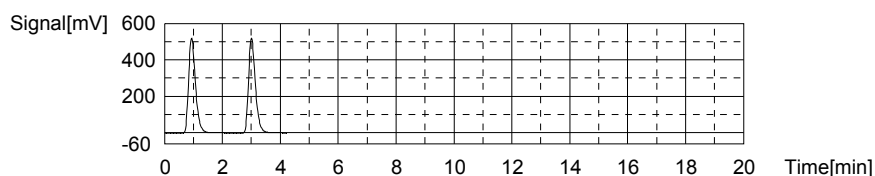
Mean Area 1205
 Mean Conc. 28.06mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	854.6	24.97mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 2:57:41 PM
2	856.4	25.03mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 3:02:32 PM

Mean Area 855.5
 Mean Conc. 25.00mg/L



Sample

Sample Name: L17081468-05
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.649mg/L TC:26.75mg/L IC:24.10mg/L

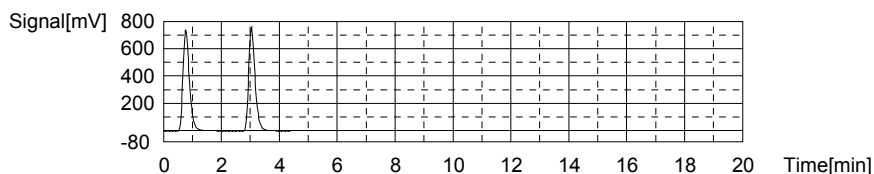
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1136	26.44mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 3:10:14 PM
2	1162	27.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 3:14:41 PM

13/27

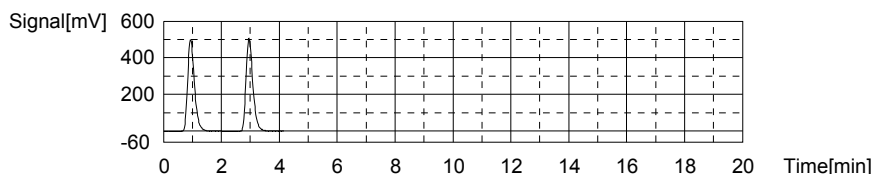
Mean Area 1149
Mean Conc. 26.75mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	814.9	23.79mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 3:19:39 PM
2	835.9	24.41mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 3:24:33 PM

Mean Area 825.4
Mean Conc. 24.10mg/L



Sample

Sample Name: L17081468-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

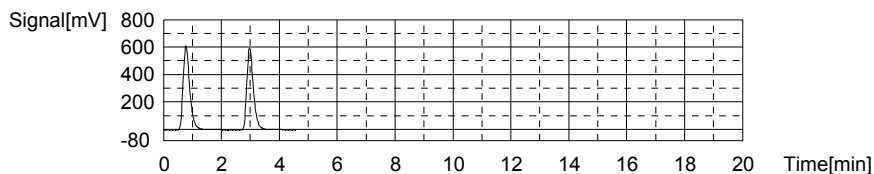
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.490mg/L TC:22.15mg/L IC:18.66mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	966.3	22.43mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 3:36:24 PM
2	942.4	21.87mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 3:41:03 PM

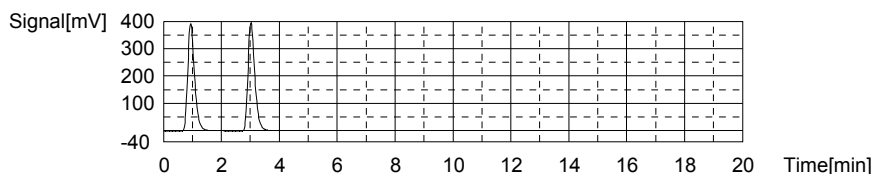
Mean Area 954.4
Mean Conc. 22.15mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	641.0	18.59mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 3:46:04 PM
2	645.5	18.73mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 3:50:42 PM

Mean Area 643.3
Mean Conc. 18.66mg/L



Sample

Sample Name: WG627555-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

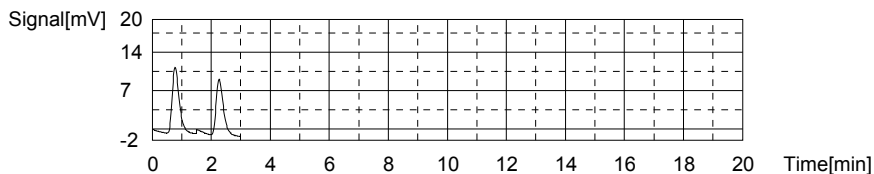
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.2049mg/L TC:0.03532mg/L IC:-0.1696mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	19.73	0.06769mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 3:57:38 PM
2	16.99	0.00295mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 4:01:25 PM

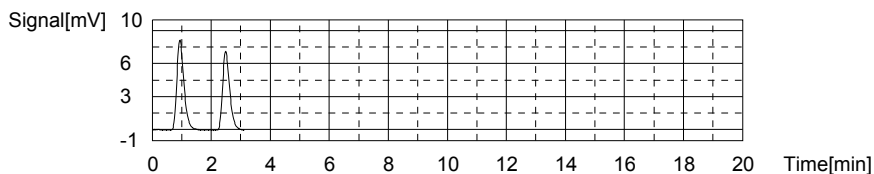
Mean Area 18.36
Mean Conc. 0.03532mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	13.52	-0.1462mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 4:05:49 PM
2	11.95	-0.1931mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 4:10:00 PM

Mean Area 12.74
Mean Conc. -0.1696mg/L



Sample

Sample Name: WG627555-06 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

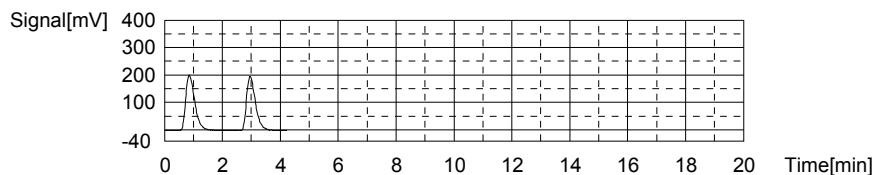
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:9.936mg/L TC:9.710mg/L IC:-0.2261mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	434.6	9.870mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 4:17:33 PM
2	421.1	9.551mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 4:21:57 PM

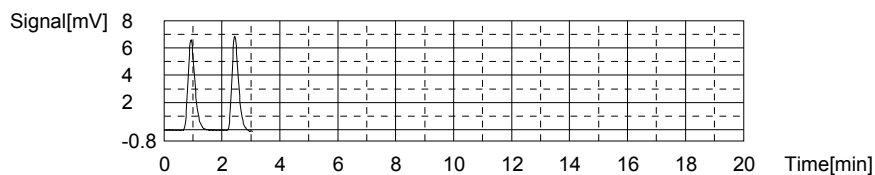
Mean Area 427.9
Mean Conc. 9.710mg/L



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_18	8/29/2017 4:26:20 PM
2	10.80	-0.2274mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 4:30:25 PM

Mean Area 10.85
Mean Conc. -0.2261mg/L



Sample

Sample Name: L17081484-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result: Completed

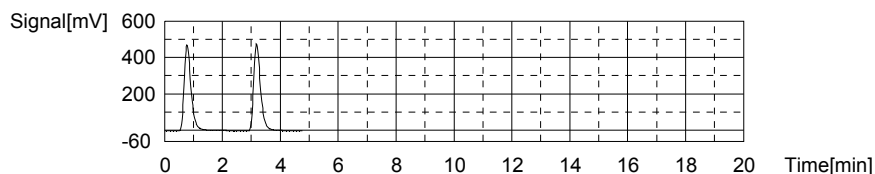
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.088mg/L TC:18.03mg/L IC:12.95mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	774.7	17.91mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 4:38:16 PM
2	785.6	18.16mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 4:42:54 PM

Mean Area 780.2
Mean Conc. 18.03mg/L



Anal.: IC

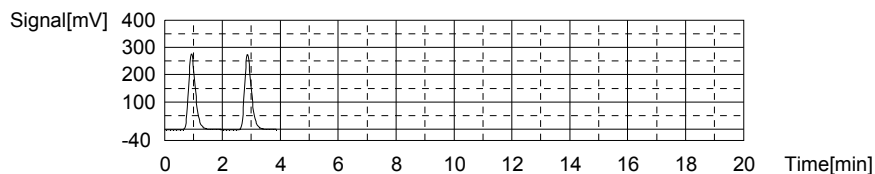
16/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	453.0	12.98mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 4:47:42 PM
2	450.8	12.91mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 4:52:17 PM

Mean Area 451.9
Mean Conc. 12.95mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

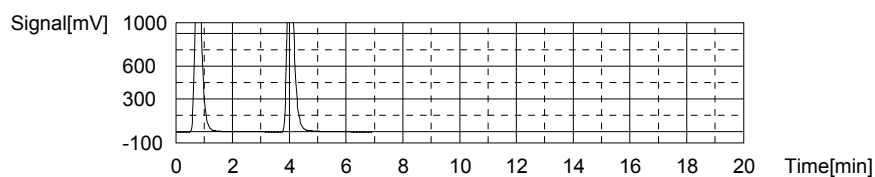
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-0.8188mg/L TC:59.39mg/L IC:60.21mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2480	58.20mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 5:00:59 PM
2	2581	60.58mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 5:07:41 PM

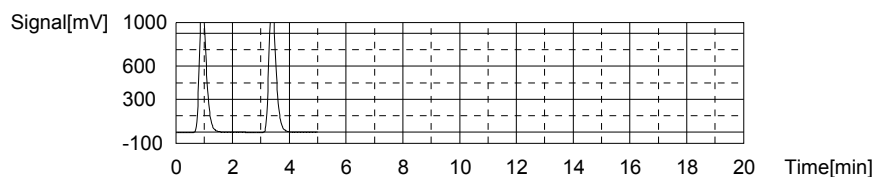
Mean Area 2531
Mean Conc. 59.39mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2022	59.83mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 5:13:14 PM
2	2047	60.58mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 5:18:39 PM

Mean Area 2035
Mean Conc. 60.21mg/L



Sample

17/27

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

Sample Name: <Untitled>
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

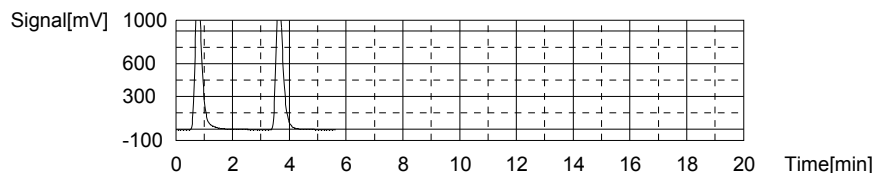
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:10.42mg/L TC:50.29mg/L IC:39.87mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2153	50.47mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 5:26:57 PM
2	2138	50.12mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 5:32:52 PM

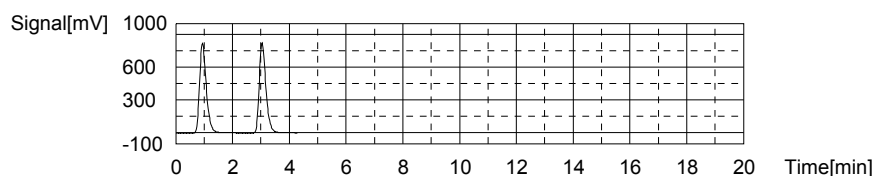
Mean Area 2146
 Mean Conc. 50.29mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1353	39.86mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 5:38:03 PM
2	1354	39.89mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 5:43:01 PM

Mean Area 1354
 Mean Conc. 39.87mg/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:25.01mg/L TC:24.95mg/L IC:-0.06195mg/L

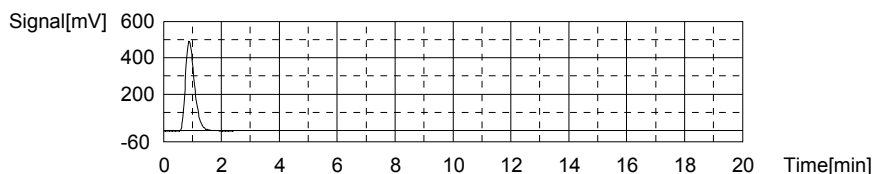
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1073	24.95mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 5:50:53 PM

18/27

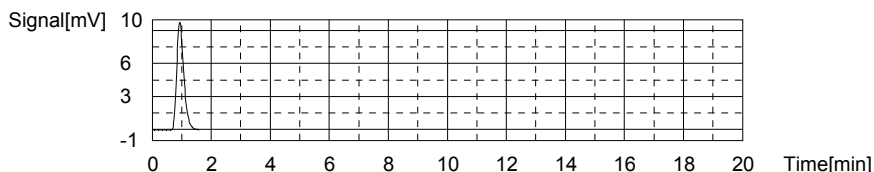
Mean Area 1073
Mean Conc. 24.95mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	16.34	-0.06195mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 5:55:20 PM

Mean Area 16.34
Mean Conc. -0.06195mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

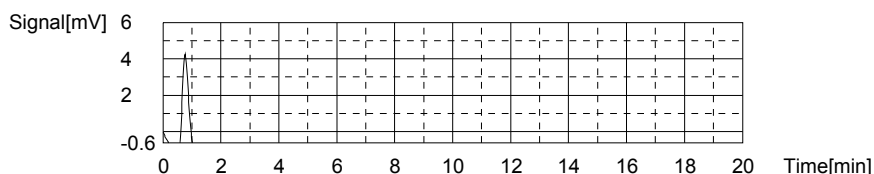
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06992mg/L TC:-0.1938mg/L IC:-0.2637mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.664	-0.1938mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/29/2017 6:00:22 PM

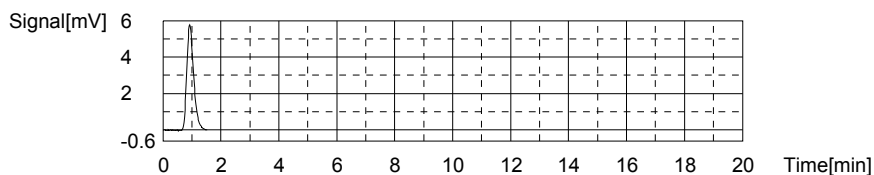
Mean Area 8.664
Mean Conc. -0.1938mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.585	-0.2637mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 6:04:16 PM

Mean Area 9.585
Mean Conc. -0.2637mg/L



Sample

Sample Name: L17081484-04
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

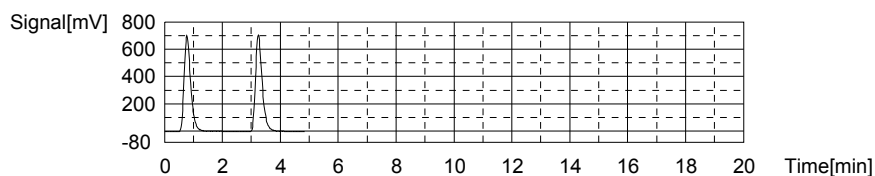
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.444mg/L TC:26.12mg/L IC:20.68mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1106	25.73mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 6:12:12 PM
2	1139	26.51mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 6:16:51 PM

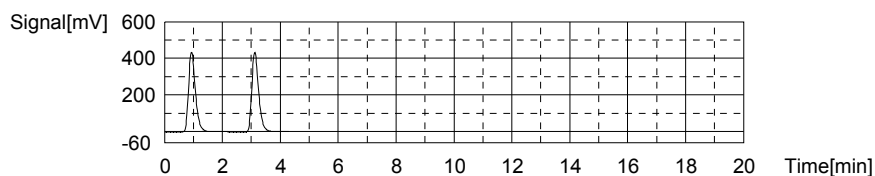
Mean Area 1123
 Mean Conc. 26.12mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	712.8	20.74mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 6:21:56 PM
2	708.9	20.62mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 6:26:44 PM

Mean Area 710.9
 Mean Conc. 20.68mg/L



Sample

Sample Name: <Untitled>
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

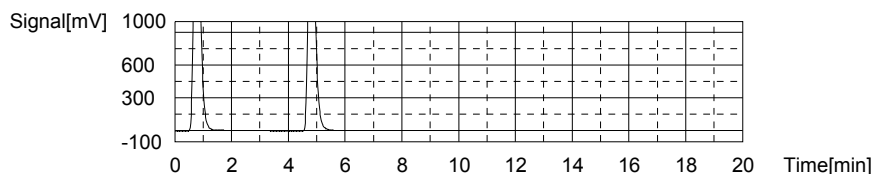
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-12.98mg/L TC:66.19mg/L IC:79.17mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2811	66.02mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 6:36:13 PM
2	2826	66.37mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 6:40:56 PM

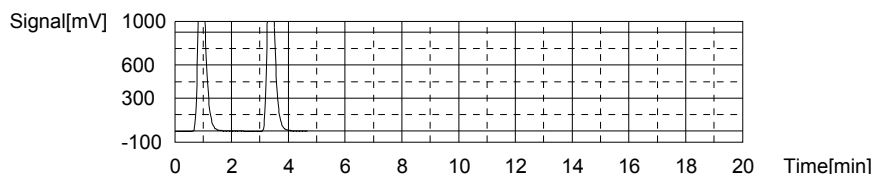
Mean Area 2819
Mean Conc. 66.19mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2675	79.33mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 6:46:32 PM
2	2664	79.01mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 6:51:46 PM

Mean Area 2670
Mean Conc. 79.17mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

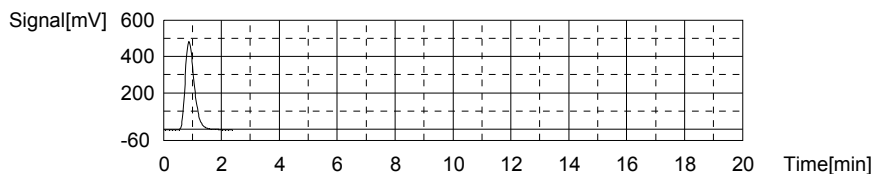
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:24.30mg/L TC:24.48mg/L IC:0.1758mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1053	24.48mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	18/29/2017 6:59:37 PM

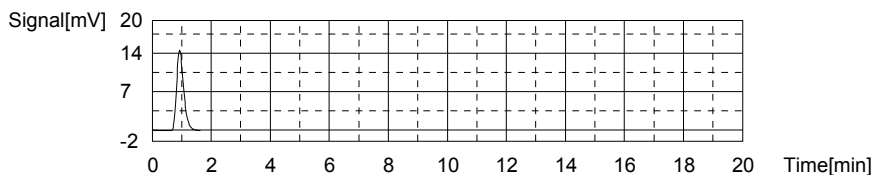
Mean Area 1053
Mean Conc. 24.48mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	24.30	0.1758mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/29/2017 7:04:15 PM

Mean Area 24.30
Mean Conc. 0.1758mg/L



8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

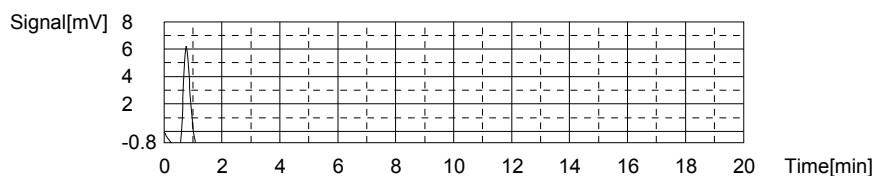
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1210mg/L TC:-0.09888mg/L IC:-0.2199mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.68	-0.09888mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/29/2017 7:09:23 PM

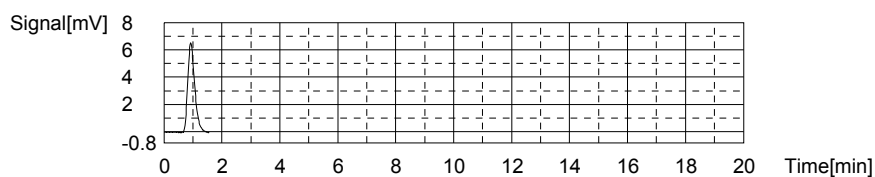
Mean Area 12.68
 Mean Conc. -0.09888mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.05	-0.2199mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/29/2017 7:13:18 PM

Mean Area 11.05
 Mean Conc. -0.2199mg/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:24.87mg/L TC:24.67mg/L IC:-0.2047mg/L

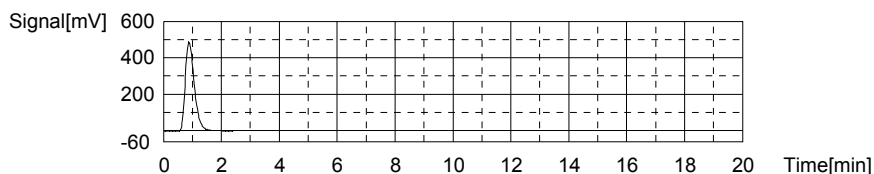
1. Det

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_58	8/30/2017 7:20:12 AM

22/27

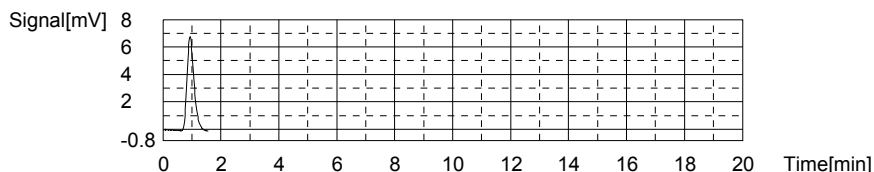
Mean Area 1061
Mean Conc. 24.67mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.56	-0.2047mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/30/2017 7:24:36 AM

Mean Area 11.56
Mean Conc. -0.2047mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

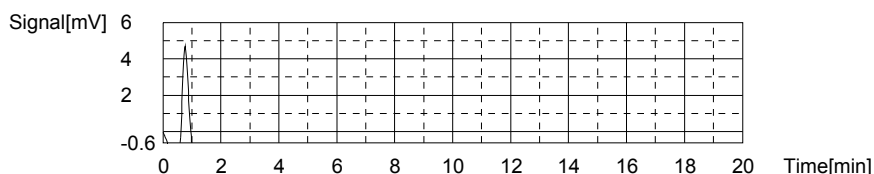
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.09451mg/L TC:-0.1647mg/L IC:-0.2592mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.896	-0.1647mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	18/30/2017 7:29:41 AM

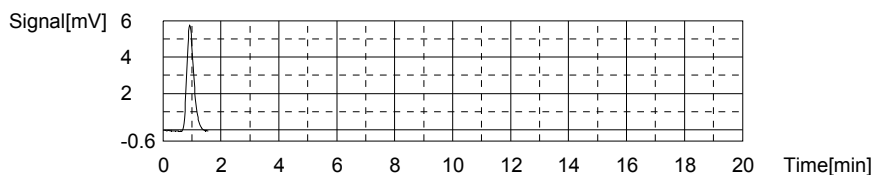
Mean Area 9.896
Mean Conc. -0.1647mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.736	-0.2592mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	18/30/2017 7:33:36 AM

Mean Area 9.736
Mean Conc. -0.2592mg/L



Sample

Sample Name: L17081484-02 (3)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

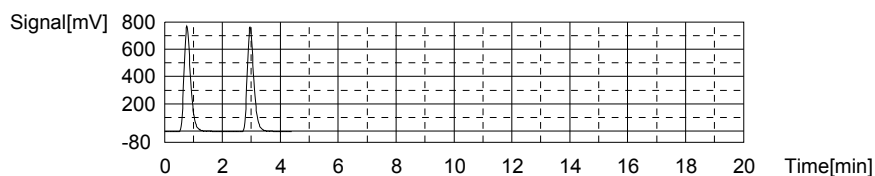
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.368mg/L TC:27.82mg/L IC:23.46mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1201	27.98mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/30/2017 7:41:16 AM
2	1188	27.67mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/30/2017 7:45:44 AM

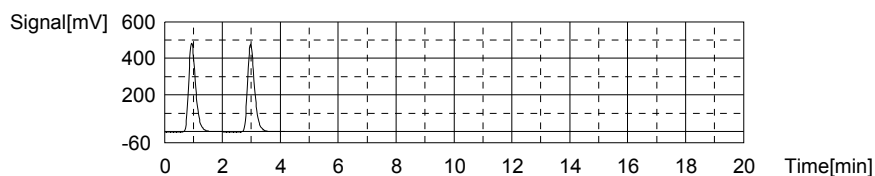
Mean Area 1195
 Mean Conc. 27.82mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	808.5	23.59mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/30/2017 7:50:42 AM
2	799.2	23.32mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/30/2017 7:55:36 AM

Mean Area 803.9
 Mean Conc. 23.46mg/L



Sample

Sample Name: L17081484-03 (3)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

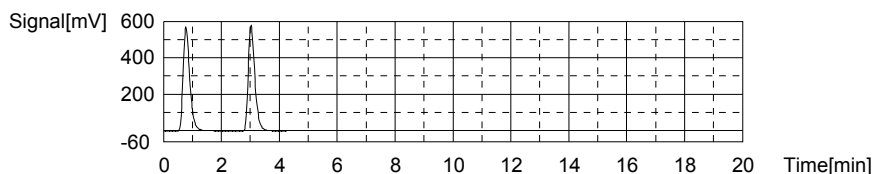
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.246mg/L TC:21.21mg/L IC:16.96mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	910.2	21.11mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/30/2017 8:03:19 AM
2	918.7	21.31mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/30/2017 8:07:35 AM

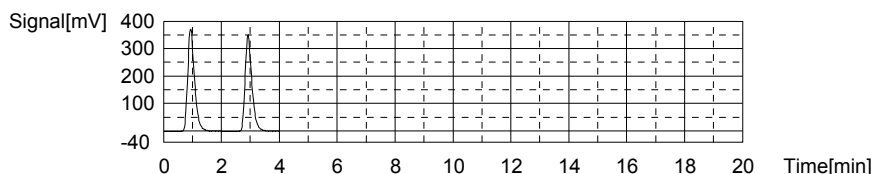
Mean Area 914.5
Mean Conc. 21.21mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	606.0	17.55mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	8/30/2017 8:12:28 AM
2	566.7	16.37mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	8/30/2017 8:17:07 AM

Mean Area 586.4
Mean Conc. 16.96mg/L



Sample

Sample Name: L17081493-01 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

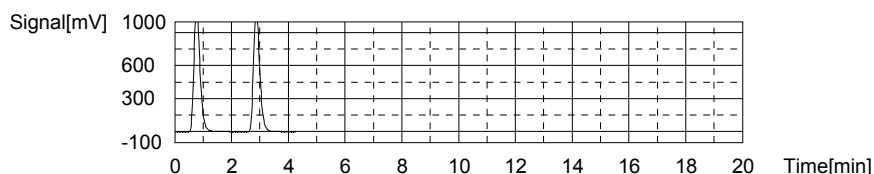
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.585mg/L TC:39.48mg/L IC:35.90mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1689	39.51mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	8/30/2017 8:24:42 AM
2	1687	39.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	8/30/2017 8:29:18 AM

Mean Area 1688
Mean Conc. 39.48mg/L



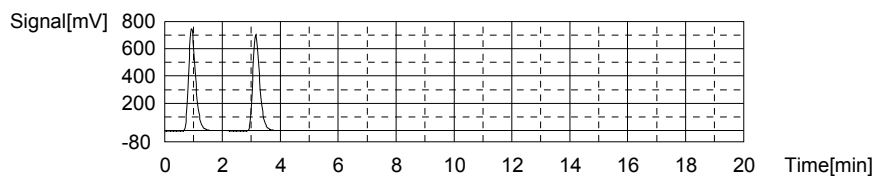
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1256	36.96mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	8/30/2017 8:34:31 AM
2	1185	34.84mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	8/30/2017 8:39:41 AM

8/30/2017 9:52:05 AM

08-29-2017-ADG-TOC.t32

Mean Area 1221
Mean Conc. 35.90mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

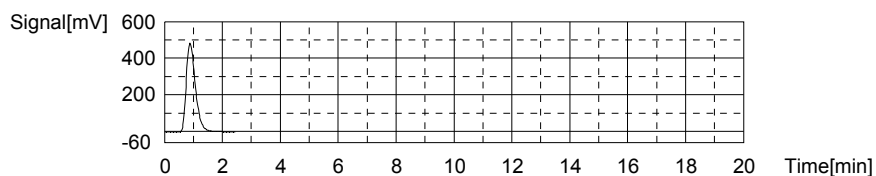
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.62mg/L TC:24.57mg/L IC:-0.04254mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1057	24.57mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/30/2017 8:47:35 AM

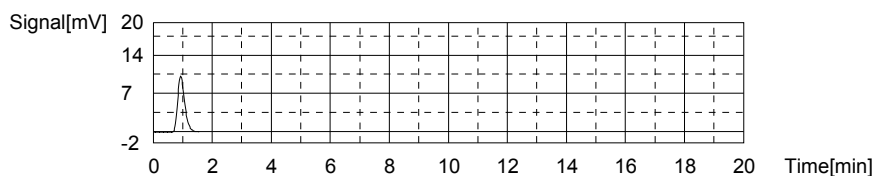
Mean Area 1057
Mean Conc. 24.57mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	16.99	-0.04254mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_18	8/30/2017 8:51:59 AM

Mean Area 16.99
Mean Conc. -0.04254mg/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:0.1669mg/L TC:-0.06911mg/L IC:-0.2361mg/L

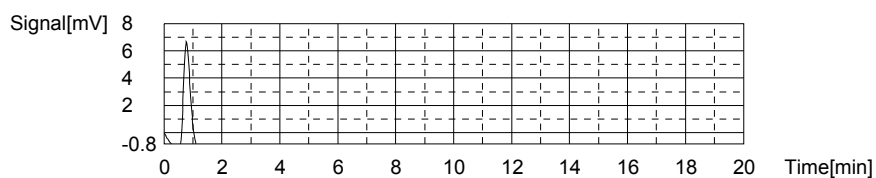
26/27

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	13.94	-0.06911mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_58	8/30/2017 8:57:10 AM

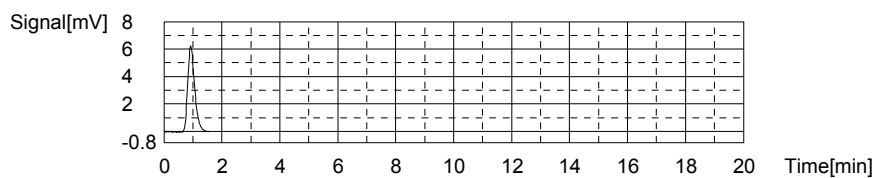
Mean Area 13.94
Mean Conc. -0.06911mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.51	-0.2361mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_18	8/30/2017 9:01:05 AM

Mean Area 10.51
Mean Conc. -0.2361mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
August 30, 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	BLR - BRANDON L. RICHARDS
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

August 30, 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

August 30, 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 WEEKLY SAMPLES		
Prepared By: Scott Beesinger		P.O. Number
Field Sample I.D. LH18/24-SP650-6465 LH18/24-SP650-6465	Sample Matrix Water Water	Date / Time 08/24/17 / 15:00 08/24/17 / 15:00
MS / MSD		
No. OF CONTAINERS		
ANALYSES		
AMMONIA-N	X	
ORTHO-PHOSPHATE	X	
TOTAL ORGANIC CARBON	X	
Remarks (Preservatives, etc.)	H2SO4	Lab I.D.#
	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>[Signature]</i>	08/24/17	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: 08/25/2017 09:53
 By: CARA STRICKLER

221000105095

Anna Strickler

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17081329

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 05-SEP-2017

Samplenum **Container ID** **Products**
L17081329-01 954958 FE PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	WET	25-AUG-2017 10:43	CLS		
2	STORE	WET	A1	25-AUG-2017 15:16	CLS	DLP	

Samplenum **Container ID** **Products**
L17081329-01 954959 MN-MSD TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	25-AUG-2017 10:43	CLS		<2
2	ANALYZ	W1	WET	29-AUG-2017 09:06	ADG	BRG	

Samplenum **Container ID** **Products**
L17081329-01 954960 826-SPE NH3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	25-AUG-2017 10:43	CLS		<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: L17081653

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 September 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 #: L17081653

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?
00110490	I	3.0		1ZW056F52210009837	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 #:** L17081653**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-SP650-6466	L17081653-01	08/30/2017 15:00	08/31/2017 10:17



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081653
Project Name:		Method:	6850
Prep Batch Number(s):	WG628979	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-11 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
Eric Lawson		Chemist III	2017-09-11 19:34:53



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081653
Project Name:		Method:	6850
Prep Batch Number(s):	WG628979	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-11 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:	L17081653
Project Name:		Method:	6850
Prep Batch Number(s):	WG628979	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-11 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		
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:	L17081653
Project Name:		Method:	6850
Prep Batch Number(s):	WG628979	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-11 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:	L17081653
Project Name:		Method:	6850
Prep Batch Number(s):	WG628979	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-11 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:	L17081653
Project Name:		Method:	6850
Prep Batch Number(s):	WG628979	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-11 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

There are no exceptions.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081653
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629047	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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
Deanna Hesson		Conventional Lab Supervisor	2017-09-11 18:37:44



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081653
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629047	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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					
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:	L17081653
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629047	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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				
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:	L17081653
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629047	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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)			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:	L17081653
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629047	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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)	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:	L17081653
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629047	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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:	L17081653
Project Name:		Method:	PO4
Prep Batch Number(s):	WG628227	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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
Deanna Hesson		Conventional Lab Supervisor	2017-09-11 18:38:17



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081653
Project Name:		Method:	PO4
Prep Batch Number(s):	WG628227	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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					
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:	L17081653
Project Name:		Method:	PO4
Prep Batch Number(s):	WG628227	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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				
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:	L17081653
Project Name:		Method:	PO4
Prep Batch Number(s):	WG628227	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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)			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:	L17081653
Project Name:		Method:	PO4
Prep Batch Number(s):	WG628227	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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)	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:	L17081653
Project Name:		Method:	PO4
Prep Batch Number(s):	WG628227	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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:	L17081653
Project Name:		Method:	TOC
Prep Batch Number(s):	WG628481	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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
Deanna Hesson		Conventional Lab Supervisor	2017-09-11 18:38:45



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081653
Project Name:		Method:	TOC
Prep Batch Number(s):	WG628481	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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					
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:	L17081653
Project Name:		Method:	TOC
Prep Batch Number(s):	WG628481	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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				
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				



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LRC Date:	2017-09-11 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)			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					



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Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17081653
Project Name:		Method:	TOC
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LRC Date:	2017-09-11 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)	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:	L17081653
Project Name:		Method:	TOC
Prep Batch Number(s):	WG628481	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-11 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 #: L17081653
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081653-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6466	Prep Method: 6850	Prep Date: 09/08/2017 15:00
Matrix: Water	Analytical Method: 6850	Cal Date: 09/08/2017 16:52
Workgroup #: WG628979	Analyst: JWR	Run Date: 09/08/2017 19:43
Collect Date: 08/30/2017 15:00	Dilution: 1	File ID: 1LM.LM40500
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 #: L17081653
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081653-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6466	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 09/09/2017 10:32
Workgroup #: WG629047	Analyst: DCM	Run Date: 09/09/2017 10:38
Collect Date: 08/30/2017 15:00	Dilution: 10	File ID: S2170909003.013
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	18.6		2.00	1.00	0.500

Certificate of Analysis

Sample #: L17081653-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6466	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 06/07/2017 15:40
Workgroup #: WG628227	Analyst: DLP	Run Date: 09/01/2017 14:30
Collect Date: 08/30/2017 15:00	Dilution: 10	File ID: 00.1709011430-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	5.02		1.00	0.500	0.250

Certificate of Analysis

Sample #: L17081653-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6466	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG628481	Analyst: DCM	Run Date: 09/07/2017 08:12
Collect Date: 08/30/2017 15:00	Dilution: 5	File ID: TC09062017.076
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	84.6		10.0	5.00	2.50

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17081653

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081653-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6466	Prep Method: 6850	Prep Date: 09/08/2017 15:00
Matrix: Water	Analytical Method: 6850	Cal Date: 09/08/2017 16:52
Workgroup #: WG628979	Analyst: JWR	Run Date: 09/08/2017 19:43
Collect Date: 08/30/2017 15:00	Dilution: 1	File ID: 1LM.LM40500
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.					

2.1.1.2 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: 090817_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 WG628979 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (09/08/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: ICAL WG628977 : 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.LM40484	WG628977-01 CCB	1	1		09/08/17 14:40
2	1LM.LM40485	WG628977-02 STD (0.1 ug/L)	1	1	STD80232	09/08/17 14:59
3	1LM.LM40486	WG628977-03 STD (0.2 ug/L)	1	1	STD80232	09/08/17 15:18
4	1LM.LM40487	WG628977-04 STD (0.5 ug/L)	1	1	STD80232	09/08/17 15:37
5	1LM.LM40488	WG628977-05 STD (1.0 ug/L)	1	1	STD80232	09/08/17 15:56
6	1LM.LM40489	WG628977-06 STD (2.0 ug/L)	1	1	STD80232	09/08/17 16:15
7	1LM.LM40490	WG628977-07 STD (5.0 ug/L)	1	1	STD80232	09/08/17 16:34
8	1LM.LM40491	WG628977-08 STD (10 ug/L)	1	1	STD80232	09/08/17 16:52
9	1LM.LM40492	WG628977-09 SSCV (1.0 ug/L)	1	1	STD80234	09/08/17 17:11
10	1LM.LM40493	WG628984-01 CCB	1	1		09/08/17 17:30
11	1LM.LM40494	WG628984-02 CCV (1.0ug/L)	1	1	STD80232	09/08/17 17:49
12	1LM.LM40495	WG628979-05 MRL (0.2ug/L)	1	1	STD80232	09/08/17 18:08
13	1LM.LM40496	WG628979-01 MCT (0.2ug/L)	1	1	STD80234	09/08/17 18:27
14	1LM.LM40497	WG628979-02 BLANK	1	1		09/08/17 18:46
15	1LM.LM40498	WG628979-03 LCS (0.2ug/L)	1	1	STD80234	09/08/17 19:05
16	1LM.LM40499	WG628979-04 LCS2 (0.2ug/L)	1	1	STD80234	09/08/17 19:24
17	1LM.LM40500	L17081653-01	1	1		09/08/17 19:43
18	1LM.LM40501	L17081653-01 (10x) (NR)	1	10		09/08/17 20:02
19	1LM.LM40502	L17081653-01 (100x) (NR)	1	100		09/08/17 20:21
20	1LM.LM40503	L17090079-01	1	1		09/08/17 20:40
21	1LM.LM40504	L17090079-02	1	1		09/08/17 20:59
22	1LM.LM40505	L17090079-03	1	1		09/08/17 21:18
23	1LM.LM40506	WG628984-03 CCV (1.0ug/L)	1	1	STD80232	09/08/17 21:37
24	1LM.LM40507	WG628979-06 MRL (0.2ug/L)	1	1	STD80232	09/08/17 21:56
25	1LM.LM40508	WG628984-04 CCB	1	1		09/08/17 22:15

Comments

Seq.	Rerun	Dil.	Reason	Analytes

Page: 1

Approved: 11-SEP-17




Microbac Laboratories Inc.

Data Checklist

Date: 08-SEP-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: WG628977
 Runlog ID: 84489
 Analytical Workgroups: L17081653, L17090079

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	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	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	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:
11-SEP-2017

John Richards

Secondary Reviewer:
11-SEP-2017

Eri C. Zum

CHECKLIST1 - Modified 03/05/2008
 Generated: SEP-11-2017 14:46:16



Analytical Method:6850
Login Number:L17081653

AAB#:WG628979

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-SP650-6466	01	08/30/17					09/08/2017	9	28		09/08/17	.2	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17081653 Work Group: WG628979
 Blank File ID: 1LM.LM40497 Blank Sample ID: WG628979-02
 Prep Date: 09/08/17 15:00 Instrument ID: LCMS1
 Analyzed Date: 09/08/17 18:46 Method: 6850
 Analyst: JWR

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG628979-05	1LM.LM40495	09/08/17 18:08	01
MCT	WG628979-01	1LM.LM40496	09/08/17 18:27	01
LCS	WG628979-03	1LM.LM40498	09/08/17 19:05	01
LCS2	WG628979-04	1LM.LM40499	09/08/17 19:24	01
LH18/24-SP650-6466	L17081653-01	1LM.LM40500	09/08/17 19:43	01
QCMRL	WG628979-06	1LM.LM40507	09/08/17 21:56	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5470397
 Report generated 09/11/2017 14:54



Login Number: L17081653 Prep Date: 09/08/17 15:00 Sample ID: WG628979-02
Instrument ID: LCMS1 Run Date: 09/08/17 18:46 Prep Method: 6850
File ID: 1LM.LM40497 Analyst: JWR Method: 6850
Workgroup (AAB#): WG628979 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-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: 5470398
11-SEP-2017 14:54



Login Number: L17081653 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG628979 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG628979-03 LCS File ID: 1LM.LM40498 Run Date: 09/08/2017 19:05
 Sample ID: WG628979-04 LCS2 File ID: 1LM.LM40499 Run Date: 09/08/2017 19:24

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.186	93.0	0.200	0.191	95.5	2.65	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5470399
 Report generated: 09/11/2017 14:54



Login Number: L17081653
Analytical Method: 6850
ICAL Workgroup: WG628977

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.469	6.88	1.00000	

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5470402
Report generated 09/11/2017 14:54



Login Number: L17081653
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 08-SEP-17 16:52
 Column ID: F

Analyte	WG628977-02			WG628977-03			WG628977-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	52500.0000	1.681	0.200	93400.0000	1.487	0.500	233000.000	1.445

INT_CAL - Modified 03/06/2008
 PDF File ID: 5470402
 Report generated 09/11/2017 14:54



Login Number: L17081653
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	WG628977-05			WG628977-06			WG628977-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	460000.000	1.440	2.00	925000.000	1.444	5.00	2230000.00	1.418

INT_CAL - Modified 03/06/2008
PDF File ID: 5470402
Report generated 09/11/2017 14:54



Login Number: L17081653
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	WG628977-08		
	CONC	RESP	RF
Perchlorate	10.0	4190000.00	1.371

INT_CAL - Modified 03/06/2008
PDF File ID: 5470402
Report generated 09/11/2017 14:54



Login Number: L17081653 Run Date: 09/08/2017 Sample ID: WG628977-09
 Instrument ID: LCMS1 Run Time: 17:11 Method: 6850
 File ID: 1LM.LM40492 Analyst: JWR QC Key: DOD4
 ICal Workgroup: WG628977 Cal ID: LCMS1 - 08-SEP-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	1.04	ug/L	1.48	4.00	15	

* Exceeds %D Limit



Login Number: L17081653 Run Date: 09/08/2017 Sample ID: WG628984-01
Instrument ID: LCMS1 Run Time: 17:30 Method: 6850
File ID: LLM.LM40493 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG628979 Cal ID: LCMS1 - 08-SEP-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: L17081653 Run Date: 09/08/2017 Sample ID: WG628984-04
Instrument ID: LCMS1 Run Time: 22:15 Method: 6850
File ID: LLM.LM40508 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG628979 Cal ID: LCMS1 - 08-SEP-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: L17081653 Run Date: 09/08/2017 Sample ID: WG628984-02
Instrument ID: LCMS1 Run Time: 17:49 Method: 6850
File ID: 1LM.LM40494 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG628979 Cal ID: LCMS1 - 08-SEP-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.07	ug/L	1.52	7.00	15	

* Exceeds %D Criteria



Login Number: L17081653 Run Date: 09/08/2017 Sample ID: WG628984-03
Instrument ID: LCMS1 Run Time: 21:37 Method: 6850
File ID: 1LM.LM40506 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG628979 Cal ID: LCMS1 - 08-SEP-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.05	ug/L	1.49	5.00	15	

* Exceeds %D Criteria



Login Number: L17081653 Run Date: 09/08/2017 Sample ID: WG628979-05
Instrument ID: LCMS1 Run Time: 18:08 Prep Method: 6850
File ID: 1LM.LM40495 Analyst: JWR Method: 6850
Workgroup (AAB#): WG628979 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.201	101	70 - 130	



Login Number: L17081653 Run Date: 09/08/2017 Sample ID: WG628979-06
Instrument ID: LCMS1 Run Time: 21:56 Prep Method: 6850
File ID: 1LM.LM40507 Analyst: JWR Method: 6850
Workgroup (AAB#): WG628979 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.195	97.5	70 - 130	



Login Number: L17081653
Instrument ID: LCMS1
Workgroup (AAB#): WG628979

ICAL CCV Number: WG628977-05
CAL ID: LCMS1-08-SEP-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG628977	NA	NA	1580000
Upper Limit	NA	NA	2370000
Lower Limit	NA	NA	790000
<u>L17081653-01</u>	<u>1.00</u>	<u>01</u>	<u>1520000</u>

IS-1 - 018LP

Underline = Response outside limits



Login Number: L17081653
Instrument ID: LCMS1
Workgroup (AAB#): WG628979

ICAL CCV Number: WG628977-05
CAL ID: LCMS1-08-SEP-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG628977	NA	NA	1580000
Upper Limit	NA	NA	2370000
Lower Limit	NA	NA	790000
<u>WG628979-02</u>	1.00	01	1700000
<u>WG628979-03</u>	1.00	01	1700000
<u>WG628979-04</u>	1.00	01	1700000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: 6850	Samplenum: L17081653-01
Instrument: LCMS1	Prep Date: 09/08/2017 15:00	File ID: 1LM.LM40500
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 19:43	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2980	1770	1.68	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628977-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40485
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 14:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	52500	17500	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628977-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40486
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 15:18	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	93400	29500	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628977-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40487
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 15:37	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	233000	79100	2.95	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628977-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40488
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 15:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	460000	150000	3.07	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653
Instrument: LCMS1
Analyst: JWR
Worknum: WG628979

Prep Method: _____
Prep Date: _____
Anal Method: 6850
Analysis Date: 09/08/2017 16:15

Samplenum: WG628977-06
File ID: 1LM.LM40489
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	925000	303000	3.05	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628977-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40490
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 16:34	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2230000	745000	2.99	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628977-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40491
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 16:52	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	4190000	1390000	3.01	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628977-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40492
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 17:11	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	478000	152000	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: 6850	Samplenum: WG628979-01
Instrument: LCMS1	Prep Date: 09/08/2017 15:00	File ID: 1LM.LM40496
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 18:27	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	97900	33300	2.94	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: 6850	Samplenum: WG628979-02
Instrument: LCMS1	Prep Date: 09/08/2017 15:00	File ID: 1LM.LM40497
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 18:46	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	3170	568	5.58	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: 6850	Samplenum: WG628979-03
Instrument: LCMS1	Prep Date: 09/08/2017 15:00	File ID: 1LM.LM40498
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 19:05	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	98000	32800	2.99	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: 6850	Samplenum: WG628979-04
Instrument: LCMS1	Prep Date: 09/08/2017 15:00	File ID: 1LM.LM40499
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 19:24	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	100000	32600	3.07	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: 6850	Samplenum: WG628979-05
Instrument: LCMS1	Prep Date: 09/08/2017 15:00	File ID: 1LM.LM40495
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 18:08	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	99500	33900	2.94	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: 6850	Samplenum: WG628979-06
Instrument: LCMS1	Prep Date: 09/08/2017 15:00	File ID: 1LM.LM40507
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 21:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	112000	36100	3.10	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628984-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40493
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 17:30	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	3380	1050	3.22	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628984-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40494
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 17:49	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	483000	157000	3.08	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628984-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40506
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 21:37	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	532000	175000	3.04	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17081653	Prep Method: _____	Samplenum: WG628984-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40508
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG628979	Analysis Date: 09/08/2017 22:15	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	3920	1130	3.47	2.3	3.8	

2.2 General Chemistry Data

2.2.1 Ammonia Data

2.2.1.1 Summary Data

Lab Report #: L17081653

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081653-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: LH18/24-SP650-6466	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 09/09/2017 10:32
Workgroup #: WG629047	Analyst: DCM	Run Date: 09/09/2017 10:38
Collect Date: 08/30/2017 15:00	Dilution: 10	File ID: S2170909003.013
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	18.6		2.00	1.00	0.500

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: 11-SEP-2017
 Analyst: DCM
 Analyst: NA
 Method: NH3
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG629047

Calibration/Linearity	09-09-2017
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:
11-SEP-2017



Secondary Reviewer:
11-SEP-2017




Analytical Method: 350.1
Login Number: L17081653

AAB#: WG629047

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-SP650-6466	01	08/30/17					09/09/2017	9.8	28		09/09/17	9.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17081653 Work Group: WG629047
 Blank File ID: S2170909003.011 Blank Sample ID: WG629047-01
 Prep Date: 09/09/17 10:36 Instrument ID: SMARTCHEM2
 Analyzed Date: 09/09/17 10:36 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	WG629047-02	S2170909003.012	09/09/17 10:37	01
LH18/24-SP650-6466	L17081653-01	S2170909003.013	09/09/17 10:38	DL01
DUP	WG629047-04	S2170909003.030	09/09/17 10:53	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5470237
 Report generated 09/11/2017 11:08



Login Number: L17081653 Prep Date: 09/09/17 10:36 Sample ID: WG629047-01
 Instrument ID: SMARTCHEM2 Run Date: 09/09/17 10:36 Prep Method: 350.1
 File ID: S2170909003.011 Analyst: DCM Method: 350.1
 Workgroup (AAB#): WG629047 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: SMARTC-09-SEP-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: 5470238
 11-SEP-2017 11:08



Login Number: L17081653 Run Date: 09/09/2017 Sample ID: WG629047-02
Instrument ID: SMARTCHEM2 Run Time: 10:37 Prep Method: 350.1
File ID: S2170909003.012 Analyst: DCM Method: 350.1
Workgroup (AAB#): WG629047 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD83234 Cal ID: SMARTC-09-SEP-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Ammonia	2.00	2.12	106	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5470239
Report generated: 09/11/2017 11:08



2.2 General Chemistry Data

2.2.2 Orthophosphate Data

2.2.2.1 Summary Data

Lab Report #: L17081653

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081653-01

PrePrep Method: N/A

Instrument: UV-2600

Client ID: LH18/24-SP650-6466

Prep Method: 365.2

Prep Date: N/A

Matrix: Water

Analytical Method: 365.2

Cal Date: 06/07/2017 15:40

Workgroup #: WG628227

Analyst: DLP

Run Date: 09/01/2017 14:30

Collect Date: 08/30/2017 15:00

Dilution: 10

File ID: 00.1709011430-06

Sample Tag:

Units: mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	5.02		1.00	0.500	0.250

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

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

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: 01-SEP-2017
 Analyst: DLP
 Analyst: NA
 Method: PO4
 Instrument: UV-2600
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG628227

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	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	
Primary Reviewer	DLP
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
02-SEP-2017

Secondary Reviewer:
05-SEP-2017

Dwight Payne

Denna Johnson



Analytical Method: 365.2
Login Number: L17081653

AAB#: WG628227

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-SP650-6466	01	08/30/17					09/01/2017	2	2		09/01/17	2	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17081653 Work Group: WG628227
 Blank File ID: 00.1709011430-03 Blank Sample ID: WG628227-01
 Prep Date: 09/01/17 14:30 Instrument ID: UV-2600
 Analyzed Date: 09/01/17 14:30 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	WG628227-02	00.1709011430-04	09/01/17 14:30	
LCS2	WG628227-03	00.1709011430-05	09/01/17 14:30	
LH18/24-SP650-6466	L17081653-01	00.1709011430-06	09/01/17 14:30	
DUP	WG628227-05	00.1709011430-07	09/01/17 14:30	

Report Name: BLANK_SUMMARY
 PDF File ID: 5462057
 Report generated 09/05/2017 13:49



Login Number: L17081653 Prep Date: 09/01/17 14:30 Sample ID: WG628227-01
 Instrument ID: UV-2600 Run Date: 09/01/17 14:30 Prep Method: 365.2
 File ID: 00.1709011430-03 Analyst: DLP Method: 365.2
 Workgroup (AAB#): WG628227 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: UV-260 - 31-AUG-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: 5462058
 05-SEP-2017 13:49



Login Number: L17081653 Analyst: DLP Prep Method: 365.2
 Instrument ID: UV-2600 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG628227 Units: mg/L
 QC Key: DOD4 Lot #: STD83662

Sample ID: WG628227-02 LCS File ID: 00.1709011430-04 Run Date: 09/01/2017 14:30
 Sample ID: WG628227-03 LCS2 File ID: 00.1709011430-05 Run Date: 09/01/2017 14:30

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	1.01	101	1.00	1.01	101	0.00	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5462059
 Report generated: 09/05/2017 13:49



2.2.2.3 Raw Data

WG6616995

Curves

Parameter: PO4

Spectrophotometer: UV-2600

Calibration (Curve) standard stock: STD 79640

Concentration: 1000 mg/L

Recipe for preparation of curve standards found in:

SOP: 3653 Revision: 17 Page: 09

Second Source Stock: STD 82182 (concentration: 10)

Daily Preparation: 10/100/100

concentration = 1.0

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
1.0	50	1cm	880	0.623
0.7				0.442
0.5				0.311
0.2				0.127
0.1				0.063
0.05				0.031
0				0
2nd Source (1.0)	50	1cm	880	0.630

Analyst: Jammy Morris

Date/Time: 6/7/17 @ 1540

DCN#126309



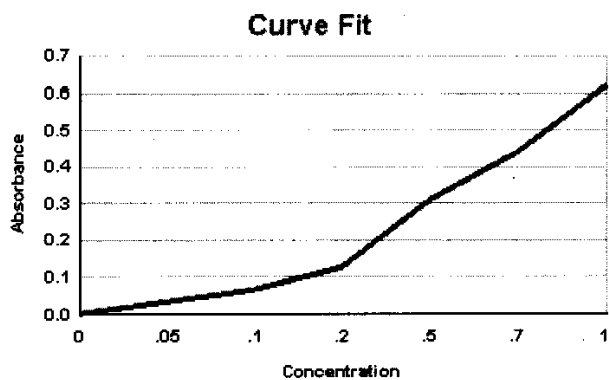
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG616995
Analytical Method: 300
Instrument ID: UV-2600

Analyst: TMM
Initial Calibration Date: 06/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.624599
Y-Intercept: 0.000610422
Coef. Of Correlation (R^2): 0.999913
Coef. Of Correlation (R): 0.999957

Concentration X	Absorbance Y	X^2	X * Y	Y-Fitted (mX^2+B)
0.00	0.00	0.00	0.00	0.000610422
0.0500	0.0310	0.00250	0.00155	0.0318404
0.100	0.0630	0.0100	0.00630	0.0630703
0.200	0.127	0.0400	0.0254	0.125530
0.500	0.311	0.250	0.156	0.312910
0.700	0.442	0.490	0.309	0.437830
1.00	0.623	1.00	0.623	0.625209



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 06/07/2017 16:24



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

00861391

Workgroup #: WG616995
File ID: 00.1706071540-08
CCV ID: WG616995-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 06/07/2017
Run Time: 15:40
Analyst: TMM
Cal ID: UV-260 - 07-JUN-17 15:40:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.01	0.630	1.0	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 06/07/2017 16:25



WORKGROUP: WG628227

Orthophosphate
(orthophosphate1)

EPA 365.2 / SM4500-P E
SOP K3653 Rev 17
Color Reagent Chemicals
RGT 410 99
RGT 40466
RGT 410 73
CA 18278

CCV: 5083661 LCS: 83662
Daily Dilution: 5(5)/502 Daily Dilution: 16(10)/100
Daily Dilution: 0.5 Daily Dilution: 1.0
Spectrophotometer W2600 Curve ID: 616995
6-07-17

Spike: STD 83362
Daily Dilution: 20(2)(10)/502
Daily Dilution: 0.40

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: mg/L	50	✓		0.315
BLK/CCB:	50	✓		0.200
LCS: ppm	50	✓		0.633
LCSD: ppm	50	✓		0.633
<u>08-1653-01</u>	50	✓	<u>1/5 1/10</u>	<u>0.628 / 0.314</u>
	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			
<u>DU 08-1653-01</u>	50		<u>1/5 1/10</u>	<u>0.615 / 0.312</u>
<u>MS: () / 1653-01</u>	50		<u>1/5 1/10</u>	<u>0.650 / 0.329</u>
<u>MSD: ()</u>	50			
<u>CCV: ()</u>	50			<u>0.319</u>
<u>CCB:</u>	50			<u>0.001</u>

Analyst: Dudley Payne

Date / Time: 09-01-17 17:30

DCN#128046



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG628227
Analyte: ORTHOPHOSPHATE

Analyst: DLP
Date: 09/01/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG628227-01	50	50	0	0.6246	0.0006104	-0.00097730	-0.00097730	1	mg/L
WG628227-02	50	50	0.633	0.6246	0.0006104	1.0125	1.0125	1	mg/L
WG628227-03	50	50	0.633	0.6246	0.0006104	1.0125	1.0125	1	mg/L
L17081653-01	50	50	0.314	0.6246	0.0006104	0.50175	5.0175	10	mg/L
WG628227-04	50	50	0.314	0.6246	0.0006104	0.50175	5.0175	10	mg/L
WG628227-05	50	50	0.312	0.6246	0.0006104	0.49854	4.9854	10	mg/L
WG628227-06	50	50	0.329	0.6246	0.0006104	0.52576	5.2576	10	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 09/02/2017 12:28

Workgroup #: WG628290 Instrument ID: UV-2600
File ID: 00.1709011430-01 Run Date: 09/01/2017
CCV ID: WG628290-01 Run Time: 14:30
Units: mg/L Analyst: DLP
Analyte: ORTHOPHOSPHATE Cal ID: UV-260 - 31-AUG-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.503	0.630	0.6	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

NET_WG_CCV - Modified 03/06/2008

Report generated 09/02/2017 12:27



Workgroup #: WG628290 Instrument ID: UV-2600
File ID: 00.1709011430-09 Run Date: 09/01/2017
CCV ID: WG628290-03 Run Time: 14:30
Units: mg/L Analyst: DLP
Analyte: ORTHOPHOSPHATE Cal ID: UV-260 - 31-AUG-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.510	0.638	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 09/02/2017 12:27



2.2 General Chemistry Data

2.2.3 Total Organic Carbon Data

2.2.3.1 Summary Data

Lab Report #: L17081653

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17081653-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6466	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG628481	Analyst: DCM	Run Date: 09/07/2017 08:12
Collect Date: 08/30/2017 15:00	Dilution: 5	File ID: TC09062017.076
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	84.6		10.0	5.00	2.50

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: 06-SEP-2017
 Analyst: DCM
 Analyst: NA
 Method: TOC
 Instrument: TOC-VWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG628481 WG628480

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:
07-SEP-2017



Secondary Reviewer:
08-SEP-2017




Analytical Method: 415.1
Login Number: L17081653

AAB#: WG628481

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-SP650-6466	01	08/30/17					09/07/2017	7.7	28		09/07/17	7.7	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17081653 Work Group: WG628481
 Blank File ID: TC09062017.034 Blank Sample ID: WG628481-01
 Prep Date: 09/06/17 15:56 Instrument ID: TOC-VWP
 Analyzed Date: 09/06/17 15:56 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	WG628481-02	TC09062017.035	09/06/17 16:15	01
LCS2	WG628481-03	TC09062017.036	09/06/17 16:36	01
DUP	WG628481-08	TC09062017.065	09/07/17 01:42	01
LH18/24-SP650-6466	L17081653-01	TC09062017.076	09/07/17 08:12	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5466429
 Report generated 09/07/2017 14:26



Login Number: L17081653 Prep Date: 09/06/17 15:56 Sample ID: WG628481-01
 Instrument ID: TOC-VWP Run Date: 09/06/17 15:56 Prep Method: 415.1
 File ID: TC09062017.034 Analyst: DCM Method: 415.1
 Workgroup (AAB#): WG628481 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: 5466430
 07-SEP-2017 14:26



Login Number: L17081653 Analyst: DCM Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG628481 Units: mg/L
 QC Key: DOD4 Lot #: STD80787
 Sample ID: WG628481-02 LCS File ID: TC09062017.035 Run Date: 09/06/2017 16:15
 Sample ID: WG628481-03 LCS2 File ID: TC09062017.036 Run Date: 09/06/2017 16:36

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	24.7	98.9	25.0	24.5	98.0	0.894	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5466431
 Report generated: 09/07/2017 14:26



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

- | | | |
|--|---|---|
| <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

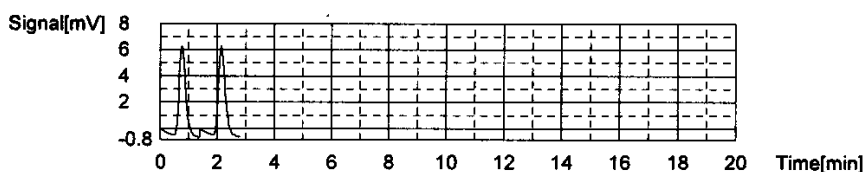
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

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

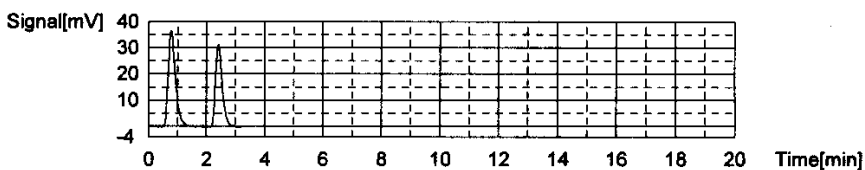
Acid Add. 0.000%
 Mean Area 10.82



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

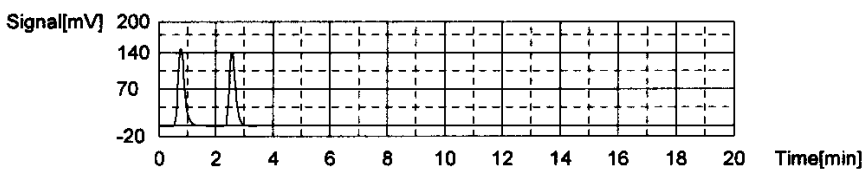
Acid Add. 0.000%
 Mean Area 57.92



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

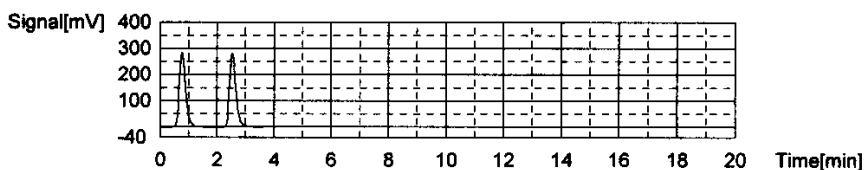


Conc: 10.00mg/L

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

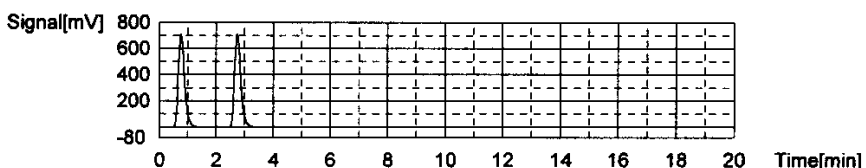
Acid Add. 0.000%
 Mean Area 440.2



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

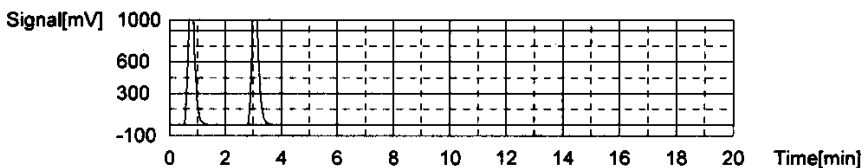
Acid Add. 0.000%
 Mean Area 1092



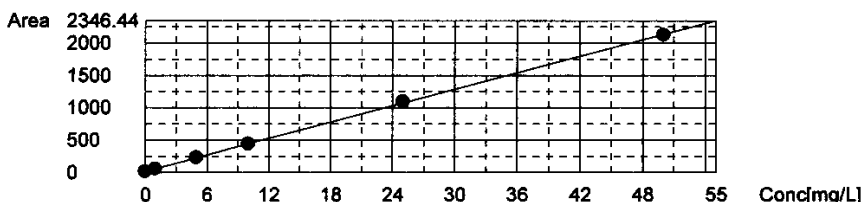
Conc: 50.00mg/L

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

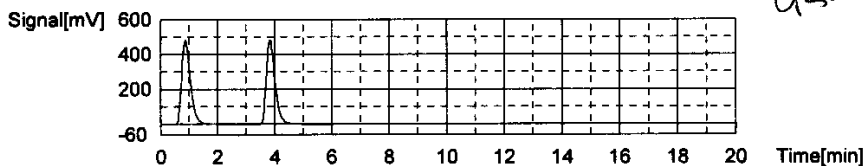
1. Det

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

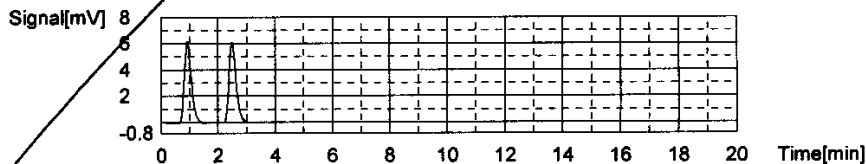
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

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

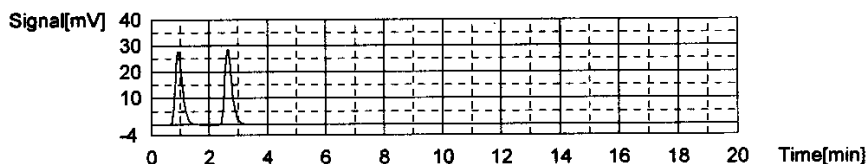
Acid Add. 3.000%
Mean Area 10.51



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

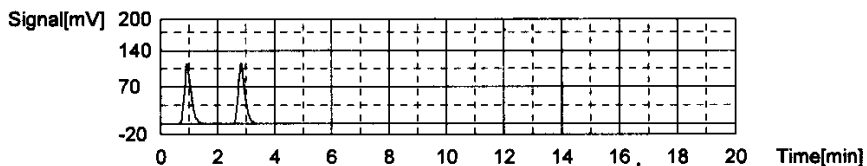


Conc: 5.000mg/L

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

*dem
3/23/17*

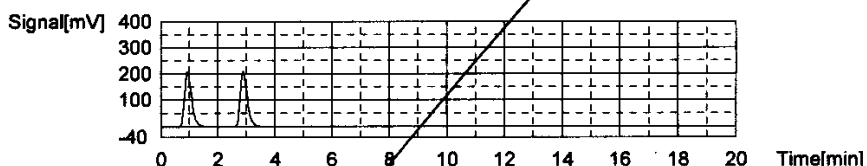
Acid Add. 3.000%
Mean Area 189.6



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

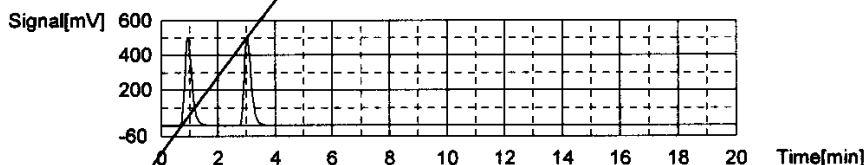
Acid Add. 3.000%
Mean Area 361.4



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

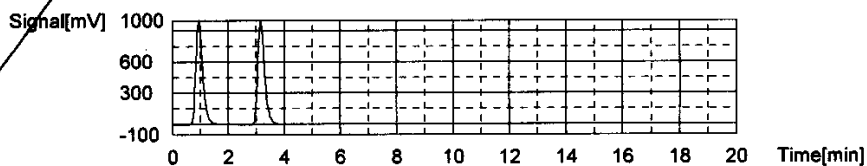
Acid Add. 3.000%
Mean Area 858.1



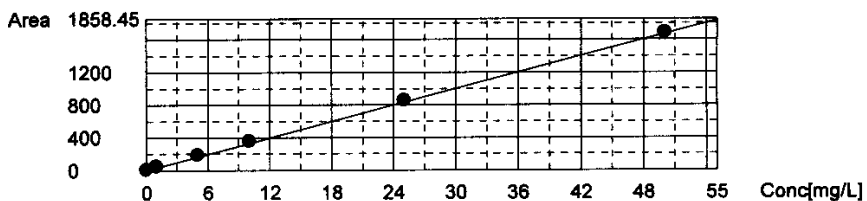
Conc: 50.00mg/L

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

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

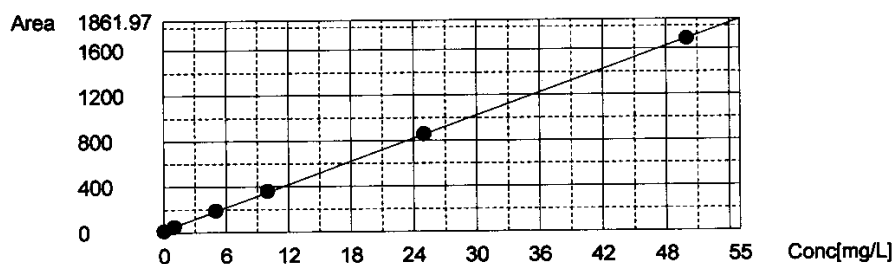
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

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:

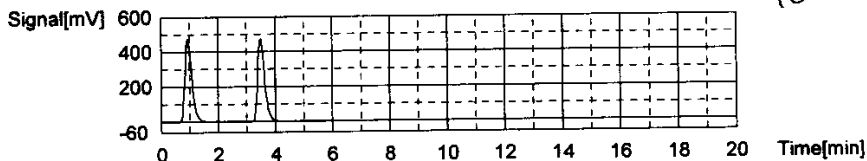
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

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:

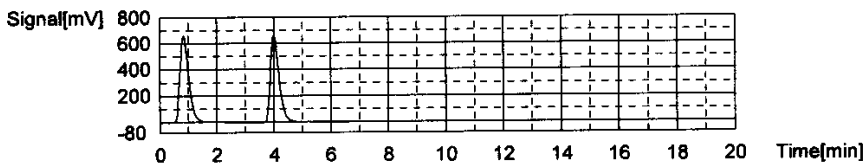
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

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.t32

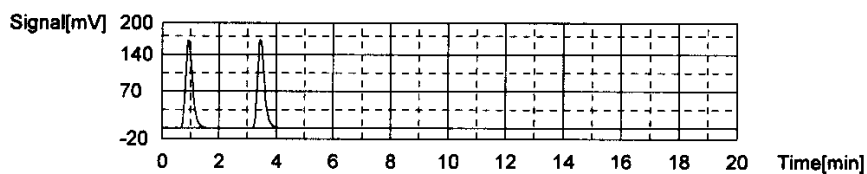
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

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

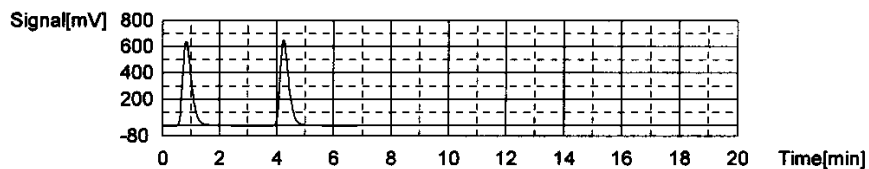
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

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: WG628480

628481

Total Organic Carbon

MAKE DAILY

CCV (TOC): Std 79381
 $(5/200)(1000) = 25\text{mg/L}$

LCS (TOC): Std 80787
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): Std 83359
 $(5/200)(1000) = 25\text{mg/L}$

MS (TOC): Std 80787
 $0.4(1000)/10 = 40$

Calibration Curve Date: 2/10/17

Reagent: REt 40983
REt 41061

SM5310-C : Matrix 2 WG 628481

EPA 415.1/9060A(mod): Matrix 1 WG 628480 SOP: K 4151 Rev. 20

SW846 9060A (4 rep) WG Instrument: Shimadzu 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	TIC	
2	TOC/TIC	
3	CCV	
4	Blk	
5	LCS	
6	LCS DUP	
7	08-1644-C1	
8	08-1559-C9	1/3
9	10	1/3
10	11	1/25
11	12	1/3
12	08-1568-C1	1/2500
13	C2	1/100
14	CCV	
15	CCB	
16	08-1568-C3	1/50
17	08-1649-C1	1/2
18	C2	1/4
19	MS	C3
20	MSD	C4
21		C5
22		C6
23		C7
24		C8
25		C9

Position	Sample ID	Dilution
26	CCV	
27	CCB	
28	08-1649-10	1/2
29	11	1/2
30	12	1/2
31	13	1/2
32	14	1/2
33	DUP 08-1649-14	1/2
34	Blk	
35	LCS	
36	LCS DUP	
37	08-1647-C7	
38	CCV	
39	CCB	
40	09-59-C1	
41	08-1653-C1	1/25
42	09-46-C1	
43	C4	
44	MS	C5
45	MSD	C6
46		13
47		16
48		19
49		22
50	CCV	

Position	Sample ID	Dilution
51	CCB	
52	09-46-25	
53	28	
54	09-94-C1	
55	C2	
56	C3	1/25
57	09-95-C1	1/10
58	C2	1/2
59	C3	1/2
60	C4	1/2
61	C5	1/2
62	CCV	
63	CCB	
64	09-95-C6	
65	DUP 09-95-C6	
66	CCV - MSD 08-1649-C4	
67	CCB - 08-1568-C1	1/100
68	08-1568-C2	1/10
69	C3	1/5
70	08-1649-C6	1/4
71	C7	1/3
72	CCV	
73	CCB	
74		
75		

dem
9/16/17

dem
9/16/17

Analyst: David Mershele

Date/Time: 9/16/17 0820

DCN#128090



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: _____
<input type="checkbox"/> SM5310-C : Matrix 2 WG _____	
<input type="checkbox"/> EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K _____ Rev. _____	
<input type="checkbox"/> SW846 9060A (4 rep) WG _____ Instrument: Shimadza TOC-VWP/ASI	

see pg. 1

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

Position	Sample ID	Dilution
1	CCV	
2	CCB	
3	08-11653-C1	1/5
4	09-94-C3	1/5
5	09-95-02	
6	05	1/2
7	08-15408-03	
8	09-94-C3	1/20
9	CCV	
10	CCB	
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

Position	Sample ID	Dilution
26		
27		
28		
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32		
33		
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49		
50		

Position	Sample ID	Dilution
51		
52		
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75		

Analyst: dcn Date/Time: 9/6/17

pg. 2

DCN#128090



	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:1.110mg/L TC:25.52mg/L IC:24.41mg/L	Complete	9/6/2017 8:31:58 AM	1
2	TOC	TOC/TOC	TOC:25.57mg/L TC:33.55mg/L IC:7.985mg/L	Complete	9/6/2017 8:44:41 AM	2
3	TOC	CCV	!!Error!! TOC:24.98mg/L TC:24.65mg/L IC:-0.3368mg/L	Complete	9/6/2017 8:56:51 AM	3
4	TOC	WG628480-01 BLK	!!Error!! TOC:0.09528mg/L TC:-0.1712mg/L IC:-0.2665mg/L	Complete	9/6/2017 9:05:51 AM	0
5	TOC	WG628480-02 LCS	!!Error!! TOC:24.59mg/L TC:24.22mg/L IC:-0.3689mg/L	Complete	9/6/2017 9:18:00 AM	5
6	TOC	WG628480-03 LCSDUP	!!Error!! TOC:24.83mg/L TC:24.46mg/L IC:-0.3695mg/L	Complete	9/6/2017 9:30:07 AM	6
7	TOC	L17081644-01	TOC:0.3464mg/L TC:2.548mg/L IC:2.201mg/L	Complete	9/6/2017 9:41:59 AM	7
8	TOC	L17081559-09 (3)	TOC:3.119mg/L TC:40.29mg/L IC:37.17mg/L	Complete	9/6/2017 9:54:32 AM	8
9	TOC	L17081559-10 (3)	TOC:2.139mg/L TC:37.10mg/L IC:34.96mg/L	Complete	9/6/2017 10:07:27 AM	9
10	TOC	L17081559-11 (25)	TOC:13.62mg/L TC:20.23mg/L IC:6.614mg/L	Complete	9/6/2017 10:20:01 AM	10
11	TOC	L17081559-12 (3)	TOC:3.055mg/L TC:42.22mg/L IC:39.17mg/L	Complete	9/6/2017 10:46:00 AM	11
12	TOC		!!Error!! TOC:5.479mg/L TC:5.463mg/L IC:-0.01566mg/L	Complete	9/6/2017 10:58:01 AM	12
13	TOC		!!Error!! TOC:0.3764mg/L TC:0.1275mg/L IC:-0.2489mg/L	Complete	9/6/2017 11:09:27 AM	13
14	TOC	CCV	!!Error!! TOC:24.37mg/L TC:24.06mg/L IC:-0.3180mg/L	Complete	9/6/2017 11:21:38 AM	14
15	TOC	CCB	!!Error!! TOC:0.1847mg/L TC:-0.09227mg/L IC:-0.2770mg/L	Complete	9/6/2017 11:30:42 AM	0
16	TOC		!!Error!! TOC:0.7085mg/L TC:0.5208mg/L IC:-0.1877mg/L	Complete	9/6/2017 11:42:13 AM	16
17	TOC	L17081649-01 (2)	TOC:0.9131mg/L TC:18.82mg/L IC:17.91mg/L	Complete	9/6/2017 11:54:46 AM	17
18	TOC	L17081649-02 (4)	TOC:2.540mg/L TC:26.61mg/L IC:24.07mg/L	Complete	9/6/2017 12:26:50 PM	18
19	TOC	L17081649-03 (4) MS	TOC:4.852mg/L TC:22.27mg/L IC:17.42mg/L	Complete	9/6/2017 12:44:32 PM	19
20	TOC		TOC:1.172mg/L TC:18.64mg/L IC:17.47mg/L	Complete	9/6/2017 12:57:04 PM	20
21	TOC	L17081649-05 (4)	TOC:4.899mg/L TC:22.03mg/L IC:17.13mg/L	Complete	9/6/2017 1:09:28 PM	21
22	TOC		!!Error!! TOC:-15.06mg/L TC:74.64mg/L IC:89.70mg/L	Complete	9/6/2017 1:23:01 PM	22
23	TOC		TOC:2.806mg/L TC:50.63mg/L IC:47.83mg/L	Complete	9/6/2017 1:36:46 PM	23
24	TOC	L17081649-08 (2)	TOC:1.986mg/L TC:35.30mg/L IC:33.32mg/L	Complete	9/6/2017 1:50:12 PM	24
25	TOC	L17081649-09 (4)	TOC:1.888mg/L TC:17.16mg/L IC:15.27mg/L	Complete	9/6/2017 2:11:04 PM	25
26	TOC	CCV	!!Error!! TOC:23.80mg/L TC:23.56mg/L IC:-0.2405mg/L	Complete	9/6/2017 2:23:14 PM	26
27	TOC	CCB	!!Error!! TOC:0.1479mg/L TC:-0.1121mg/L IC:-0.2600mg/L	Complete	9/6/2017 2:32:19 PM	0
28	TOC	L17081649-10 (2)	TOC:2.625mg/L TC:36.39mg/L IC:33.76mg/L	Complete	9/6/2017 2:45:00 PM	28
29	TOC	L17081649-11 (2)	TOC:3.732mg/L TC:45.77mg/L IC:42.04mg/L	Complete	9/6/2017 2:58:03 PM	29
30	TOC	L17081649-12 (2)	TOC:2.252mg/L TC:35.54mg/L IC:33.29mg/L	Complete	9/6/2017 3:10:57 PM	30
31	TOC	L17081649-13 (2)	TOC:2.066mg/L TC:33.53mg/L IC:31.46mg/L	Complete	9/6/2017 3:23:26 PM	31
32	TOC	L17081649-14 (2)	TOC:3.134mg/L TC:41.59mg/L IC:38.45mg/L	Complete	9/6/2017 3:36:47 PM	32
33	TOC	WG628480-08 (2) DUP	TOC:3.061mg/L TC:37.45mg/L IC:34.39mg/L	Complete	9/6/2017 3:49:32 PM	33
34	TOC	WG628481-01 BLK	!!Error!! TOC:0.06380mg/L TC:-0.1530mg/L IC:-0.2168mg/L	Complete	9/6/2017 4:08:11 PM	0
35	TOC	WG628481-02 LCS	!!Error!! TOC:24.72mg/L TC:24.44mg/L IC:-0.2708mg/L	Complete	9/6/2017 4:23:52 PM	35
36	TOC	WG628481-03 LCSDUP	!!Error!! TOC:24.50mg/L TC:24.22mg/L IC:-0.2779mg/L	Complete	9/6/2017 4:50:01 PM	36
37	TOC	L17081697-07	TOC:1.847mg/L TC:4.281mg/L IC:2.433mg/L	Complete	9/6/2017 5:10:30 PM	37
38	TOC	CCV	!!Error!! TOC:23.77mg/L TC:23.51mg/L IC:-0.2634mg/L	Complete	9/6/2017 5:22:40 PM	38
39	TOC	CCB	!!Error!! TOC:0.09330mg/L TC:-0.1815mg/L IC:-0.2748mg/L	Complete	9/6/2017 5:31:41 PM	0
40	TOC	L17090059-01	!!Error!! TOC:0.5721mg/L TC:0.2858mg/L IC:-0.2863mg/L	Complete	9/6/2017 5:51:08 PM	40
41	TOC		TOC:3.198mg/L TC:4.011mg/L IC:0.8135mg/L	Complete	9/6/2017 6:11:34 PM	41
42	TOC	L17090046-01	TOC:1.547mg/L TC:15.00mg/L IC:13.45mg/L	Complete	9/6/2017 6:32:48 PM	42
43	TOC	L17090046-04	TOC:0.8533mg/L TC:7.124mg/L IC:6.271mg/L	Complete	9/6/2017 6:53:22 PM	43
44	TOC	L17090046-05 MS	TOC:11.38mg/L TC:15.14mg/L IC:3.753mg/L	Complete	9/6/2017 7:14:28 PM	44
45	TOC	L17090046-06 MSD	TOC:11.68mg/L TC:14.60mg/L IC:2.912mg/L	Complete	9/6/2017 7:35:25 PM	45
46	TOC	L17090046-13	TOC:0.7700mg/L TC:8.062mg/L IC:7.292mg/L	Complete	9/6/2017 7:56:12 PM	46
47	TOC	L17090046-16	TOC:0.7794mg/L TC:7.964mg/L IC:7.185mg/L	Complete	9/6/2017 8:16:55 PM	47
48	TOC	L17090046-19	TOC:0.8761mg/L TC:7.892mg/L IC:7.016mg/L	Complete	9/6/2017 8:37:32 PM	48
49	TOC	L17090022 46-22	TOC:0.8814mg/L TC:4.241mg/L IC:3.359mg/L	Complete	9/6/2017 8:57:48 PM	49
50	TOC	CCV	!!Error!! TOC:23.26mg/L TC:22.99mg/L IC:-0.2733mg/L	Complete	9/6/2017 9:09:59 PM	50
51	TOC	CCB	!!Error!! TOC:0.2022mg/L TC:-0.05777mg/L IC:-0.2599mg/L	Complete	9/6/2017 9:19:11 PM	0
52	TOC	L17090046-25	!!Error!! TOC:1.119mg/L TC:1.004mg/L IC:-0.1150mg/L	Complete	9/6/2017 9:39:05 PM	52
53	TOC	L17090046-28	!!Error!! TOC:1.107mg/L TC:1.023mg/L IC:-0.08375mg/L	Complete	9/6/2017 9:59:03 PM	53
54	TOC	L17090094-01	TOC:9.312mg/L TC:36.19mg/L IC:26.88mg/L	Complete	9/6/2017 10:22:00 PM	54
55	TOC	L17090094-02	TOC:14.12mg/L TC:37.58mg/L IC:23.46mg/L	Complete	9/6/2017 10:45:16 PM	55
56	TOC	<Untitled>	TOC:4.102mg/L TC:5.390mg/L IC:1.288mg/L	Complete	9/6/2017 11:05:48 PM	56
57	TOC	L17090095-01 (10)	TOC:12.61mg/L TC:17.81mg/L IC:5.200mg/L	Complete	9/6/2017 11:27:24 PM	57
58	TOC		TOC:1.684mg/L TC:7.382mg/L IC:5.698mg/L	Complete	9/6/2017 11:48:18 PM	58
59	TOC	L17090095-03 (2)	TOC:5.538mg/L TC:17.00mg/L IC:11.46mg/L	Complete	9/7/2017 12:09:49 AM	59
60	TOC	L17090095-04 (2)	TOC:2.878mg/L TC:13.24mg/L IC:10.36mg/L	Complete	9/7/2017 12:30:50 AM	60
61	TOC	<Untitled>	TOC:1.558mg/L TC:8.238mg/L IC:6.680mg/L	Complete	9/7/2017 12:51:39 AM	61
62	TOC	CCV	!!Error!! TOC:24.57mg/L TC:24.31mg/L IC:-0.2526mg/L	Complete	9/7/2017 1:03:58 AM	62
63	TOC	CCB	!!Error!! TOC:0.07839mg/L TC:-0.1726mg/L IC:-0.2510mg/L	Complete	9/7/2017 1:13:02 AM	0
64	TOC	L17090095-06	TOC:2.513mg/L TC:19.02mg/L IC:16.50mg/L	Complete	9/7/2017 1:34:44 AM	64
65	TOC	WG628481-03 DUP	TOC:3.007mg/L TC:16.83mg/L IC:13.82mg/L	Complete	9/7/2017 1:56:20 AM	65
66	TOC	L17081649-04 (4) MSD	TOC:11.10mg/L TC:21.73mg/L IC:10.64mg/L	Complete	9/7/2017 2:09:15 AM	1
67	TOC	L17081568-01 (100)	TOC:12.45mg/L TC:12.63mg/L IC:0.1784mg/L	Complete	9/7/2017 2:21:33 AM	2

dcw
9/6/17

dcw
9/6/17

dcw
9/6/17

	Analysis	Sample Name	Result	Status	Date / Time	Vial
68	TOC	L17081568-02 (10)	!!Error!! TOC:10.89mg/L TC:10.78mg/L IC:-0.1100mg/L	Complete	9/7/2017 2:34:54 AM	3
69	TOC		TOC:8.390mg/L TC:8.525mg/L IC:0.1357mg/L	Complete	9/7/2017 2:47:32 AM	4
70	TOC	L17081649-06 (4)	TOC:3.587mg/L TC:13.83mg/L IC:10.24mg/L	Complete	9/7/2017 2:59:51 AM	5
71	TOC	L17081649-07 (3)	TOC:2.889mg/L TC:11.67mg/L IC:8.785mg/L	Complete	9/7/2017 3:11:51 AM	6
72	TOC	CCV	!!Error!! TOC:23.81mg/L TC:23.56mg/L IC:-0.2465mg/L	Complete	9/7/2017 3:24:10 AM	7
73	TOC	CCB	!!Error!! TOC:0.1051mg/L TC:-0.1393mg/L IC:-0.2444mg/L	Complete	9/7/2017 3:33:06 AM	0
74	TOC	CCV	!!Error!! TOC:25.08mg/L TC:24.88mg/L IC:-0.2020mg/L	Complete	9/7/2017 7:55:41 AM	1
75	TOC	CCB	!!Error!! TOC:0.1178mg/L TC:-0.2198mg/L IC:-0.3376mg/L	Complete	9/7/2017 8:04:31 AM	0
76	TOC	L17081653-01 (5)	TOC:16.91mg/L TC:27.76mg/L IC:10.85mg/L	Complete	9/7/2017 8:17:21 AM	3
77	TOC	09-94-03 Y5	TOC:26.44mg/L TC:60.32mg/L IC:33.88mg/L	Complete	9/7/2017 8:30:28 AM	4
78	TOC	L17090094-03 (5) 09-95-02	TOC:2.690mg/L TC:47.68mg/L IC:44.99mg/L	Complete	9/7/2017 8:44:14 AM	5
79	TOC	L17090095-02 09-95-03 (2)	TOC:1.950mg/L TC:25.14mg/L IC:23.19mg/L	Complete	9/7/2017 9:17:28 AM	6
80	TOC	L17090095-05 (2) 09-1568-03	TOC:33.18mg/L TC:36.46mg/L IC:3.282mg/L	Complete	9/7/2017 9:32:16 AM	7
81	TOC	L17090094-03 (20)	TOC:6.357mg/L TC:12.94mg/L IC:6.581mg/L	Complete	9/7/2017 9:44:33 AM	8
82	TOC	CCV	!!Error!! TOC:24.86mg/L TC:24.67mg/L IC:-0.1916mg/L	Complete	9/7/2017 9:56:41 AM	9
83	TOC	CCB	!!Error!! TOC:0.1211mg/L TC:-0.2141mg/L IC:-0.3352mg/L	Complete	9/7/2017 10:05:31 AM	0

don
9/7/17

9/7/2017 11:02:25 AM

2/2

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

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

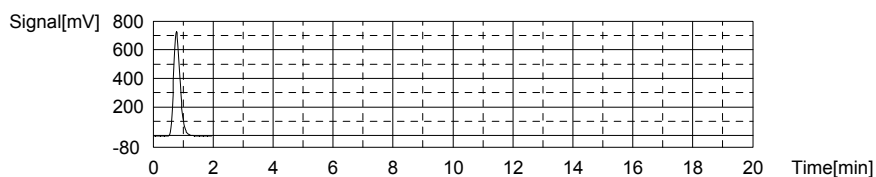
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.110mg/L TC:25.52mg/L IC:24.41mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1097	25.52mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 8:26:51 AM

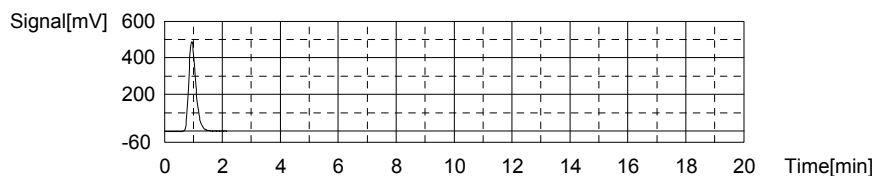
Mean Area 1097
 Mean Conc. 25.52mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	835.8	24.41mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 8:31:58 AM

Mean Area 835.8
 Mean Conc. 24.41mg/L



Sample

Sample Name: TOC/TOC
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:25.57mg/L TC:33.55mg/L IC:7.985mg/L

1. Det

Anal.: TC

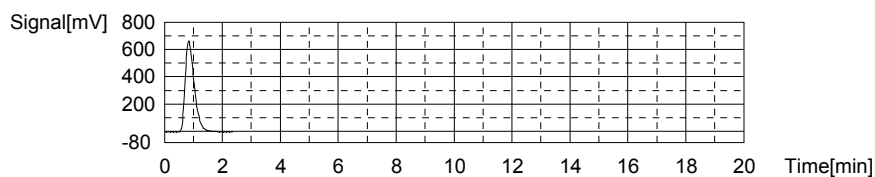
1/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1437	33.55mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 8:39:46 AM

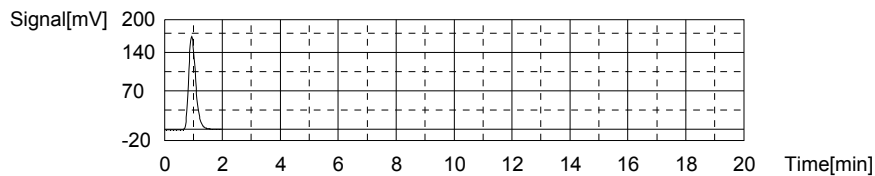
Mean Area 1437
Mean Conc. 33.55mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	285.8	7.985mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 8:44:41 AM

Mean Area 285.8
Mean Conc. 7.985mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

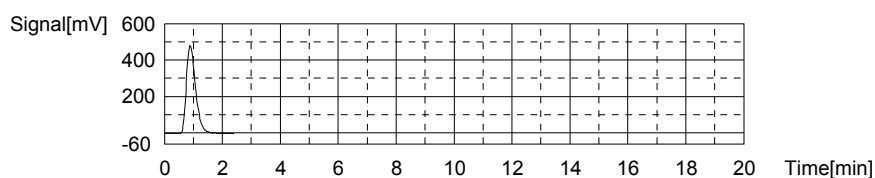
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.98mg/L TC:24.65mg/L IC:-0.3368mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1060	24.65mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 8:52:31 AM

Mean Area 1060
Mean Conc. 24.65mg/L



Anal.: IC

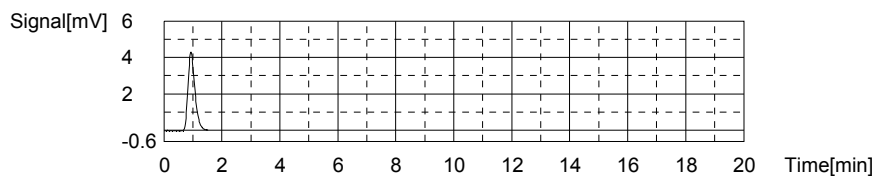
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.137	-0.3368mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 8:56:51 AM

2/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 7.137
Mean Conc. -0.3368mg/L



Sample

Sample Name: WG628480-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

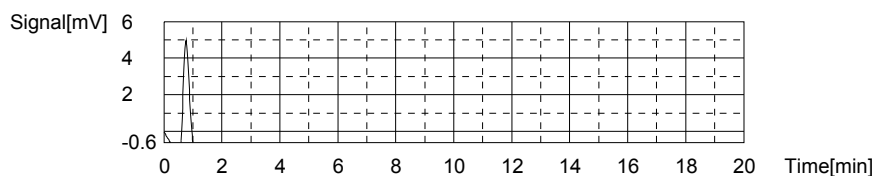
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.09528mg/L TC:-0.1712mg/L IC:-0.2665mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.620	-0.1712mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 9:01:55 AM

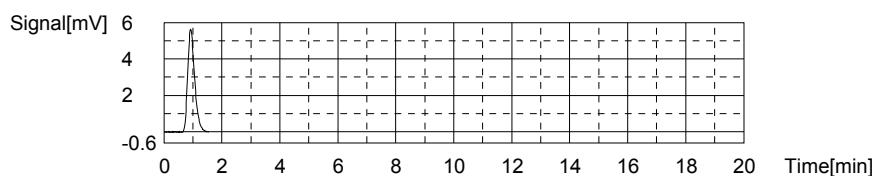
Mean Area 9.620
Mean Conc. -0.1712mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.492	-0.2665mg/L	500uL	1		TIC-CURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 9:05:51 AM

Mean Area 9.492
Mean Conc. -0.2665mg/L



Sample

Sample Name: WG628480-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.59mg/L TC:24.22mg/L IC:-0.3689mg/L

3/57

9/7/2017 11:02:28 AM

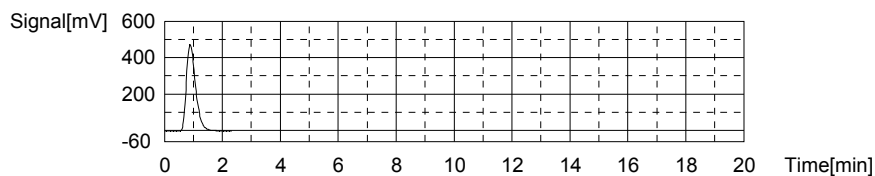
09-06-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1042	24.22mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 9:13:37 AM

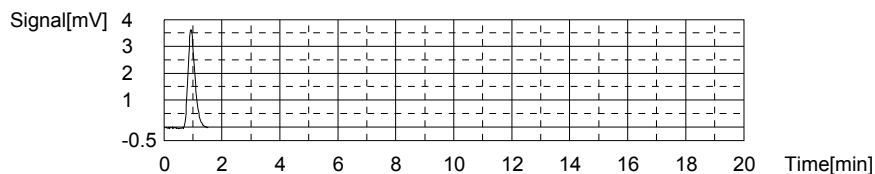
Mean Area 1042
Mean Conc. 24.22mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.062	-0.3689mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 9:18:00 AM

Mean Area 6.062
Mean Conc. -0.3689mg/L



Sample

Sample Name: WG628480-03 LCSDUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

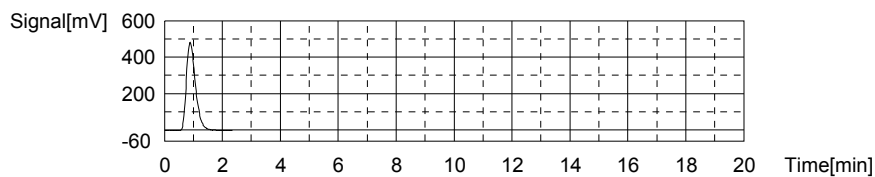
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.83mg/L TC:24.46mg/L IC:-0.3695mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1052	24.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 9:25:46 AM

Mean Area 1052
Mean Conc. 24.46mg/L



Anal.: IC

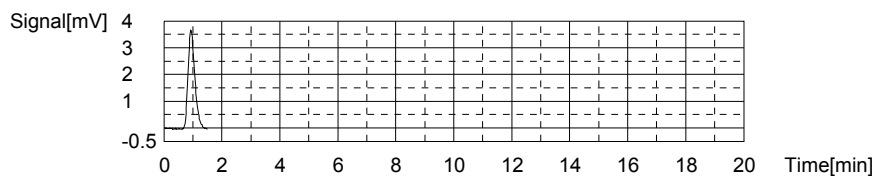
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.043	-0.3695mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 9:30:07 AM

4/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 6.043
Mean Conc. -0.3695mg/L



Sample

Sample Name: L17081644-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

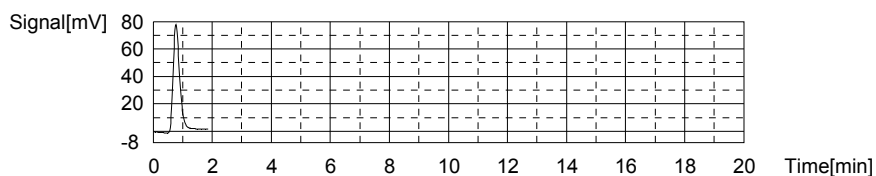
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.3464mg/L TC:2.548mg/L IC:2.201mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	124.7	2.548mg/L	500uL	1		TC	9/6/2017 9:37:25 AM

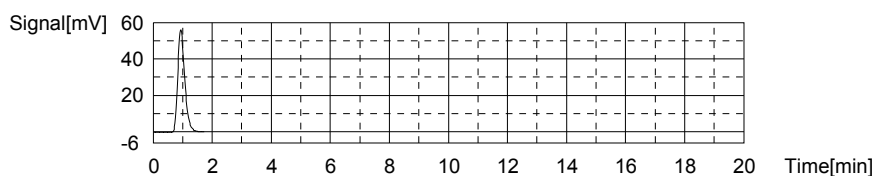
Mean Area 124.7
Mean Conc. 2.548mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	92.13	2.201mg/L	500uL	1		IC	9/6/2017 9:41:59 AM

Mean Area 92.13
Mean Conc. 2.201mg/L



Sample

Sample Name: L17081559-09 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.119mg/L TC:40.29mg/L IC:37.17mg/L

5/57

9/7/2017 11:02:28 AM

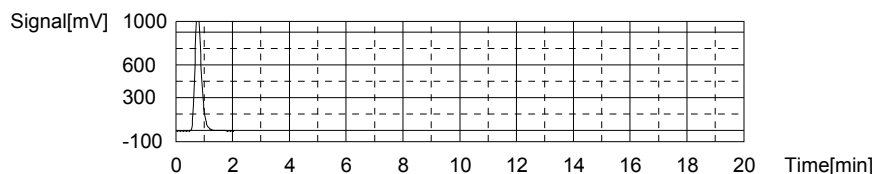
09-06-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1722	40.29mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 9:49:29 AM

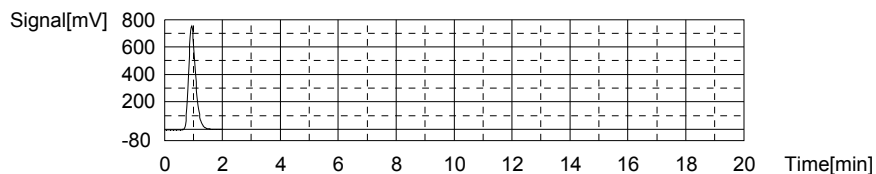
Mean Area 1722
Mean Conc. 40.29mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1263	37.17mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 9:54:32 AM

Mean Area 1263
Mean Conc. 37.17mg/L



Sample

Sample Name: L17081559-10 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

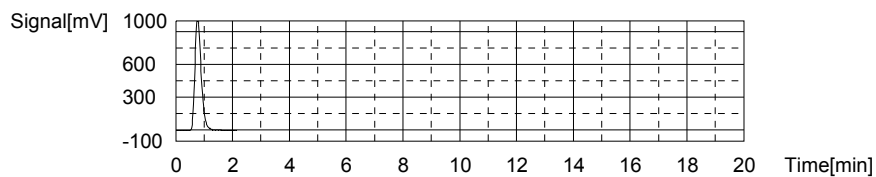
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.139mg/L TC:37.10mg/L IC:34.96mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1587	37.10mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 10:02:08 AM

Mean Area 1587
Mean Conc. 37.10mg/L



Anal.: IC

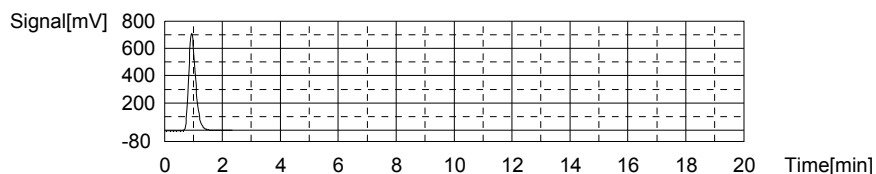
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1189	34.96mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 10:07:27 AM

6/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 1189
Mean Conc. 34.96mg/L



Sample

Sample Name: L17081559-11 (25)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

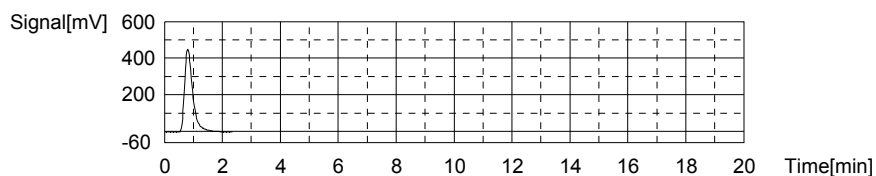
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:13.62mg/L TC:20.23mg/L IC:6.614mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	873.2	20.23mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 10:15:14 AM

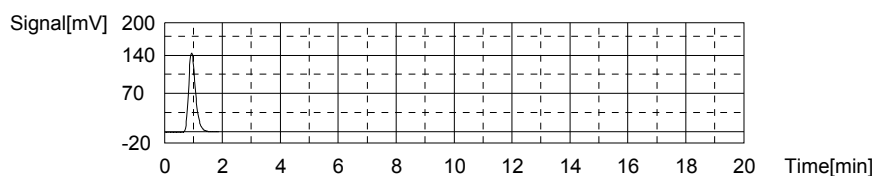
Mean Area 873.2
Mean Conc. 20.23mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	239.9	6.614mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 10:20:01 AM

Mean Area 239.9
Mean Conc. 6.614mg/L



Sample

Sample Name: L17081559-12 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.055mg/L TC:42.22mg/L IC:39.17mg/L

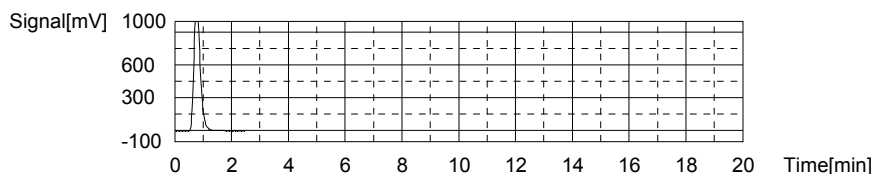
7/57

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1804	42.22mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 10:40:45 AM

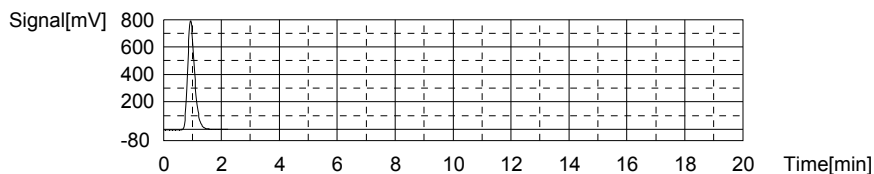
Mean Area 1804
Mean Conc. 42.22mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1330	39.17mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 10:46:00 AM

Mean Area 1330
Mean Conc. 39.17mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

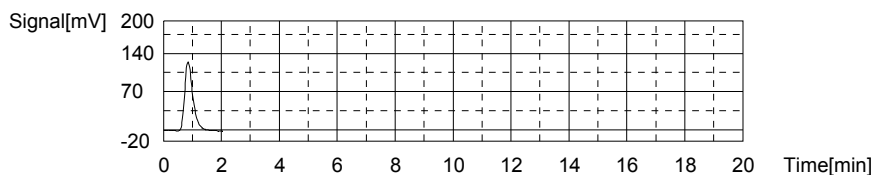
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:5.479mg/L TC:5.463mg/L IC:-0.01566mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	248.1	5.463mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 10:53:30 AM

Mean Area 248.1
Mean Conc. 5.463mg/L



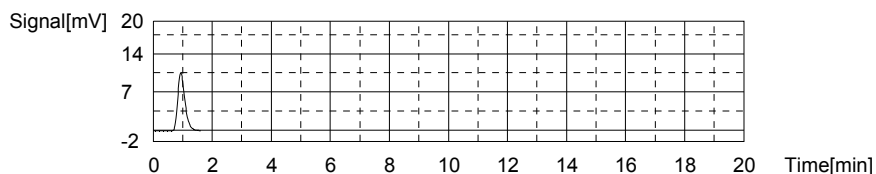
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	17.89	-0.01566mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 10:58:01 AM

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 17.89
Mean Conc. -0.01566mg/L



Sample

Sample Name: <Untitled>
Sample ID: TOC-02-10-2017.met
Origin: Completed
Status: Completed
Chk. Result

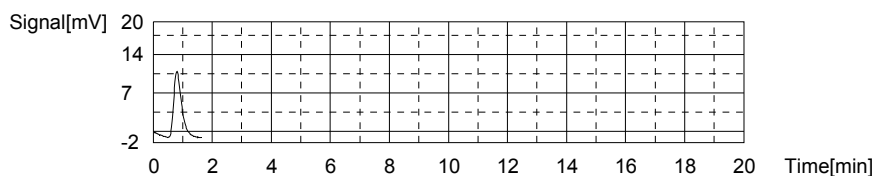
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.3764mg/L TC:0.1275mg/L IC:-0.2489mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	22.26	0.1275mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 11:05:05 AM

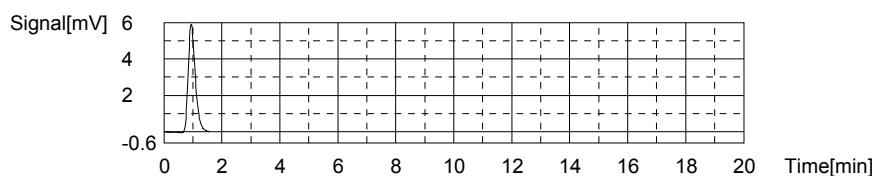
Mean Area 22.26
Mean Conc. 0.1275mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.08	-0.2489mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 11:09:27 AM

Mean Area 10.08
Mean Conc. -0.2489mg/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:24.37mg/L TC:24.06mg/L IC:-0.3180mg/L

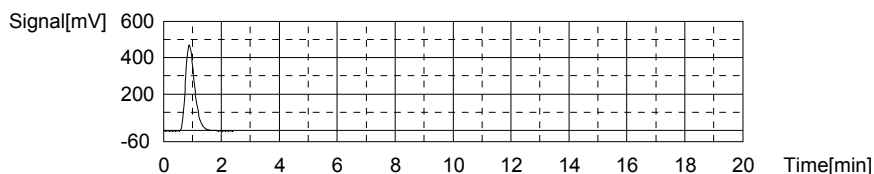
9/57

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_59	9/6/2017 11:17:19 AM

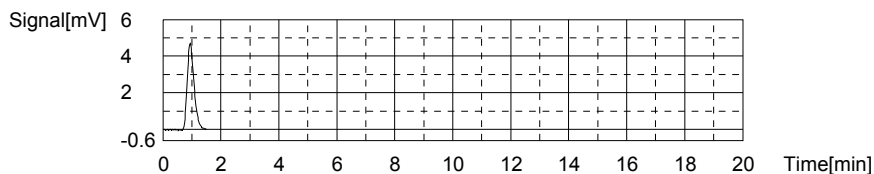
Mean Area 1035
Mean Conc. 24.06mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.765	-0.3180mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 11:21:38 AM

Mean Area 7.765
Mean Conc. -0.3180mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

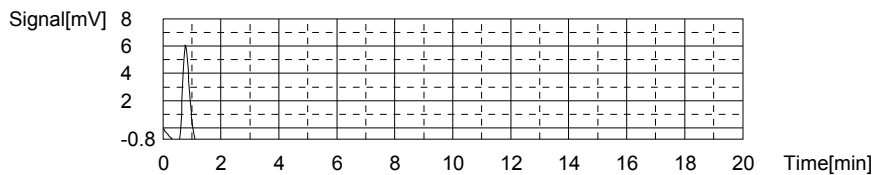
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1847mg/L TC:-0.09227mg/L IC:-0.2770mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.96	-0.09227mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 11:26:48 AM

Mean Area 12.96
Mean Conc. -0.09227mg/L



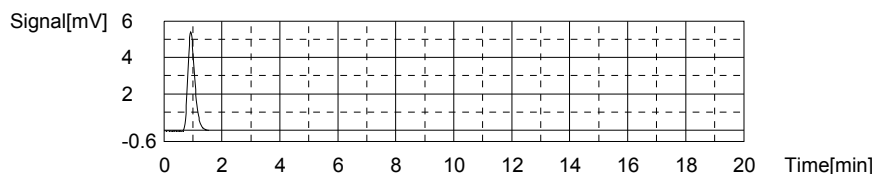
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.140	-0.2770mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 11:30:42 AM

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 9.140
Mean Conc. -0.2770mg/L



Sample

Sample Name: <Untitled>
Sample ID: TOC-02-10-2017.met
Origin: Completed
Status: Completed
Chk. Result

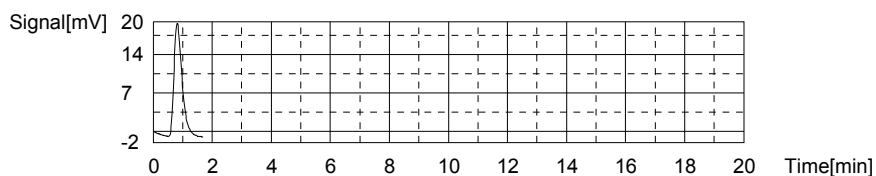
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.7085mg/L TC:0.5208mg/L IC:-0.1877mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	38.91	0.5208mg/L	500uL	1		TC	9/6/2017 11:37:50 AM

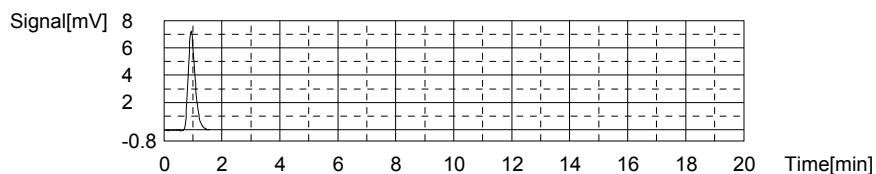
Mean Area 38.91
Mean Conc. 0.5208mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.13	-0.1877mg/L	500uL	1		IC	9/6/2017 11:42:13 AM

Mean Area 12.13
Mean Conc. -0.1877mg/L



Sample

Sample Name: L17081649-01 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.9131mg/L TC:18.82mg/L IC:17.91mg/L

11/57

9/7/2017 11:02:28 AM

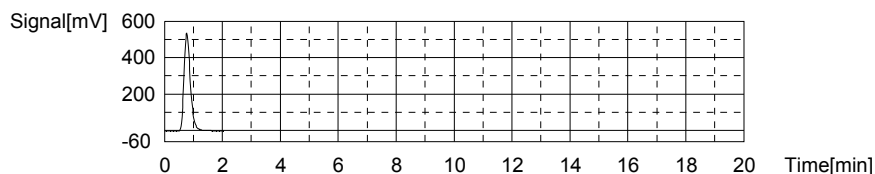
09-06-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	813.5	18.82mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 11:49:43 AM

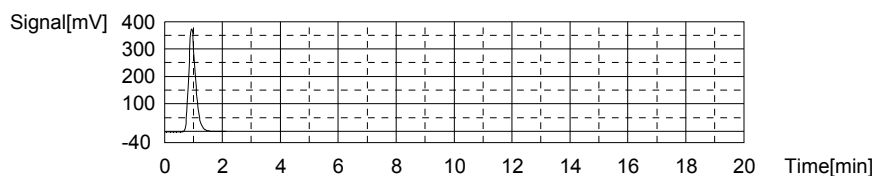
Mean Area 813.5
Mean Conc. 18.82mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	618.1	17.91mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 11:54:46 AM

Mean Area 618.1
Mean Conc. 17.91mg/L



Sample

Sample Name: L17081649-02 (4)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

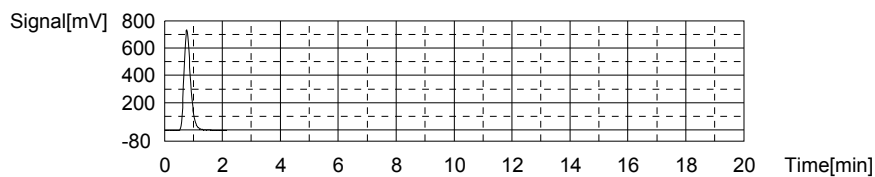
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.540mg/L TC:26.61mg/L IC:24.07mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1143	26.61mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 12:21:41 PM

Mean Area 1143
Mean Conc. 26.61mg/L



Anal.: IC

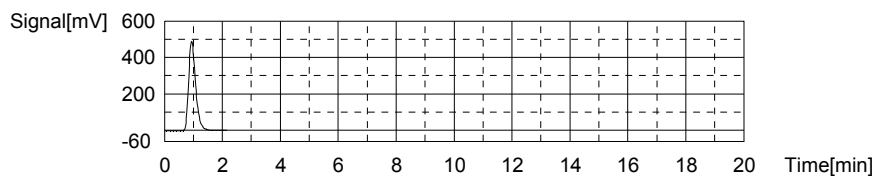
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	824.3	24.07mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 12:26:50 PM

12/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 824.3
Mean Conc. 24.07mg/L



Sample

Sample Name: L170801649-03 (4) MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

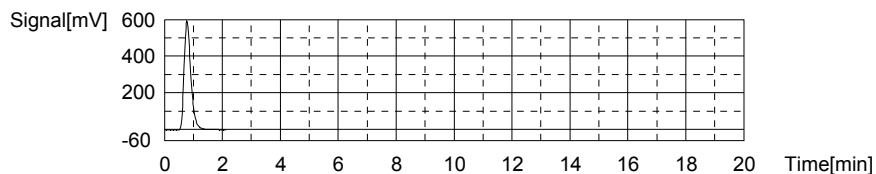
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.852mg/L TC:22.27mg/L IC:17.42mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	959.6	22.27mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 12:39:33 PM

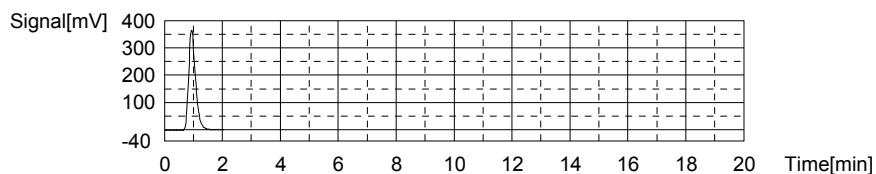
Mean Area 959.6
Mean Conc. 22.27mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	601.8	17.42mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 12:44:32 PM

Mean Area 601.8
Mean Conc. 17.42mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.172mg/L TC:18.64mg/L IC:17.47mg/L

13/57

9/7/2017 11:02:28 AM

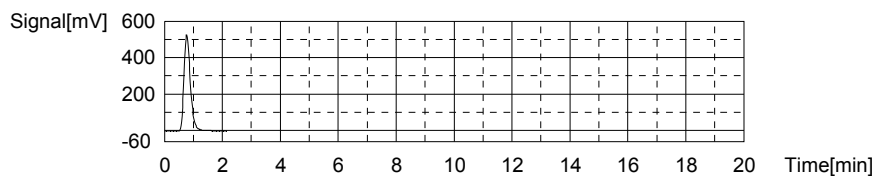
09-06-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	806.0	18.64mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 12:52:09 PM

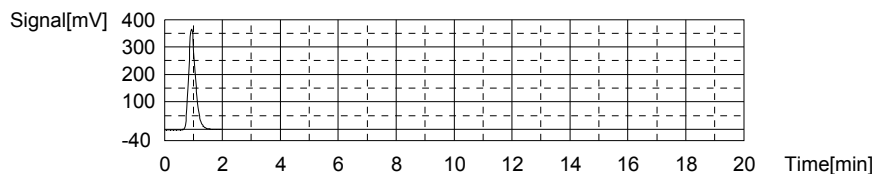
Mean Area 806.0
Mean Conc. 18.64mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	603.5	17.47mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 12:57:04 PM

Mean Area 603.5
Mean Conc. 17.47mg/L



Sample

Sample Name: L17081649-05 (4)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

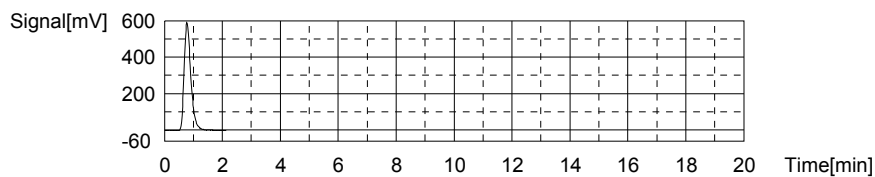
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.899mg/L TC:22.03mg/L IC:17.13mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	949.1	22.03mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 1:04:38 PM

Mean Area 949.1
Mean Conc. 22.03mg/L

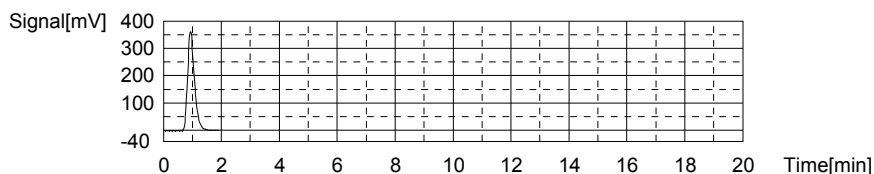


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	591.9	17.13mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 1:09:28 PM

14/57

Mean Area 591.9
Mean Conc. 17.13mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

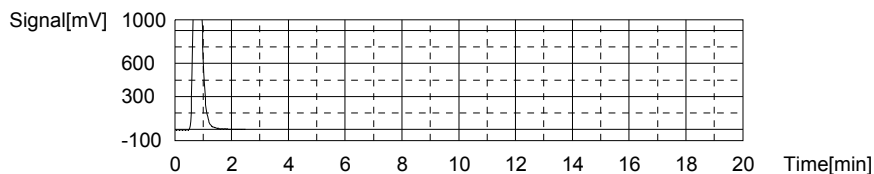
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-15.06mg/L TC:74.64mg/L IC:89.70mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	3176	74.64mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	9/6/2017 1:17:24 PM

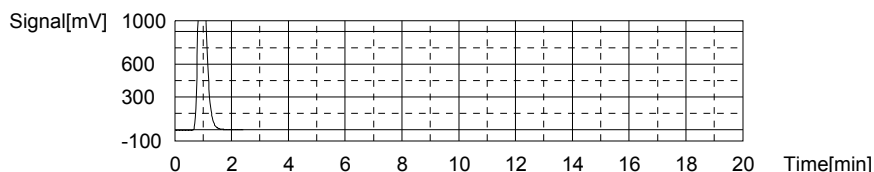
Mean Area 3176
Mean Conc. 74.64mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	3022	89.70mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_1	9/6/2017 1:23:01 PM

Mean Area 3022
Mean Conc. 89.70mg/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:2.806mg/L TC:50.63mg/L IC:47.83mg/L

9/7/2017 11:02:28 AM

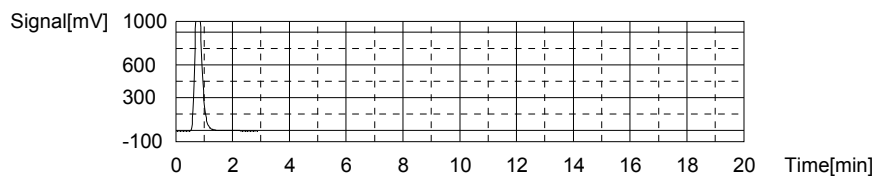
09-06-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2160	50.63mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 1:31:20 PM

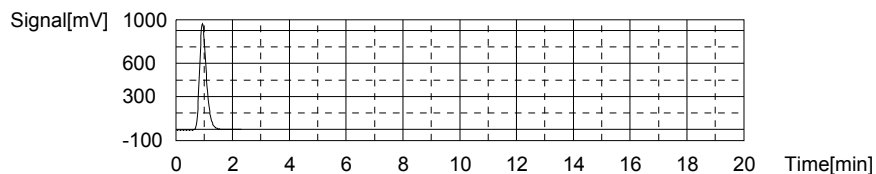
Mean Area 2160
Mean Conc. 50.63mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1620	47.83mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 1:36:46 PM

Mean Area 1620
Mean Conc. 47.83mg/L



Sample

Sample Name: L17081649-08 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

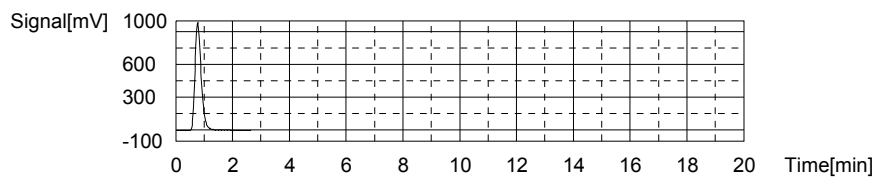
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.986mg/L TC:35.30mg/L IC:33.32mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1511	35.30mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 1:44:51 PM

Mean Area 1511
Mean Conc. 35.30mg/L



Anal.: IC

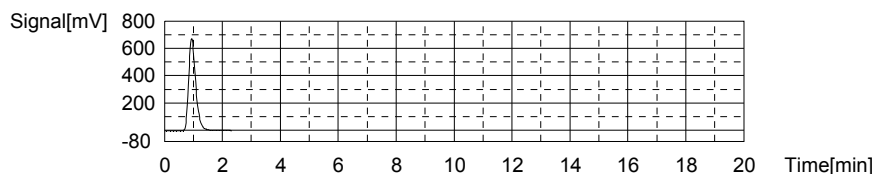
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1134	33.32mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 1:50:12 PM

16/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 1134
Mean Conc. 33.32mg/L



Sample

Sample Name: L17081649-09 (4)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

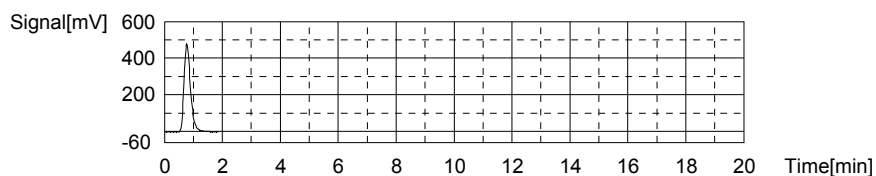
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.888mg/L TC:17.16mg/L IC:15.27mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	743.3	17.16mg/L	500uL	1		TC	9/6/2017 2:05:59 PM

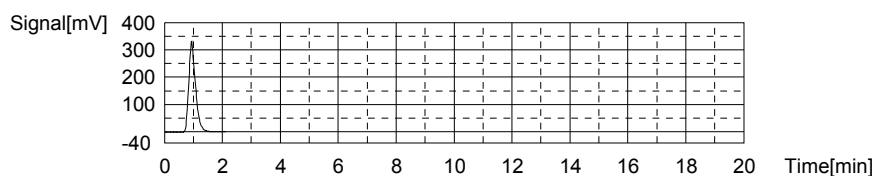
Mean Area 743.3
Mean Conc. 17.16mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	529.9	15.27mg/L	500uL	1		IC	9/6/2017 2:11:04 PM

Mean Area 529.9
Mean Conc. 15.27mg/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:23.80mg/L TC:23.56mg/L IC:-0.2405mg/L

17/57

9/7/2017 11:02:28 AM

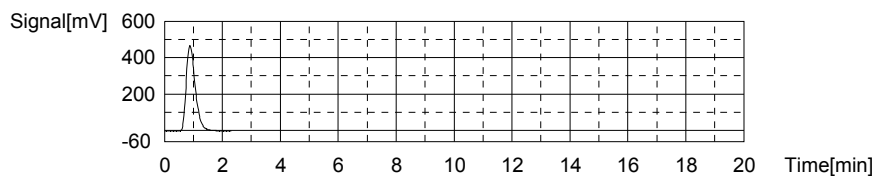
09-06-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1014	23.56mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 2:18:50 PM

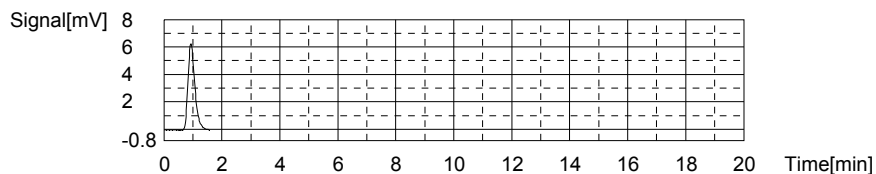
Mean Area 1014
Mean Conc. 23.56mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.36	-0.2405mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 2:23:14 PM

Mean Area 10.36
Mean Conc. -0.2405mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

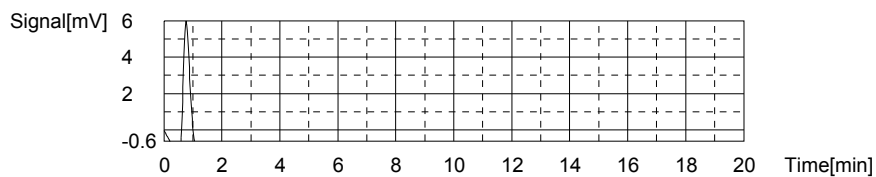
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1479mg/L TC:-0.1121mg/L IC:-0.2600mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.12	-0.1121mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 2:28:23 PM

Mean Area 12.12
Mean Conc. -0.1121mg/L



Anal.: IC

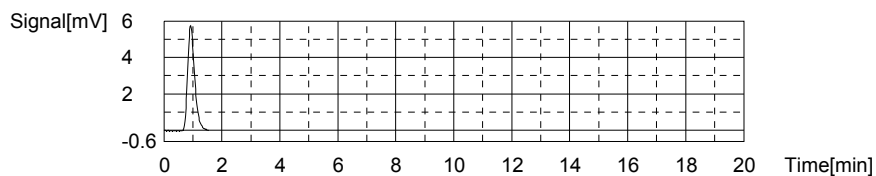
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.707	-0.2600mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 2:32:19 PM

18/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 9.707
Mean Conc. -0.2600mg/L



Sample

Sample Name: L17081649-10 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

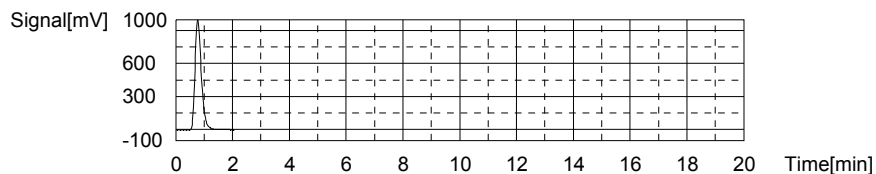
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.625mg/L TC:36.39mg/L IC:33.76mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1557	36.39mg/L	500uL	1		TC	9/6/2017 2:39:50 PM

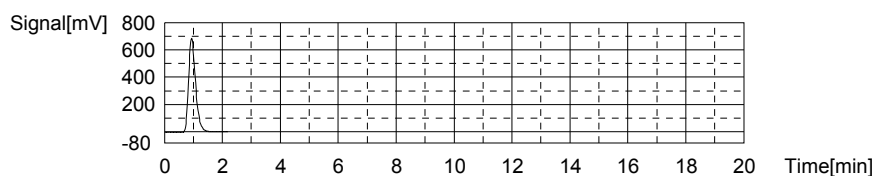
Mean Area 1557
Mean Conc. 36.39mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1149	33.76mg/L	500uL	1		IC	9/6/2017 2:45:00 PM

Mean Area 1149
Mean Conc. 33.76mg/L



Sample

Sample Name: L17081649-11 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.732mg/L TC:45.77mg/L IC:42.04mg/L

19/57

9/7/2017 11:02:28 AM

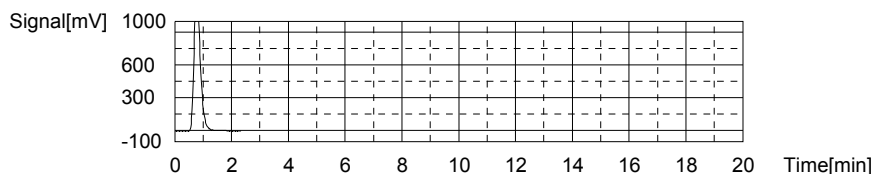
09-06-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1954	45.77mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 2:52:47 PM

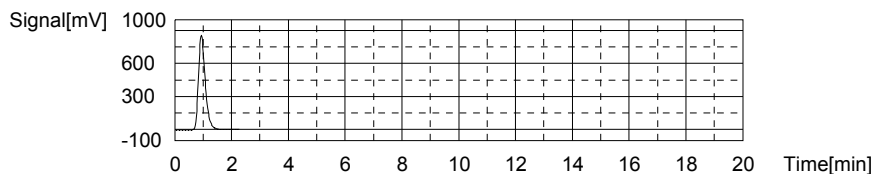
Mean Area 1954
Mean Conc. 45.77mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1426	42.04mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 2:58:03 PM

Mean Area 1426
Mean Conc. 42.04mg/L



Sample

Sample Name: L17081649-12 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

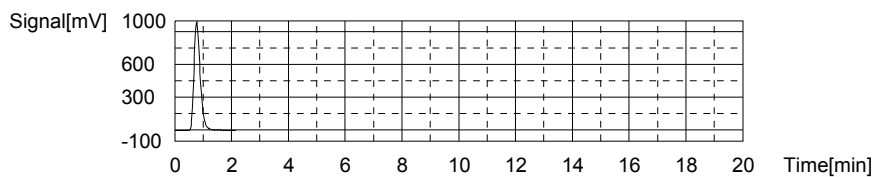
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.252mg/L TC:35.54mg/L IC:33.29mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1521	35.54mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 3:05:40 PM

Mean Area 1521
Mean Conc. 35.54mg/L



Anal.: IC

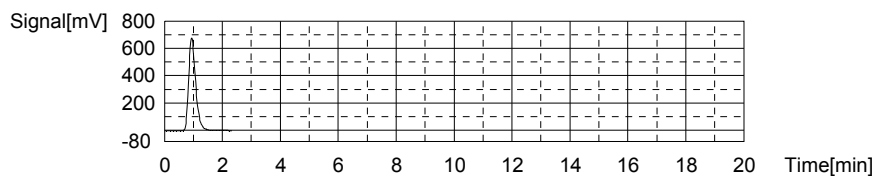
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1133	33.29mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 3:10:57 PM

20/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 1133
Mean Conc. 33.29mg/L



Sample

Sample Name: L17081649-13 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

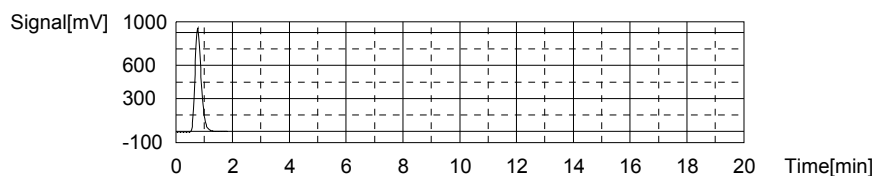
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.066mg/L TC:33.53mg/L IC:31.46mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1436	33.53mg/L	500uL	1		TC	02_10_09_32_59/6/2017 3:18:15 PM

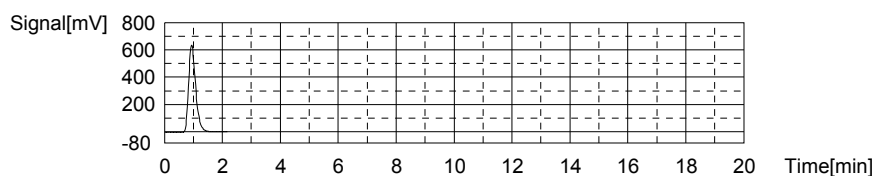
Mean Area 1436
Mean Conc. 33.53mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1072	31.46mg/L	500uL	1		IC	02_10_14_45_19/6/2017 3:23:26 PM

Mean Area 1072
Mean Conc. 31.46mg/L



Sample

Sample Name: L17081649-14 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.134mg/L TC:41.59mg/L IC:38.45mg/L

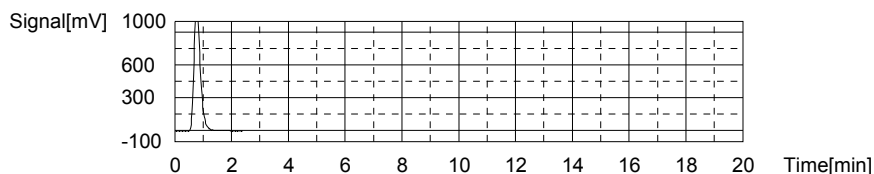
21/57

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1777	41.59mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 3:31:17 PM

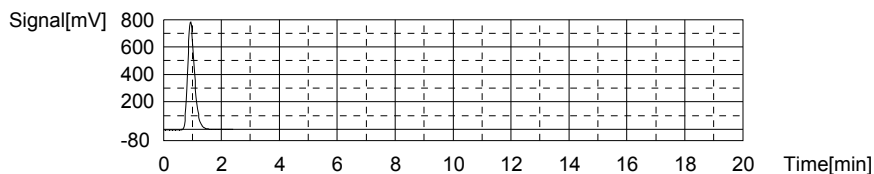
Mean Area 1777
Mean Conc. 41.59mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1306	38.45mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 3:36:47 PM

Mean Area 1306
Mean Conc. 38.45mg/L



Sample

Sample Name: WG628480-08 (2) DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

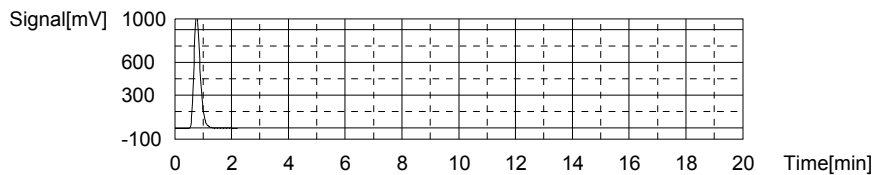
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.061mg/L TC:37.45mg/L IC:34.39mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1602	37.45mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 3:44:26 PM

Mean Area 1602
Mean Conc. 37.45mg/L



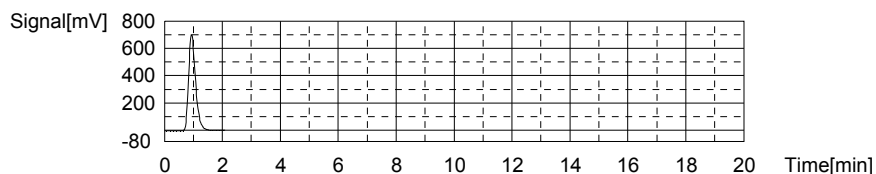
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1170	34.39mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/6/2017 3:49:32 PM

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 1170
Mean Conc. 34.39mg/L



Sample

Sample Name: WG628481-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

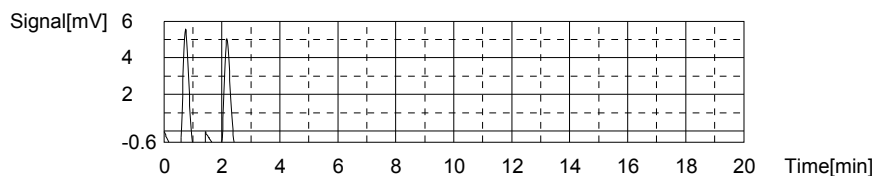
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06380mg/L TC:-0.1530mg/L IC:-0.2168mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.02	-0.1381mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 3:56:42 PM	
2	9.759	-0.1679mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 4:00:18 PM	

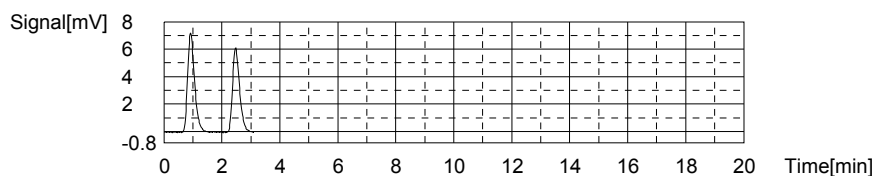
Mean Area 10.39
Mean Conc. -0.1530mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.05	-0.1901mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19/6/2017 4:04:17 PM	
2	10.26	-0.2435mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19/6/2017 4:08:11 PM	

Mean Area 11.16
Mean Conc. -0.2168mg/L



Sample

Sample Name: WG628481-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

23/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

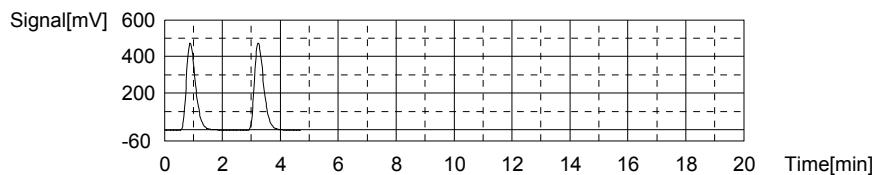
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.72mg/L TC:24.44mg/L IC:-0.2708mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1046	24.31mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 4:15:53 PM	
2	1057	24.57mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 4:20:31 PM	

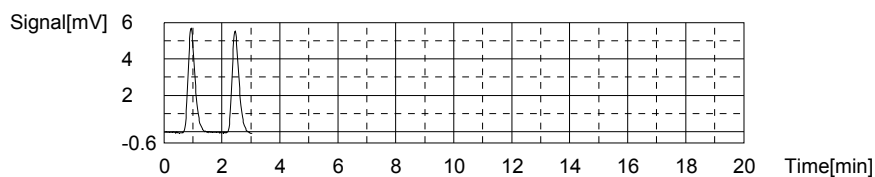
Mean Area 1052
Mean Conc. 24.44mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.474	-0.2670mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19/6/2017 4:24:51 PM	
2	9.216	-0.2747mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19/6/2017 4:28:58 PM	

Mean Area 9.345
Mean Conc. -0.2708mg/L



Sample

Sample Name: WG628481-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result:

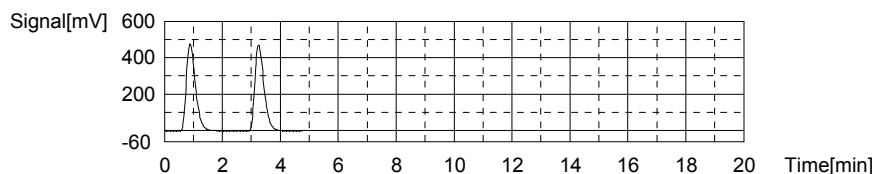
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.50mg/L TC:24.22mg/L IC:-0.2779mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1048	24.36mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 4:36:50 PM	
2	1036	24.08mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 4:41:32 PM	

Mean Area 1042
Mean Conc. 24.22mg/L



Anal.: IC

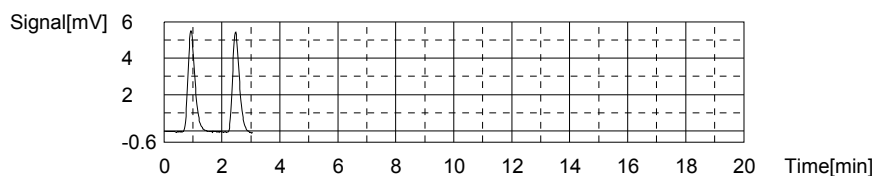
24/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.233	-0.2742mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 4:45:53 PM
2	8.987	-0.2815mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 4:50:01 PM

Mean Area 9.110
Mean Conc. -0.2779mg/L



Sample

Sample Name: L17081697-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

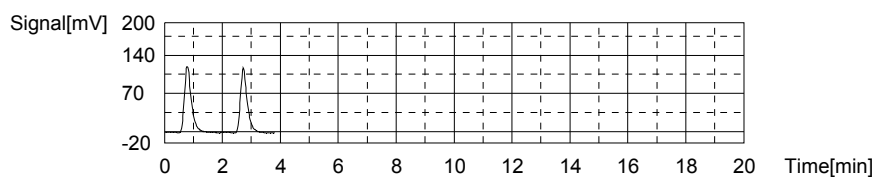
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.847mg/L TC:4.281mg/L IC:2.433mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	202.0	4.374mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 4:57:25 PM
2	194.1	4.187mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 5:01:34 PM

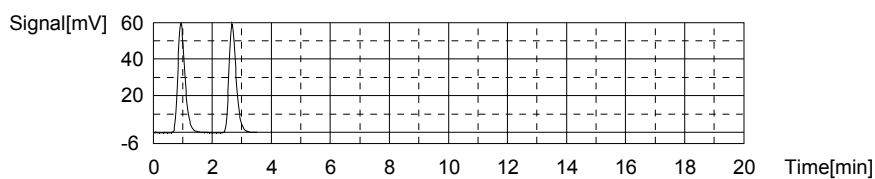
Mean Area 198.1
Mean Conc. 4.281mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	99.87	2.433mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 5:06:08 PM
2	99.92	2.434mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 5:10:30 PM

Mean Area 99.90
Mean Conc. 2.433mg/L



Sample

25/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

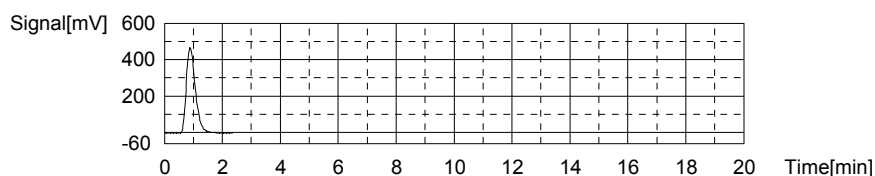
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.77mg/L TC:23.51mg/L IC:-0.2634mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1012	23.51mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 5:18:20 PM

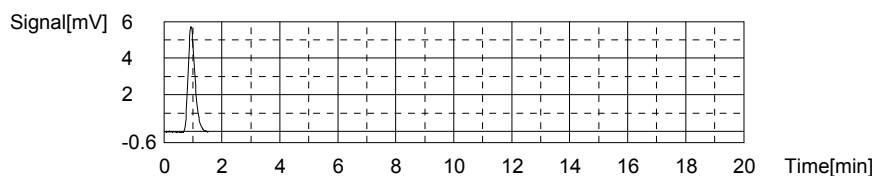
Mean Area 1012
 Mean Conc. 23.51mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.595	-0.2634mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 5:22:40 PM

Mean Area 9.595
 Mean Conc. -0.2634mg/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:0.09330mg/L TC:-0.1815mg/L IC:-0.2748mg/L

1. Det

Anal.: TC

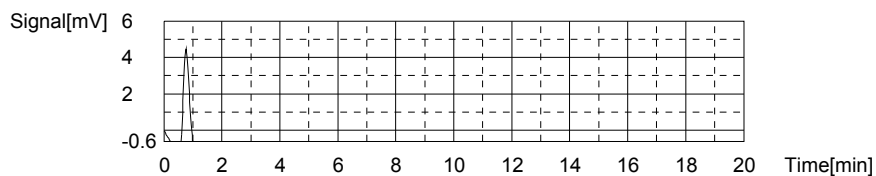
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.181	-0.1815mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 5:27:47 PM

26/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

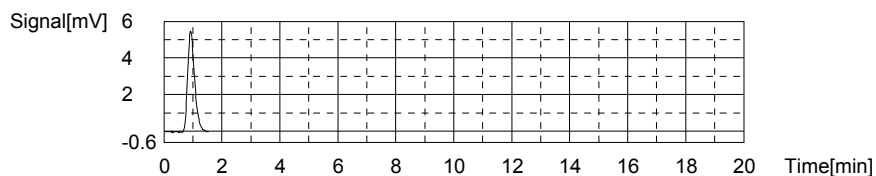
Mean Area 9.181
Mean Conc. -0.1815mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.211	-0.2748mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 5:31:41 PM

Mean Area 9.211
Mean Conc. -0.2748mg/L



Sample

Sample Name: L17090059-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

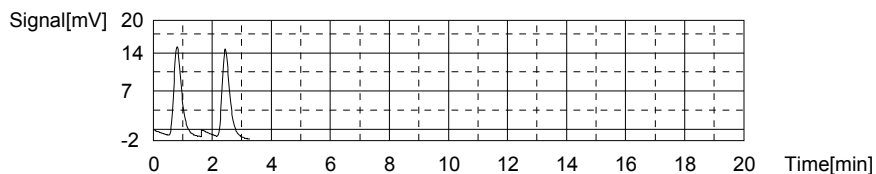
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.5721mg/L TC:0.2858mg/L IC:-0.2863mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	29.30	0.2938mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 5:38:47 PM
2	28.62	0.2777mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 5:42:42 PM

Mean Area 28.96
Mean Conc. 0.2858mg/L



Anal.: IC

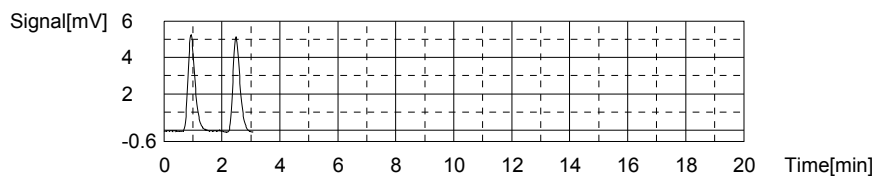
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.876	-0.2849mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 5:47:02 PM
2	8.778	-0.2878mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 5:51:08 PM

27/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 8.827
Mean Conc. -0.2863mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

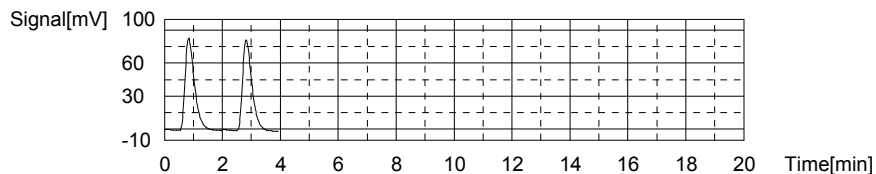
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.198mg/L TC:4.011mg/L IC:0.8135mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	187.9	4.041mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 5:58:35 PM
2	185.4	3.982mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 6:02:49 PM

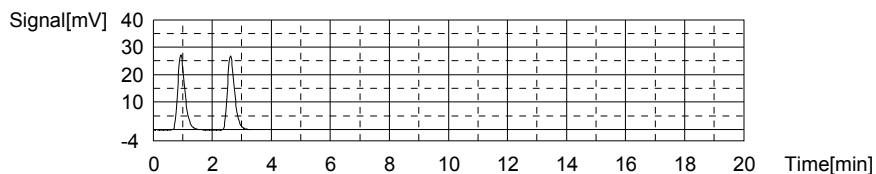
Mean Area 186.7
Mean Conc. 4.011mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	45.93	0.8217mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 6:07:19 PM
2	45.38	0.8053mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 6:11:34 PM

Mean Area 45.66
Mean Conc. 0.8135mg/L



Sample

Sample Name: L17090046-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

28/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

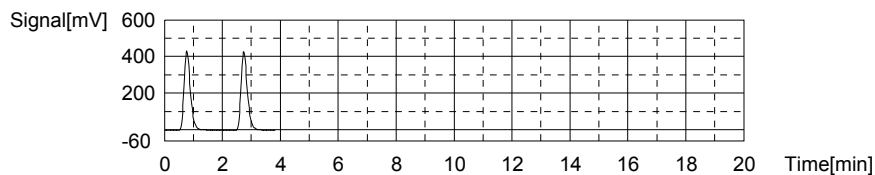
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.547mg/L TC:15.00mg/L IC:13.45mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	649.3	14.94mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 6:19:00 PM	
2	654.1	15.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 6:23:13 PM	

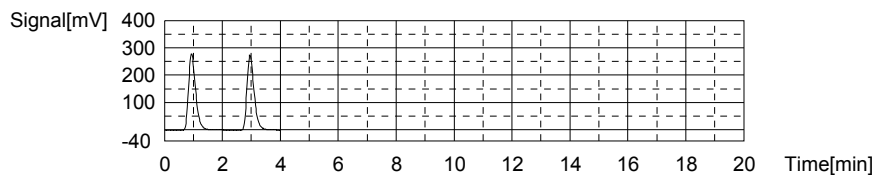
Mean Area 651.7
Mean Conc. 15.00mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	472.5	13.56mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19/6/2017 6:28:10 PM	
2	465.2	13.34mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19/6/2017 6:32:48 PM	

Mean Area 468.9
Mean Conc. 13.45mg/L



Sample

Sample Name: L17090046-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

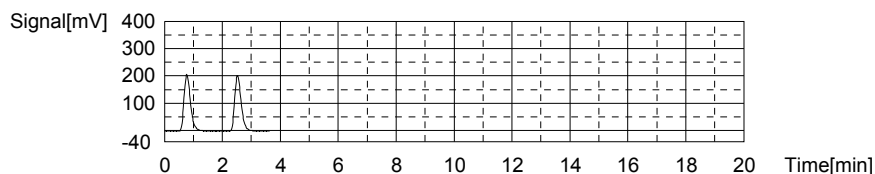
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.8533mg/L TC:7.124mg/L IC:6.271mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	319.3	7.145mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 6:40:00 PM	
2	317.5	7.103mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 6:44:09 PM	

Mean Area 318.4
Mean Conc. 7.124mg/L



Anal.: IC

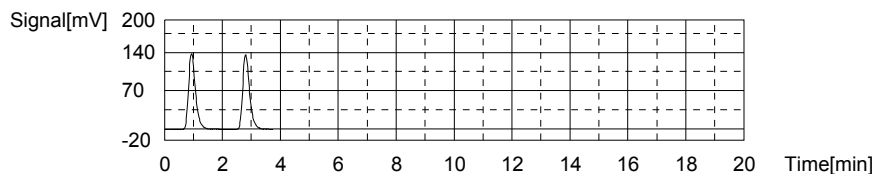
29/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	229.7	6.310mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 6:48:52 PM
2	227.1	6.232mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 6:53:22 PM

Mean Area 228.4
Mean Conc. 6.271mg/L



Sample

Sample Name: L17090046-05 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

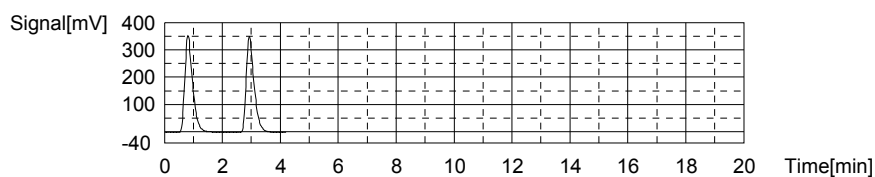
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.38mg/L TC:15.14mg/L IC:3.753mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	656.7	15.12mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 7:00:57 PM
2	658.4	15.16mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 7:05:18 PM

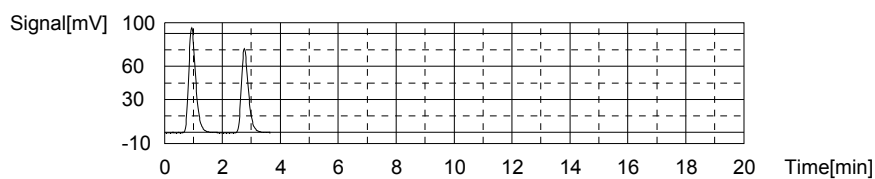
Mean Area 657.5
Mean Conc. 15.14mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	159.1	4.201mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 7:10:00 PM
2	129.1	3.305mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 7:14:28 PM

Mean Area 144.1
Mean Conc. 3.753mg/L



Sample

30/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Sample Name: L17090046-06 MSD
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

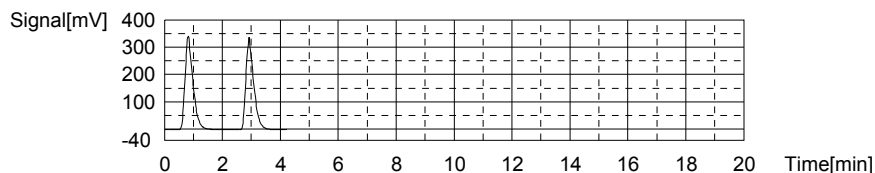
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.68mg/L TC:14.60mg/L IC:2.912mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	641.6	14.76mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 7:22:01 PM	
2	627.8	14.43mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 7:26:24 PM	

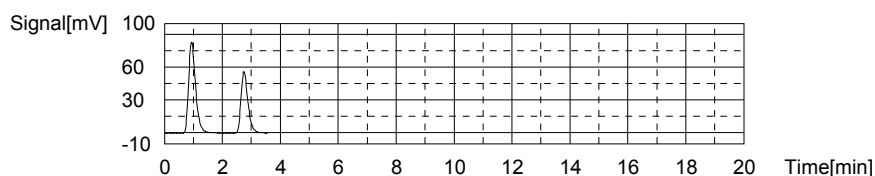
Mean Area 634.7
 Mean Conc. 14.60mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	138.4	3.583mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19/6/2017 7:31:05 PM	
2	93.48	2.242mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19/6/2017 7:35:25 PM	

Mean Area 115.9
 Mean Conc. 2.912mg/L



Sample

Sample Name: L17090046-13
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.7700mg/L TC:8.062mg/L IC:7.292mg/L

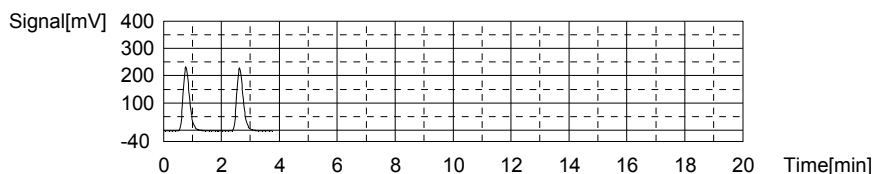
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	358.7	8.076mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 7:42:44 PM	
2	357.5	8.048mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 7:46:55 PM	

31/57

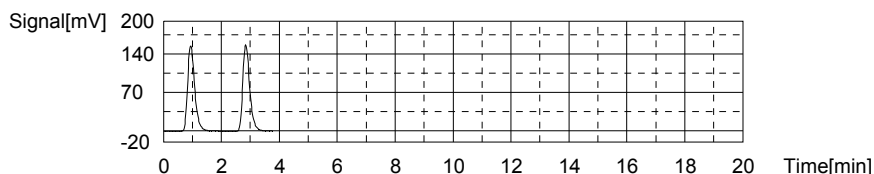
Mean Area 358.1
Mean Conc. 8.062mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	261.9	7.271mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 7:51:41 PM
2	263.3	7.313mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 7:56:12 PM

Mean Area 262.6
Mean Conc. 7.292mg/L



Sample

Sample Name: L17090046-16
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

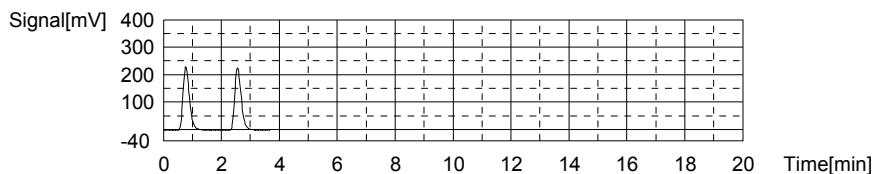
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.7794mg/L TC:7.964mg/L IC:7.185mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	354.3	7.972mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 8:03:27 PM
2	353.6	7.956mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 8:07:35 PM

Mean Area 354.0
Mean Conc. 7.964mg/L



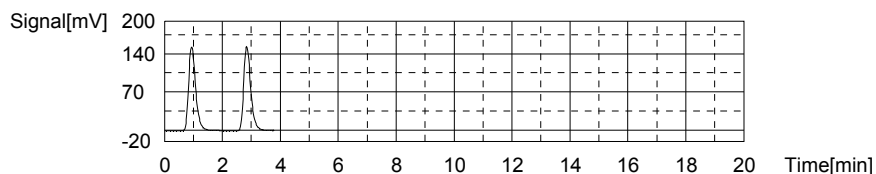
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	257.6	7.143mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 8:12:23 PM
2	260.4	7.227mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 8:16:55 PM

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 259.0
Mean Conc. 7.185mg/L



Sample

Sample Name: L17090046-19
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

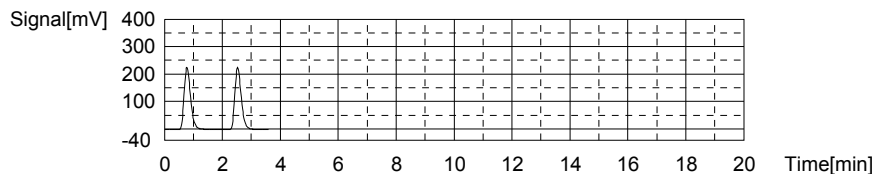
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.8761mg/L TC:7.892mg/L IC:7.016mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	351.5	7.906mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 8:24:09 PM
2	350.3	7.878mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 8:28:16 PM

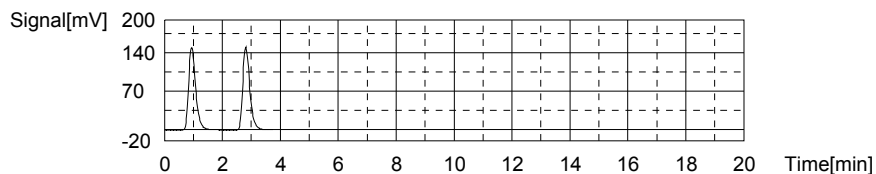
Mean Area 350.9
Mean Conc. 7.892mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	252.6	6.994mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 8:33:01 PM
2	254.1	7.038mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 8:37:32 PM

Mean Area 253.4
Mean Conc. 7.016mg/L



Sample

Sample Name: L17090022
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

33/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

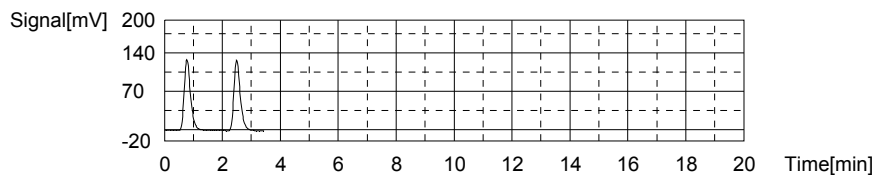
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.8814mg/L TC:4.241mg/L IC:3.359mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	196.5	4.244mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 8:44:44 PM	
2	196.2	4.237mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 8:48:44 PM	

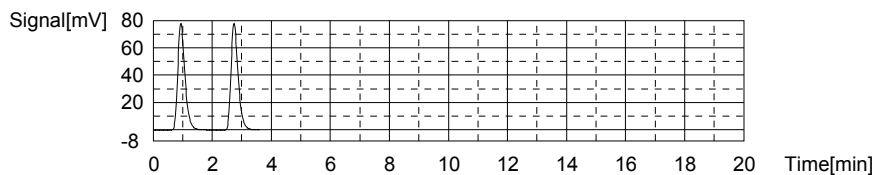
Mean Area 196.4
Mean Conc. 4.241mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	131.1	3.365mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19/6/2017 8:53:23 PM	
2	130.7	3.353mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19/6/2017 8:57:48 PM	

Mean Area 130.9
Mean Conc. 3.359mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status Completed
Chk. Result

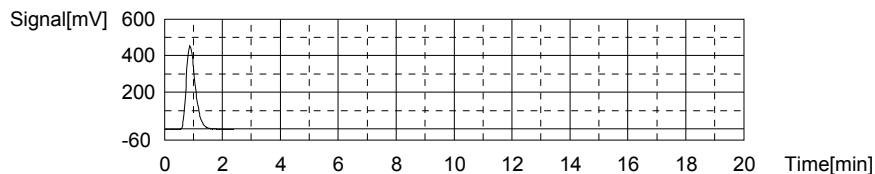
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.26mg/L TC:22.99mg/L IC:-0.2733mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	989.9	22.99mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 9:05:39 PM	

Mean Area 989.9
Mean Conc. 22.99mg/L



Anal.: IC

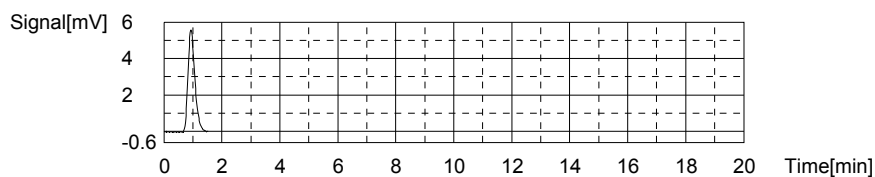
34/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.262	-0.2733mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/6/2017 9:09:59 PM

Mean Area 9.262
Mean Conc. -0.2733mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

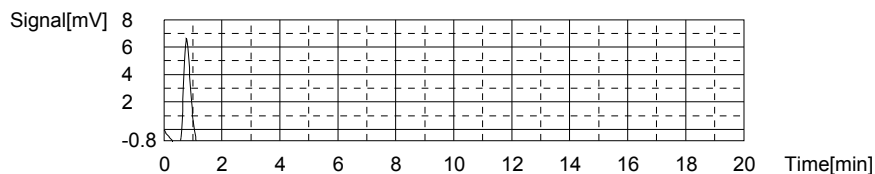
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.2022mg/L TC:-0.05777mg/L IC:-0.2599mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	14.42	-0.05777mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	9/6/2017 9:15:13 PM

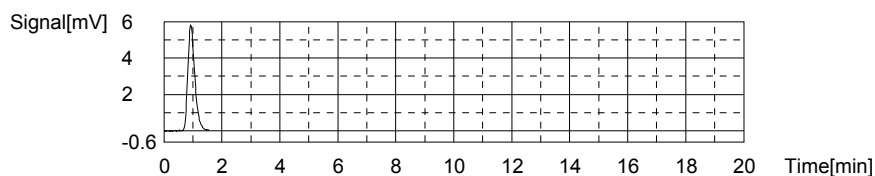
Mean Area 14.42
Mean Conc. -0.05777mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.710	-0.2599mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/6/2017 9:19:11 PM

Mean Area 9.710
Mean Conc. -0.2599mg/L



Sample

Sample Name: L17090046-25
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

35/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

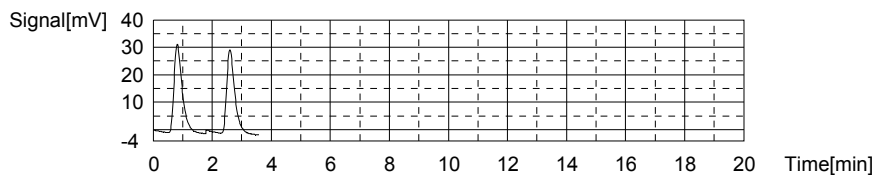
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:1.119mg/L TC:1.004mg/L IC:-0.1150mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	61.50	1.055mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 9:26:27 PM	
2	57.22	0.9534mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 9:30:31 PM	

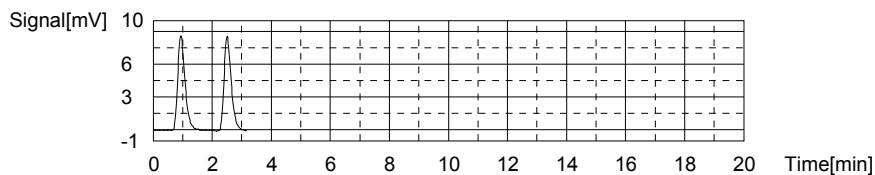
Mean Area 59.36
Mean Conc. 1.004mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	14.56	-0.1151mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19/6/2017 9:34:54 PM	
2	14.57	-0.1148mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19/6/2017 9:39:05 PM	

Mean Area 14.57
Mean Conc. -0.1150mg/L



Sample

Sample Name: L17090046-28
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

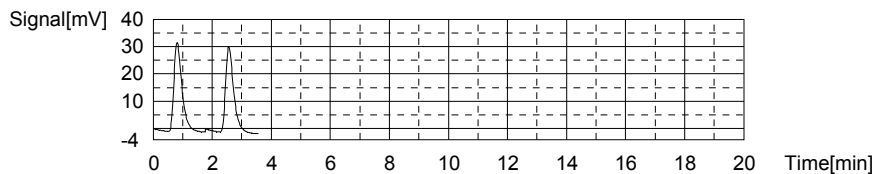
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:1.107mg/L TC:1.023mg/L IC:-0.08375mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	61.56	1.056mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 9:46:21 PM	
2	58.78	0.9903mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59/6/2017 9:50:26 PM	

Mean Area 60.17
Mean Conc. 1.023mg/L



Anal.: IC

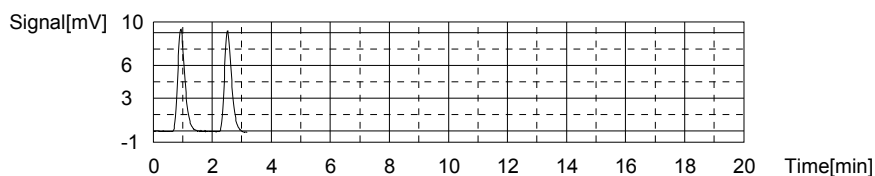
36/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	15.61	-0.08375mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 9:54:53 PM
2	15.61	-0.08375mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 9:59:03 PM

Mean Area 15.61
Mean Conc. -0.08375mg/L



Sample

Sample Name: L17090094-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

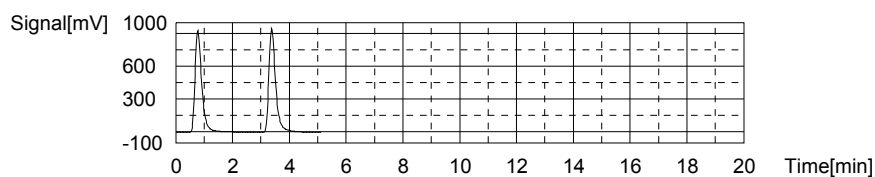
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:9.312mg/L TC:36.19mg/L IC:26.88mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1529	35.73mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 10:07:08 PM
2	1568	36.65mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/6/2017 10:11:55 PM

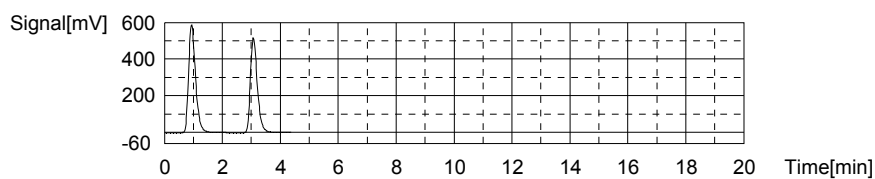
Mean Area 1549
Mean Conc. 36.19mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	977.5	28.64mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 10:17:02 PM
2	859.2	25.11mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 10:22:00 PM

Mean Area 918.4
Mean Conc. 26.88mg/L



Sample

37/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Sample Name: L17090094-02
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

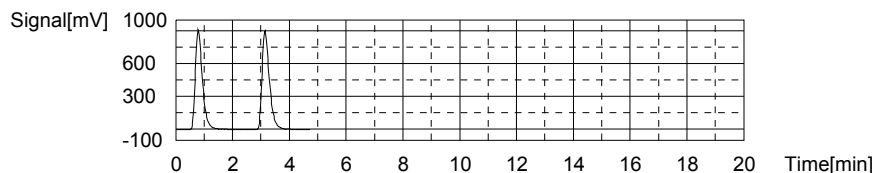
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.12mg/L TC:37.58mg/L IC:23.46mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1587	37.10mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 10:29:50 PM
2	1628	38.07mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 10:35:19 PM

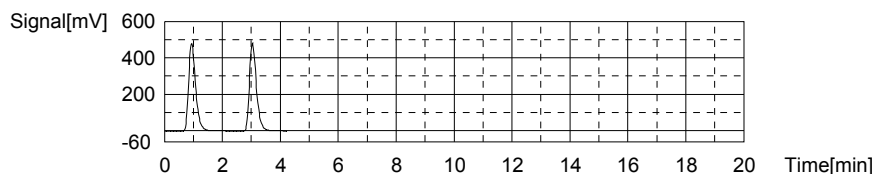
Mean Area: 1608
 Mean Conc.: 37.58mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	803.0	23.43mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 10:40:24 PM
2	804.9	23.49mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 10:45:16 PM

Mean Area: 804.0
 Mean Conc.: 23.46mg/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:4.102mg/L TC:5.390mg/L IC:1.288mg/L

1. Det

Anal.: TC

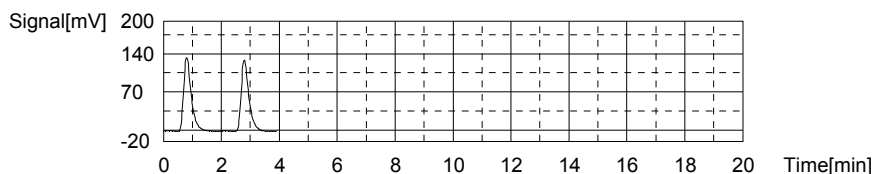
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	247.4	5.447mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 10:52:44 PM
2	242.6	5.333mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 10:56:56 PM

38/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

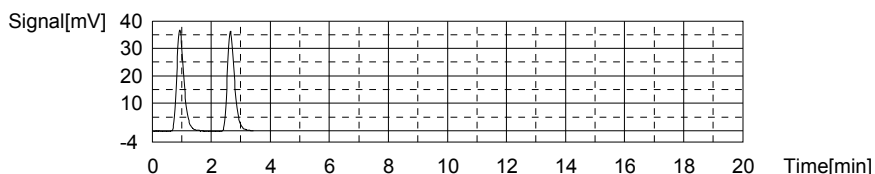
Mean Area 245.0
Mean Conc. 5.390mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	61.95	1.300mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 11:01:30 PM
2	61.16	1.277mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 11:05:48 PM

Mean Area 61.56
Mean Conc. 1.288mg/L



Sample

Sample Name: L17090095-01 (10)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

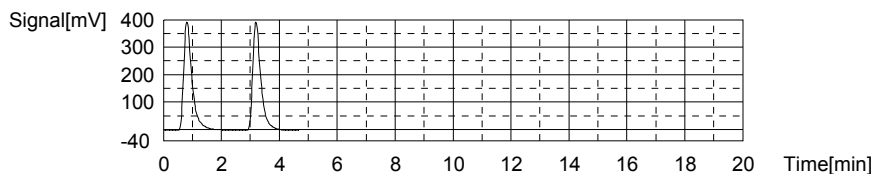
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.61mg/L TC:17.81mg/L IC:5.200mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	782.1	18.08mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/9/6/2017 11:13:39 PM
2	759.3	17.54mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/9/6/2017 11:18:13 PM

Mean Area 770.7
Mean Conc. 17.81mg/L



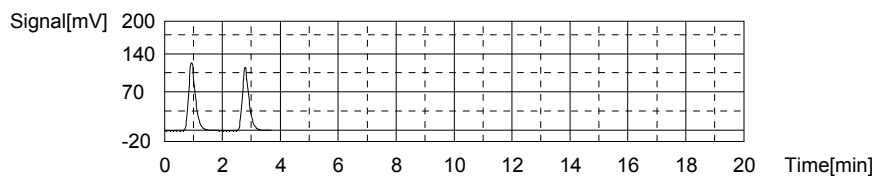
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	201.3	5.462mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 11:22:56 PM
2	183.8	4.939mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/6/2017 11:27:24 PM

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Mean Area 192.6
Mean Conc. 5.200mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

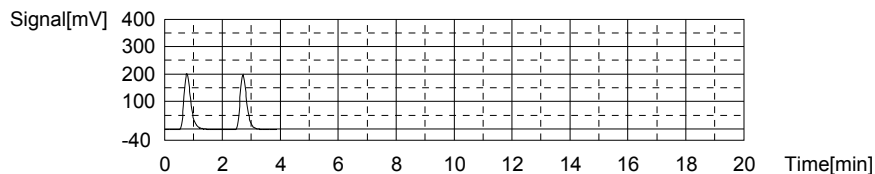
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.684mg/L TC:7.382mg/L IC:5.698mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	335.7	7.533mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 11:34:49 PM
2	322.9	7.231mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 11:39:02 PM

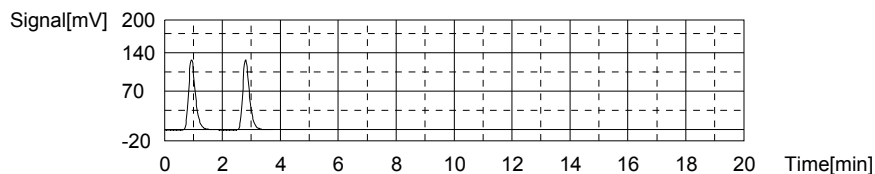
Mean Area 329.3
Mean Conc. 7.382mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	209.1	5.695mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 11:43:46 PM
2	209.3	5.700mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_19	9/6/2017 11:48:18 PM

Mean Area 209.2
Mean Conc. 5.698mg/L



Sample

Sample Name: L17090095-03 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

40/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

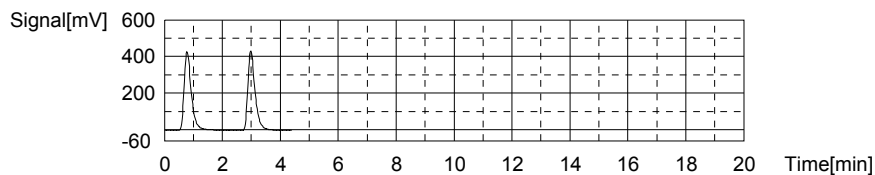
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.538mg/L TC:17.00mg/L IC:11.46mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	728.5	16.81mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/6/2017 11:55:59 PM
2	744.2	17.18mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 12:00:28 AM

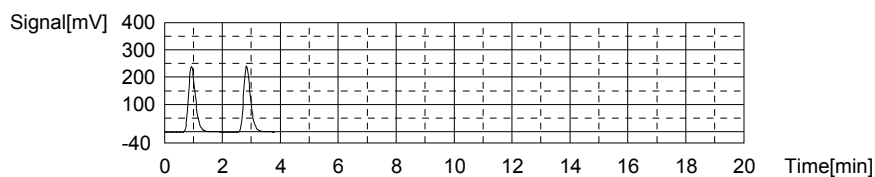
Mean Area 736.4
Mean Conc. 17.00mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	401.0	11.43mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/7/2017 12:05:16 AM
2	403.4	11.50mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/7/2017 12:09:49 AM

Mean Area 402.2
Mean Conc. 11.46mg/L



Sample

Sample Name: L17090095-04 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

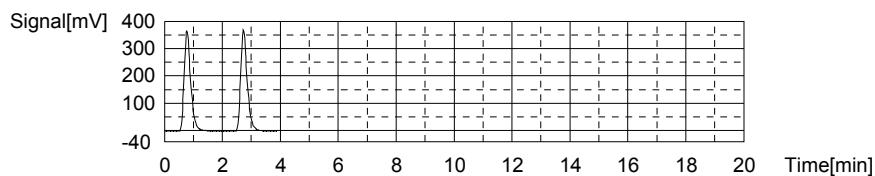
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.878mg/L TC:13.24mg/L IC:10.36mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	570.4	13.08mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 12:17:15 AM
2	584.1	13.40mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 12:21:27 AM

Mean Area 577.3
Mean Conc. 13.24mg/L



Anal.: IC

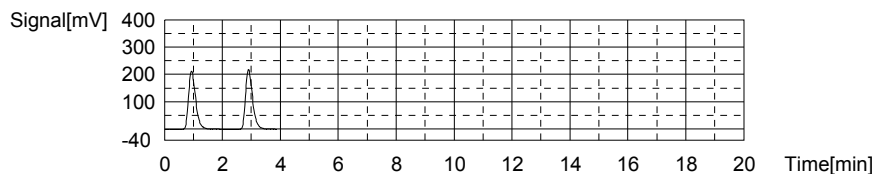
41/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	361.6	10.25mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 12:26:18 AM
2	369.2	10.48mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 12:30:50 AM

Mean Area 365.4
Mean Conc. 10.36mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

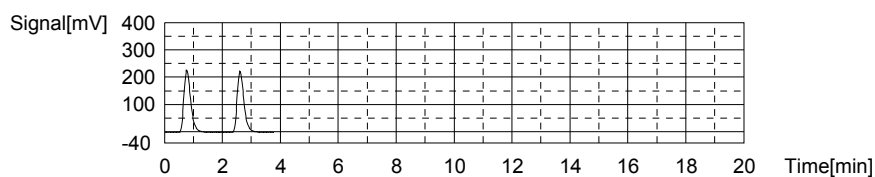
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.558mg/L TC:8.238mg/L IC:6.680mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	369.4	8.329mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/7/2017 12:38:09 AM
2	361.7	8.147mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/7/2017 12:42:24 AM

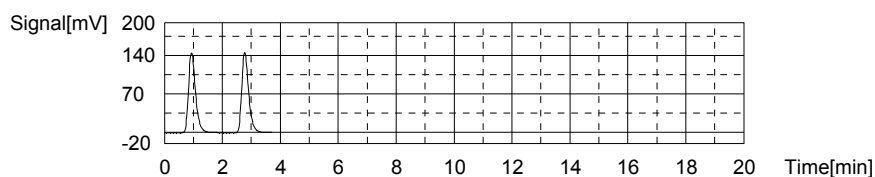
Mean Area 365.6
Mean Conc. 8.238mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	242.0	6.677mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 12:47:09 AM
2	242.2	6.683mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 12:51:39 AM

Mean Area 242.1
Mean Conc. 6.680mg/L



Sample

42/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

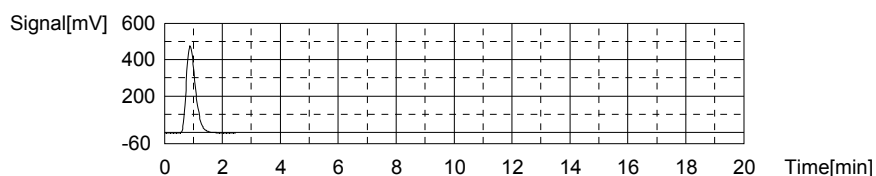
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.57mg/L TC:24.31mg/L IC:-0.2526mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1046	24.31mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 12:59:37 AM

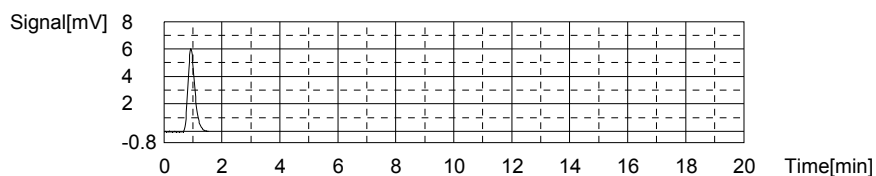
Mean Area 1046
 Mean Conc. 24.31mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.956	-0.2526mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/7/2017 1:03:58 AM

Mean Area 9.956
 Mean Conc. -0.2526mg/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:0.07839mg/L TC:-0.1726mg/L IC:-0.2510mg/L

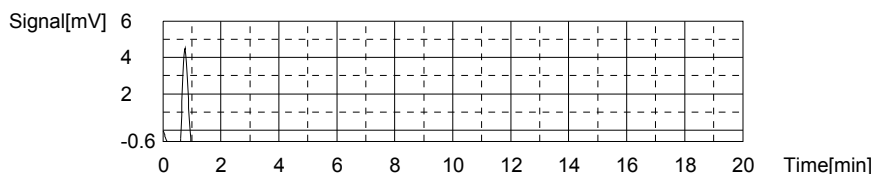
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.560	-0.1726mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 1:09:07 AM

43/57

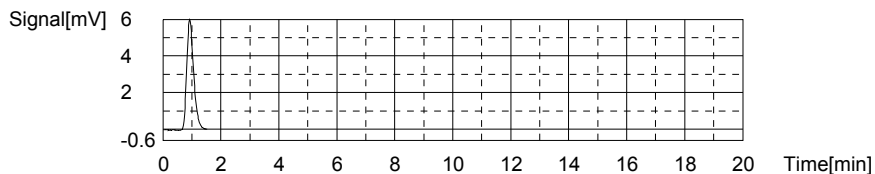
Mean Area 9.560
 Mean Conc. -0.1726mg/L



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	19/7/2017 1:13:02 AM

Mean Area 10.01
 Mean Conc. -0.2510mg/L



Sample

Sample Name: L17090095-06
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

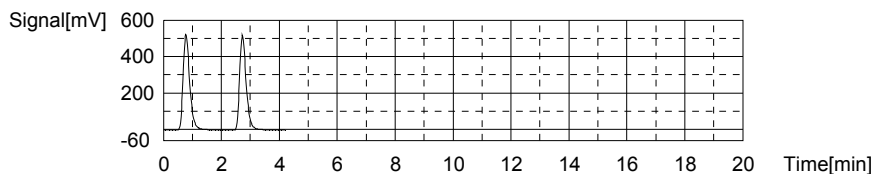
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.513mg/L TC:19.02mg/L IC:16.50mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	823.5	19.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/7/2017 1:20:33 AM
2	820.0	18.98mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/7/2017 1:25:04 AM

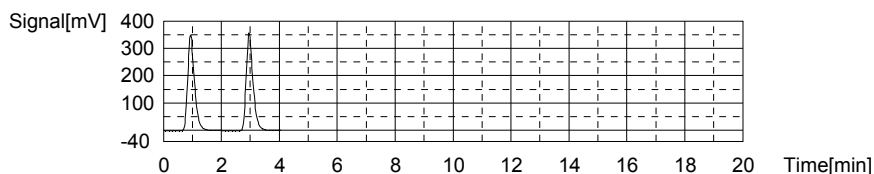
Mean Area 821.8
 Mean Conc. 19.02mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	564.4	16.31mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 1:30:01 AM
2	577.7	16.70mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 1:34:44 AM

Mean Area 571.0
Mean Conc. 16.50mg/L



Sample

Sample Name: WG628481-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

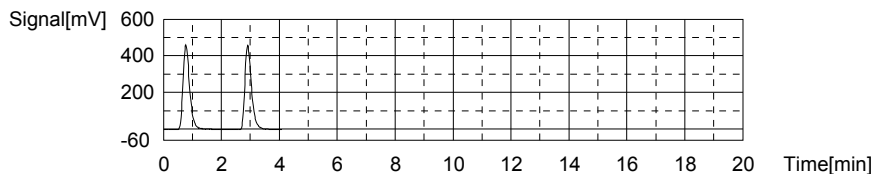
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.007mg/L TC:16.83mg/L IC:13.82mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	728.7	16.82mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 1:42:22 AM
2	729.6	16.84mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 1:46:47 AM

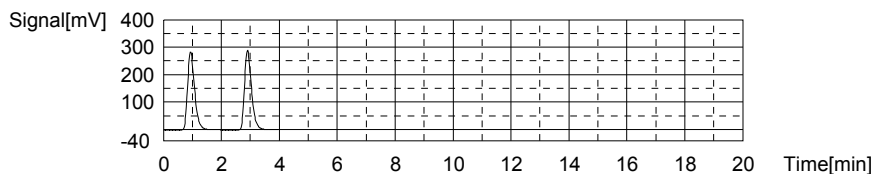
Mean Area 729.2
Mean Conc. 16.83mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	476.5	13.68mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/7/2017 1:51:41 AM
2	486.0	13.96mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/7/2017 1:56:20 AM

Mean Area 481.3
Mean Conc. 13.82mg/L



Sample

Sample Name: L17081649-04 (4) MSD
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

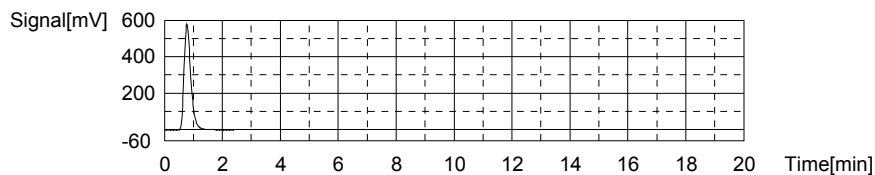
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.10mg/L TC:21.73mg/L IC:10.64mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	936.8	21.73mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 2:04:18 AM

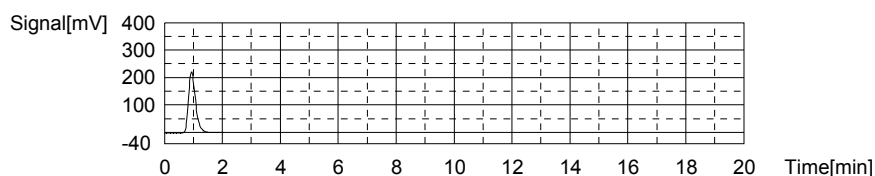
Mean Area 936.8
Mean Conc. 21.73mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	374.6	10.64mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/7/2017 2:09:15 AM

Mean Area 374.6
Mean Conc. 10.64mg/L



Sample

Sample Name: L17081568-01 (100)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

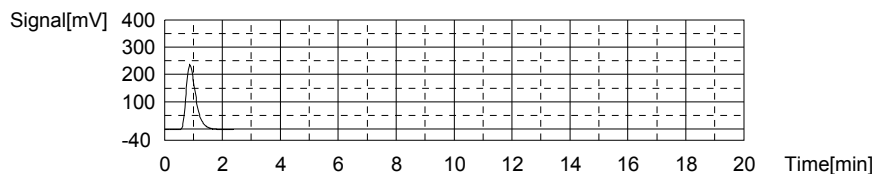
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.45mg/L TC:12.63mg/L IC:0.1784mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	551.5	12.63mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 2:17:04 AM

Mean Area 551.5
Mean Conc. 12.63mg/L



Anal.: IC

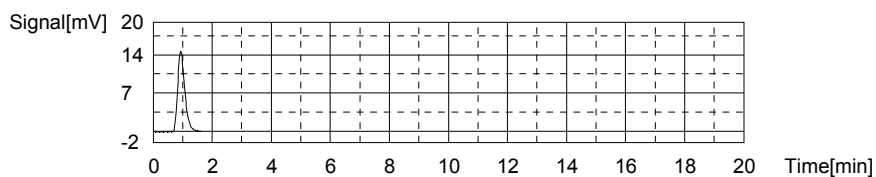
46/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	24.39	0.1784mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 2:21:33 AM

Mean Area 24.39
Mean Conc. 0.1784mg/L



Sample

Sample Name: L17081568-02 (10)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

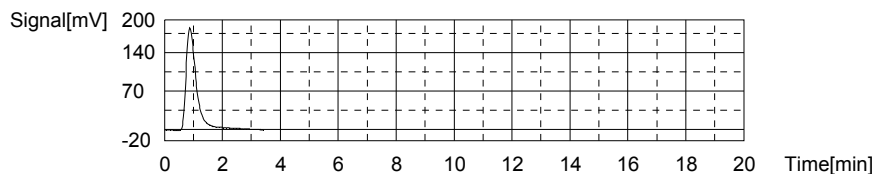
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:10.89mg/L TC:10.78mg/L IC:-0.1100mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	473.3	10.78mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	19/7/2017 2:30:25 AM

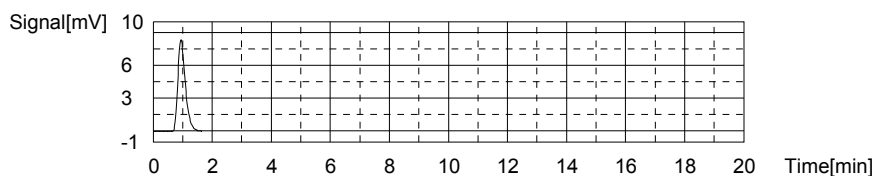
Mean Area 473.3
Mean Conc. 10.78mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	14.73	-0.1100mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 2:34:54 AM

Mean Area 14.73
Mean Conc. -0.1100mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

47/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

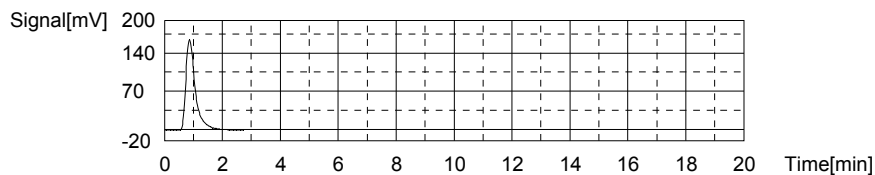
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:8.390mg/L TC:8.525mg/L IC:0.1357mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	377.7	8.525mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	9/7/2017 2:43:05 AM

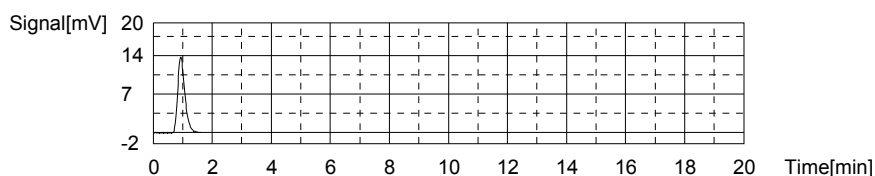
Mean Area 377.7
Mean Conc. 8.525mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	22.96	0.1357mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	9/7/2017 2:47:32 AM

Mean Area 22.96
Mean Conc. 0.1357mg/L



Sample

Sample Name: L17081649-06 (4)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

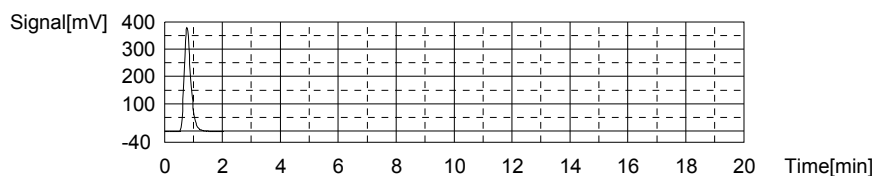
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.587mg/L TC:13.83mg/L IC:10.24mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	602.2	13.83mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	9/7/2017 2:55:00 AM

Mean Area 602.2
Mean Conc. 13.83mg/L



Anal.: IC

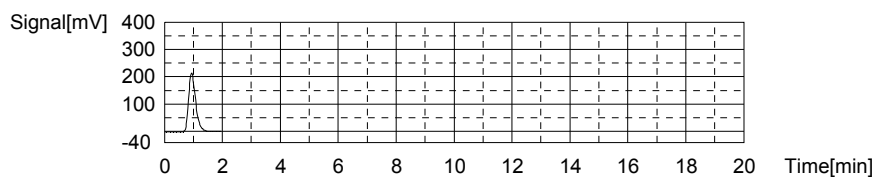
48/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	361.4	10.24mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 2:59:51 AM

Mean Area 361.4
Mean Conc. 10.24mg/L



Sample

Sample Name: L17081649-07 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

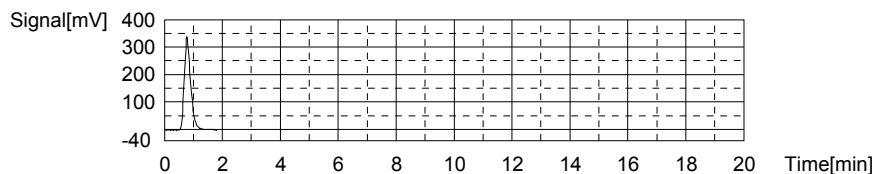
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.889mg/L TC:11.67mg/L IC:8.785mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	511.0	11.67mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_5	19/7/2017 3:07:06 AM

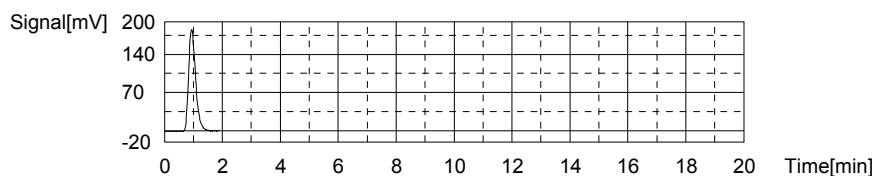
Mean Area 511.0
Mean Conc. 11.67mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	312.6	8.785mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 3:11:51 AM

Mean Area 312.6
Mean Conc. 8.785mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

49/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

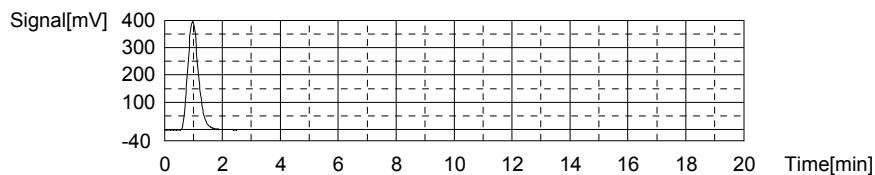
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.81mg/L TC:23.56mg/L IC:-0.2465mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1014	23.56mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 3:19:47 AM

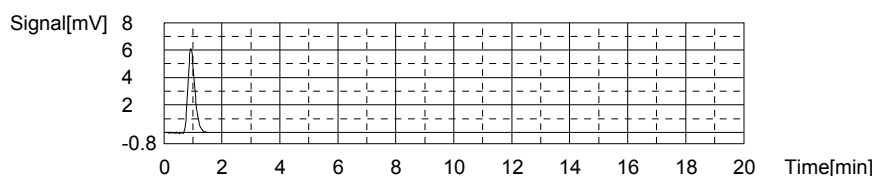
Mean Area 1014
Mean Conc. 23.56mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.16	-0.2465mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/7/2017 3:24:10 AM

Mean Area 10.16
Mean Conc. -0.2465mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

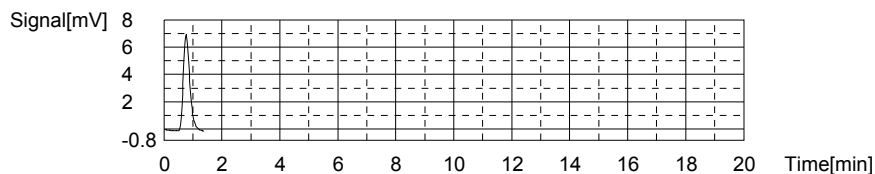
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1051mg/L TC:-0.1393mg/L IC:-0.2444mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.97	-0.1393mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 3:29:11 AM

Mean Area 10.97
Mean Conc. -0.1393mg/L



Anal.: IC

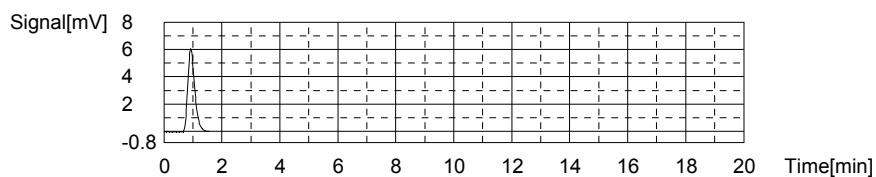
50/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.23	-0.2444mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 3:33:06 AM

Mean Area 10.23
Mean Conc. -0.2444mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

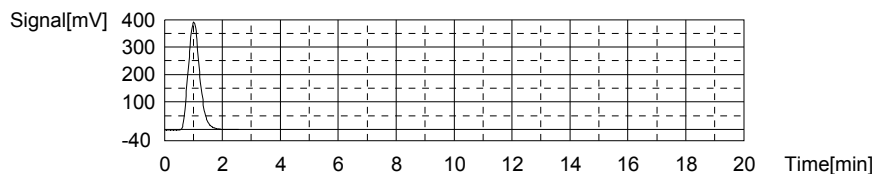
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.08mg/L TC:24.88mg/L IC:-0.2020mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1070	24.88mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_5	19/7/2017 7:51:19 AM

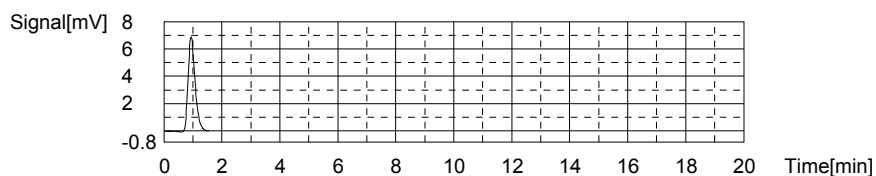
Mean Area 1070
Mean Conc. 24.88mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.65	-0.2020mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 7:55:41 AM

Mean Area 11.65
Mean Conc. -0.2020mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

51/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

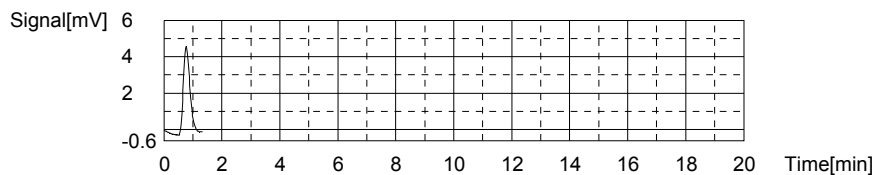
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1178mg/L TC:-0.2198mg/L IC:-0.3376mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.562	-0.2198mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 8:00:39 AM

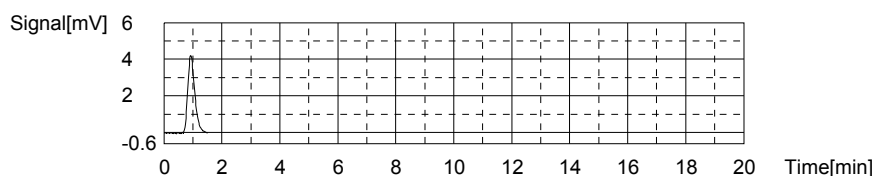
Mean Area 7.562
Mean Conc. -0.2198mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.110	-0.3376mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/7/2017 8:04:31 AM

Mean Area 7.110
Mean Conc. -0.3376mg/L



Sample

Sample Name: L17081653-01 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

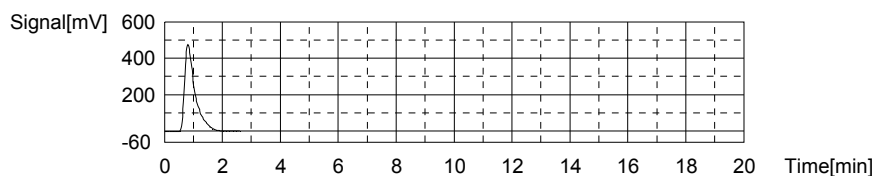
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:16.91mg/L TC:27.76mg/L IC:10.85mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1192	27.76mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/7/2017 8:12:34 AM

Mean Area 1192
Mean Conc. 27.76mg/L



Anal.: IC

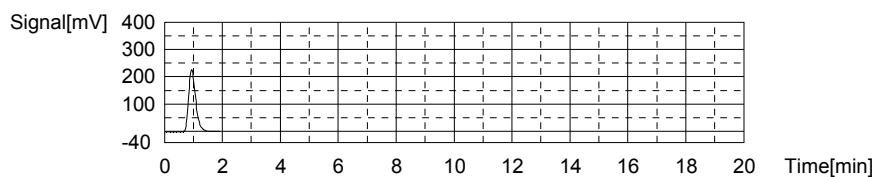
52/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	381.8	10.85mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 8:17:21 AM

Mean Area 381.8
Mean Conc. 10.85mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

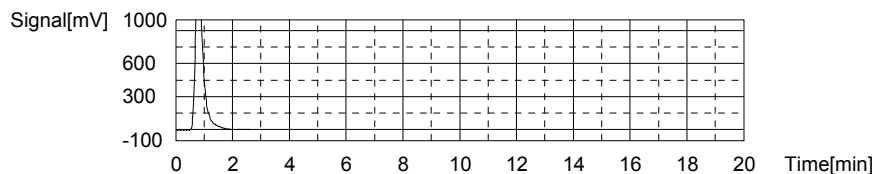
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.44mg/L TC:60.32mg/L IC:33.88mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2570	60.32mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_5	19/7/2017 8:25:25 AM

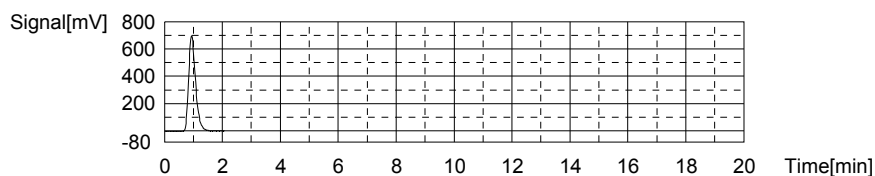
Mean Area 2570
Mean Conc. 60.32mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1153	33.88mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 8:30:28 AM

Mean Area 1153
Mean Conc. 33.88mg/L



Sample

Sample Name: L17090094-03 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

53/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

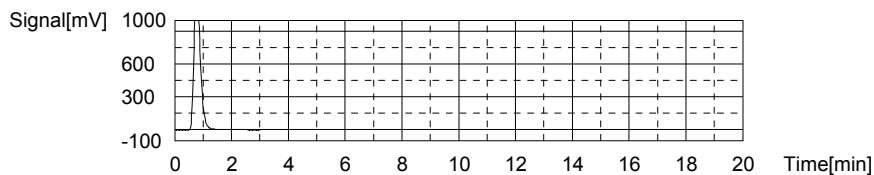
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.690mg/L TC:47.68mg/L IC:44.99mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2035	47.68mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	9/7/2017 8:38:55 AM

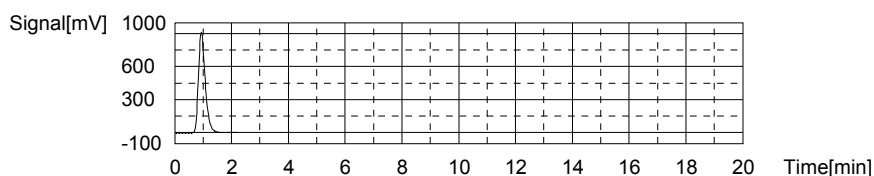
Mean Area 2035
Mean Conc. 47.68mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1525	44.99mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	9/7/2017 8:44:14 AM

Mean Area 1525
Mean Conc. 44.99mg/L



Sample

Sample Name: L17090095-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

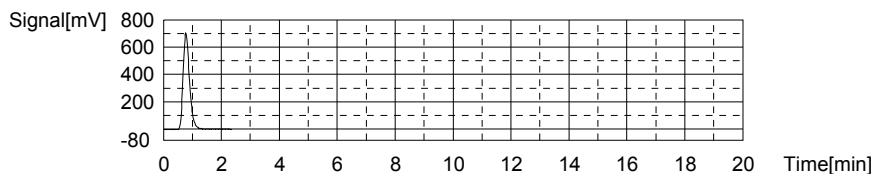
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.950mg/L TC:25.14mg/L IC:23.19mg/L

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_5	9/7/2017 9:12:17 AM

Mean Area 1081
Mean Conc. 25.14mg/L



Anal.: IC

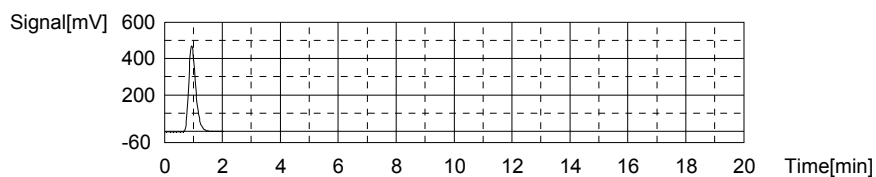
54/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	795.0	23.19mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 9:17:28 AM

Mean Area 795.0
Mean Conc. 23.19mg/L



Sample

Sample Name: L17090095-05 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

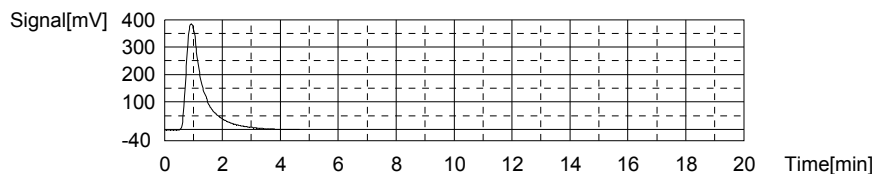
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:33.18mg/L TC:36.46mg/L IC:3.282mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1560	36.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	19/7/2017 9:27:36 AM

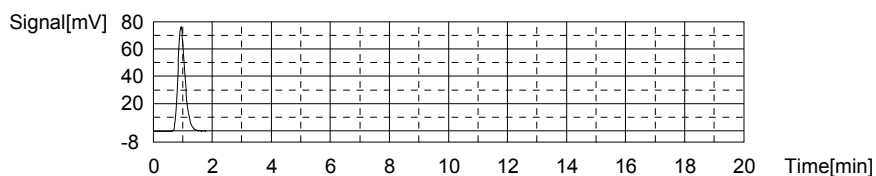
Mean Area 1560
Mean Conc. 36.46mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	128.3	3.282mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 9:32:16 AM

Mean Area 128.3
Mean Conc. 3.282mg/L



Sample

Sample Name: L17090094-03 (20)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

55/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

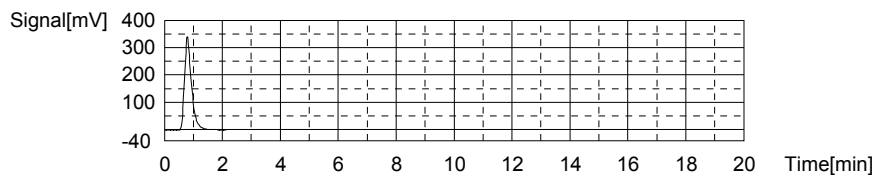
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:6.357mg/L TC:12.94mg/L IC:6.581mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	564.5	12.94mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	9/7/2017 9:39:50 AM

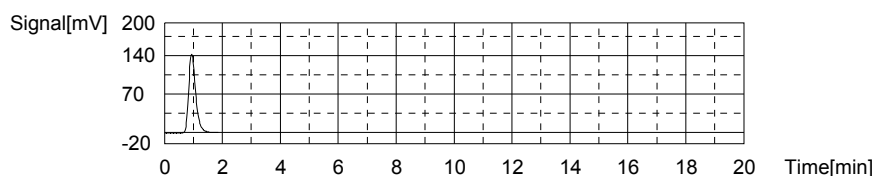
Mean Area 564.5
Mean Conc. 12.94mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	238.8	6.581mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	9/7/2017 9:44:33 AM

Mean Area 238.8
Mean Conc. 6.581mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

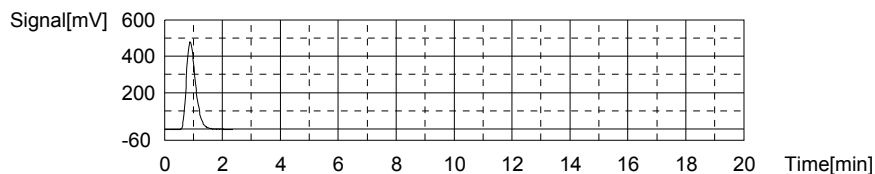
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.86mg/L TC:24.67mg/L IC:-0.1916mg/L

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_5	9/7/2017 9:52:20 AM

Mean Area 1061
Mean Conc. 24.67mg/L



Anal.: IC

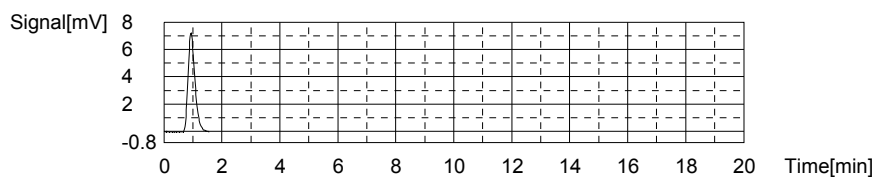
56/57

9/7/2017 11:02:28 AM

09-06-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.00	-0.1916mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 9:56:41 AM

Mean Area 12.00
Mean Conc. -0.1916mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

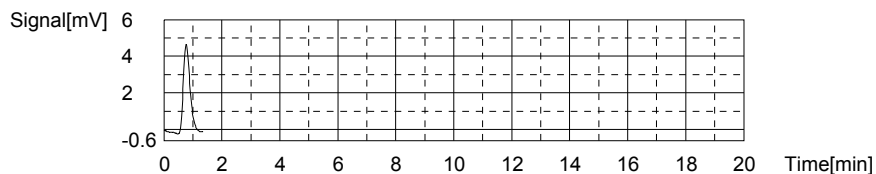
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1211mg/L TC:-0.2141mg/L IC:-0.3352mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.805	-0.2141mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	19/7/2017 10:01:40 AM

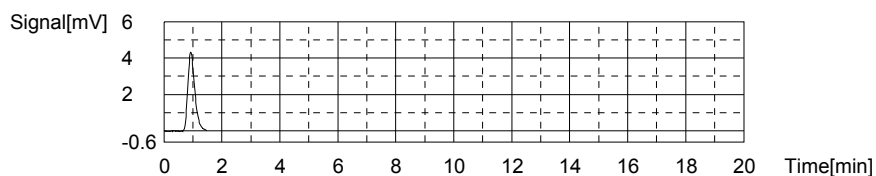
Mean Area 7.805
Mean Conc. -0.2141mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.190	-0.3352mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/7/2017 10:05:31 AM

Mean Area 7.190
Mean Conc. -0.3352mg/L



57/57

3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
September 11, 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	BLR - BRANDON L. RICHARDS
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

September 11, 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

September 11, 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.GWTPT
 HRUMAR16

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	NO. OF CONTAINERS	AMMONIA-N	ORTHO-PHOSPHATE	TOTAL ORGANIC CARBON	PERCHLORATE
LH18/24-SP650-6466	Water	08/30/17 / 15:00		2	X		X	
LH18/24-SP650-6466	Water	08/30/17 / 15:00		1		X		
LH18/24-SP650-6466	Water	08/30/17 / 15:00		1			X	

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>[Signature]</i>	08/30/17	15:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Microbac OVD
 Received: 08/31/2017 10:17
 By: CARA STRICKLER
 221000105322

Cara Strickler

COOLER TEMP >6° C LOG

Cooler ID 5322

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C
OJD 8/31/17						

pH Exceptions

pH Lot # H0601354

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6
OJD 8/31/17						
PRESERVATIVE EXCEPTIONS ✓ <u>NONE</u> AS NOTED <u>OJD 8/31/17</u>						

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17081653

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 11-SEP-2017

Samplenum **Container ID** **Products**
L17081653-01 957644 F PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	31-AUG-2017 12:43	BRG		
2	ANALYZ	W1	WET	31-AUG-2017 12:54	DLP	CLS	
3	STORE	WET	A1	02-SEP-2017 11:02	BRG	DLP	

Samplenum **Container ID** **Products**
L17081653-01 957645 NH3 NH3-R 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	31-AUG-2017 12:43	BRG		
2	ANALYZ	W1	SEM	07-SEP-2017 15:44	JWR	CLS	
3	STORE	SEM	A1	11-SEP-2017 16:15	CLS	JWR	

Samplenum **Container ID** **Products**
L17081653-01 957646 AL FE MN TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	31-AUG-2017 12:43	BRG		<2
2	ANALYZ	W1	WET	06-SEP-2017 08:07	DCM	CLS	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	31-AUG-2017 12:43	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: L17090414

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 September 19 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 #: L17090414

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
All sample labels, except for the Perchlorate, have 9/2/17 as the date collected. CLS	Please log per COC. ALS

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
00115280	I	3.0		1ZW056F52210009800	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?	No
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 #:** L17090414**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-SP650-6467	L17090414-01	09/06/2017 15:00	09/08/2017 11:38



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090414
Project Name:		Method:	6850
Prep Batch Number(s):	WG629365	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-13 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
Eric Lawson		Chemist III	2017-09-13 18:37:19



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090414
Project Name:		Method:	6850
Prep Batch Number(s):	WG629365	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-13 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:	L17090414
Project Name:		Method:	6850
Prep Batch Number(s):	WG629365	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-13 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:	L17090414
Project Name:		Method:	6850
Prep Batch Number(s):	WG629365	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-13 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)					
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:	L17090414
Project Name:		Method:	6850
Prep Batch Number(s):	WG629365	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-13 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:	L17090414
Project Name:		Method:	6850
Prep Batch Number(s):	WG629365	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-13 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

There are no exceptions.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090414
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629396	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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	2017-09-19 15:10:01



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090414
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629396	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629396	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629396	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629396	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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.

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Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090414
Project Name:		Method:	NH3
Prep Batch Number(s):	WG629396	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629003	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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	2017-09-19 15:08:16



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090414
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629003	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629003	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629003	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629003	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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).

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Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090414
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629003	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629656	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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	2017-09-19 15:11:09



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090414
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629656	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629656	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629656	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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:	L17090414
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629656	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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).

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Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090414
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629656	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-19 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 #: L17090414
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090414-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6467	Prep Method: 6850	Prep Date: 09/12/2017 12:30
Matrix: Water	Analytical Method: 6850	Cal Date: 09/08/2017 16:52
Workgroup #: WG629365	Analyst: JWR	Run Date: 09/12/2017 15:07
Collect Date: 09/06/2017 15:00	Dilution: 1	File ID: 1LM.LM40516
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 #: L17090414
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090414-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: LH18/24-SP650-6467	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 09/12/2017 15:33
Workgroup #: WG629396	Analyst: TB	Run Date: 09/12/2017 17:10
Collect Date: 09/06/2017 15:00	Dilution: 25	File ID: SC170912003.081
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	29.8		5.00	2.50	1.25

Certificate of Analysis

Sample #: L17090414-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6467	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:25
Workgroup #: WG629003	Analyst: DLP	Run Date: 09/08/2017 13:45
Collect Date: 09/06/2017 15:00	Dilution: 10	File ID: 00.1709081345-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	7.84		1.00	0.500	0.250

Certificate of Analysis

Sample #: L17090414-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6467	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG629656	Analyst: DCM	Run Date: 09/14/2017 11:23
Collect Date: 09/06/2017 15:00	Dilution: 5	File ID: TC09142017.009
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	107		10.0	5.00	2.50

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17090414

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090414-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6467	Prep Method: 6850	Prep Date: 09/12/2017 12:30
Matrix: Water	Analytical Method: 6850	Cal Date: 09/08/2017 16:52
Workgroup #: WG629365	Analyst: JWR	Run Date: 09/12/2017 15:07
Collect Date: 09/06/2017 15:00	Dilution: 1	File ID: 1LM.LM40516
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.					

2.1.1.2 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: 090817_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 WG628979 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (09/08/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: ICAL WG628977 : 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.LM40484	WG628977-01 CCB	1	1		09/08/17 14:40
2	1LM.LM40485	WG628977-02 STD (0.1 ug/L)	1	1	STD80232	09/08/17 14:59
3	1LM.LM40486	WG628977-03 STD (0.2 ug/L)	1	1	STD80232	09/08/17 15:18
4	1LM.LM40487	WG628977-04 STD (0.5 ug/L)	1	1	STD80232	09/08/17 15:37
5	1LM.LM40488	WG628977-05 STD (1.0 ug/L)	1	1	STD80232	09/08/17 15:56
6	1LM.LM40489	WG628977-06 STD (2.0 ug/L)	1	1	STD80232	09/08/17 16:15
7	1LM.LM40490	WG628977-07 STD (5.0 ug/L)	1	1	STD80232	09/08/17 16:34
8	1LM.LM40491	WG628977-08 STD (10 ug/L)	1	1	STD80232	09/08/17 16:52
9	1LM.LM40492	WG628977-09 SSCV (1.0 ug/L)	1	1	STD80234	09/08/17 17:11
10	1LM.LM40493	WG628984-01 CCB	1	1		09/08/17 17:30
11	1LM.LM40494	WG628984-02 CCV (1.0ug/L)	1	1	STD80232	09/08/17 17:49
12	1LM.LM40495	WG628979-05 MRL (0.2ug/L)	1	1	STD80232	09/08/17 18:08
13	1LM.LM40496	WG628979-01 MCT (0.2ug/L)	1	1	STD80234	09/08/17 18:27
14	1LM.LM40497	WG628979-02 BLANK	1	1		09/08/17 18:46
15	1LM.LM40498	WG628979-03 LCS (0.2ug/L)	1	1	STD80234	09/08/17 19:05
16	1LM.LM40499	WG628979-04 LCS2 (0.2ug/L)	1	1	STD80234	09/08/17 19:24
17	1LM.LM40500	L17081653-01	1	1		09/08/17 19:43
18	1LM.LM40501	L17081653-01 (10x) (NR)	1	10		09/08/17 20:02
19	1LM.LM40502	L17081653-01 (100x) (NR)	1	100		09/08/17 20:21
20	1LM.LM40503	L17090079-01	1	1		09/08/17 20:40
21	1LM.LM40504	L17090079-02	1	1		09/08/17 20:59
22	1LM.LM40505	L17090079-03	1	1		09/08/17 21:18
23	1LM.LM40506	WG628984-03 CCV (1.0ug/L)	1	1	STD80232	09/08/17 21:37
24	1LM.LM40507	WG628979-06 MRL (0.2ug/L)	1	1	STD80232	09/08/17 21:56
25	1LM.LM40508	WG628984-04 CCB	1	1		09/08/17 22:15

Comments

Seq.	Rerun	Dil.	Reason	Analytes
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Page: 1

Approved: 11-SEP-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 091217_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 WG629365 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (09/08/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: Sample L17090414-01 was analyzed neat and at multiple dilutions based on its range of historical results.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40509	WG629368-01 CCB	1	1		09/12/17 12:54
2	1LM.LM40510	WG629368-02 CCV (1.0ug/L)	1	1	STD80232	09/12/17 13:13
3	1LM.LM40511	WG629365-05 MRL (0.2ug/L)	1	1	STD80232	09/12/17 13:32
4	1LM.LM40512	WG629365-01 MCT (0.2ug/L)	1	1	STD80234	09/12/17 13:51
5	1LM.LM40513	WG629365-02 BLANK	1	1		09/12/17 14:10
6	1LM.LM40514	WG629365-03 LCS (0.2ug/L)	1	1	STD80234	09/12/17 14:29
7	1LM.LM40515	WG629365-04 LCS2 (0.2ug/L)	1	1	STD80234	09/12/17 14:48
8	1LM.LM40516	L17090414-01	1	1		09/12/17 15:07
9	1LM.LM40517	L17090414-01 (10x) (NR)	1	10		09/12/17 15:26
10	1LM.LM40518	L17090414-01 (100x) (NR)	1	100		09/12/17 15:45
11	1LM.LM40519	WG629368-03 CCV (1.0ug/L)	1	1	STD80232	09/12/17 16:04
12	1LM.LM40520	WG629365-06 MRL (0.2ug/L)	1	1	STD80232	09/12/17 16:23
13	1LM.LM40521	WG629368-04 CCB	1	1		09/12/17 16:42

Comments

Seq.	Rerun	Dil.	Reason	Analytes

Page: 1

Approved: 13-SEP-17




Microbac Laboratories Inc.

Data Checklist

Date: 08-SEP-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: WG628977
 Runlog ID: 84489
 Analytical Workgroups: L17081653, L17090079

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	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	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	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:
11-SEP-2017



Secondary Reviewer:
11-SEP-2017




Microbac Laboratories Inc.

Data Checklist

Date: 12-SEP-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 84552
 Analytical Workgroups: L17090414

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	NA
Recoveries	NA
%RPD	NA
Interference check sample (ICS) (LCMS)	MCT
Samples	X
TCL hits	ND
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	
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:
12-SEP-2017



Secondary Reviewer:
13-SEP-2017




Analytical Method:6850
Login Number:L17090414

AAB#:WG629365

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-SP650-6467	01	09/06/17					09/12/2017	5.9	28		09/12/17	.1	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17090414 Work Group: WG629365
 Blank File ID: 1LM.LM40513 Blank Sample ID: WG629365-02
 Prep Date: 09/12/17 12:30 Instrument ID: LCMS1
 Analyzed Date: 09/12/17 14:10 Method: 6850
 Analyst: JWR

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG629365-05	1LM.LM40511	09/12/17 13:32	01
MCT	WG629365-01	1LM.LM40512	09/12/17 13:51	01
LCS	WG629365-03	1LM.LM40514	09/12/17 14:29	01
LCS2	WG629365-04	1LM.LM40515	09/12/17 14:48	01
LH18/24-SP650-6467	L17090414-01	1LM.LM40516	09/12/17 15:07	01
QCMRL	WG629365-06	1LM.LM40520	09/12/17 16:23	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5474501
 Report generated 09/13/2017 14:52



Login Number: L17090414 Prep Date: 09/12/17 12:30 Sample ID: WG629365-02
 Instrument ID: LCMS1 Run Date: 09/12/17 14:10 Prep Method: 6850
 File ID: 1LM.LM40513 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG629365 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-08-SEP-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: 5474502
 13-SEP-2017 14:52



Login Number: L17090414 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG629365 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG629365-03 LCS File ID: 1LM.LM40514 Run Date: 09/12/2017 14:29
 Sample ID: WG629365-04 LCS2 File ID: 1LM.LM40515 Run Date: 09/12/2017 14:48

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.198	99.0	0.200	0.187	93.5	5.71	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5474503
 Report generated: 09/13/2017 14:52



Login Number: L17090414
Analytical Method: 6850
ICAL Workgroup: WG628977

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.469	6.88	1.00000	

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5475888
Report generated 09/13/2017 14:52



Login Number: L17090414
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 08-SEP-17 16:52
 Column ID: F

Analyte	WG628977-02			WG628977-03			WG628977-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	52500.0000	1.681	0.200	93400.0000	1.487	0.500	233000.000	1.445

INT_CAL - Modified 03/06/2008
 PDF File ID: 5475888
 Report generated 09/13/2017 14:52



Login Number: L17090414
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 08-SEP-17 16:52
 Column ID: F

Analyte	WG628977-05			WG628977-06			WG628977-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	460000.000	1.440	2.00	925000.000	1.444	5.00	2230000.00	1.418

INT_CAL - Modified 03/06/2008
 PDF File ID: 5475888
 Report generated 09/13/2017 14:52



Login Number: L17090414
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	WG628977-08		
	CONC	RESP	RF
Perchlorate	10.0	4190000.00	1.371

INT_CAL - Modified 03/06/2008
PDF File ID: 5475888
Report generated 09/13/2017 14:52



Login Number: L17090414 Run Date: 09/08/2017 Sample ID: WG628977-09
 Instrument ID: LCMS1 Run Time: 17:11 Method: 6850
 File ID: 1LM.LM40492 Analyst: JWR QC Key: DOD4
 ICal Workgroup: WG628977 Cal ID: LCMS1 - 08-SEP-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	1.04	ug/L	1.48	4.00	15	

* Exceeds %D Limit



Login Number: L17090414 Run Date: 09/12/2017 Sample ID: WG629368-01
Instrument ID: LCMS1 Run Time: 12:54 Method: 6850
File ID: LLM.LM40509 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG629365 Cal ID: LCMS1 - 08-SEP-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: L17090414 Run Date: 09/12/2017 Sample ID: WG629368-04
Instrument ID: LCMS1 Run Time: 16:42 Method: 6850
File ID: 1LM.LM40521 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG629365 Cal ID: LCMS1 - 08-SEP-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: L17090414 Run Date: 09/12/2017 Sample ID: WG629368-02
 Instrument ID: LCMS1 Run Time: 13:13 Method: 6850
 File ID: 1LM.LM40510 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG629365 Cal ID: LCMS1 - 08-SEP-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.08	ug/L	1.53	8.00	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5474505
 Report generated 09/13/2017 14:52



Login Number: L17090414 Run Date: 09/12/2017 Sample ID: WG629368-03
 Instrument ID: LCMS1 Run Time: 16:04 Method: 6850
 File ID: 1LM.LM40519 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG629365 Cal ID: LCMS1 - 08-SEP-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.09	ug/L	1.54	9.00	15	

* Exceeds %D Criteria



Login Number: L17090414 Run Date: 09/12/2017 Sample ID: WG629365-05
Instrument ID: LCMS1 Run Time: 13:32 Prep Method: 6850
File ID: 1LM.LM40511 Analyst: JWR Method: 6850
Workgroup (AAB#): WG629365 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.190	95.0	70 - 130	



Login Number: L17090414 Run Date: 09/12/2017 Sample ID: WG629365-06
 Instrument ID: LCMS1 Run Time: 16:23 Prep Method: 6850
 File ID: 1LM.LM40520 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG629365 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.198	99.0	70 - 130	



Login Number: L17090414
Instrument ID: LCMS1
Workgroup (AAB#): WG629365

ICAL CCV Number: WG628977-05
CAL ID: LCMS1-08-SEP-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG628977	NA	NA	1580000
Upper Limit	NA	NA	2370000
Lower Limit	NA	NA	790000
<u>L17090414-01</u>	1.00	01	1350000
WG629365-02	1.00	01	1480000
WG629365-03	1.00	01	1500000
WG629365-04	1.00	01	1510000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: 6850	Samplenum: L17090414-01
Instrument: LCMS1	Prep Date: 09/12/2017 12:30	File ID: 1LM.LM40516
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 15:07	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	4540	1460	3.11	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG628977-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40485
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/08/2017 14:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	52500	17500	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG628977-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40486
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/08/2017 15:18	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	93400	29500	3.17	2.3	3.8	

Perchlorate Ion Ratios
 Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG628977-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40487
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/08/2017 15:37	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	233000	79100	2.95	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG628977-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40488
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/08/2017 15:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	460000	150000	3.07	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG628977-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40489
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/08/2017 16:15	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	925000	303000	3.05	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG628977-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40490
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/08/2017 16:34	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2230000	745000	2.99	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG628977-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40491
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/08/2017 16:52	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	4190000	1390000	3.01	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG628977-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40492
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/08/2017 17:11	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	478000	152000	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: 6850	Samplenum: WG629365-01
Instrument: LCMS1	Prep Date: 09/12/2017 12:30	File ID: 1LM.LM40512
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 13:51	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	82100	27800	2.95	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: 6850	Samplenum: WG629365-02
Instrument: LCMS1	Prep Date: 09/12/2017 12:30	File ID: 1LM.LM40513
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 14:10	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2580	1110	2.32	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: 6850	Samplenum: WG629365-03
Instrument: LCMS1	Prep Date: 09/12/2017 12:30	File ID: 1LM.LM40514
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 14:29	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	91400	30900	2.96	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: 6850	Samplenum: WG629365-04
Instrument: LCMS1	Prep Date: 09/12/2017 12:30	File ID: 1LM.LM40515
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 14:48	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	87600	29400	2.98	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: 6850	Samplenum: WG629365-05
Instrument: LCMS1	Prep Date: 09/12/2017 12:30	File ID: 1LM.LM40511
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 13:32	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	82100	28600	2.87	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: 6850	Samplenum: WG629365-06
Instrument: LCMS1	Prep Date: 09/12/2017 12:30	File ID: 1LM.LM40520
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 16:23	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	97100	33100	2.93	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG629368-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40509
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 12:54	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2180	983	2.22	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG629368-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40510
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 13:13	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	410000	132000	3.11	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG629368-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40519
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 16:04	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	486000	157000	3.10	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090414	Prep Method: _____	Samplenum: WG629368-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40521
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG629365	Analysis Date: 09/12/2017 16:42	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	5430	3700	1.47	2.3	3.8	*

2.2 General Chemistry Data

2.2.1 Ammonia Data

2.2.1.1 Summary Data

Lab Report #: L17090414

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090414-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: LH18/24-SP650-6467	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 09/12/2017 15:33
Workgroup #: WG629396	Analyst: TB	Run Date: 09/12/2017 17:10
Collect Date: 09/06/2017 15:00	Dilution: 25	File ID: SC170912003.081
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	29.8		5.00	2.50	1.25

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: 12-SEP-2017
 Analyst: TB
 Analyst: NA
 Method: NH3
 Instrument: SC
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG629341 WG629396 WG629397

Calibration/Linearity	09/12/2017
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:
12-SEP-2017

Todd Boyle

Secondary Reviewer:
13-SEP-2017

Denna Johnson



Analytical Method:350.1
Login Number:L17090414

AAB#:WG629396

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-SP650-6467	01	09/06/17					09/12/2017	6.1	28		09/12/17	6.1	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17090414 Work Group: WG629396
 Blank File ID: SC170912003.065 Blank Sample ID: WG629396-01
 Prep Date: 09/12/17 16:26 Instrument ID: SMARTCHEM
 Analyzed Date: 09/12/17 16:26 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	WG629396-02	SC170912003.036	09/12/17 16:00	01
DUP	WG629396-04	SC170912003.046	09/12/17 16:09	01
LH18/24-SP650-6467	L17090414-01	SC170912003.081	09/12/17 17:10	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5474182
 Report generated 09/13/2017 07:53



Login Number: L17090414 Prep Date: 09/12/17 16:26 Sample ID: WG629396-01
Instrument ID: SMARTCHEM Run Date: 09/12/17 16:26 Prep Method: 350.1
File ID: SC170912003.065 Analyst: TB Method: 350.1
Workgroup (AAB#): WG629396 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-12-SEP-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: 5474183
13-SEP-2017 07:53



Login Number: L17090414 Run Date: 09/12/2017 Sample ID: WG629396-02
Instrument ID: SMARTCHEM Run Time: 16:00 Prep Method: 350.1
File ID: SC170912003.036 Analyst: TB Method: 350.1
Workgroup (AAB#): WG629396 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD83234 Cal ID: SMARTC-12-SEP-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Ammonia	2.00	1.99	99.4	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5474184
Report generated: 09/13/2017 07:53



2.2 General Chemistry Data

2.2.2 Orthophosphate Data

2.2.2.1 Summary Data

Lab Report #: L17090414

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090414-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6467	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:25
Workgroup #: WG629003	Analyst: DLP	Run Date: 09/08/2017 13:45
Collect Date: 09/06/2017 15:00	Dilution: 10	File ID: 00.1709081345-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	7.84		1.00	0.500	0.250

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: 08-SEP-2017
 Analyst: DLP
 Analyst: NA
 Method: PO4
 Instrument: V-1200
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG629003

Calibration/Linearity	09-07-17
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	
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	
Primary Reviewer	DLP
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
08-SEP-2017

Secondary Reviewer:
13-SEP-2017

Dwight Payne

Denna Johnson



Analytical Method: 365.2
Login Number: L17090414

AAB#: WG629003

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-SP650-6467	01	09/06/17					09/08/2017	1.9	2		09/08/17	1.9	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17090414 Work Group: WG629003
 Blank File ID: 00.1709081345-03 Blank Sample ID: WG629003-01
 Prep Date: 09/08/17 13:45 Instrument ID: V-1200
 Analyzed Date: 09/08/17 13:45 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	WG629003-02	00.1709081345-04	09/08/17 13:45	
LCS2	WG629003-03	00.1709081345-05	09/08/17 13:45	
LH18/24-SP650-6467	L17090414-01	00.1709081345-06	09/08/17 13:45	
DUP	WG629003-05	00.1709081345-07	09/08/17 13:45	

Report Name: BLANK_SUMMARY
 PDF File ID: 5475842
 Report generated 09/13/2017 14:25



Login Number: L17090414 Prep Date: 09/08/17 13:45 Sample ID: WG629003-01
Instrument ID: V-1200 Run Date: 09/08/17 13:45 Prep Method: 365.2
File ID: 00.1709081345-03 Analyst: DLP Method: 365.2
Workgroup (AAB#): WG629003 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: V-1200-07-SEP-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: 5475843
13-SEP-2017 14:25



Login Number: L17090414 Analyst: DLP Prep Method: 365.2
 Instrument ID: V-1200 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG629003 Units: mg/L
 QC Key: DOD4 Lot #: STD83662
 Sample ID: WG629003-02 LCS File ID: 00.1709081345-04 Run Date: 09/08/2017 13:45
 Sample ID: WG629003-03 LCS2 File ID: 00.1709081345-05 Run Date: 09/08/2017 13:45

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	1.01	101	1.00	1.00	100	1.10	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5475844
 Report generated: 09/13/2017 14:26



2.2.2.3 Raw Data

Microbac Laboratories Inc.
INITIAL CALIBRATION

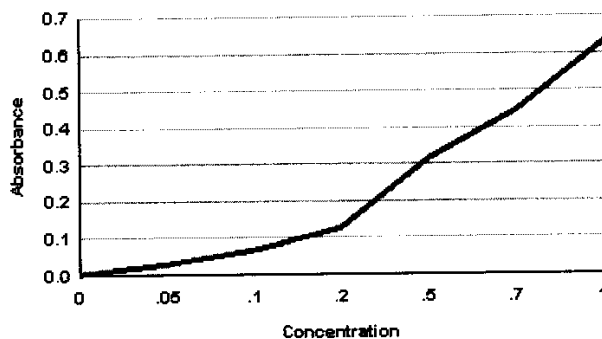
Workgroup: WG628802
Analytical Method: 300
Instrument ID: V-1200

Analyst: DLP
Initial Calibration Date: 09/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.631729
Y-Intercept: -0.000558313
Coef. Of Correlation (R^2): 0.999969
Coef. Of Correlation (R): 0.999985

Concentration X	Absorbance Y	X ²	X * Y	Y-Fitted (mX ² +B)
0.00	0.00	0.00	0.00	-0.000558313
0.0500	0.0290	0.00250	0.00145	0.0310281
0.100	0.0640	0.0100	0.00640	0.0626146
0.200	0.125	0.0400	0.0250	0.125787
0.500	0.316	0.250	0.158	0.315306
0.700	0.443	0.490	0.310	0.441652
1.00	0.630	1.00	0.630	0.631170

Curve Fit



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 09/07/2017 16:16



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

00861589

Workgroup #: WG628802
File ID: 00.1709071525-08
CCV ID: WG628802-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 09/07/2017
Run Time: 15:25
Analyst: DLP
Cal ID: V-1200 - 07-SEP-17 15:25:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.01	0.636	1.0	

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

WET_WG_SSCV - Modified 03/06/2008
Report generated 09/07/2017 16:17



Orthophosphate
(orthophosphate1)

EPA 365.2 / SM4500-P E
SOP K3653 Rev 17
Color Reagent Chemicals
RGT 41099
RGT 40462
RGT 41073
CB 18278

CCV: STD 83661
Daily Dilution: 5(5) / 50 =
Daily Dilution: 0.5
Spectrophotometer: V-1200
LCS: STD 83662
Daily Dilution: 1(10) / 100 =
Daily Dilution: 1
Curve ID: 628802
9-07-17

Spike: STD 83662
Daily Dilution: 2(10) / 60 =
Daily Dilution: 0.4

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: 0.5 mg/L	50			0.317
BLK/CCB:	50			0.000
LCS: 1.0 ppm	50			0.639
LCSD: 1.0 ppm	50			0.632
9-414-1	50	✓	1/10	0.495
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
CCV:	50			
CCB:	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
DUP 9-414-01	50	✓	1/10	0.492
MS: () 414-01	50		1/10	0.487
MSD: ()	50			
CCV: () 0.5	50			0.320
CCB:	50			0.000

Analyst: Christy Payne

Date / Time: 9-08-17 11:345

DCN#128173



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG629003

Analyst: DLP

Analyte: ORTHOPHOSPHATE

Date: 09/08/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG629003-01	50	50	0	0.6317	-0.0005583	0.00088379	0.00088379	1	mg/L
WG629003-02	50	50	0.639	0.6317	-0.0005583	1.0124	1.0124	1	mg/L
WG629003-03	50	50	0.632	0.6317	-0.0005583	1.0013	1.0013	1	mg/L
L17090414-01	50	50	0.495	0.6317	-0.0005583	0.78445	7.8445	10	mg/L
WG629003-04	50	50	0.495	0.6317	-0.0005583	0.78445	7.8445	10	mg/L
WG629003-05	50	50	0.492	0.6317	-0.0005583	0.77970	7.7970	10	mg/L
WG629003-06	50	50	0.487	0.6317	-0.0005583	0.77178	7.7178	10	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 09/08/2017 17:20

Workgroup #: WG629062 Instrument ID: V-1200
File ID: 00.1709081345-01 Run Date: 09/08/2017
CCV ID: WG629062-01 Run Time: 13:45
Units: mg/L Analyst: DLP
Analyte: ORTHOPHOSPHATE Cal ID: V-1200 - 07-SEP-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.503	0.634	0.6	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 09/08/2017 17:19



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00861593

Workgroup #: WG629062
File ID: 00.1709081345-09
CCV ID: WG629062-03
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 09/08/2017
Run Time: 13:45
Analyst: DLP
Cal ID: V-1200 - 07-SEP-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.507	0.640	1.4	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 09/08/2017 17:19



2.2 General Chemistry Data

2.2.3 Total Organic Carbon Data

2.2.3.1 Summary Data

Lab Report #: L17090414

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090414-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6467	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG629656	Analyst: DCM	Run Date: 09/14/2017 11:23
Collect Date: 09/06/2017 15:00	Dilution: 5	File ID: TC09142017.009
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	107		10.0	5.00	2.50

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: 14-SEP-2017
 Analyst: DCM
 Analyst: NA
 Method: TOC
 Instrument: TOC-VWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG628656

Calibration/Linearity	09-14-2017
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:
14-SEP-2017



Secondary Reviewer:
18-SEP-2017




Analytical Method: 415.1
Login Number: L17090414

AAB#: WG629656

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-SP650-6467	01	09/06/17					09/14/2017	7.8	28		09/14/17	7.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17090414 Work Group: WG629656
 Blank File ID: TC09142017.004 Blank Sample ID: WG629656-01
 Prep Date: 09/14/17 09:36 Instrument ID: TOC-VWP
 Analyzed Date: 09/14/17 09:36 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	WG629656-02	TC09142017.005	09/14/17 09:55	01
LCS2	WG629656-03	TC09142017.006	09/14/17 10:16	01
LH18/24-SP650-6467	L17090414-01	TC09142017.009	09/14/17 11:23	DL01
DUP	WG629656-05	TC09142017.010	09/14/17 11:45	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5478354
 Report generated 09/14/2017 17:02



Login Number: L17090414 Prep Date: 09/14/17 09:36 Sample ID: WG629656-01
 Instrument ID: TOC-VWP Run Date: 09/14/17 09:36 Prep Method: 415.1
 File ID: TC09142017.004 Analyst: DCM Method: 415.1
 Workgroup (AAB#): WG629656 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: 5478355
 14-SEP-2017 17:02



Login Number: L17090414 Analyst: DCM Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG629656 Units: mg/L
 QC Key: DOD4 Lot #: STD83735
 Sample ID: WG629656-02 LCS File ID: TC09142017.005 Run Date: 09/14/2017 09:55
 Sample ID: WG629656-03 LCS2 File ID: TC09142017.006 Run Date: 09/14/2017 10:16

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	25.1	101	25.0	25.0	99.8	0.759	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5478356
 Report generated: 09/14/2017 17:02



2.2.3.3 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

- | | | |
|--|---|---|
| <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

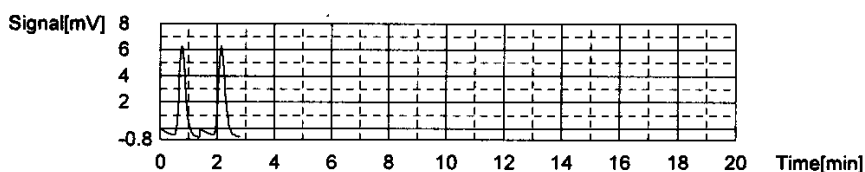
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

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

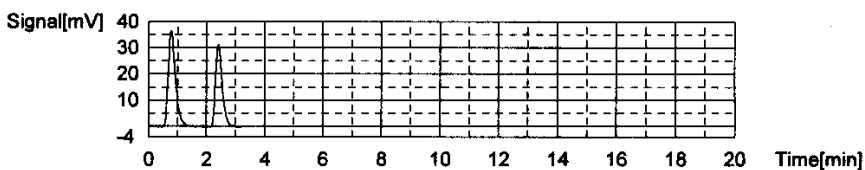
Acid Add. 0.000%
 Mean Area 10.82



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

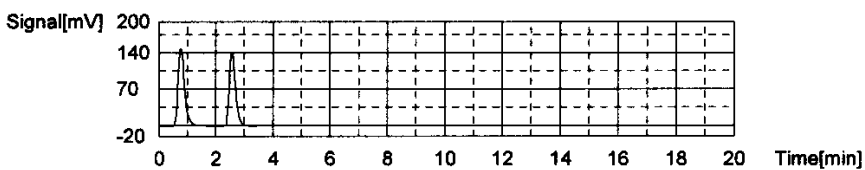
Acid Add. 0.000%
 Mean Area 57.92



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

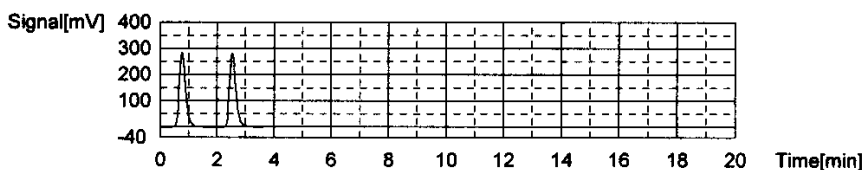


Conc: 10.00mg/L

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

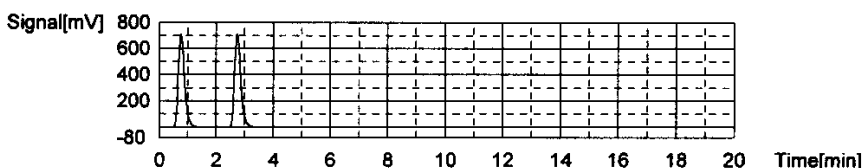
Acid Add. 0.000%
Mean Area 440.2



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

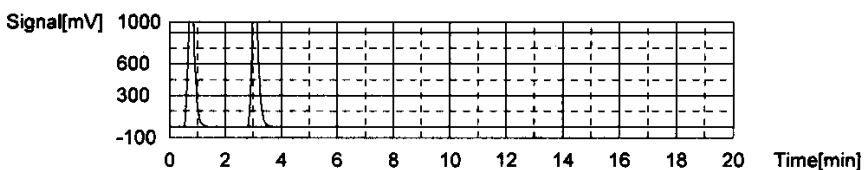
Acid Add. 0.000%
Mean Area 1092



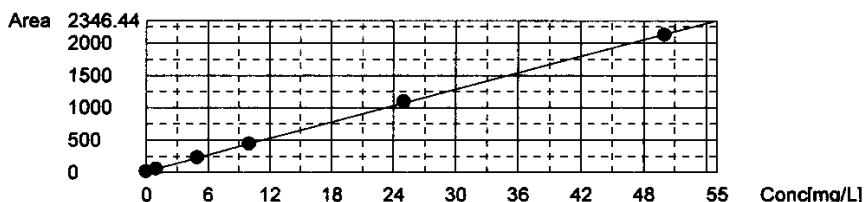
Conc: 50.00mg/L

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

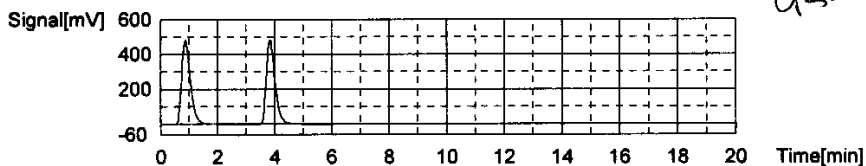
1. Det

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

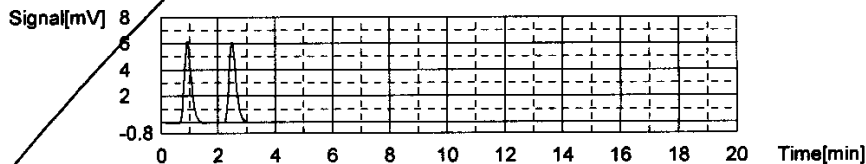
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

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

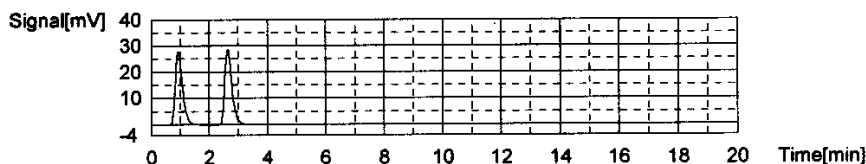
Acid Add. 3.000%
Mean Area 10.51



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

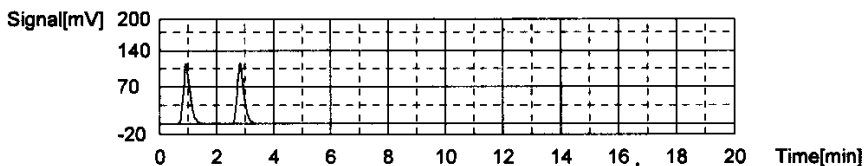


Conc: 5.000mg/L

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

*dem
3/23/17*

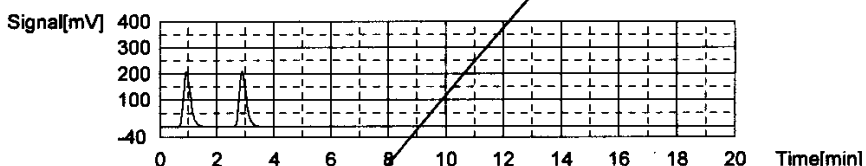
Acid Add. 3.000%
Mean Area 189.6



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

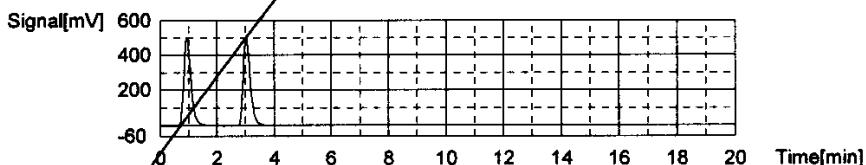
Acid Add. 3.000%
Mean Area 361.4



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

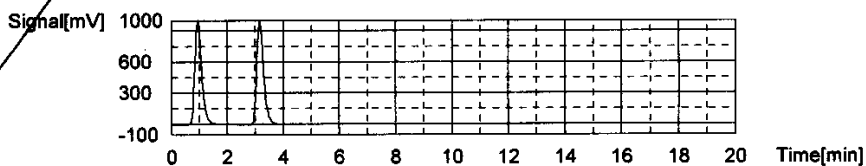
Acid Add. 3.000%
Mean Area 858.1



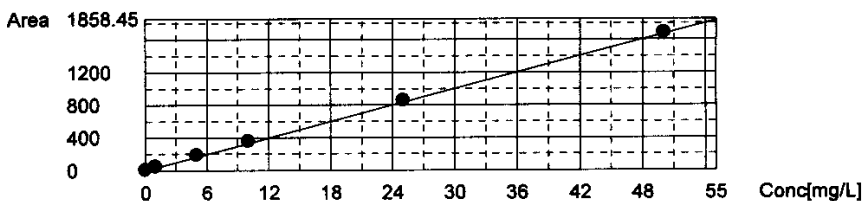
Conc: 50.00mg/L

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

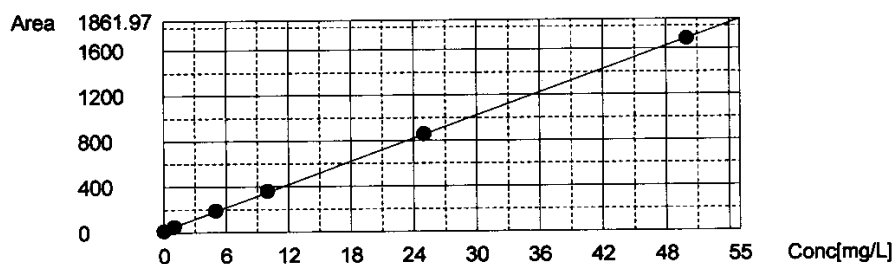
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

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:

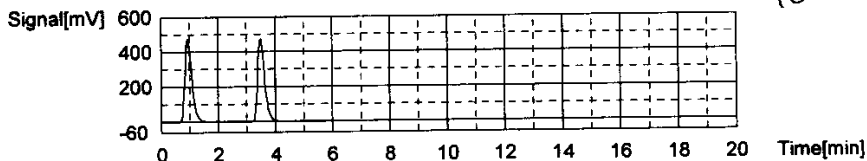
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

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:

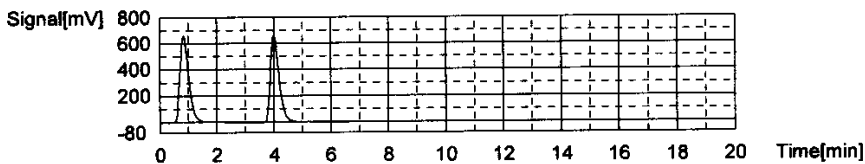
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

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.t32

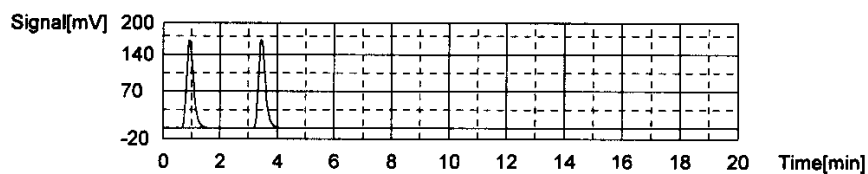
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

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

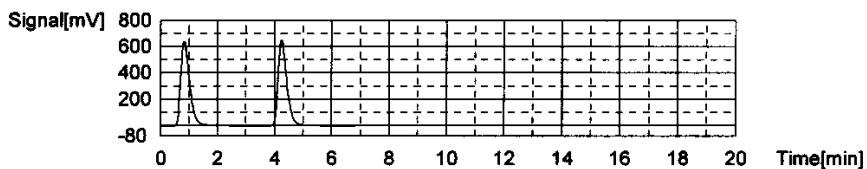
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

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

Total Organic Carbon

MAKE DAILY

CCV (TOC): Std 79381
 $(5/200)(1000) = 25\text{mg/L}$

LCS (TOC): Std 83735
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): Std 83359
 $(5/200)(1000) = 25\text{mg/L}$

MS (TOC): Std 83735
 $\frac{2.4(1000)}{90} = 10$

Calibration Curve Date: 2/14/17

Reagent: REAGENT 40983
REAGENT 91061

SM5310-C : Matrix 2 WG 629656

EPA 415.1/9060A(mod): Matrix 1 WG _____

SW846 9060A (4 rep) WG _____

SOP: K 4151 Rev. 19

Instrument: Shimadzu TOC-VWP/ASI

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> drain reservoir filled | <input checked="" type="checkbox"/> 3 rd bottle full | <input checked="" 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			51		
2	TOC/TIC		27			52		
3	CCV		28			53		
4	Blk		29			54		
5	LCS		30			55		
6	LCS DUP		31			56		
7	09-614-c1		32			57		
8	C3		33			58		
9	09-414-c1	1/5	34			59		
10	DUP 09-614-c1		35			60		
11	MS 09-614-c1		36			61		
ct1	12	09-763-c1	1/2	37		62		
ct1	13	C1	1/5	38		63		
	14	CCV	39			64		
	15	CCB	40			65		
ct1	16	09-763-c2	1/3	41		66		
ct1	17	C3	42			67		
ct1	18	09-763-c1	1/5	43		68		
dem	19	09-763-03	1/5	44		69		
9/14/17	20	CCB CCV	45			70		
	21	CCB	46			71		
	22		47			72		
	23		48			73		
	24		49			74		
	25		50			75		

Analyst: David Heschel Date/Time: 9/14/17 0903

DCN#128283



	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:1.172mg/L TC:26.11mg/L IC:24.94mg/L	Complete	9/14/2017 9:03:30 AM	1
2	TOC	TOC/TIC	TOC:26.35mg/L TC:34.85mg/L IC:8.505mg/L	Complete	9/14/2017 9:16:12 AM	2
3	TOC	CCV	!!Error!! TOC:25.29mg/L TC:24.95mg/L IC:-0.3331mg/L	Complete	9/14/2017 9:28:29 AM	3
4	TOC	WG629656-01 BLK	!!Error!! TOC:0.08142mg/L TC:-0.1660mg/L IC:-0.2474mg/L	Complete	9/14/2017 9:47:56 AM	0
5	TOC	WG629656-02 LCS	!!Error!! TOC:25.14mg/L TC:24.80mg/L IC:-0.3382mg/L	Complete	9/14/2017 10:08:42 AM	5
6	TOC	WG629656-03 LCSDUF	!!Error!! TOC:24.95mg/L TC:24.62mg/L IC:-0.3289mg/L	Complete	9/14/2017 10:29:39 AM	6
7	TOC	L17090614-01	TOC:2.490mg/L TC:7.848mg/L IC:5.359mg/L	Complete	9/14/2017 10:50:33 AM	7
8	TOC	L17090614-03	TOC:2.629mg/L TC:7.422mg/L IC:4.793mg/L	Complete	9/14/2017 11:15:37 AM	8
9	TOC	L17090414-01 (5)	TOC:21.30mg/L TC:35.27mg/L IC:13.97mg/L	Complete	9/14/2017 11:38:06 AM	9
10	TOC	WG629656-05 DUP	TOC:2.561mg/L TC:7.603mg/L IC:5.042mg/L	Complete	9/14/2017 11:59:01 AM	10
11	TOC	WG629656-06 MS	TOC:14.19mg/L TC:16.92mg/L IC:2.734mg/L	Complete	9/14/2017 12:20:04 PM	11
12	TOC	<Untitled>	TOC:13.81mg/L TC:27.85mg/L IC:14.04mg/L	Complete	9/14/2017 12:48:13 PM	12
13	TOC	<Untitled>	TOC:19.36mg/L TC:58.30mg/L IC:38.94mg/L	Complete	9/14/2017 1:17:35 PM	13
14	TOC	CCV	!!Error!! TOC:25.17mg/L TC:24.95mg/L IC:-0.2175mg/L	Complete	9/14/2017 1:29:59 PM	14
15	TOC	CCB	!!Error!! TOC:0.06896mg/L TC:-0.1749mg/L IC:-0.2438mg/L	Complete	9/14/2017 1:43:19 PM	0
16	TOC	L17090763-02 (3)	TOC:3.166mg/L TC:48.65mg/L IC:45.48mg/L	Complete	9/14/2017 2:24:12 PM	16
17	TOC	<Untitled>	!!Error!! TOC:-13.74mg/L TC:77.62mg/L IC:91.35mg/L	Complete	9/14/2017 2:53:17 PM	17
18	TOC	L17090763-01 (5)	TOC:12.84mg/L TC:28.51mg/L IC:15.67mg/L	Complete	9/14/2017 3:21:30 PM	18
19	TOC	L17090763-03 (5)	TOC:2.273mg/L TC:30.04mg/L IC:27.77mg/L	Complete	9/14/2017 4:02:47 PM	19
20	TOC	CCV	!!Error!! TOC:25.29mg/L TC:25.09mg/L IC:-0.1922mg/L	Complete	9/14/2017 4:15:12 PM	20
21	TOC	CCB	!!Error!! TOC:0.08393mg/L TC:-0.1972mg/L IC:-0.2811mg/L	Complete	9/14/2017 4:24:08 PM	0

9/14/2017 4:33:03 PM

1/1

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

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

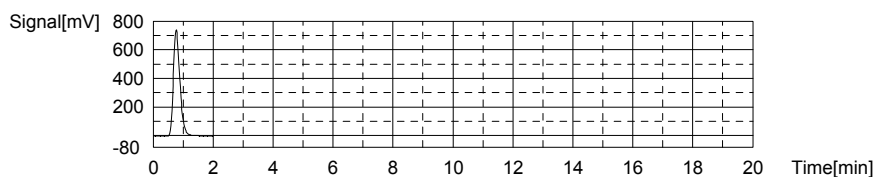
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.172mg/L TC:26.11mg/L IC:24.94mg/L

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_59	9/14/2017 8:58:04 AM

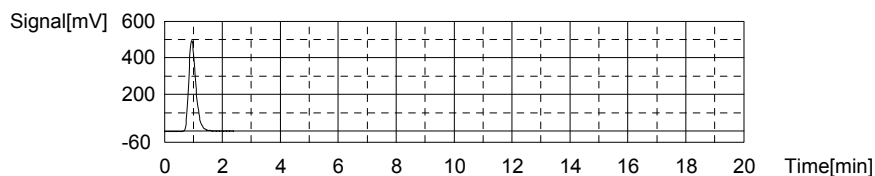
Mean Area 1122
 Mean Conc. 26.11mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	853.5	24.94mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 9:03:30 AM

Mean Area 853.5
 Mean Conc. 24.94mg/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:26.35mg/L TC:34.85mg/L IC:8.505mg/L

1. Det

Anal.: TC

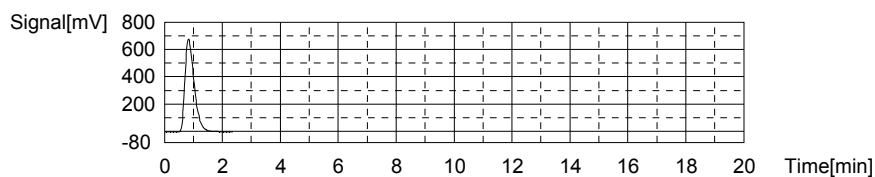
1/15

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1492	34.85mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 9:11:18 AM

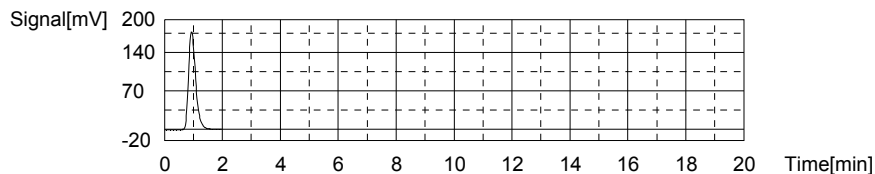
Mean Area 1492
Mean Conc. 34.85mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	303.2	8.505mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 9:16:12 AM

Mean Area 303.2
Mean Conc. 8.505mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

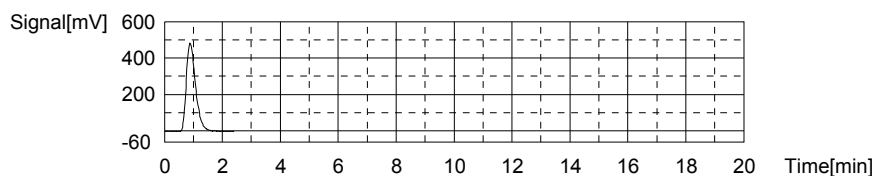
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.29mg/L TC:24.95mg/L IC:-0.3331mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1073	24.95mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 9:24:03 AM

Mean Area 1073
Mean Conc. 24.95mg/L



Anal.: IC

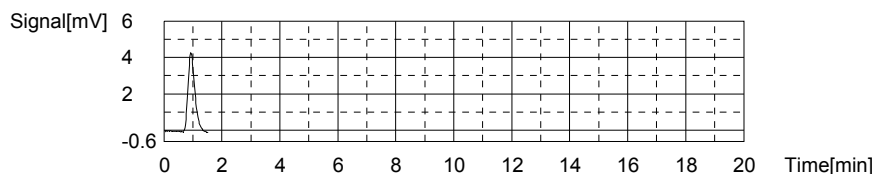
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.261	-0.3331mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 9:28:29 AM

2/15

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

Mean Area 7.261
Mean Conc. -0.3331mg/L



Sample

Sample Name: WG629656-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

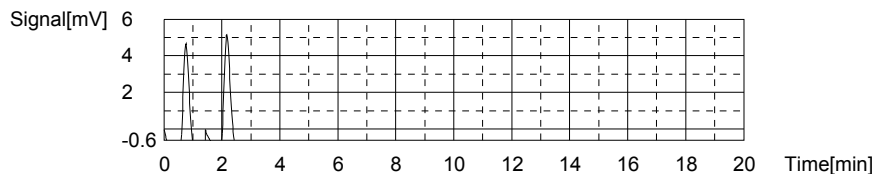
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.08142mg/L TC:-0.1660mg/L IC:-0.2474mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.923	-0.1640mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/14/2017 9:36:32 AM
2	9.757	-0.1679mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/14/2017 9:40:06 AM

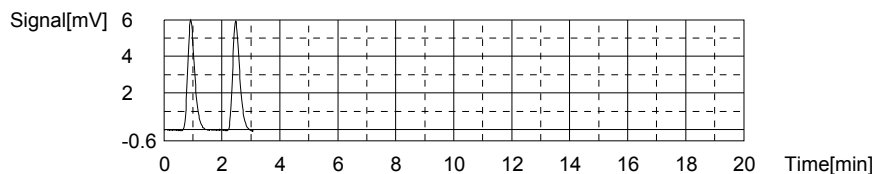
Mean Area 9.840
Mean Conc. -0.1660mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.14	-0.2471mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/14/2017 9:44:02 AM
2	10.12	-0.2477mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/14/2017 9:47:56 AM

Mean Area 10.13
Mean Conc. -0.2474mg/L



Sample

Sample Name: WG629656-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

3/15

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

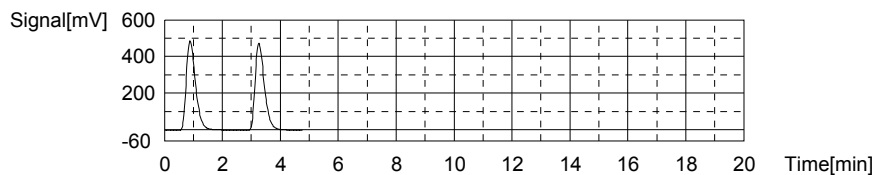
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.14mg/L TC:24.80mg/L IC:-0.3382mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1083	25.19mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 9:55:34 AM
2	1050	24.41mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 10:00:13 AM

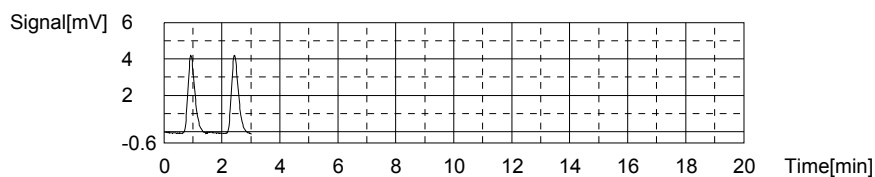
Mean Area 1067
Mean Conc. 24.80mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.087	-0.3383mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 10:04:34 AM
2	7.090	-0.3382mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 10:08:42 AM

Mean Area 7.089
Mean Conc. -0.3382mg/L



Sample

Sample Name: WG629656-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

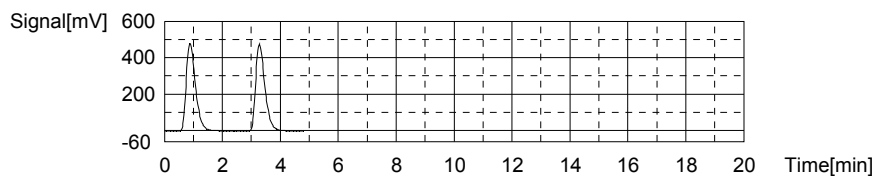
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.95mg/L TC:24.62mg/L IC:-0.3289mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1066	24.79mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 10:16:34 AM
2	1052	24.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 10:21:14 AM

Mean Area 1059
Mean Conc. 24.62mg/L



Anal.: IC

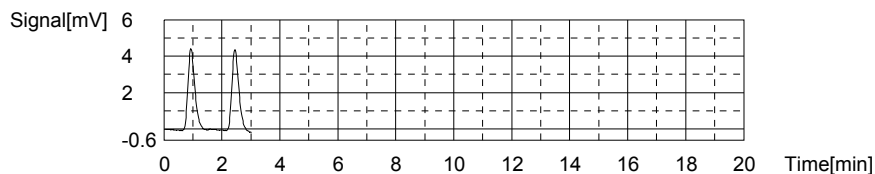
4/15

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.409	-0.3287mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 10:25:33 AM
2	7.390	-0.3292mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 10:29:39 AM

Mean Area 7.400
Mean Conc. -0.3289mg/L



Sample

Sample Name: L17090614-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

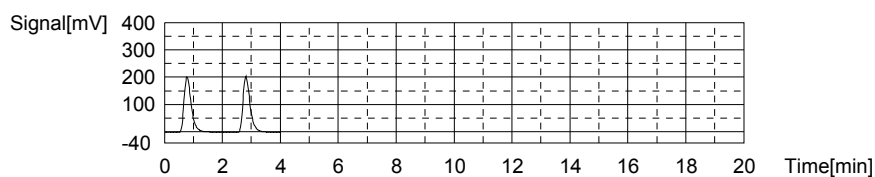
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.490mg/L TC:7.848mg/L IC:5.359mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	348.6	7.838mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/14/2017 10:37:08 AM
2	349.5	7.859mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/14/2017 10:41:23 AM

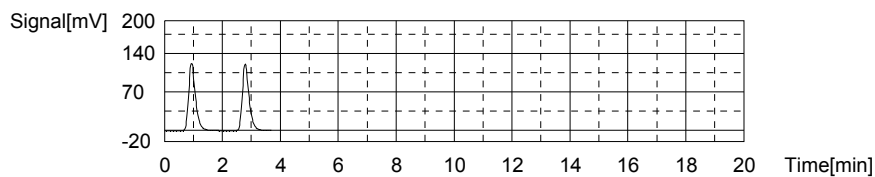
Mean Area 349.1
Mean Conc. 7.848mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	199.9	5.420mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 10:46:04 AM
2	195.8	5.297mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 10:50:33 AM

Mean Area 197.9
Mean Conc. 5.359mg/L



Sample

5/15

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

Sample Name: L17090614-03
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

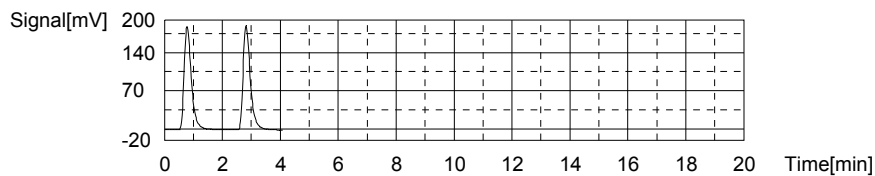
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.629mg/L TC:7.422mg/L IC:4.793mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	327.7	7.344mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 11:02:04 AM
2	334.3	7.500mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 11:06:23 AM

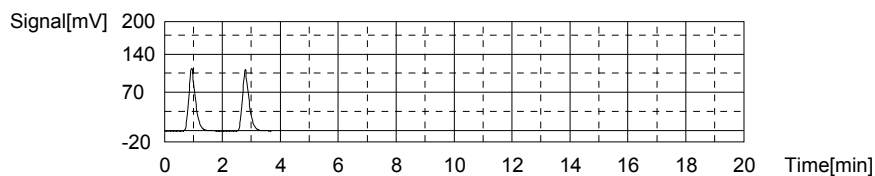
Mean Area 331.0
 Mean Conc. 7.422mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	180.9	4.852mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 11:11:07 AM
2	176.9	4.733mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 11:15:37 AM

Mean Area 178.9
 Mean Conc. 4.793mg/L



Sample

Sample Name: L17090414-01 (5)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:21.30mg/L TC:35.27mg/L IC:13.97mg/L

1. Det

Anal.: TC

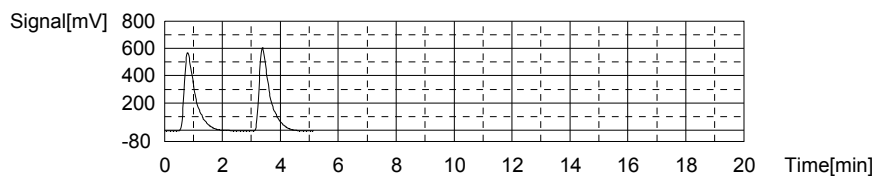
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1486	34.71mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 11:23:38 AM
2	1533	35.82mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 11:28:29 AM

6/15

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

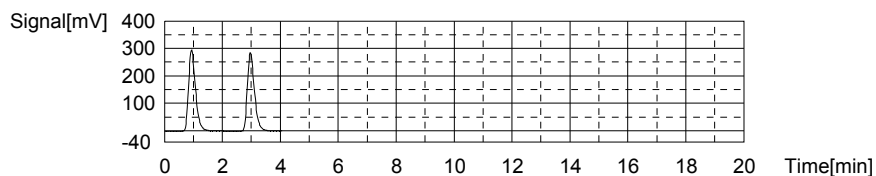
Mean Area 1510
Mean Conc. 35.27mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	490.6	14.10mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 11:33:24 AM
2	481.8	13.84mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 11:38:06 AM

Mean Area 486.2
Mean Conc. 13.97mg/L



Sample

Sample Name: WG629656-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

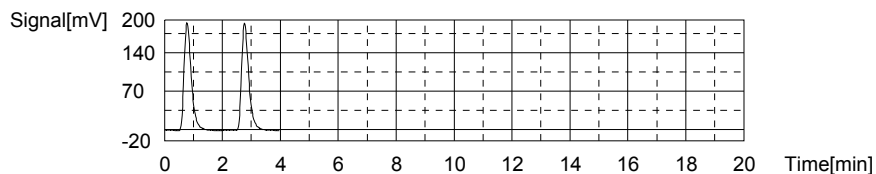
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.561mg/L TC:7.603mg/L IC:5.042mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	340.5	7.646mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/14/2017 11:45:32 AM
2	336.8	7.559mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/14/2017 11:49:46 AM

Mean Area 338.6
Mean Conc. 7.603mg/L

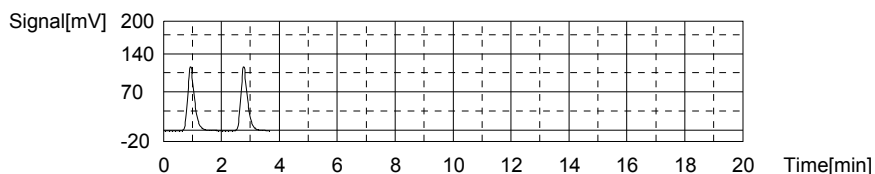


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	187.7	5.055mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 11:54:32 AM
2	186.8	5.029mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 11:59:01 AM

7/15

Mean Area 187.3
Mean Conc. 5.042mg/L



Sample

Sample Name: WG629656-06 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

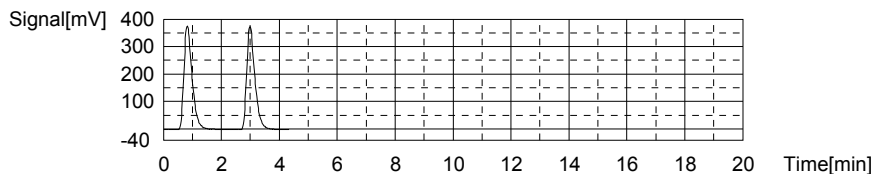
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.19mg/L TC:16.92mg/L IC:2.734mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	734.6	16.96mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 12:06:38 PM
2	731.5	16.88mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 12:11:05 PM

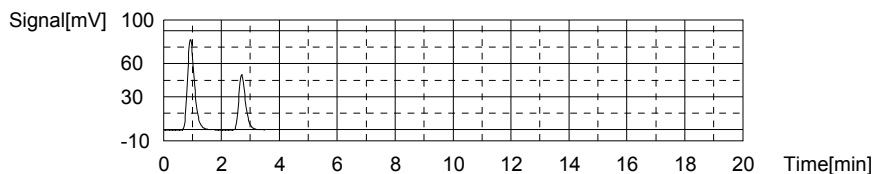
Mean Area 733.0
Mean Conc. 16.92mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	137.9	3.568mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 12:15:44 PM
2	82.06	1.901mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 12:20:04 PM

Mean Area 110.0
Mean Conc. 2.734mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

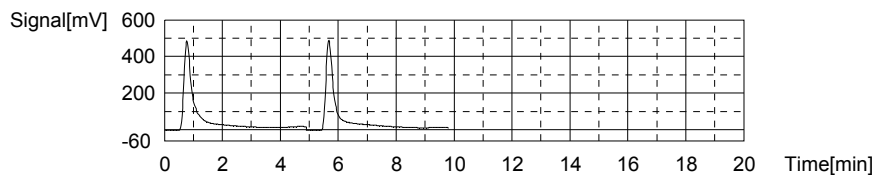
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:13.81mg/L TC:27.85mg/L IC:14.04mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1174	27.34mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 12:30:25 PM
2	1217	28.36mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 12:38:36 PM

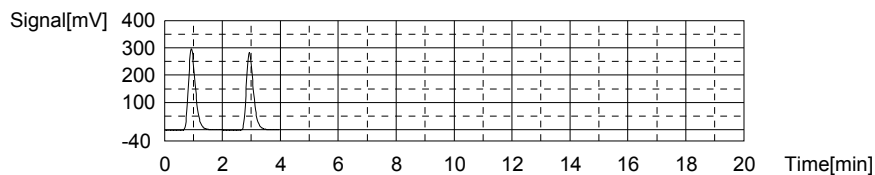
Mean Area 1196
Mean Conc. 27.85mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	499.8	14.38mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 12:43:33 PM
2	477.4	13.71mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 12:48:13 PM

Mean Area 488.6
Mean Conc. 14.04mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

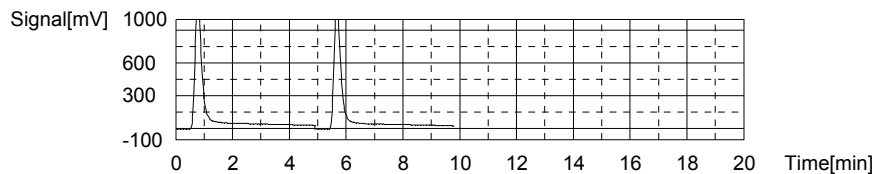
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:19.36mg/L TC:58.30mg/L IC:38.94mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2531	59.40mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 12:58:35 PM
2	2438	57.20mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 1:07:15 PM

Mean Area 2485
Mean Conc. 58.30mg/L

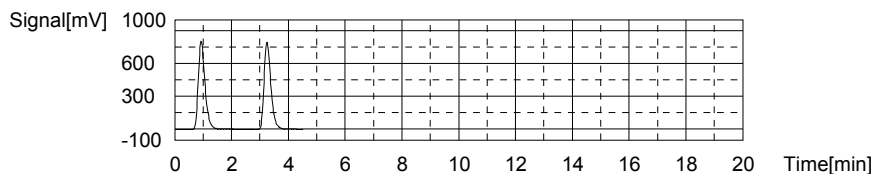


Anal.: IC

9/15

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1327	39.08mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/14/2017 1:12:34 PM
2	1318	38.81mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/14/2017 1:17:35 PM

Mean Area 1323
Mean Conc. 38.94mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

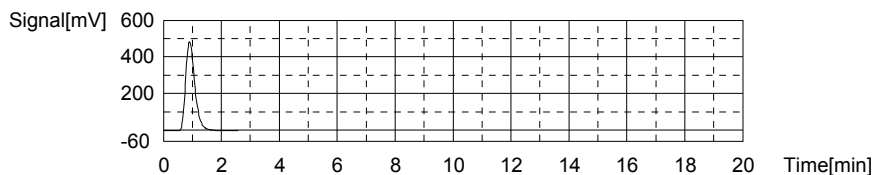
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.17mg/L TC:24.95mg/L IC:-0.2175mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1073	24.95mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 1:25:35 PM

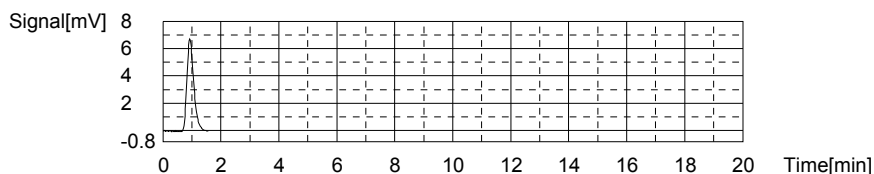
Mean Area 1073
Mean Conc. 24.95mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.13	-0.2175mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/14/2017 1:29:59 PM

Mean Area 11.13
Mean Conc. -0.2175mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

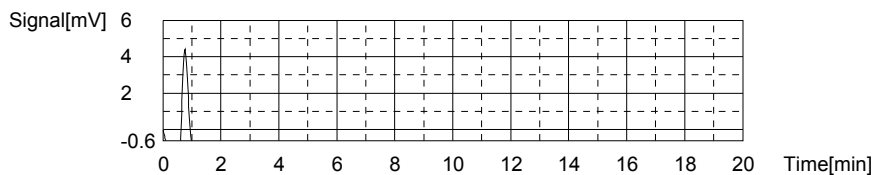
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06896mg/L TC:-0.1749mg/L IC:-0.2438mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.464	-0.1749mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 1:39:22 PM

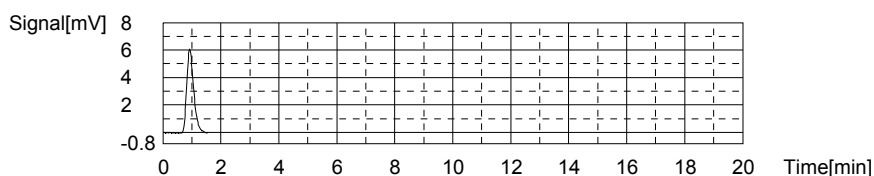
Mean Area 9.464
Mean Conc. -0.1749mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.25	-0.2438mg/L	500uL	1	1	TICURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 1:43:19 PM

Mean Area 10.25
Mean Conc. -0.2438mg/L



Sample

Sample Name: L17090763-02 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

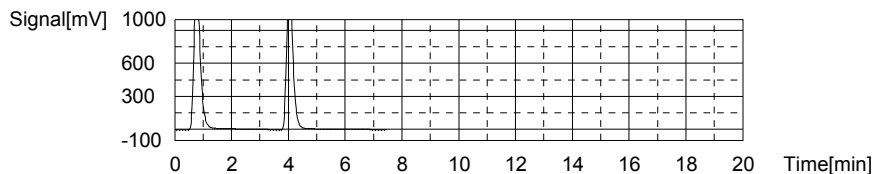
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.166mg/L TC:48.65mg/L IC:45.48mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2096	49.12mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 2:06:26 PM
2	2056	48.18mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 2:13:43 PM

Mean Area 2076
Mean Conc. 48.65mg/L



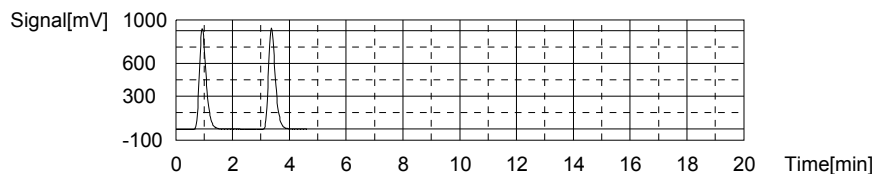
Anal.: IC

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1536	45.32mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 2:19:13 PM
2	1547	45.65mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 2:24:12 PM

Mean Area 1542
Mean Conc. 45.48mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

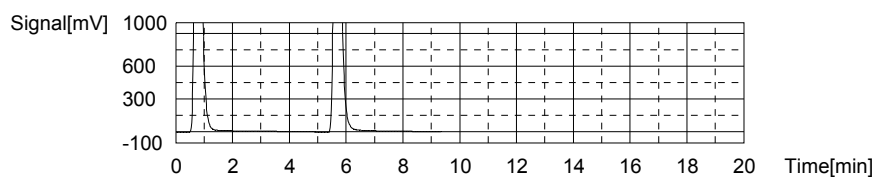
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-13.74mg/L TC:77.62mg/L IC:91.35mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	3257	76.55mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/14/2017 2:34:34 PM
2	3347	78.68mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/14/2017 2:42:10 PM

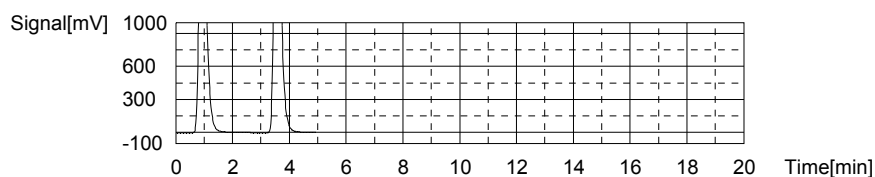
Mean Area 3302
Mean Conc. 77.62mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	3096	91.91mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 2:48:07 PM
2	3059	90.80mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 2:53:17 PM

Mean Area 3078
Mean Conc. 91.35mg/L



Sample

12/15

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

Sample Name: L17090763-01 (5)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

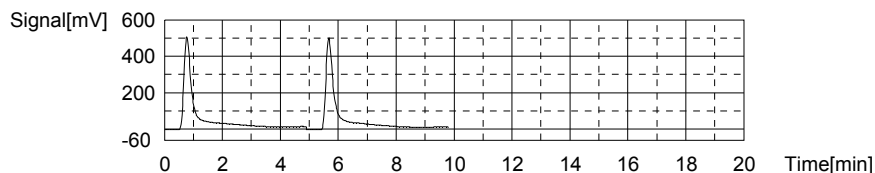
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.84mg/L TC:28.51mg/L IC:15.67mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1222	28.47mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 3:03:38 PM
2	1225	28.54mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 3:11:41 PM

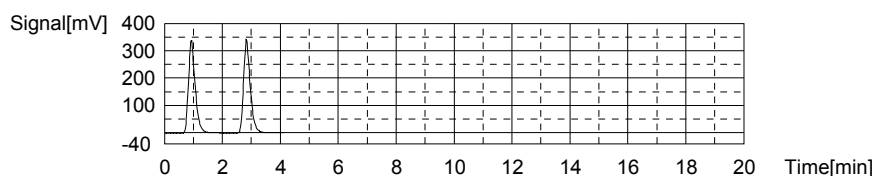
Mean Area 1224
 Mean Conc. 28.51mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	537.9	15.51mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 3:16:33 PM
2	548.1	15.82mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/14/2017 3:21:30 PM

Mean Area 543.0
 Mean Conc. 15.67mg/L



Sample

Sample Name: L17090763-03 (5)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.273mg/L TC:30.04mg/L IC:27.77mg/L

1. Det

Anal.: TC

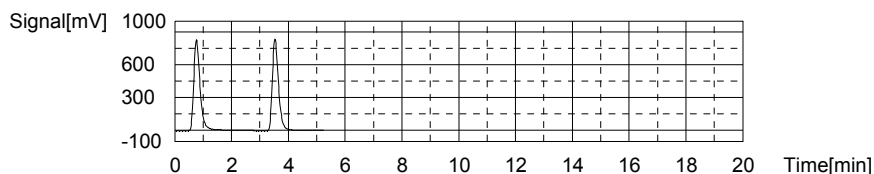
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1298	30.27mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 3:47:11 PM
2	1279	29.82mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 3:52:48 PM

13/15

9/14/2017 4:33:37 PM

09-14-2017-DCM-TOC.t32

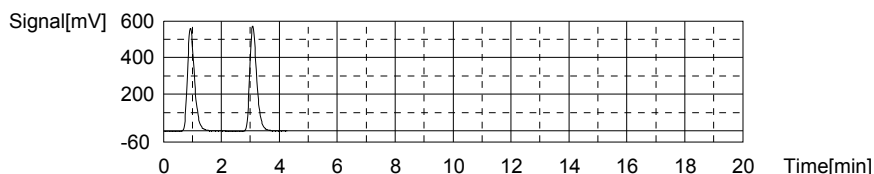
Mean Area 1289
Mean Conc. 30.04mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	943.1	27.61mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 3:57:57 PM
2	953.6	27.93mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 4:02:47 PM

Mean Area 948.4
Mean Conc. 27.77mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

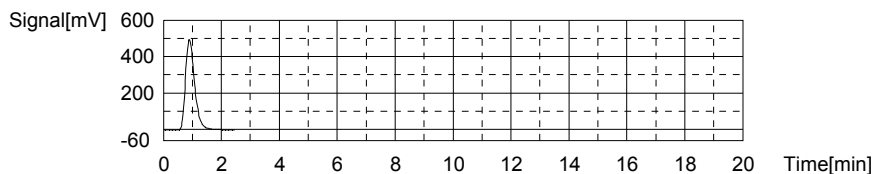
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.29mg/L TC:25.09mg/L IC:-0.1922mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1079	25.09mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	19/14/2017 4:10:42 PM

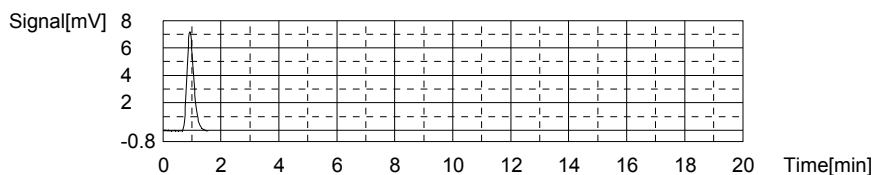
Mean Area 1079
Mean Conc. 25.09mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.98	-0.1922mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/14/2017 4:15:12 PM

Mean Area 11.98
Mean Conc. -0.1922mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

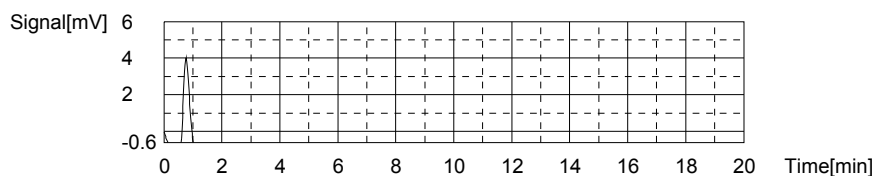
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.08393mg/L TC:-0.1972mg/L IC:-0.2811mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.519	-0.1972mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/14/2017 4:20:13 PM

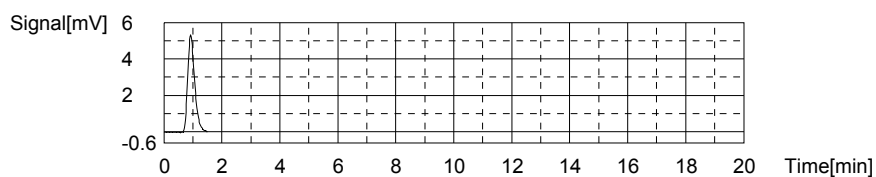
Mean Area 8.519
 Mean Conc. -0.1972mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.001	-0.2811mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/14/2017 4:24:08 PM

Mean Area 9.001
 Mean Conc. -0.2811mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
September 19, 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	BLR - BRANDON L. RICHARDS
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

September 19, 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

September 19, 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:

<p>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: <i>STANDARD</i> Project Name/Location: Longhorn Project Number: <i>60256135.GWTPHUR MARLB</i></p>		<p>Project Manager: <i>ELSPETH SHARP</i> Phone/Fax Number: 210-296-2000 Sampler (print): Scott Beesinger Signature: <i>Scott Beesinger</i></p>		<p>Mail to: Linda Raabe 112 East Pecan STE. 400 San Antonio, TX 78205 210-296-2000 Fed Ex Airbill No:</p>	
<p>Site Name: <i>GWTP Weekly</i></p>		<p>Sample ID/Location ID: <i>LH18124-SR1050-6467</i></p>		<p>Number of Containers: <i>4</i></p>	
<p>Matrix: <i>N</i></p>		<p>Grab: <i>X</i></p>		<p>Comp: <i>X</i></p>	
<p>Date: <i>9/16/17</i></p>		<p>Time: <i>1500</i></p>		<p>SA CODE</p>	
<p>SED</p>		<p>SBD</p>		<p>Cooler ID</p>	
<p>ABLOT</p>		<p>EBLOT</p>		<p>TBLOT</p>	
<p>Orthophosphate</p>		<p>Ammonia-N</p>		<p>TOC</p>	
<p>Pechlorate</p>					

Comments: *STANDARD TAT*

Microbac OVD
 Received: 09/08/2017 11:38
 By: CARA STRICKLER

Relinquished by: *Scott Beesinger* (Signature) Time Received: *1530*
 Relinquished by: *Anna Strickler* (Signature) Time Received: _____

Relinquished by: _____ (Signature) Time Relinquished by: (Signature)

Remarks: _____

221000105745

-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 5745

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

04D 9/8/17

pH Lot # HCl 601354

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

04D 9/8/17

PRESERVATIVE EXCEPTIONS

✓ **NONE AS NOTED**

04D 9/8/17

Document Control # 1957
Last 10-07-2016

Issued to: Document Master File

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17090414

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 19-SEP-2017

Samplenum **Container ID** **Products**
L17090414-01 961503 TOC 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-SEP-2017 13:12	CLS		
2	ANALYZ	W1	SEM	12-SEP-2017 12:07	JWR	CLS	
3	STORE	SEM	A1	12-SEP-2017 16:56	CLS	JWR	

Samplenum **Container ID** **Products**
L17090414-01 961504 TOC-D PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-SEP-2017 13:12	CLS		
2	ANALYZ	W1	WET	08-SEP-2017 13:23	TB	CLS	
3	STORE	WET	A1	12-SEP-2017 07:39	CLS	DLP	

Samplenum **Container ID** **Products**
L17090414-01 961505 8330-SPE1 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-SEP-2017 13:12	CLS		<2
2	ANALYZ	W1	WET	14-SEP-2017 08:40	DCM	BRG	

Samplenum **Container ID** **Products**
L17090414-01 961506 9056 NH3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-SEP-2017 13:12	CLS		<2
2	ANALYZ	W1	WET	11-SEP-2017 08:26	EPT	CLS	
3	STORE	WET	A1	13-SEP-2017 16:50	BRG	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: L17090765

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 September 25 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 #: L17090765

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?
00112144	I	3.0		1ZW056F52210009793	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 #:** L17090765**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-SP650-6468	L17090765-01	09/13/2017 15:00	09/14/2017 10:08




Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090765
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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	2017-09-25 15:38:00



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090765
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	NH3
Prep Batch Number(s):	WG630221	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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	2017-09-25 13:56:15



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090765
Project Name:		Method:	NH3
Prep Batch Number(s):	WG630221	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	NH3
Prep Batch Number(s):	WG630221	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	NH3
Prep Batch Number(s):	WG630221	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	NH3
Prep Batch Number(s):	WG630221	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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.

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Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090765
Project Name:		Method:	NH3
Prep Batch Number(s):	WG630221	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629753	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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	2017-09-25 13:55:35



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090765
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629753	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629753	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629753	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629753	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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).

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Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090765
Project Name:		Method:	PO4
Prep Batch Number(s):	WG629753	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629808	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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	2017-09-25 13:56:44



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090765
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629808	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629808	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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				
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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:	L17090765
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629808	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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:	L17090765
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629808	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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				

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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).

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Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17090765
Project Name:		Method:	TOC
Prep Batch Number(s):	WG629808	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-25 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 #: L17090765
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090765-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6468	Prep Method: 6850	Prep Date: 09/21/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 09/08/2017 16:52
Workgroup #: WG630807	Analyst: JWR	Run Date: 09/21/2017 19:13
Collect Date: 09/13/2017 15:00	Dilution: 1	File ID: 1LM.LM40529
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.540		0.400	0.200	0.100

Certificate of Analysis

Sample #: L17090765-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: LH18/24-SP650-6468	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 09/19/2017 10:02
Workgroup #: WG630221	Analyst: TMM	Run Date: 09/19/2017 11:10
Collect Date: 09/13/2017 15:00	Dilution: 20	File ID: SC170919001.064
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	43.8		4.00	2.00	1.00

Certificate of Analysis

Sample #: L17090765-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6468	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:25
Workgroup #: WG629753	Analyst: TMM	Run Date: 09/14/2017 14:10
Collect Date: 09/13/2017 15:00	Dilution: 5	File ID: 00.1709141410-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.34		0.500	0.250	0.125

Certificate of Analysis

Lab Report #: L17090765
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Sample #: L17090765-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6468	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:25
Workgroup #: WG629753	Analyst: TMM	Run Date: 09/14/2017 14:10
Collect Date: 09/13/2017 15:00	Dilution: 10	File ID: 00.1709141410-07
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.93		1.00	0.500	0.250

Certificate of Analysis

Sample #: L17090765-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6468	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG629808	Analyst: DCM	Run Date: 09/16/2017 02:49
Collect Date: 09/13/2017 15:00	Dilution: 10	File ID: TC09152017.070
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	206		20.0	10.0	5.00

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17090765

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090765-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6468	Prep Method: 6850	Prep Date: 09/21/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 09/08/2017 16:52
Workgroup #: WG630807	Analyst: JWR	Run Date: 09/21/2017 19:13
Collect Date: 09/13/2017 15:00	Dilution: 1	File ID: 1LM.LM40529
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.540		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: 090817_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 WG628979 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (09/08/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: ICAL WG628977 : 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.LM40484	WG628977-01 CCB	1	1		09/08/17 14:40
2	1LM.LM40485	WG628977-02 STD (0.1 ug/L)	1	1	STD80232	09/08/17 14:59
3	1LM.LM40486	WG628977-03 STD (0.2 ug/L)	1	1	STD80232	09/08/17 15:18
4	1LM.LM40487	WG628977-04 STD (0.5 ug/L)	1	1	STD80232	09/08/17 15:37
5	1LM.LM40488	WG628977-05 STD (1.0 ug/L)	1	1	STD80232	09/08/17 15:56
6	1LM.LM40489	WG628977-06 STD (2.0 ug/L)	1	1	STD80232	09/08/17 16:15
7	1LM.LM40490	WG628977-07 STD (5.0 ug/L)	1	1	STD80232	09/08/17 16:34
8	1LM.LM40491	WG628977-08 STD (10 ug/L)	1	1	STD80232	09/08/17 16:52
9	1LM.LM40492	WG628977-09 SSCV (1.0 ug/L)	1	1	STD80234	09/08/17 17:11
10	1LM.LM40493	WG628984-01 CCB	1	1		09/08/17 17:30
11	1LM.LM40494	WG628984-02 CCV (1.0ug/L)	1	1	STD80232	09/08/17 17:49
12	1LM.LM40495	WG628979-05 MRL (0.2ug/L)	1	1	STD80232	09/08/17 18:08
13	1LM.LM40496	WG628979-01 MCT (0.2ug/L)	1	1	STD80234	09/08/17 18:27
14	1LM.LM40497	WG628979-02 BLANK	1	1		09/08/17 18:46
15	1LM.LM40498	WG628979-03 LCS (0.2ug/L)	1	1	STD80234	09/08/17 19:05
16	1LM.LM40499	WG628979-04 LCS2 (0.2ug/L)	1	1	STD80234	09/08/17 19:24
17	1LM.LM40500	L17081653-01	1	1		09/08/17 19:43
18	1LM.LM40501	L17081653-01 (10x) (NR)	1	10		09/08/17 20:02
19	1LM.LM40502	L17081653-01 (100x) (NR)	1	100		09/08/17 20:21
20	1LM.LM40503	L17090079-01	1	1		09/08/17 20:40
21	1LM.LM40504	L17090079-02	1	1		09/08/17 20:59
22	1LM.LM40505	L17090079-03	1	1		09/08/17 21:18
23	1LM.LM40506	WG628984-03 CCV (1.0ug/L)	1	1	STD80232	09/08/17 21:37
24	1LM.LM40507	WG628979-06 MRL (0.2ug/L)	1	1	STD80232	09/08/17 21:56
25	1LM.LM40508	WG628984-04 CCB	1	1		09/08/17 22:15

Comments

Seq.	Rerun	Dil.	Reason	Analytes
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Page: 1

Approved: 11-SEP-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 092117_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 WG630807 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (09/08/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: Samples L17090765-01 and L17091185-01 were analyzed neat and at multiple dilutions based on their range of historical results.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40522	WG630810-01 CCB	1	1		09/21/17 17:00
2	1LM.LM40523	WG630810-02 CCV (1.0ug/L)	1	1	STD80232	09/21/17 17:19
3	1LM.LM40524	WG630807-05 MRL (0.2ug/L)	1	1	STD80232	09/21/17 17:38
4	1LM.LM40525	WG630807-01 MCT (0.2ug/L)	1	1	STD80234	09/21/17 17:57
5	1LM.LM40526	WG630807-02 BLANK	1	1		09/21/17 18:16
6	1LM.LM40527	WG630807-03 LCS (0.2ug/L)	1	1	STD80234	09/21/17 18:35
7	1LM.LM40528	WG630807-04 LCS2 (0.2ug/L)	1	1	STD80234	09/21/17 18:54
8	1LM.LM40529	L17090765-01	1	1		09/21/17 19:13
9	1LM.LM40530	L17090765-01 (10x) (NR)	1	10		09/21/17 19:31
10	1LM.LM40531	L17090765-01 (100x) (NR)	1	100		09/21/17 19:50
11	1LM.LM40532	L17091185-01	1	1		09/21/17 20:09
12	1LM.LM40533	L17091185-01 (10x) (NR)	1	10		09/21/17 20:28
13	1LM.LM40534	L17091185-01 (100x) (NR)	1	100		09/21/17 20:47
14	1LM.LM40535	WG630810-03 CCV (1.0ug/L)	1	1	STD80232	09/21/17 21:06
15	1LM.LM40536	WG630807-06 MRL (0.2ug/L)	1	1	STD80232	09/21/17 21:25
16	1LM.LM40537	WG630810-04 CCB	1	1		09/21/17 21:44

Comments

Seq.	Rerun	Dil.	Reason	Analytes

Eri C. J. J. J.



Microbac Laboratories Inc.

Data Checklist

Date: 08-SEP-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: WG628977
 Runlog ID: 84489
 Analytical Workgroups: L17081653, L17090079

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	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	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	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:
11-SEP-2017



Secondary Reviewer:
11-SEP-2017




Microbac Laboratories Inc.

Data Checklist

Date: 21-SEP-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 84799
 Analytical Workgroups: L17090765, L17091185

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)	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	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-SEP-2017



Secondary Reviewer:
25-SEP-2017




Analytical Method:6850
Login Number:L17090765

AAB#:WG630807

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-SP650-6468	01	09/13/17					09/21/2017	8.1	28		09/21/17	.1	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17090765
 Blank File ID: 1LM.LM40526
 Prep Date: 09/21/17 16:30
 Analyzed Date: 09/21/17 18:16
 Analyst: JWR

Work Group: WG630807
 Blank Sample ID: WG630807-02
 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	WG630807-05	1LM.LM40524	09/21/17 17:38	01
MCT	WG630807-01	1LM.LM40525	09/21/17 17:57	01
LCS	WG630807-03	1LM.LM40527	09/21/17 18:35	01
LCS2	WG630807-04	1LM.LM40528	09/21/17 18:54	01
LH18/24-SP650-6468	L17090765-01	1LM.LM40529	09/21/17 19:13	01
QCMRL	WG630807-06	1LM.LM40536	09/21/17 21:25	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5492584
 Report generated 09/25/2017 10:31



Login Number: L17090765 Prep Date: 09/21/17 16:30 Sample ID: WG630807-02
Instrument ID: LCMS1 Run Date: 09/21/17 18:16 Prep Method: 6850
File ID: 1LM.LM40526 Analyst: JWR Method: 6850
Workgroup (AAB#): WG630807 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-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: 5492585
25-SEP-2017 10:31



Login Number: L17090765 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG630807 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG630807-03 LCS File ID: 1LM.LM40527 Run Date: 09/21/2017 18:35
 Sample ID: WG630807-04 LCS2 File ID: 1LM.LM40528 Run Date: 09/21/2017 18:54

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.204	102	0.200	0.200	100	1.98	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5492586
 Report generated: 09/25/2017 10:31



Login Number: L17090765
Analytical Method: 6850
ICAL Workgroup: WG628977

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.469	6.88	1.00000	

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5493242
Report generated 09/25/2017 11:32



Login Number: L17090765
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	WG628977-02			WG628977-03			WG628977-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	52500.0000	1.681	0.200	93400.0000	1.487	0.500	233000.000	1.445

INT_CAL - Modified 03/06/2008
PDF File ID: 5493242
Report generated 09/25/2017 11:32



Login Number: L17090765
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 08-SEP-17 16:52
 Column ID: F

Analyte	WG628977-05			WG628977-06			WG628977-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	460000.000	1.440	2.00	925000.000	1.444	5.00	2230000.00	1.418

INT_CAL - Modified 03/06/2008
 PDF File ID: 5493242
 Report generated 09/25/2017 11:32



Login Number: L17090765
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	WG628977-08		
	CONC	RESP	RF
Perchlorate	10.0	4190000.00	1.371

INT_CAL - Modified 03/06/2008
PDF File ID: 5493242
Report generated 09/25/2017 11:32



Login Number: L17090765 Run Date: 09/08/2017 Sample ID: WG628977-09
 Instrument ID: LCMS1 Run Time: 17:11 Method: 6850
 File ID: 1LM.LM40492 Analyst: JWR QC Key: DOD4
 ICal Workgroup: WG628977 Cal ID: LCMS1 - 08-SEP-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	1.04	ug/L	1.48	4.00	15	

* Exceeds %D Limit



Login Number: L17090765 Run Date: 09/21/2017 Sample ID: WG630810-01
Instrument ID: LCMS1 Run Time: 17:00 Method: 6850
File ID: 1LM.LM40522 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG630807 Cal ID: LCMS1 - 08-SEP-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: L17090765 Run Date: 09/21/2017 Sample ID: WG630810-04
 Instrument ID: LCMS1 Run Time: 21:44 Method: 6850
 File ID: LLM.LM40537 Analyst: JWR Units: ug/L
 Workgroup (AAB#): WG630807 Cal ID: LCMS1 - 08-SEP-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: 5492589
 Report generated 09/25/2017 10:31



Login Number: L17090765 Run Date: 09/21/2017 Sample ID: WG630810-02
Instrument ID: LCMS1 Run Time: 17:19 Method: 6850
File ID: 1LM.LM40523 Analyst: JWR QC Key: DOD4
Workgroup (AAB#): WG630807 Cal ID: LCMS1 - 08-SEP-17
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.07	ug/L	1.52	7.00	15	

* Exceeds %D Criteria



Login Number: L17090765 Run Date: 09/21/2017 Sample ID: WG630810-03
 Instrument ID: LCMS1 Run Time: 21:06 Method: 6850
 File ID: 1LM.LM40535 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG630807 Cal ID: LCMS1 - 08-SEP-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.06	ug/L	1.51	6.00	15	

* Exceeds %D Criteria



Login Number: L17090765 Run Date: 09/21/2017 Sample ID: WG630807-05
Instrument ID: LCMS1 Run Time: 17:38 Prep Method: 6850
File ID: 1LM.LM40524 Analyst: JWR Method: 6850
Workgroup (AAB#): WG630807 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.196	98.0	70 - 130	



Login Number: L17090765 Run Date: 09/21/2017 Sample ID: WG630807-06
Instrument ID: LCMS1 Run Time: 21:25 Prep Method: 6850
File ID: 1LM.LM40536 Analyst: JWR Method: 6850
Workgroup (AAB#): WG630807 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.198	99.0	70 - 130	



Login Number: L17090765
Instrument ID: LCMS1
Workgroup (AAB#): WG630807

ICAL CCV Number: WG628977-05
CAL ID: LCMS1-08-SEP-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG628977	NA	NA	1580000
Upper Limit	NA	NA	2370000
Lower Limit	NA	NA	790000
<u>L17090765-01</u>	1.00	01	1460000
WG630807-02	1.00	01	1540000
WG630807-03	1.00	01	1590000
WG630807-04	1.00	01	1610000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: 6850	Samplenum: L17090765-01
Instrument: LCMS1	Prep Date: 09/21/2017 16:30	File ID: 1LM.LM40529
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 19:13	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	228000	78400	2.91	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: _____	Samplenum: WG628977-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40485
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/08/2017 14:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	52500	17500	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method: _____
Prep Date: _____
Anal Method: 6850
Analysis Date: 09/08/2017 15:18

Samplenum: WG628977-03
File ID: 1LM.LM40486
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	93400	29500	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: _____	Samplenum: WG628977-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40487
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/08/2017 15:37	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	233000	79100	2.95	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: _____	Samplenum: WG628977-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40488
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/08/2017 15:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	460000	150000	3.07	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method: _____
Prep Date: _____
Anal Method: 6850
Analysis Date: 09/08/2017 16:15

Samplenum: WG628977-06
File ID: 1LM.LM40489
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	925000	303000	3.05	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: _____	Samplenum: WG628977-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40490
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/08/2017 16:34	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2230000	745000	2.99	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: _____	Samplenum: WG628977-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40491
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/08/2017 16:52	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	4190000	1390000	3.01	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method: _____
Prep Date: _____
Anal Method: 6850
Analysis Date: 09/08/2017 17:11

Samplenum: WG628977-09
File ID: 1LM.LM40492
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	478000	152000	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: 6850	Samplenum: WG630807-01
Instrument: LCMS1	Prep Date: 09/21/2017 16:30	File ID: 1LM.LM40525
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 17:57	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	96800	31300	3.09	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method: 6850
Prep Date: 09/21/2017 16:30
Anal Method: 6850
Analysis Date: 09/21/2017 18:16

Samplenum: WG630807-02
File ID: 1LM.LM40526
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	3570	1190	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: 6850	Samplenum: WG630807-03
Instrument: LCMS1	Prep Date: 09/21/2017 16:30	File ID: 1LM.LM40527
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 18:35	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	99800	34700	2.88	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: 6850	Samplenum: WG630807-04
Instrument: LCMS1	Prep Date: 09/21/2017 16:30	File ID: 1LM.LM40528
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 18:54	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	99100	32400	3.06	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: 6850	Samplenum: WG630807-05
Instrument: LCMS1	Prep Date: 09/21/2017 16:30	File ID: 1LM.LM40524
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 17:38	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	92000	28500	3.23	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: 6850	Samplenum: WG630807-06
Instrument: LCMS1	Prep Date: 09/21/2017 16:30	File ID: 1LM.LM40536
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 21:25	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	113000	36600	3.09	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: _____	Samplenum: WG630810-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40522
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 17:00	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	3200	0.000	2.3	3.8	*

Perchlorate Ion Ratios
 Microbac Laboratories Inc.



Login #: L17090765	Prep Method: _____	Samplenum: WG630810-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40523
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 17:19	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	440000	139000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: _____	Samplenum: WG630810-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40535
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 21:06	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	543000	179000	3.03	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17090765	Prep Method: _____	Samplenum: WG630810-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40537
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 21:44	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	53900	2190	24.6	2.3	3.8	*

2.2 General Chemistry Data

2.2.1 Ammonia Data

2.2.1.1 Summary Data

Lab Report #: L17090765

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090765-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: LH18/24-SP650-6468	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 09/19/2017 10:02
Workgroup #: WG630221	Analyst: TMM	Run Date: 09/19/2017 11:10
Collect Date: 09/13/2017 15:00	Dilution: 20	File ID: SC170919001.064
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	43.8		4.00	2.00	1.00

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: 19-SEP-2017
 Analyst: TMM
 Analyst: NA
 Method: NH3
 Instrument: SC1
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG630221 WG630222

Calibration/Linearity	9/19/17
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	X
Primary Reviewer	TMM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
20-SEP-2017

Jammy Morris

Secondary Reviewer:
21-SEP-2017

Denna Johnson



Analytical Method: 350.1
Login Number: L17090765

AAB#: WG630221

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-SP650-6468	01	09/13/17					09/19/2017	5.8	28		09/19/17	5.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17090765 Work Group: WG630221
 Blank File ID: SC170919001.026 Blank Sample ID: WG630221-01
 Prep Date: 09/19/17 10:20 Instrument ID: SMARTCHEM
 Analyzed Date: 09/19/17 10:20 Method: 350.1
 Analyst: TMM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG630221-02	SC170919001.027	09/19/17 10:20	01
DUP	WG630221-04	SC170919001.062	09/19/17 11:06	DL01
LH18/24-SP650-6468	L17090765-01	SC170919001.064	09/19/17 11:10	DL02

Report Name: BLANK_SUMMARY
 PDF File ID: 5486630
 Report generated 09/20/2017 14:41



Login Number: L17090765 Prep Date: 09/19/17 10:20 Sample ID: WG630221-01
 Instrument ID: SMARTCHEM Run Date: 09/19/17 10:20 Prep Method: 350.1
 File ID: SC170919001.026 Analyst: TMM Method: 350.1
 Workgroup (AAB#): WG630221 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: SMARTC-19-SEP-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Nitrogen, Ammonia	0.0500	0.200	0.0858	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: 5486631
 20-SEP-2017 14:42



Login Number: L17090765 Run Date: 09/19/2017 Sample ID: WG630221-02
Instrument ID: SMARTCHEM Run Time: 10:20 Prep Method: 350.1
File ID: SC170919001.027 Analyst: TMM Method: 350.1
Workgroup (AAB#): WG630221 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD83234 Cal ID: SMARTC-19-SEP-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Ammonia	2.00	2.02	101	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5486632
Report generated: 09/20/2017 14:42



2.2 General Chemistry Data

2.2.2 Orthophosphate Data

2.2.2.1 Summary Data

Lab Report #: L17090765

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090765-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6468	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:25
Workgroup #: WG629753	Analyst: TMM	Run Date: 09/14/2017 14:10
Collect Date: 09/13/2017 15:00	Dilution: 5	File ID: 00.1709141410-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.34		0.500	0.250	0.125

Certificate of Analysis

Sample #: L17090765-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6468	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:25
Workgroup #: WG629753	Analyst: TMM	Run Date: 09/14/2017 14:10
Collect Date: 09/13/2017 15:00	Dilution: 10	File ID: 00.1709141410-07
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.93		1.00	0.500	0.250

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

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

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: 14-SEP-2017
 Analyst: TMM
 Analyst: NA
 Method: PO4
 Instrument: V-1200
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG629753

Calibration/Linearity	9/7/17
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	X
Primary Reviewer	TMM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
18-SEP-2017

Jammy Morris

Secondary Reviewer:
21-SEP-2017

Denna Johnson



Analytical Method: 365.2
Login Number: L17090765

AAB#: WG629753

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-SP650-6468	01	09/13/17					09/14/2017	1	2		09/14/17	1	2	
LH18/24-SP650-6468	01	09/13/17					09/14/2017	1	2		09/14/17	1	2	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5486242
Report generated 09/20/2017 13:04



METHOD BLANK SUMMARY

Login Number: L17090765 Work Group: WG629753
 Blank File ID: 00.1709141410-03 Blank Sample ID: WG629753-01
 Prep Date: 09/14/17 14:10 Instrument ID: V-1200
 Analyzed Date: 09/14/17 14:10 Method: 365.2
 Analyst: TMM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG629753-02	00.1709141410-04	09/14/17 14:10	
LCS2	WG629753-03	00.1709141410-05	09/14/17 14:10	
LH18/24-SP650-6468	L17090765-01	00.1709141410-06	09/14/17 14:10	
LH18/24-SP650-6468	L17090765-01	00.1709141410-07	09/14/17 14:10	DL01
DUP	WG629753-05	00.1709141410-08	09/14/17 14:10	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5486243
 Report generated 09/20/2017 13:04



Login Number: L17090765 Prep Date: 09/14/17 14:10 Sample ID: WG629753-01
Instrument ID: V-1200 Run Date: 09/14/17 14:10 Prep Method: 365.2
File ID: 00.1709141410-03 Analyst: TMM Method: 365.2
Workgroup (AAB#): WG629753 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: V-1200-13-SEP-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: 5486244
20-SEP-2017 13:04



Login Number: L17090765 Analyst: TMM Prep Method: 365.2
 Instrument ID: V-1200 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG629753 Units: mg/L
 QC Key: DOD4 Lot #: STD83662
 Sample ID: WG629753-02 LCS File ID: 00.1709141410-04 Run Date: 09/14/2017 14:10
 Sample ID: WG629753-03 LCS2 File ID: 00.1709141410-05 Run Date: 09/14/2017 14:10

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	0.989	98.9	1.00	0.981	98.1	0.804	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5486245
 Report generated: 09/20/2017 13:04



2.2.2.3 Raw Data

Curves

WG 628802

Parameter: P04

Spectrophotometer: V-1200

Calibration (Curve) standard stock: STD 79640

Concentration: 1000 mg/L

Recipe for preparation of curve standards found in:

SOP: 3653 Revision: 11 Page: 9

Second Source Stock: STD 83662 (concentration: 10 mg/L)

Daily Preparation: 10 (10) / 100 x

concentration = _____

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
STD 1	1.0	50	880	0.630
STD 2	0.7	1		0.443
STD 3	0.5	1		0.316
STD 4	0.2	1		0.125
STD 5	0.1	1		0.064
STD 6	0.05	1		0.029
STD 7	0.02	1		0.000
2nd Source 1.0	1	1		0.636

Analyst: Anthony Payne

Date/Time: 09-07-17 / 1525

DCN#128143



Microbac Laboratories Inc.
INITIAL CALIBRATION

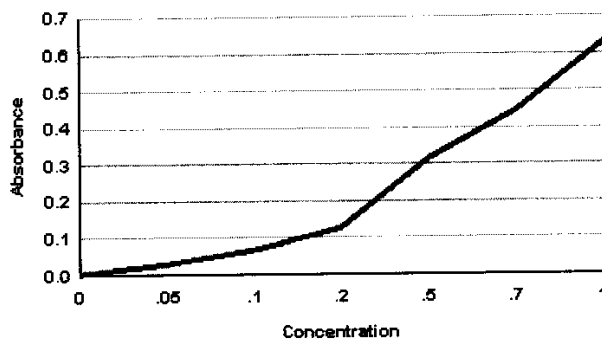
Workgroup: WG628802
Analytical Method: 300
Instrument ID: V-1200

Analyst: DLP
Initial Calibration Date: 09/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.631729
Y-Intercept: -0.000558313
Coef. Of Correlation (R^2): 0.999969
Coef. Of Correlation (R): 0.999985

Concentration X	Absorbance Y	X ²	X * Y	Y-Fitted (mX^2+B)
0.00	0.00	0.00	0.00	-0.000558313
0.0500	0.0290	0.00250	0.00145	0.0310281
0.100	0.0640	0.0100	0.00640	0.0626146
0.200	0.125	0.0400	0.0250	0.125787
0.500	0.316	0.250	0.158	0.315306
0.700	0.443	0.490	0.310	0.441652
1.00	0.630	1.00	0.630	0.631170

Curve Fit



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 09/07/2017 16:16



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

00861742

Workgroup #: WG628802
File ID: 00.1709071525-08
CCV ID: WG628802-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 09/07/2017
Run Time: 15:25
Analyst: DLP
Cal ID: V-1200 - 07-SEP-17 15:25:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.01	0.636	1.0	

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

WET_WG_SSCV - Modified 03/06/2008
Report generated 09/07/2017 16:17



Orthophosphate
(orthophosphate1)

EPA 365.2 / SM4500-P E
SOP K3653 Rev 17
Color Reagent Chemicals
RB+41099
40466
41073
CoA18278

CCV: Std 83661 LCS: Std 83662
Daily Dilution: 5(5)/50= Daily Dilution: 0(10)/100=
Daily Dilution: 0.5 Daily Dilution: 1
Spectrophotometer: V-1200 Curve ID: 628802
9/17/17

Spike: 83662
Daily Dilution: 2(10)/50
Daily Dilution: =0.4

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: 0.5 mg/L	50	✓	0.318	
BLK/CCB:	50	✓	0.002	
LCS: 1.0 ppm	50	✓	0.624	
LCSD: 1.0 ppm	50	✓	0.619	
09-765-01	50	✓	0.422	
09-765-01	50	✓	0.248	
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
CCV:	50			
CCB:	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
DUP 09-765-01	50	✓	0.254	
MS: (0.4) ↓	50	✓	0.268	
MSD: ()	50			
CCV: ()	50		0.318	
CCB:	50		0.318 0.001	

Analyst: Jimmy Morris

Date / Time: 9/14/17 10:14:10

DCN#128299



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG629753Analyst: TMMAnalyte: ORTHOPHOSPHATEDate: 09/14/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG629753-01	50	50	0.00200	0.6317	-0.0005583	0.0040497	0.0040497	1	mg/L
WG629753-02	50	50	0.624	0.6317	-0.0005583	0.98865	0.98865	1	mg/L
WG629753-03	50	50	0.619	0.6317	-0.0005583	0.98073	0.98073	1	mg/L
L17090765-01	50	50	0.422	0.6317	-0.0005583	0.66889	3.3445	5	mg/L
WG629753-04	50	50	0.422	0.6317	-0.0005583	0.66889	3.3445	5	mg/L
WG629753-04	50	50	0.248	0.6317	-0.0005583	0.39346	3.9346	10	mg/L
L17090765-01	50	50	0.248	0.6317	-0.0005583	0.39346	3.9346	10	mg/L
WG629753-05	50	50	0.254	0.6317	-0.0005583	0.40296	4.0296	10	mg/L
WG629753-06	50	50	0.268	0.6317	-0.0005583	0.42512	4.2512	10	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 09/18/2017 14:04

Workgroup #: WG630178
File ID: 00.1709141410-10
CCV ID: WG630178-03
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 09/14/2017
Run Time: 14:10
Analyst: TMM
Cal ID: V-1200 - 13-SEP-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.504	0.636	0.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 09/18/2017 14:15



Workgroup #: WG630178 Instrument ID: V-1200
File ID: 00.1709141410-01 Run Date: 09/14/2017
CCV ID: WG630178-01 Run Time: 14:10
Units: mg/L Analyst: TMM
Analyte: ORTHOPHOSPHATE Cal ID: V-1200 - 13-SEP-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.504	0.636	0.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 09/18/2017 14:15



2.2 General Chemistry Data

2.2.3 Total Organic Carbon Data

2.2.3.1 Summary Data

Lab Report #: L17090765

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17090765-01

PrePrep Method: N/A

Instrument: TOC-VWP

Client ID: LH18/24-SP650-6468

Prep Method: 415.1

Prep Date: N/A

Matrix: Water

Analytical Method: 415.1

Cal Date: 02/10/2017 10:25

Workgroup #: WG629808

Analyst: DCM

Run Date: 09/16/2017 02:49

Collect Date: 09/13/2017 15:00

Dilution: 10

File ID: TC09152017.070

Sample Tag: DL01

Units: mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	206		20.0	10.0	5.00

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: 15-SEP-2017
 Analyst: DCM
 Analyst: NA
 Method: TOC
 Instrument: TOC
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG629808 WG629813

Calibration/Linearity	2/10/17
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	
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	DIH
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
21-SEP-2017

Secondary Reviewer:
21-SEP-2017

Dianna Johnson

Dianna Johnson



Analytical Method: 415.1
Login Number: L17090765

AAB#: WG629808

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-SP650-6468	01	09/13/17					09/16/2017	2.5	28		09/16/17	2.5	28	

* = SEE PROJECT QAPP REQUIREMENTS



Login Number: L17090765 Prep Date: 09/15/17 08:52 Sample ID: WG629808-01
Instrument ID: TOC-VWP Run Date: 09/15/17 08:52 Prep Method: 415.1
File ID: TC09152017.004 Analyst: DCM Method: 415.1
Workgroup (AAB#): WG629808 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: 5488747
21-SEP-2017 15:00



Login Number: L17090765 Analyst: DCM Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG629808 Units: mg/L
 QC Key: DOD4 Lot #: STD83735
 Sample ID: WG629808-02 LCS File ID: TC09152017.005 Run Date: 09/15/2017 09:04
 Sample ID: WG629808-03 LCS2 File ID: TC09152017.006 Run Date: 09/15/2017 09:16

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	24.2	96.8	25.0	24.7	98.6	1.84	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5488748
 Report generated: 09/21/2017 15:01



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 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

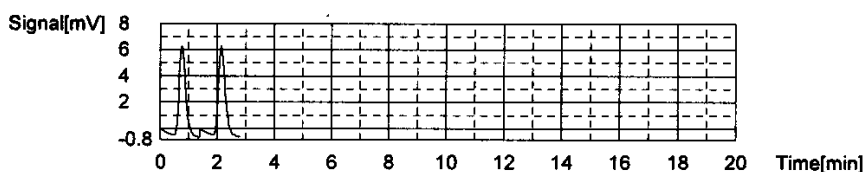
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

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

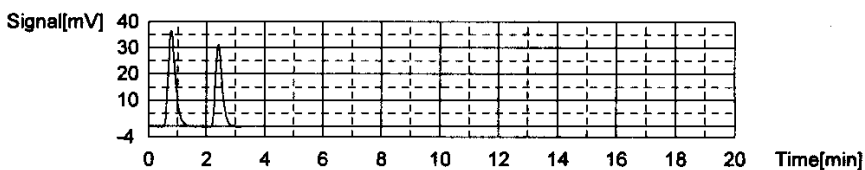
Acid Add. 0.000%
 Mean Area 10.82



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

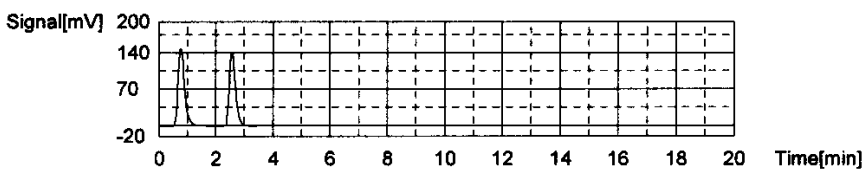
Acid Add. 0.000%
 Mean Area 57.92



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

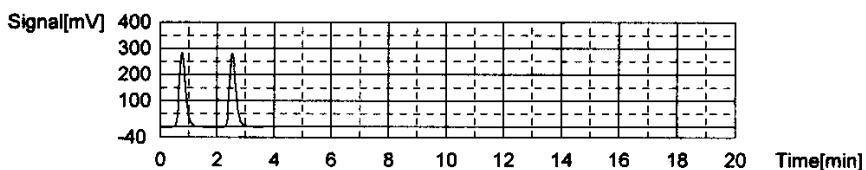


Conc: 10.00mg/L

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

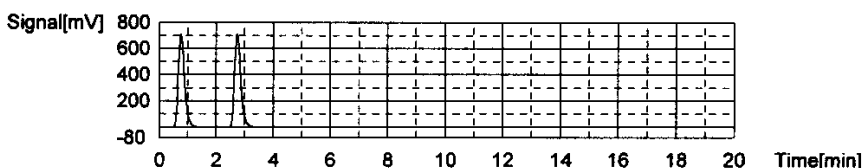
Acid Add. 0.000%
Mean Area 440.2



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

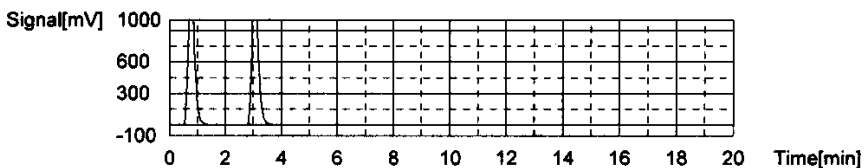
Acid Add. 0.000%
Mean Area 1092



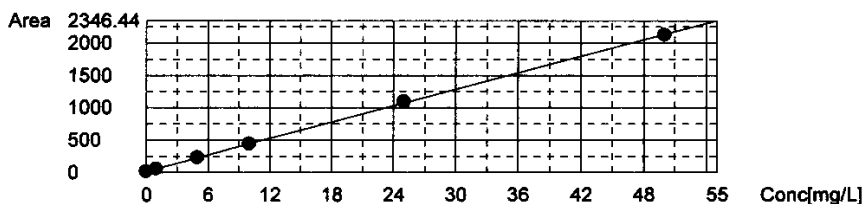
Conc: 50.00mg/L

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

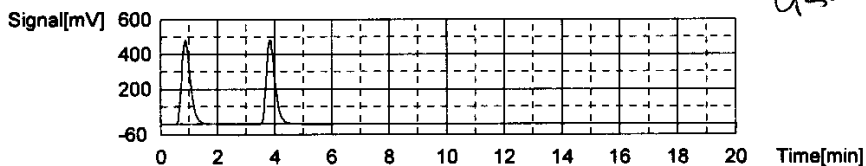
1. Det

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

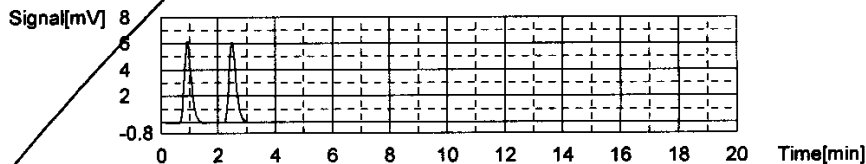
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

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

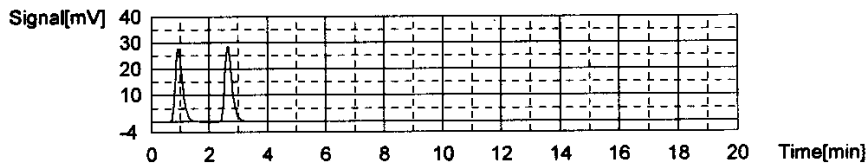
Acid Add. 3.000%
Mean Area 10.51



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

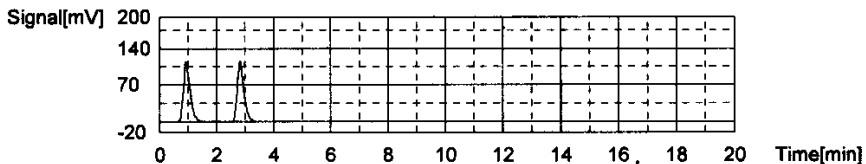


Conc: 5.000mg/L

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*

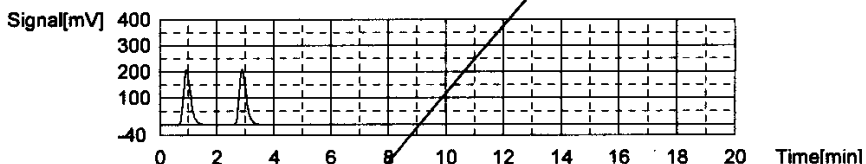
Acid Add. 3.000%
Mean Area 189.6



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

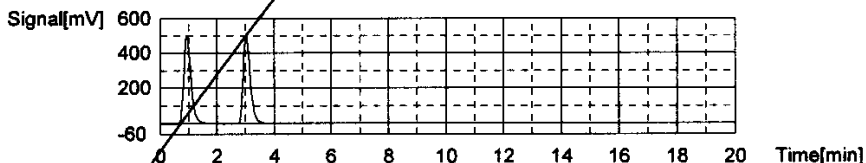
Acid Add. 3.000%
Mean Area 361.4



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

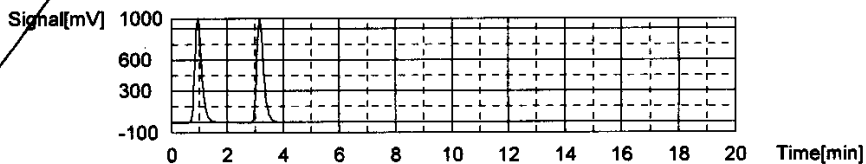
Acid Add. 3.000%
Mean Area 858.1



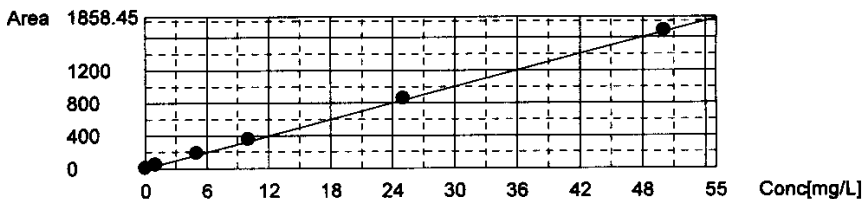
Conc: 50.00mg/L

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

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

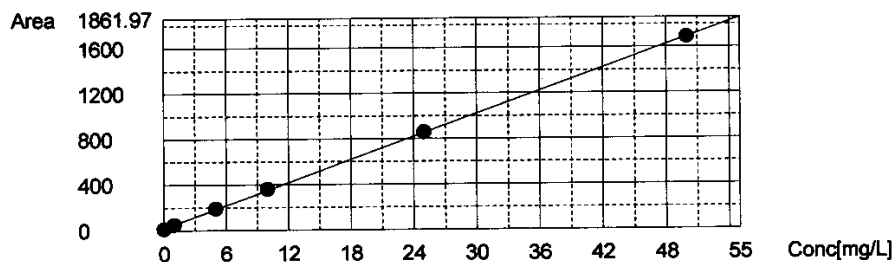
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

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:

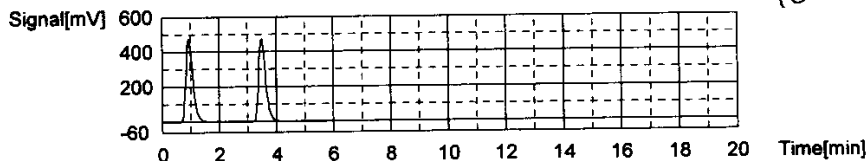
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

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:

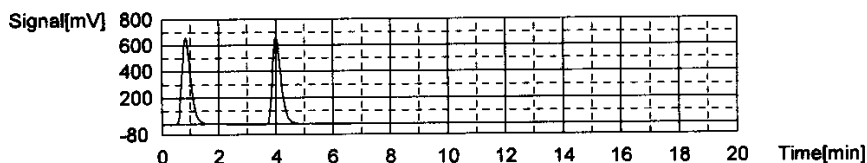
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

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

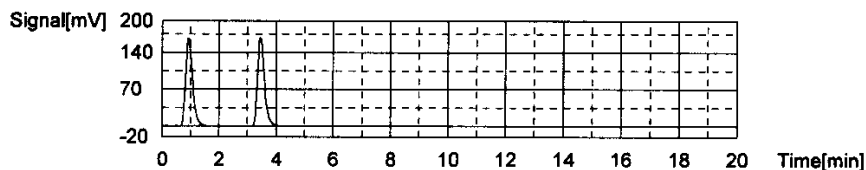
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

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	2/10/2017 4:37:09 PM
2	287.2	8.577mg/L	500ul	1		TICCURVE-02-10-2017.2017_02_10_14_45	2/10/2017 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

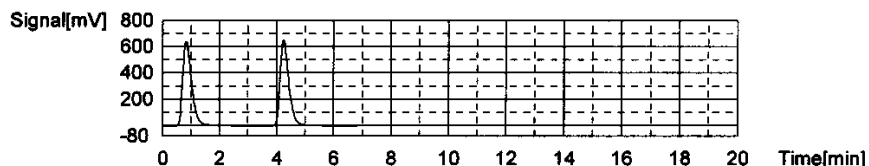
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

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	2/10/2017 4:55:07 PM
2	1373	32.04mg/L	500ul	1		TCCURVE-02-10-2017.2017_02_10_09_32_52	2/10/2017 5:01:02 PM

Mean Area 1376
Mean Conc. 32.10mg/L



629813

Total Organic Carbon

MAKE DAILY

CCV (TOC): Std 79381
 (5/200)(1000) = 25mg/L

LCS (TOC): Std 83735
 (5/200)(1000) = 25mg/L

CCV (TIC): Std 83359
 (5/200)(1000) = 25mg/L

MS (TOC): Std 83735
 0.4(1000) = 400

Calibration Curve Date: 2/10/17

Reagent: RGT 90883
REIT 41061

SM5310-C : Matrix 2 WG 629805 629813
 EPA 415.1/9060A(mod): Matrix 1 WG 629808 SOP: K 4151 Rev. 19
 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	TIC	
2	TOC/TIC	
3	CCV	
4	Blk	
5	LCS	
6	LCS/DUP	
7	09-688-01	
8	C2	
9	C3	
10	C4	
11	C5	1/3
12	C6	1/3
13	C7	1/3
14	CCV	
15	CCB	
16	09-688-08	
17	C9	
18	10	
19	11	1/3
20	12	
21	09-705-05	1/5
22	09-771-01	
23	MS C2	
24	MSD C3	
25	C4	

Position	Sample ID	Dilution
26	CCV	
27	CCB	
28	09-771-05	dup
29	09-771-07	dup
30	C7	
31	C8	
32	C9	
33	DUP 09-771-09	
34	Blk	
35	LCS	
36	LCS/DUP	
37	09-718-01	
38	CCV	
39	CCB	
40	09-718-02	
41	C3	
42	09-719-01	
43	C2	
44	09-720-01	
45	C2	
46	C3	
47	C4	
48	C5	
49	C6	
50	CCV	

Position	Sample ID	Dilution
51	CCB	
52	09-720-07	
53	09-771-10	
54	11	
55	12	
56	13	1/2
57	14	1/2
58	15	
59	MS 16	
60	MSD 17	
61	09-770-03	09-885-01
62	CCV	
63	CCB	
64	DUP 09-885-03	
65	09-885-03	
66	CCV	
67	CCB	
68		
69		
70		
71		
72		
73		
74		
75		

Analyst: David Merckelb Date/Time: 9/15/17 0822

DCN#128309



Total Organic Carbon

MAKE DAILY

CCV (TOC): _____
 $(5/200)(1000) = 25\text{mg/L}$

LCS (TOC): _____
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): _____
 $(5/200)(1000) = 25\text{mg/L}$

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

see
pg. 1

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

done
9/15/17

Position	Sample ID	Dilution	Position	Sample ID	Dilution	Position	Sample ID	Dilution
1	09-688-03	1/2	26			51		
2	04	1/2	27			52		
3	09-765-01	1/2	28			53		
4	09-771-01	1/3	29			54		
5	MS C2	1/3	30			55		
6	MSD C3	1/3	31			56		
7	04	1/3	32			57		
8	05	1/2	33			58		
9	06	1/2	34			59		
10	CCV		35			60		
11	ECB		36			61		
12			37			62		
13			38			63		
14			39			64		
15			40			65		
16			41			66		
17			42			67		
18			43			68		
19			44			69		
20			45			70		
21			46			71		
22			47			72		
23			48			73		
24			49			74		
25			50			75		

Analyst: David Merrill Date/Time: 9/15/17

pg. 2

DCN#128309



	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:1.422mg/L TC:25.43mg/L IC:24.00mg/L	Complete	9/15/2017 8:22:33 AM	1
2	TOC	TOC/TIC	TOC:25.66mg/L TC:33.98mg/L IC:8.317mg/L	Complete	9/15/2017 8:35:11 AM	2
3	TOC	CCV	!!Error!! TOC:24.35mg/L TC:24.03mg/L IC:-0.3152mg/L	Complete	9/15/2017 8:47:23 AM	3
4	TOC	WG629808-01 BLK	!!Error!! TOC:0.06805mg/L TC:-0.1917mg/L IC:-0.2597mg/L	Complete	9/15/2017 8:56:18 AM	0
5	TOC	WG629808-02 LCS	!!Error!! TOC:24.20mg/L TC:23.87mg/L IC:-0.3354mg/L	Complete	9/15/2017 9:08:30 AM	5
6	TOC	WG629808-03 LCSDUP	!!Error!! TOC:24.65mg/L TC:24.31mg/L IC:-0.3338mg/L	Complete	9/15/2017 9:20:38 AM	6
7	TOC	L17090688-01	TOC:1.445mg/L TC:46.29mg/L IC:44.84mg/L	Complete	9/15/2017 9:33:34 AM	7
8	TOC	L17090688-02	TOC:0.4712mg/L TC:49.52mg/L IC:49.05mg/L	Complete	9/15/2017 9:46:34 AM	8
9	TOC		!!Error!! TOC:-0.1696mg/L TC:51.27mg/L IC:51.44mg/L	Complete	9/15/2017 10:00:03 AM	9
10	TOC		!!Error!! TOC:-5.675mg/L TC:59.12mg/L IC:64.79mg/L	Complete	9/15/2017 10:13:56 AM	10
11	TOC	L17090688-05 (3)	TOC:1.348mg/L TC:32.51mg/L IC:31.17mg/L	Complete	9/15/2017 10:26:23 AM	11
12	TOC	L17090688-06 (3)	TOC:1.366mg/L TC:31.3mg/L IC:31.76mg/L	Complete	9/15/2017 10:39:05 AM	12
13	TOC	L17090688-07 (3)	TOC:0.9608mg/L TC:28.97mg/L IC:28.01mg/L	Complete	9/15/2017 10:51:46 AM	13
14	TOC	CCV	!!Error!! TOC:24.38mg/L TC:24.17mg/L IC:-0.2053mg/L	Complete	9/15/2017 11:03:59 AM	14
15	TOC	CCB	!!Error!! TOC:0.06186mg/L TC:-0.1888mg/L IC:-0.2507mg/L	Complete	9/15/2017 11:12:57 AM	0
16	TOC	L17090688-08	TOC:3.486mg/L TC:43.38mg/L IC:42.63mg/L	Complete	9/15/2017 11:26:26 AM	16
17	TOC	L17090688-09	TOC:3.074mg/L TC:36.84mg/L IC:33.76mg/L	Complete	9/15/2017 11:39:22 AM	17
18	TOC	L17090688-10	TOC:3.109mg/L TC:30.17mg/L IC:27.06mg/L	Complete	9/15/2017 11:58:00 AM	18
19	TOC	L17090688-11 (3)	TOC:2.303mg/L TC:26.16mg/L IC:23.85mg/L	Complete	9/15/2017 12:10:50 PM	19
20	TOC	L17090688-12	TOC:3.366mg/L TC:44.82mg/L IC:41.26mg/L	Complete	9/15/2017 12:24:34 PM	20
21	TOC		TOC:41.17mg/L TC:51.75mg/L IC:10.57mg/L	Complete	9/15/2017 12:38:16 PM	21
22	TOC	W629808-04 ref	!!Error!! TOC:-8.933mg/L TC:59.92mg/L IC:68.85mg/L	Complete	9/15/2017 12:51:58 PM	22
23	TOC	-06.M5	TOC:3.945mg/L TC:62.05mg/L IC:58.10mg/L	Complete	9/15/2017 1:05:26 PM	23
24	TOC		TOC:3.306mg/L TC:59.83mg/L IC:56.52mg/L	Complete	9/15/2017 1:18:45 PM	24
25	TOC		!!Error!! TOC:-11.14mg/L TC:61.48mg/L IC:72.62mg/L	Complete	9/15/2017 1:32:45 PM	25
26	TOC	CCV	TOC:23.80mg/L TC:23.87mg/L IC:0.06975mg/L	Complete	9/15/2017 1:45:03 PM	26
27	TOC	CCB	!!Error!! TOC:0.04609mg/L TC:-0.1768mg/L IC:-0.2229mg/L	Complete	9/15/2017 1:53:57 PM	0
28	TOC		!!Error!! TOC:-6.486mg/L TC:57.44mg/L IC:63.93mg/L	Complete	9/15/2017 2:07:12 PM	28
29	TOC		!!Error!! TOC:-3.926mg/L TC:54.42mg/L IC:58.34mg/L	Complete	9/15/2017 2:21:24 PM	29
30	TOC	L17090771-07	TOC:2.214mg/L TC:38.96mg/L IC:36.75mg/L	Complete	9/15/2017 2:34:45 PM	30
31	TOC	L17090771-08	TOC:1.999mg/L TC:42.72mg/L IC:40.72mg/L	Complete	9/15/2017 2:48:25 PM	31
32	TOC	L17090771-09	TOC:1.761mg/L TC:26.87mg/L IC:25.11mg/L	Complete	9/15/2017 3:05:31 PM	32
33	TOC	WG629808-05 DUP	TOC:1.963mg/L TC:27.76mg/L IC:25.80mg/L	Complete	9/15/2017 3:18:24 PM	33
34	TOC	WG629813-01 BLK	!!Error!! TOC:0.04123mg/L TC:-0.1750mg/L IC:-0.2162mg/L	Complete	9/15/2017 3:34:42 PM	0
35	TOC	WG629813-02 LCS	!!Error!! TOC:25.02mg/L TC:24.78mg/L IC:-0.2493mg/L	Complete	9/15/2017 3:55:45 PM	35
36	TOC	WG629813-03 LCSDUP	!!Error!! TOC:25.07mg/L TC:24.81mg/L IC:-0.2607mg/L	Complete	9/15/2017 4:16:45 PM	36
37	TOC	L17090718-01	TOC:3.138mg/L TC:9.309mg/L IC:6.171mg/L	Complete	9/15/2017 4:38:04 PM	37
38	TOC	CCV	!!Error!! TOC:25.22mg/L TC:24.98mg/L IC:-0.2399mg/L	Complete	9/15/2017 4:50:20 PM	38
39	TOC	CCB	!!Error!! TOC:0.07721mg/L TC:-0.2002mg/L IC:-0.2774mg/L	Complete	9/15/2017 4:59:14 PM	0
40	TOC	L17090718-02	TOC:7.166mg/L TC:24.20mg/L IC:17.03mg/L	Complete	9/15/2017 5:21:52 PM	40
41	TOC		!!Error!! TOC:-2.631mg/L TC:69.54mg/L IC:72.17mg/L	Complete	9/15/2017 5:46:23 PM	41
42	TOC	L17090719-01	TOC:3.278mg/L TC:12.49mg/L IC:9.217mg/L	Complete	9/15/2017 6:10:25 PM	42
43	TOC	L17090719-02	TOC:1.559mg/L TC:9.214mg/L IC:7.655mg/L	Complete	9/15/2017 6:33:18 PM	43
44	TOC	L17090720-01	TOC:14.95mg/L TC:21.07mg/L IC:6.116mg/L	Complete	9/15/2017 6:56:12 PM	44
45	TOC	L17090720-02	TOC:7.578mg/L TC:19.62mg/L IC:12.04mg/L	Complete	9/15/2017 7:18:02 PM	45
46	TOC	L17090720-03	TOC:20.83mg/L TC:32.94mg/L IC:12.11mg/L	Complete	9/15/2017 7:40:35 PM	46
47	TOC	L17090720-04	TOC:6.362mg/L TC:9.266mg/L IC:2.904mg/L	Complete	9/15/2017 8:01:58 PM	47
48	TOC	L17090720-05	TOC:17.04mg/L TC:27.53mg/L IC:10.49mg/L	Complete	9/15/2017 8:26:03 PM	48
49	TOC	L17090720-06	TOC:4.970mg/L TC:7.283mg/L IC:2.313mg/L	Complete	9/15/2017 8:47:59 PM	49
50	TOC	CCV	!!Error!! TOC:26.17mg/L TC:25.92mg/L IC:-0.2456mg/L	Complete	9/15/2017 9:00:39 PM	50
51	TOC	CCB	!!Error!! TOC:0.07064mg/L TC:-0.1847mg/L IC:-0.2554mg/L	Complete	9/15/2017 9:09:32 PM	0
52	TOC	L17090720-07	TOC:6.525mg/L TC:9.955mg/L IC:3.429mg/L	Complete	9/15/2017 9:31:24 PM	52
53	TOC	L17090771-10	TOC:2.606mg/L TC:19.27mg/L IC:16.67mg/L	Complete	9/15/2017 9:53:29 PM	53
54	TOC	L17090771-11	TOC:2.208mg/L TC:2.723mg/L IC:0.5141mg/L	Complete	9/15/2017 10:13:54 PM	54
55	TOC	L17090771-12	TOC:3.115mg/L TC:25.65mg/L IC:22.53mg/L	Complete	9/15/2017 10:36:12 PM	55
56	TOC	L17090771-13 (2)	TOC:2.437mg/L TC:12.11mg/L IC:9.674mg/L	Complete	9/15/2017 10:57:19 PM	56
57	TOC	L17090771-14 (2)	TOC:2.579mg/L TC:14.39mg/L IC:11.82mg/L	Complete	9/15/2017 11:18:46 PM	57
58	TOC ref	<Untitled> W629808-04	!!Error!! TOC:-2.183mg/L TC:53.75mg/L IC:55.94mg/L	Complete	9/15/2017 11:41:50 PM	58
59	TOC	<Untitled> W629808-06	TOC:22.91mg/L TC:47.21mg/L IC:24.30mg/L	Complete	9/16/2017 12:05:04 AM	59
60	TOC	<Untitled>	TOC:22.92mg/L TC:44.40mg/L IC:21.47mg/L	Complete	9/16/2017 12:27:29 AM	60
61	TOC	L17090885-01	TOC:3.949mg/L TC:7.323mg/L IC:3.374mg/L	Complete	9/16/2017 12:48:49 AM	61
62	TOC	CCV	!!Error!! TOC:25.21mg/L TC:24.98mg/L IC:-0.2313mg/L	Complete	9/16/2017 1:01:12 AM	62
63	TOC	CCB	!!Error!! TOC:0.05705mg/L TC:-0.1850mg/L IC:-0.2420mg/L	Complete	9/16/2017 1:10:08 AM	0
64	TOC	WG629813-05 DUP	TOC:11.74mg/L TC:37.24mg/L IC:25.50mg/L	Complete	9/16/2017 1:33:22 AM	64
65	TOC	L17090885-03	TOC:3.515mg/L TC:5.327mg/L IC:1.813mg/L	Complete	9/16/2017 1:54:34 AM	65
66	TOC	CCV	!!Error!! TOC:25.33mg/L TC:25.09mg/L IC:-0.2402mg/L	Complete	9/16/2017 2:06:55 AM	66
67	TOC	CCB	!!Error!! TOC:0.06323mg/L TC:-0.1818mg/L IC:-0.2450mg/L	Complete	9/16/2017 2:15:52 AM	0

9/18/2017 7:39:26 AM

1/2

	Analysis	Sample Name	Result	Status	Date / Time	Vial
68	TOC		TOC:1.508mg/L TC:7.450mg/L IC:5.942mg/L	Complete	9/16/2017 2:28:04 AM	1
69	TOC		TOC:2.190mg/L TC:9.414mg/L IC:7.224mg/L	Complete	9/16/2017 2:40:58 AM	2
70	TOC	L17090765-01 (10)	TOC:20.63mg/L TC:22.26mg/L IC:1.631mg/L	Complete	9/16/2017 2:53:40 AM	3
71	TOC		TOC:1.674mg/L TC:7.521mg/L IC:5.847mg/L	Complete	9/16/2017 3:05:36 AM	4
72	TOC		TOC:5.486mg/L TC:9.690mg/L IC:4.204mg/L	Complete	9/16/2017 3:17:49 AM	5
73	TOC		TOC:5.014mg/L TC:10.04mg/L IC:5.029mg/L	Complete	9/16/2017 3:29:56 AM	6
74	TOC		TOC:1.713mg/L TC:7.330mg/L IC:5.617mg/L	Complete	9/16/2017 3:41:59 AM	7
75	TOC		TOC:2.146mg/L TC:8.802mg/L IC:6.656mg/L	Complete	9/16/2017 3:54:24 AM	8
76	TOC		TOC:1.759mg/L TC:8.376mg/L IC:6.617mg/L	Complete	9/16/2017 4:06:27 AM	9
77	TOC	CCV	!!Error!! TOC:25.43mg/L TC:25.21mg/L IC:-0.2169mg/L	Complete	9/16/2017 4:18:41 AM	10
78	TOC	CCB	!!Error!! TOC:0.1209mg/L TC:-0.1152mg/L IC:-0.2361mg/L	Complete	9/16/2017 4:27:42 AM	0

9/18/2017 7:39:27 AM

2/2

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

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

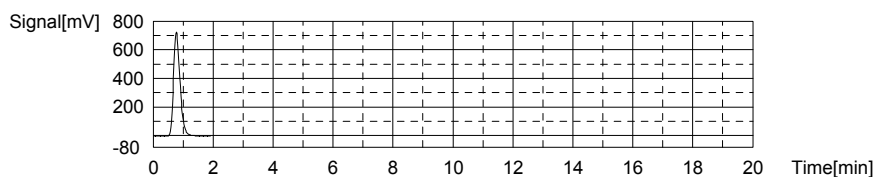
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.422mg/L TC:25.43mg/L IC:24.00mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1093	25.43mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 8:17:19 AM

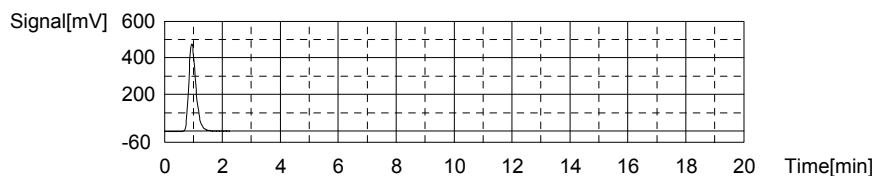
Mean Area 1093
 Mean Conc. 25.43mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	822.2	24.00mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 8:22:33 AM

Mean Area 822.2
 Mean Conc. 24.00mg/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:25.66mg/L TC:33.98mg/L IC:8.317mg/L

1. Det

Anal.: TC

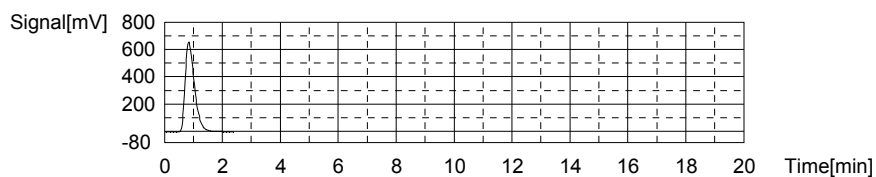
1/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1455	33.98mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	15/2017 8:30:24 AM

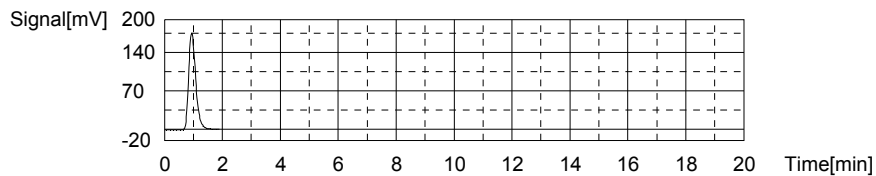
Mean Area 1455
Mean Conc. 33.98mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	296.9	8.317mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	15/2017 8:35:11 AM

Mean Area 296.9
Mean Conc. 8.317mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

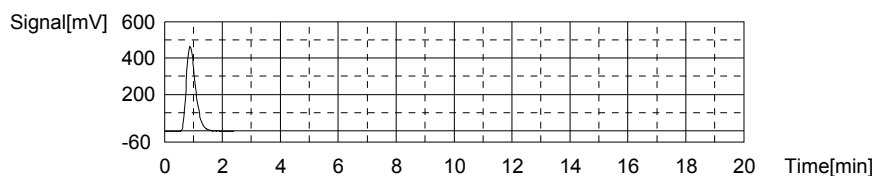
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.35mg/L TC:24.03mg/L IC:-0.3152mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1034	24.03mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	15/2017 8:43:00 AM

Mean Area 1034
Mean Conc. 24.03mg/L



Anal.: IC

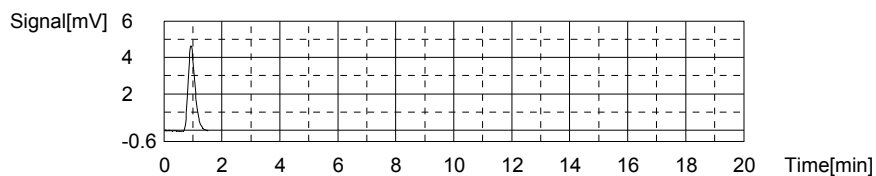
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.860	-0.3152mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	15/2017 8:47:23 AM

2/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Mean Area 7.860
Mean Conc. -0.3152mg/L



Sample

Sample Name: WG629808-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

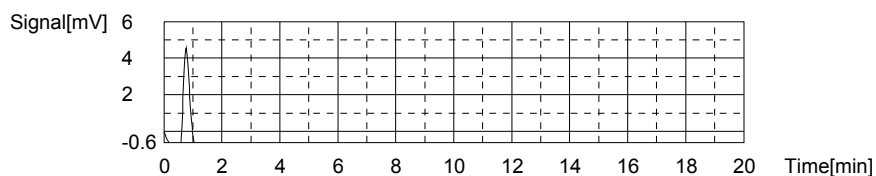
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06805mg/L TC:-0.1917mg/L IC:-0.2597mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.752	-0.1917mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_09_32_59	15/2017 8:52:23 AM

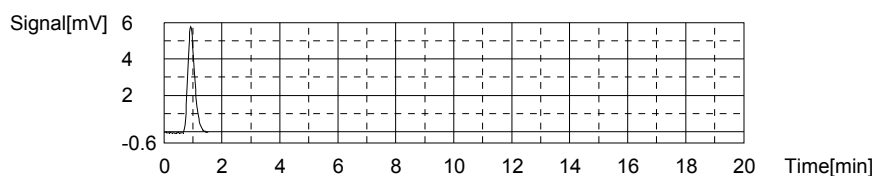
Mean Area 8.752
Mean Conc. -0.1917mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.717	-0.2597mg/L	500uL	1		TIC-CURVE-02-10-2017.2017_02_10_14_45_19	15/2017 8:56:18 AM

Mean Area 9.717
Mean Conc. -0.2597mg/L



Sample

Sample Name: WG629808-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.20mg/L TC:23.87mg/L IC:-0.3354mg/L

3/54

9/18/2017 7:39:45 AM

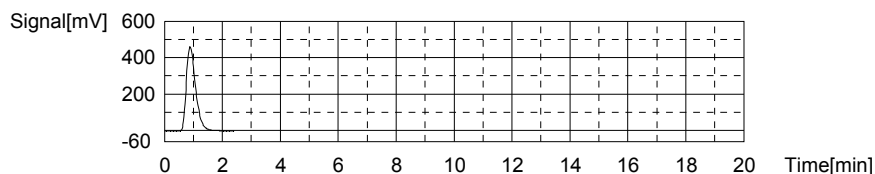
09-15-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1027	23.87mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 9:04:10 AM

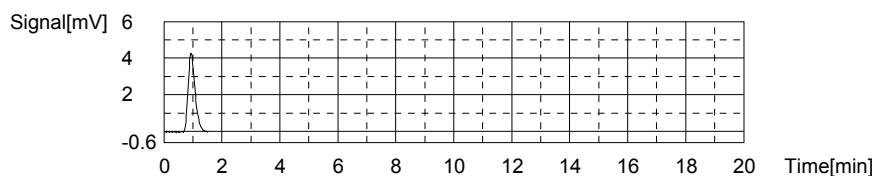
Mean Area 1027
Mean Conc. 23.87mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.185	-0.3354mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 9:08:30 AM

Mean Area 7.185
Mean Conc. -0.3354mg/L



Sample

Sample Name: WG629808-03 LCSDUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

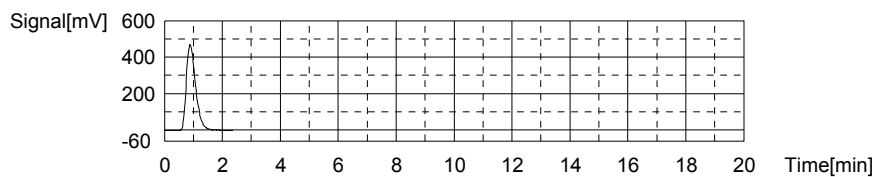
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.65mg/L TC:24.31mg/L IC:-0.3338mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1046	24.31mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 9:16:17 AM

Mean Area 1046
Mean Conc. 24.31mg/L



Anal.: IC

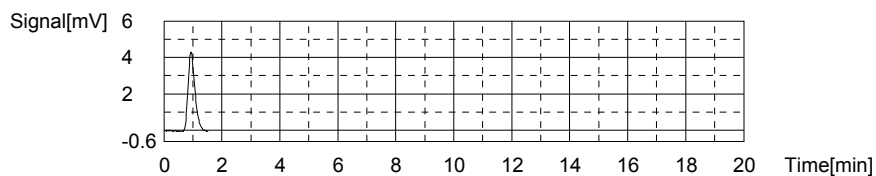
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.238	-0.3338mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 9:20:38 AM

4/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Mean Area 7.238
Mean Conc. -0.3338mg/L



Sample

Sample Name: L17090688-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

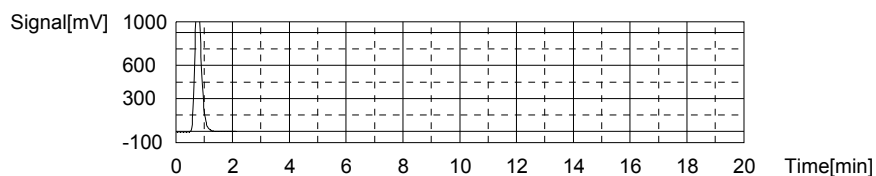
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.445mg/L TC:46.29mg/L IC:44.84mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1976	46.29mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 9:28:13 AM

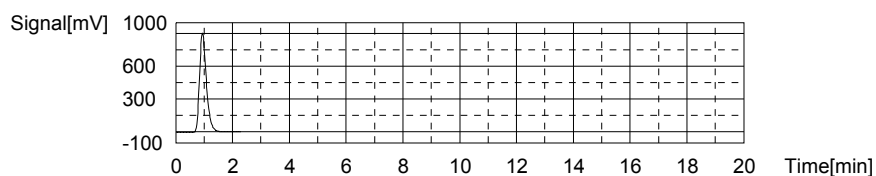
Mean Area 1976
Mean Conc. 46.29mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1520	44.84mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 9:33:34 AM

Mean Area 1520
Mean Conc. 44.84mg/L



Sample

Sample Name: L17090688-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4712mg/L TC:49.52mg/L IC:49.05mg/L

5/54

9/18/2017 7:39:45 AM

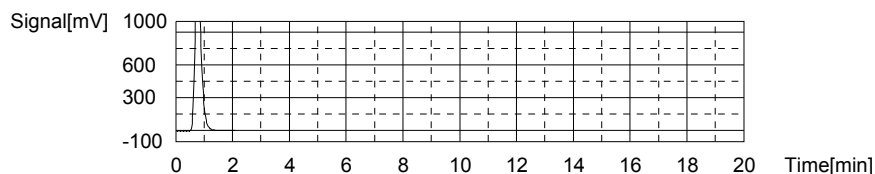
09-15-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2113	49.52mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 9:41:05 AM

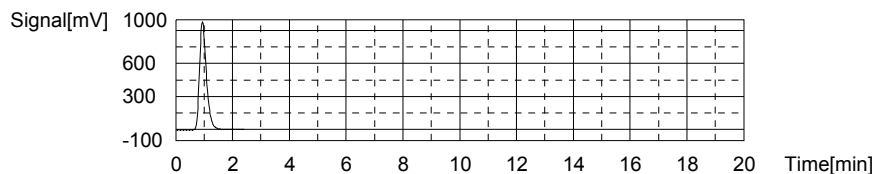
Mean Area 2113
Mean Conc. 49.52mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1661	49.05mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 9:46:34 AM

Mean Area 1661
Mean Conc. 49.05mg/L



Sample

Sample Name:

Sample ID:

Origin:

Status

Chk. Result

<Untitled>
TOC-02-10-2017.met
Completed

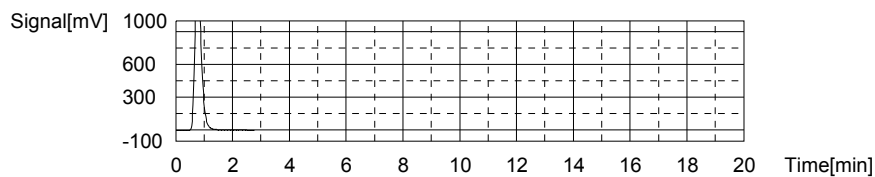
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-0.1696mg/L TC:51.27mg/L IC:51.44mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2187	51.27mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 9:54:46 AM

Mean Area 2187
Mean Conc. 51.27mg/L



Anal.: IC

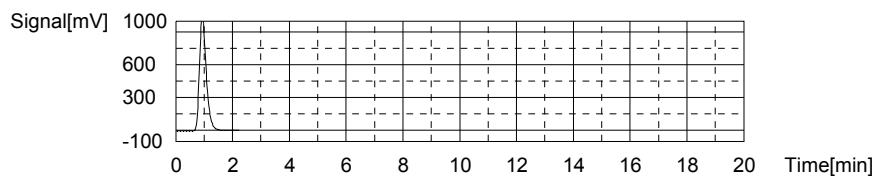
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1741	51.44mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 10:00:03 AM

6/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Mean Area 1741
Mean Conc. 51.44mg/L



Sample

Sample Name: <Untitled>
Sample ID: TOC-02-10-2017.met
Origin: Completed
Status: Completed
Chk. Result

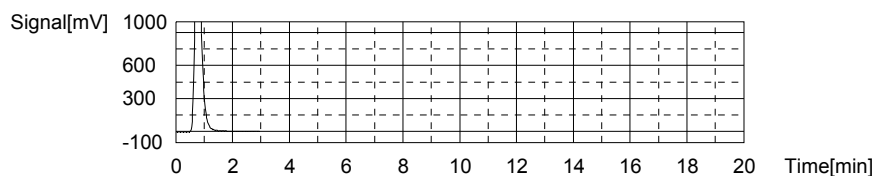
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-5.675mg/L TC:59.12mg/L IC:64.79mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2519	59.12mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_09_32_59	15/2017 10:08:27 AM

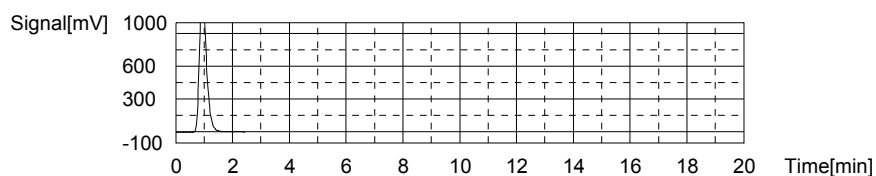
Mean Area 2519
Mean Conc. 59.12mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2188	64.79mg/L	500uL	1		TIC-CURVE-02-10-2017.2017_02_10_14_45_19	15/2017 10:13:56 AM

Mean Area 2188
Mean Conc. 64.79mg/L



Sample

Sample Name: L17090688-05 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.348mg/L TC:32.51mg/L IC:31.17mg/L

7/54

9/18/2017 7:39:45 AM

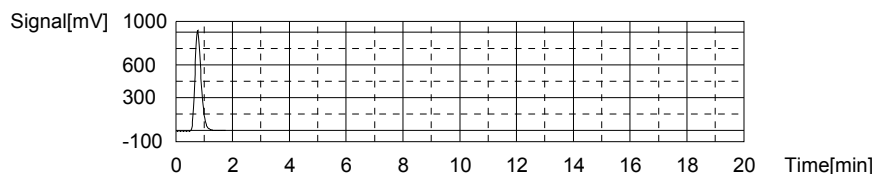
09-15-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1393	32.51mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 10:21:08 AM

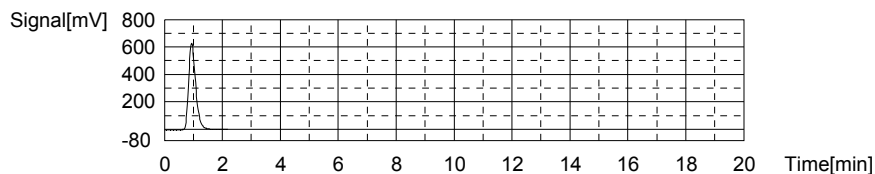
Mean Area 1393
Mean Conc. 32.51mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1062	31.17mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 10:26:23 AM

Mean Area 1062
Mean Conc. 31.17mg/L



Sample

Sample Name: L17090688-06 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

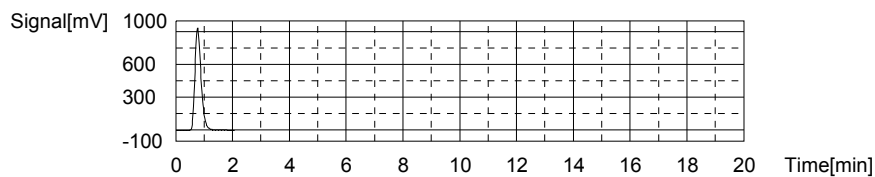
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.365mg/L TC:33.13mg/L IC:31.76mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1419	33.13mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 10:33:55 AM

Mean Area 1419
Mean Conc. 33.13mg/L

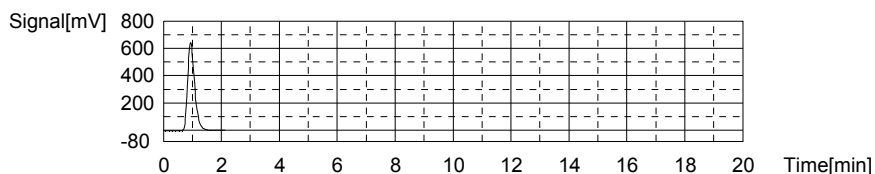


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1082	31.76mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 10:39:05 AM

8/54

Mean Area 1082
Mean Conc. 31.76mg/L



Sample

Sample Name: L17090688-07 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

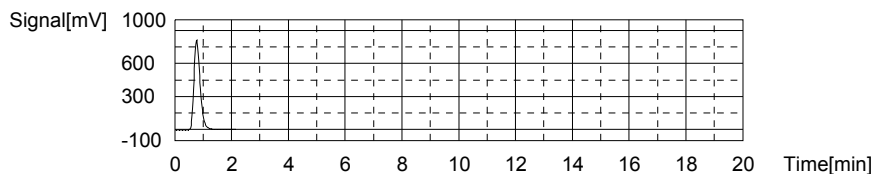
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.9608mg/L TC:28.97mg/L IC:28.01mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1243	28.97mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 10:46:41 AM

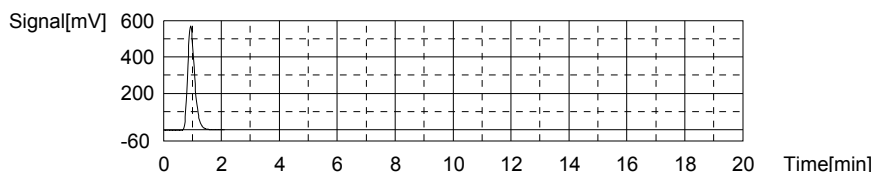
Mean Area 1243
Mean Conc. 28.97mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	956.3	28.01mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 10:51:46 AM

Mean Area 956.3
Mean Conc. 28.01mg/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:24.38mg/L TC:24.17mg/L IC:-0.2053mg/L

9/18/2017 7:39:45 AM

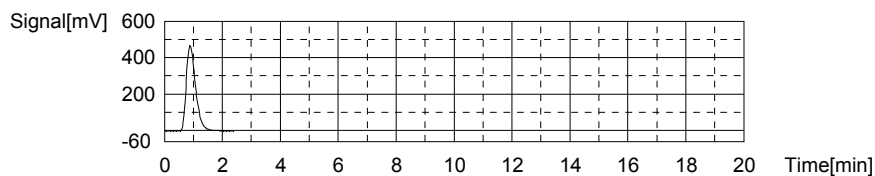
09-15-2017-DCM-TOC.t32

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_59	19/15/2017 10:59:35 AM

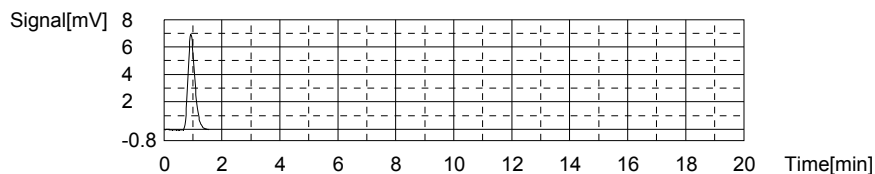
Mean Area 1040
Mean Conc. 24.17mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.54	-0.2053mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 11:03:59 AM

Mean Area 11.54
Mean Conc. -0.2053mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

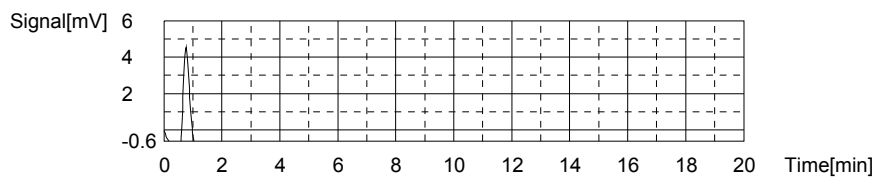
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06186mg/L TC:-0.1888mg/L IC:-0.2507mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.873	-0.1888mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 11:08:58 AM

Mean Area 8.873
Mean Conc. -0.1888mg/L



Anal.: IC

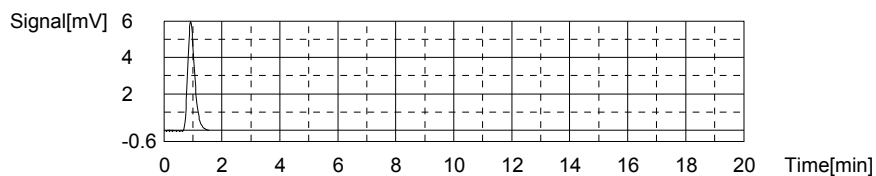
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.02	-0.2507mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 11:12:57 AM

10/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Mean Area 10.02
Mean Conc. -0.2507mg/L



Sample

Sample Name: L17090688-08
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

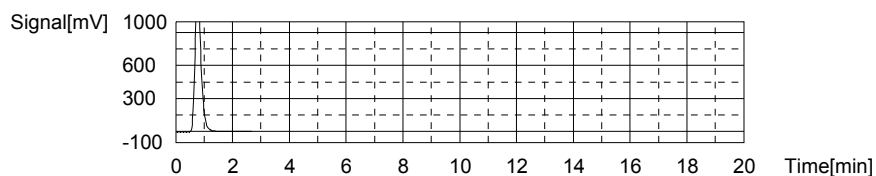
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.7489mg/L TC:43.38mg/L IC:42.63mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1853	43.38mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_09_32_59	15/2017 11:21:05 AM

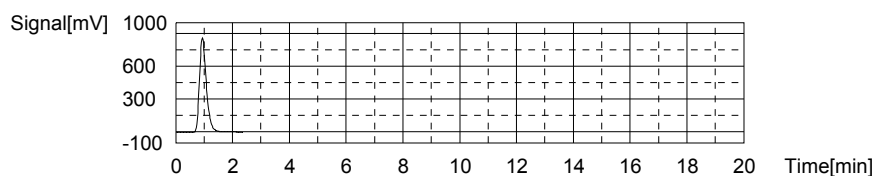
Mean Area 1853
Mean Conc. 43.38mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1446	42.63mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_14_45_19	15/2017 11:26:26 AM

Mean Area 1446
Mean Conc. 42.63mg/L



Sample

Sample Name: L17090688-09
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.074mg/L TC:36.84mg/L IC:33.76mg/L

11/54

9/18/2017 7:39:45 AM

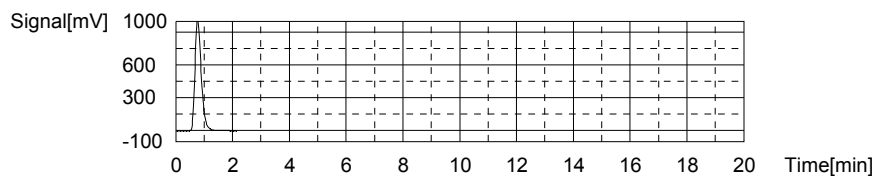
09-15-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1576	36.84mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 11:34:01 AM

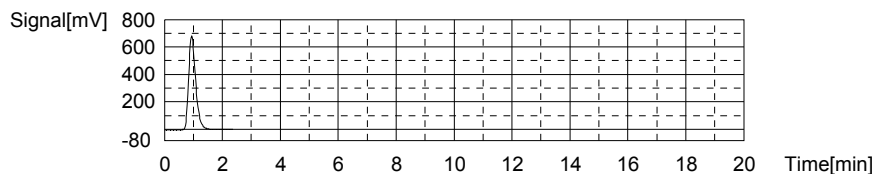
Mean Area 1576
Mean Conc. 36.84mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1149	33.76mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 11:39:22 AM

Mean Area 1149
Mean Conc. 33.76mg/L



Sample

Sample Name: L17090688-10
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

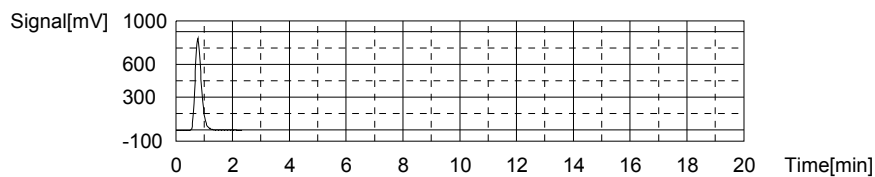
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.109mg/L TC:30.17mg/L IC:27.06mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1294	30.17mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 11:52:50 AM

Mean Area 1294
Mean Conc. 30.17mg/L



Anal.: IC

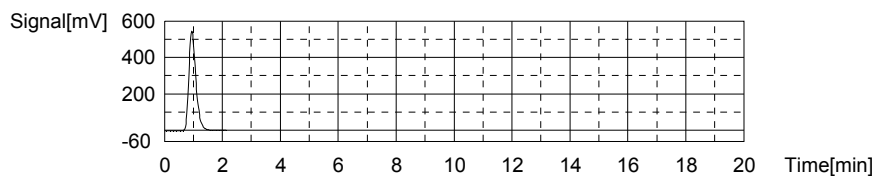
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	924.7	27.06mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 11:58:00 AM

12/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Mean Area 924.7
Mean Conc. 27.06mg/L



Sample

Sample Name: L17090688-11 (3)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

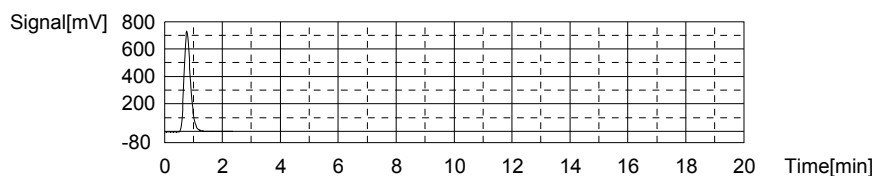
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.303mg/L TC:26.16mg/L IC:23.85mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1124	26.16mg/L	500uL	1		TC	09/15/2017 12:05:48 PM

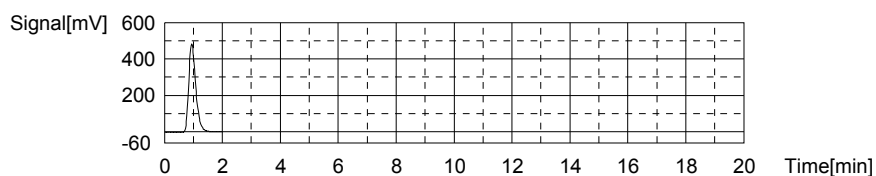
Mean Area 1124
Mean Conc. 26.16mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	817.2	23.85mg/L	500uL	1		IC	09/15/2017 12:10:50 PM

Mean Area 817.2
Mean Conc. 23.85mg/L



Sample

Sample Name: L17090688-12
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.564mg/L TC:44.82mg/L IC:41.26mg/L

13/54

9/18/2017 7:39:45 AM

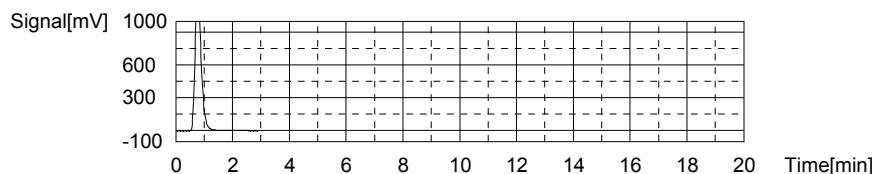
09-15-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1914	44.82mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 12:19:12 PM

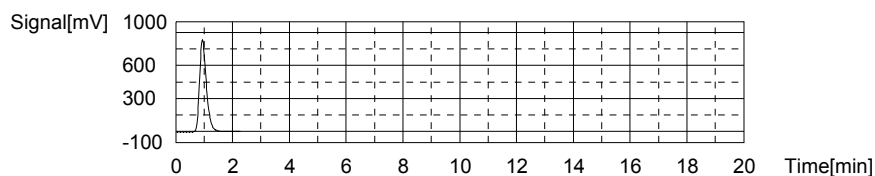
Mean Area 1914
Mean Conc. 44.82mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1400	41.26mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 12:24:34 PM

Mean Area 1400
Mean Conc. 41.26mg/L



Sample

Sample Name:

Sample ID:

Origin:

Status

Chk. Result

<Untitled>
TOC-02-10-2017.met
Completed

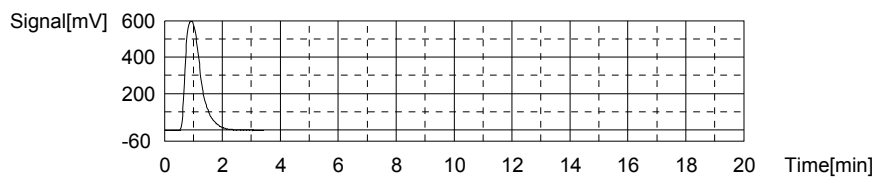
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:41.17mg/L TC:51.75mg/L IC:10.57mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2207	51.75mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 12:33:26 PM

Mean Area 2207
Mean Conc. 51.75mg/L

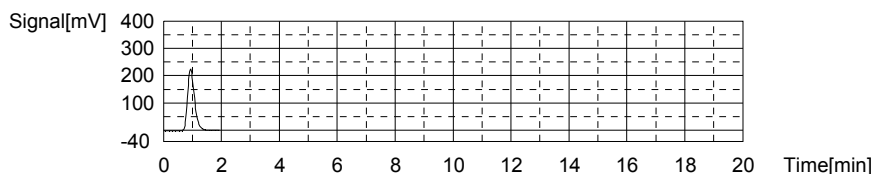


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	372.5	10.57mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 12:38:16 PM

14/54

Mean Area 372.5
Mean Conc. 10.57mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

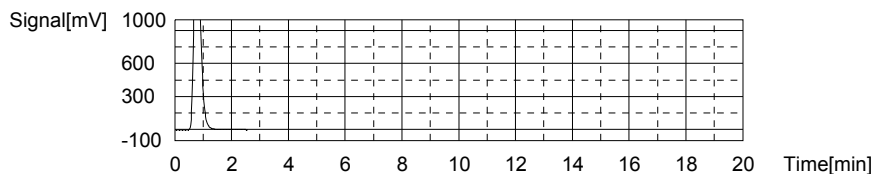
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-8.933mg/L TC:59.92mg/L IC:68.85mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2553	59.92mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	15/2017 12:46:18 PM

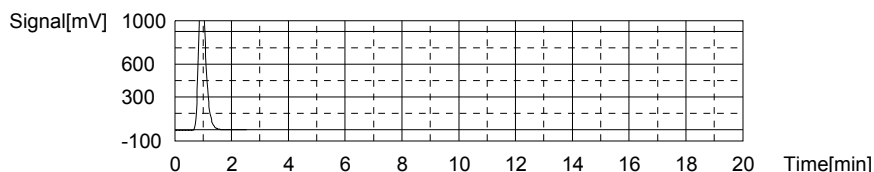
Mean Area 2553
Mean Conc. 59.92mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2324	68.85mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	15/2017 12:51:58 PM

Mean Area 2324
Mean Conc. 68.85mg/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:3.945mg/L TC:62.05mg/L IC:58.10mg/L

9/18/2017 7:39:45 AM

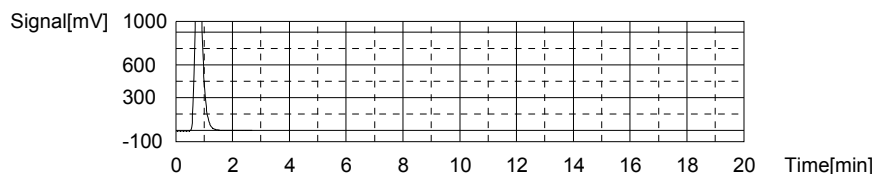
09-15-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2643	62.05mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 1:00:06 PM

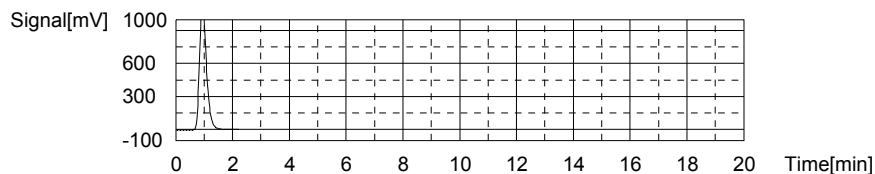
Mean Area 2643
Mean Conc. 62.05mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1964	58.10mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 1:05:26 PM

Mean Area 1964
Mean Conc. 58.10mg/L



Sample

Sample Name:

Sample ID:

Origin:

Status

Chk. Result

<Untitled>
TOC-02-10-2017.met
Completed

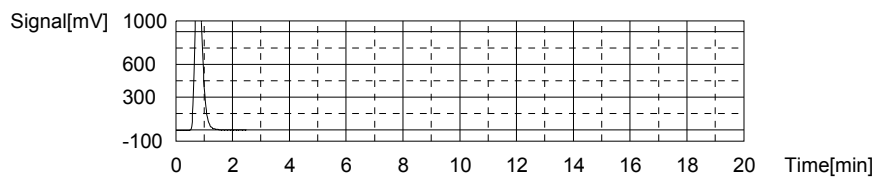
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.306mg/L TC:59.83mg/L IC:56.52mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2549	59.83mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 1:13:22 PM

Mean Area 2549
Mean Conc. 59.83mg/L



Anal.: IC

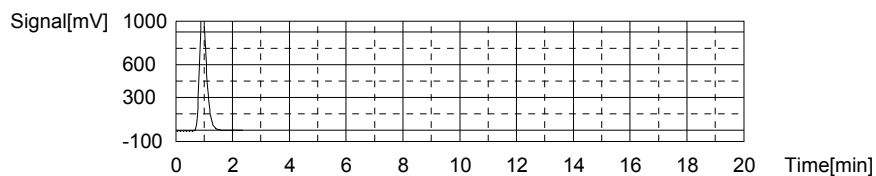
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1911	56.52mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 1:18:45 PM

16/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Mean Area 1911
Mean Conc. 56.52mg/L



Sample

Sample Name: <Untitled>
Sample ID: TOC-02-10-2017.met
Origin: Completed
Status: Completed
Chk. Result

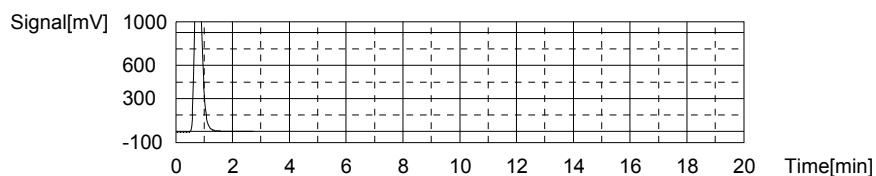
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-11.14mg/L TC:61.48mg/L IC:72.62mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2619	61.48mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_09_32_59	15/2017 1:26:56 PM

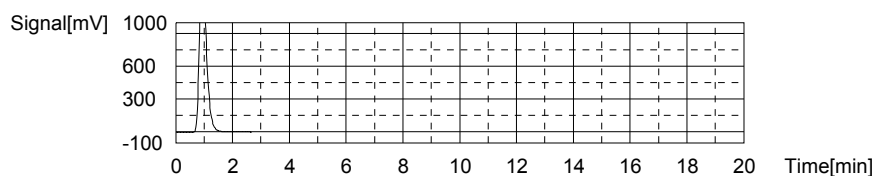
Mean Area 2619
Mean Conc. 61.48mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2450	72.62mg/L	500uL	1		TIC-CURVE-02-10-2017.2017_02_10_14_45_19	15/2017 1:32:45 PM

Mean Area 2450
Mean Conc. 72.62mg/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	TOC:23.80mg/L TC:23.87mg/L IC:0.06975mg/L

17/54

9/18/2017 7:39:45 AM

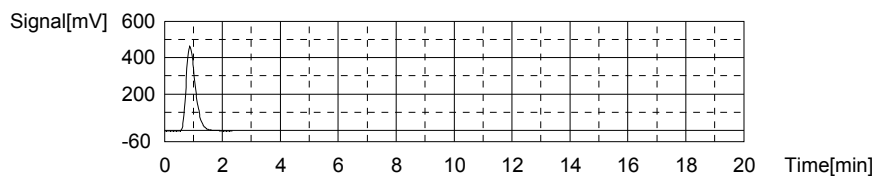
09-15-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1027	23.87mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 1:40:32 PM

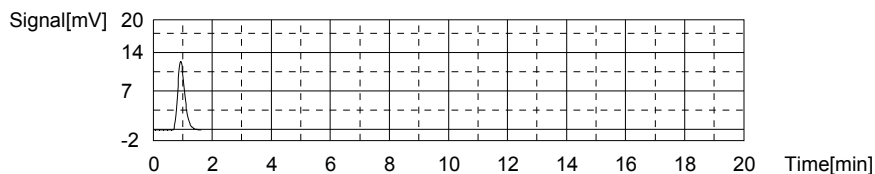
Mean Area 1027
Mean Conc. 23.87mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	20.75	0.06975mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 1:45:03 PM

Mean Area 20.75
Mean Conc. 0.06975mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status Completed
Chk. Result

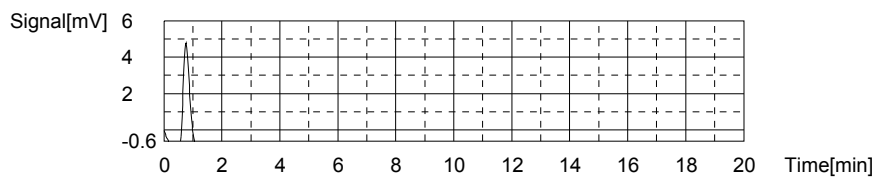
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.04609mg/L TC:-0.1768mg/L IC:-0.2229mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.381	-0.1768mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 1:50:02 PM

Mean Area 9.381
Mean Conc. -0.1768mg/L

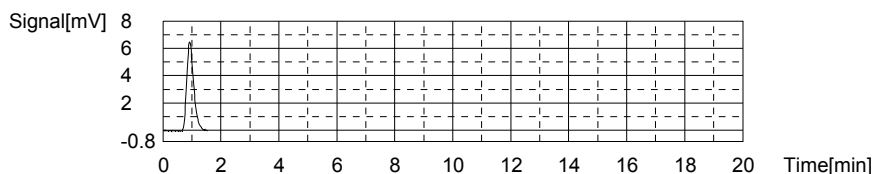


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.95	-0.2229mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 1:53:57 PM

18/54

Mean Area 10.95
 Mean Conc. -0.2229mg/L



Sample

Sample Name:
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

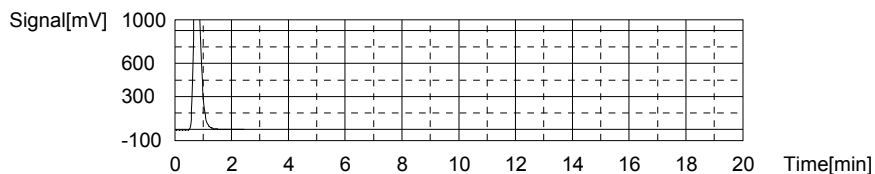
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-6.486mg/L TC:57.44mg/L IC:63.93mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2448	57.44mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 2:01:51 PM

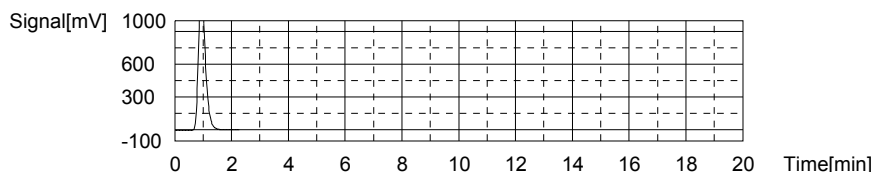
Mean Area 2448
 Mean Conc. 57.44mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2159	63.93mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 2:07:12 PM

Mean Area 2159
 Mean Conc. 63.93mg/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	!!Error!! TOC:-3.926mg/L TC:54.42mg/L IC:58.34mg/L

9/18/2017 7:39:45 AM

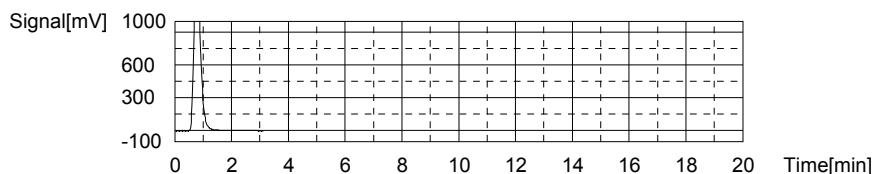
09-15-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2320	54.42mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 2:15:47 PM

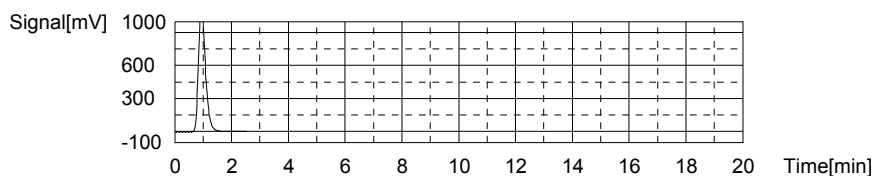
Mean Area 2320
Mean Conc. 54.42mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1972	58.34mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 2:21:24 PM

Mean Area 1972
Mean Conc. 58.34mg/L



Sample

Sample Name: L17090771-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

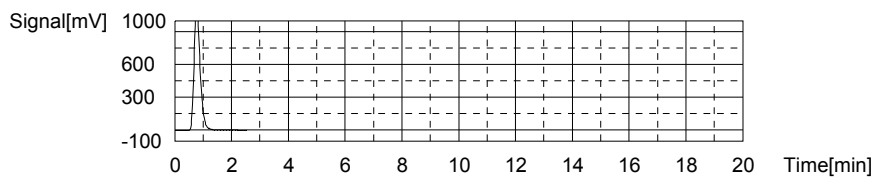
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.214mg/L TC:38.96mg/L IC:36.75mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1666	38.96mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 2:29:25 PM

Mean Area 1666
Mean Conc. 38.96mg/L



Anal.: IC

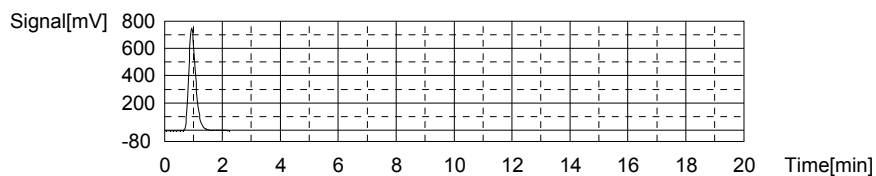
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1249	36.75mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 2:34:45 PM

20/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Mean Area 1249
Mean Conc. 36.75mg/L



Sample

Sample Name: L17090771-08
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

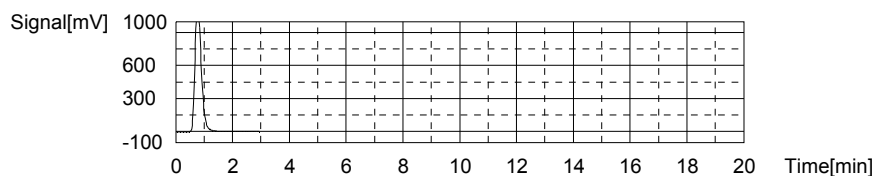
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.999mg/L TC:42.72mg/L IC:40.72mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1825	42.72mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	15/2017 2:43:10 PM

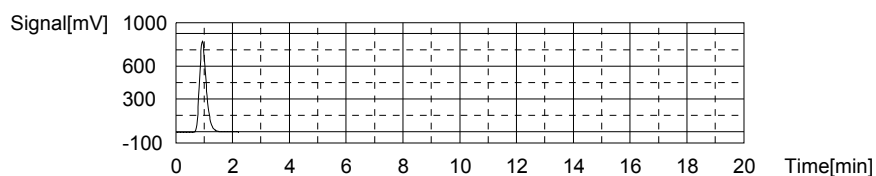
Mean Area 1825
Mean Conc. 42.72mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1382	40.72mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	15/2017 2:48:25 PM

Mean Area 1382
Mean Conc. 40.72mg/L



Sample

Sample Name: L17090771-09
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.761mg/L TC:26.87mg/L IC:25.11mg/L

21/54

9/18/2017 7:39:45 AM

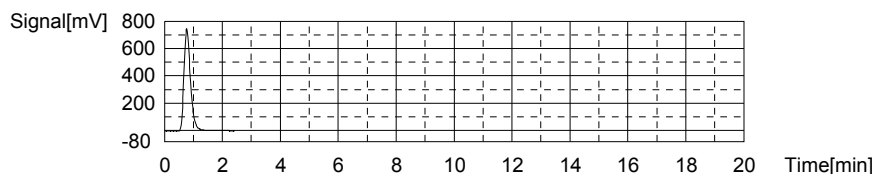
09-15-2017-DCM-TOC.t32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1154	26.87mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 3:00:28 PM

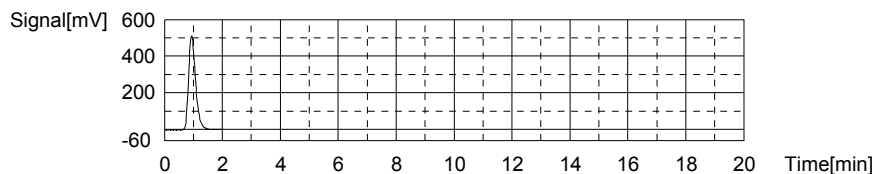
Mean Area 1154
Mean Conc. 26.87mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	859.1	25.11mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 3:05:31 PM

Mean Area 859.1
Mean Conc. 25.11mg/L



Sample

Sample Name: WG629808-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

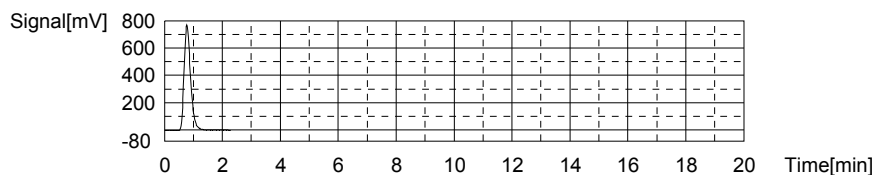
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.963mg/L TC:27.76mg/L IC:25.80mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1192	27.76mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 3:13:16 PM

Mean Area 1192
Mean Conc. 27.76mg/L



Anal.: IC

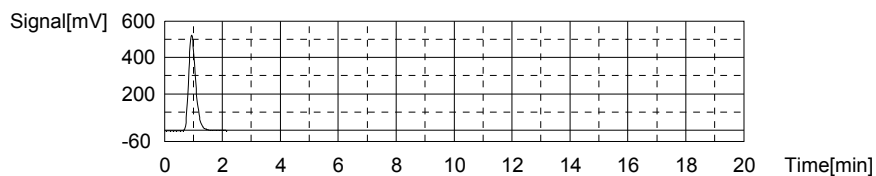
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	882.4	25.80mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 3:18:24 PM

22/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Mean Area 882.4
Mean Conc. 25.80mg/L



Sample

Sample Name: WG629813-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

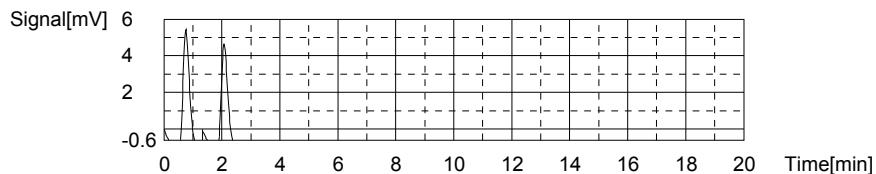
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.04123mg/L TC:-0.1750mg/L IC:-0.2162mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.02	-0.1617mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 3:23:22 PM
2	8.899	-0.1882mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 3:26:50 PM

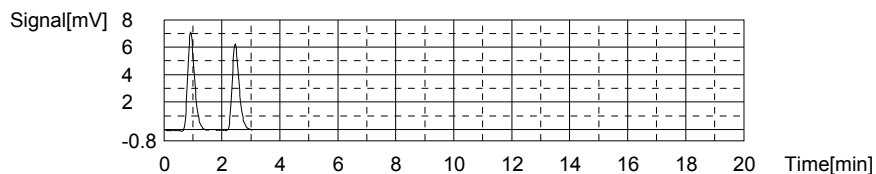
Mean Area 9.460
Mean Conc. -0.1750mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.92	-0.1939mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 3:30:46 PM
2	10.43	-0.2384mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 3:34:42 PM

Mean Area 11.18
Mean Conc. -0.2162mg/L



Sample

Sample Name: WG629813-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

23/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

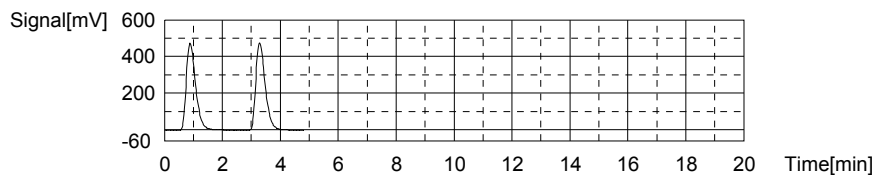
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.02mg/L TC:24.78mg/L IC:-0.2493mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1059	24.62mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 3:42:35 PM
2	1072	24.93mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 3:47:16 PM

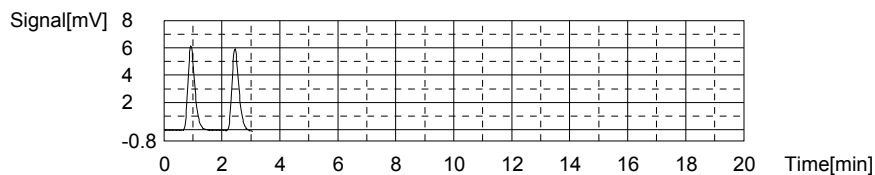
Mean Area 1066
Mean Conc. 24.78mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.14	-0.2471mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 3:51:38 PM
2	9.991	-0.2516mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 3:55:45 PM

Mean Area 10.07
Mean Conc. -0.2493mg/L



Sample

Sample Name: WG629813-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

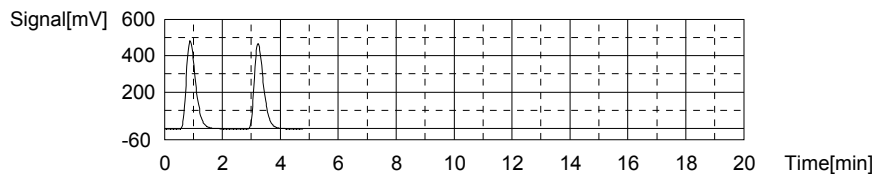
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.07mg/L TC:24.81mg/L IC:-0.2607mg/L

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_59	9/15/2017 4:03:35 PM
2	1045	24.29mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 4:08:17 PM

Mean Area 1067
Mean Conc. 24.81mg/L



Anal.: IC

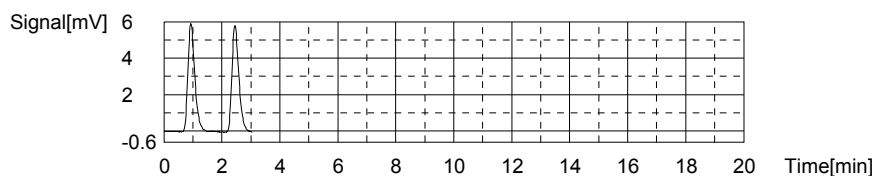
24/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.782	-0.2578mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 4:12:39 PM
2	9.585	-0.2637mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 4:16:45 PM

Mean Area 9.684
Mean Conc. -0.2607mg/L



Sample

Sample Name: L17090718-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

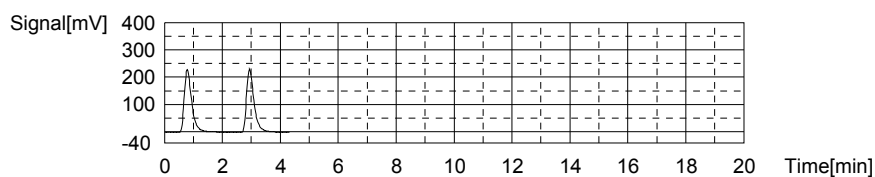
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.138mg/L TC:9.309mg/L IC:6.171mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	406.0	9.194mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 4:24:22 PM
2	415.7	9.423mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 4:28:48 PM

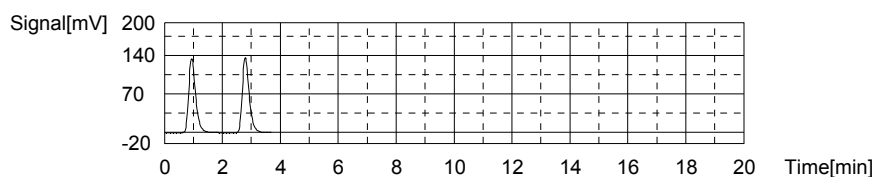
Mean Area 410.9
Mean Conc. 9.309mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	222.8	6.104mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 4:33:31 PM
2	227.3	6.238mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 4:38:04 PM

Mean Area 225.1
Mean Conc. 6.171mg/L



Sample

25/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

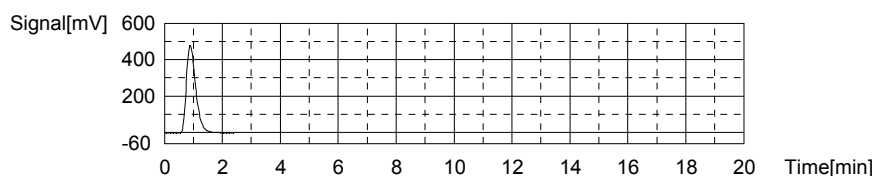
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.22mg/L TC:24.98mg/L IC:-0.2399mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1074	24.98mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	15/2017 4:45:58 PM

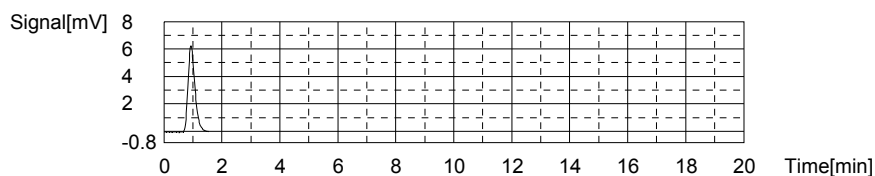
Mean Area 1074
 Mean Conc. 24.98mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.38	-0.2399mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	15/2017 4:50:20 PM

Mean Area 10.38
 Mean Conc. -0.2399mg/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:0.07721mg/L TC:-0.2002mg/L IC:-0.2774mg/L

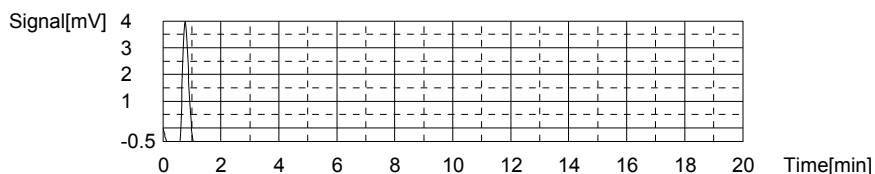
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.390	-0.2002mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	15/2017 4:55:20 PM

26/54

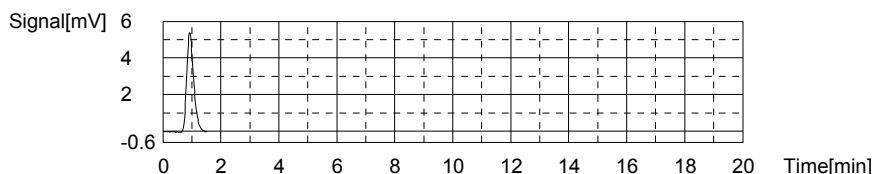
Mean Area 8.390
 Mean Conc. -0.2002mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.124	-0.2774mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 4:59:14 PM

Mean Area 9.124
 Mean Conc. -0.2774mg/L



Sample

Sample Name: L17090718-02
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

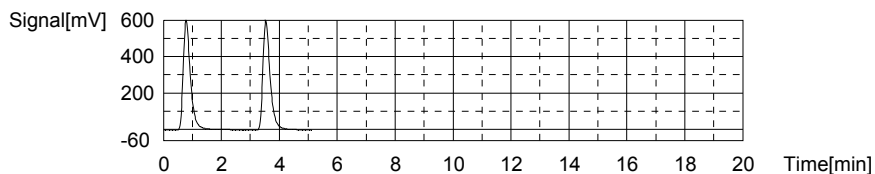
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.166mg/L TC:24.20mg/L IC:17.03mg/L

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_59	19/15/2017 5:07:27 PM
2	1041	24.20mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 5:12:12 PM

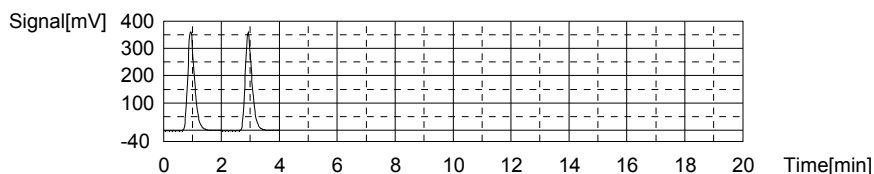
Mean Area 1041
 Mean Conc. 24.20mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	591.9	17.13mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 5:17:08 PM
2	585.5	16.94mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 5:21:52 PM

Mean Area 588.7
 Mean Conc. 17.03mg/L



Sample

Sample Name:
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

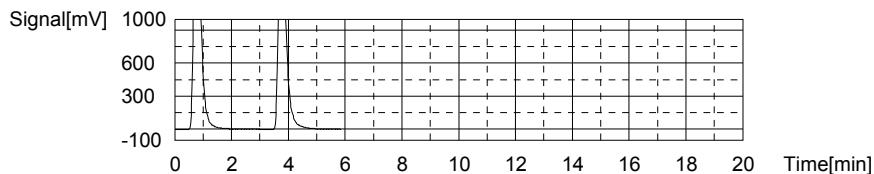
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-2.631mg/L TC:69.54mg/L IC:72.17mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2933	68.90mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 5:30:19 PM
2	2987	70.17mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 5:35:33 PM

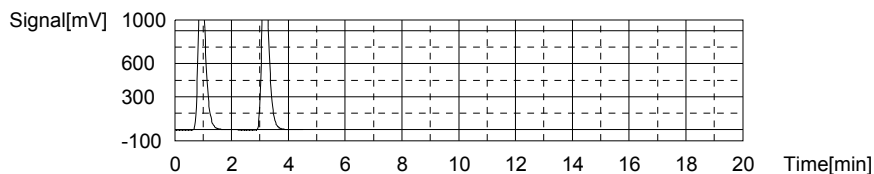
Mean Area 2960
 Mean Conc. 69.54mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2433	72.11mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 5:40:59 PM
2	2437	72.23mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 5:46:23 PM

Mean Area 2435
 Mean Conc. 72.17mg/L



Sample

Sample Name: L17090719-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

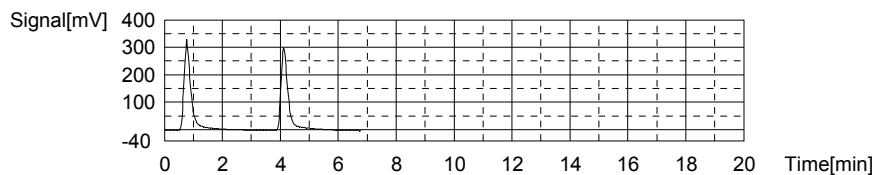
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.278mg/L TC:12.49mg/L IC:9.217mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	554.8	12.71mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 5:55:13 PM
2	536.6	12.28mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 6:00:58 PM

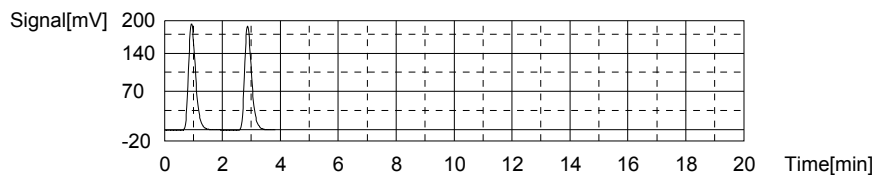
Mean Area 545.7
Mean Conc. 12.49mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	331.3	9.344mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 6:05:51 PM
2	322.8	9.090mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 6:10:25 PM

Mean Area 327.1
Mean Conc. 9.217mg/L



Sample

Sample Name: L17090719-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

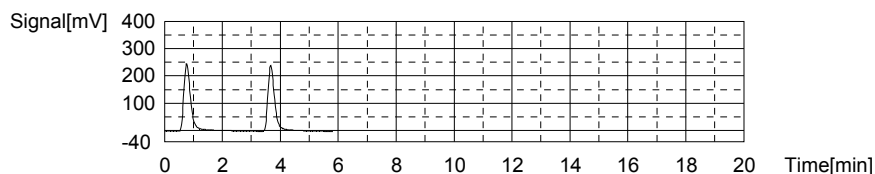
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.559mg/L TC:9.214mg/L IC:7.655mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	411.0	9.312mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 6:18:48 PM
2	402.7	9.116mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 6:23:59 PM

Mean Area 406.9
Mean Conc. 9.214mg/L



Anal.: IC

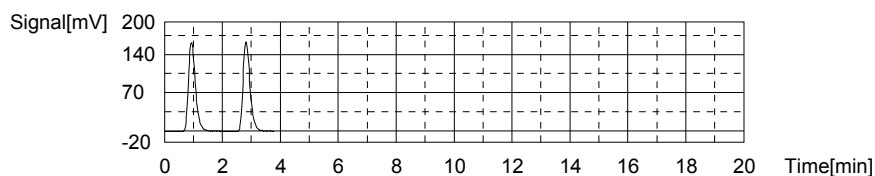
29/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	272.9	7.600mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 6:28:45 PM
2	276.6	7.710mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 6:33:18 PM

Mean Area 274.8
Mean Conc. 7.655mg/L



Sample

Sample Name: L17090720-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

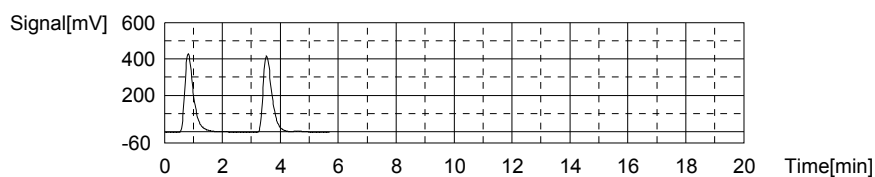
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.95mg/L TC:21.07mg/L IC:6.116mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	907.8	21.05mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 6:41:28 PM
2	909.4	21.09mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 6:46:55 PM

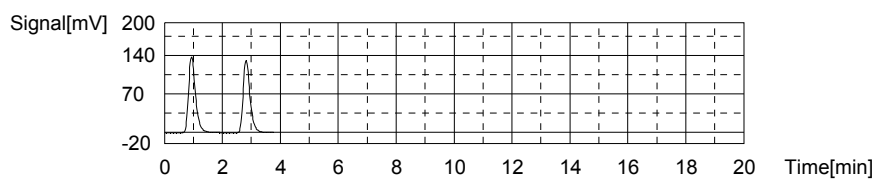
Mean Area 908.6
Mean Conc. 21.07mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	228.5	6.274mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 6:51:41 PM
2	217.9	5.957mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 6:56:12 PM

Mean Area 223.2
Mean Conc. 6.116mg/L



Sample

30/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Sample Name: L17090720-02
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

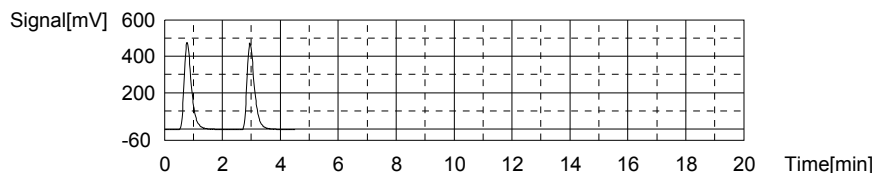
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.578mg/L TC:19.62mg/L IC:12.04mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	842.9	19.52mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 7:03:50 PM
2	851.9	19.73mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 7:08:27 PM

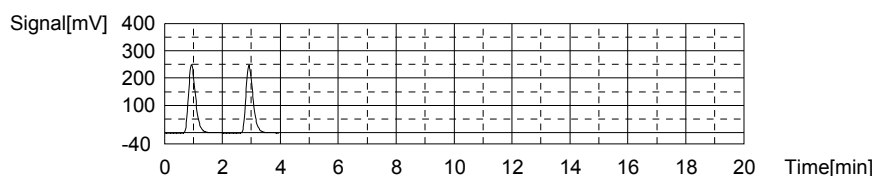
Mean Area 847.4
 Mean Conc. 19.62mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	423.1	12.09mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 7:13:22 PM
2	420.4	12.00mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 7:18:02 PM

Mean Area 421.8
 Mean Conc. 12.04mg/L



Sample

Sample Name: L17090720-03
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:20.83mg/L TC:32.94mg/L IC:12.11mg/L

1. Det

Anal.: TC

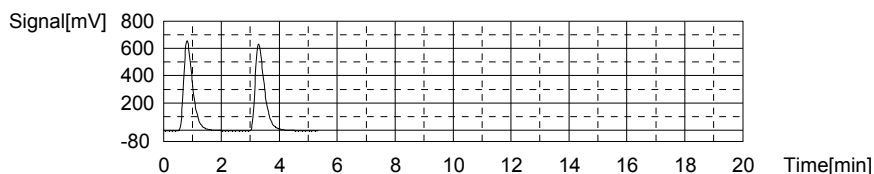
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1407	32.84mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 7:25:58 PM
2	1415	33.03mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 7:31:07 PM

31/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

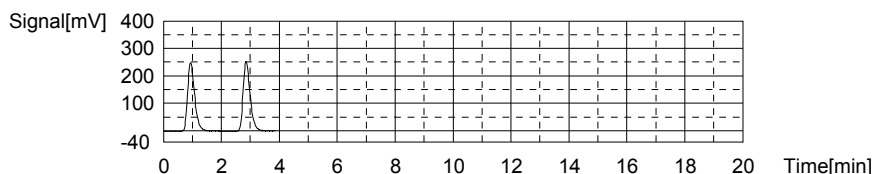
Mean Area 1411
Mean Conc. 32.94mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	419.6	11.98mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 7:35:57 PM
2	428.2	12.24mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 7:40:35 PM

Mean Area 423.9
Mean Conc. 12.11mg/L



Sample

Sample Name: L17090720-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

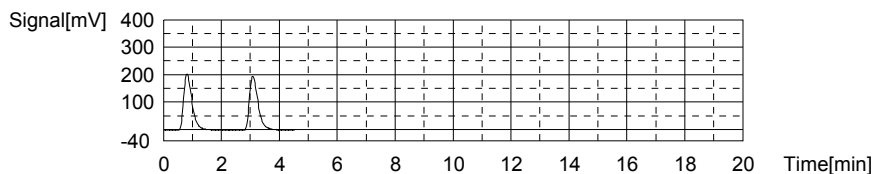
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:6.362mg/L TC:9.266mg/L IC:2.904mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	408.6	9.255mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 7:48:20 PM
2	409.5	9.277mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 7:52:52 PM

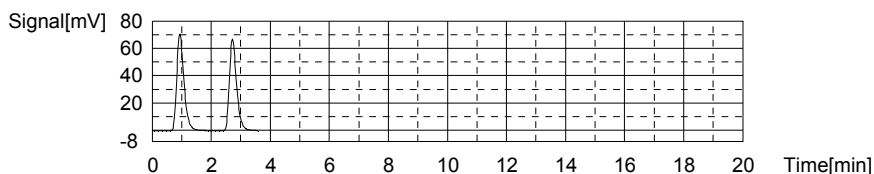
Mean Area 409.1
Mean Conc. 9.266mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	118.9	3.001mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 7:57:30 PM
2	112.4	2.807mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 8:01:58 PM

Mean Area 115.7
Mean Conc. 2.904mg/L



Sample

Sample Name: L17090720-05
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

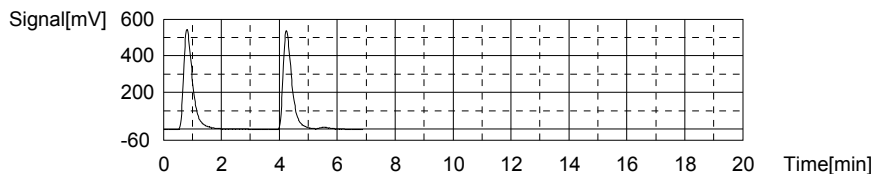
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:17.04mg/L TC:27.53mg/L IC:10.49mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1190	27.72mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 8:10:53 PM
2	1174	27.34mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 8:16:37 PM

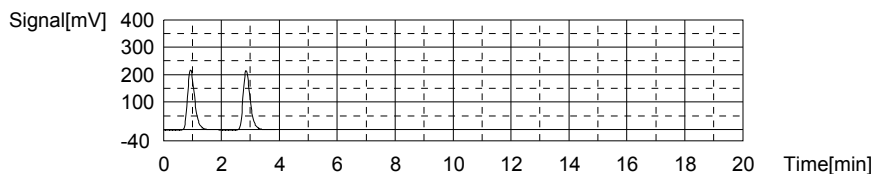
Mean Area 1182
Mean Conc. 27.53mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	371.6	10.55mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 8:21:24 PM
2	367.9	10.44mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 8:26:03 PM

Mean Area 369.8
Mean Conc. 10.49mg/L



Sample

Sample Name: L17090720-06
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

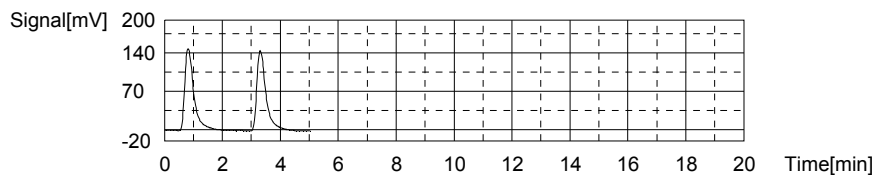
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.970mg/L TC:7.283mg/L IC:2.313mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	326.0	7.304mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 8:34:02 PM
2	324.2	7.261mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 8:38:54 PM

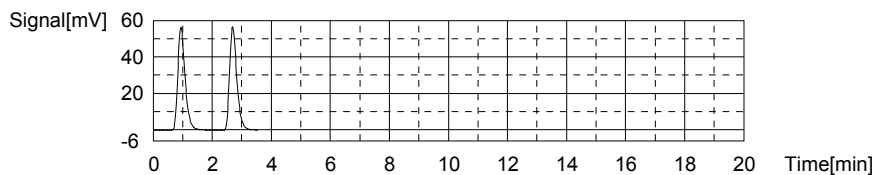
Mean Area 325.1
Mean Conc. 7.283mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	95.52	2.303mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 8:43:33 PM
2	96.21	2.323mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 8:47:59 PM

Mean Area 95.87
Mean Conc. 2.313mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

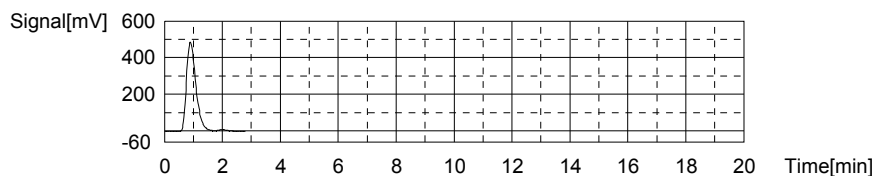
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.17mg/L TC:25.92mg/L IC:-0.2456mg/L

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_59	9/15/2017 8:56:15 PM

Mean Area 1114
Mean Conc. 25.92mg/L



Anal.: IC

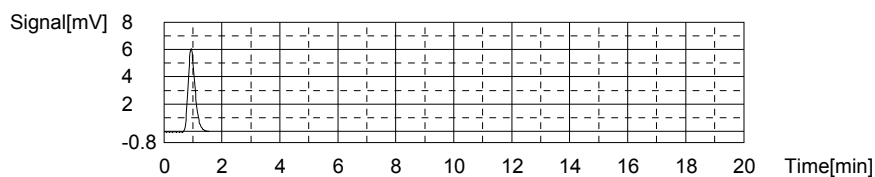
34/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.19	-0.2456mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 9:00:39 PM

Mean Area 10.19
Mean Conc. -0.2456mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

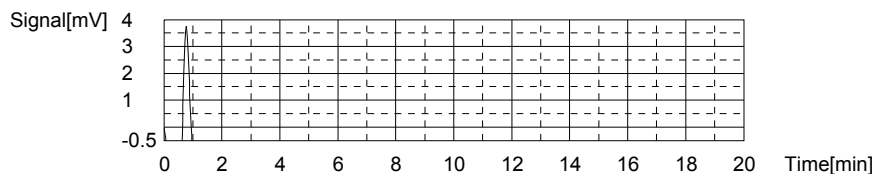
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.07064mg/L TC:-0.1847mg/L IC:-0.2554mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.046	-0.1847mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 9:05:38 PM

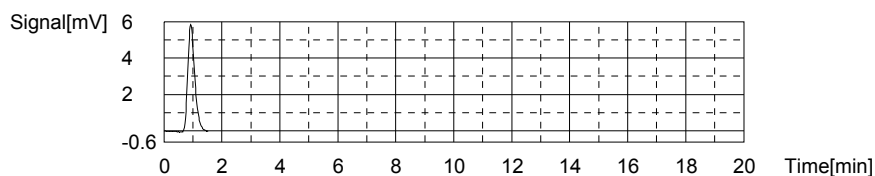
Mean Area 9.046
Mean Conc. -0.1847mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.863	-0.2554mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 9:09:32 PM

Mean Area 9.863
Mean Conc. -0.2554mg/L



Sample

Sample Name: L17090720-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

35/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

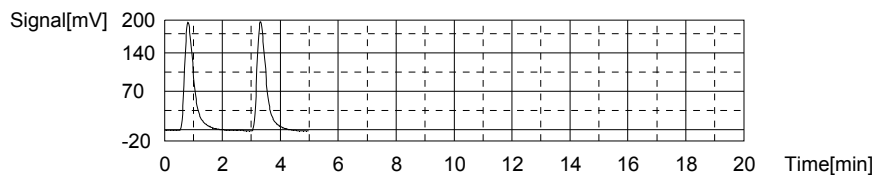
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:6.525mg/L TC:9.955mg/L IC:3.429mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	439.6	9.988mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 9:17:32 PM
2	436.8	9.922mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 9:22:17 PM

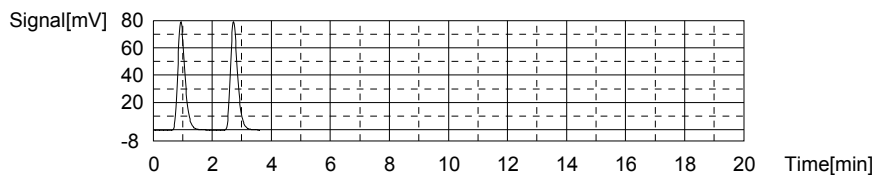
Mean Area 438.2
Mean Conc. 9.955mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	133.1	3.425mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 9:26:56 PM
2	133.4	3.434mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 9:31:24 PM

Mean Area 133.3
Mean Conc. 3.429mg/L



Sample

Sample Name: L17090771-10
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

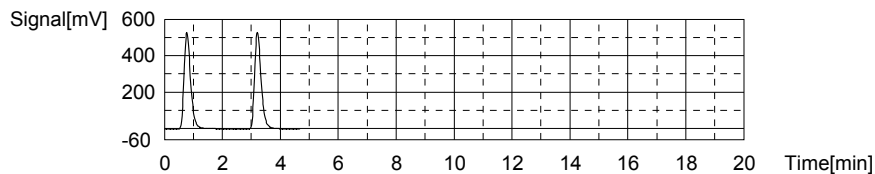
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.606mg/L TC:19.27mg/L IC:16.67mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	829.9	19.21mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 9:39:20 PM
2	835.4	19.34mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 9:43:50 PM

Mean Area 832.7
Mean Conc. 19.27mg/L



Anal.: IC

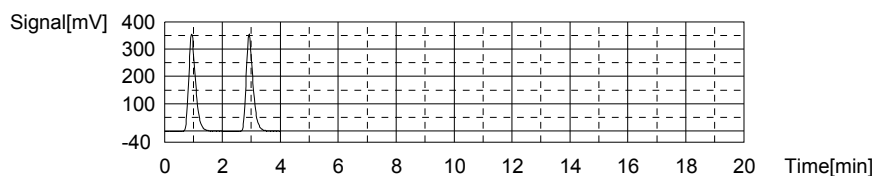
36/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	577.5	16.70mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 9:48:46 PM
2	575.6	16.64mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 9:53:29 PM

Mean Area 576.5
Mean Conc. 16.67mg/L



Sample

Sample Name: L17090771-11
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

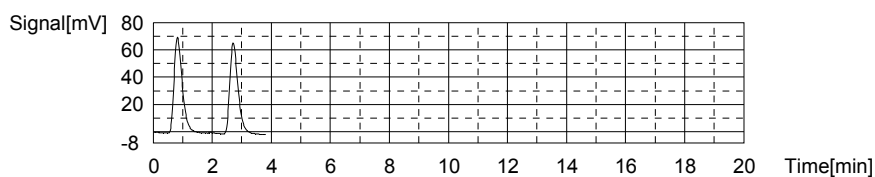
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.208mg/L TC:2.723mg/L IC:0.5141mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	135.5	2.803mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 10:00:51 PM
2	128.7	2.642mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 10:05:03 PM

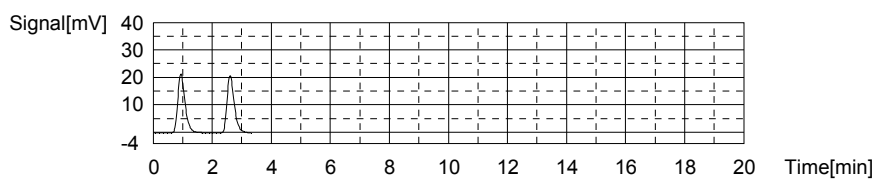
Mean Area 132.1
Mean Conc. 2.723mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	36.09	0.5279mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 10:09:36 PM
2	35.17	0.5004mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 10:13:54 PM

Mean Area 35.63
Mean Conc. 0.5141mg/L



Sample

37/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Sample Name: L17090771-12
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

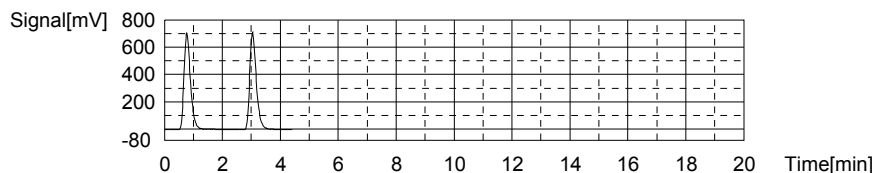
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.115mg/L TC:25.65mg/L IC:22.53mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1087	25.28mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 10:21:39 PM
2	1118	26.02mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 10:26:16 PM

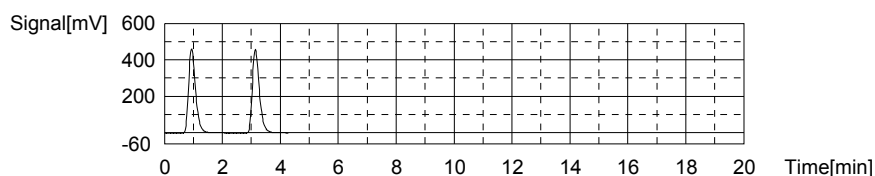
Mean Area 1103
 Mean Conc. 25.65mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	773.7	22.56mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 10:31:22 PM
2	772.3	22.51mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/15/2017 10:36:12 PM

Mean Area 773.0
 Mean Conc. 22.53mg/L



Sample

Sample Name: L17090771-13 (2)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.437mg/L TC:12.11mg/L IC:9.674mg/L

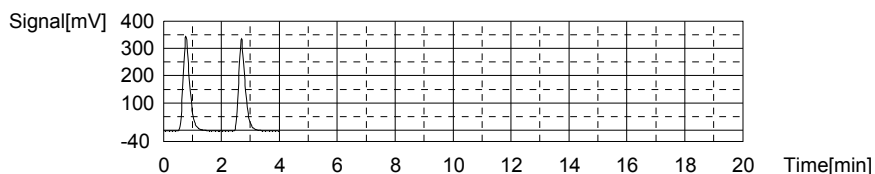
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	536.2	12.27mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 10:43:37 PM
2	522.7	11.95mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 10:47:57 PM

38/54

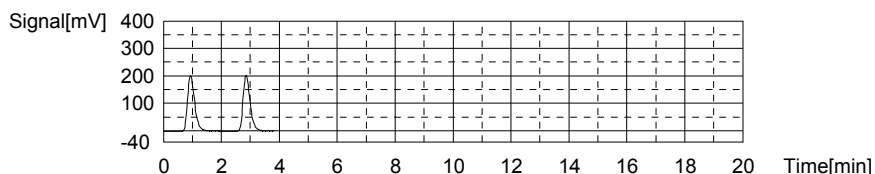
Mean Area 529.5
Mean Conc. 12.11mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	341.0	9.634mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 10:52:47 PM
2	343.7	9.714mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 10:57:19 PM

Mean Area 342.4
Mean Conc. 9.674mg/L



Sample

Sample Name: L17090771-14 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

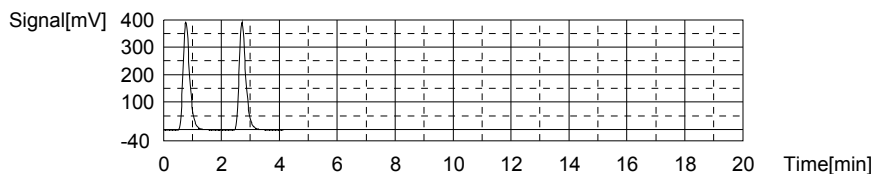
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.579mg/L TC:14.39mg/L IC:11.82mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	621.4	14.28mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 11:04:44 PM
2	630.8	14.51mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 11:09:14 PM

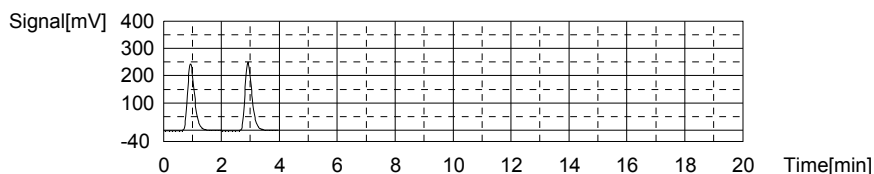
Mean Area 626.1
Mean Conc. 14.39mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	411.0	11.72mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 11:14:05 PM
2	417.1	11.91mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/15/2017 11:18:46 PM

Mean Area 414.1
 Mean Conc. 11.82mg/L



Sample

Sample Name: <Untitled>
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

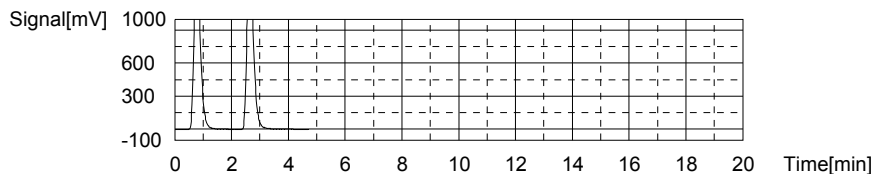
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-2.183mg/L TC:53.75mg/L IC:55.94mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2262	53.04mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 11:26:07 PM
2	2322	54.46mg/L	500uL	1	1	TCCURVE-02-10-2017.2017_02_10_09_32_59	19/15/2017 11:31:14 PM

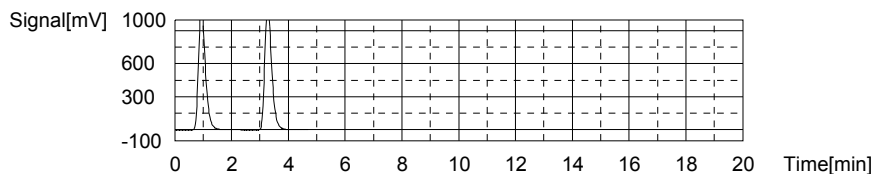
Mean Area 2292
 Mean Conc. 53.75mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1880	55.59mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 11:36:38 PM
2	1903	56.28mg/L	500uL	1	1	TICCURVE-02-10-2017.2017_02_10_14_45_19	19/15/2017 11:41:50 PM

Mean Area 1892
 Mean Conc. 55.94mg/L



Sample

Sample Name: <Untitled>
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

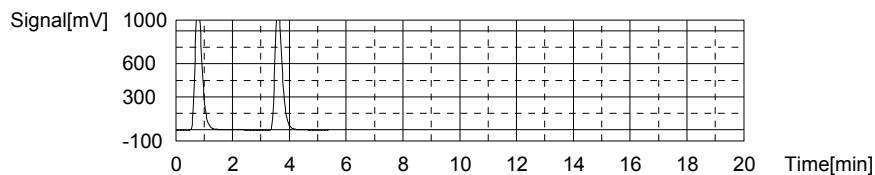
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:22.91mg/L TC:47.21mg/L IC:24.30mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2018	47.28mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 11:50:09 PM
2	2012	47.14mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/15/2017 11:55:08 PM

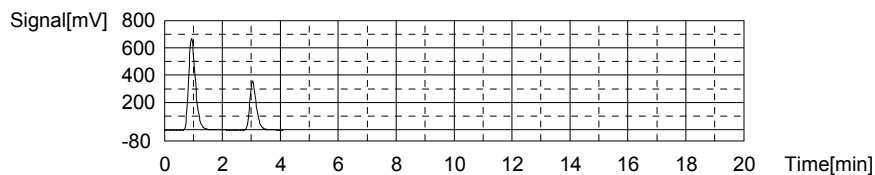
Mean Area 2015
Mean Conc. 47.21mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1102	32.36mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/16/2017 12:00:20 AM
2	562.3	16.24mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/16/2017 12:05:04 AM

Mean Area 832.2
Mean Conc. 24.30mg/L



Sample

Sample Name: <Untitled>
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status Completed
Chk. Result

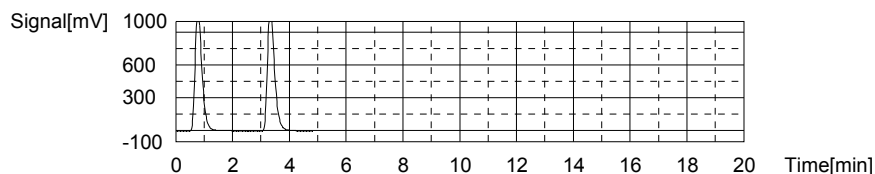
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:22.92mg/L TC:44.40mg/L IC:21.47mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1864	43.64mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 12:13:07 AM
2	1928	45.15mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 12:17:39 AM

Mean Area 1896
Mean Conc. 44.40mg/L



Anal.: IC

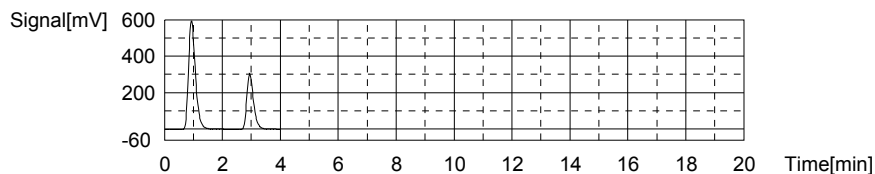
41/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	983.7	28.83mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/16/2017 12:22:44 AM
2	491.3	14.12mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/16/2017 12:27:29 AM

Mean Area 737.5
Mean Conc. 21.47mg/L



Sample

Sample Name: L17090885-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

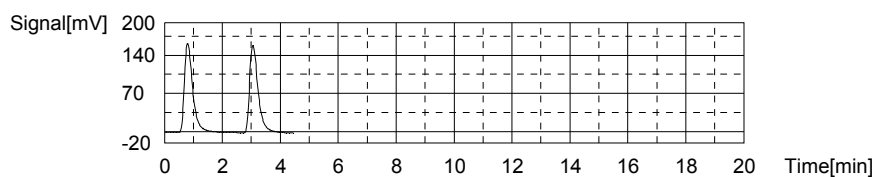
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.949mg/L TC:7.323mg/L IC:3.374mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	326.8	7.323mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/16/2017 12:35:14 AM
2	326.8	7.323mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/16/2017 12:39:43 AM

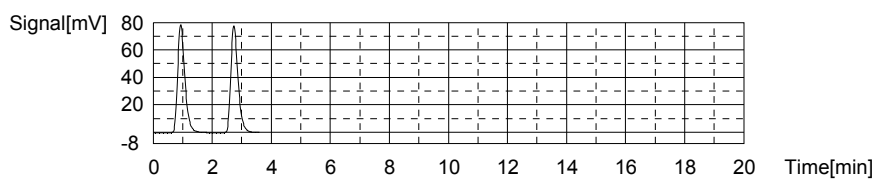
Mean Area 326.8
Mean Conc. 7.323mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	132.1	3.395mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/16/2017 12:44:25 AM
2	130.7	3.353mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/16/2017 12:48:49 AM

Mean Area 131.4
Mean Conc. 3.374mg/L



Sample

42/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

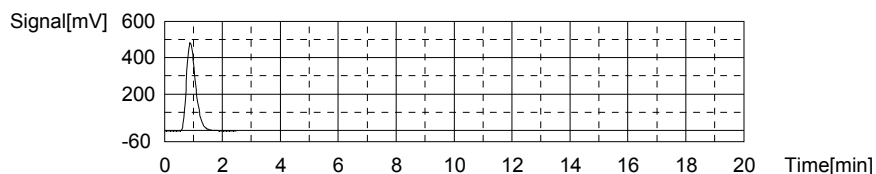
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.21mg/L TC:24.98mg/L IC:-0.2313mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1074	24.98mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/16/2017 12:56:48 AM

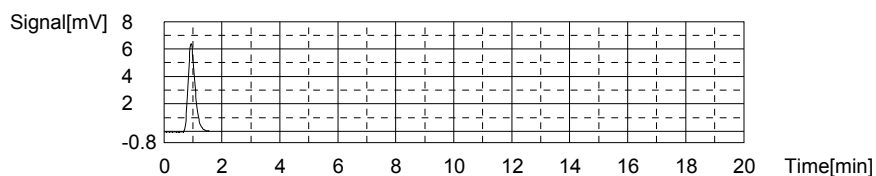
Mean Area 1074
 Mean Conc. 24.98mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.67	-0.2313mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/16/2017 1:01:12 AM

Mean Area 10.67
 Mean Conc. -0.2313mg/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:0.05705mg/L TC:-0.1850mg/L IC:-0.2420mg/L

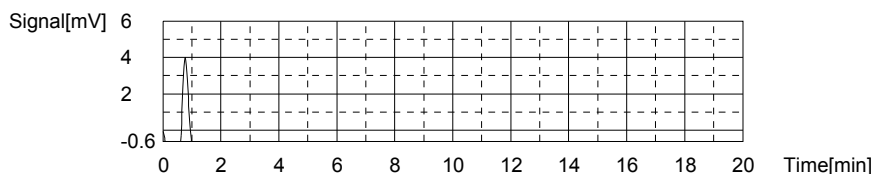
1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.036	-0.1850mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/16/2017 1:06:10 AM

43/54

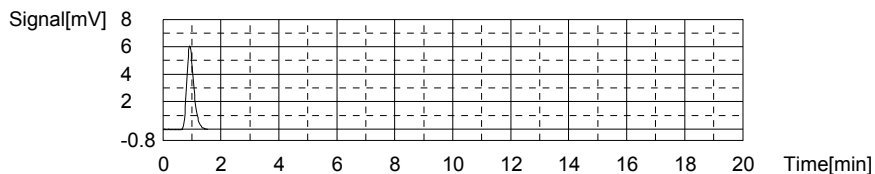
Mean Area 9.036
Mean Conc. -0.1850mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.31	-0.2420mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/16/2017 1:10:08 AM

Mean Area 10.31
Mean Conc. -0.2420mg/L



Sample

Sample Name: WG629813-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result:

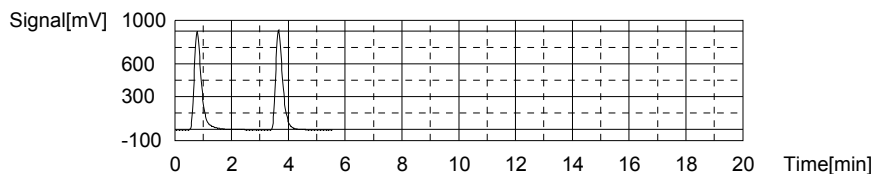
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.74mg/L TC:37.24mg/L IC:25.50mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1608	37.59mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/16/2017 1:18:32 AM
2	1578	36.88mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/16/2017 1:23:30 AM

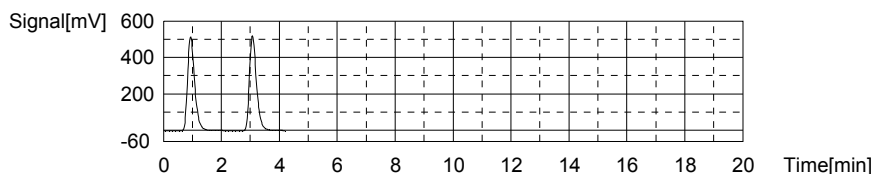
Mean Area 1593
Mean Conc. 37.24mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	867.6	25.36mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/16/2017 1:28:35 AM
2	877.1	25.64mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/16/2017 1:33:22 AM

Mean Area 872.4
Mean Conc. 25.50mg/L



Sample

Sample Name: L17090885-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

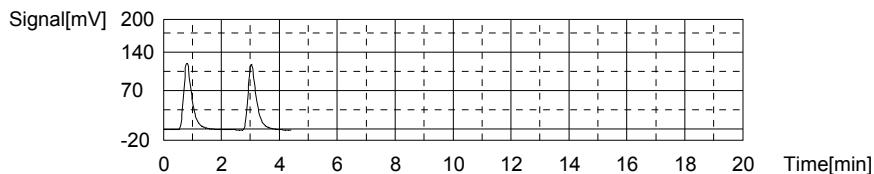
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.515mg/L TC:5.327mg/L IC:1.813mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	242.4	5.329mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/16/2017 1:41:05 AM
2	242.3	5.326mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/16/2017 1:45:33 AM

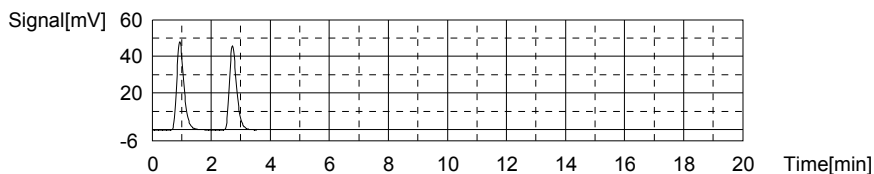
Mean Area 242.4
Mean Conc. 5.327mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	80.86	1.865mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/16/2017 1:50:12 AM
2	77.38	1.761mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/16/2017 1:54:34 AM

Mean Area 79.12
Mean Conc. 1.813mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

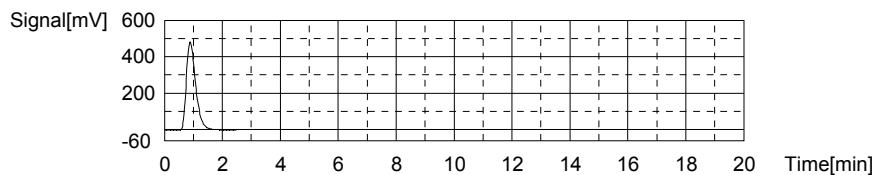
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.33mg/L TC:25.09mg/L IC:-0.2402mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1079	25.09mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 2:02:33 AM

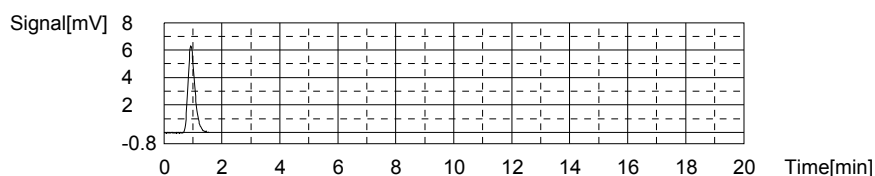
Mean Area 1079
Mean Conc. 25.09mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.37	-0.2402mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/16/2017 2:06:55 AM

Mean Area 10.37
Mean Conc. -0.2402mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

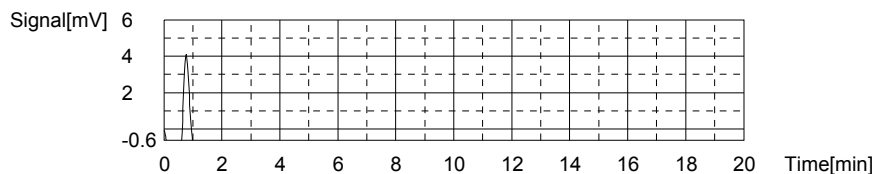
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06323mg/L TC:-0.1818mg/L IC:-0.2450mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.171	-0.1818mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 2:11:54 AM

Mean Area 9.171
Mean Conc. -0.1818mg/L



Anal.: IC

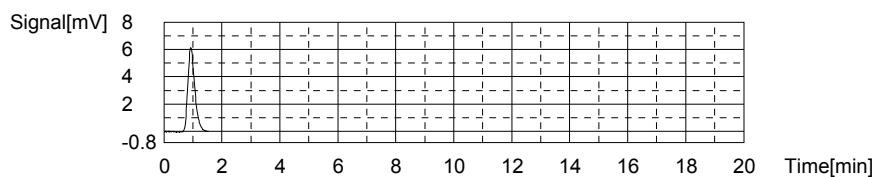
46/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.21	-0.2450mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/16/2017 2:15:52 AM

Mean Area 10.21
Mean Conc. -0.2450mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

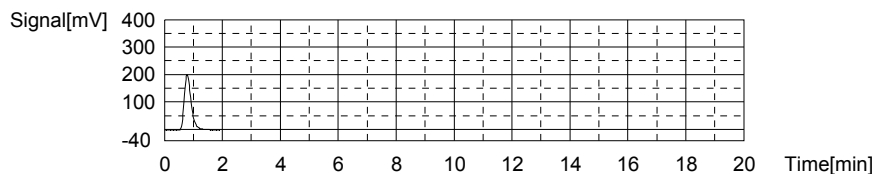
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.508mg/L TC:7.450mg/L IC:5.942mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	332.2	7.450mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 2:23:21 AM

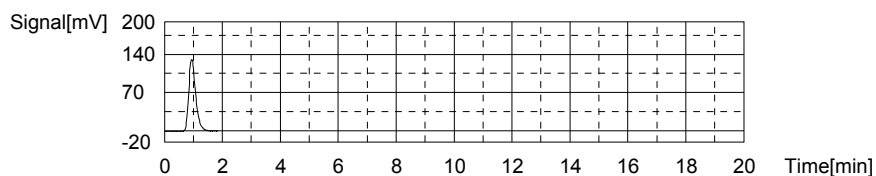
Mean Area 332.2
Mean Conc. 7.450mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	217.4	5.942mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/16/2017 2:28:04 AM

Mean Area 217.4
Mean Conc. 5.942mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

47/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

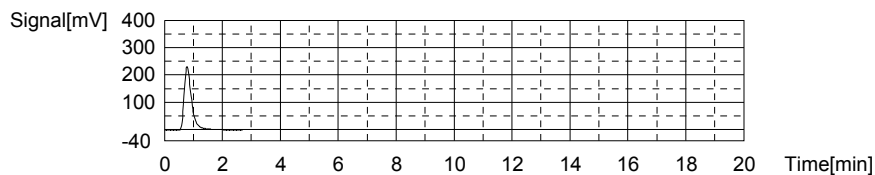
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.190mg/L TC:9.414mg/L IC:7.224mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	415.3	9.414mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 2:36:13 AM

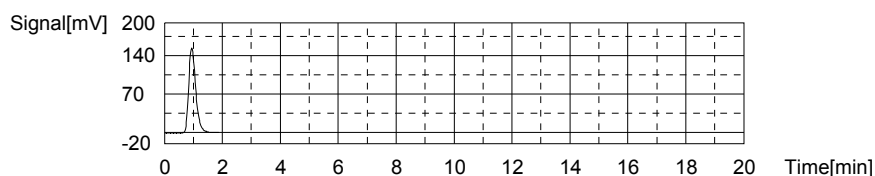
Mean Area 415.3
Mean Conc. 9.414mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	260.3	7.224mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/16/2017 2:40:58 AM

Mean Area 260.3
Mean Conc. 7.224mg/L



Sample

Sample Name: L17090765-01 (10)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

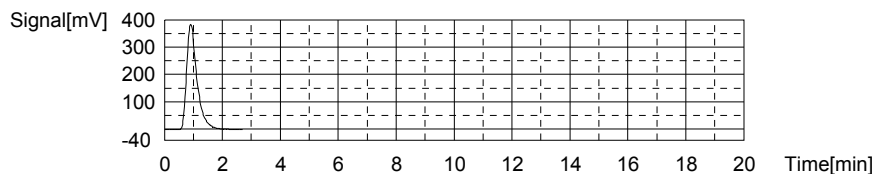
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:20.63mg/L TC:22.26mg/L IC:1.631mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	959.0	22.26mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 2:49:06 AM

Mean Area 959.0
Mean Conc. 22.26mg/L



Anal.: IC

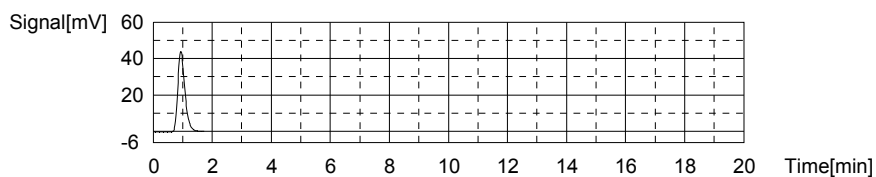
48/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	73.03	1.631mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/16/2017 2:53:40 AM

Mean Area 73.03
Mean Conc. 1.631mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

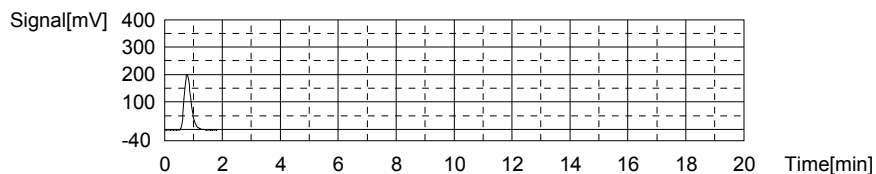
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.674mg/L TC:7.521mg/L IC:5.847mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	335.2	7.521mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 3:00:56 AM

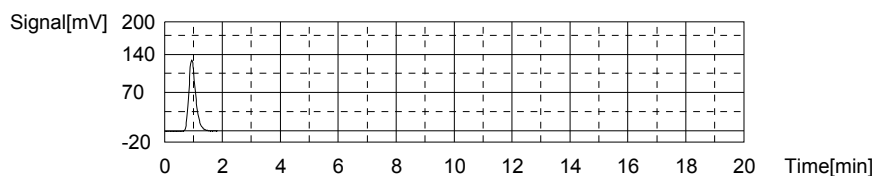
Mean Area 335.2
Mean Conc. 7.521mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	214.2	5.847mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/16/2017 3:05:36 AM

Mean Area 214.2
Mean Conc. 5.847mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

49/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

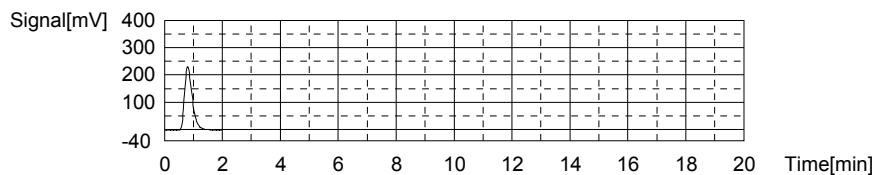
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.486mg/L TC:9.690mg/L IC:4.204mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	427.0	9.690mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 3:13:03 AM

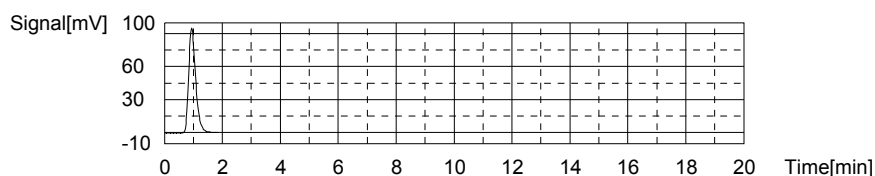
Mean Area 427.0
Mean Conc. 9.690mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	159.2	4.204mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/16/2017 3:17:49 AM

Mean Area 159.2
Mean Conc. 4.204mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

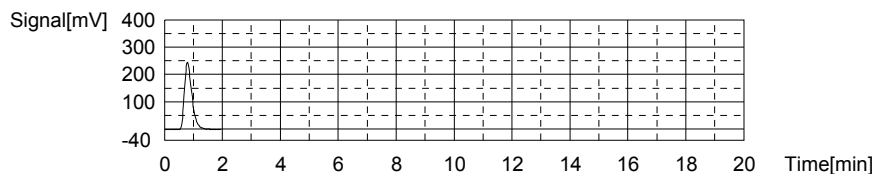
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.014mg/L TC:10.04mg/L IC:5.029mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	441.9	10.04mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 3:25:13 AM

Mean Area 441.9
Mean Conc. 10.04mg/L



Anal.: IC

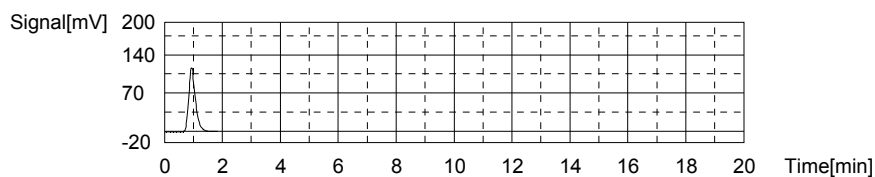
50/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	186.8	5.029mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/16/2017 3:29:56 AM

Mean Area 186.8
Mean Conc. 5.029mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

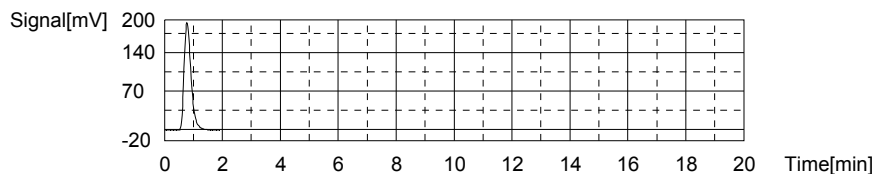
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.713mg/L TC:7.330mg/L IC:5.617mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	327.1	7.330mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32	9/16/2017 3:37:17 AM

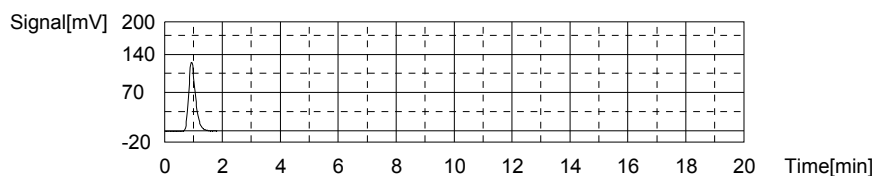
Mean Area 327.1
Mean Conc. 7.330mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	206.5	5.617mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	9/16/2017 3:41:59 AM

Mean Area 206.5
Mean Conc. 5.617mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

51/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

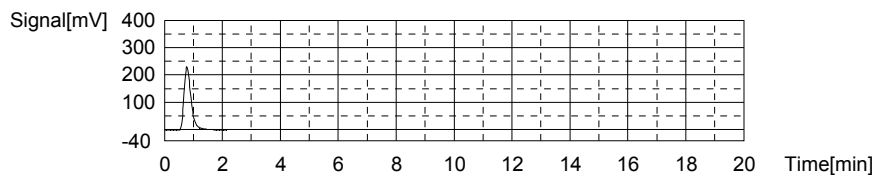
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.146mg/L TC:8.802mg/L IC:6.656mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	389.4	8.802mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 3:49:35 AM

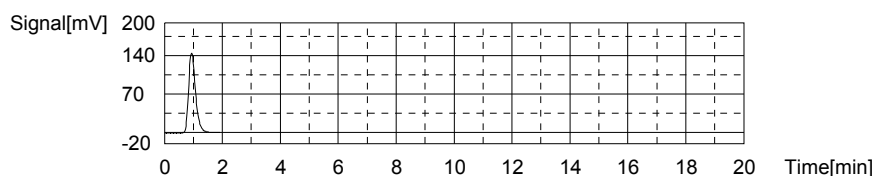
Mean Area 389.4
Mean Conc. 8.802mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	241.3	6.656mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/16/2017 3:54:24 AM

Mean Area 241.3
Mean Conc. 6.656mg/L



Sample

Sample Name:

Sample ID:

<Untitled>

Origin:

TOC-02-10-2017.met

Status

Completed

Chk. Result

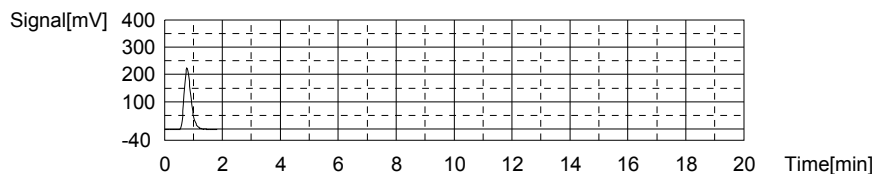
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.759mg/L TC:8.376mg/L IC:6.617mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	371.4	8.376mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 4:01:40 AM

Mean Area 371.4
Mean Conc. 8.376mg/L



Anal.: IC

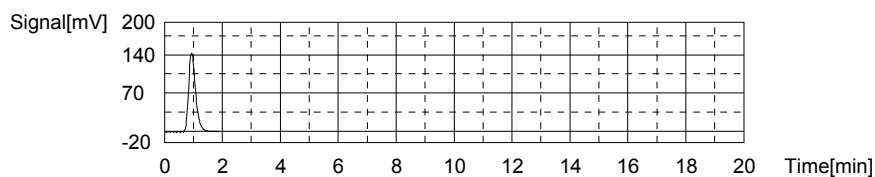
52/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	240.0	6.617mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/16/2017 4:06:27 AM

Mean Area 240.0
Mean Conc. 6.617mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

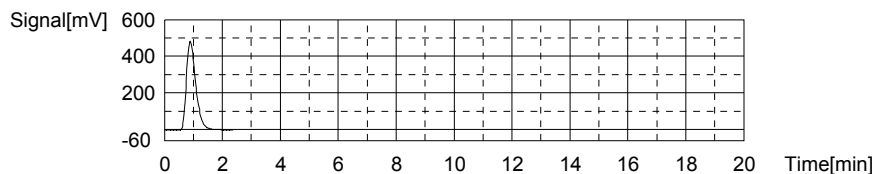
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.43mg/L TC:25.21mg/L IC:-0.2169mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1084	25.21mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/16/2017 4:14:16 AM

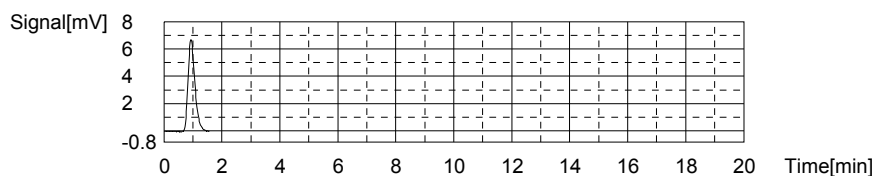
Mean Area 1084
Mean Conc. 25.21mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.15	-0.2169mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/16/2017 4:18:41 AM

Mean Area 11.15
Mean Conc. -0.2169mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

53/54

9/18/2017 7:39:45 AM

09-15-2017-DCM-TOC.t32

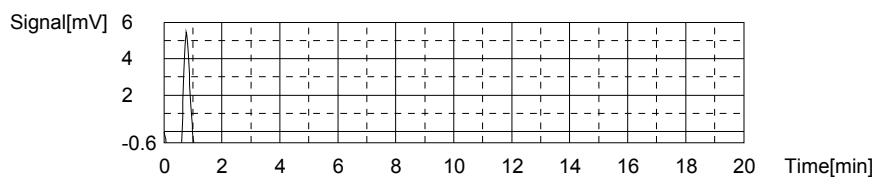
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1209mg/L TC:-0.1152mg/L IC:-0.2361mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.99	-0.1152mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/16/2017 4:23:44 AM

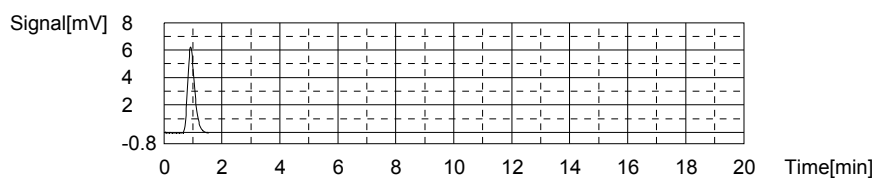
Mean Area 11.99
Mean Conc. -0.1152mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.51	-0.2361mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/16/2017 4:27:42 AM

Mean Area 10.51
Mean Conc. -0.2361mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
September 25, 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	BLR - BRANDON L. RICHARDS
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

September 25, 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

September 25, 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: ~~Scott Beesinger~~ **ELSPETH 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:

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: **60256135.6WTPTRUMAR16**

Program:
 pH:
 Number of Containers: 4

Site Name	Sample ID/Location ID	SBD	SED	Date	Time	Comp	Grab	Matrix	ERPIMS REQUIRED FIELDS					
									SA CODE	Cooler ID	LOT CONTROL NUMBERS			
									ABL	EBL	TBL			
GUTR WEEELLY	LH18/24-SP150-6468			9/13/17	1500		<input checked="" type="checkbox"/>	W	<input checked="" type="checkbox"/>	Ammonia-N				
						<input checked="" type="checkbox"/>	PENTHOSPHATE							
						<input checked="" type="checkbox"/>	TOC							
						<input checked="" type="checkbox"/>	Orthophosphate							

Microbac OVD
 Received: 09/14/2017 10:08
 By: BRENDA GREGORY
 221000105989

Comments: **STANDARD TAT**
 Relinquished by: *Scott Beesinger* Date: **9/13/17** Time: **1530**
 Relinquished by: *Brenda Gregory* Date: _____ Time: _____
 Received for Laboratory by: _____ (Signature)
 Received for Laboratory by: _____ (Signature)

Relinquished by: _____ (Signature) Date: _____ Time: _____ Remarks: _____
 Relinquished by: _____ (Signature) Date: _____ Time: _____
 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 5989

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

9/14/17

B19

pH Lot # HC 613865

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

9/14/17

B19

PRESERVATIVE
EXCEPTIONS
NONE

AS NOTED

B19 9/14/17

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17090765

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 25-SEP-2017

Samplenum **Container ID** **Products**
L17090765-01 964549 TSS 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	14-SEP-2017 11:00	BRG		
2	ANALYZ	W1	SEM	21-SEP-2017 15:56	JWR	BRG	
3	STORE	SEM	A1	25-SEP-2017 11:14	CLS	JWR	

Samplenum **Container ID** **Products**
L17090765-01 964550 NH3AA2 TOCLOW PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	WET	14-SEP-2017 11:00	BRG		
2	STORE	WET	A1	19-SEP-2017 10:11	BRG	TMM	

Samplenum **Container ID** **Products**
L17090765-01 964551 CR-AX2B PB-MS TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	14-SEP-2017 11:00	BRG		<2
2	ANALYZ	W1	WET	15-SEP-2017 07:11	DCM	BRG	
3	STORE	WET	A1	22-SEP-2017 16:50	BRG	EPT	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	14-SEP-2017 11:00	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: L17091185

Linda Raabe
AECOM Technical Services, Inc.
112 East Pecan
San Antonio, TX 78205

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 September 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



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

Lab Report #: L17091185

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?
00112159	H	2.0		1ZW056F52210009784	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 #:** L17091185**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-SP650-6470	L17091185-01	09/20/2017 15:00	09/21/2017 10:33



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091185
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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	2017-09-25 15:39:56



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091185
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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:	L17091185
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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:	L17091185
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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:	L17091185
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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:	L17091185
Project Name:		Method:	6850
Prep Batch Number(s):	WG630807	Reviewer Name:	Eric Lawson
LRC Date:	2017-09-25 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:	L17091185
Project Name:		Method:	NH3
Prep Batch Number(s):	WG631854	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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	2017-09-29 17:46:00



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091185
Project Name:		Method:	NH3
Prep Batch Number(s):	WG631854	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	NH3
Prep Batch Number(s):	WG631854	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	NH3
Prep Batch Number(s):	WG631854	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	NH3
Prep Batch Number(s):	WG631854	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	NH3
Prep Batch Number(s):	WG631854	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	PO4
Prep Batch Number(s):	WG630744	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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	2017-09-29 17:45:20



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091185
Project Name:		Method:	PO4
Prep Batch Number(s):	WG630744	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	PO4
Prep Batch Number(s):	WG630744	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	PO4
Prep Batch Number(s):	WG630744	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	PO4
Prep Batch Number(s):	WG630744	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	PO4
Prep Batch Number(s):	WG630744	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	TOC
Prep Batch Number(s):	WG631406	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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	2017-09-29 17:46:32



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091185
Project Name:		Method:	TOC
Prep Batch Number(s):	WG631406	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	TOC
Prep Batch Number(s):	WG631406	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	TOC
Prep Batch Number(s):	WG631406	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	TOC
Prep Batch Number(s):	WG631406	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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:	L17091185
Project Name:		Method:	TOC
Prep Batch Number(s):	WG631406	Reviewer Name:	Deanna Hesson
LRC Date:	2017-09-29 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 #: L17091185
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091185-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6470	Prep Method: 6850	Prep Date: 09/21/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 09/08/2017 16:52
Workgroup #: WG630807	Analyst: JWR	Run Date: 09/21/2017 20:09
Collect Date: 09/20/2017 15:00	Dilution: 1	File ID: 1LM.LM40532
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.622		0.400	0.200	0.100

Certificate of Analysis

Sample #: L17091185-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: LH18/24-SP650-6470	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 09/29/2017 09:44
Workgroup #: WG631854	Analyst: TB	Run Date: 09/29/2017 10:25
Collect Date: 09/20/2017 15:00	Dilution: 10	File ID: SC170929001.040
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	26.0		2.00	1.00	0.500

Certificate of Analysis

Sample #: L17091185-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6470	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:25
Workgroup #: WG630744	Analyst: DLP	Run Date: 09/21/2017 14:40
Collect Date: 09/20/2017 15:00	Dilution: 10	File ID: 00.1709211440-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.92		1.00	0.500	0.250

Certificate of Analysis

Lab Report #: L17091185
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Sample #: L17091185-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6470	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG631406	Analyst: DIH	Run Date: 09/27/2017 22:08
Collect Date: 09/20/2017 15:00	Dilution: 5	File ID: TC09272017.057
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	116		10.0	5.00	2.50

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17091185

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091185-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6470	Prep Method: 6850	Prep Date: 09/21/2017 16:30
Matrix: Water	Analytical Method: 6850	Cal Date: 09/08/2017 16:52
Workgroup #: WG630807	Analyst: JWR	Run Date: 09/21/2017 20:09
Collect Date: 09/20/2017 15:00	Dilution: 1	File ID: 1LM.LM40532
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.622		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: 090817_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 WG628979 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (09/08/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: ICAL WG628977 : 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.LM40484	WG628977-01 CCB	1	1		09/08/17 14:40
2	1LM.LM40485	WG628977-02 STD (0.1 ug/L)	1	1	STD80232	09/08/17 14:59
3	1LM.LM40486	WG628977-03 STD (0.2 ug/L)	1	1	STD80232	09/08/17 15:18
4	1LM.LM40487	WG628977-04 STD (0.5 ug/L)	1	1	STD80232	09/08/17 15:37
5	1LM.LM40488	WG628977-05 STD (1.0 ug/L)	1	1	STD80232	09/08/17 15:56
6	1LM.LM40489	WG628977-06 STD (2.0 ug/L)	1	1	STD80232	09/08/17 16:15
7	1LM.LM40490	WG628977-07 STD (5.0 ug/L)	1	1	STD80232	09/08/17 16:34
8	1LM.LM40491	WG628977-08 STD (10 ug/L)	1	1	STD80232	09/08/17 16:52
9	1LM.LM40492	WG628977-09 SSCV (1.0 ug/L)	1	1	STD80234	09/08/17 17:11
10	1LM.LM40493	WG628984-01 CCB	1	1		09/08/17 17:30
11	1LM.LM40494	WG628984-02 CCV (1.0ug/L)	1	1	STD80232	09/08/17 17:49
12	1LM.LM40495	WG628979-05 MRL (0.2ug/L)	1	1	STD80232	09/08/17 18:08
13	1LM.LM40496	WG628979-01 MCT (0.2ug/L)	1	1	STD80234	09/08/17 18:27
14	1LM.LM40497	WG628979-02 BLANK	1	1		09/08/17 18:46
15	1LM.LM40498	WG628979-03 LCS (0.2ug/L)	1	1	STD80234	09/08/17 19:05
16	1LM.LM40499	WG628979-04 LCS2 (0.2ug/L)	1	1	STD80234	09/08/17 19:24
17	1LM.LM40500	L17081653-01	1	1		09/08/17 19:43
18	1LM.LM40501	L17081653-01 (10x) (NR)	1	10		09/08/17 20:02
19	1LM.LM40502	L17081653-01 (100x) (NR)	1	100		09/08/17 20:21
20	1LM.LM40503	L17090079-01	1	1		09/08/17 20:40
21	1LM.LM40504	L17090079-02	1	1		09/08/17 20:59
22	1LM.LM40505	L17090079-03	1	1		09/08/17 21:18
23	1LM.LM40506	WG628984-03 CCV (1.0ug/L)	1	1	STD80232	09/08/17 21:37
24	1LM.LM40507	WG628979-06 MRL (0.2ug/L)	1	1	STD80232	09/08/17 21:56
25	1LM.LM40508	WG628984-04 CCB	1	1		09/08/17 22:15

Comments

Seq.	Rerun	Dil.	Reason	Analytes
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Page: 1

Approved: 11-SEP-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 092117_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 WG630807 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (09/08/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: Samples L17090765-01 and L17091185-01 were analyzed neat and at multiple dilutions based on their range of historical results.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40522	WG630810-01 CCB	1	1		09/21/17 17:00
2	1LM.LM40523	WG630810-02 CCV (1.0ug/L)	1	1	STD80232	09/21/17 17:19
3	1LM.LM40524	WG630807-05 MRL (0.2ug/L)	1	1	STD80232	09/21/17 17:38
4	1LM.LM40525	WG630807-01 MCT (0.2ug/L)	1	1	STD80234	09/21/17 17:57
5	1LM.LM40526	WG630807-02 BLANK	1	1		09/21/17 18:16
6	1LM.LM40527	WG630807-03 LCS (0.2ug/L)	1	1	STD80234	09/21/17 18:35
7	1LM.LM40528	WG630807-04 LCS2 (0.2ug/L)	1	1	STD80234	09/21/17 18:54
8	1LM.LM40529	L17090765-01	1	1		09/21/17 19:13
9	1LM.LM40530	L17090765-01 (10x) (NR)	1	10		09/21/17 19:31
10	1LM.LM40531	L17090765-01 (100x) (NR)	1	100		09/21/17 19:50
11	1LM.LM40532	L17091185-01	1	1		09/21/17 20:09
12	1LM.LM40533	L17091185-01 (10x) (NR)	1	10		09/21/17 20:28
13	1LM.LM40534	L17091185-01 (100x) (NR)	1	100		09/21/17 20:47
14	1LM.LM40535	WG630810-03 CCV (1.0ug/L)	1	1	STD80232	09/21/17 21:06
15	1LM.LM40536	WG630807-06 MRL (0.2ug/L)	1	1	STD80232	09/21/17 21:25
16	1LM.LM40537	WG630810-04 CCB	1	1		09/21/17 21:44

Comments

Seq.	Rerun	Dil.	Reason	Analytes

Eri C. J...



Microbac Laboratories Inc.

Data Checklist

Date: 08-SEP-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: WG628977
 Runlog ID: 84489
 Analytical Workgroups: L17081653, L17090079

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	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	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	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:
11-SEP-2017



Secondary Reviewer:
11-SEP-2017




Microbac Laboratories Inc.

Data Checklist

Date: 21-SEP-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 84799
 Analytical Workgroups: L17090765, L17091185

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)	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	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-SEP-2017



Secondary Reviewer:
25-SEP-2017




Analytical Method:6850
Login Number:L17091185

AAB#:WG630807

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-SP650-6470	01	09/20/17					09/21/2017	1.1	28		09/21/17	.2	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17091185 Work Group: WG630807
 Blank File ID: 1LM.LM40526 Blank Sample ID: WG630807-02
 Prep Date: 09/21/17 16:30 Instrument ID: LCMS1
 Analyzed Date: 09/21/17 18:16 Method: 6850
 Analyst: JWR

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG630807-05	1LM.LM40524	09/21/17 17:38	01
MCT	WG630807-01	1LM.LM40525	09/21/17 17:57	01
LCS	WG630807-03	1LM.LM40527	09/21/17 18:35	01
LCS2	WG630807-04	1LM.LM40528	09/21/17 18:54	01
LH18/24-SP650-6470	L17091185-01	1LM.LM40532	09/21/17 20:09	01
QCMRL	WG630807-06	1LM.LM40536	09/21/17 21:25	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5492605
 Report generated 09/25/2017 16:10



Login Number: L17091185 Prep Date: 09/21/17 16:30 Sample ID: WG630807-02
 Instrument ID: LCMS1 Run Date: 09/21/17 18:16 Prep Method: 6850
 File ID: 1LM.LM40526 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG630807 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-08-SEP-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: 5492606
 25-SEP-2017 16:10



Login Number: L17091185 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG630807 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG630807-03 LCS File ID: 1LM.LM40527 Run Date: 09/21/2017 18:35
 Sample ID: WG630807-04 LCS2 File ID: 1LM.LM40528 Run Date: 09/21/2017 18:54

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.204	102	0.200	0.200	100	1.98	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5492607
 Report generated: 09/25/2017 16:10



Login Number: L17091185
Analytical Method: 6850
ICAL Workgroup: WG628977

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.469	6.88	1.00000	

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5493254
Report generated 09/25/2017 16:10



Login Number: L17091185
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	WG628977-02			WG628977-03			WG628977-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	52500.0000	1.681	0.200	93400.0000	1.487	0.500	233000.000	1.445

INT_CAL - Modified 03/06/2008
PDF File ID: 5493254
Report generated 09/25/2017 16:10



Login Number: L17091185
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 08-SEP-17 16:52
 Column ID: F

Analyte	WG628977-05			WG628977-06			WG628977-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	460000.000	1.440	2.00	925000.000	1.444	5.00	2230000.00	1.418

INT_CAL - Modified 03/06/2008
 PDF File ID: 5493254
 Report generated 09/25/2017 16:10



Login Number: L17091185
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	WG628977-08		
	CONC	RESP	RF
Perchlorate	10.0	4190000.00	1.371

INT_CAL - Modified 03/06/2008
PDF File ID: 5493254
Report generated 09/25/2017 16:10



Login Number: L17091185 Run Date: 09/08/2017 Sample ID: WG628977-09
 Instrument ID: LCMS1 Run Time: 17:11 Method: 6850
 File ID: 1LM.LM40492 Analyst: JWR QC Key: DOD4
 ICal Workgroup: WG628977 Cal ID: LCMS1 - 08-SEP-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	1.04	ug/L	1.48	4.00	15	

* Exceeds %D Limit



Login Number: L17091185 Run Date: 09/21/2017 Sample ID: WG630810-01
Instrument ID: LCMS1 Run Time: 17:00 Method: 6850
File ID: LLM.LM40522 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG630807 Cal ID: LCMS1 - 08-SEP-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: L17091185 Run Date: 09/21/2017 Sample ID: WG630810-04
Instrument ID: LCMS1 Run Time: 21:44 Method: 6850
File ID: LLM.LM40537 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG630807 Cal ID: LCMS1 - 08-SEP-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: L17091185 Run Date: 09/21/2017 Sample ID: WG630810-02
 Instrument ID: LCMS1 Run Time: 17:19 Method: 6850
 File ID: 1LM.LM40523 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG630807 Cal ID: LCMS1 - 08-SEP-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.07	ug/L	1.52	7.00	15	

* Exceeds %D Criteria



Login Number: L17091185 Run Date: 09/21/2017 Sample ID: WG630810-03
 Instrument ID: LCMS1 Run Time: 21:06 Method: 6850
 File ID: 1LM.LM40535 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG630807 Cal ID: LCMS1 - 08-SEP-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.06	ug/L	1.51	6.00	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5492609
 Report generated 09/25/2017 16:10



Login Number: L17091185 Run Date: 09/21/2017 Sample ID: WG630807-05
Instrument ID: LCMS1 Run Time: 17:38 Prep Method: 6850
File ID: 1LM.LM40524 Analyst: JWR Method: 6850
Workgroup (AAB#): WG630807 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.196	98.0	70 - 130	



Login Number: L17091185 Run Date: 09/21/2017 Sample ID: WG630807-06
Instrument ID: LCMS1 Run Time: 21:25 Prep Method: 6850
File ID: 1LM.LM40536 Analyst: JWR Method: 6850
Workgroup (AAB#): WG630807 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.198	99.0	70 - 130	



Login Number: L17091185
Instrument ID: LCMS1
Workgroup (AAB#): WG630807

ICAL CCV Number: WG628977-05
CAL ID: LCMS1-08-SEP-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG628977	NA	NA	1580000
Upper Limit	NA	NA	2370000
Lower Limit	NA	NA	790000
<u>L17091185-01</u>	1.00	01	1420000
WG630807-02	1.00	01	1540000
WG630807-03	1.00	01	1590000
WG630807-04	1.00	01	1610000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method: 6850
Prep Date: 09/21/2017 16:30
Anal Method: 6850
Analysis Date: 09/21/2017 20:09

Samplenum: L17091185-01
File ID: 1LM.LM40532
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	255000	85900	2.97	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: _____	Samplenum: WG628977-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40485
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/08/2017 14:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	52500	17500	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: _____	Samplenum: WG628977-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40486
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/08/2017 15:18	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	93400	29500	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: _____	Samplenum: WG628977-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40487
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/08/2017 15:37	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	233000	79100	2.95	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: _____	Samplenum: WG628977-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40488
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/08/2017 15:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	460000	150000	3.07	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: _____	Samplenum: WG628977-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40489
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/08/2017 16:15	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	925000	303000	3.05	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method: _____
Prep Date: _____
Anal Method: 6850
Analysis Date: 09/08/2017 16:34

Samplenum: WG628977-07
File ID: 1LM.LM40490
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2230000	745000	2.99	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method: _____
Prep Date: _____
Anal Method: 6850
Analysis Date: 09/08/2017 16:52

Samplenum: WG628977-08
File ID: 1LM.LM40491
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	4190000	1390000	3.01	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method:
Prep Date:
Anal Method: 6850
Analysis Date: 09/08/2017 17:11

Samplenum: WG628977-09
File ID: 1LM.LM40492
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	478000	152000	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: 6850	Samplenum: WG630807-01
Instrument: LCMS1	Prep Date: 09/21/2017 16:30	File ID: 1LM.LM40525
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 17:57	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	96800	31300	3.09	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: 6850	Samplenum: WG630807-02
Instrument: LCMS1	Prep Date: 09/21/2017 16:30	File ID: 1LM.LM40526
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 18:16	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	3570	1190	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method: 6850
Prep Date: 09/21/2017 16:30
Anal Method: 6850
Analysis Date: 09/21/2017 18:35

Samplenum: WG630807-03
File ID: 1LM.LM40527
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	99800	34700	2.88	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method: 6850
Prep Date: 09/21/2017 16:30
Anal Method: 6850
Analysis Date: 09/21/2017 18:54

Samplenum: WG630807-04
File ID: 1LM.LM40528
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	99100	32400	3.06	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: 6850	Samplenum: WG630807-05
Instrument: LCMS1	Prep Date: 09/21/2017 16:30	File ID: 1LM.LM40524
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 17:38	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	92000	28500	3.23	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method: 6850
Prep Date: 09/21/2017 16:30
Anal Method: 6850
Analysis Date: 09/21/2017 21:25

Samplenum: WG630807-06
File ID: 1LM.LM40536
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	113000	36600	3.09	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: _____	Samplenum: WG630810-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40522
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 17:00	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	3200	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: _____	Samplenum: WG630810-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40523
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 17:19	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	440000	139000	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185
Instrument: LCMS1
Analyst: JWR
Worknum: WG630807

Prep Method:
Prep Date:
Anal Method: 6850
Analysis Date: 09/21/2017 21:06

Samplenum: WG630810-03
File ID: 1LM.LM40535
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	543000	179000	3.03	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091185	Prep Method: _____	Samplenum: WG630810-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40537
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG630807	Analysis Date: 09/21/2017 21:44	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	53900	2190	24.6	2.3	3.8	*

2.2 General Chemistry Data

2.2.1 Ammonia Data

2.2.1.1 Summary Data

Lab Report #: L17091185

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091185-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: LH18/24-SP650-6470	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 09/29/2017 09:44
Workgroup #: WG631854	Analyst: TB	Run Date: 09/29/2017 10:25
Collect Date: 09/20/2017 15:00	Dilution: 10	File ID: SC170929001.040
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	26.0		2.00	1.00	0.500

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: 29-SEP-2017
 Analyst: TB
 Analyst: NA
 Method: NH3
 Instrument: SC
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG631854

Calibration/Linearity	09/29/2017
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:
29-SEP-2017

Secondary Reviewer:
29-SEP-2017

Todd Boyle

Denna Johnson



Analytical Method: 350.1
Login Number: L17091185

AAB#: WG631854

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-SP650-6470	01	09/20/17					09/29/2017	8.8	28		09/29/17	8.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17091185 Work Group: WG631854
 Blank File ID: SC170929001.037 Blank Sample ID: WG631854-01
 Prep Date: 09/29/17 10:11 Instrument ID: SMARTCHEM
 Analyzed Date: 09/29/17 10:11 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	WG631854-02	SC170929001.012	09/29/17 09:49	01
LH18/24-SP650-6470	L17091185-01	SC170929001.040	09/29/17 10:25	DL01
DUP	WG631854-05	SC170929001.043	09/29/17 10:30	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5502754
 Report generated 09/29/2017 12:35



Login Number: L17091185 Prep Date: 09/29/17 10:11 Sample ID: WG631854-01
Instrument ID: SMARTCHEM Run Date: 09/29/17 10:11 Prep Method: 350.1
File ID: SC170929001.037 Analyst: TB Method: 350.1
Workgroup (AAB#): WG631854 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-29-SEP-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Nitrogen, Ammonia	0.0500	0.200	0.0668	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: 5502755
29-SEP-2017 12:35



Login Number: L17091185 Run Date: 09/29/2017 Sample ID: WG631854-02
Instrument ID: SMARTCHEM Run Time: 09:49 Prep Method: 350.1
File ID: SC170929001.012 Analyst: TB Method: 350.1
Workgroup (AAB#): WG631854 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD83234 Cal ID: SMARTC-29-SEP-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Ammonia	2.00	2.04	102	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5502756
Report generated: 09/29/2017 12:35



2.2 General Chemistry Data

2.2.2 Orthophosphate Data

2.2.2.1 Summary Data

Lab Report #: L17091185

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091185-01	PrePrep Method: N/A	Instrument: V-1200
Client ID: LH18/24-SP650-6470	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:25
Workgroup #: WG630744	Analyst: DLP	Run Date: 09/21/2017 14:40
Collect Date: 09/20/2017 15:00	Dilution: 10	File ID: 00.1709211440-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.92		1.00	0.500	0.250

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

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

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: 21-SEP-2017
 Analyst: DLP
 Analyst: NA
 Method: PO4
 Instrument: V-1200
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG630744

Calibration/Linearity	09-07-17
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	
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	
Primary Reviewer	DLP
Secondary Reviewer	SAV
Comments	

Primary Reviewer:
21-SEP-2017

Secondary Reviewer:
22-SEP-2017

Dwight Payne

Sarah Vandenberg



Analytical Method: 365.2
Login Number: L17091185

AAB#: WG630744

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-SP650-6470	01	09/20/17					09/21/2017	1	2		09/21/17	1	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17091185 Work Group: WG630744
 Blank File ID: 00.1709211440-03 Blank Sample ID: WG630744-01
 Prep Date: 09/21/17 14:40 Instrument ID: V-1200
 Analyzed Date: 09/21/17 14:40 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	WG630744-02	00.1709211440-04	09/21/17 14:40	
LCS2	WG630744-03	00.1709211440-05	09/21/17 14:40	
LH18/24-SP650-6470	L17091185-01	00.1709211440-06	09/21/17 14:40	
DUP	WG630744-05	00.1709211440-07	09/21/17 14:40	

Report Name: BLANK_SUMMARY
 PDF File ID: 5491440
 Report generated 09/22/2017 14:03



Login Number: L17091185 Prep Date: 09/21/17 14:40 Sample ID: WG630744-01
 Instrument ID: V-1200 Run Date: 09/21/17 14:40 Prep Method: 365.2
 File ID: 00.1709211440-03 Analyst: DLP Method: 365.2
 Workgroup (AAB#): WG630744 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: V-1200-19-SEP-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: 5491441
 22-SEP-2017 14:03



Login Number: L17091185 Analyst: DLP Prep Method: 365.2
 Instrument ID: V-1200 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG630744 Units: mg/L
 QC Key: DOD4 Lot #: STD83996
 Sample ID: WG630744-02 LCS File ID: 00.1709211440-04 Run Date: 09/21/2017 14:40
 Sample ID: WG630744-03 LCS2 File ID: 00.1709211440-05 Run Date: 09/21/2017 14:40

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	1.41	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5491442
 Report generated: 09/22/2017 14:03



2.2.2.3 Raw Data

Curves

WG 628802

Parameter: P04

Spectrophotometer: V-1200

Calibration (Curve) standard stock: STD 79640

Concentration: 1000 mg/L

Recipe for preparation of curve standards found in:

SOP: 3653 Revision: 11 Page: 9

Second Source Stock: STD 83662 (concentration: 10 mg/L)

Daily Preparation: 10 (10) / 100 x
1.0

concentration = _____

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
STD 1 1.0	50	1 cm	880	0.630
STD 2 0.7	1			0.443
STD 3 0.5	1			0.316
STD 4 0.2	1			0.125
STD 5 0.1	1			0.064
STD 6 0.05	1			0.029
STD 7 0.020	1			0.000
2nd Source 1.0	1			0.636

Analyst: Christy Payne

Date/Time: 09-07-17 1525

DCN#128143



Microbac Laboratories Inc.
INITIAL CALIBRATION

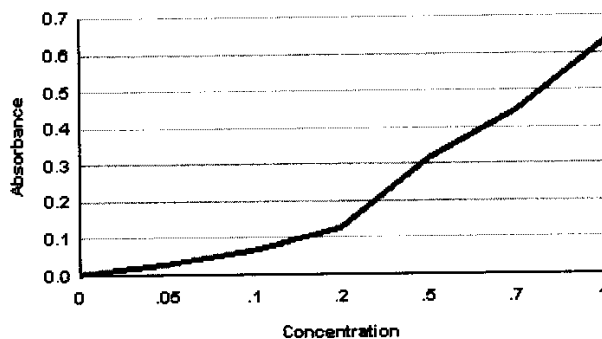
Workgroup: WG628802
Analytical Method: 300
Instrument ID: V-1200

Analyst: DLP
Initial Calibration Date: 09/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.631729
Y-Intercept: -0.000558313
Coef. Of Correlation (R^2): 0.999969
Coef. Of Correlation (R): 0.999985

Concentration X	Absorbance Y	X ²	X * Y	Y-Fitted (mX ² +B)
0.00	0.00	0.00	0.00	-0.000558313
0.0500	0.0290	0.00250	0.00145	0.0310281
0.100	0.0640	0.0100	0.00640	0.0626146
0.200	0.125	0.0400	0.0250	0.125787
0.500	0.316	0.250	0.158	0.315306
0.700	0.443	0.490	0.310	0.441652
1.00	0.630	1.00	0.630	0.631170

Curve Fit



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 09/07/2017 16:16



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

00861936

Workgroup #: WG628802
File ID: 00.1709071525-08
CCV ID: WG628802-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: V-1200
Run Date: 09/07/2017
Run Time: 15:25
Analyst: DLP
Cal ID: V-1200 - 07-SEP-17 15:25:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.01	0.636	1.0	

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

WET_WG_SSCV - Modified 03/06/2008
Report generated 09/07/2017 16:17



WORKGROUP: WG630744

Orthophosphate
(orthophosphate1)

EPA 365.2 / SM4500-P E
SOP K3653 Rev 17
Color Reagent Chemicals
RGT 41099
RGT 40466
RGT 41073
COA 18278

CCV: STD 83995 LCS: STD 83996
Daily Dilution: 5(5)180 Daily Dilution: 6(6)1100
Daily Dilution: 0.50 Daily Dilution: 1.0
Spectrophotometer: V-1200 Curve ID: WS 628802
09-07-17

Spike: STD 83996
Daily Dilution: 2(2)180
Daily Dilution: 0.40

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: 0.5 mg/L	50			0.324
BLK/CCB:	50			0.000
LCS: 1.0 ppm	50			0.635
LCSD: 1.0 ppm	50			0.644
09-1185-01	50		1/10	0.247
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
DUB 1185-01	50		1/10	0.253
MS: () 1185-01	50		1/10	0.271
MSD: ()	50			
CCV: ()	50			0.327
CCB:	50			0.003

Analyst: Quincy Payne Date / Time: 09-21-17 | 1440

DCN#128444



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG630744Analyst: DLPAnalyte: ORTHOPHOSPHATEDate: 09/21/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG630744-01	50	50	0	0.6317	-0.0005583	0.00088379	0.00088379	1	mg/L
WG630744-02	50	50	0.635	0.6317	-0.0005583	1.0061	1.0061	1	mg/L
WG630744-03	50	50	0.644	0.6317	-0.0005583	1.0203	1.0203	1	mg/L
L17091185-01	50	50	0.247	0.6317	-0.0005583	0.39187	3.9187	10	mg/L
WG630744-04	50	50	0.247	0.6317	-0.0005583	0.39187	3.9187	10	mg/L
WG630744-05	50	50	0.253	0.6317	-0.0005583	0.40137	4.0137	10	mg/L
WG630744-06	50	50	0.271	0.6317	-0.0005583	0.42987	4.2987	10	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 09/21/2017 16:41



Workgroup #: WG630805 Instrument ID: V-1200
File ID: 00.1709211440-09 Run Date: 09/21/2017
CCV ID: WG630805-03 Run Time: 14:40
Units: mg/L Analyst: DLP
Analyte: ORTHOPHOSPHATE Cal ID: V-1200 - 19-SEP-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.519	0.654	3.8	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 09/21/2017 16:39



Workgroup #: WG630805 Instrument ID: V-1200
File ID: 00.1709211440-01 Run Date: 09/21/2017
CCV ID: WG630805-01 Run Time: 14:40
Units: mg/L Analyst: DLP
Analyte: ORTHOPHOSPHATE Cal ID: V-1200 - 19-SEP-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.514	0.648	2.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 09/21/2017 16:39



2.2 General Chemistry Data

2.2.3 Total Organic Carbon Data

2.2.3.1 Summary Data

Lab Report #: L17091185

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091185-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6470	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG631406	Analyst: DIH	Run Date: 09/27/2017 22:08
Collect Date: 09/20/2017 15:00	Dilution: 5	File ID: TC09272017.057
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	116		10.0	5.00	2.50

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: 27-SEP-2017
 Analyst: DIH
 Analyst: NA
 Method: TOC
 Instrument: TOC
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG631406 WG631408

Calibration/Linearity	2/10/2017
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	
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	DIH
Secondary Reviewer	DCM
Comments	

Primary Reviewer:
28-SEP-2017

Secondary Reviewer:
28-SEP-2017



Analytical Method: 415.1
Login Number: L17091185

AAB#: WG631406

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-SP650-6470	01	09/20/17					09/27/2017	7.3	28		09/27/17	7.3	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17091185
 Blank File ID: TC09272017.004
 Prep Date: 09/27/17 10:47
 Analyzed Date: 09/27/17 10:47
 Analyst: DIH

Work Group: WG631406
 Blank Sample ID: WG631406-01
 Instrument ID: TOC-VWP
 Method: 415.1

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG631406-02	TC09272017.005	09/27/17 10:58	01
LCS2	WG631406-03	TC09272017.006	09/27/17 11:11	01
DUP	WG631406-05	TC09272017.031	09/27/17 16:45	DL01
LH18/24-SP650-6470	L17091185-01	TC09272017.057	09/27/17 22:08	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5498921
 Report generated 09/28/2017 08:45



Login Number: L17091185 Prep Date: 09/27/17 10:47 Sample ID: WG631406-01
 Instrument ID: TOC-VWP Run Date: 09/27/17 10:47 Prep Method: 415.1
 File ID: TC09272017.004 Analyst: DIH Method: 415.1
 Workgroup (AAB#): WG631406 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: 5498922
 28-SEP-2017 08:45



Login Number: L17091185 Analyst: DIH Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG631406 Units: mg/L
 QC Key: DOD4 Lot #: STD83735
 Sample ID: WG631406-02 LCS File ID: TC09272017.005 Run Date: 09/27/2017 10:58
 Sample ID: WG631406-03 LCS2 File ID: TC09272017.006 Run Date: 09/27/2017 11:11

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	25.2	101	25.0	25.5	102	1.11	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5498923
 Report generated: 09/28/2017 08:45



2.2.3.3 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

- | | | |
|--|---|---|
| <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

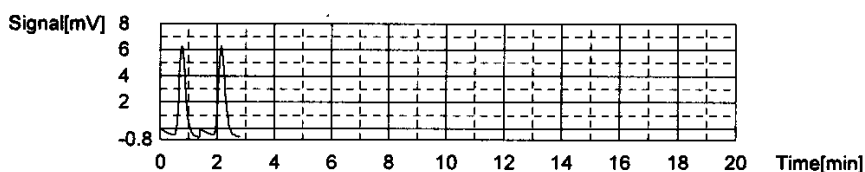
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

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

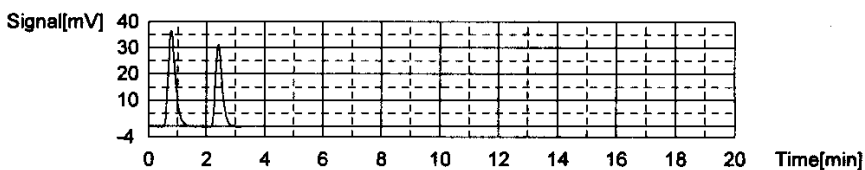
Acid Add. 0.000%
 Mean Area 10.82



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

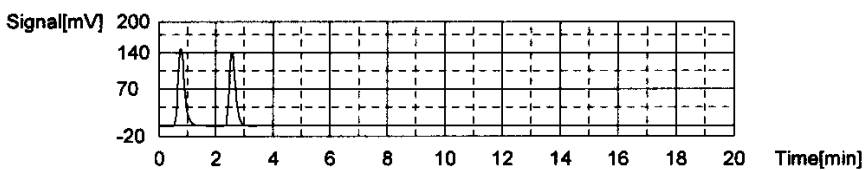
Acid Add. 0.000%
 Mean Area 57.92



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

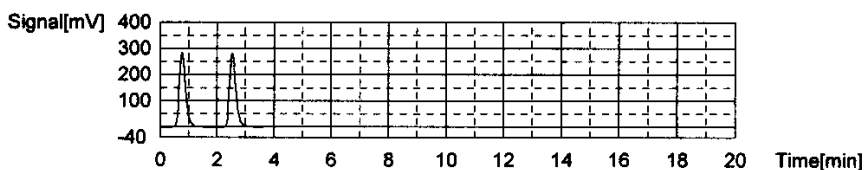


Conc: 10.00mg/L

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

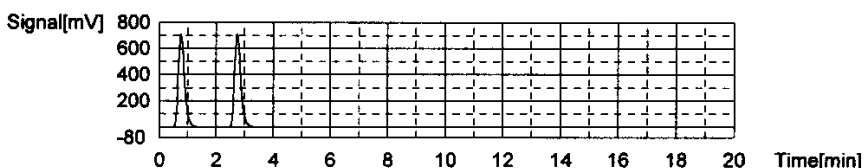
Acid Add. 0.000%
 Mean Area 440.2



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

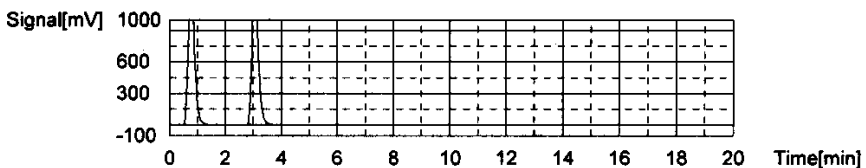
Acid Add. 0.000%
 Mean Area 1092



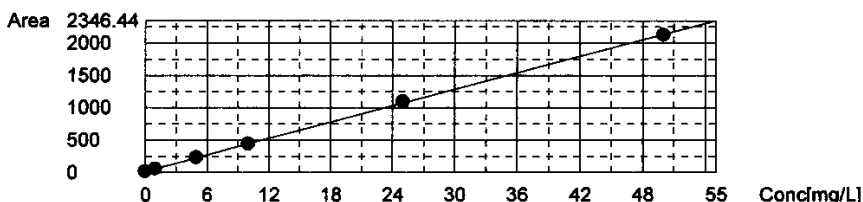
Conc: 50.00mg/L

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

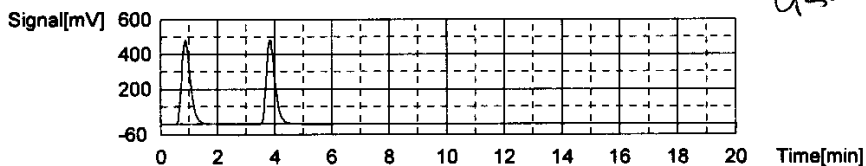
1. Det

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

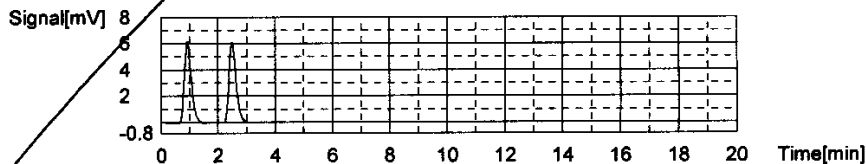
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

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

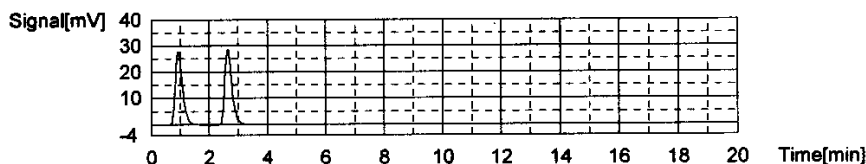
Acid Add. 3.000%
Mean Area 10.51



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

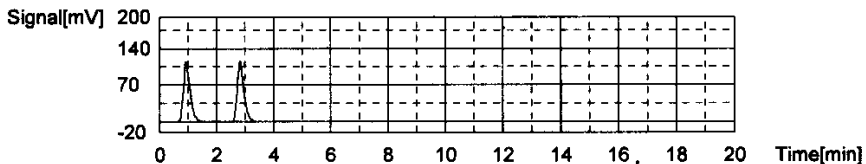


Conc: 5.000mg/L

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

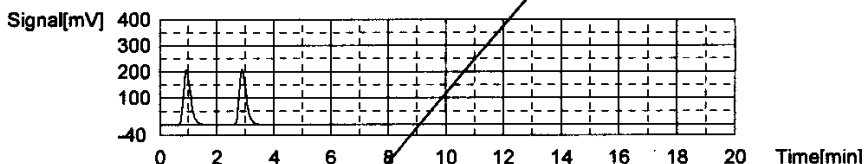
Acid Add. 3.000%
Mean Area 189.6



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

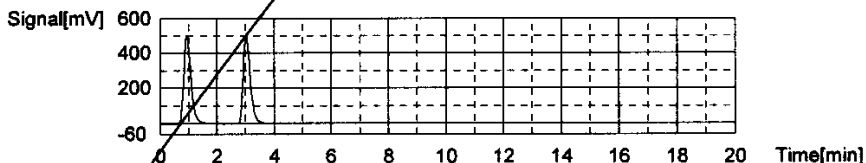
Acid Add. 3.000%
Mean Area 361.4



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

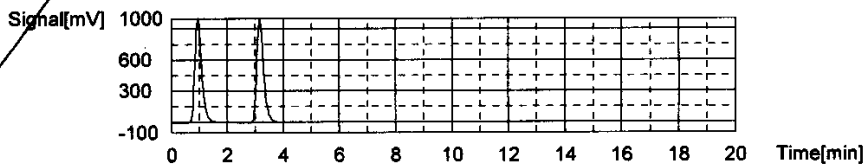
Acid Add. 3.000%
Mean Area 858.1



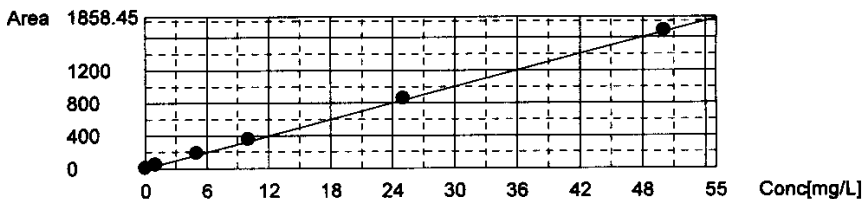
Conc: 50.00mg/L

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

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

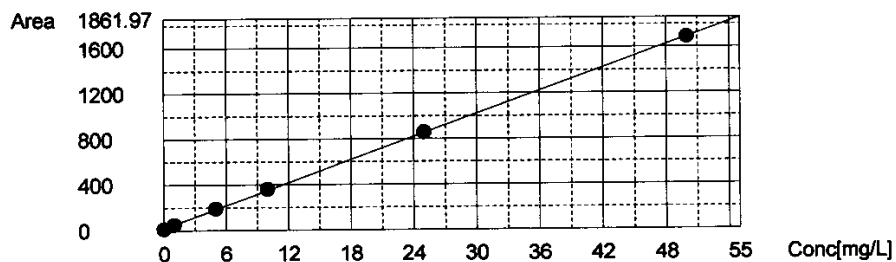
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

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:

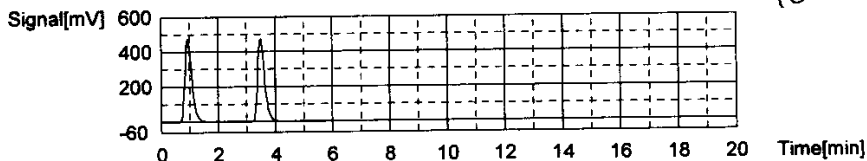
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

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:

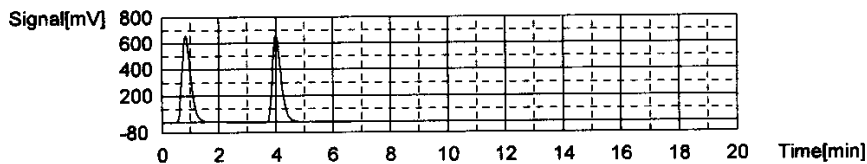
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

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

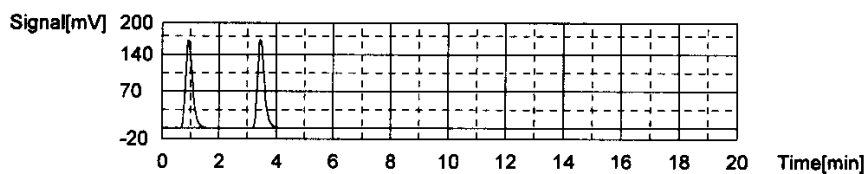
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

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

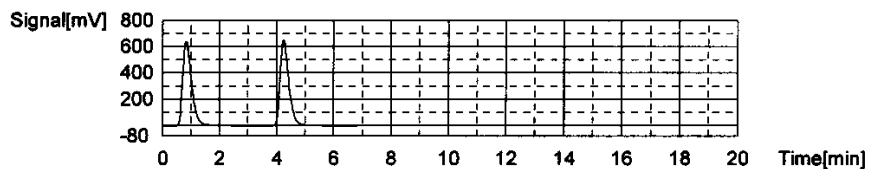
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

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

Total Organic Carbon

MAKE DAILY

CCV (TOC): 19381
 $(5/200)(1000) = 25\text{mg/L}$

LCS (TOC): 83735
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): 83359
 $(5/200)(1000) = 25\text{mg/L}$

MS (TOC): 0.4/40(1000) = 10

Calibration Curve Date: 2/10/17

Reagent: RGT 41359
41061

SM5310-C: Matrix 2 WG _____

EPA 415.1/9060A(mod): Matrix 1 WG _____ SOP: K 451 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	TIC 25	
2	TOC/TIC	
3	CCV 25	
4	BIK	
5	LCS	
6	LCS DUP	
7	09-1037-01	1/3
8	02	1/3
9	07	1/2
10	09-1097-06	1/5
11	08	1/2
12	09	1/2
13	09-1101-01	
14	CCV	
15	CCB	
16	09-1101-02	
17	03	
18	04	
19	05	
20	06	
21	07	
22	09-1109-01	1/100*
23	02	1/10*
24	03	
25	09-1185-01	

Position	Sample ID	Dilution
26	CCV	
27	CCB	
28	09-1186-01	
29	02	
30	03	1/2
31	DUP 03	1/2
32	MS 03	1/2
33	BIK	
34	LCS	
35	LCS DUP	
36	09-1186-04	1/2
37	05	1/2
38	CCV	
39	CCB	
40	09-1186-06	1/2
41	09-1191-01	1/3
42	08	
43	09-1312-01	
44	02	
45	03	
46	04	1/2
47	09-1318-01	
48	03	1/5
49	09-1458-01	1/5
50	CCV	

Position	Sample ID	Dilution
51	CCB	
52	09-1458-03	
53	DUP	
54	MS	
55	09-1109-01	1/100*
56	1109-01	1/1000*
57	09-1185-01	1/5
58	01	1/10
59	09-1186-02	1/2
60		
61		
62	CCV	
63	CCB	
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		

Analyst: Deanna Johnson Date/Time: 9/27/17

* matrix

DCN#128545



Analy	Sample Name	Result	Status	Date / Time	Vial	
1	TOC	TIC 25	TOC:1.060mg/L TC:25.45mg/L IC:24.39mg/L	Complete	9/27/2017 10:17:24 AM	1
2	TOC	TOC/TIC	TOC:26.14mg/L TC:33.93mg/L IC:7.791mg/L	Complete	9/27/2017 10:29:55 AM	2
3	TOC	CCV 25	!!Error!! TOC:24.93mg/L TC:24.62mg/L IC:-0.3088mg/L	Complete	9/27/2017 10:42:06 AM	3
4	TOC	WG631406-01 BLK	!!Error!! TOC:0.1013mg/L TC:-0.1908mg/L IC:-0.2921mg/L	Complete	9/27/2017 10:50:59 AM	0
5	TOC	WG631406-02 LCS	!!Error!! TOC:25.19mg/L TC:24.88mg/L IC:-0.3033mg/L	Complete	9/27/2017 11:03:11 AM	5
6	TOC	WG631406-03 LCSDUP	!!Error!! TOC:25.47mg/L TC:25.17mg/L IC:-0.3081mg/L	Complete	9/27/2017 11:15:19 AM	6
7	TOC	L17091037-01 (3)	TOC:3.290mg/L TC:37.26mg/L IC:33.97mg/L	Complete	9/27/2017 11:28:08 AM	7
8	TOC	L17091037-02 (3)	TOC:4.266mg/L TC:33.06mg/L IC:28.79mg/L	Complete	9/27/2017 11:41:17 AM	8
9	TOC	L17091037-07 (2)	TOC:2.541mg/L TC:23.89mg/L IC:21.35mg/L	Complete	9/27/2017 11:54:20 AM	9
10	TOC	L17091097-06 (5)	TOC:2.637mg/L TC:17.53mg/L IC:14.89mg/L	Complete	9/27/2017 12:07:23 PM	10
11	TOC	L17091097-08 (2)	TOC:1.627mg/L TC:22.71mg/L IC:21.08mg/L	Complete	9/27/2017 12:19:56 PM	11
12	TOC	L17091097-09 (2)	TOC:1.632mg/L TC:22.45mg/L IC:20.81mg/L	Complete	9/27/2017 12:32:07 PM	12
13	TOC	L17091101-01	TOC:0.9005mg/L TC:10.60mg/L IC:9.699mg/L	Complete	9/27/2017 12:44:15 PM	13
14	TOC	CCV	!!Error!! TOC:24.85mg/L TC:24.60mg/L IC:-0.2513mg/L	Complete	9/27/2017 12:56:25 PM	14
15	TOC	CCB	!!Error!! TOC:0.09812mg/L TC:-0.1979mg/L IC:-0.2960mg/L	Complete	9/27/2017 1:05:18 PM	0
16	TOC	L17091101-02	TOC:1.500mg/L TC:15.30mg/L IC:13.80mg/L	Complete	9/27/2017 1:17:40 PM	16
17	TOC	L17091101-03	TOC:1.180mg/L TC:15.01mg/L IC:13.83mg/L	Complete	9/27/2017 1:29:58 PM	17
18	TOC	L17091101-04	TOC:0.2509mg/L TC:18.91mg/L IC:18.66mg/L	Complete	9/27/2017 1:42:49 PM	18
19	TOC	L17091101-05	TOC:0.4944mg/L TC:20.91mg/L IC:20.41mg/L	Complete	9/27/2017 1:55:35 PM	19
20	TOC	L17091101-06	TOC:0.4819mg/L TC:22.50mg/L IC:22.02mg/L	Complete	9/27/2017 2:08:23 PM	20
21	TOC	L17091101-07	TOC:0.8117mg/L TC:19.93mg/L IC:19.12mg/L	Complete	9/27/2017 2:20:31 PM	21
22	TOC		TOC:132.0mg/L TC:135.7mg/L IC:3.646mg/L	Complete	9/27/2017 2:35:32 PM	22
23	TOC	L17091109-02 (10)	TOC:17.06mg/L TC:17.58mg/L IC:0.4935mg/L	Complete	9/27/2017 2:48:21 PM	23
24	TOC	L17091109-03	TOC:16.57mg/L TC:26.80mg/L IC:10.23mg/L	Complete	9/27/2017 3:02:44 PM	24
25	TOC		TOC:77.74mg/L TC:149.9mg/L IC:72.20mg/L	Complete	9/27/2017 3:18:34 PM	25
26	TOC	CCV	TOC:25.08mg/L TC:25.14mg/L IC:0.06377mg/L	Complete	9/27/2017 3:30:51 PM	26
27	TOC	CCB	!!Error!! TOC:0.06791mg/L TC:-0.1771mg/L IC:-0.2450mg/L	Complete	9/27/2017 3:39:45 PM	0
28	TOC	L17091186-01	TOC:2.529mg/L TC:32.11mg/L IC:29.58mg/L	Complete	9/27/2017 3:52:15 PM	28
29	TOC		!!Error!! TOC:-1.94mg/L TC:62.94mg/L IC:74.89mg/L	Complete	9/27/2017 4:05:35 PM	29
30	TOC	L17091186-03 (2)	TOC:2.176mg/L TC:24.76mg/L IC:22.59mg/L	Complete	9/27/2017 4:38:21 PM	30
31	TOC	WG631406-05 (2) DUP	TOC:1.237mg/L TC:17.80mg/L IC:16.56mg/L	Complete	9/27/2017 4:50:45 PM	31
32	TOC	WG631406-06 (2) MS	TOC:5.550mg/L TC:19.40mg/L IC:13.85mg/L	Complete	9/27/2017 5:03:02 PM	32
33	TOC	WG631408-01 BLK	!!Error!! TOC:0.04713mg/L TC:-0.1725mg/L IC:-0.2196mg/L	Complete	9/27/2017 5:11:58 PM	0
34	TOC	WG631408-02 LCS	!!Error!! TOC:26.45mg/L TC:26.23mg/L IC:-0.2205mg/L	Complete	9/27/2017 5:24:12 PM	34
35	TOC	WG631408-03 LCSDUP	!!Error!! TOC:25.47mg/L TC:25.24mg/L IC:-0.2364mg/L	Complete	9/27/2017 5:36:23 PM	35
36	TOC	L17091186-04 (2)	TOC:1.456mg/L TC:22.08mg/L IC:20.63mg/L	Complete	9/27/2017 5:48:45 PM	36
37	TOC	L17091186-05 (2)	TOC:1.822mg/L TC:18.78mg/L IC:16.96mg/L	Complete	9/27/2017 6:01:35 PM	37
38	TOC	CCV	!!Error!! TOC:23.93mg/L TC:23.75mg/L IC:-0.1817mg/L	Complete	9/27/2017 6:13:49 PM	38
39	TOC	CCB	!!Error!! TOC:0.08203mg/L TC:-0.1846mg/L IC:-0.2666mg/L	Complete	9/27/2017 6:22:43 PM	0
40	TOC	L17091186-06 (2)	TOC:2.017mg/L TC:22.57mg/L IC:20.55mg/L	Complete	9/27/2017 6:35:11 PM	40
41	TOC	L17091191-01 (3)	TOC:2.440mg/L TC:15.38mg/L IC:12.94mg/L	Complete	9/27/2017 6:47:35 PM	41
42	TOC	L17091191-08	!!Error!! TOC:0.6207mg/L TC:0.4653mg/L IC:-0.1554mg/L	Complete	9/27/2017 6:58:57 PM	42
43	TOC		TOC:186.7mg/L TC:235.8mg/L IC:49.17mg/L	Complete	9/27/2017 7:14:42 PM	43
44	TOC		TOC:23.81mg/L TC:61.46mg/L IC:37.65mg/L	Complete	9/27/2017 7:28:02 PM	44
45	TOC		TOC:22.89mg/L TC:54.75mg/L IC:31.85mg/L	Complete	9/27/2017 7:41:23 PM	45
46	TOC	L17091312-04 (2)	TOC:40.96mg/L TC:48.13mg/L IC:7.170mg/L	Complete	9/27/2017 7:54:11 PM	46
47	TOC	L17091318-01	TOC:3.263mg/L TC:20.37mg/L IC:17.11mg/L	Complete	9/27/2017 8:06:36 PM	47
48	TOC	L17091318-03 (5)	TOC:12.83mg/L TC:49.19mg/L IC:36.36mg/L	Complete	9/27/2017 8:19:47 PM	48
49	TOC	L17091458-01 (5)	TOC:14.40mg/L TC:37.85mg/L IC:23.45mg/L	Complete	9/27/2017 8:32:42 PM	49
50	TOC	CCV	!!Error!! TOC:25.17mg/L TC:25.02mg/L IC:-0.1483mg/L	Complete	9/27/2017 8:45:02 PM	50
51	TOC	CCB	!!Error!! TOC:0.07438mg/L TC:-0.1851mg/L IC:-0.2595mg/L	Complete	9/27/2017 8:53:57 PM	0
52	TOC	L17091458-03	TOC:2.264mg/L TC:13.77mg/L IC:11.51mg/L	Complete	9/27/2017 9:06:14 PM	52
53	TOC	WG631408-05 DUP	TOC:2.186mg/L TC:14.07mg/L IC:11.88mg/L	Complete	9/27/2017 9:18:46 PM	53
54	TOC	WG631408-06 MS	TOC:11.80mg/L TC:20.74mg/L IC:8.938mg/L	Complete	9/27/2017 9:31:08 PM	54
55	TOC		TOC:126.1mg/L TC:130.3mg/L IC:4.136mg/L	Complete	9/27/2017 9:46:07 PM	55
56	TOC	L17091109-01 (1000)	TOC:27.21mg/L TC:28.21mg/L IC:1.004mg/L	Complete	9/27/2017 9:59:40 PM	56
57	TOC	L17091185-01 (5)	TOC:23.29mg/L TC:34.19mg/L IC:10.90mg/L	Complete	9/27/2017 10:12:53 PM	57
58	TOC		TOC:1.530mg/L TC:1.553mg/L IC:0.02286mg/L	Complete	9/27/2017 10:24:30 PM	58
59	TOC	L17091186-02 (2)	TOC:0.9842mg/L TC:17.96mg/L IC:16.98mg/L	Complete	9/27/2017 10:36:52 PM	59
60	TOC		!!Error!! TOC:0.5128mg/L TC:0.3559mg/L IC:-0.1569mg/L	Complete	9/27/2017 10:48:17 PM	60
61	TOC		!!Error!! TOC:0.8273mg/L TC:0.6376mg/L IC:-0.1898mg/L	Complete	9/27/2017 10:59:54 PM	61
62	TOC	CCV	!!Error!! TOC:24.78mg/L TC:24.53mg/L IC:-0.2549mg/L	Complete	9/27/2017 11:12:10 PM	62
63	TOC	CCB	!!Error!! TOC:0.4016mg/L TC:0.1383mg/L IC:-0.2632mg/L	Complete	9/27/2017 11:21:40 PM	0

9/28/2017 8:13:43 AM

09-27-2017-DIH-TOC.i32

Instr. Information

System TOCVW ASI
 Detector Wet Chemical

Sample

Sample Name: TIC 25
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

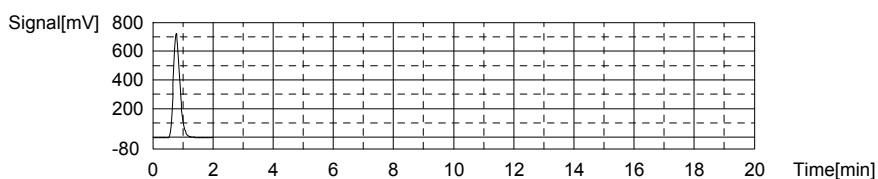
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.060mg/L TC:25.45mg/L IC:24.39mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1094	25.45mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 10:12:11 AM

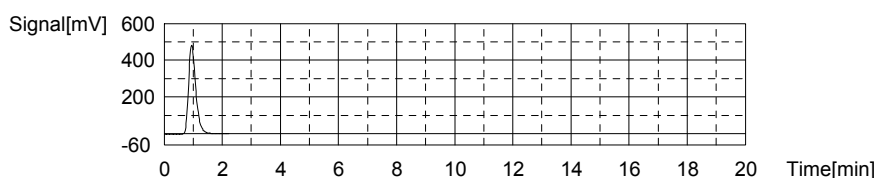
Mean Area 1094
 Mean Conc. 25.45mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	835.1	24.39mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	19/27/2017 10:17:24 AM

Mean Area 835.1
 Mean Conc. 24.39mg/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:26.14mg/L TC:33.93mg/L IC:7.791mg/L

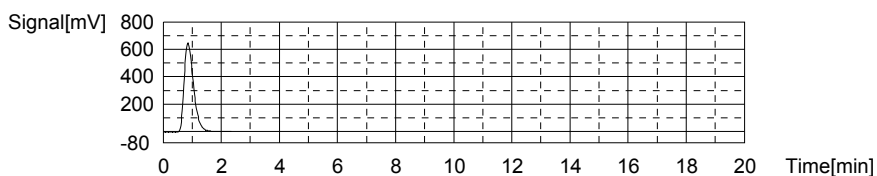
1. Det

Anal.: TC

1/43

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1453	33.93mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 10:25:11 AM

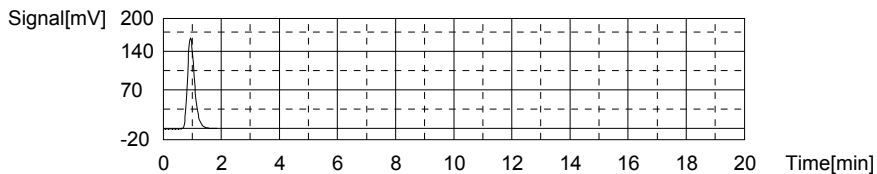
Mean Area 1453
Mean Conc. 33.93mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	279.3	7.791mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 10:29:55 AM

Mean Area 279.3
Mean Conc. 7.791mg/L



Sample

Sample Name: CCV 25
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

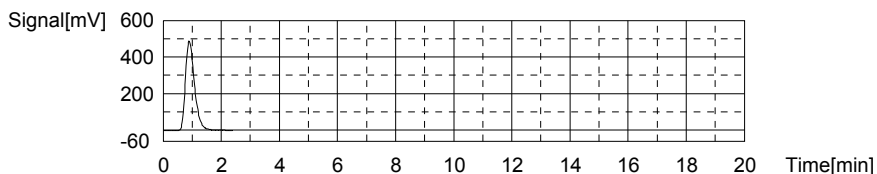
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.93mg/L TC:24.62mg/L IC:-0.3088mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1059	24.62mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 10:37:45 AM

Mean Area 1059
Mean Conc. 24.62mg/L



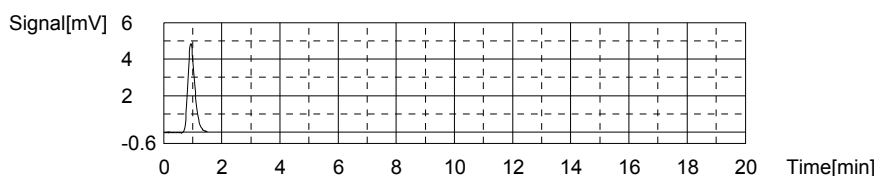
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.075	-0.3088mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 10:42:06 AM

9/28/2017 8:13:43 AM

09-27-2017-DIH-TOC.i32

Mean Area 8.075
Mean Conc. -0.3088mg/L



Sample

Sample Name: WG631406-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

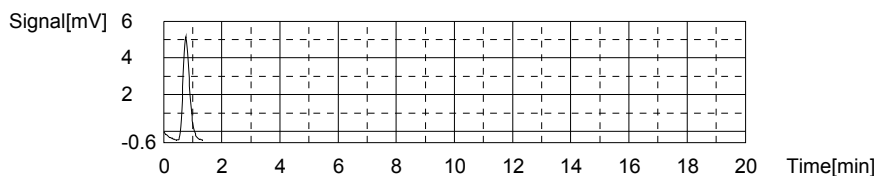
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.1013mg/L TC:-0.1908mg/L IC:-0.2921mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.790	-0.1908mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 10:47:06 AM

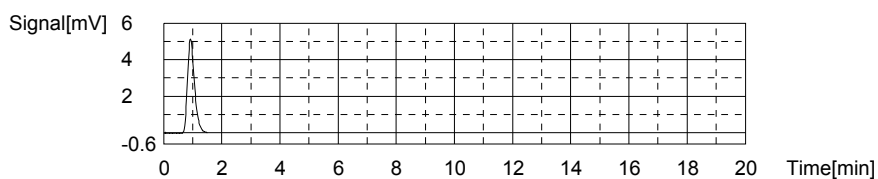
Mean Area 8.790
Mean Conc. -0.1908mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.633	-0.2921mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 10:50:59 AM

Mean Area 8.633
Mean Conc. -0.2921mg/L



Sample

Sample Name: WG631406-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.19mg/L TC:24.88mg/L IC:-0.3033mg/L

3/43

9/28/2017 8:13:43 AM

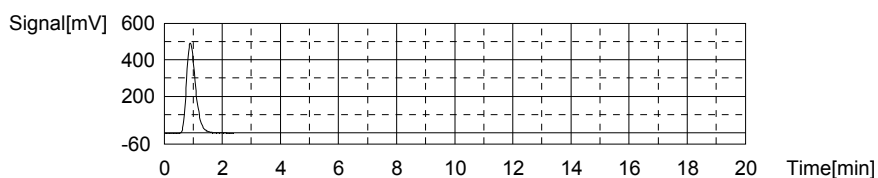
09-27-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1070	24.88mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 10:58:49 AM

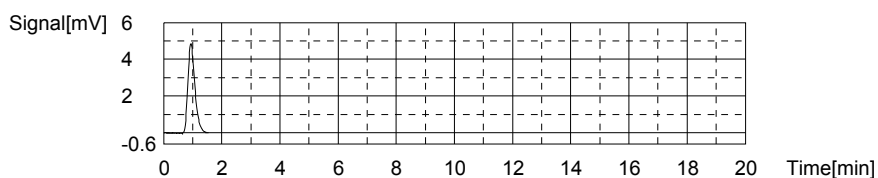
Mean Area 1070
Mean Conc. 24.88mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.259	-0.3033mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 11:03:11 AM

Mean Area 8.259
Mean Conc. -0.3033mg/L



Sample

Sample Name: WG631406-03 LCSDUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

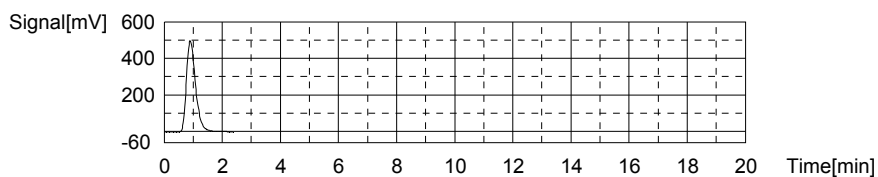
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.47mg/L TC:25.17mg/L IC:-0.3081mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1082	25.17mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 11:11:00 AM

Mean Area 1082
Mean Conc. 25.17mg/L

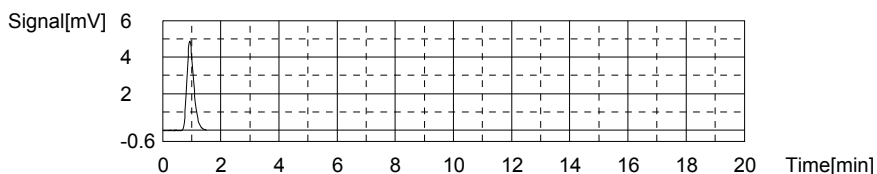


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.097	-0.3081mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 11:15:19 AM

4/43

Mean Area 8.097
 Mean Conc. -0.3081mg/L



Sample

Sample Name: L17091037-01 (3)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

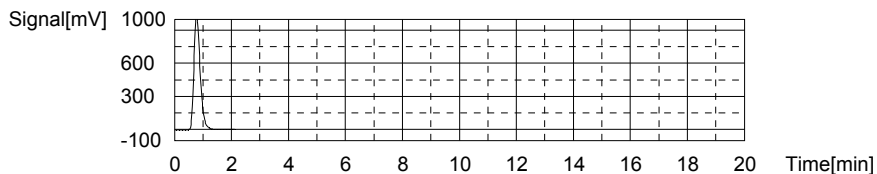
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.290mg/L TC:37.26mg/L IC:33.97mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1594	37.26mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 11:22:53 AM

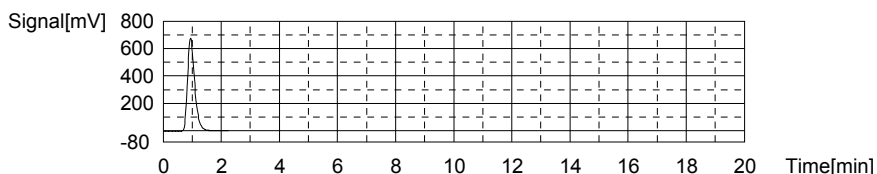
Mean Area 1594
 Mean Conc. 37.26mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1156	33.97mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	19/27/2017 11:28:08 AM

Mean Area 1156
 Mean Conc. 33.97mg/L



Sample

Sample Name: L17091037-02 (3)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.266mg/L TC:33.06mg/L IC:28.79mg/L

9/28/2017 8:13:43 AM

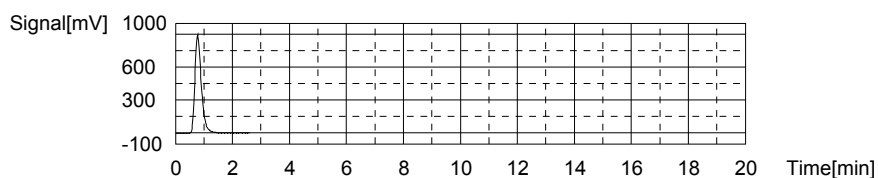
09-27-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1416	33.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 11:36:11 AM

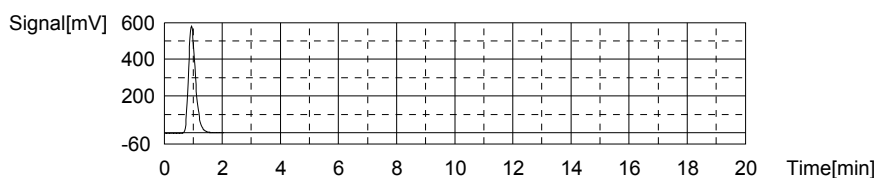
Mean Area 1416
Mean Conc. 33.06mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	982.5	28.79mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 11:41:17 AM

Mean Area 982.5
Mean Conc. 28.79mg/L



Sample

Sample Name: L17091037-07 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

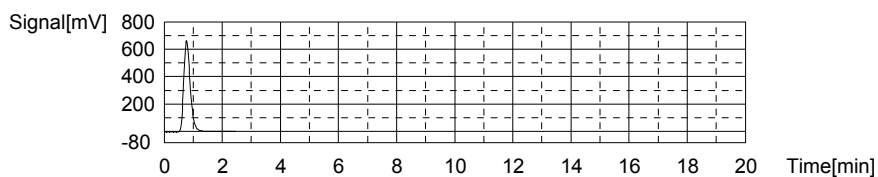
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.541mg/L TC:23.89mg/L IC:21.35mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1028	23.89mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 11:49:11 AM

Mean Area 1028
Mean Conc. 23.89mg/L



Anal.: IC

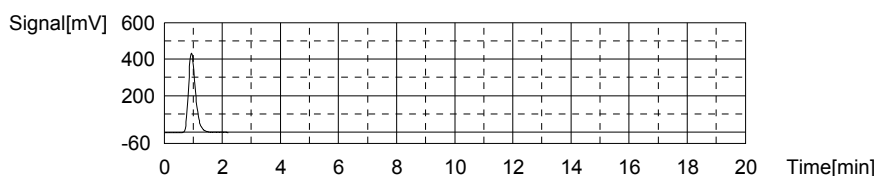
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	733.3	21.35mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 11:54:20 AM

6/43

9/28/2017 8:13:43 AM

09-27-2017-DIH-TOC.i32

Mean Area 733.3
Mean Conc. 21.35mg/L



Sample

Sample Name: L17091097-06 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

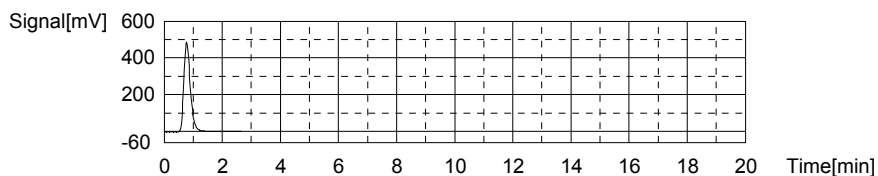
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.637mg/L TC:17.53mg/L IC:14.89mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	758.8	17.53mg/L	500uL	1		TC	19/27/2017 12:02:26 PM

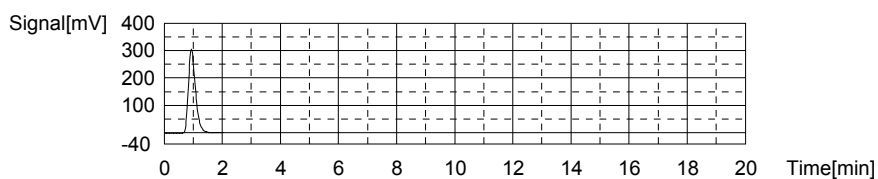
Mean Area 758.8
Mean Conc. 17.53mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	517.1	14.89mg/L	500uL	1		IC	19/27/2017 12:07:23 PM

Mean Area 517.1
Mean Conc. 14.89mg/L



Sample

Sample Name: L17091097-08 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.627mg/L TC:22.71mg/L IC:21.08mg/L

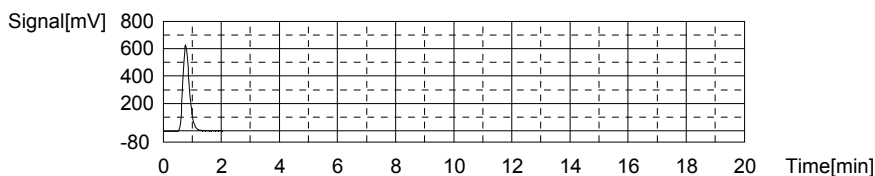
7/43

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	978.1	22.71mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 12:14:52 PM

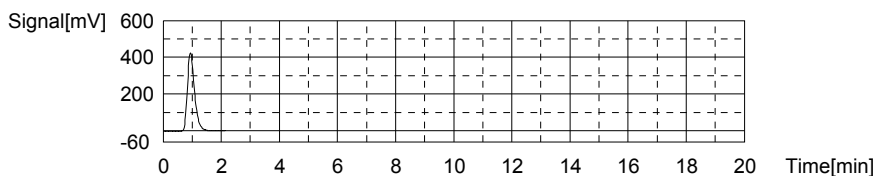
Mean Area 978.1
Mean Conc. 22.71mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	724.4	21.08mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 12:19:55 PM

Mean Area 724.4
Mean Conc. 21.08mg/L



Sample

Sample Name: L17091097-09 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

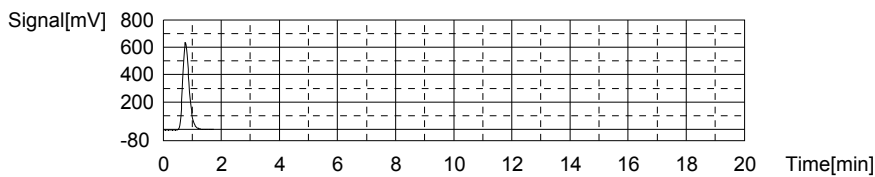
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.632mg/L TC:22.45mg/L IC:20.81mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	966.9	22.45mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 12:27:06 PM

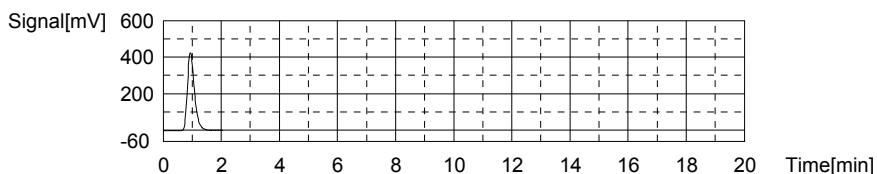
Mean Area 966.9
Mean Conc. 22.45mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	715.4	20.81mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 12:32:07 PM

Mean Area 715.4
Mean Conc. 20.81mg/L



Sample

Sample Name: L17091101-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

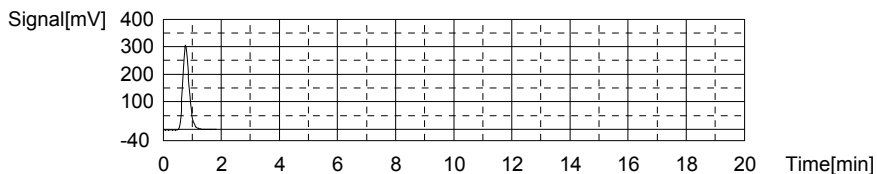
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.9005mg/L TC:10.60mg/L IC:9.699mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	465.5	10.60mg/L	500uL	1		TC	19/27/2017 12:39:24 PM

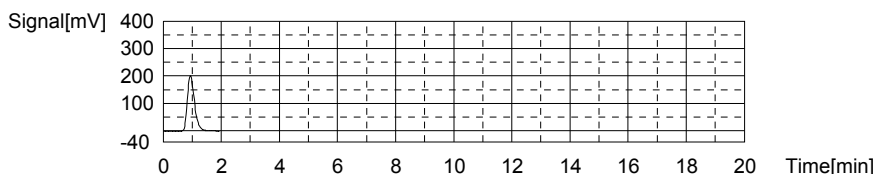
Mean Area 465.5
Mean Conc. 10.60mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	343.2	9.699mg/L	500uL	1		IC	19/27/2017 12:44:15 PM

Mean Area 343.2
Mean Conc. 9.699mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

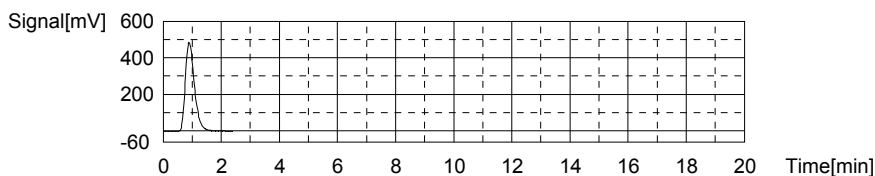
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.85mg/L TC:24.60mg/L IC:-0.2513mg/L

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_59	19/27/2017 12:52:05 PM

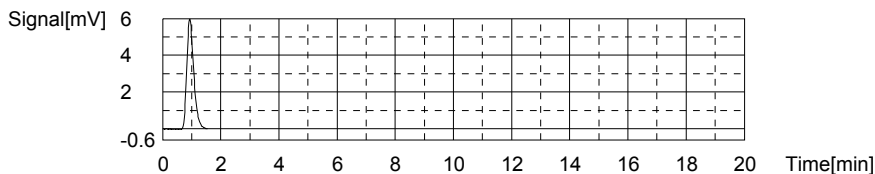
Mean Area 1058
Mean Conc. 24.60mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.999	-0.2513mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 12:56:25 PM

Mean Area 9.999
Mean Conc. -0.2513mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

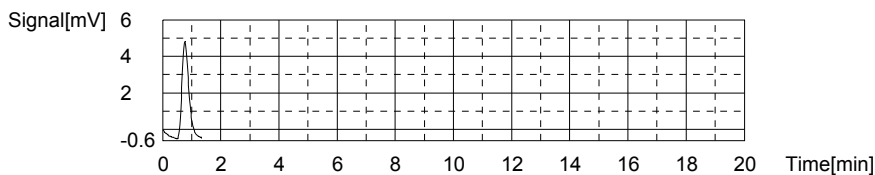
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.09812mg/L TC:-0.1979mg/L IC:-0.2960mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.490	-0.1979mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 1:01:25 PM

Mean Area 8.490
Mean Conc. -0.1979mg/L



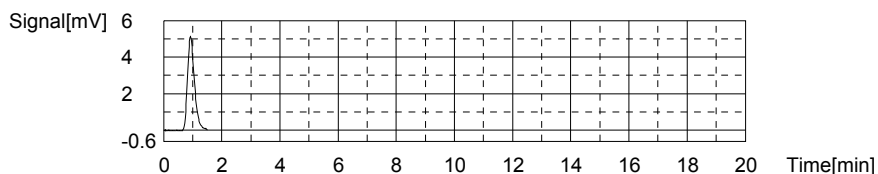
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.503	-0.2960mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 1:05:18 PM

9/28/2017 8:13:43 AM

09-27-2017-DIH-TOC.i32

Mean Area 8.503
Mean Conc. -0.2960mg/L



Sample

Sample Name: L17091101-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

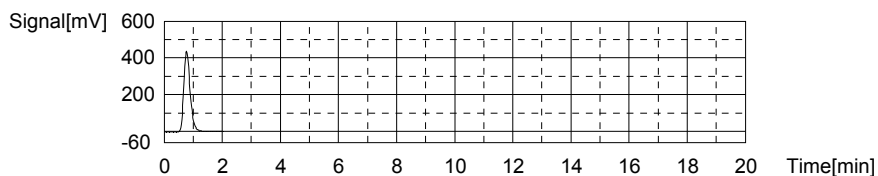
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.500mg/L TC:15.30mg/L IC:13.80mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	664.3	15.30mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 1:12:47 PM

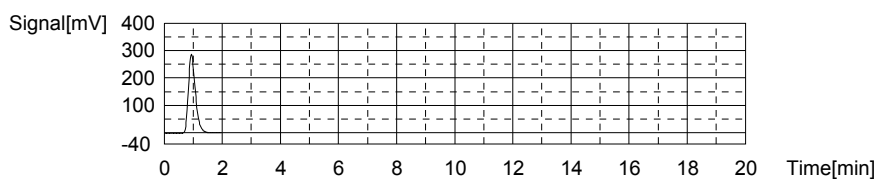
Mean Area 664.3
Mean Conc. 15.30mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	480.4	13.80mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	19/27/2017 1:17:40 PM

Mean Area 480.4
Mean Conc. 13.80mg/L



Sample

Sample Name: L17091101-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.180mg/L TC:15.01mg/L IC:13.83mg/L

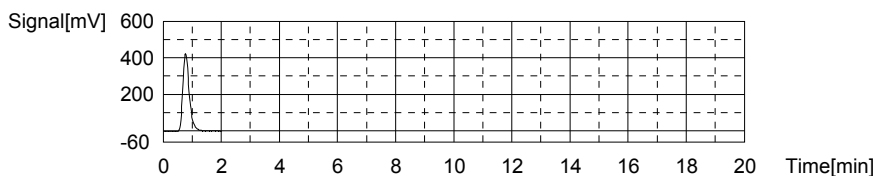
11/43

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	652.0	15.01mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 1:25:07 PM

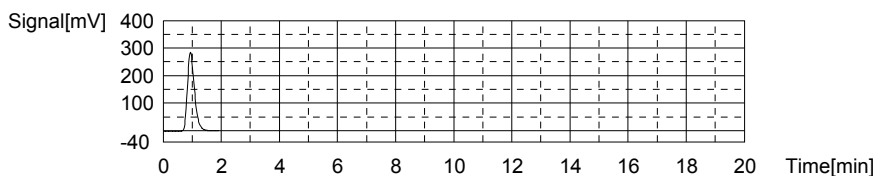
Mean Area 652.0
Mean Conc. 15.01mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	481.4	13.83mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 1:29:58 PM

Mean Area 481.4
Mean Conc. 13.83mg/L



Sample

Sample Name: L17091101-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

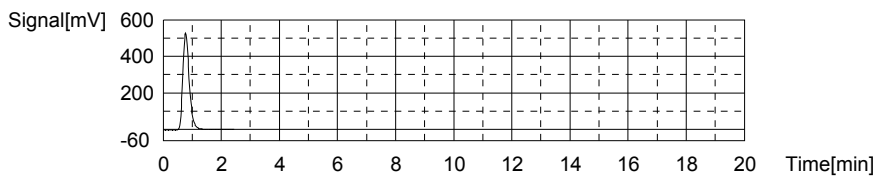
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.2509mg/L TC:18.91mg/L IC:18.66mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	817.2	18.91mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 1:37:51 PM

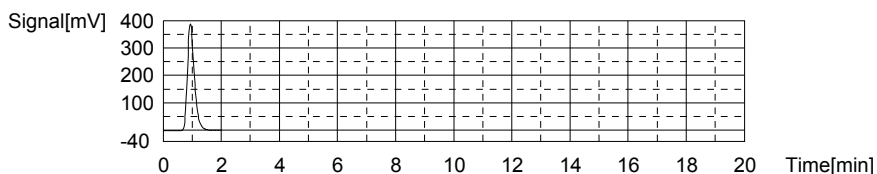
Mean Area 817.2
Mean Conc. 18.91mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	643.2	18.66mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 1:42:49 PM

Mean Area 643.2
Mean Conc. 18.66mg/L



Sample

Sample Name: L17091101-05
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

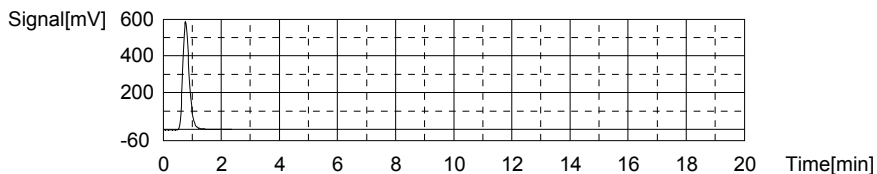
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4944mg/L TC:20.91mg/L IC:20.41mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	901.7	20.91mg/L	500uL	1		TC	19/27/2017 1:50:37 PM

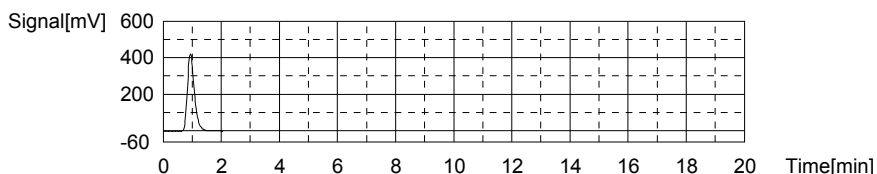
Mean Area 901.7
Mean Conc. 20.91mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	701.9	20.41mg/L	500uL	1		IC	19/27/2017 1:55:35 PM

Mean Area 701.9
Mean Conc. 20.41mg/L



Sample

Sample Name: L17091101-06
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4819mg/L TC:22.50mg/L IC:22.02mg/L

9/28/2017 8:13:43 AM

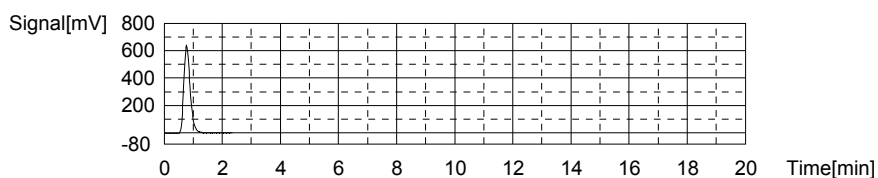
09-27-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	969.3	22.50mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 2:03:22 PM

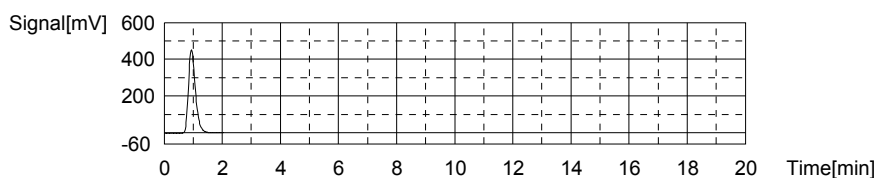
Mean Area 969.3
Mean Conc. 22.50mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	755.8	22.02mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 2:08:23 PM

Mean Area 755.8
Mean Conc. 22.02mg/L



Sample

Sample Name: L17091101-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

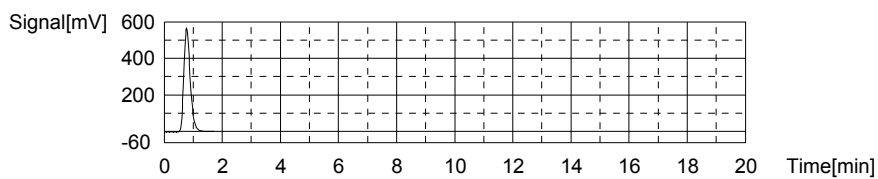
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.8117mg/L TC:19.93mg/L IC:19.12mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	860.4	19.93mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 2:15:33 PM

Mean Area 860.4
Mean Conc. 19.93mg/L

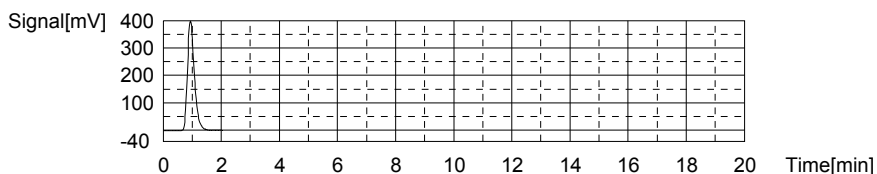


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	658.6	19.12mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 2:20:31 PM

14/43

Mean Area 658.6
Mean Conc. 19.12mg/L



Sample

Sample Name: <Untitled>
Sample ID: TOC-02-10-2017.met
Origin: Completed
Status: Completed
Chk. Result

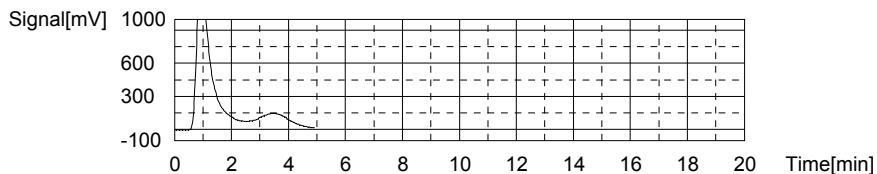
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:132.0mg/L TC:135.7mg/L IC:3.646mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	5759	135.7mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/9/27/2017 2:30:52 PM

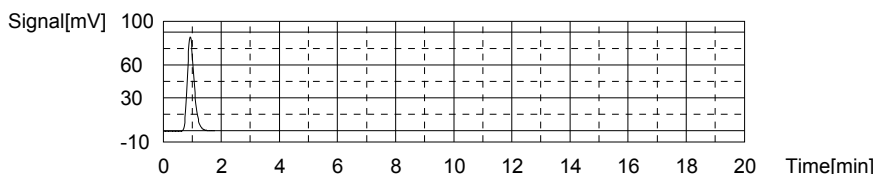
Mean Area 5759
Mean Conc. 135.7mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	140.5	3.646mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	1/9/27/2017 2:35:32 PM

Mean Area 140.5
Mean Conc. 3.646mg/L



Sample

Sample Name: L17091109-02 (10)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

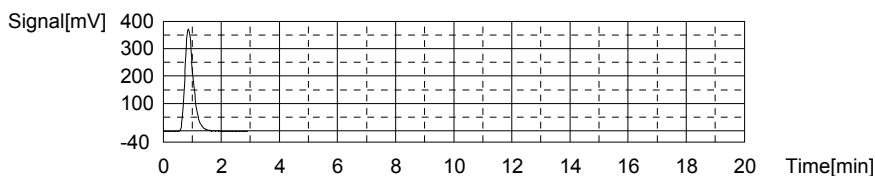
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:17.06mg/L TC:17.56mg/L IC:0.4935mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	759.9	17.56mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 2:43:53 PM

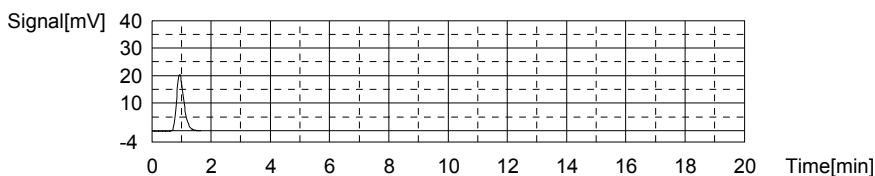
Mean Area 759.9
Mean Conc. 17.56mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	34.94	0.4935mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 2:48:21 PM

Mean Area 34.94
Mean Conc. 0.4935mg/L



Sample

Sample Name: L17091109-03
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

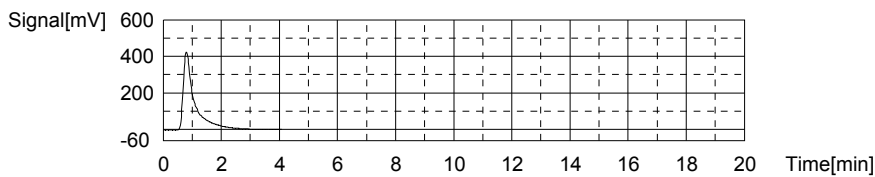
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:16.57mg/L TC:26.80mg/L IC:10.23mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1151	26.80mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 2:57:52 PM

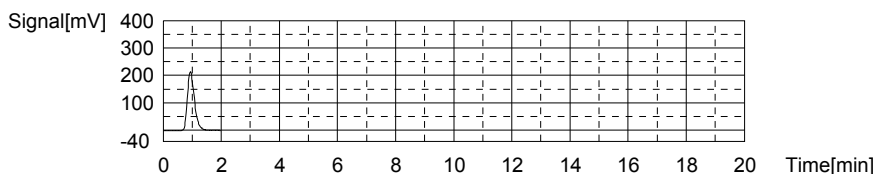
Mean Area 1151
Mean Conc. 26.80mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	360.9	10.23mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 3:02:44 PM

Mean Area 360.9
 Mean Conc. 10.23mg/L



Sample

Sample Name: <Untitled>
 Sample ID: TOC-02-10-2017.met
 Origin: Completed
 Status: Completed
 Chk. Result: Completed

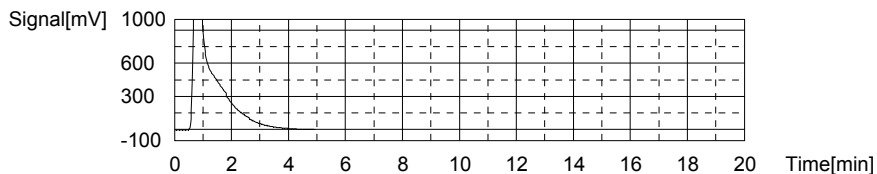
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:77.74mg/L TC:149.9mg/L IC:72.20mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6363	149.9mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 3:13:05 PM

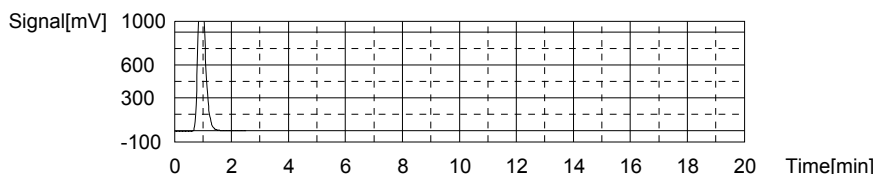
Mean Area 6363
 Mean Conc. 149.9mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2436	72.20mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	19/27/2017 3:18:34 PM

Mean Area 2436
 Mean Conc. 72.20mg/L



Sample

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result: Completed

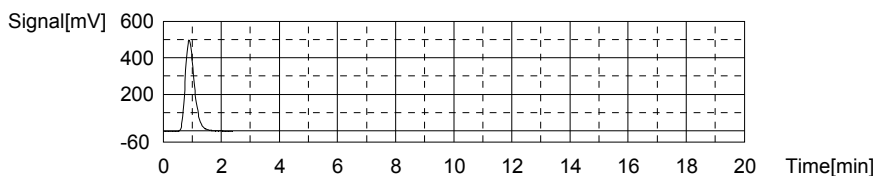
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:25.08mg/L TC:25.14mg/L IC:0.06377mg/L

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_59	9/27/2017 3:26:23 PM

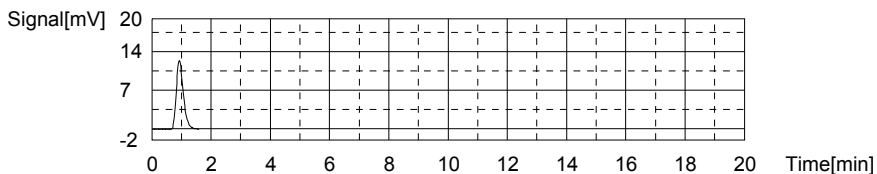
Mean Area 1081
Mean Conc. 25.14mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	20.55	0.06377mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 3:30:51 PM

Mean Area 20.55
Mean Conc. 0.06377mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

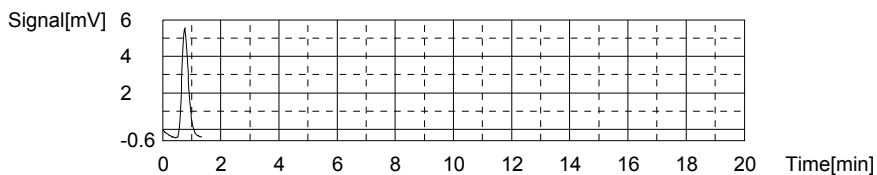
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06791mg/L TC:-0.1771mg/L IC:-0.2450mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.369	-0.1771mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 3:35:50 PM

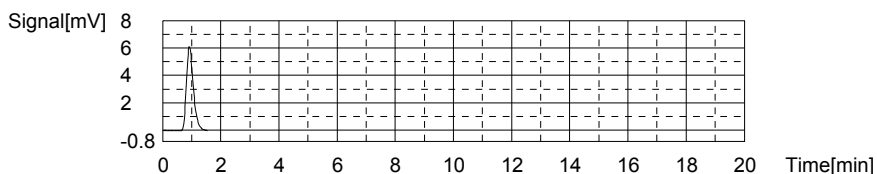
Mean Area 9.369
Mean Conc. -0.1771mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.21	-0.2450mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 3:39:45 PM

Mean Area 10.21
 Mean Conc. -0.2450mg/L



Sample

Sample Name: L17091186-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

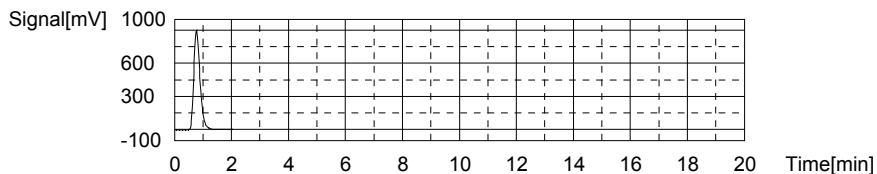
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.529mg/L TC:32.11mg/L IC:29.58mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1376	32.11mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 3:47:15 PM

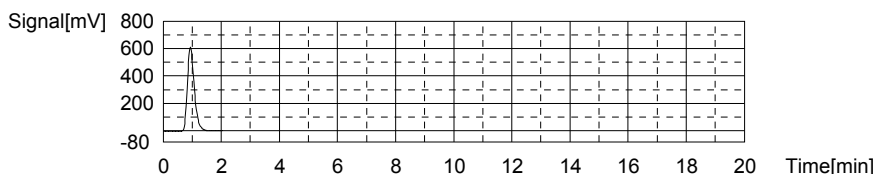
Mean Area 1376
 Mean Conc. 32.11mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1009	29.58mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	19/27/2017 3:52:15 PM

Mean Area 1009
 Mean Conc. 29.58mg/L



Sample

Sample Name: <Untitled>
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

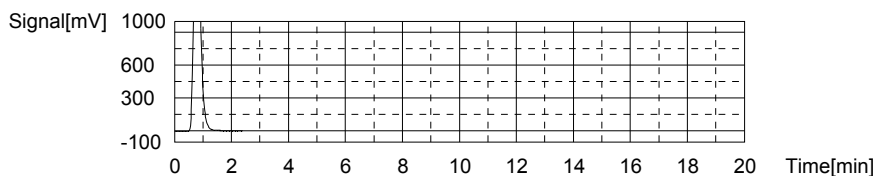
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-11.94mg/L TC:62.94mg/L IC:74.89mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2681	62.94mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 4:00:06 PM

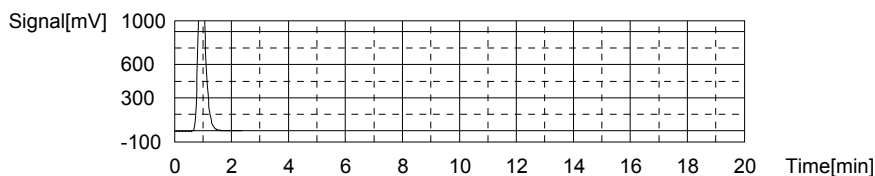
Mean Area 2681
Mean Conc. 62.94mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2526	74.89mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 4:05:35 PM

Mean Area 2526
Mean Conc. 74.89mg/L



Sample

Sample Name: L17091186-03 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

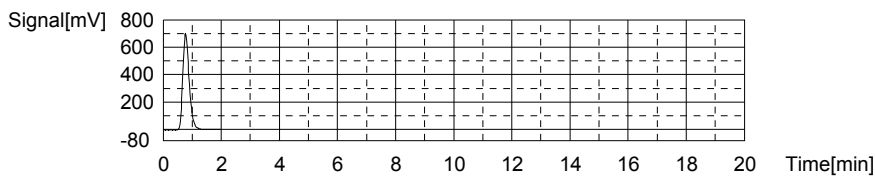
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.176mg/L TC:24.76mg/L IC:22.59mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1065	24.76mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 4:33:13 PM

Mean Area 1065
Mean Conc. 24.76mg/L



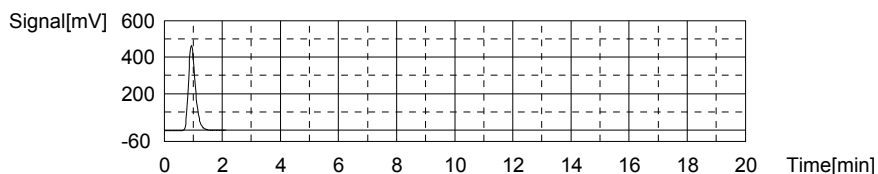
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	774.8	22.59mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 4:38:21 PM

9/28/2017 8:13:43 AM

09-27-2017-DIH-TOC.i32

Mean Area 774.8
Mean Conc. 22.59mg/L



Sample

Sample Name: WG631406-05 (2) DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

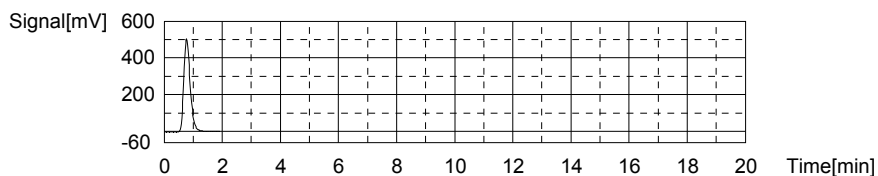
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.237mg/L TC:17.80mg/L IC:16.56mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	770.2	17.80mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 4:45:44 PM

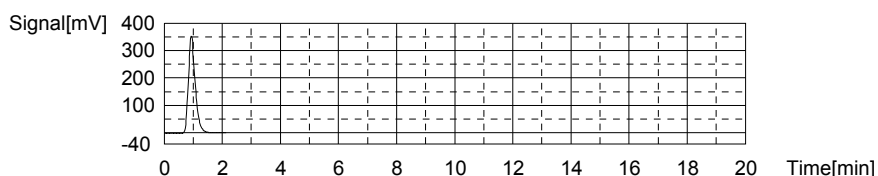
Mean Area 770.2
Mean Conc. 17.80mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	573.0	16.56mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 4:50:45 PM

Mean Area 573.0
Mean Conc. 16.56mg/L



Sample

Sample Name: WG631406-06 (2) MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.550mg/L TC:19.40mg/L IC:13.85mg/L

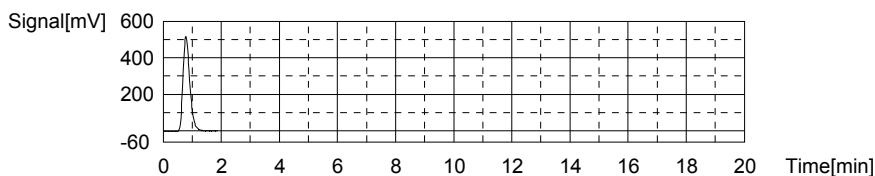
21/43

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	838.0	19.40mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 4:58:05 PM

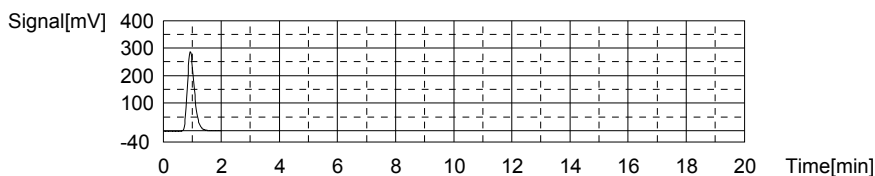
Mean Area 838.0
Mean Conc. 19.40mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	482.2	13.85mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 5:03:02 PM

Mean Area 482.2
Mean Conc. 13.85mg/L



Sample

Sample Name: WG631408-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

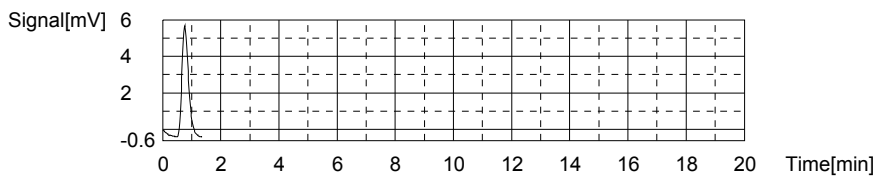
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.04713mg/L TC:-0.1725mg/L IC:-0.2196mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.564	-0.1725mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 5:08:01 PM

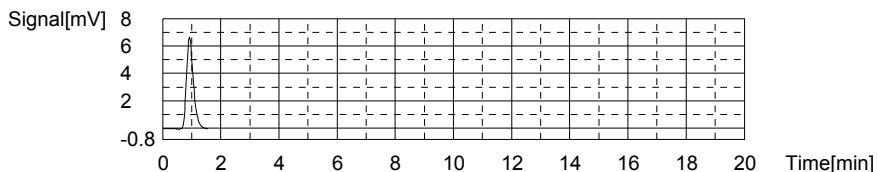
Mean Area 9.564
Mean Conc. -0.1725mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.06	-0.2196mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 5:11:58 PM

Mean Area 11.06
 Mean Conc. -0.2196mg/L



Sample

Sample Name: WG631408-02 LCS
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

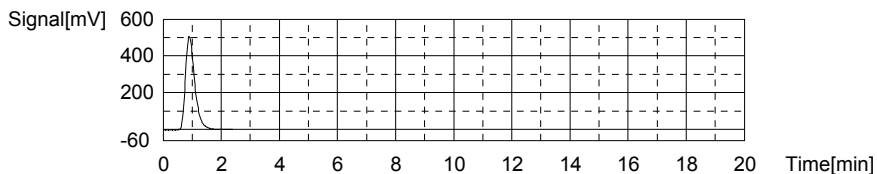
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.45mg/L TC:26.23mg/L IC:-0.2205mg/L

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_59	19/27/2017 5:19:49 PM

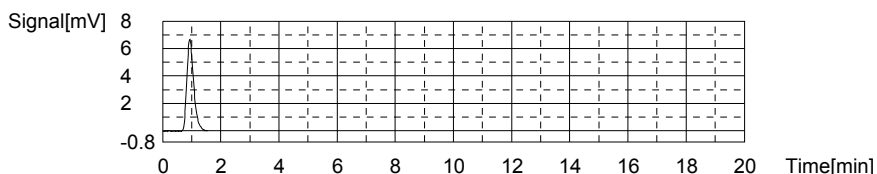
Mean Area 1127
 Mean Conc. 26.23mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.03	-0.2205mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	19/27/2017 5:24:12 PM

Mean Area 11.03
 Mean Conc. -0.2205mg/L



Sample

Sample Name: WG631408-03 LCSDUP
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

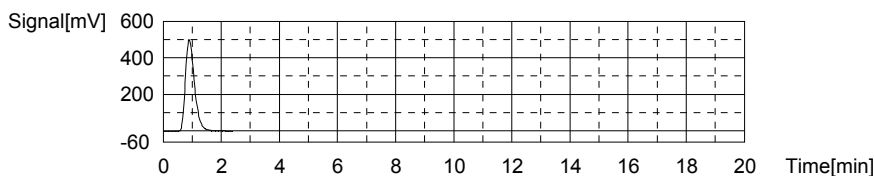
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.47mg/L TC:25.24mg/L IC:-0.2364mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1085	25.24mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 5:32:02 PM

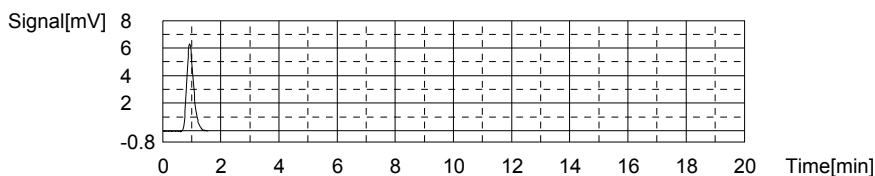
Mean Area 1085
Mean Conc. 25.24mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.50	-0.2364mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 5:36:23 PM

Mean Area 10.50
Mean Conc. -0.2364mg/L



Sample

Sample Name: L17091186-04 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

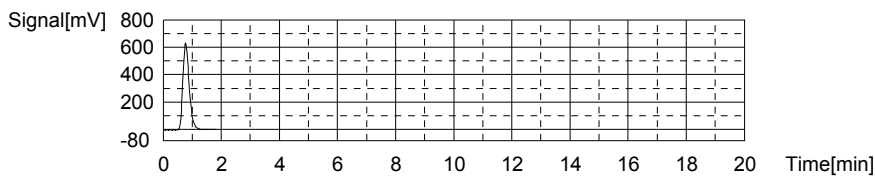
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.456mg/L TC:22.08mg/L IC:20.63mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	951.5	22.08mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 5:43:41 PM

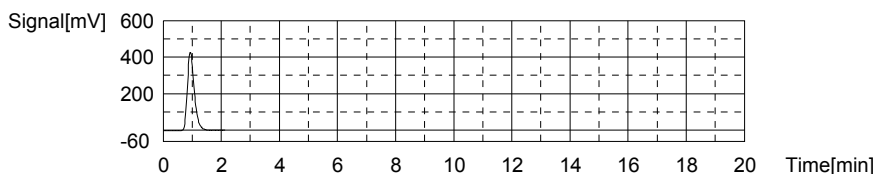
Mean Area 951.5
Mean Conc. 22.08mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	709.1	20.63mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 5:48:45 PM

Mean Area 709.1
Mean Conc. 20.63mg/L



Sample

Sample Name: L17091186-05 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

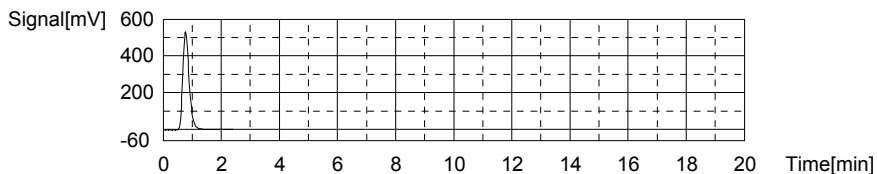
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.822mg/L TC:18.78mg/L IC:16.96mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	811.9	18.78mg/L	500uL	1		TC	19/27/2017 5:56:37 PM

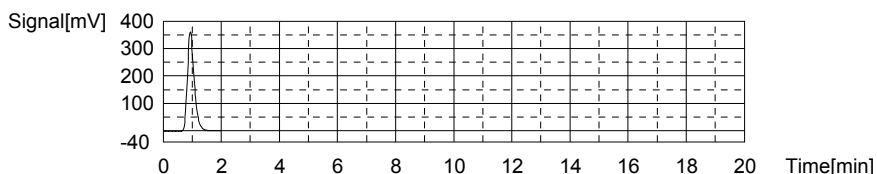
Mean Area 811.9
Mean Conc. 18.78mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	586.4	16.96mg/L	500uL	1		IC	19/27/2017 6:01:35 PM

Mean Area 586.4
Mean Conc. 16.96mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

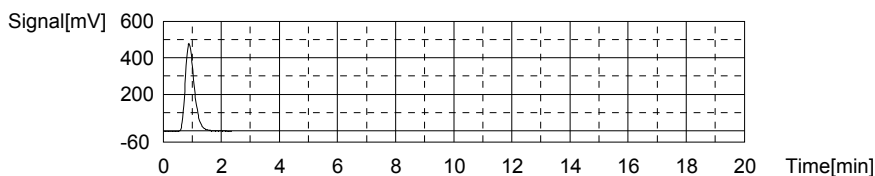
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:23.93mg/L TC:23.75mg/L IC:-0.1817mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1022	23.75mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 6:09:24 PM

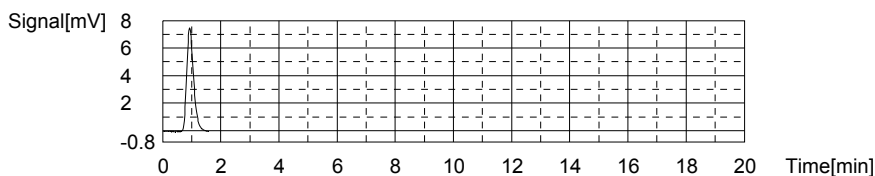
Mean Area 1022
Mean Conc. 23.75mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.33	-0.1817mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 6:13:49 PM

Mean Area 12.33
Mean Conc. -0.1817mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

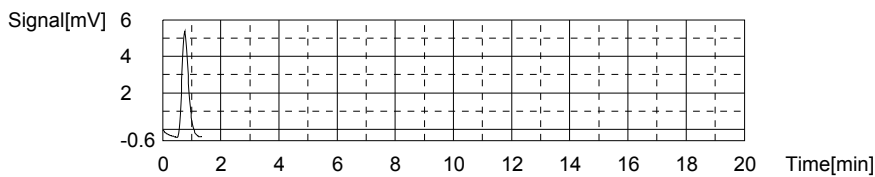
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.08203mg/L TC:-0.1846mg/L IC:-0.2666mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.053	-0.1846mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 6:18:49 PM

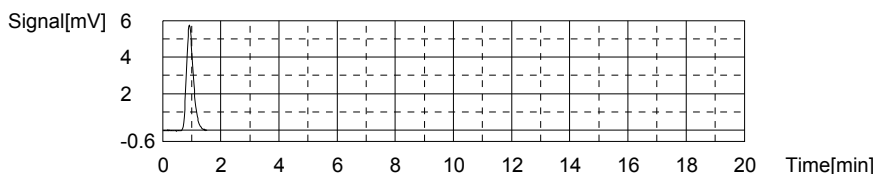
Mean Area 9.053
Mean Conc. -0.1846mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.487	-0.2666mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 6:22:43 PM

Mean Area 9.487
 Mean Conc. -0.2666mg/L



Sample

Sample Name: L17091186-06 (2)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

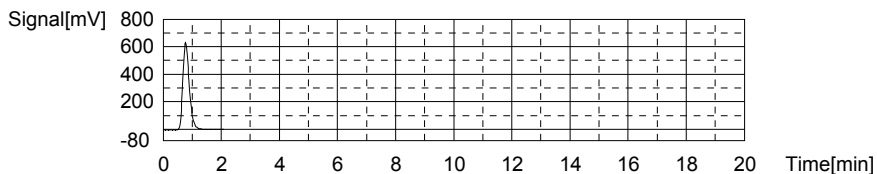
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.017mg/L TC:22.57mg/L IC:20.55mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	972.1	22.57mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 6:30:16 PM

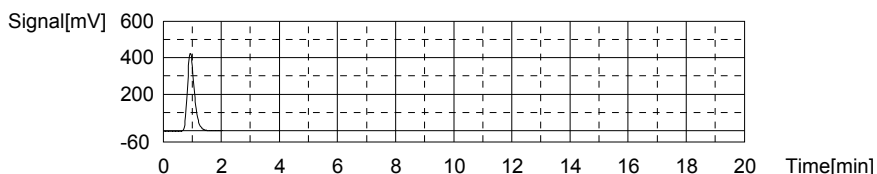
Mean Area 972.1
 Mean Conc. 22.57mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	706.6	20.55mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 6:35:11 PM

Mean Area 706.6
 Mean Conc. 20.55mg/L



Sample

Sample Name: L17091191-01 (3)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

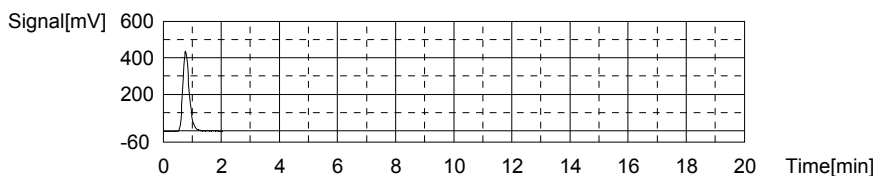
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.440mg/L TC:15.38mg/L IC:12.94mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	667.8	15.38mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 6:42:40 PM

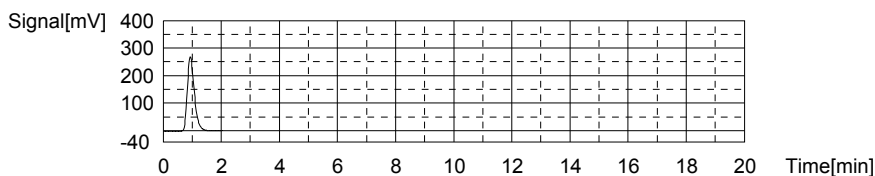
Mean Area 667.8
Mean Conc. 15.38mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	451.7	12.94mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 6:47:35 PM

Mean Area 451.7
Mean Conc. 12.94mg/L



Sample

Sample Name: L17091191-08
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

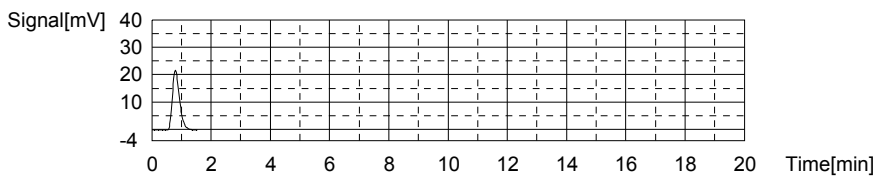
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.6207mg/L TC:0.4653mg/L IC:-0.1554mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	36.56	0.4653mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	9/27/2017 6:54:35 PM

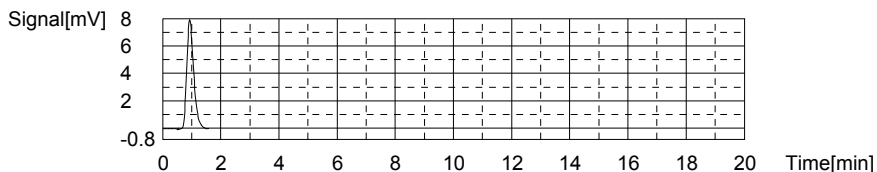
Mean Area 36.56
Mean Conc. 0.4653mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	13.21	-0.1554mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	9/27/2017 6:58:57 PM

Mean Area 13.21
 Mean Conc. -0.1554mg/L



Sample

Sample Name:
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

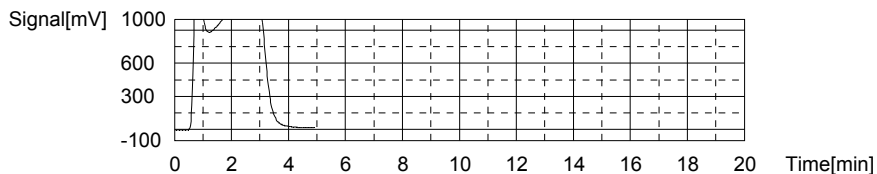
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:186.7mg/L TC:235.8mg/L IC:49.17mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9999	235.8mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 7:09:19 PM

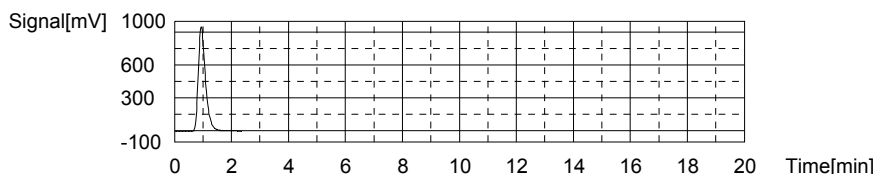
Mean Area 9999
 Mean Conc. 235.8mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1665	49.17mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	19/27/2017 7:14:42 PM

Mean Area 1665
 Mean Conc. 49.17mg/L



Sample

Sample Name:
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

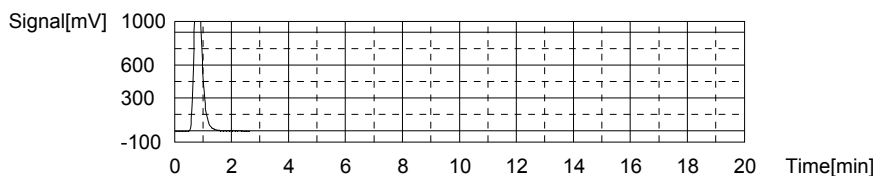
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:23.81mg/L TC:61.46mg/L IC:37.65mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2618	61.46mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 7:22:48 PM

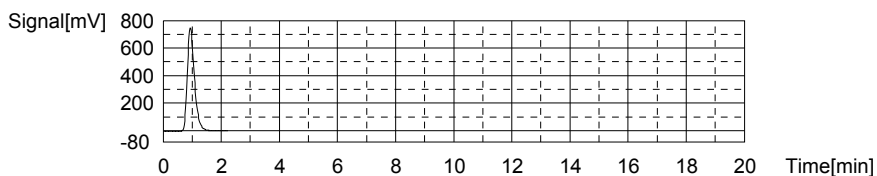
Mean Area 2618
Mean Conc. 61.46mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1279	37.65mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 7:28:02 PM

Mean Area 1279
Mean Conc. 37.65mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

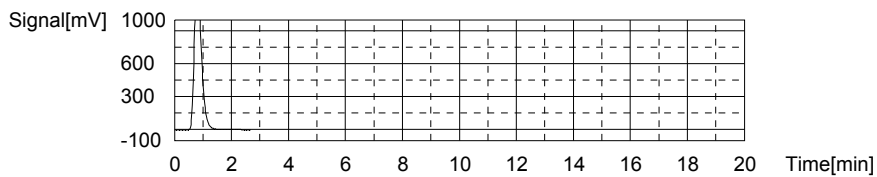
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:22.89mg/L TC:54.75mg/L IC:31.85mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2334	54.75mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 7:36:10 PM

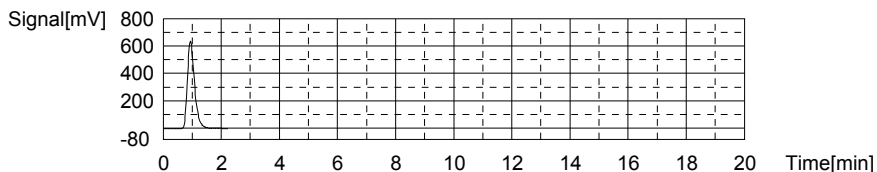
Mean Area 2334
Mean Conc. 54.75mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1085	31.85mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 7:41:23 PM

Mean Area 1085
Mean Conc. 31.85mg/L



Sample

Sample Name: L17091312-04 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

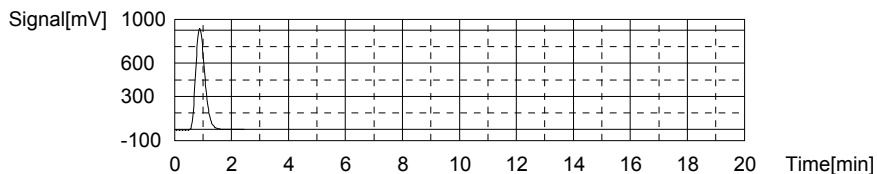
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:40.96mg/L TC:48.13mg/L IC:7.170mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2054	48.13mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 7:49:17 PM

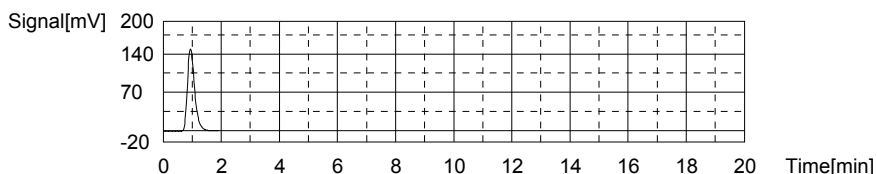
Mean Area 2054
Mean Conc. 48.13mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	258.5	7.170mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	19/27/2017 7:54:11 PM

Mean Area 258.5
Mean Conc. 7.170mg/L



Sample

Sample Name: L17091318-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

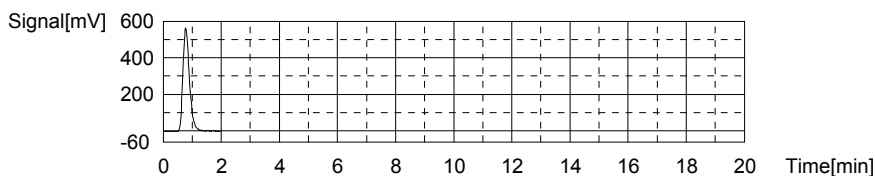
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.263mg/L TC:20.37mg/L IC:17.11mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	879.2	20.37mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 8:01:38 PM

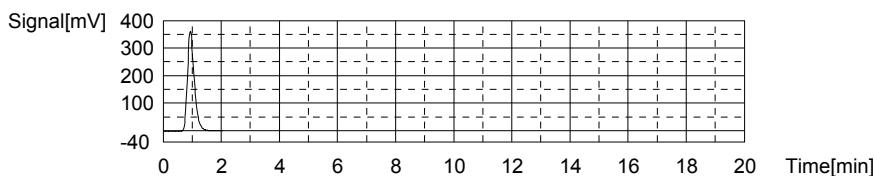
Mean Area 879.2
Mean Conc. 20.37mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	591.4	17.11mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 8:06:36 PM

Mean Area 591.4
Mean Conc. 17.11mg/L



Sample

Sample Name: L17091318-03 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

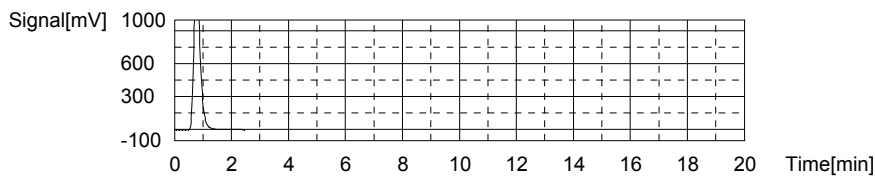
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.83mg/L TC:49.19mg/L IC:36.36mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2099	49.19mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 8:14:32 PM

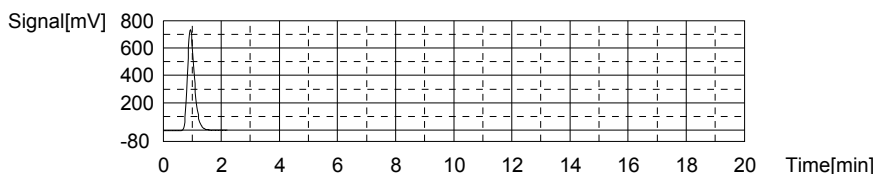
Mean Area 2099
Mean Conc. 49.19mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1236	36.36mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 8:19:47 PM

Mean Area 1236
Mean Conc. 36.36mg/L



Sample

Sample Name: L17091458-01 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

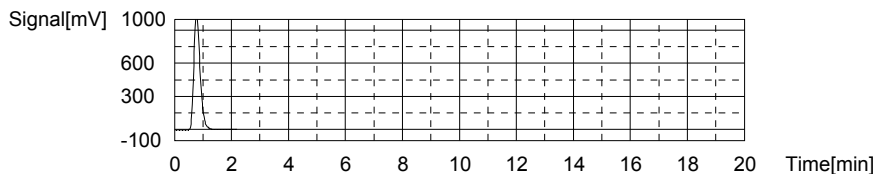
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.40mg/L TC:37.85mg/L IC:23.45mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1619	37.85mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 8:27:27 PM

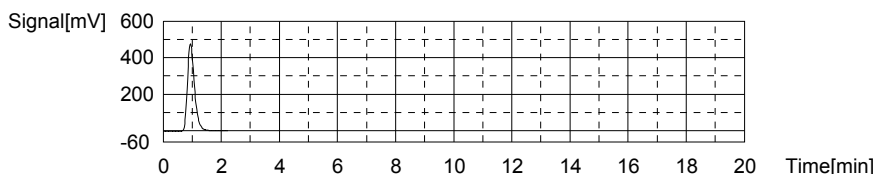
Mean Area 1619
Mean Conc. 37.85mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	803.7	23.45mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	19/27/2017 8:32:42 PM

Mean Area 803.7
Mean Conc. 23.45mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

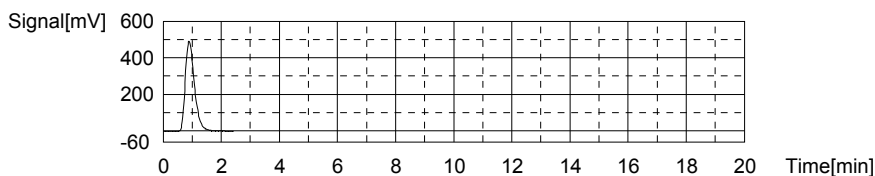
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.17mg/L TC:25.02mg/L IC:-0.1483mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1076	25.02mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 8:40:36 PM

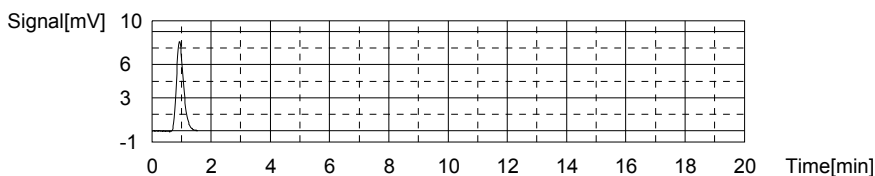
Mean Area 1076
Mean Conc. 25.02mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	13.45	-0.1483mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 8:45:02 PM

Mean Area 13.45
Mean Conc. -0.1483mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

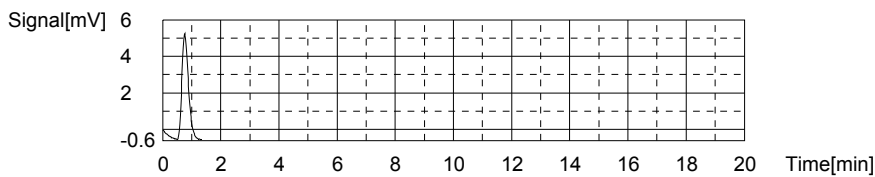
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.07438mg/L TC:-0.1851mg/L IC:-0.2595mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.031	-0.1851mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 8:50:01 PM

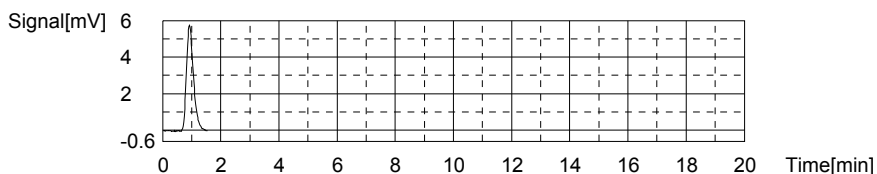
Mean Area 9.031
Mean Conc. -0.1851mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.726	-0.2595mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 8:53:57 PM

Mean Area 9.726
 Mean Conc. -0.2595mg/L



Sample

Sample Name: L17091458-03
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

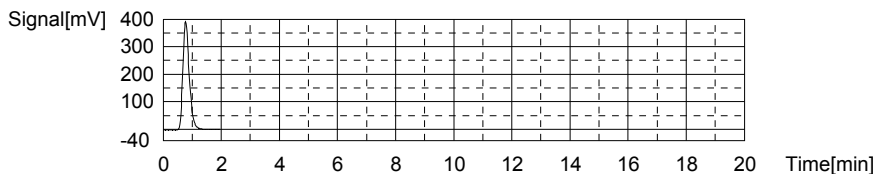
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.264mg/L TC:13.77mg/L IC:11.51mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	599.8	13.77mg/L	500uL	1		TC	19/27/2017 9:01:24 PM

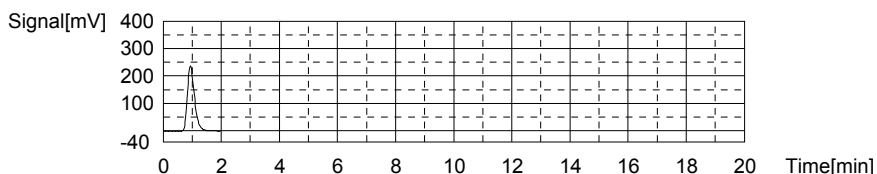
Mean Area 599.8
 Mean Conc. 13.77mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	403.8	11.51mg/L	500uL	1		IC	19/27/2017 9:06:14 PM

Mean Area 403.8
 Mean Conc. 11.51mg/L



Sample

Sample Name: WG631408-05 DUP
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.186mg/L TC:14.07mg/L IC:11.88mg/L

9/28/2017 8:13:43 AM

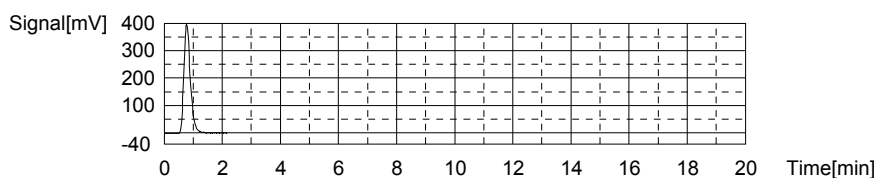
09-27-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	612.2	14.07mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 9:13:53 PM

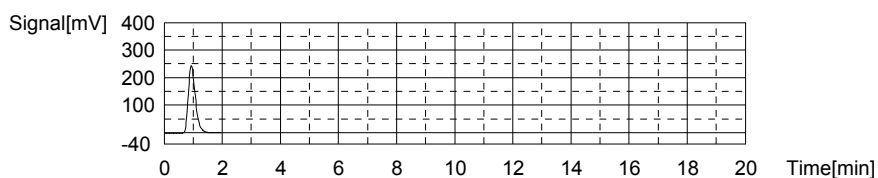
Mean Area 612.2
Mean Conc. 14.07mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	416.2	11.88mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 9:18:46 PM

Mean Area 416.2
Mean Conc. 11.88mg/L



Sample

Sample Name: WG631408-06 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

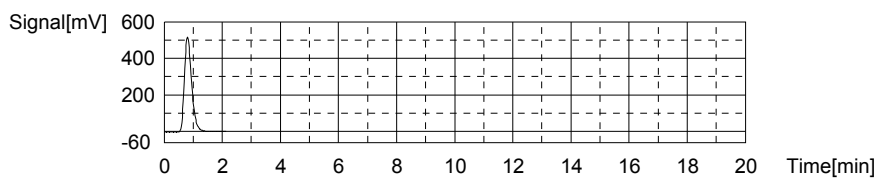
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.80mg/L TC:20.74mg/L IC:8.938mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	894.7	20.74mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 9:26:22 PM

Mean Area 894.7
Mean Conc. 20.74mg/L

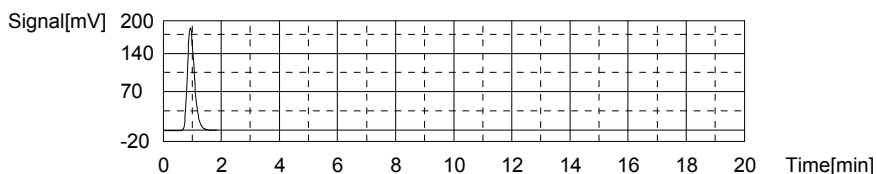


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	317.7	8.938mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 9:31:08 PM

36/43

Mean Area 317.7
Mean Conc. 8.938mg/L



Sample

Sample Name: <Untitled>
Sample ID: TOC-02-10-2017.met
Origin: Completed
Status: Completed
Chk. Result

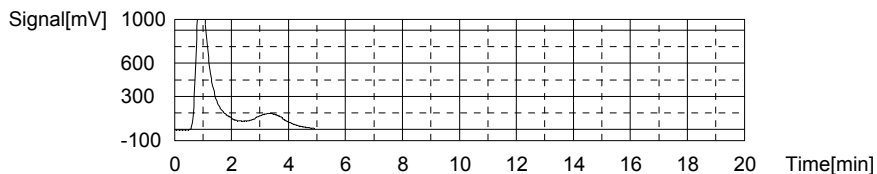
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:126.1mg/L TC:130.3mg/L IC:4.136mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	5531	130.3mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32	5/9/27/2017 9:41:31 PM

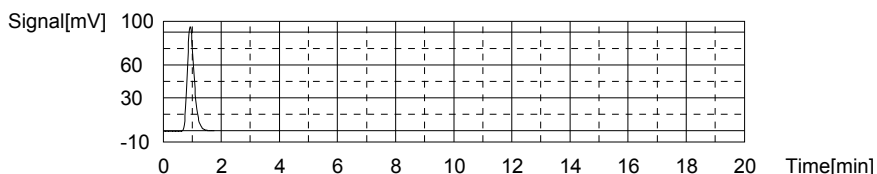
Mean Area 5531
Mean Conc. 130.3mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	156.9	4.136mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	1/9/27/2017 9:46:07 PM

Mean Area 156.9
Mean Conc. 4.136mg/L



Sample

Sample Name: L17091109-01 (1000)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.21mg/L TC:28.21mg/L IC:1.004mg/L

9/28/2017 8:13:43 AM

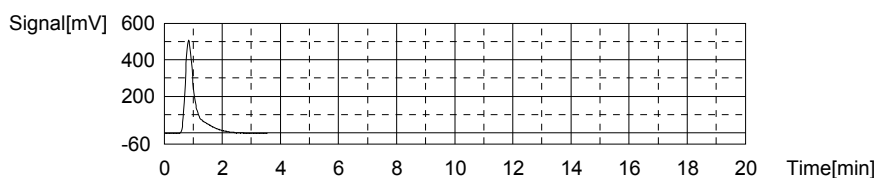
09-27-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1211	28.21mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 9:55:09 PM

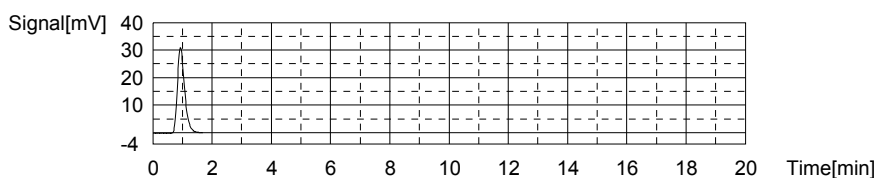
Mean Area 1211
Mean Conc. 28.21mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	52.05	1.004mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 9:59:40 PM

Mean Area 52.05
Mean Conc. 1.004mg/L



Sample

Sample Name: L17091185-01 (5)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

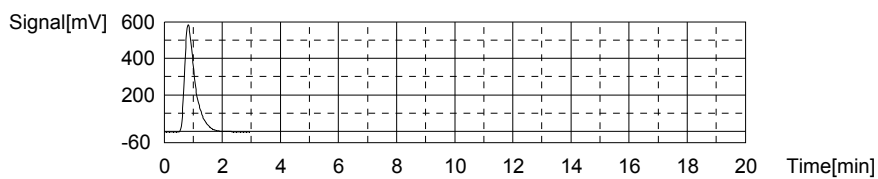
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:23.29mg/L TC:34.19mg/L IC:10.90mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1464	34.19mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 10:08:06 PM

Mean Area 1464
Mean Conc. 34.19mg/L

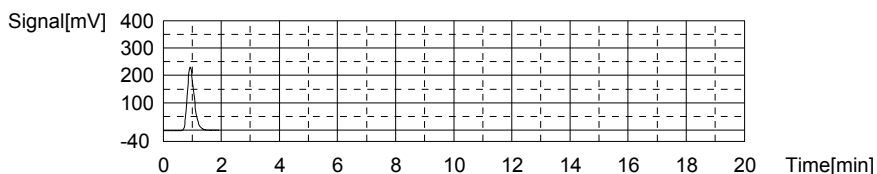


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	383.5	10.90mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 10:12:53 PM

38/43

Mean Area 383.5
Mean Conc. 10.90mg/L



Sample

Sample Name: <Untitled>
Sample ID: TOC-02-10-2017.met
Origin: Completed
Status: Completed
Chk. Result

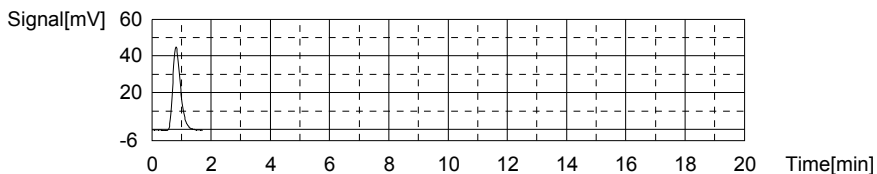
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.530mg/L TC:1.553mg/L IC:0.02286mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	82.59	1.553mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 10:20:04 PM

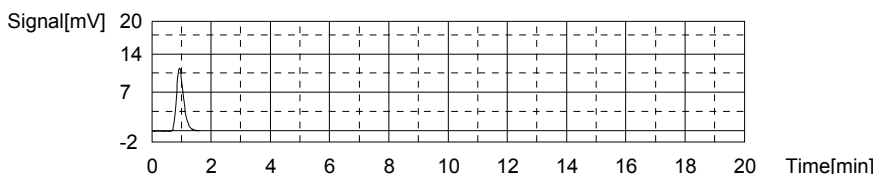
Mean Area 82.59
Mean Conc. 1.553mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	19.18	0.02286mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45	19/27/2017 10:24:30 PM

Mean Area 19.18
Mean Conc. 0.02286mg/L



Sample

Sample Name: L17091186-02 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

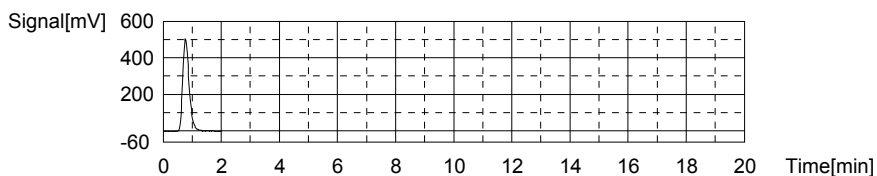
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.9842mg/L TC:17.96mg/L IC:16.98mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	777.2	17.96mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 10:31:59 PM

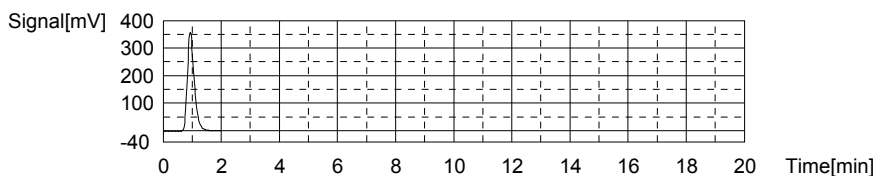
Mean Area 777.2
Mean Conc. 17.96mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	587.0	16.98mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 10:36:52 PM

Mean Area 587.0
Mean Conc. 16.98mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

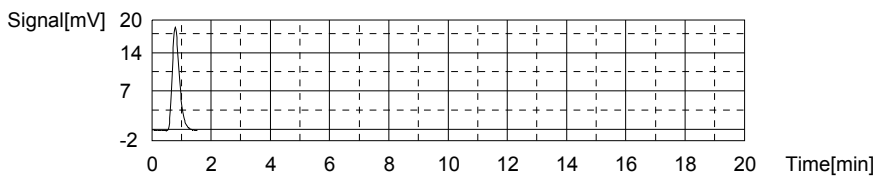
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.5128mg/L TC:0.3559mg/L IC:-0.1569mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	31.93	0.3559mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 10:43:53 PM

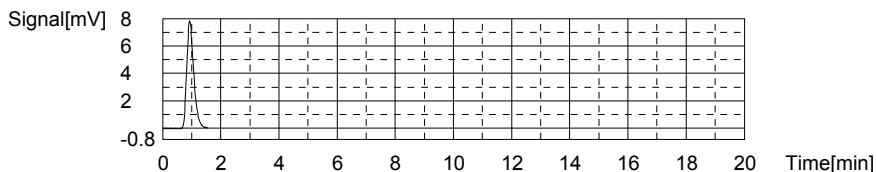
Mean Area 31.93
Mean Conc. 0.3559mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	13.16	-0.1569mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 10:48:17 PM

Mean Area 13.16
Mean Conc. -0.1569mg/L



Sample

Sample Name: <Untitled>
Sample ID: TOC-02-10-2017.met
Origin: Completed
Status: Completed
Chk. Result

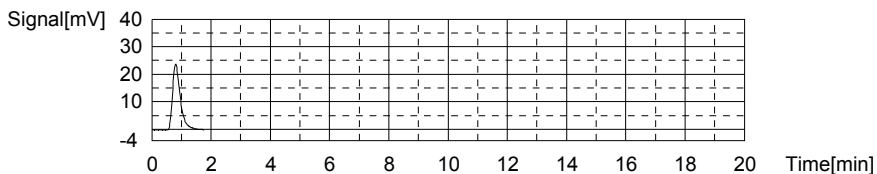
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.8273mg/L TC:0.6376mg/L IC:-0.1898mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	43.85	0.6376mg/L	500uL	1		TC	19/27/2017 10:55:32 PM

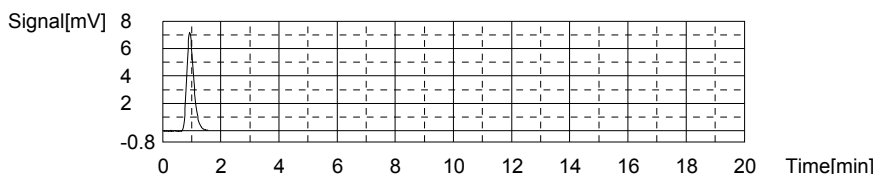
Mean Area 43.85
Mean Conc. 0.6376mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.06	-0.1898mg/L	500uL	1		IC	19/27/2017 10:59:54 PM

Mean Area 12.06
Mean Conc. -0.1898mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

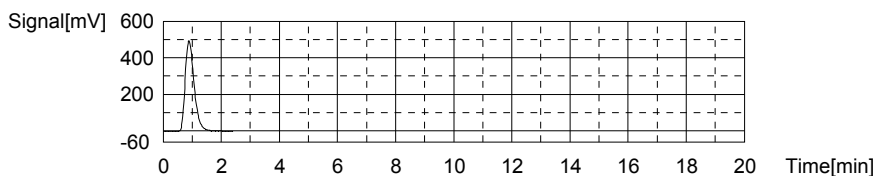
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.78mg/L TC:24.53mg/L IC:-0.2549mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1055	24.53mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 11:07:48 PM

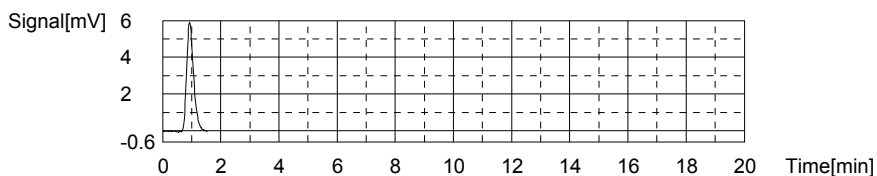
Mean Area 1055
Mean Conc. 24.53mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.879	-0.2549mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 11:12:10 PM

Mean Area 9.879
Mean Conc. -0.2549mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

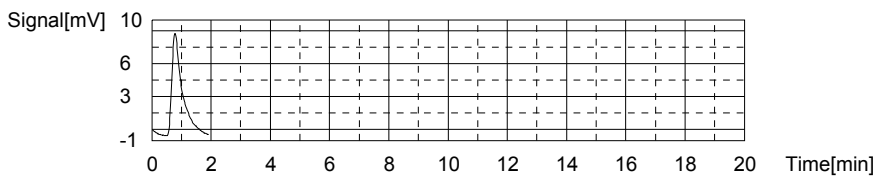
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.4016mg/L TC:0.1383mg/L IC:-0.2632mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	22.72	0.1383mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_59	19/27/2017 11:17:44 PM

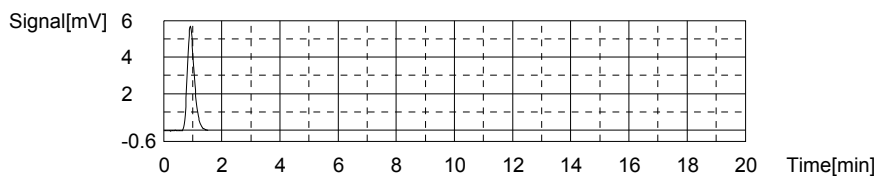
Mean Area 22.72
Mean Conc. 0.1383mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.600	-0.2632mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_19	19/27/2017 11:21:40 PM

Mean Area 9.600
Mean Conc. -0.2632mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
September 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	BLR - BRANDON L. RICHARDS
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

September 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

September 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

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

**GROUNDWATER TREATMENT PLANT
 WEEKLY SAMPLES**

Job:

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.#
					AMMONIA-N	ORTHO-PHOSPHATE	TOTAL ORGANIC CARBON	PERCHLORATE		
LH18/24-SP650-6470	Water	09/20/17 / 15:00		2	X				H2SO4	
LH18/24-SP650-6470	Water	09/20/17 / 15:00		1	X				NONE	
LH18/24-SP650-6470	Water	09/20/17 / 15:00		1		X			NONE	
<p style="text-align: center;">Microbac OVD Received: 09/21/2017 10:33 By: BRENDA GREGORY 221000106351</p> <p style="text-align: right;"><i>Brenda Gregory</i></p>										

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>	09/20/17	15:30									

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

(Word) S:\1-ees\Forms\Chain of Custody - BiWeekly



COOLER TEMP >6° C LOG

Cooler ID 6351

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

CJD 9/21/17

pH Exceptions

pH Lot # HC613865

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

CJD 9/21/17

**PRESERVATIVE
EXCEPTIONS**

**NONE
AS NOTED**

CJD 9/21/17

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17091185

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 02-OCT-2017

Samplenum **Container ID** **Products**
L17091185-01 968598 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	21-SEP-2017 11:47	BRG		
2	ANALYZ	W1	WET	21-SEP-2017 11:56	DLP	BRG	
3	STORE	WET	A1	22-SEP-2017 08:14	BRG	DLP	

Samplenum **Container ID** **Products**
L17091185-01 968599 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	21-SEP-2017 11:47	BRG		<2
2	PREP	W1	WET	27-SEP-2017 09:16	DIH	BRG	
3	STORE	WET	A1	28-SEP-2017 08:10	CLS	DIH	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	21-SEP-2017 11:47	BRG		<2
2	PREP	W1	WET	27-SEP-2017 09:16	DIH	BRG	

Samplenum **Container ID** **Products**
L17091185-01 968600 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	21-SEP-2017 11:49	BRG		
2	ANALYZ	W1	SEM	21-SEP-2017 15:56	JWR	BRG	
3	STORE	SEM	A1	25-SEP-2017 11:14	CLS	JWR	

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: L17091202

Linda Raabe
AECOM Technical Services, Inc.
112 East Pecan
San Antonio, TX 78205

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 October 03 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 #: L17091202

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: LH18/24-SP650-6469. 2 of 3 voa vials received w/headspace >6mm. BRG	Please proceed and analyze vials without headspace first. ALS

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
00112159	H	2.0		1ZW056F52210009784	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 #:** L17091202**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-SP650-6469	L17091202-01	09/20/2017 15:00	09/21/2017 10:33
TRIP BLANK	L17091202-02	09/20/2017 00:01	09/21/2017 10:33



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091202
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-09-29 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
Anthony Canter		Volatiles Lab Supervisor	2017-09-29 13:58:51



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091202
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-09-29 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	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:	L17091202
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-09-29 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:	L17091202
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-09-29 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)					
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:	L17091202
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-09-29 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)					
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:	L17091202
Project Name:		Method:	8260
Prep Batch Number(s):		Reviewer Name:	Anthony Canter
LRC Date:	2017-09-29 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

There are no exceptions.



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091202
Project Name:		Method:	9056
Prep Batch Number(s):	WG632016	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-02 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	2017-10-02 19:55:31



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091202
Project Name:		Method:	9056
Prep Batch Number(s):	WG632016	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-02 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:	L17091202
Project Name:		Method:	9056
Prep Batch Number(s):	WG632016	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-02 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:	L17091202
Project Name:		Method:	9056
Prep Batch Number(s):	WG632016	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-02 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:	L17091202
Project Name:		Method:	9056
Prep Batch Number(s):	WG632016	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-02 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:	L17091202
Project Name:		Method:	9056
Prep Batch Number(s):	WG632016	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-02 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 #: L17091202

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091202-01	PrePrep Method: N/A	Instrument: HPMS6
Client ID: LH18/24-SP650-6469	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/12/2017 12:31
Workgroup #: WG631087	Analyst: TMB	Run Date: 09/25/2017 14:32
Collect Date: 09/20/2017 15:00	Dilution: 1	File ID: 6M150190
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	16.3		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	106	70	120	
4-Bromofluorobenzene	110	75	120	
Dibromofluoromethane	92.3	85	115	
Toluene-d8	98.5	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.
---	--

Lab Report #: L17091202
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091202-01	PrePrep Method: N/A	Instrument: IC1
Client ID: LH18/24-SP650-6469	Prep Method: 9056	Prep Date: 09/29/2017 17:31
Matrix: Water	Analytical Method: 9056	Cal Date: 08/30/2017 13:05
Workgroup #: WG632016	Analyst: CAS	Run Date: 09/29/2017 18:44
Collect Date: 09/20/2017 15:00	Dilution: 5	File ID: I1_092917-07
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Sulfate	14808-79-8	89.9		10.0	5.00	2.50
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17091202
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091202-01	PrePrep Method: N/A	Instrument: IC1
Client ID: LH18/24-SP650-6469	Prep Method: 9056	Prep Date: 09/29/2017 17:31
Matrix: Water	Analytical Method: 9056	Cal Date: 08/30/2017 13:05
Workgroup #: WG632016	Analyst: CAS	Run Date: 09/29/2017 19:02
Collect Date: 09/20/2017 15:00	Dilution: 50	File ID: I1_092917-08
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chloride	16887-00-6	565		20.0	10.0	5.00
J	Estimated value ; the analyte concentration was less than the LOQ.					

Certificate of Analysis

Sample #: L17091202-02	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: 09/12/2017 12:31
Workgroup #: WG631087	Analyst: TMB	Run Date: 09/25/2017 14:04
Collect Date: 09/20/2017 00:01	Dilution: 1	File ID: 6M150189
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	6.84	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	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	107	70	120	
4-Bromofluorobenzene	110	75	120	
Dibromofluoromethane	91.7	85	115	
Toluene-d8	97.9	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 #: L17091202

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 #: L17091202-01	PrePrep Method: N/A	Instrument: HPMS6
Client ID: LH18/24-SP650-6469	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/12/2017 12:31
Workgroup #: WG631087	Analyst: TMB	Run Date: 09/25/2017 14:32
Collect Date: 09/20/2017 15:00	Dilution: 1	File ID: 6M150190
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	16.3		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	106	70	120	
4-Bromofluorobenzene	110	75	120	
Dibromofluoromethane	92.3	85	115	
Toluene-d8	98.5	85	120	

U Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #: L17091202-02

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: 09/12/2017 12:31

Workgroup #: WG631087

Analyst: TMB

Run Date: 09/25/2017 14:04

Collect Date: 09/20/2017 00:01

Dilution: 1

File ID: 6M150189

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	6.84	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	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	107	70	120			
4-Bromofluorobenzene	110	75	120			
Dibromofluoromethane	91.7	85	115			
Toluene-d8	97.9	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.					

2.1.1.2 QC Summary Data

Example 8260 Calculations

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

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

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

Example

2.0 Calculating the concentration (C) of a compound in water using the average RF: *

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

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

Example

3.0 Calculating the concentration (C) of a compound in soil using the average RF: *

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

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

Example

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: 082317
 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: 54300

Internal Standard: STD83284 Surrogate Standard: STD83284
 CCV: STD83151 LCS: STD83193 MS/MSD: NA
 Column 1 ID: RTX502.02 Column 2 ID: NA
 Workgroups: WG626990

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M149720	RINSE	NA	1	1		08/23/17 10:57
6M149721	WG626990-01 50ng BFB STD 8260	NA	1	1	STD83478	08/23/17 14:06
6M149722	WG626990-02 50ug/L CCV STD 8260	NA	1	1	STD83378	08/23/17 14:31
6M149723	RINSE	NA	1	1		08/23/17 15:01
6M149724	WG626990-01 50ng BFB STD 8260	NA	1	1	STD83478	08/23/17 15:38
6M149725	RINSE	NA	1	1		08/23/17 16:06
6M149726	WG626990-02 5ug/L A9/FOO	NA	1	1	STD83151	08/23/17 16:35
6M149727	WG626990-03 20ug/L A9/FOO	NA	1	1	STD83151	08/23/17 17:05
6M149728	WG626990-04 50ug/L A9/FOO	NA	1	1	STD83151	08/23/17 17:34
6M149729	WG626990-05 100ug/L A9/FOO	NA	1	1	STD83151	08/23/17 18:04
6M149730	WG626990-06 200ug/L A9/FOO	NA	1	1	STD83151	08/23/17 18:34
6M149731	WG626990-07 300ug/L A9/FOO	NA	1	1	STD83151	08/23/17 19:04
6M149732	WG626990-08 400ug/L A9/FOO	NA	1	1	STD83151	08/23/17 19:34
6M149733	WG626990-09 500ug/L A9/FOO	NA	1	1	STD83151	08/23/17 20:04
6M149734	RINSE	NA	1	1		08/23/17 20:34
6M149735	RINSE	NA	1	1		08/23/17 21:04
6M149736	WG626990-10 100ug/L ALT SRC A9/FOO	NA	1	1	STD83193	08/23/17 21:33
6M149737	RINSE	NA	1	1		08/23/17 22:03

Approved: August 25, 2017

Page: 1

Cathy Carter



Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 091217
 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: _____

Internal Standard: STD83648 Surrogate Standard: STD83648
 CCV: STD83799 LCS: STD83830 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG628383

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M149987	WG628383-01 50ng BFB STD 8260	NA	1	1	STD83478	09/12/17 07:13
6M149988	RINSE	NA	1	1		09/12/17 07:39
6M149989	WG628383-02 0.3ug/L STD 8260	NA	1	1	STD83799	09/12/17 08:08
6M149990	WG628383-03 0.4ug/L STD 8260	NA	1	1	STD83799	09/12/17 08:37
6M149991	WG628383-04 1ug/L STD 8260	NA	1	1	STD83799	09/12/17 09:06
6M149992	WG628383-05 2ug/L STD 8260	NA	1	1	STD83799	09/12/17 09:36
6M149993	WG628383-06 5ug/L STD 8260	NA	1	1	STD83799	09/12/17 10:05
6M149994	WG628383-07 20ug/L STD 8260	NA	1	1	STD83799	09/12/17 10:34
6M149995	WG628383-08 50ug/L STD 8260	NA	1	1	STD83799	09/12/17 11:04
6M149996	WG628383-09 100ug/L STD 8260	NA	1	1	STD83799	09/12/17 11:33
6M149997	WG628383-10 200ug/L STD 8260	NA	1	1	STD83799	09/12/17 12:02
6M149998	WG628383-11 300ug/L STD 8260	NA	1	1	STD83799	09/12/17 12:31
6M149999	RINSE	NA	1	1		09/12/17 13:29
6M150000	RINSE	NA	1	1		09/12/17 13:58
6M150001	WG628383-12 50ug/L ALT SRC STD 8260	NA	1	1	STD83822	09/12/17 14:27
6M150002	CCV CHECK	NA	1	1	STD83799	09/12/17 14:56
6M150003	A9 CCV CHECK	NA	1	1	STD83554	09/12/17 15:25
6M150004	RINSE	NA	1	1		09/12/17 15:55
6M150005	LCS	NA	1	1	STD83822	09/12/17 16:24
6M150006	RINSE	NA	1	1		09/12/17 16:53

Comments

Seq.	Rerun	Dil.	Reason	Analytes
15	X			
File ID: 6M150001				
The gases were 10x lower than expected. The standard containing the gases was made wrong. Concentration was off in the COA. DNR.				

Approved: September 14, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 091317
 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: _____

Internal Standard: STD83648 Surrogate Standard: STD83648
 CCV: STD83799 LCS: STD83830 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG629515

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M150007	WG629513-01 50ng BFB STD 8260	NA	1	1	STD83478	09/13/17 10:50
6M150008	WG629513-02 50ug/L CCV STD 8260	NA	1	1	STD83799	09/13/17 11:15
6M150009	WG629513-02 50ug/L CCV STD 8260	NA	1	1	STD83799	09/13/17 11:49
6M150010	WG628383-12 50ug/L ALT SRC STD 8260	NA	1	1	STD83830	09/13/17 12:18
6M150011	WG000000-01 100ug/L A9 CCV STD 8260	NA	1	1	STD83554	09/13/17 12:47
6M150012	WG629515-01 BLANK 0913 STD 8260	NA	1	1		09/13/17 13:16
6M150013	WG628383-12 20ug/L ALT SRC STD 8260	NA	1	1	STD83830	09/13/17 13:46
6M150014	WG629515-02 20ug/L LCS STD 8260	NA	1	1	STD83830	09/13/17 14:14
6M150015	WG629515-03 20ug/L LCS2 STD 8260	NA	1	1	STD83830	09/13/17 14:43
6M150016	L17090508-01 A 10X 826-TC	NA	17	10		09/13/17 15:12
6M150017	L17090579-04 A TB 826-SPE	<2	1	1		09/13/17 15:41
6M150018	L17090579-03 A 826-SPE	<2	1	1		09/13/17 16:11
6M150019	L17090579-01 A 826-SPE	6	1	1		09/13/17 16:40
6M150020	L17090579-02 A 2.5X 826-SPE 00	<2	1	2.5		09/13/17 17:09
6M150021	L17090697-10 A EB 826-SPE	<2	1	1		09/13/17 17:39
6M150022	L17090697-12 A TB 826-SPE	<2	1	1		09/13/17 18:08
6M150023	L17090697-13 A TB 826-SPE	<2	1	1		09/13/17 18:37
6M150024	L17081308-01 B 826-REF-BLK	<2	1	1		09/13/17 19:06
6M150025	L17081308-02 B 826-REF-BLK	<2	1	1		09/13/17 19:36
6M150026	L17081308-03 B 826-REF-BLK	<2	1	1		09/13/17 20:05
6M150027	L17081308-04 B 826-REF-BLK	<2	1	1		09/13/17 20:34
6M150028	L17081308-05 B 826-REF-BLK	<2	1	1		09/13/17 21:04
6M150029	L17090714-01 A 826-SPE	<2	1	1		09/13/17 21:33
6M150030	L17090697-11 A 5X 826-SPE	3	1	5		09/13/17 22:02
6M150031	L17090697-14 A 5X 826-SPE	<2	1	5		09/13/17 22:31
6M150032	RINSE	NA	1	1		09/13/17 23:01
6M150033	WG629515-04 BLANK 0913 STD 624	NA	2	1		09/13/17 23:30
6M150034	L17090705-01 A 624-SPE1	7	2	1		09/14/17 08:44
6M150035	L17090705-02 A 624-SPE1	7	2	1		09/14/17 09:13
6M150036	L17090705-03 A 624-SPE1	7	2	1		09/14/17 09:45
6M150037	L17090705-04 A 624-SPE1	8	2	1		09/14/17 10:14
6M150038	L17090725-01 A 624-SPE2	6	2	1		09/14/17 10:43
6M150039	WG629158-01 A FBLK 10X 826-TC	NA	17	1		09/14/17 11:12
6M150040	CCV	NA	1	1		09/14/17 11:42

Approved: September 15, 2017

Page: 1

Cathy Carter



Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 091317
 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: _____

Internal Standard: STD83648 Surrogate Standard: STD83648
 CCV: STD83799 LCS: STD83830 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG629515

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M150041	RINSE	NA	1	1		09/14/17 12:11

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2	X			
File ID: 6M150008				
Chloromethane was low.				
4	X			
File ID: 6M150010				
VC was low. DNR.				
5				
File ID: 6M150011				
Not needed. DNR.				
12	X	5	Analyzed too dilute	Toluene
File ID: 6M150018				
L17090579-03				
24	X	1	Analyzed too dilute	
File ID: 6M150030				
L17090697-11 DNR.				
25	X	25	Over Calibration Range	NAPH
File ID: 6M150031				
L17090697-14				

Approved: September 15, 2017

Page: 2




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 092517
 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: _____

Internal Standard: STD8368 Surrogate Standard: STD83648
 CCV: STD83834 LCS: STD84000 MS/MSD: NA

Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG631087

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
6M150182	WG631085-01 50ng BFB STD 8260	NA	1	1	STD84001	09/25/17 09:43
6M150183	WG631085-02 50ug/L CCV STD 8260	NA	1	1	STD83834	09/25/17 10:08
6M150184	RINSE	NA	1	1		09/25/17 10:41
6M150185	WG631087-01 BLK0925 STD 8260	NA	1	1		09/25/17 11:09
6M150186	WG631087-02 20ug/L LCS STD 8260	NA	1	1	STD84000	09/25/17 12:34
6M150187	WG631087-03 20ug/L LCS2 STD 8260	NA	1	1	STD84000	09/25/17 13:07
6M150188	L17091217-01 A 826-SPE4	<2	1	1		09/25/17 13:35
6M150189	L17091202-02 A TB 826-LOW	<2	1	1		09/25/17 14:04
6M150190	L17091202-01 A 826-LOW	<2	1	1		09/25/17 14:32
6M150191	L17091210-02 A 826-SPE4	<2	1	1		09/25/17 15:01
6M150192	L17091210-03 A 826-SPE4	<2	1	1		09/25/17 15:30
6M150193	L17091210-04 A 826-SPE4	<2	1	1		09/25/17 15:59
6M150194	L17091210-05 A 826-SPE4	<2	1	1		09/25/17 16:28
6M150195	L17091210-01 A 5X 826-SPE4	<2	1	5		09/25/17 16:57
6M150196	L17091216-01 A 2X 826-SPE4	<2	1	2		09/25/17 17:26
6M150197	L17091216-02 A 2X 826-SPE4	<2	1	2		09/25/17 17:55
6M150198	L17091216-03 A 2X 826-SPE4	<2	1	2		09/25/17 18:24
6M150199	L17091216-04 A 5X 826-SPE4 D1	<2	1	5		09/25/17 18:53
6M150200	L17091216-05 A 100X 826-SPE4	<2	1	100		09/25/17 19:21
6M150201	CCV	NA	1	1		09/25/17 19:50
6M150202	RINSE	NA	1	1		09/25/17 20:19
6M150203	RINSE	NA	1	1		09/25/17 20:48

Comments

Seq.	Rerun	Dil.	Reason	Analytes
14	X	1	Analyzed too dilute	
File ID: 6M150195				
DNR.				
16	X	1	Analyzed too dilute	
File ID: 6M150197				
DNR.				
18	X	2	Analyzed too dilute	
File ID: 6M150199				
L17091216-04=D1				

Approved: September 27, 2017

Page: 1




Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS6 Dataset: 092517
 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: _____

Internal Standard: STD8368 Surrogate Standard: STD83648
 CCV: STD83834 LCS: STD84000 MS/MSD: NA
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG631087

Comments:

Comments

Seq.	Rerun	Dil.	Reason	Analytes
19	X	50	Analyzed too dilute	
File ID: 6M150200				
DNR.				

Approved: September 27, 2017

Page: 2




Microbac Laboratories Inc.

Data Checklist

Date: 23-AUG-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/OVAP/624
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 84155
 Analytical Workgroups: WG626990

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	X
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	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:
24-AUG-2017

Tiffany Bailey

Secondary Reviewer:
25-AUG-2017

Adrian Carter



Microbac Laboratories Inc.

Data Checklist

Date: 12-SEP-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 84572
 Analytical Workgroups: WG628383

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	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:
13-SEP-2017

Tiffany Bailey

Secondary Reviewer:
14-SEP-2017

Aditya Carter



Microbac Laboratories Inc.

Data Checklist

Date: 13-SEP-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 84579
 Analytical Workgroups: WG629515

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	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	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:
14-SEP-2017

Tiffany Bailey

Secondary Reviewer:
15-SEP-2017

Adrian Carter



Microbac Laboratories Inc.

Data Checklist

Date: 25-SEP-2017
 Analyst: TMB
 Analyst: NA
 Method: 8260B/624/OVAP
 Instrument: HPMS6
 Curve Workgroup: NA
 Runlog ID: 84831
 Analytical Workgroups: WG631087

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	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:
26-SEP-2017

Tiffany Bailey

Secondary Reviewer:
27-SEP-2017

Anthony Carter



Analytical Method:8260B
Login Number:L17091202

AAB#:WG631087

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-SP650-6469	01	09/20/17					09/25/2017	5	14		09/25/17	5	14	
TRIP BLANK	02	09/20/17					09/25/2017	5.6	14		09/25/17	5.6	14	

* = SEE PROJECT QAPP REQUIREMENTS



Login Number: L17091202
 Instrument Id: HPMS6
 Workgroup (AAB#): WG631087

Method: 8260
 CAL ID: HPMS6-12-SEP-17
 Matrix: Water

Sample Number	Dilution	Tag	1	2	3	4
L17091202-01	1.00	01	106	92.3	110	98.5
L17091202-02	1.00	01	107	91.7	110	97.9
WG631087-01	1.00	01	108	91.3	109	98.7
WG631087-02	1.00	01	103	91.8	109	97.4
WG631087-03	1.00	01	104	91.3	109	98.1

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: L17091202 Work Group: WG631087
Blank File ID: 6M150185 Blank Sample ID: WG631087-01
Prep Date: 09/25/17 11:09 Instrument ID: HPMS6
Analyzed Date: 09/25/17 11:09 Method: 8260B
Analyst: TMB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG631087-02	6M150186	09/25/17 12:34	01
LCS2	WG631087-03	6M150187	09/25/17 13:07	01
TRIP BLANK	L17091202-02	6M150189	09/25/17 14:04	01
LH18/24-SP650-6469	L17091202-01	6M150190	09/25/17 14:32	01

Report Name: BLANK_SUMMARY
PDF File ID: 5498497
Report generated 09/27/2017 14:39



Login Number: L17091202 Prep Date: 09/25/17 11:09 Sample ID: WG631087-01
 Instrument ID: HPMS6 Run Date: 09/25/17 11:09 Prep Method: 5030B/5030C/503
 File ID: 6M150185 Analyst: TMB Method: 8260B
 Workgroup (AAB#): WG631087 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS6-12-SEP-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	108	70 - 120	PASS
4-Bromofluorobenzene	109	75 - 120	PASS
Dibromofluoromethane	91.3	85 - 115	PASS
Toluene-d8	98.7	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: 5494797
 26-SEP-2017 09:29



Login Number: L17091202 Analyst: TMB Prep Method: 5030B/5030C/503
 Instrument ID: HPMS6 Matrix: Water Method: 8260B
 Workgroup (AAB#): WG631087 Units: ug/L
 QC Key: DOD4 Lot #: STD84000

Sample ID: WG631087-02 LCS File ID: 6M150186 Run Date: 09/25/2017 12:34
 Sample ID: WG631087-03 LCS2 File ID: 6M150187 Run Date: 09/25/2017 13:07

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
1,1,1-Trichloroethane	20.0	21.5	107	20.0	21.0	105	2.16	65 - 130	30	
1,1,2-Trichloroethane	20.0	18.0	90.2	20.0	18.7	93.6	3.70	75 - 125	30	
1,1-Dichloroethane	20.0	21.1	105	20.0	20.9	104	1.11	70 - 135	30	
1,1-Dichloroethene	20.0	22.7	113	20.0	22.4	112	1.30	70 - 130	30	
1,2-Dichloroethane	20.0	22.3	112	20.0	22.7	114	1.67	70 - 130	30	
Acetone	20.0	17.4	87.2	20.0	23.5	118	29.8	40 - 140	30	
Benzene	20.0	20.5	103	20.0	20.4	102	0.719	80 - 120	30	
Carbon tetrachloride	20.0	21.1	105	20.0	20.6	103	2.40	65 - 140	30	
Chloroform	20.0	20.7	103	20.0	20.7	104	0.245	65 - 135	30	
Ethylbenzene	20.0	20.5	102	20.0	20.4	102	0.0903	75 - 125	30	
m,p-Xylene	40.0	40.5	101	40.0	40.6	102	0.396	75 - 130	30	
Methylene chloride	20.0	19.2	96.0	20.0	19.2	96.2	0.225	55 - 140	30	
o-Xylene	20.0	21.4	107	20.0	21.5	107	0.231	80 - 120	30	
Styrene	20.0	20.6	103	20.0	20.9	105	1.56	65 - 135	30	
Tetrachloroethene	20.0	18.7	93.4	20.0	18.7	93.3	0.0890	45 - 150	30	
Toluene	20.0	20.0	99.9	20.0	20.1	101	0.813	75 - 120	30	
Trichloroethene	20.0	20.1	101	20.0	19.6	97.9	2.70	70 - 125	30	
Vinyl chloride	20.0	19.4	97.1	20.0	19.4	97.2	0.0546	50 - 145	30	

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
1,2-Dichloroethane-d4	103	104	70 - 120	PASS
Dibromofluoromethane	91.8	91.3	85 - 115	PASS
4-Bromofluorobenzene	109	109	75 - 120	PASS
Toluene-d8	97.4	98.1	85 - 120	PASS

* EXCEEDS %REC LIMIT
 # EXCEEDS RPD LIMIT



BFB

Login Number: L17091202 Tune ID: WG627256-01
 Instrument: HPMS6 Run Date: 08/23/2017
 Analyst: TMB Run Time: 15:38
 Workgroup: WG627256 File ID: 6M149724
 Cal ID: HPMS6-23-AUG-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	15.9	7479	PASS
75.0	95.0	30.0	60.0	42.5	20035	PASS
95.0	95.0	100	100	100	47157	PASS
96.0	95.0	5.00	9.00	7.09	3344	PASS
173	174	0	2.00	0.344	151	PASS
174	95.0	50.0	100	93.2	43933	PASS
175	174	5.00	9.00	7.27	3196	PASS
176	174	95.0	101	98.0	43053	PASS
177	176	5.00	9.00	6.79	2922	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG627256-02	STD	01	08/23/2017 16:35	
WG627256-03	STD	01	08/23/2017 17:05	
WG627256-04	STD	01	08/23/2017 17:34	
WG627256-05	STD-CCV	01	08/23/2017 18:04	
WG627256-06	STD	01	08/23/2017 18:34	
WG627256-07	STD	01	08/23/2017 19:04	
WG627256-08	STD	01	08/23/2017 19:34	
WG627256-09	STD	01	08/23/2017 20:04	
WG627256-10	SSCV	01	08/23/2017 21:33	

* Sample past 12 hour tune limit



BFB

Login Number: L17091202 Tune ID: WG628383-01
 Instrument: HPMS6 Run Date: 09/12/2017
 Analyst: TMB Run Time: 07:13
 Workgroup: WG628383 File ID: 6M149987
 Cal ID: HPMS6-12-SEP-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	17.2	6356	PASS
75.0	95.0	30.0	60.0	43.7	16191	PASS
95.0	95.0	100	100	100	37058	PASS
96.0	95.0	5.00	9.00	6.53	2420	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	91.1	33746	PASS
175	174	5.00	9.00	7.37	2488	PASS
176	174	95.0	101	99.0	33400	PASS
177	176	5.00	9.00	6.67	2228	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG628383-02	STD	01	09/12/2017 08:08	
WG628383-03	STD	01	09/12/2017 08:37	
WG628383-04	STD	01	09/12/2017 09:06	
WG628383-05	STD	01	09/12/2017 09:36	
WG628383-06	STD	01	09/12/2017 10:05	
WG628383-07	STD	01	09/12/2017 10:34	
WG628383-08	STD-CCV	01	09/12/2017 11:04	
WG628383-09	STD	01	09/12/2017 11:33	
WG628383-10	STD	01	09/12/2017 12:02	
WG628383-11	STD	01	09/12/2017 12:31	

* Sample past 12 hour tune limit



BFB

Login Number: L17091202

Tune ID: WG629513-01

Instrument: HPMS6

Run Date: 09/13/2017

Analyst: TMB

Run Time: 10:50

Workgroup: WG629513

File ID: 6M150007

Cal ID: HPMS6-12-SEP-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	17.6	9286	PASS
75.0	95.0	30.0	60.0	44.5	23488	PASS
95.0	95.0	100	100	100	52736	PASS
96.0	95.0	5.00	9.00	6.60	3481	PASS
173	174	0	2.00	0.688	294	PASS
174	95.0	50.0	100	81.0	42736	PASS
175	174	5.00	9.00	7.35	3140	PASS
176	174	95.0	101	96.7	41333	PASS
177	176	5.00	9.00	7.06	2919	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG628383-12	SSCV	01	09/13/2017 13:46	

* Sample past 12 hour tune limit



BFB

Login Number: L17091202 Tune ID: WG631085-01
 Instrument: HPMS6 Run Date: 09/25/2017
 Analyst: TMB Run Time: 09:43
 Workgroup: WG631085 File ID: 6M150182
 Cal ID: HPMS6-12-SEP-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	20.8	8367	PASS
75.0	95.0	30.0	60.0	46.9	18878	PASS
95.0	95.0	100	100	100	40216	PASS
96.0	95.0	5.00	9.00	6.88	2768	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	83.0	33386	PASS
175	174	5.00	9.00	7.34	2451	PASS
176	174	95.0	101	98.8	33002	PASS
177	176	5.00	9.00	6.72	2219	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG631085-02	CCV	01	09/25/2017 10:08	
WG631087-01	BLANK	01	09/25/2017 11:09	
WG631087-02	LCS	01	09/25/2017 12:34	
WG631087-03	LCS2	01	09/25/2017 13:07	
L17091202-02	TRIP BLANK	01	09/25/2017 14:04	
L17091202-01	LH18/24-SP650-6469	01	09/25/2017 14:32	

* Sample past 12 hour tune limit



T	1,2,3-Trichloropropane		0.146	0.179	0.179	0.169	0.177	0.169	0.174		0.1705	6.7755	
T	trans-1,4-Dichloro-2-Butene		0.069	0.094	0.109	0.119	0.143	0.142	0.148	0.137	0.1201	23.397	0.998
T	n-Propylbenzene	3.04	3.188	3.101	3.491	3.499	3.554	3.271	3.058		3.2754	6.4762	
T	Bromobenzene	0.87	0.877	0.794	0.84	0.86	0.843	0.854	0.81	0.824	0.8413	3.2913	
T	1,3,5-Trimethylbenzene		2.02	2.221	2.189	2.47	2.492	2.553	2.369	2.324	2.3297	7.692	
T	2-Chlorotoluene		2.146	2.196	2.19	2.297	2.235	2.224	2.088	2.025	2.1752	3.9807	
T	4-Chlorotoluene		2.043	2.125	2.101	2.182	2.126	2.187	2.038	2.022	2.1028	3.0493	
T	a-Methylstyrene				1.38	1.427	1.544	1.441	1.392	1.253	1.4062	6.7399	
T	tert-Butylbenzene		0.468	0.483	0.554	0.556	0.564	0.524	0.53		0.5256	7.106	
T	1,2,4-Trimethylbenzene		2.397	2.469	2.631	2.578	2.634	2.429	2.332		2.4956	4.8006	
T	sec-Butylbenzene		2.773	2.667	2.986	3.018	3.096	2.817	2.68		2.8623	5.9841	
T	p-Isopropyltoluene		2.416	2.287	2.647	2.691	2.74	2.496	2.378		2.5221	6.8662	
T	1,3-Dichlorobenzene	1.671	1.69	1.63	1.647	1.616	1.638	1.512	1.476		1.6098	4.6952	
T	1,4-Dichlorobenzene	1.76	1.799	1.731	1.614	1.685	1.609	1.624	1.498	1.454	1.6417	7.0347	
T	n-Butylbenzene			2.179	2.021	2.289	2.318	2.378	2.155	2.06	2.1999	6.0905	
T	1,2-Dichlorobenzene	1.513	1.468	1.474	1.485	1.508	1.484	1.511	1.392	1.336	1.4634	4.1192	
T	1,2-Dibromo-3-Chloropropane				0.087	0.092	0.096	0.097	0.092	0.091	0.0925	3.8381	
T	1,2,4-Trichlorobenzene		1.074	1.081	1.05	1.066	1.084	1.104	1.005	0.984	1.0559	3.9308	
T	Hexachlorobutadiene		0.461	0.492	0.404	0.445	0.442	0.454	0.407	0.406	0.439	7.1551	
T	Naphthalene		1.701	1.789	1.798	1.904	2	2.035	1.851	1.768	1.8558	6.2723	
T	1,2,3-Trichlorobenzene	1.049	1.008	0.972	0.947	0.935	0.953	0.955	0.874	0.856	0.9498	6.288	

Wed Sep 13 12:10:43 2017

Login Number: L17091202 Run Date: 09/13/2017 Sample ID: WG628383-12
 Instrument ID: HPMS6 Run Time: 13:46 Method: 8260B
 File ID: 6M150013 Analyst: TMB QC Key: DOD4
 ICal Workgroup: WG628383 Cal ID: HPMS6 - 12-SEP-17

Analyte		Expected	Found	Units	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	20.0	19.2	ug/L	0.406	3.80	20	
Chloroform	CCC	20.0	19.4	ug/L	0.485	3.20	20	
Ethylbenzene	CCC	20.0	20.5	ug/L	0.538	2.60	20	
Toluene	CCC	20.0	20.3	ug/L	1.47	1.30	20	
Vinyl Chloride	CCC	20.0	17.7	ug/L	0.230	11.7	20	
1,1,2,2-Tetrachloroethane	SPCC	20.0	19.2	ug/L	0.565	4.00	20	
Chloromethane	SPCC	20.0	16.9	ug/L	0.268	15.6	20	
Bromoform	SPCC	20.0	19.1	ug/L	0.224	4.60	20	
Chlorobenzene	SPCC	20.0	20.0	ug/L	1.02	0.200	20	
1,1-Dichloroethane	SPCC	20.0	18.7	ug/L	0.498	6.50	20	
1,1,1-Trichloroethane		20.0	19.4	ug/L	0.427	3.20	20	
1,1,2-Trichloroethane		20.0	19.9	ug/L	0.280	0.600	20	
1,2-Dichloroethane		20.0	19.5	ug/L	0.323	2.50	20	
Acetone		20.0	20.8	ug/L	0.0569	4.00	20	
Benzene		20.0	19.5	ug/L	1.09	2.50	20	
Carbon Tetrachloride		20.0	19.3	ug/L	0.385	3.40	20	
Methylene Chloride		20.0	19.1	ug/L	0.290	4.70	20	
m-,p-Xylene		40.0	41.4	ug/L	0.659	3.40	20	
o-Xylene		20.0	21.7	ug/L	0.665	8.30	20	
Styrene		20.0	21.6	ug/L	1.13	8.20	20	
Tetrachloroethene		20.0	20.0	ug/L	0.412	0.100	20	
Trichloroethene		20.0	19.8	ug/L	0.308	1.20	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Login Number: L17091202 Run Date: 09/25/2017 Sample ID: WG631085-02
Instrument ID: HPMS6 Run Time: 10:08 Method: 8260B
File ID: 6M150183 Analyst: TMB QC Key: DOD4
Workgroup (AAB#): WG631087 Cal ID: HPMS6 - 12-SEP-17
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,2-Dichloropropane	CCC	50.0	53.8	ug/L	0.331	7.53	20	
1,1-Dichloroethene	CCC	50.0	57.4	ug/L	0.485	14.8	20	
Chloroform	CCC	50.0	51.8	ug/L	0.519	3.61	20	
Ethylbenzene	CCC	50.0	51.7	ug/L	0.543	3.47	20	
Toluene	CCC	50.0	51.0	ug/L	1.48	2.00	20	
Vinyl Chloride	CCC	50.0	48.8	ug/L	0.255	2.33	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	44.6	ug/L	0.526	10.7	20	
Bromoform	SPCC	50.0	43.9	ug/L	0.206	12.2	20	
Chlorobenzene	SPCC	50.0	47.8	ug/L	0.980	4.30	20	
Chloromethane	SPCC	50.0	46.7	ug/L	0.297	6.53	20	
1,1-Dichloroethane	SPCC	50.0	54.3	ug/L	0.579	8.67	20	
Xylenes		150	155	ug/L	0.651	3.30	20	
1,1,1-Trichloroethane		50.0	54.1	ug/L	0.477	8.23	20	
1,1,2-Trichloroethane		50.0	45.4	ug/L	0.255	9.26	20	
1,2-Dichloroethane		50.0	55.9	ug/L	0.371	11.7	20	
Acetone		50.0	53.3	ug/L	0.0584	6.64	20	
Benzene		50.0	51.2	ug/L	1.15	2.40	20	
Carbon Tetrachloride		50.0	54.5	ug/L	0.435	9.04	20	
Methylene Chloride		50.0	47.7	ug/L	0.290	4.52	20	
m-,p-Xylene		100	102	ug/L	0.648	1.72	20	
o-Xylene		50.0	53.2	ug/L	0.654	6.46	20	
Styrene		50.0	52.5	ug/L	1.10	4.95	20	
Tetrachloroethene		50.0	48.9	ug/L	0.404	2.22	20	
Trichloroethene		50.0	50.7	ug/L	0.316	1.47	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

CCV - Modified 03/05/2008

PDF File ID: 5494801

Report generated 09/26/2017 09:29



Login Number: L17091202
Instrument ID: HPMS6
Workgroup (AAB#): WG631087

ICAL CCV Number: WG628383-08
CAL ID: HPMS6-12-SEP-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG628383-08	NA	NA	305738	544096	694073
Upper Limit	NA	NA	611476	1088192	1388146
Lower Limit	NA	NA	152869	272048	347037
<u>L17091202-01</u>	1.00	01	348657	625078	775795
L17091202-02	1.00	01	360407	651215	810323
WG631087-01	1.00	01	358584	643531	799925
WG631087-02	1.00	01	366471	663735	813967
WG631087-03	1.00	01	368686	663726	821432

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)

00862071

Login Number: L17091202
Instrument ID: HPMS6
Workgroup (AAB#): WG631087

ICAL CCV Number: WG628383-08
CAL ID: HPMS6-12-SEP-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG628383-08	NA	NA	18.15	15.12	11.24
Upper Limit	NA	NA	18.65	15.62	11.74
Lower Limit	NA	NA	17.65	14.62	10.74
<u>L17091202-01</u>	1.00	01	18.13	15.1	11.22
<u>L17091202-02</u>	1.00	01	18.13	15.1	11.22
WG631087-01	1.00	01	18.12	15.1	11.22
WG631087-02	1.00	01	18.12	15.09	11.21
WG631087-03	1.00	01	18.13	15.1	11.22

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



2.2 General Chemistry Data

2.2.1 Method 9056

2.2.1.1 Summary Data

Lab Report #: L17091202

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091202-01	PrePrep Method: N/A	Instrument: IC1
Client ID: LH18/24-SP650-6469	Prep Method: 9056	Prep Date: 09/29/2017 17:31
Matrix: Water	Analytical Method: 9056	Cal Date: 08/30/2017 13:05
Workgroup #: WG632016	Analyst: CAS	Run Date: 09/29/2017 18:44
Collect Date: 09/20/2017 15:00	Dilution: 5	File ID: I1_092917-07
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Sulfate	14808-79-8	89.9		10.0	5.00	2.50
J	Estimated value ; the analyte concentration was greater than the highest standard					

Lab Report #: L17091202

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091202-01

PrePrep Method: N/A

Instrument: IC1

Client ID: LH18/24-SP650-6469

Prep Method: 9056

Prep Date: 09/29/2017 17:31

Matrix: Water

Analytical Method: 9056

Cal Date: 08/30/2017 13:05

Workgroup #: WG632016

Analyst: CAS

Run Date: 09/29/2017 19:02

Collect Date: 09/20/2017 15:00

Dilution: 50

File ID: I1_092917-08

Sample Tag: DL02

Units: mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Chloride	16887-00-6	565		20.0	10.0	5.00
J	Estimated value ; the analyte concentration was less than the LOQ.					

2.2.1.2 QC Summary Data

9056/300 Calculations

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: IC1 _____ Dataset: 083017 IC1 ICAL.SEQ _____
 Analyst1: CAS _____ Analyst2: NA _____
 Method: 300/9056 _____ SOP: IC01 _____ Rev: 19 _____

Maintenance Log ID: _____ Syringe Filter Lot#: 170105254 _____

Eluent ID#: RGT41111 _____

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

Internal STD: NA _____ Surrogate STD: NA _____ Calibration STD: STD81395(30-AUG-2017)

CCV STD: STD81395 _____ LCS STD: STD81396 _____ MS/MSD STD: STD81396 _____

Comments: ICAL WG627709 : Alternate Source STD81396
 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_083017-01	ELUENT	1	1		08/30/17 10:57
2	I1_083017-02	DI WATER	1	1		08/30/17 11:16
3	I1_083017-03	WG627709-01 STD	1	1	STD81395	08/30/17 11:34
4	I1_083017-04	WG627709-02 STD	1	1	STD81395	08/30/17 11:52
5	I1_083017-05	WG627709-03 STD	1	1	STD81395	08/30/17 12:10
6	I1_083017-06	WG627709-04 STD	1	1	STD81395	08/30/17 12:28
7	I1_083017-07	WG627709-05 STD	1	1	STD81395	08/30/17 12:47
8	I1_083017-08	WG627709-06 STD	1	1	STD81395	08/30/17 13:05
9	I1_083017-09	WG627709-07 SSCV	1	1	STD81396	08/30/17 13:23
10	I1_083017-10	LCRV @Level-6	1	1	STD81396	08/30/17 13:41
11	I1_083017-11	LCRV @Level-4	1	1	STD81396	08/30/17 14:00
12	I1_083017-12	LCRV @Level-2	1	1	STD81396	08/30/17 14:18
13	I1_083017-13	LCRV @Level-0	1	1		08/30/17 14:36
14	I1_083017-14	END	1	1		08/30/17 14:54

Comments

Seq.	Rerun	Dil.	Reason	Analytes

Page: 1

Approved: 30-AUG-17

Eri C. Zimm



Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC1 Dataset: 092917 IC1.SEQ
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 170105254
 Eluent ID#: RGT41431

Workgroups: Column 1 ID: AG14A 4MM Column 2 ID: AS14A 4MM
 Analytical WG632016 (Waters)
 Internal STD: NA Surrogate STD: NA Calibration STD STD81395(30-AUG-2017)
 CCV STD: STD81395 LCS STD: STD81396 MS/MSD STD: STD81396

Comments: System Backpressure: 1704 psi
 Samples L17091202-01, L17091436-01, L17091437-01, L17091438-01, and L17091473 (-07,09,11) were analyzed at dilutions only due to their pre-run screen results for chloride, which were greater than 200 ppm.
 Sample L17091473-05 was analyzed at a dilution only due to its pre-run screen results for chloride and sulfate, which were greater than their calibration maxima.
 Samples L17091473 (-01,03) were analyzed at dilutions only due to their pre-run screen results for sulfate, which were greater than 200 ppm.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I1_092917-01	ELUENT	1	1		09/29/17 16:54
2	I1_092917-02	DI WATER	1	1		09/29/17 17:13
3	I1_092917-03	WG632017-01 ANION CCV	1	1	STD81395	09/29/17 17:31
4	I1_092917-04	WG632017-02 ANION CCB	1	1		09/29/17 17:49
5	I1_092917-05	WG632016-01 ANION BLANK	1	1		09/29/17 18:07
6	I1_092917-06	WG632016-02 ANION LCS	1	1	STD81396	09/29/17 18:26
7	I1_092917-07	L17091202-01 (CL,SO4) 5x	1	5		09/29/17 18:44
8	I1_092917-08	L17091202-01 RR CL 50x	1	50		09/29/17 19:02
9	I1_092917-09	L17091436-01 (CL,SO4) 5x	1	5		09/29/17 19:20
10	I1_092917-10	L17091436-01 RR CL 50x	1	50		09/29/17 19:38
11	I1_092917-11	L17091437-01 (CL,SO4) 200x	1	200		09/29/17 19:57
12	I1_092917-12	L17091437-01 RR CL 2000x	1	2000		09/29/17 20:15
13	I1_092917-13	L17091438-01 (CL,SO4) 50x	1	50		09/29/17 20:33
14	I1_092917-14	L17091438-01 RR CL 500x	1	500		09/29/17 20:51
15	I1_092917-15	WG632017-03 ANION CCV	1	1	STD81395	09/29/17 21:09
16	I1_092917-16	WG632017-04 ANION CCB	1	1		09/29/17 21:28
17	I1_092917-17	L17091473-01 (CL,SO4) 10x	2	10		09/29/17 21:46
18	I1_092917-18	L17091473-03 (CL,SO4) 10x	2	10		09/29/17 22:04
19	I1_092917-19	L17091473-05 (CL,SO4) 10x	2	10		09/29/17 22:22
20	I1_092917-20	L17091473-07 (CL,SO4) 100x	2	100		09/29/17 22:40
21	I1_092917-21	L17091473-09 (CL,SO4) 50x	2	50		09/29/17 22:59
22	I1_092917-22	L17091473-11 (CL,SO4) 5x	2	5		09/29/17 23:17
23	I1_092917-23	L17091473-11 RR CL 50x	2	50		09/29/17 23:35
24	I1_092917-24	L17091527-03 (CL,BR,SO4)	2	1		09/29/17 23:53
25	I1_092917-25	L17091527-03 RR SO4 5x	2	5		09/30/17 00:12
26	I1_092917-26	L17091527-03 RR CL 10x	2	10		09/30/17 00:30
27	I1_092917-27	WG632017-05 ANION CCV	1	1	STD81395	09/30/17 00:48
28	I1_092917-28	WG632017-06 ANION CCB	1	1		09/30/17 01:06

Page: 1

Approved: 02-OCT-17

Mary Schilling

Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC1 _____ Dataset: 092917 IC1.SEQ _____
 Analyst1: CAS _____ Analyst2: NA _____
 Method: 300/9056 _____ SOP: IC01 _____ Rev: 19 _____

Maintenance Log ID: _____ Syringe Filter Lot#: 170105254 _____
 Eluent ID#: RGT41431 _____

Workgroups: Column 1 ID: AG14A 4MM _____ Column 2 ID: AS14A 4MM _____
 Analytical WG632016 (Waters) _____
 Internal STD: NA _____ Surrogate STD: NA _____ STD81395(30-AUG-2017) _____
 CCV STD: STD81395 _____ LCS STD: STD81396 _____ STD81396 _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
29	I1_092917-29	L17091555-01 (CL,SO4)	1	1		09/30/17 01:24
30	I1_092917-30	L17091555-01 RR CL 5x	1	5		09/30/17 01:43
31	I1_092917-31	L17091555-02 (CL,SO4)	1	1		09/30/17 02:01
32	I1_092917-32	L17091555-02 RR CL 5x	1	5		09/30/17 02:19
33	I1_092917-33	L17091555-03 (CL,SO4) REF	1	1		09/30/17 02:37
34	I1_092917-34	WG632016-04 DUP 1555-03	1	1		09/30/17 02:55
35	I1_092917-35	WG632016-05 MS 1555-03	1	1	STD81396	09/30/17 03:14
36	I1_092917-36	WG632016-06 MSD 1555-03	1	1	STD81396	09/30/17 03:32
37	I1_092917-37	L17091555-04 (CL,SO4)	1	1		09/30/17 03:50
38	I1_092917-38	L17091555-05 (CL,SO4)	1	1		09/30/17 04:08
39	I1_092917-39	WG632017-07 ANION CCV	1	1	STD81395	09/30/17 04:26
40	I1_092917-40	WG632017-08 ANION CCB	1	1		09/30/17 04:45
41	I1_092917-41	L17091719-01 (CL,NO3,SO4) REF	1	1		09/30/17 05:03
42	I1_092917-42	WG632016-08 DUP 1719-01	1	1		09/30/17 05:21
43	I1_092917-43	L17091719-03 (CL,NO3,SO4)	1	1		09/30/17 05:39
44	I1_092917-44	L17091719-05 (CL,NO3,SO4)	1	1		09/30/17 05:57
45	I1_092917-45	WG632017-09 ANION CCV	1	1	STD81395	09/30/17 06:16
46	I1_092917-46	WG632017-10 ANION CCB	1	1		09/30/17 06:34
47	I1_092917-47	END	1	1		09/30/17 06:52

Comments

Seq.	Rerun	Dil.	Reason	Analytes
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Mary Schilling



Microbac Laboratories Inc.

Data Checklist


Date: 30-AUG-2017
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC1
 Curve Workgroup: WG627709
 Runlog ID: 84296
 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)	1678 PSI
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	NA
Project/client specific requirements	NA
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:
30-AUG-2017



Secondary Reviewer:
30-AUG-2017




Microbac Laboratories Inc.

Data Checklist

Date: 29-SEP-2017
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC1
 Curve Workgroup: NA
 Runlog ID: 84962
 Analytical Workgroups: L17091202,1436,1437,1438,1473,1527,1555,1719

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)	1704 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	MES

Primary Reviewer:
02-OCT-2017

CAS

Secondary Reviewer:
02-OCT-2017

Mary Schilling

CHECKLIST1 - Modified 03/05/2008

Generated: OCT-02-2017 15:10:39



Analytical Method:9056
Login Number:L17091202

AAB#:WG632016

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-SP650-6469	01	09/20/17					09/29/2017	9.1	2	*	09/29/17	9.2	2	*
LH18/24-SP650-6469	01	09/20/17					09/29/2017	9.1	2	*	09/29/17	9.2	2	*

* = SEE PROJECT QAPP REQUIREMENTS



Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

SURROGATES - Modified 03/06/2008
PDF File ID: 5505798
Report generated: 10/02/2017 15:55



METHOD BLANK SUMMARY

Login Number: L17091202 Work Group: WG632016
 Blank File ID: I1_092917-05 Blank Sample ID: WG632016-01
 Prep Date: 09/29/17 17:31 Instrument ID: IC1
 Analyzed Date: 09/29/17 18:07 Method: 9056
 Analyst: CAS

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG632016-02	I1_092917-06	09/29/17 18:26	01
LH18/24-SP650-6469	L17091202-01	I1_092917-07	09/29/17 18:44	DL01
LH18/24-SP650-6469	L17091202-01	I1_092917-08	09/29/17 19:02	DL02
DUP	WG632016-04	I1_092917-34	09/30/17 02:55	01
DUP	WG632016-08	I1_092917-42	09/30/17 05:21	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5503817
 Report generated 10/02/2017 08:52



Login Number: L17091202 Prep Date: 09/29/17 17:31 Sample ID: WG632016-01
 Instrument ID: IC1 Run Date: 09/29/17 18:07 Prep Method: 9056
 File ID: I1 092917-05 Analyst: CAS Method: 9056
 Workgroup (AAB#): WG632016 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: IC1-30-AUG-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: 5503818
 02-OCT-2017 08:52



Login Number: L17091202 Run Date: 09/29/2017 Sample ID: WG632016-02
Instrument ID: IC1 Run Time: 18:26 Prep Method: 9056
File ID: I1 092917-06 Analyst: CAS Method: 9056
Workgroup (AAB#): WG632016 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD81396 Cal ID: IC1-30-AUG-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Chloride	8.00	8.25	103	90 - 110	
Sulfate	40.0	42.2	106	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5503819
Report generated: 10/02/2017 08:52



Loginnum: L17091202 Cal ID: IC1 - Worknum: WG632016
 Instrument ID: IC1 Contract #: _____ Method: 9056
 Parent ID: WG632016-03 File ID: I1 092917-33 Dil: 1 Matrix: WATER
 Sample ID: WG632016-05 MS File ID: I1 092917-35 Dil: 1 Units: mg/L
 Sample ID: WG632016-06 MSD File ID: I1 092917-36 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Chloride	1.07	8.00	9.26	102	8.00	9.27	102	0.0648	90 - 110	20	
Sulfate	6.26	40.0	48.8	106	40.0	48.7	106	0.259	90 - 110	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Login Number: L17091202
Analytical Method: 9056
ICAL Workgroup: WG627709

Instrument ID: IC1
Initial Calibration Date: 30-AUG-17 13:05
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Chloride	5.705	6.21		0.99800
Sulfate	7.895	10.4		0.99700

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5505532
Report generated 10/02/2017 15:23



Login Number: L17091202
 Analytical Method: 9056

Instrument ID: IC1
 Initial Calibration Date: 30-AUG-17 13:05
 Column ID: F

Analyte	WG627709-01			WG627709-02			WG627709-03		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloride	0.200	0.037000000 0	5.405	1.00	0.168000000	5.952	4.00	0.659000000	6.070
Sulfate	1.00	0.113000000	8.850	5.00	0.588000000	8.503	20.0	2.45200000	8.157

INT_CAL - Modified 03/06/2008
 PDF File ID: 5505532
 Report generated 10/02/2017 15:23



Login Number: L17091202
 Analytical Method: 9056

Instrument ID: IC1
 Initial Calibration Date: 30-AUG-17 13:05
 Column ID: F

Analyte	WG627709-04			WG627709-05			WG627709-06		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloride	8.00	1.36500000	5.861	12.0	2.08300000	5.761	24.0	4.63300000	5.180
Sulfate	40.0	5.18300000	7.718	60.0	8.02200000	7.479	120	18.01500000	6.661

INT_CAL - Modified 03/06/2008
 PDF File ID: 5505532
 Report generated 10/02/2017 15:23



Login Number: L17091202 Run Date: 08/30/2017 Sample ID: WG627709-07
 Instrument ID: IC1 Run Time: 13:23 Method: 9056
 File ID: I1 083017-09 Analyst: CAS QC Key: DOD4
 ICal Workgroup: WG627709 Cal ID: IC1 - 30-AUG-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Chloride	8.00	8.25	mg/L	5.71	3.10	10	
Sulfate	40.0	41.3	mg/L	7.51	3.20	10	

* Exceeds %D Limit



Login Number: L17091202 Run Date: 09/29/2017 Sample ID: WG632017-02
 Instrument ID: IC1 Run Time: 17:49 Method: 9056
 File ID: I1 092917-04 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG632016 Cal ID: IC1 - 30-AUG-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: L17091202 Run Date: 09/29/2017 Sample ID: WG632017-04
 Instrument ID: IC1 Run Time: 21:28 Method: 9056
 File ID: I1 092917-16 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG632016 Cal ID: IC1 - 30-AUG-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.

CCB - Modified 03/05/2008
 PDF File ID: 5503822
 Report generated 10/02/2017 08:53



Login Number: L17091202 Run Date: 09/29/2017 Sample ID: WG632017-01
 Instrument ID: IC1 Run Time: 17:31 Method: 9056
 File ID: I1 092917-03 Analyst: CAS QC Key: DOD4
 Workgroup (AAB#): WG632016 Cal ID: IC1 - 30-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.20	mg/L	5.75	2.51	10	
Sulfate	40.0	41.8	mg/L	7.41	4.52	10	

* Exceeds %D Criteria



Login Number: L17091202 Run Date: 09/29/2017 Sample ID: WG632017-03
 Instrument ID: IC1 Run Time: 21:09 Method: 9056
 File ID: I1 092917-15 Analyst: CAS QC Key: DOD4
 Workgroup (AAB#): WG632016 Cal ID: IC1 - 30-AUG-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.22	mg/L	5.73	2.76	10	
Sulfate	40.0	41.9	mg/L	7.40	4.63	10	

* Exceeds %D Criteria



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
October 3, 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	BLR - BRANDON L. RICHARDS
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

October 03, 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

October 03, 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

Page ---

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 BI-WEEKLY SAMPLES			
Prepared By: Scott Beesinger		P.O Number	
Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD
LH18/24-SP650-6469	Water	09/20/17 / 15:00	3
LH18/24-SP650-6469	Water	09/20/17 / 15:00	1
Trip Blank	Water	09/20/17	2
Additional Remarks: STANDARD TAT ON ALL PARAMETERS.			No. OF CONTAINERS 3
Relinquished By: <i>Scott Beesinger</i>			VOC CHLORIDE, SULFATE
Date	Time	Date	Time
09/20/17	15:30		
Relinquished By:			Remarks (Preservatives, etc.) HCL NONE HCL
Date	Time	Date	Time
Received At Lab By:			Lab I.D.#
Date	Time	Date	Time
Received By:			Microbac OVD Received: 09/21/2017 10:33 By: BRENDA GREGORY 221000106350 <i>Brenda Gregory</i>
Date	Time	Date	Time
Relinquished By:			EMAIL RESULTS TO hinda.mabbe@ecocom.com
Date	Time	Date	Time

Relinquished By:		Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Received At Lab By:		Date	Time	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
Remarks									



COOLER TEMP >6° C LOG

Cooler ID 6350

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C
<i>CDD 9/21/17</i>						

pH Lot # HC613865

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6
<i>CDD 9/21/17</i>						

PRESERVATIVE EXCEPTIONS
✓ **NONE AS NOTED**
CDD 9/21/17

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17091202

Account: 2551

Project: 2551.096

Samples: 2

Due Date: 02-OCT-2017

Samplenum **Container ID** **Products**
L17091202-01 968699 826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	21-SEP-2017 14:33	BRG		
2	ANALYZ	V1	ORG4	21-SEP-2017 18:22	JDS	BRG	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	21-SEP-2017 14:33	BRG		
2	ANALYZ	V1	ORG4	21-SEP-2017 18:22	JDS	BRG	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	21-SEP-2017 14:33	BRG		
2	ANALYZ	V1	ORG4	21-SEP-2017 18:22	JDS	BRG	

Samplenum **Container ID** **Products**
L17091202-01 968700 9056

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	21-SEP-2017 14:33	BRG		
2	PREP	W1	SEM	28-SEP-2017 15:14	CAS	BRG	

Samplenum **Container ID** **Products**
L17091202-02 968701 826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	21-SEP-2017 14:33	BRG		
2	ANALYZ	V1	ORG4	21-SEP-2017 18:22	JDS	BRG	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	21-SEP-2017 14:33	BRG		
2	ANALYZ	V1	ORG4	21-SEP-2017 18:22	JDS	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: L17091609

Linda Raabe
AECOM Technical Services, Inc.
112 East Pecan
San Antonio, TX 78205

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 October 09 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 #: L17091609

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?
0019819	I	4.0		J4616882096	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 #:** L17091609**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-SP650-6473	L17091609-01	09/27/2017 15:00	09/28/2017 09:49



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091609
Project Name:		Method:	6850
Prep Batch Number(s):	WG632566	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-05 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	2017-10-05 18:12:50



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091609
Project Name:		Method:	6850
Prep Batch Number(s):	WG632566	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	6850
Prep Batch Number(s):	WG632566	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	6850
Prep Batch Number(s):	WG632566	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	6850
Prep Batch Number(s):	WG632566	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	6850
Prep Batch Number(s):	WG632566	Reviewer Name:	Eric Lawson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	NH3
Prep Batch Number(s):	WG632242	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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	2017-10-05 13:14:49



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091609
Project Name:		Method:	NH3
Prep Batch Number(s):	WG632242	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	NH3
Prep Batch Number(s):	WG632242	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	NH3
Prep Batch Number(s):	WG632242	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	NH3
Prep Batch Number(s):	WG632242	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	NH3
Prep Batch Number(s):	WG632242	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	PO4
Prep Batch Number(s):	WG631768	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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	2017-10-05 13:13:55



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091609
Project Name:		Method:	PO4
Prep Batch Number(s):	WG631768	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	PO4
Prep Batch Number(s):	WG631768	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	PO4
Prep Batch Number(s):	WG631768	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	PO4
Prep Batch Number(s):	WG631768	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	PO4
Prep Batch Number(s):	WG631768	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	TOC
Prep Batch Number(s):	WG632219	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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	2017-10-05 13:15:22



Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	Laboratory Log Number:	L17091609
Project Name:		Method:	TOC
Prep Batch Number(s):	WG632219	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	TOC
Prep Batch Number(s):	WG632219	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	TOC
Prep Batch Number(s):	WG632219	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	TOC
Prep Batch Number(s):	WG632219	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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:	L17091609
Project Name:		Method:	TOC
Prep Batch Number(s):	WG632219	Reviewer Name:	Deanna Hesson
LRC Date:	2017-10-05 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 #: L17091609
 Lab Project #: 2551.096
 Project Name: Longhorn Army Ammunition
 Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091609-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6473	Prep Method: 6850	Prep Date: 10/04/2017 13:00
Matrix: Water	Analytical Method: 6850	Cal Date: 09/08/2017 16:52
Workgroup #: WG632566	Analyst: JWR	Run Date: 10/04/2017 17:11
Collect Date: 09/27/2017 15:00	Dilution: 1	File ID: 1LM.LM40634
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.761		0.400	0.200	0.100

Certificate of Analysis

Sample #: L17091609-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: LH18/24-SP650-6473	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 10/03/2017 11:45
Workgroup #: WG632242	Analyst: TMM	Run Date: 10/03/2017 12:01
Collect Date: 09/27/2017 15:00	Dilution: 5	File ID: SC171003002.024
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	9.30		1.00	0.500	0.250

Certificate of Analysis

Sample #: L17091609-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6473	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:20
Workgroup #: WG631768	Analyst: TMM	Run Date: 09/28/2017 15:50
Collect Date: 09/27/2017 15:00	Dilution: 5	File ID: 00.1709281550-07
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.83		0.500	0.250	0.125

Certificate of Analysis

Lab Report #: L17091609
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Sample #: L17091609-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6473	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:20
Workgroup #: WG631768	Analyst: TMM	Run Date: 09/28/2017 15:50
Collect Date: 09/27/2017 15:00	Dilution: 10	File ID: 00.1709281550-06
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.91		1.00	0.500	0.250

Certificate of Analysis

Sample #: L17091609-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6473	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG632219	Analyst: DIH	Run Date: 10/03/2017 10:58
Collect Date: 09/27/2017 15:00	Dilution: 2	File ID: TC10032017.009
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	50.5		4.00	2.00	1.00

2.1 General Chromatography Data

2.1.1 LC/MS Data (6850)

2.1.1.1 Summary Data

Lab Report #: L17091609

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091609-01	PrePrep Method: N/A	Instrument: LCMS1
Client ID: LH18/24-SP650-6473	Prep Method: 6850	Prep Date: 10/04/2017 13:00
Matrix: Water	Analytical Method: 6850	Cal Date: 09/08/2017 16:52
Workgroup #: WG632566	Analyst: JWR	Run Date: 10/04/2017 17:11
Collect Date: 09/27/2017 15:00	Dilution: 1	File ID: 1LM.LM40634
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Perchlorate	14797-73-0	0.761		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: 090817_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 WG628979 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (09/08/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments: ICAL WG628977 : 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.LM40484	WG628977-01 CCB	1	1		09/08/17 14:40
2	1LM.LM40485	WG628977-02 STD (0.1 ug/L)	1	1	STD80232	09/08/17 14:59
3	1LM.LM40486	WG628977-03 STD (0.2 ug/L)	1	1	STD80232	09/08/17 15:18
4	1LM.LM40487	WG628977-04 STD (0.5 ug/L)	1	1	STD80232	09/08/17 15:37
5	1LM.LM40488	WG628977-05 STD (1.0 ug/L)	1	1	STD80232	09/08/17 15:56
6	1LM.LM40489	WG628977-06 STD (2.0 ug/L)	1	1	STD80232	09/08/17 16:15
7	1LM.LM40490	WG628977-07 STD (5.0 ug/L)	1	1	STD80232	09/08/17 16:34
8	1LM.LM40491	WG628977-08 STD (10 ug/L)	1	1	STD80232	09/08/17 16:52
9	1LM.LM40492	WG628977-09 SSCV (1.0 ug/L)	1	1	STD80234	09/08/17 17:11
10	1LM.LM40493	WG628984-01 CCB	1	1		09/08/17 17:30
11	1LM.LM40494	WG628984-02 CCV (1.0ug/L)	1	1	STD80232	09/08/17 17:49
12	1LM.LM40495	WG628979-05 MRL (0.2ug/L)	1	1	STD80232	09/08/17 18:08
13	1LM.LM40496	WG628979-01 MCT (0.2ug/L)	1	1	STD80234	09/08/17 18:27
14	1LM.LM40497	WG628979-02 BLANK	1	1		09/08/17 18:46
15	1LM.LM40498	WG628979-03 LCS (0.2ug/L)	1	1	STD80234	09/08/17 19:05
16	1LM.LM40499	WG628979-04 LCS2 (0.2ug/L)	1	1	STD80234	09/08/17 19:24
17	1LM.LM40500	L17081653-01	1	1		09/08/17 19:43
18	1LM.LM40501	L17081653-01 (10x) (NR)	1	10		09/08/17 20:02
19	1LM.LM40502	L17081653-01 (100x) (NR)	1	100		09/08/17 20:21
20	1LM.LM40503	L17090079-01	1	1		09/08/17 20:40
21	1LM.LM40504	L17090079-02	1	1		09/08/17 20:59
22	1LM.LM40505	L17090079-03	1	1		09/08/17 21:18
23	1LM.LM40506	WG628984-03 CCV (1.0ug/L)	1	1	STD80232	09/08/17 21:37
24	1LM.LM40507	WG628979-06 MRL (0.2ug/L)	1	1	STD80232	09/08/17 21:56
25	1LM.LM40508	WG628984-04 CCB	1	1		09/08/17 22:15

Comments

Seq.	Rerun	Dil.	Reason	Analytes

Page: 1

Approved: 11-SEP-17




Microbac Laboratories Inc.
Instrument Run Log

Instrument: LCMS1 Dataset: 100417_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 WG632566 (waters)
 Internal STD: COA19471 Surrogate STD: NA Calibration STD STD80232 (09/08/2017)
 CCV STD: STD80232 LCS STD: STD80234 MS/MSD STD: NA

Comments:

Samples L17091609-01 and L17091705-01 were analyzed neat and at multiple dilutions based on their range of historical results. Samples L17091647-01 and L17091706-01 were analyzed at dilutions only based on their historical results.
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Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	1LM.LM40625	WG632570-01 CCB	1	1		10/04/17 14:21
2	1LM.LM40626	WG632570-02 CCV (1.0ug/L)	1	1	STD80232	10/04/17 14:40
3	1LM.LM40627	WG632566-05 MRL (0.2ug/L)	1	1	STD80232	10/04/17 14:58
4	1LM.LM40628	WG632566-01 MCT (0.2ug/L)	1	1	STD80234	10/04/17 15:17
5	1LM.LM40629	WG632566-02 BLANK	1	1		10/04/17 15:36
6	1LM.LM40630	WG632566-03 LCS (0.2ug/L)	1	1	STD80234	10/04/17 15:55
7	1LM.LM40631	WG632566-04 LCS2 (0.2ug/L)	1	1	STD80234	10/04/17 16:14
8	1LM.LM40632	L17100003-01 LOQ (0.20ug/L)	1	1	STD80234	10/04/17 16:33
9	1LM.LM40633	L17100001-01 LOD (0.10ug/L)	1	1	STD80234	10/04/17 16:52
10	1LM.LM40634	L17091609-01	1	1		10/04/17 17:11
11	1LM.LM40635	L17091609-01 (10x) (NR)	1	10		10/04/17 17:30
12	1LM.LM40636	L17091609-01 (100x) (NR)	1	100		10/04/17 17:49
13	1LM.LM40637	L17091647-01 (10,000x)	1	10000		10/04/17 18:08
14	1LM.LM40638	WG632570-03 CCV (1.0ug/L)	1	1	STD80232	10/04/17 18:27
15	1LM.LM40639	WG632566-06 MRL (0.2ug/L)	1	1	STD80232	10/04/17 18:46
16	1LM.LM40640	WG632570-04 CCB	1	1		10/04/17 19:05
17	1LM.LM40641	L17091705-01	1	1		10/04/17 19:24
18	1LM.LM40642	L17091705-01 (10x) (NR)	1	10		10/04/17 19:42
19	1LM.LM40643	L17091705-01 (100x) (NR)	1	100		10/04/17 20:01
20	1LM.LM40644	L17091706-01 (10,000x)	1	10000		10/04/17 20:20
21	1LM.LM40645	WG632570-05 CCV (1.0ug/L)	1	1	STD80232	10/04/17 20:39
22	1LM.LM40646	WG632566-07 MRL (0.2ug/L)	1	1	STD80232	10/04/17 20:58
23	1LM.LM40647	WG632570-06 CCB	1	1		10/04/17 21:17

Comments

Seq.	Rerun	Dil.	Reason	Analytes
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Microbac Laboratories Inc.

Data Checklist

Date: 08-SEP-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: WG628977
 Runlog ID: 84489
 Analytical Workgroups: L17081653, L17090079

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	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	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	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:
11-SEP-2017



Secondary Reviewer:
11-SEP-2017




Microbac Laboratories Inc.

Data Checklist

Date: 04-OCT-2017
 Analyst: JWR
 Analyst: NA
 Method: 6850
 Instrument: LCMS1
 Curve Workgroup: NA
 Runlog ID: 85061
 Analytical Workgroups: L17091609, L17091647, L17091705, 091706 L17100001, 100003

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	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)	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	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:
05-OCT-2017



Secondary Reviewer:
05-OCT-2017




Analytical Method:6850
Login Number:L17091609

AAB#:WG632566

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-SP650-6473	01	09/27/17					10/04/2017	6.9	28		10/04/17	.2	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17091609 Work Group: WG632566
 Blank File ID: 1LM.LM40629 Blank Sample ID: WG632566-02
 Prep Date: 10/04/17 13:00 Instrument ID: LCMS1
 Analyzed Date: 10/04/17 15:36 Method: 6850
 Analyst: JWR

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG632566-05	1LM.LM40627	10/04/17 14:58	01
MCT	WG632566-01	1LM.LM40628	10/04/17 15:17	01
LCS	WG632566-03	1LM.LM40630	10/04/17 15:55	01
LCS2	WG632566-04	1LM.LM40631	10/04/17 16:14	01
LH18/24-SP650-6473	L17091609-01	1LM.LM40634	10/04/17 17:11	01
QCMRL	WG632566-06	1LM.LM40639	10/04/17 18:46	01
QCMRL	WG632566-07	1LM.LM40646	10/04/17 20:58	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5512510
 Report generated 10/09/2017 08:34



Login Number: L17091609 Prep Date: 10/04/17 13:00 Sample ID: WG632566-02
Instrument ID: LCMS1 Run Date: 10/04/17 15:36 Prep Method: 6850
File ID: 1LM.LM40629 Analyst: JWR Method: 6850
Workgroup (AAB#): WG632566 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-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: 5512511
09-OCT-2017 08:34



Login Number: L17091609 Analyst: JWR Prep Method: 6850
 Instrument ID: LCMS1 Matrix: Water Method: 6850
 Workgroup (AAB#): WG632566 Units: ug/L
 QC Key: DOD4 Lot #: STD80234
 Sample ID: WG632566-03 LCS File ID: 1LM.LM40630 Run Date: 10/04/2017 15:55
 Sample ID: WG632566-04 LCS2 File ID: 1LM.LM40631 Run Date: 10/04/2017 16:14

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Perchlorate	0.200	0.193	96.5	0.200	0.197	98.5	2.05	80 - 120	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5512513
 Report generated: 10/09/2017 08:34



Login Number: L17091609
Analytical Method: 6850
ICAL Workgroup: WG628977

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Perchlorate	1.469	6.88	1.00000	

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5515812
Report generated 10/09/2017 08:34



Login Number: L17091609
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	WG628977-02			WG628977-03			WG628977-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	52500.0000	1.681	0.200	93400.0000	1.487	0.500	233000.000	1.445

INT_CAL - Modified 03/06/2008
PDF File ID: 5515812
Report generated 10/09/2017 08:34



Login Number: L17091609
 Analytical Method: 6850

Instrument ID: LCMS1
 Initial Calibration Date: 08-SEP-17 16:52
 Column ID: F

Analyte	WG628977-05			WG628977-06			WG628977-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	460000.000	1.440	2.00	925000.000	1.444	5.00	2230000.00	1.418

INT_CAL - Modified 03/06/2008
 PDF File ID: 5515812
 Report generated 10/09/2017 08:34



Login Number: L17091609
Analytical Method: 6850

Instrument ID: LCMS1
Initial Calibration Date: 08-SEP-17 16:52
Column ID: F

Analyte	WG628977-08		
	CONC	RESP	RF
Perchlorate	10.0	4190000.00	1.371

INT_CAL - Modified 03/06/2008
PDF File ID: 5515812
Report generated 10/09/2017 08:34



Login Number: L17091609 Run Date: 09/08/2017 Sample ID: WG628977-09
 Instrument ID: LCMS1 Run Time: 17:11 Method: 6850
 File ID: 1LM.LM40492 Analyst: JWR QC Key: DOD4
 ICal Workgroup: WG628977 Cal ID: LCMS1 - 08-SEP-17

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Perchlorate	1.00	1.04	ug/L	1.48	4.00	15	

* Exceeds %D Limit



Login Number: L17091609 Run Date: 10/04/2017 Sample ID: WG632570-01
Instrument ID: LCMS1 Run Time: 14:21 Method: 6850
File ID: LLM.LM40625 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG632566 Cal ID: LCMS1 - 08-SEP-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: L17091609 Run Date: 10/04/2017 Sample ID: WG632570-04
Instrument ID: LCMS1 Run Time: 19:05 Method: 6850
File ID: LLM.LM40640 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG632566 Cal ID: LCMS1 - 08-SEP-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: 5512519
Report generated 10/09/2017 08:34



Login Number: L17091609 Run Date: 10/04/2017 Sample ID: WG632570-06
Instrument ID: LCMS1 Run Time: 21:17 Method: 6850
File ID: LLM.LM40647 Analyst: JWR Units: ug/L
Workgroup (AAB#): WG632566 Cal ID: LCMS1 - 08-SEP-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: L17091609 Run Date: 10/04/2017 Sample ID: WG632570-02
 Instrument ID: LCMS1 Run Time: 14:40 Method: 6850
 File ID: 1LM.LM40626 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG632566 Cal ID: LCMS1 - 08-SEP-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.12	ug/L	1.58	12.0	15	

* Exceeds %D Criteria



Login Number: L17091609 Run Date: 10/04/2017 Sample ID: WG632570-03
 Instrument ID: LCMS1 Run Time: 18:27 Method: 6850
 File ID: 1LM.LM40638 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG632566 Cal ID: LCMS1 - 08-SEP-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.05	ug/L	1.48	5.00	15	

* Exceeds %D Criteria



Login Number: L17091609 Run Date: 10/04/2017 Sample ID: WG632570-05
 Instrument ID: LCMS1 Run Time: 20:39 Method: 6850
 File ID: 1LM.LM40645 Analyst: JWR QC Key: DOD4
 Workgroup (AAB#): WG632566 Cal ID: LCMS1 - 08-SEP-17
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate	1.00	1.07	ug/L	1.52	7.00	15	

* Exceeds %D Criteria



Login Number: L17091609 Run Date: 10/04/2017 Sample ID: WG632566-05
Instrument ID: LCMS1 Run Time: 14:58 Prep Method: 6850
File ID: 1LM.LM40627 Analyst: JWR Method: 6850
Workgroup (AAB#): WG632566 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.200	100	70 - 130	



Login Number: L17091609 Run Date: 10/04/2017 Sample ID: WG632566-06
 Instrument ID: LCMS1 Run Time: 18:46 Prep Method: 6850
 File ID: 1LM.LM40639 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG632566 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.204	102	70 - 130	



Login Number: L17091609 Run Date: 10/04/2017 Sample ID: WG632566-07
 Instrument ID: LCMS1 Run Time: 20:58 Prep Method: 6850
 File ID: 1LM.LM40646 Analyst: JWR Method: 6850
 Workgroup (AAB#): WG632566 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: LCMS1-08-SEP-17

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.197	98.5	70 - 130	



Login Number: L17091609
Instrument ID: LCMS1
Workgroup (AAB#): WG632566

ICAL CCV Number: WG628977-05
CAL ID: LCMS1-08-SEP-17
Matrix: WATER

Sample Number	Dilution	Tag	IS-1
WG628977	NA	NA	1580000
Upper Limit	NA	NA	2370000
Lower Limit	NA	NA	790000
<u>L17091609-01</u>	1.00	01	1510000
WG632566-02	1.00	01	1650000
WG632566-03	1.00	01	1670000
WG632566-04	1.00	01	1700000

IS-1 - 018LP

Underline = Response outside limits



Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: 6850	Samplenum: L17091609-01
Instrument: LCMS1	Prep Date: 10/04/2017 13:00	File ID: 1LM.LM40634
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 17:11	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	329000	115000	2.86	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG628977-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40485
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 09/08/2017 14:59	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	52500	17500	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG628977-03
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40486
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 09/08/2017 15:18	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	93400	29500	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG628977-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40487
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 09/08/2017 15:37	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	233000	79100	2.95	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG628977-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40488
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 09/08/2017 15:56	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	460000	150000	3.07	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG628977-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40489
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 09/08/2017 16:15	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	925000	303000	3.05	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG628977-07
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40490
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 09/08/2017 16:34	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2230000	745000	2.99	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG628977-08
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40491
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 09/08/2017 16:52	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	4190000	1390000	3.01	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG628977-09
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40492
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 09/08/2017 17:11	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	478000	152000	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: 6850	Samplenum: WG632566-01
Instrument: LCMS1	Prep Date: 10/04/2017 13:00	File ID: 1LM.LM40628
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 15:17	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	102000	34000	3.00	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: 6850	Samplenum: WG632566-02
Instrument: LCMS1	Prep Date: 10/04/2017 13:00	File ID: 1LM.LM40629
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 15:36	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2230	0.000	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: 6850	Samplenum: WG632566-03
Instrument: LCMS1	Prep Date: 10/04/2017 13:00	File ID: 1LM.LM40630
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 15:55	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	100000	34100	2.93	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: 6850	Samplenum: WG632566-04
Instrument: LCMS1	Prep Date: 10/04/2017 13:00	File ID: 1LM.LM40631
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 16:14	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	103000	32500	3.17	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: 6850	Samplenum: WG632566-05
Instrument: LCMS1	Prep Date: 10/04/2017 13:00	File ID: 1LM.LM40627
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 14:58	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	98100	32300	3.04	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: 6850	Samplenum: WG632566-06
Instrument: LCMS1	Prep Date: 10/04/2017 13:00	File ID: 1LM.LM40639
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 18:46	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	116000	37600	3.09	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: 6850	Samplenum: WG632566-07
Instrument: LCMS1	Prep Date: 10/04/2017 13:00	File ID: 1LM.LM40646
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 20:58	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	116000	40300	2.88	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG632570-01
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40625
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 14:21	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	1420	0.000	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG632570-02
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40626
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 14:40	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	490000	156000	3.14	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609
Instrument: LCMS1
Analyst: JWR
Worknum: WG632566

Prep Method:
Prep Date:
Anal Method: 6850
Analysis Date: 10/04/2017 18:27

Samplenum: WG632570-03
File ID: 1LM.LM40638
Matrix: Water
Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	547000	183000	2.99	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG632570-04
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40640
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 19:05	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	1690	1440	1.17	2.3	3.8	*

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG632570-05
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40645
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 20:39	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	579000	190000	3.05	2.3	3.8	

Perchlorate Ion Ratios
Microbac Laboratories Inc.



Login #: L17091609	Prep Method: _____	Samplenum: WG632570-06
Instrument: LCMS1	Prep Date: _____	File ID: 1LM.LM40647
Analyst: JWR	Anal Method: 6850	Matrix: Water
Worknum: WG632566	Analysis Date: 10/04/2017 21:17	Units: ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	2310	1310	1.76	2.3	3.8	*

2.2 General Chemistry Data

2.2.1 Ammonia Data

2.2.1.1 Summary Data

Lab Report #: L17091609

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091609-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: LH18/24-SP650-6473	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 10/03/2017 11:45
Workgroup #: WG632242	Analyst: TMM	Run Date: 10/03/2017 12:01
Collect Date: 09/27/2017 15:00	Dilution: 5	File ID: SC171003002.024
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Nitrogen, Ammonia	7664-41-7	9.30		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: 03-OCT-2017
 Analyst: TMM
 Analyst: NA
 Method: NH3
 Instrument: SC1
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG632242

Calibration/Linearity	10/03/17
Second Source Check	
ICV/CCV (std)	X
ICB/CCB	X
Blank	X
LCS/LCS Dup	X
MS/MSD	X
Duplicate	XX
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	TMM
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
03-OCT-2017

Jammy Morris

Secondary Reviewer:
05-OCT-2017

Denna Johnson



Analytical Method: 350.1
Login Number: L17091609

AAB#: WG632242

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-SP650-6473	01	09/27/17					10/03/2017	5.9	28		10/03/17	5.9	28	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17091609 Work Group: WG632242
 Blank File ID: SC171003002.038 Blank Sample ID: WG632242-01
 Prep Date: 10/03/17 12:14 Instrument ID: SMARTCHEM
 Analyzed Date: 10/03/17 12:14 Method: 350.1
 Analyst: TMM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG632242-02	SC171003002.012	10/03/17 11:50	01
LH18/24-SP650-6473	L17091609-01	SC171003002.024	10/03/17 12:01	DL01
DUP	WG632242-04	SC171003002.034	10/03/17 12:10	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5507871
 Report generated 10/03/2017 15:04



Login Number: L17091609 Prep Date: 10/03/17 12:14 Sample ID: WG632242-01
 Instrument ID: SMARTCHEM Run Date: 10/03/17 12:14 Prep Method: 350.1
 File ID: SC171003002.038 Analyst: TMM Method: 350.1
 Workgroup (AAB#): WG632242 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: SMARTC-03-OCT-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: 5507872
 03-OCT-2017 15:04



Login Number: L17091609 Run Date: 10/03/2017 Sample ID: WG632242-02
Instrument ID: SMARTCHEM Run Time: 11:50 Prep Method: 350.1
File ID: SC171003002.012 Analyst: TMM Method: 350.1
Workgroup (AAB#): WG632242 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD83234 Cal ID: SMARTC - 03-OCT-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Ammonia	2.00	1.86	93.2	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5507873
Report generated: 10/03/2017 15:04



2.2 General Chemistry Data

2.2.2 Orthophosphate Data

2.2.2.1 Summary Data

Lab Report #: L17091609

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091609-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6473	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:20
Workgroup #: WG631768	Analyst: TMM	Run Date: 09/28/2017 15:50
Collect Date: 09/27/2017 15:00	Dilution: 5	File ID: 00.1709281550-07
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.83		0.500	0.250	0.125

Certificate of Analysis

Sample #: L17091609-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: LH18/24-SP650-6473	Prep Method: 365.2	Prep Date: N/A
Matrix: Water	Analytical Method: 365.2	Cal Date: 09/07/2017 15:20
Workgroup #: WG631768	Analyst: TMM	Run Date: 09/28/2017 15:50
Collect Date: 09/27/2017 15:00	Dilution: 10	File ID: 00.1709281550-06
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Orthophosphate	14265-44-2	3.91		1.00	0.500	0.250

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: 28-SEP-2017
 Analyst: TMM
 Analyst: NA
 Method: PO4
 Instrument: UV-2600
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG631768

Calibration/Linearity	9/7/17
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:
03-OCT-2017

Jammy Morris

Secondary Reviewer:
03-OCT-2017

Denna Johnson



Analytical Method: 365.2
Login Number: L17091609

AAB#: WG631768

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-SP650-6473	01	09/27/17					09/28/2017	1	2		09/28/17	1	2	
LH18/24-SP650-6473	01	09/27/17					09/28/2017	1	2		09/28/17	1	2	

* = SEE PROJECT QAPP REQUIREMENTS



METHOD BLANK SUMMARY

Login Number: L17091609 Work Group: WG631768
 Blank File ID: 00.1709281550-03 Blank Sample ID: WG631768-01
 Prep Date: 09/28/17 15:50 Instrument ID: UV-2600
 Analyzed Date: 09/28/17 15:50 Method: 365.2
 Analyst: TMM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG631768-02	00.1709281550-04	09/28/17 15:50	
LCS2	WG631768-03	00.1709281550-05	09/28/17 15:50	
LH18/24-SP650-6473	L17091609-01	00.1709281550-06	09/28/17 15:50	DL01
LH18/24-SP650-6473	L17091609-01	00.1709281550-07	09/28/17 15:50	
DUP	WG631768-05	00.1709281550-08	09/28/17 15:50	

Report Name: BLANK_SUMMARY
 PDF File ID: 5507624
 Report generated 10/03/2017 12:45



Login Number: L17091609 Prep Date: 09/28/17 15:50 Sample ID: WG631768-01
Instrument ID: UV-2600 Run Date: 09/28/17 15:50 Prep Method: 365.2
File ID: 00.1709281550-03 Analyst: TMM Method: 365.2
Workgroup (AAB#): WG631768 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: UV-260-28-SEP-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: 5507625
03-OCT-2017 12:45



Login Number: L17091609 Analyst: TMM Prep Method: 365.2
 Instrument ID: UV-2600 Matrix: Water Method: 365.2
 Workgroup (AAB#): WG631768 Units: mg/L
 QC Key: DOD4 Lot #: STD83996
 Sample ID: WG631768-02 LCS File ID: 00.1709281550-04 Run Date: 09/28/2017 15:50
 Sample ID: WG631768-03 LCS2 File ID: 00.1709281550-05 Run Date: 09/28/2017 15:50

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	1.02	102	1.00	1.02	102	0.156	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5507626
 Report generated: 10/03/2017 12:45



2.2.2.3 Raw Data

Microbac Laboratories Inc.
INITIAL CALIBRATION

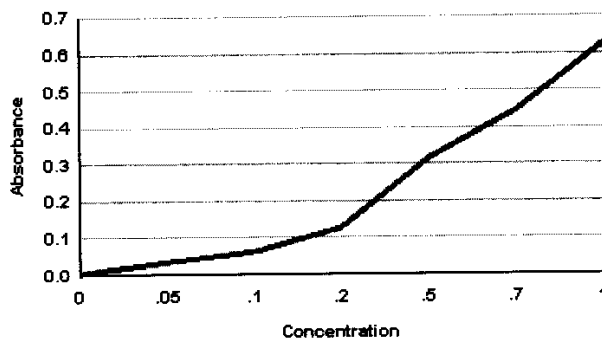
Workgroup: WG628800
Analytical Method: 300
Instrument ID: UV-2600

Analyst: DLP
Initial Calibration Date: 09/07/2017

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.629793
Y-Intercept: -0.000138958
Coef. Of Correlation (R^2): 0.999974
Coef. Of Correlation (R): 0.999987

Concentration X	Absorbance Y	X ²	X * Y	Y-Fitted (mX ² +B)
0.00	0.00	0.00	0.00	-0.000138958
0.0500	0.0310	0.00250	0.00155	0.0313507
0.100	0.0620	0.0100	0.00620	0.0628404
0.200	0.126	0.0400	0.0252	0.125820
0.500	0.315	0.250	0.158	0.314758
0.700	0.443	0.490	0.310	0.440716
1.00	0.628	1.00	0.628	0.629654

Curve Fit



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 09/07/2017 16:12



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

00862214

Workgroup #: WG628800
File ID: 00.1709071520-08
CCV ID: WG628800-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 09/07/2017
Run Time: 15:20
Analyst: DLP
Cal ID: UV-260 - 07-SEP-17 15:20:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	1.01	0.633	1.0	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_BSCV - Modified 03/06/2008
Report generated 09/07/2017 16:14



Microbac Laboratories Inc.
SAMPLE REPORT

Workgroup: WG631768
Analyte: ORTHOPHOSPHATE

Analyst: TMM
Date: 09/28/2017

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG631768-01	50	50	0.00100	0.6298	-0.0001390	0.0018085	0.0018085	1	mg/L
WG631768-02	50	50	0.641	0.6298	-0.0001390	1.0180	1.0180	1	mg/L
WG631768-03	50	50	0.642	0.6298	-0.0001390	1.0196	1.0196	1	mg/L
L17091609-01	50	50	0.246	0.6298	-0.0001390	0.39083	3.9083	10	mg/L
WG631768-04	50	50	0.246	0.6298	-0.0001390	0.39083	3.9083	10	mg/L
WG631768-04	50	50	0.482	0.6298	-0.0001390	0.76555	3.8278	5	mg/L
L17091609-01	50	50	0.482	0.6298	-0.0001390	0.76555	3.8278	5	mg/L
WG631768-05	50	50	0.490	0.6298	-0.0001390	0.77825	3.8913	5	mg/L
WG631768-06	50	50	0.548	0.6298	-0.0001390	0.87035	4.3517	5	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 10/03/2017 10:40

Workgroup #: WG632289 Instrument ID: UV-2600
File ID: 00.1709281550-01 Run Date: 09/28/2017
CCV ID: WG632289-01 Run Time: 15:50
Units: mg/L Analyst: TMM
Analyte: ORTHOPHOSPHATE Cal ID: UV-260 - 28-SEP-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.524	0.660	4.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 10/03/2017 12:09



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

00862218

Workgroup #: WG632289 Instrument ID: UV-2600
File ID: 00.1709281550-10 Run Date: 09/28/2017
CCV ID: WG632289-03 Run Time: 15:50
Units: mg/L Analyst: TMM
Analyte: ORTHOPOSPHATE Cal ID: UV-260 - 28-SEP-17

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.526	0.662	5.2	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 10/03/2017 12:09



2.2 General Chemistry Data

2.2.3 Total Organic Carbon Data

2.2.3.1 Summary Data

Lab Report #: L17091609

Lab Project #: 2551.096

Project Name: Longhorn Army Ammunition

Lab Contact: Adriane Steed

Certificate of Analysis

Sample #: L17091609-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: LH18/24-SP650-6473	Prep Method: 415.1	Prep Date: N/A
Matrix: Water	Analytical Method: 415.1	Cal Date: 02/10/2017 10:25
Workgroup #: WG632219	Analyst: DIH	Run Date: 10/03/2017 10:58
Collect Date: 09/27/2017 15:00	Dilution: 2	File ID: TC10032017.009
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Total Organic Carbon	TOC	50.5		4.00	2.00	1.00

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: 03-OCT-2017
 Analyst: DIH
 Analyst: NA
 Method: TOC
 Instrument: TOC
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG632221 WG632222 WG632219

Calibration/Linearity	2/10/2017
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	
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	DIH
Secondary Reviewer	DCM
Comments	

Primary Reviewer:
05-OCT-2017

Secondary Reviewer:
05-OCT-2017

Dianna Johnson

David Meekle



Analytical Method: 415.1
Login Number: L17091609

AAB#: WG632219

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-SP650-6473	01	09/27/17					10/03/2017	5.8	28		10/03/17	5.8	28	

* = SEE PROJECT QAPP REQUIREMENTS



Login Number: L17091609 Prep Date: 10/03/17 09:56 Sample ID: WG632219-01
 Instrument ID: TOC-VWP Run Date: 10/03/17 09:56 Prep Method: 415.1
 File ID: TC10032017.004 Analyst: DIH Method: 415.1
 Workgroup (AAB#): WG632219 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: 5510847
 05-OCT-2017 08:18



Login Number: L17091609 Analyst: DIH Prep Method: 415.1
 Instrument ID: TOC-VWP Matrix: Water Method: 415.1
 Workgroup (AAB#): WG632219 Units: mg/L
 QC Key: DOD4 Lot #: STD83735
 Sample ID: WG632219-02 LCS File ID: TC10032017.005 Run Date: 10/03/2017 10:07
 Sample ID: WG632219-03 LCS2 File ID: TC10032017.006 Run Date: 10/03/2017 10:20

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	25.5	102	1.94	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5510848
 Report generated: 10/05/2017 08:18



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 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

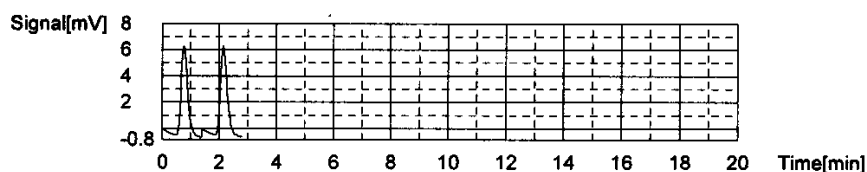
Sample Name: TCCURVE
 Sample ID: Untitled
 Cal. Curve: TCCURVE-02-10-2017.2017_02_10_09_32_59.cal
 Status: Completed

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

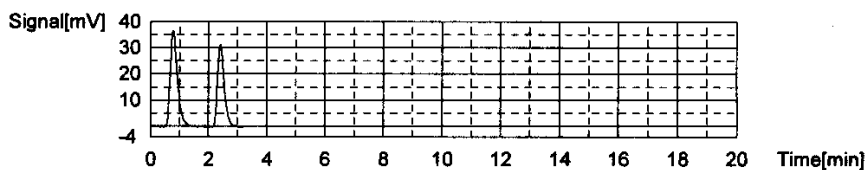
Acid Add. 0.000%
 Mean Area 10.82



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

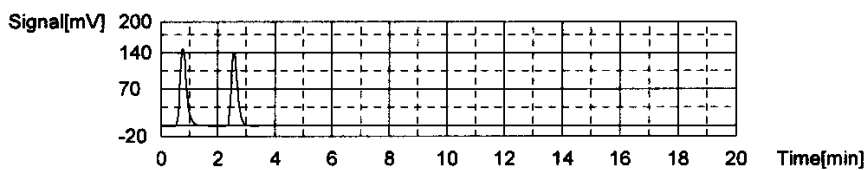
Acid Add. 0.000%
 Mean Area 57.92



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

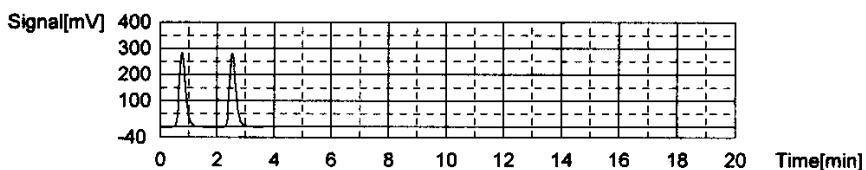


Conc: 10.00mg/L

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

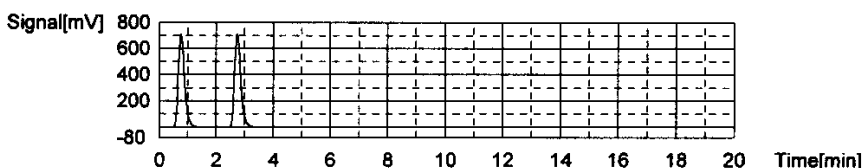
Acid Add. 0.000%
 Mean Area 440.2



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

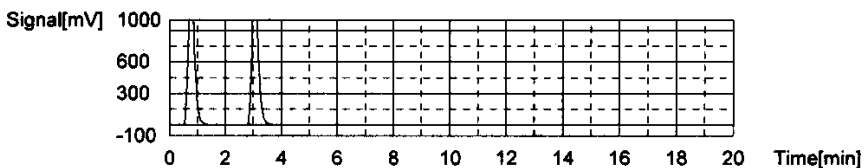
Acid Add. 0.000%
 Mean Area 1092



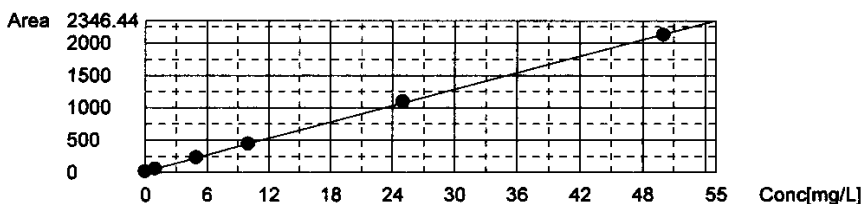
Conc: 50.00mg/L

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

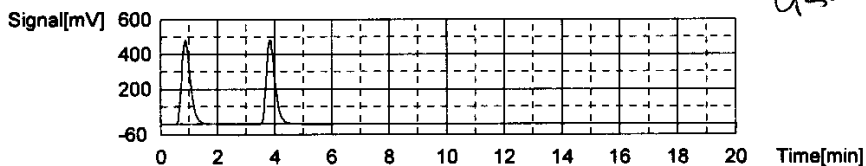
1. Det

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

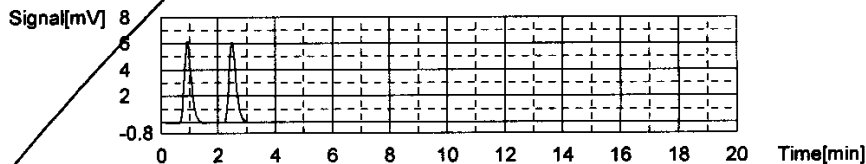
Sample Name: TICCURVE
Sample ID: Untitled
Cal. Curve: TICCURVE-02-10-2017.2017_02_10_14_45_10.cal
Status: Completed

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

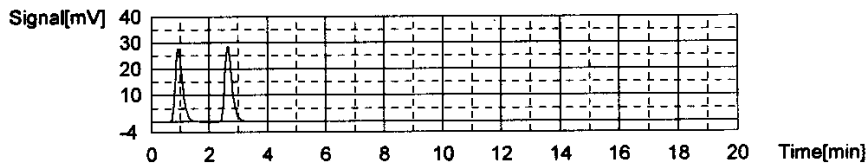
Acid Add. 3.000%
Mean Area 10.51



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

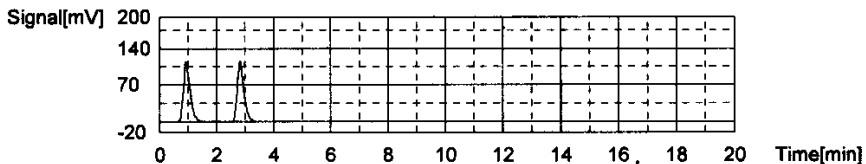


Conc: 5.000mg/L

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

dem
3/23/17

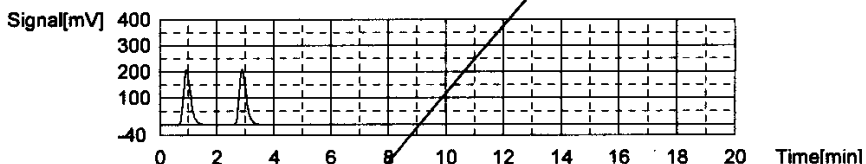
Acid Add. 3.000%
Mean Area 189.6



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

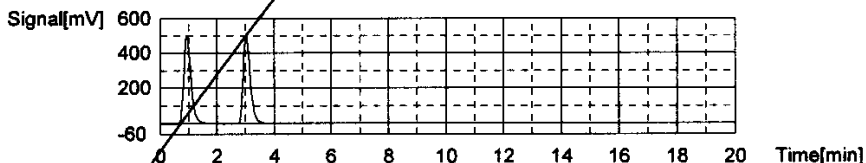
Acid Add. 3.000%
Mean Area 361.4



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

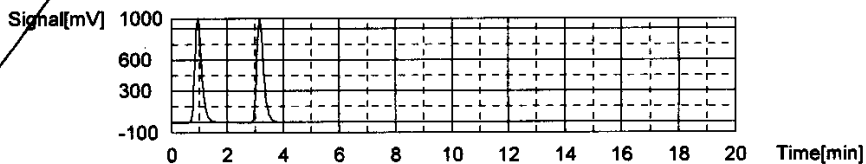
Acid Add. 3.000%
Mean Area 858.1



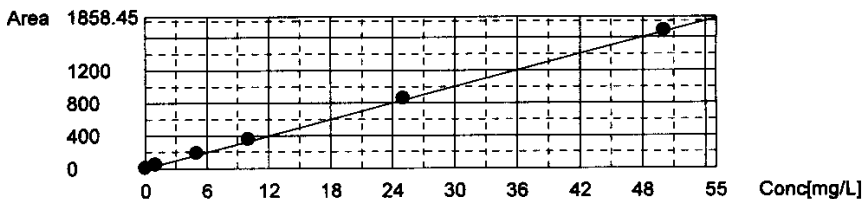
Conc: 50.00mg/L

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

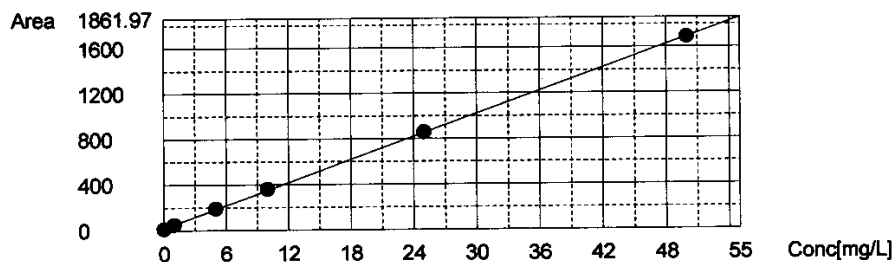
Acid Add. 3.000%
 Mean Area 858.1
 SD Area 1.697
 CV Area 0.20%
 Vial 4

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:

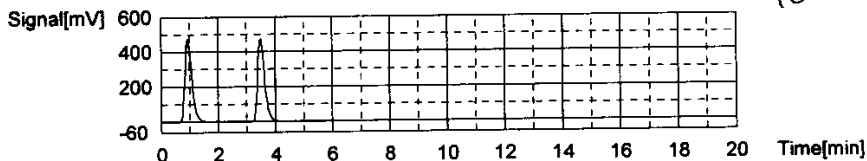
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:24.27mg/L

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:

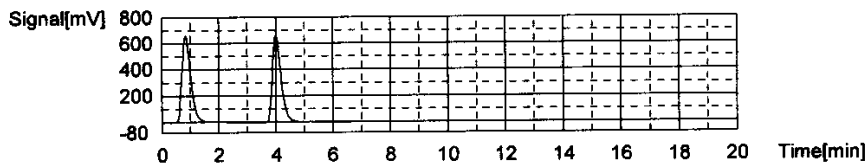
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:0.000mg/L

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:

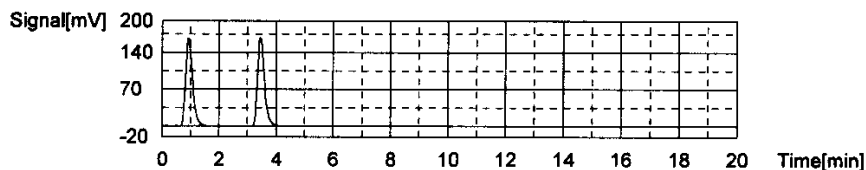
Type	Anal.	Dil.	Result
Unknown	IC	1.000	IC:8.571mg/L

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

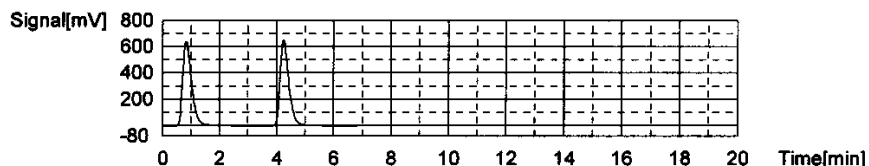
Type	Anal.	Dil.	Result
Unknown	TC	1.000	TC:32.10mg/L

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: WG632219

Total Organic Carbon

632221
63222a

MAKE DAILY

CCV (TOC): 79381
(5/200)(1000) = 25mg/L

CCV (TIC): 83359
(5/200)(1000) = 25mg/L

Calibration Curve Date: 2/10/17

LCS (TOC): 83735
(5/200)(1000) = 25mg/L

MS (TOC): 0.4/40(1000) = 10

Reagent: RB 41399
RB 41061

SMS310-C: Matrix 2 WG 632222

EPA 415.1/9060A(mod): Matrix 1 WG 632219 SOP: K 4151 Rev. 18

SW846 9060A (4 rep) WG 632221 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	TIC 25		26	CCV		51	CCB	
2	TOC/TIC		27	CCB		52	09-1700-19	
3	CCV 25		28	10-056-11		53	23	
4	BIK		29	12		54	25	
5	LCS 25		30	13		55	28	
6	LCS OUP		31	DVP 13		56	10-001-01	
7	09-1523-05		32	MS 13		57	10-003-01	
8	09-1523-07		33	BIK		58	BIK	
9	09-1609-01	1/2	34	LCS 25		59	LCS 25	
10	09-1645-15	1/2	35	LCS OUP		60	LCS OUP	
11	09-1719-01		36	10-056-14		61	09-1704-01	
12	03		37	15		62	CCV	
13	05		38	CCV		63	CCB	
14	CCV		39	CCB		64	09-1704-02	
15	CCB		40	10-056-16		65	DVP	
16	10-056-01		41	17		66	MS ↓	
17	02		42	18		67	10-001-01 09-140-01	
18	03		43	09-1700-01		68	10-003-01 10-143-07	
19	04		44	04		69	-	
20	05		45	DVP 04		70	10-056-06	1/10
21	06		46	MS 05		71	09-1719-03	1/4
22	07		47	MSO 06		72	09-056-02	1/10
23	08		48	13		73	03	1/2
24	09		49	16		74	CCV	
25	10		50	CCV		75	CCB	

Analyst: Deanna Johnson Date/Time: 9/10/17

pg 1

DCN#128666



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

see pg 1

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

Position	Sample ID	Dilution
26 1	CCV	
0 2	CCB	
5 3	LCS	
5 4	10-001-01	
5 7 5	10-003-01	
38 6	CCV	
0 7	CCB	
8		
9		
10		
11		
12		
13		
14		
15		
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		
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50		

Position	Sample ID	Dilution
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
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64		
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72		
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74		
75		

Analyst: Deanna Johnson Date/Time: 10/31/17

pg 2

DCN#128666



	Analy	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC/TOC	TOC:27.11mg/L TC:35.58mg/L IC:8.478mg/L	Complete	10/3/2017 9:26:36 AM	1
2	TOC	TIC 25	TOC:1.424mg/L TC:25.99mg/L IC:24.57mg/L	Complete	10/3/2017 9:39:06 AM	2
3	TOC	CCV 25	!!Error!! TOC:25.54mg/L TC:25.24mg/L IC:-0.3058mg/L	Complete	10/3/2017 9:51:20 AM	3
4	TOC	WG632219-01 BLK	!!Error!! TOC:0.08265mg/L TC:-0.3005mg/L IC:-0.3831mg/L	Complete	10/3/2017 10:00:05 AM	0
5	TOC	WG632219-02 LCS	!!Error!! TOC:26.03mg/L TC:25.71mg/L IC:-0.3162mg/L	Complete	10/3/2017 10:12:18 AM	5
6	TOC	WG632219-03 LCSDUP	!!Error!! TOC:25.53mg/L TC:25.21mg/L IC:-0.3131mg/L	Complete	10/3/2017 10:24:33 AM	6
7	TOC	L17091523-05	TOC:3.087mg/L TC:30.06mg/L IC:26.97mg/L	Complete	10/3/2017 10:37:09 AM	7
8	TOC	L17091523-07	TOC:3.596mg/L TC:28.90mg/L IC:25.30mg/L	Complete	10/3/2017 10:49:48 AM	8
9	TOC	L17091609-01 (2)	TOC:25.24mg/L TC:44.40mg/L IC:19.15mg/L	Complete	10/3/2017 11:03:37 AM	9
10	TOC	L17091645-05 (2)	TOC:10.79mg/L TC:35.92mg/L IC:25.12mg/L	Complete	10/3/2017 11:16:19 AM	10
11	TOC	L17091719-01	TOC:2.485mg/L TC:48.91mg/L IC:46.43mg/L	Complete	10/3/2017 11:29:50 AM	11
12	TOC		!!Error!! TOC:-17.07mg/L TC:83.29mg/L IC:100.4mg/L	Complete	10/3/2017 11:44:57 AM	12
13	TOC	L17091719-05	TOC:0.4974mg/L TC:1.062mg/L IC:0.5643mg/L	Complete	10/3/2017 11:56:37 AM	13
14	TOC	CCV	!!Error!! TOC:24.94mg/L TC:24.74mg/L IC:-0.2020mg/L	Complete	10/3/2017 12:08:54 PM	14
15	TOC	CCB	!!Error!! TOC:0.05043mg/L TC:-0.3022mg/L IC:-0.3526mg/L	Complete	10/3/2017 12:17:41 PM	0
16	TOC	L17100056-01	TOC:18.36mg/L TC:30.69mg/L IC:12.33mg/L	Complete	10/3/2017 12:31:43 PM	16
17	TOC		TOC:138.3mg/L TC:21.15mg/L IC:73.24mg/L	Complete	10/3/2017 12:47:48 PM	17
18	TOC		TOC:31.28mg/L TC:52.60mg/L IC:21.32mg/L	Complete	10/3/2017 1:02:44 PM	18
19	TOC	L17100056-04	TOC:24.21mg/L TC:36.41mg/L IC:12.20mg/L	Complete	10/3/2017 1:17:05 PM	19
20	TOC	L17100056-05	TOC:18.88mg/L TC:31.21mg/L IC:12.33mg/L	Complete	10/3/2017 1:31:14 PM	20
21	TOC		TOC:126.3mg/L TC:208.4mg/L IC:82.11mg/L	Complete	10/3/2017 1:47:43 PM	21
22	TOC	L17100056-07	TOC:1.742mg/L TC:15.53mg/L IC:13.79mg/L	Complete	10/3/2017 2:00:10 PM	22
23	TOC	L17100056-08	TOC:1.768mg/L TC:13.06mg/L IC:11.29mg/L	Complete	10/3/2017 2:12:22 PM	23
24	TOC	L17100056-09	TOC:1.509mg/L TC:11.45mg/L IC:9.941mg/L	Complete	10/3/2017 2:24:34 PM	24
25	TOC	L17100056-10	TOC:1.888mg/L TC:9.971mg/L IC:8.084mg/L	Complete	10/3/2017 2:36:32 PM	25
26	TOC	CCV	!!Error!! TOC:25.49mg/L TC:25.26mg/L IC:-0.2346mg/L	Complete	10/3/2017 2:48:43 PM	26
27	TOC	CCB	!!Error!! TOC:0.06506mg/L TC:-0.3014mg/L IC:-0.3664mg/L	Complete	10/3/2017 2:57:29 PM	0
28	TOC	L17100056-11	TOC:1.492mg/L TC:11.41mg/L IC:9.923mg/L	Complete	10/3/2017 3:09:50 PM	28
29	TOC	L17100056-12	TOC:1.414mg/L TC:10.86mg/L IC:9.445mg/L	Complete	10/3/2017 3:21:59 PM	29
30	TOC	L17100056-13	TOC:1.874mg/L TC:13.30mg/L IC:11.43mg/L	Complete	10/3/2017 3:34:19 PM	30
31	TOC	WG632219-05 DUP	TOC:1.829mg/L TC:12.26mg/L IC:10.43mg/L	Complete	10/3/2017 3:46:47 PM	31
32	TOC	WG632219-06 MS	TOC:12.21mg/L TC:21.51mg/L IC:9.293mg/L	Complete	10/3/2017 3:59:20 PM	32
33	TOC	WG632221-01 BLK	!!Error!! TOC:0.04376mg/L TC:-0.2925mg/L IC:-0.3363mg/L	Complete	10/3/2017 4:08:11 PM	0
34	TOC	WG632221-02 LCS	!!Error!! TOC:25.59mg/L TC:25.35mg/L IC:-0.2384mg/L	Complete	10/3/2017 4:20:24 PM	34
35	TOC	WG632221-03 LCSDUP	!!Error!! TOC:26.35mg/L TC:26.11mg/L IC:-0.2426mg/L	Complete	10/3/2017 4:32:40 PM	35
36	TOC	L17100056-14	TOC:1.733mg/L TC:12.04mg/L IC:10.38mg/L	Complete	10/3/2017 4:45:06 PM	36
37	TOC	L17100056-15	TOC:1.627mg/L TC:10.11mg/L IC:8.481mg/L	Complete	10/3/2017 4:57:14 PM	37
38	TOC	CCV	!!Error!! TOC:24.42mg/L TC:24.20mg/L IC:-0.2187mg/L	Complete	10/3/2017 5:09:26 PM	38
39	TOC	CCB	!!Error!! TOC:0.06666mg/L TC:-0.2991mg/L IC:-0.3657mg/L	Complete	10/3/2017 5:18:14 PM	0
40	TOC	L17100056-16	TOC:2.133mg/L TC:12.04mg/L IC:9.905mg/L	Complete	10/3/2017 5:30:19 PM	40
41	TOC	L17100056-17	TOC:1.656mg/L TC:11.04mg/L IC:9.386mg/L	Complete	10/3/2017 5:42:34 PM	41
42	TOC	L17100056-18	TOC:1.639mg/L TC:10.45mg/L IC:8.812mg/L	Complete	10/3/2017 5:54:46 PM	42
43	TOC	L17091700-01	TOC:1.153mg/L TC:11.94mg/L IC:10.79mg/L	Complete	10/3/2017 6:07:02 PM	43
44	TOC	L17091700-04	TOC:0.8756mg/L TC:7.164mg/L IC:6.289mg/L	Complete	10/3/2017 6:19:02 PM	44
45	TOC	WG632221-05 DUP	TOC:1.098mg/L TC:7.826mg/L IC:6.728mg/L	Complete	10/3/2017 6:31:05 PM	45
46	TOC	L17091700-05 MS	TOC:11.00mg/L TC:16.26mg/L IC:5.262mg/L	Complete	10/3/2017 6:43:24 PM	46
47	TOC	L17091700-06 MSD	TOC:10.94mg/L TC:18.07mg/L IC:7.134mg/L	Complete	10/3/2017 6:55:43 PM	47
48	TOC	L17091700-13	TOC:0.7114mg/L TC:2.855mg/L IC:2.143mg/L	Complete	10/3/2017 7:07:27 PM	48
49	TOC	L17091700-16	TOC:0.6927mg/L TC:2.368mg/L IC:1.678mg/L	Complete	10/3/2017 7:19:10 PM	49
50	TOC	CCV	!!Error!! TOC:25.36mg/L TC:25.12mg/L IC:-0.2447mg/L	Complete	10/3/2017 7:31:21 PM	50
51	TOC	CCB	!!Error!! TOC:0.06355mg/L TC:-0.2912mg/L IC:-0.3547mg/L	Complete	10/3/2017 7:40:07 PM	0
52	TOC	L17091700-19	TOC:0.9863mg/L TC:6.078mg/L IC:5.091mg/L	Complete	10/3/2017 7:52:05 PM	52
53	TOC	L17091700-22	TOC:0.8521mg/L TC:4.832mg/L IC:3.980mg/L	Complete	10/3/2017 8:03:53 PM	53
54	TOC	L17091700-25	!!Error!! TOC:1.289mg/L TC:1.225mg/L IC:-0.06434mg/L	Complete	10/3/2017 8:15:28 PM	54
55	TOC	L17091700-28	!!Error!! TOC:1.258mg/L TC:1.183mg/L IC:-0.07539mg/L	Complete	10/3/2017 8:27:08 PM	55
56	TOC		!!Error!! TOC:0.8192mg/L TC:0.7203mg/L IC:-0.09898mg/L	Complete	10/3/2017 8:38:40 PM	56
57	TOC		!!Error!! TOC:1.325mg/L TC:1.201mg/L IC:-0.1238mg/L	Complete	10/3/2017 8:50:16 PM	57
58	TOC	WG632222-01 BLK	!!Error!! TOC:0.06285mg/L TC:-0.2871mg/L IC:-0.3500mg/L	Complete	10/3/2017 9:06:28 PM	0
59	TOC	WG632222-02 LCS	TOC:2.364mg/L TC:9.181mg/L IC:6.817mg/L	Complete	10/3/2017 9:27:26 PM	59
60	TOC	WG632222-03 LCSDUP	!!Error!! TOC:25.50mg/L TC:25.25mg/L IC:-0.2482mg/L	Complete	10/3/2017 9:48:27 PM	60
61	TOC	L17091704-01	TOC:2.175mg/L TC:2.466mg/L IC:0.2916mg/L	Complete	10/3/2017 10:08:35 PM	61
62	TOC	CCV	!!Error!! TOC:25.04mg/L TC:24.79mg/L IC:-0.2552mg/L	Complete	10/3/2017 10:20:50 PM	62
63	TOC	CCB	!!Error!! TOC:0.07012mg/L TC:-0.2766mg/L IC:-0.3467mg/L	Complete	10/3/2017 10:29:38 PM	0
64	TOC	L17091704-02	TOC:2.087mg/L TC:2.399mg/L IC:0.3124mg/L	Complete	10/3/2017 10:49:43 PM	64
65	TOC	WG632222-05 DUP	TOC:2.081mg/L TC:2.349mg/L IC:0.2683mg/L	Complete	10/3/2017 11:09:51 PM	65
66	TOC	WG632222-06 MS	TOC:12.30mg/L TC:12.54mg/L IC:0.2379mg/L	Complete	10/3/2017 11:30:25 PM	66
67	TOC	L17100140-01	!!Error!! TOC:0.06196mg/L TC:-0.1910mg/L IC:-0.2530mg/L	Complete	10/3/2017 11:48:59 PM	67

	Analy	Sample Name	Result	Status	Date / Time	Vial
68	TOC	L17100143-07	!!Error!! TOC:1.350mg/L TC:1.148mg/L IC:-0.2019mg/L	Complete	10/4/2017 12:08:44 AM	68
69	TOC		!!Error!! TOC:0.3087mg/L TC:0.1803mg/L IC:-0.1284mg/L	Complete	10/4/2017 12:28:13 AM	4
70	TOC	L17100056-06 (10)	TOC:18.47mg/L TC:19.11mg/L IC:0.6363mg/L	Complete	10/4/2017 12:49:36 AM	15
71	TOC	L17091719-03 (4)	TOC:3.776mg/L TC:9.324mg/L IC:5.548mg/L	Complete	10/4/2017 1:01:55 AM	27
72	TOC	L17100056-02 (10)	TOC:15.90mg/L TC:17.58mg/L IC:1.684mg/L	Complete	10/4/2017 1:14:22 AM	33
73	TOC	L17100056-03 (2)	TOC:14.72mg/L TC:16.00mg/L IC:1.272mg/L	Complete	10/4/2017 1:27:26 AM	39
74	TOC	CCV	!!Error!! TOC:24.74mg/L TC:24.48mg/L IC:-0.2576mg/L	Complete	10/4/2017 1:39:50 AM	62
75	TOC	CCB	!!Error!! TOC:0.07195mg/L TC:-0.2602mg/L IC:-0.3322mg/L	Complete	10/4/2017 1:48:43 AM	0
76	TOC	CCV	!!Error!! TOC:25.30mg/L TC:25.07mg/L IC:-0.2286mg/L	Complete	10/4/2017 1:58:12 PM	26
77	TOC	CCB	!!Error!! TOC:0.06660mg/L TC:-0.2435mg/L IC:-0.3101mg/L	Complete	10/4/2017 2:07:01 PM	0
78	TOC	WG632222-02 LCS	!!Error!! TOC:26.10mg/L TC:25.86mg/L IC:-0.2362mg/L	Complete	10/4/2017 2:27:58 PM	5
79	TOC	L17100001-01	!!Error!! TOC:0.6974mg/L TC:0.6050mg/L IC:-0.09241mg/L	Complete	10/4/2017 2:39:35 PM	56
80	TOC	L17100003-01	!!Error!! TOC:0.9338mg/L TC:0.8247mg/L IC:-0.1091mg/L	Complete	10/4/2017 2:51:07 PM	57
81	TOC	CCV	!!Error!! TOC:24.89mg/L TC:24.67mg/L IC:-0.2241mg/L	Complete	10/4/2017 3:03:31 PM	38
82	TOC	CCB	!!Error!! TOC:0.06130mg/L TC:-0.2474mg/L IC:-0.3087mg/L	Complete	10/4/2017 3:12:23 PM	0

10/4/2017 3:19:14 PM

2/2

Instr. Information

System TOCVW ASI
 Detector Wet Chemical

Sample

Sample Name: TIC/TOC
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

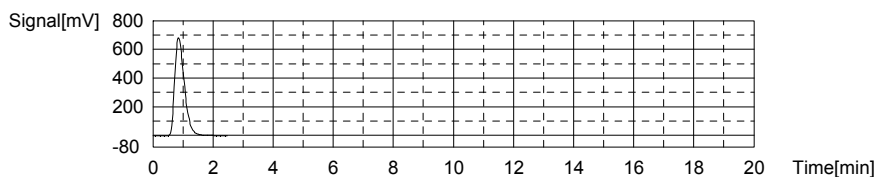
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.11mg/L TC:35.58mg/L IC:8.478mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1523	35.58mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 9:21:45 AM

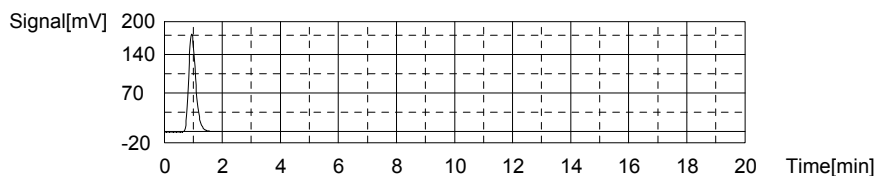
Mean Area 1523
 Mean Conc. 35.58mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	302.3	8.478mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 9:26:36 AM

Mean Area 302.3
 Mean Conc. 8.478mg/L



Sample

Sample Name: TIC 25
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.424mg/L TC:25.99mg/L IC:24.57mg/L

1. Det

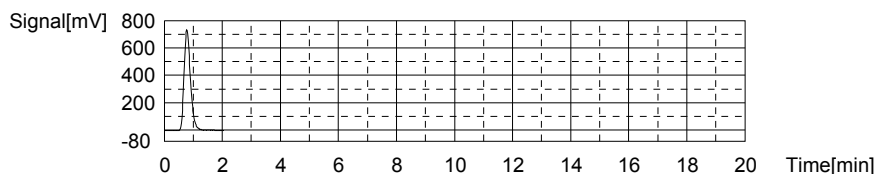
Anal.: TC

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1117	25.99mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 9:34:04 AM

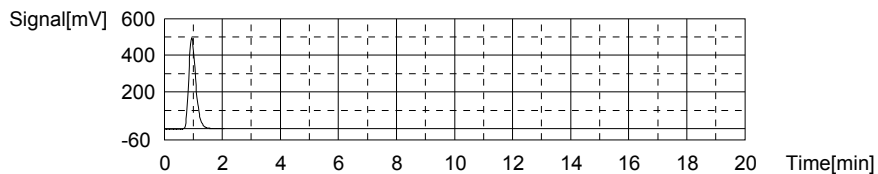
Mean Area 1117
Mean Conc. 25.99mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	841.1	24.57mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 9:39:06 AM

Mean Area 841.1
Mean Conc. 24.57mg/L



Sample

Sample Name: CCV 25
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

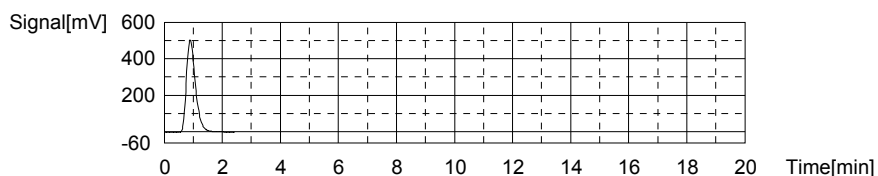
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.54mg/L TC:25.24mg/L IC:-0.3058mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1085	25.24mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 9:46:58 AM

Mean Area 1085
Mean Conc. 25.24mg/L

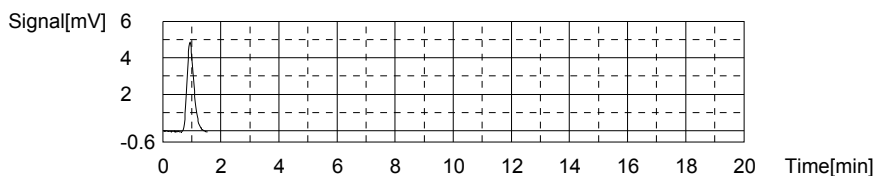


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.174	-0.3058mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 9:51:20 AM

2/56

Mean Area 8.174
 Mean Conc. -0.3058mg/L



Sample

Sample Name: WG632219-01 BLK
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

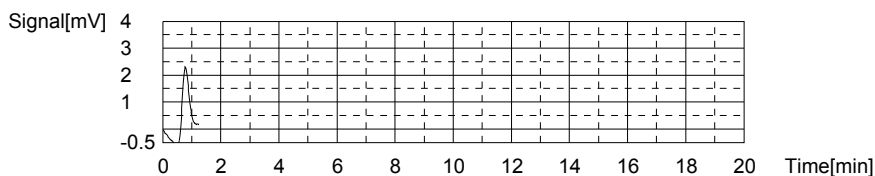
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.08265mg/L TC:-0.3005mg/L IC:-0.3831mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	4.147	-0.3005mg/L	500uL	1		TC	10/3/2017 9:56:14 AM

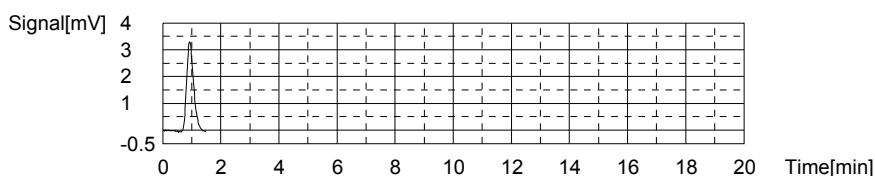
Mean Area 4.147
 Mean Conc. -0.3005mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	5.585	-0.3831mg/L	500uL	1		IC	10/3/2017 10:00:05 AM

Mean Area 5.585
 Mean Conc. -0.3831mg/L



Sample

Sample Name: WG632219-02 LCS
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.03mg/L TC:25.71mg/L IC:-0.3162mg/L

10/4/2017 3:19:22 PM

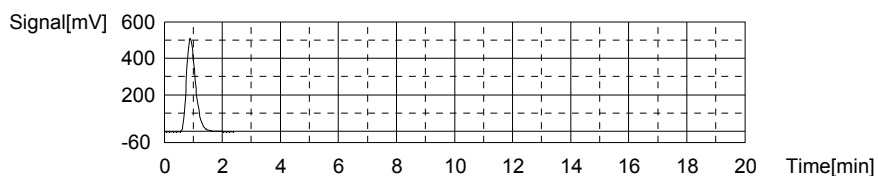
10-03-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1105	25.71mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 10:07:56 AM

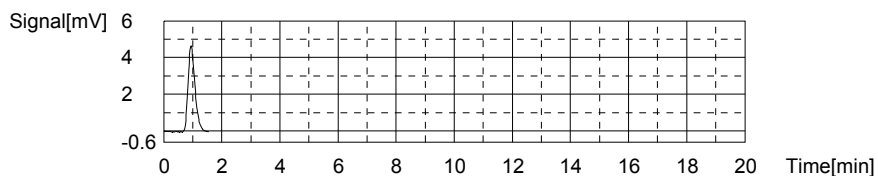
Mean Area 1105
Mean Conc. 25.71mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.825	-0.3162mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 10:12:18 AM

Mean Area 7.825
Mean Conc. -0.3162mg/L



Sample

Sample Name: WG632219-03 LCSDUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

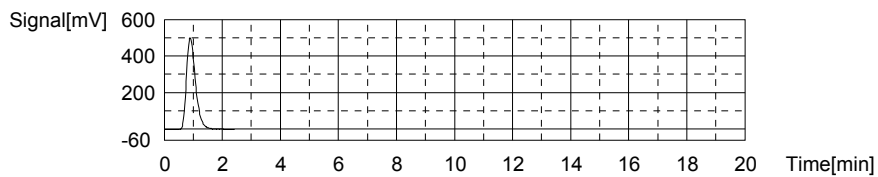
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.53mg/L TC:25.21mg/L IC:-0.3131mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1084	25.21mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 10:20:10 AM

Mean Area 1084
Mean Conc. 25.21mg/L

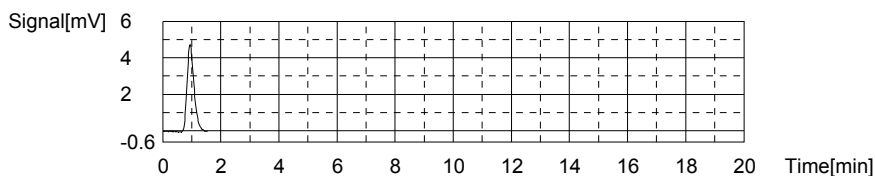


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.930	-0.3131mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 10:24:33 AM

4/56

Mean Area 7.930
 Mean Conc. -0.3131mg/L



Sample

Sample Name: L17091523-05
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

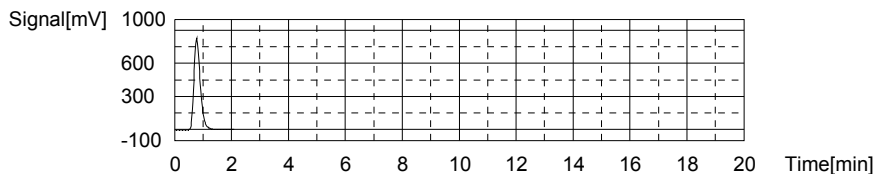
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.087mg/L TC:30.06mg/L IC:26.97mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1289	30.06mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 10:32:04 AM

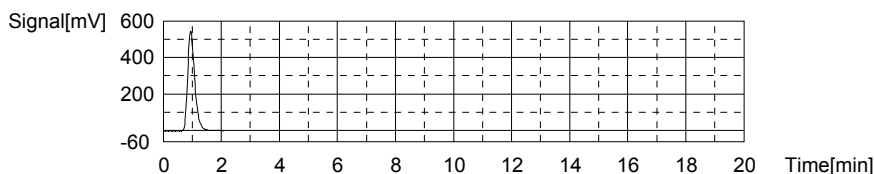
Mean Area 1289
 Mean Conc. 30.06mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	921.5	26.97mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 10:37:09 AM

Mean Area 921.5
 Mean Conc. 26.97mg/L



Sample

Sample Name: L17091523-07
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

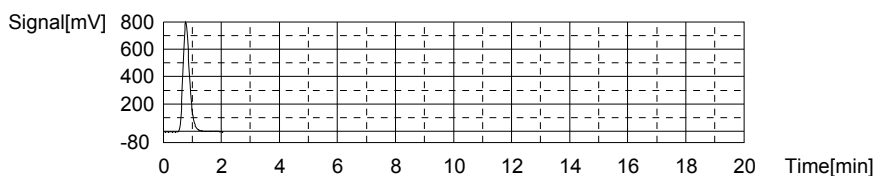
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.596mg/L TC:28.90mg/L IC:25.30mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1240	28.90mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	10/3/2017 10:44:39 AM

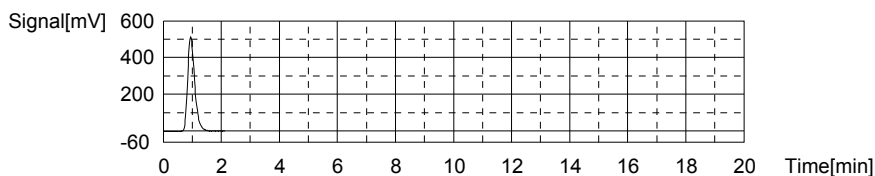
Mean Area 1240
Mean Conc. 28.90mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	865.7	25.30mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_1	10/3/2017 10:49:48 AM

Mean Area 865.7
Mean Conc. 25.30mg/L



Sample

Sample Name: L17091609-01 (2)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

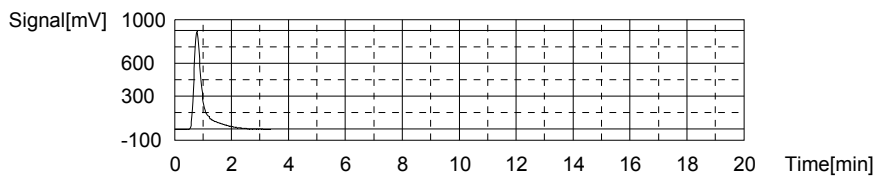
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:25.24mg/L TC:44.40mg/L IC:19.15mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1896	44.40mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	10/3/2017 10:58:38 AM

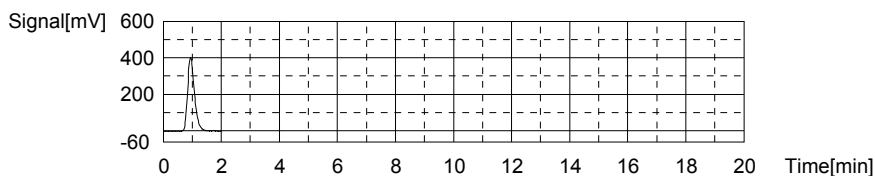
Mean Area 1896
Mean Conc. 44.40mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	659.8	19.15mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_1	10/3/2017 11:03:37 AM

Mean Area 659.8
 Mean Conc. 19.15mg/L



Sample

Sample Name: L17091645-05 (2)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

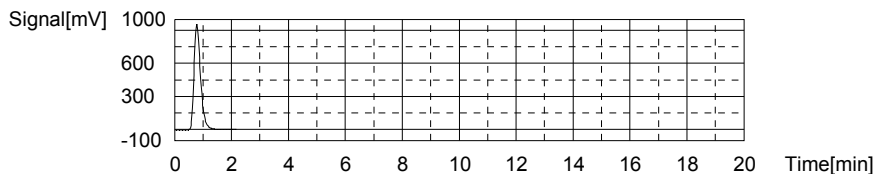
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:10.79mg/L TC:35.92mg/L IC:25.12mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1537	35.92mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 11:11:13 AM

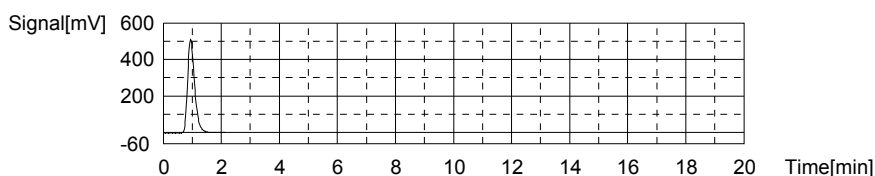
Mean Area 1537
 Mean Conc. 35.92mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	859.6	25.12mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 11:16:19 AM

Mean Area 859.6
 Mean Conc. 25.12mg/L



Sample

Sample Name: L17091719-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.485mg/L TC:48.91mg/L IC:46.43mg/L

10/4/2017 3:19:22 PM

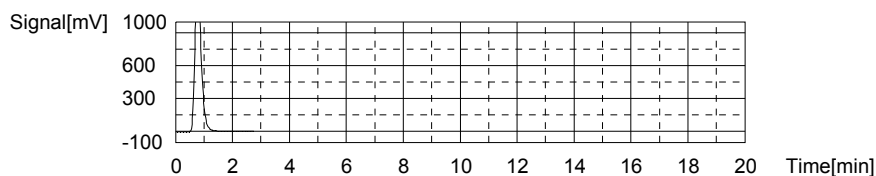
10-03-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2087	48.91mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 11:24:31 AM

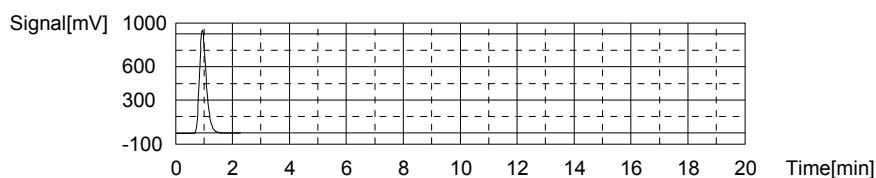
Mean Area 2087
Mean Conc. 48.91mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1573	46.43mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 11:29:50 AM

Mean Area 1573
Mean Conc. 46.43mg/L



Sample

Sample Name:
Sample ID:
Origin:
Status
Chk. Result

<Untitled>
TOC-02-10-2017.met
Completed

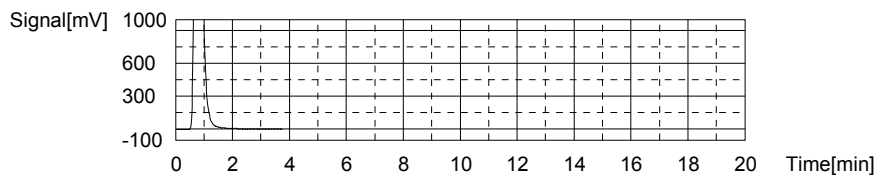
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-17.07mg/L TC:83.29mg/L IC:100.4mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	3542	83.29mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 11:39:02 AM

Mean Area 3542
Mean Conc. 83.29mg/L

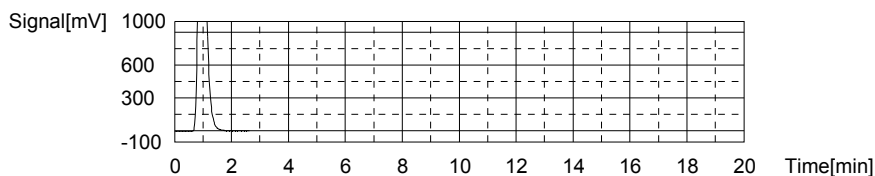


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	3379	100.4mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 11:44:57 AM

8/56

Mean Area 3379
Mean Conc. 100.4mg/L



Sample

Sample Name: L17091719-05
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

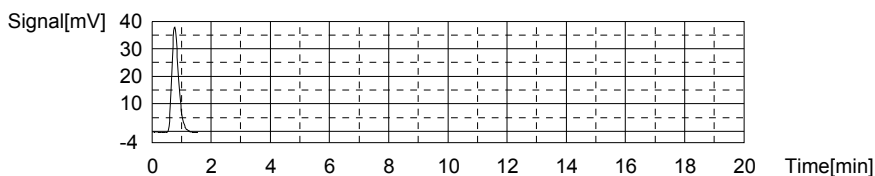
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4974mg/L TC:1.062mg/L IC:0.5643mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	61.80	1.062mg/L	500uL	1		TC	10/3/2017 11:51:56 AM

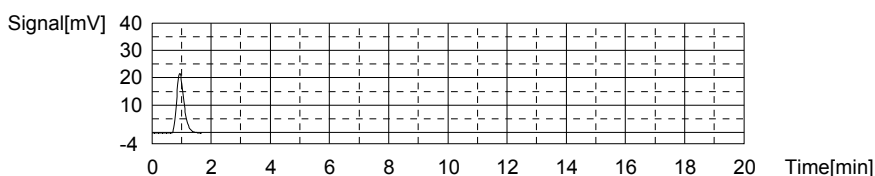
Mean Area 61.80
Mean Conc. 1.062mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	37.31	0.5643mg/L	500uL	1		IC	10/3/2017 11:56:37 AM

Mean Area 37.31
Mean Conc. 0.5643mg/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:24.94mg/L TC:24.74mg/L IC:-0.2020mg/L

10/4/2017 3:19:22 PM

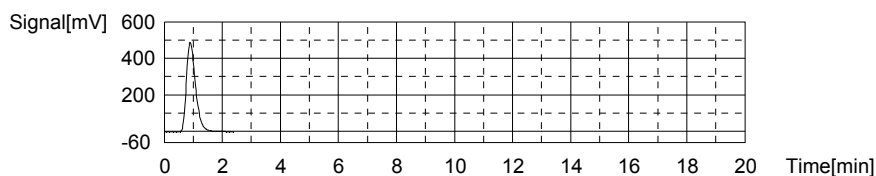
10-03-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1064	24.74mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 12:04:28 PM

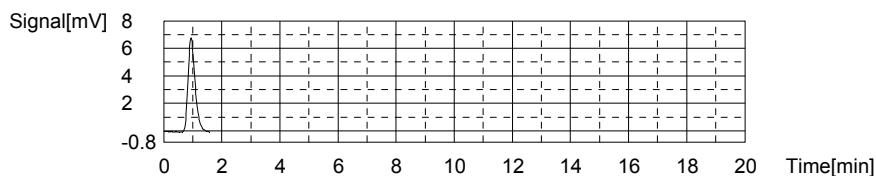
Mean Area 1064
Mean Conc. 24.74mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.65	-0.2020mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 12:08:54 PM

Mean Area 11.65
Mean Conc. -0.2020mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

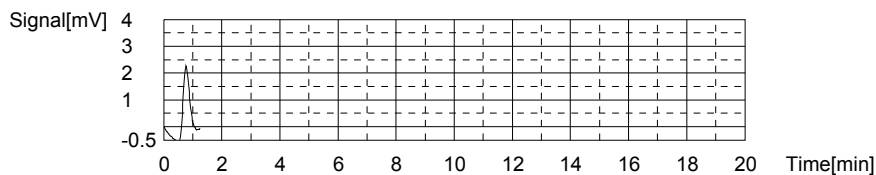
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.05043mg/L TC:-0.3022mg/L IC:-0.3526mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	4.075	-0.3022mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 12:13:48 PM

Mean Area 4.075
Mean Conc. -0.3022mg/L

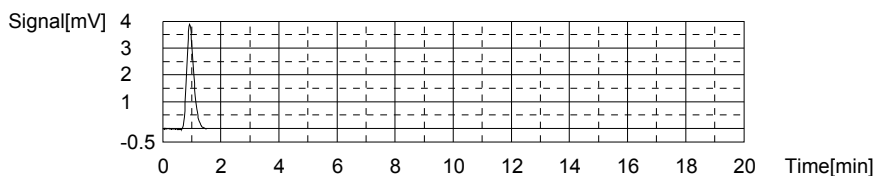


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.607	-0.3526mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 12:17:41 PM

10/56

Mean Area 6.607
 Mean Conc. -0.3526mg/L



Sample

Sample Name: L17100056-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

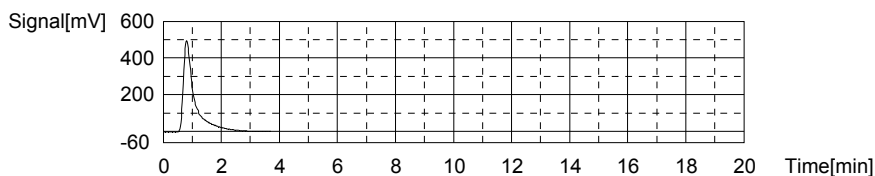
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:18.36mg/L TC:30.69mg/L IC:12.33mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1316	30.69mg/L	500uL	1		TC	10/3/2017 12:26:50 PM

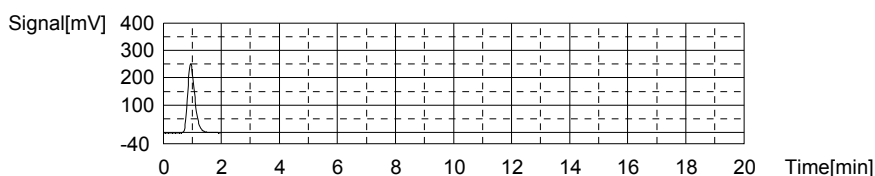
Mean Area 1316
 Mean Conc. 30.69mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	431.3	12.33mg/L	500uL	1		IC	10/3/2017 12:31:43 PM

Mean Area 431.3
 Mean Conc. 12.33mg/L



Sample

Sample Name: <Untitled>
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

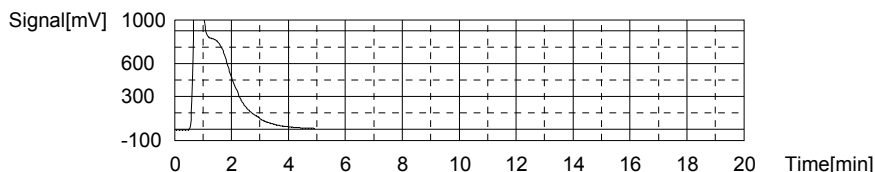
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:138.3mg/L TC:211.5mg/L IC:73.24mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8969	211.5mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 12:42:04 PM

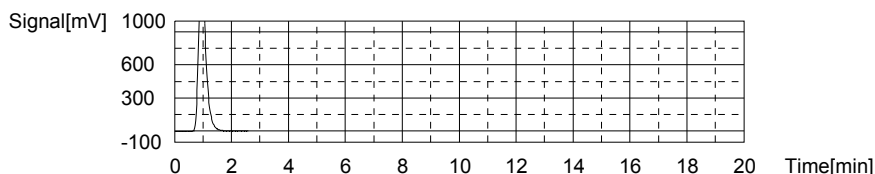
Mean Area 8969
Mean Conc. 211.5mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2471	73.24mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 12:47:48 PM

Mean Area 2471
Mean Conc. 73.24mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

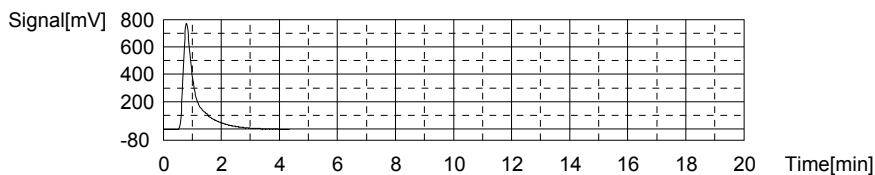
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:31.28mg/L TC:52.60mg/L IC:21.32mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2243	52.60mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 12:57:35 PM

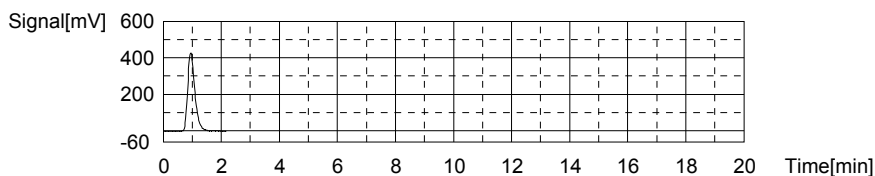
Mean Area 2243
Mean Conc. 52.60mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	732.3	21.32mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 1:02:44 PM

Mean Area 732.3
 Mean Conc. 21.32mg/L



Sample

Sample Name: L17100056-04
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

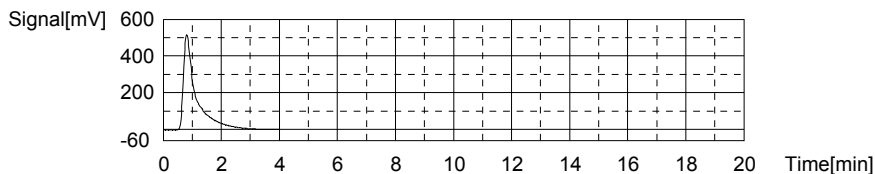
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:24.21mg/L TC:36.41mg/L IC:12.20mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1558	36.41mg/L	500uL	1	1	TC	10/3/2017 1:12:10 PM

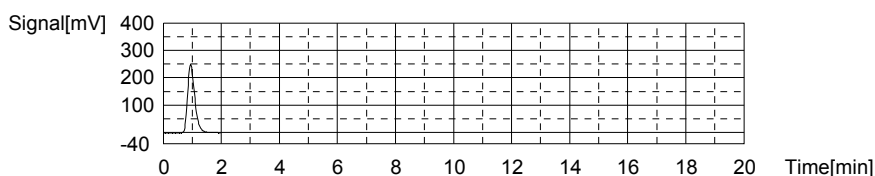
Mean Area 1558
 Mean Conc. 36.41mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	427.0	12.20mg/L	500uL	1	1	IC	10/3/2017 1:17:05 PM

Mean Area 427.0
 Mean Conc. 12.20mg/L



Sample

Sample Name: L17100056-05
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

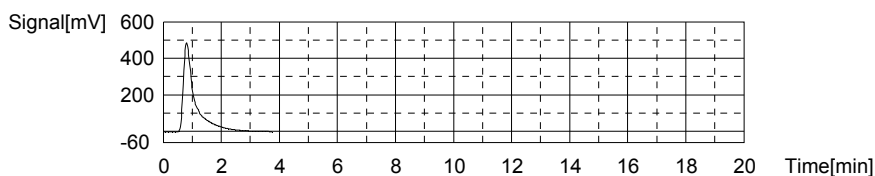
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:18.88mg/L TC:31.21mg/L IC:12.33mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1338	31.21mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 1:26:17 PM

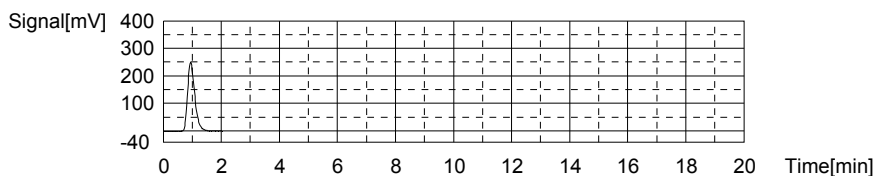
Mean Area 1338
Mean Conc. 31.21mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	431.4	12.33mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 1:31:14 PM

Mean Area 431.4
Mean Conc. 12.33mg/L



Sample

Sample Name:
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

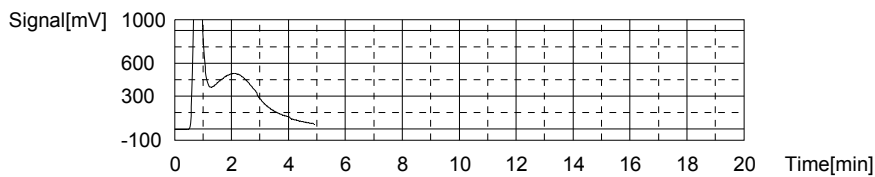
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:126.3mg/L TC:208.4mg/L IC:82.11mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8837	208.4mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 1:41:35 PM

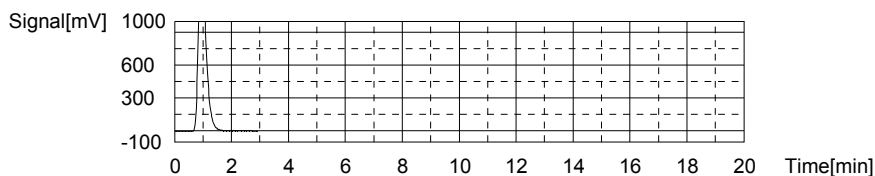
Mean Area 8837
Mean Conc. 208.4mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	2768	82.11mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 1:47:43 PM

Mean Area 2768
Mean Conc. 82.11mg/L



Sample

Sample Name: L17100056-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

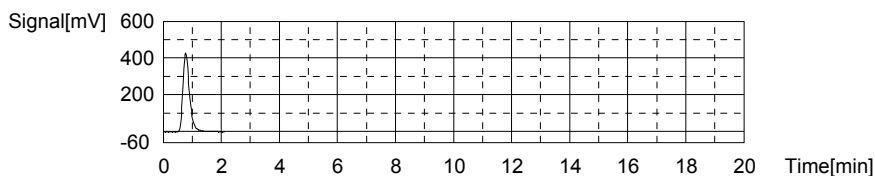
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.742mg/L TC:15.53mg/L IC:13.79mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	674.3	15.53mg/L	500uL	1		TC	10/3/2017 1:55:15 PM

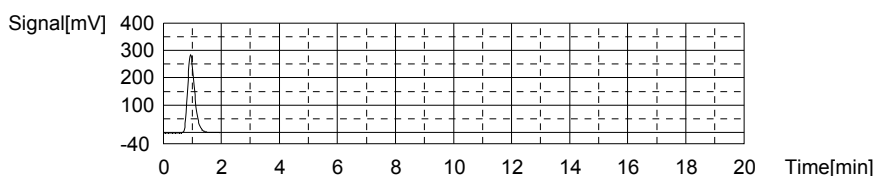
Mean Area 674.3
Mean Conc. 15.53mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	480.2	13.79mg/L	500uL	1		IC	10/3/2017 2:00:10 PM

Mean Area 480.2
Mean Conc. 13.79mg/L



Sample

Sample Name: L17100056-08
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

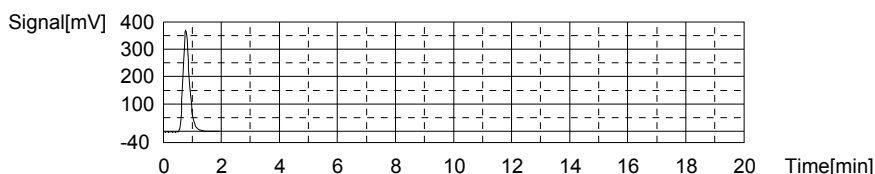
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.768mg/L TC:13.06mg/L IC:11.29mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	569.7	13.06mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 2:07:33 PM

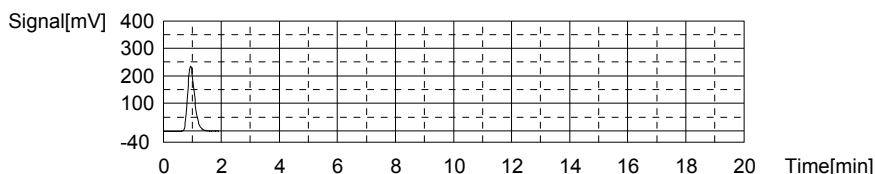
Mean Area 569.7
Mean Conc. 13.06mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	396.6	11.29mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 2:12:22 PM

Mean Area 396.6
Mean Conc. 11.29mg/L



Sample

Sample Name: L17100056-09
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

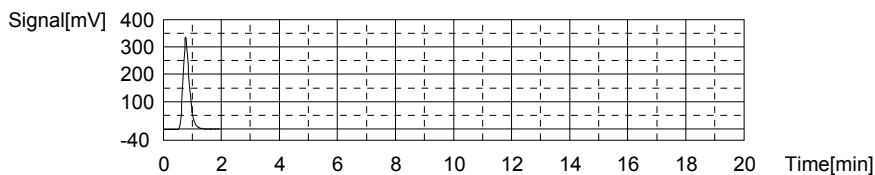
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.509mg/L TC:11.45mg/L IC:9.941mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	501.5	11.45mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 2:19:45 PM

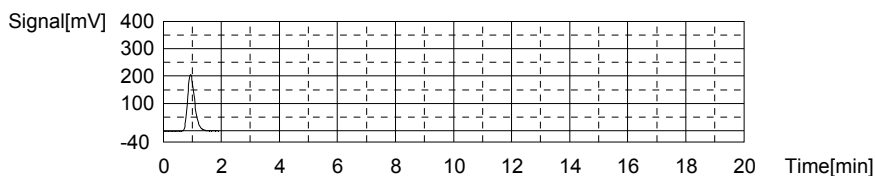
Mean Area 501.5
Mean Conc. 11.45mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	351.3	9.941mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 2:24:34 PM

Mean Area 351.3
Mean Conc. 9.941mg/L



Sample

Sample Name: L17100056-10
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

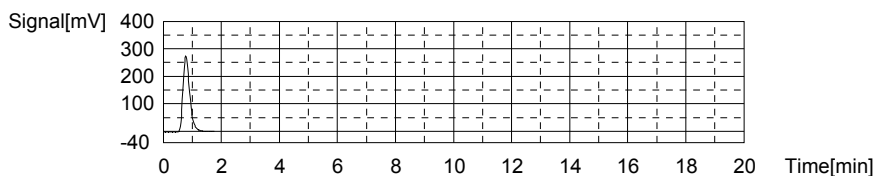
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.888mg/L TC:9.971mg/L IC:8.084mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	438.9	9.971mg/L	500uL	1		TC	10/3/2017 2:31:45 PM

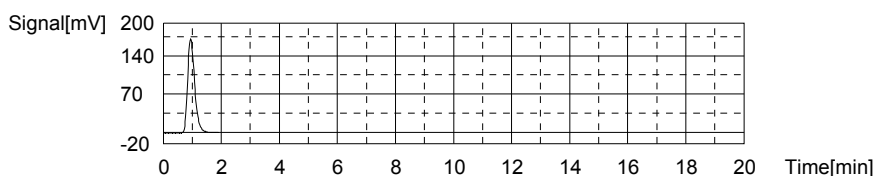
Mean Area 438.9
Mean Conc. 9.971mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	289.1	8.084mg/L	500uL	1		IC	10/3/2017 2:36:32 PM

Mean Area 289.1
Mean Conc. 8.084mg/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:25.49mg/L TC:25.26mg/L IC:-0.2346mg/L

10/4/2017 3:19:22 PM

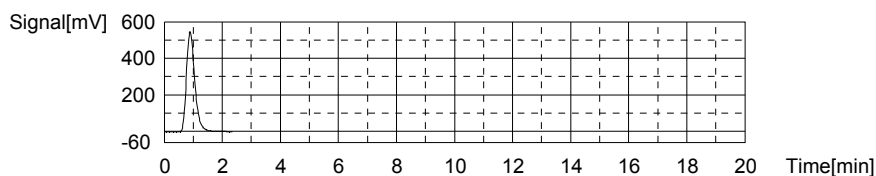
10-03-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1086	25.26mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 2:44:19 PM

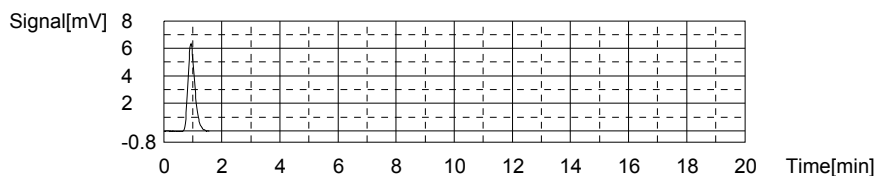
Mean Area 1086
Mean Conc. 25.26mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.56	-0.2346mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 2:48:43 PM

Mean Area 10.56
Mean Conc. -0.2346mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

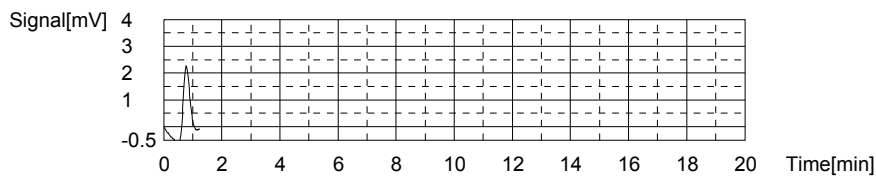
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06506mg/L TC:-0.3014mg/L IC:-0.3664mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	4.109	-0.3014mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 2:53:36 PM

Mean Area 4.109
Mean Conc. -0.3014mg/L



Anal.: IC

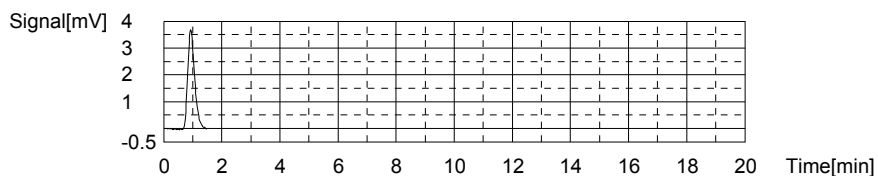
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.144	-0.3664mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 2:57:29 PM

18/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

Mean Area 6.144
Mean Conc. -0.3664mg/L



Sample

Sample Name: L17100056-11
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

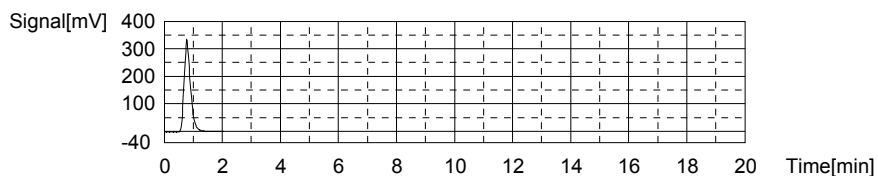
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.492mg/L TC:11.41mg/L IC:9.923mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	500.0	11.41mg/L	500uL	1		TC	10/3/2017 3:05:00 PM

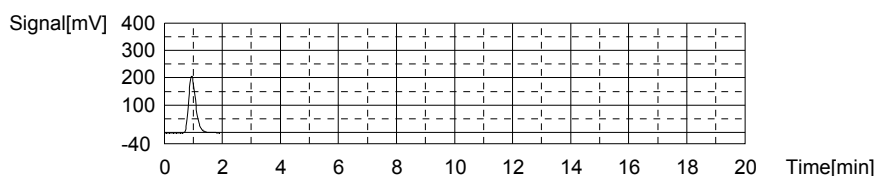
Mean Area 500.0
Mean Conc. 11.41mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	350.7	9.923mg/L	500uL	1		IC	10/3/2017 3:09:50 PM

Mean Area 350.7
Mean Conc. 9.923mg/L



Sample

Sample Name: L17100056-12
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.414mg/L TC:10.86mg/L IC:9.445mg/L

19/56

10/4/2017 3:19:22 PM

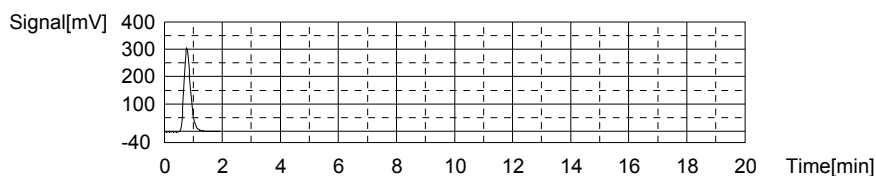
10-03-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	476.5	10.86mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 3:17:13 PM

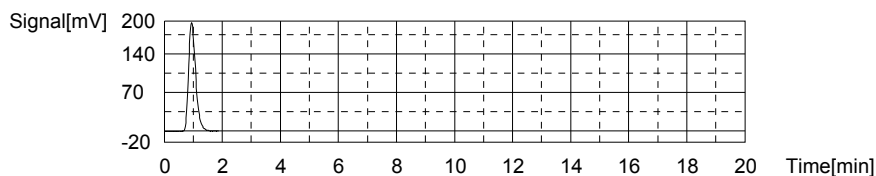
Mean Area 476.5
Mean Conc. 10.86mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	334.7	9.445mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 3:21:59 PM

Mean Area 334.7
Mean Conc. 9.445mg/L



Sample

Sample Name: L17100056-13
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

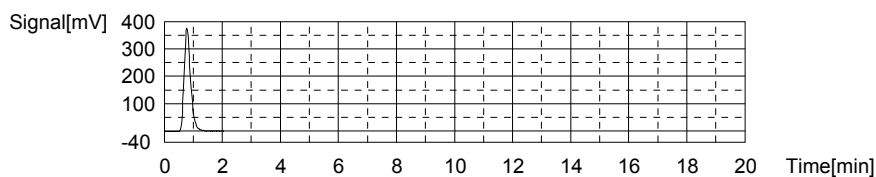
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.874mg/L TC:13.30mg/L IC:11.43mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	580.0	13.30mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 3:29:29 PM

Mean Area 580.0
Mean Conc. 13.30mg/L

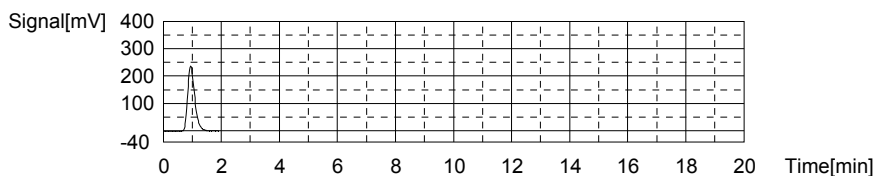


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	401.2	11.43mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 3:34:19 PM

20/56

Mean Area 401.2
Mean Conc. 11.43mg/L



Sample

Sample Name: WG632219-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

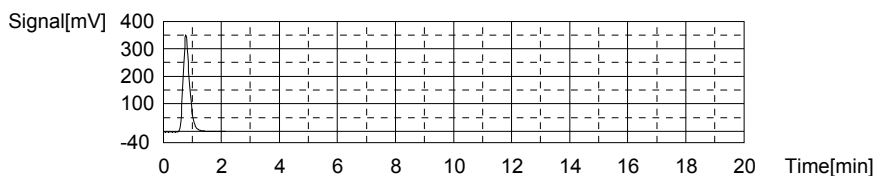
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.829mg/L TC:12.26mg/L IC:10.43mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	535.9	12.26mg/L	500uL	1		TC	10/3/2017 3:41:55 PM

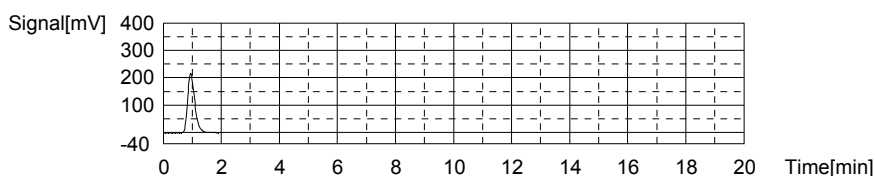
Mean Area 535.9
Mean Conc. 12.26mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	367.8	10.43mg/L	500uL	1		IC	10/3/2017 3:46:47 PM

Mean Area 367.8
Mean Conc. 10.43mg/L



Sample

Sample Name: WG632219-06 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.21mg/L TC:21.51mg/L IC:9.293mg/L

10/4/2017 3:19:22 PM

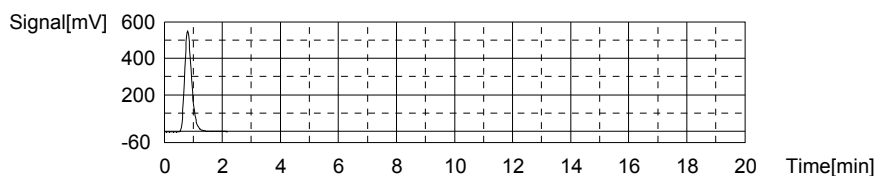
10-03-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	927.1	21.51mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 3:54:26 PM

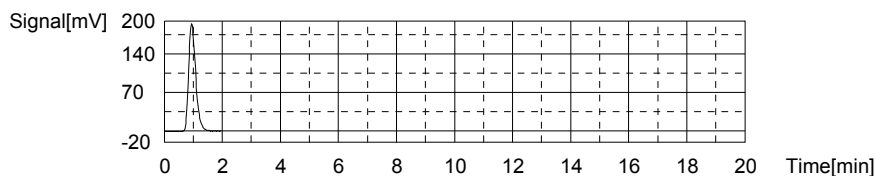
Mean Area 927.1
Mean Conc. 21.51mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	329.6	9.293mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 3:59:20 PM

Mean Area 329.6
Mean Conc. 9.293mg/L



Sample

Sample Name: WG632221-01 BLK
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

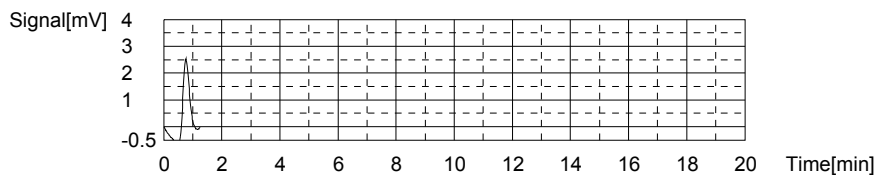
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.04376mg/L TC:-0.2925mg/L IC:-0.3363mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	4.483	-0.2925mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 4:04:17 PM

Mean Area 4.483
Mean Conc. -0.2925mg/L



Anal.: IC

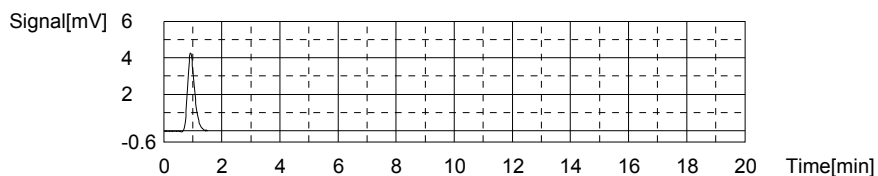
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.153	-0.3363mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 4:08:11 PM

22/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

Mean Area 7.153
Mean Conc. -0.3363mg/L



Sample

Sample Name: WG632221-02 LCS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

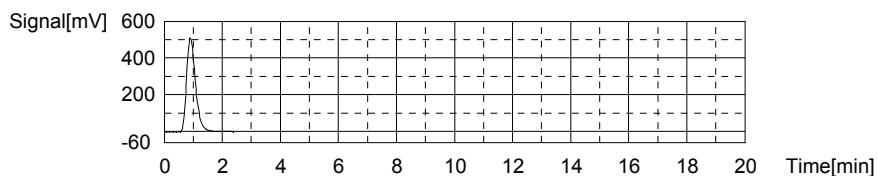
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.59mg/L TC:25.35mg/L IC:-0.2384mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1090	25.35mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 4:16:02 PM

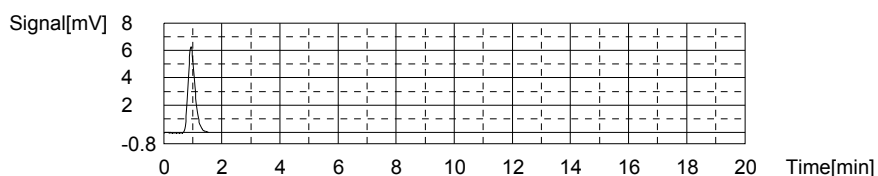
Mean Area 1090
Mean Conc. 25.35mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.43	-0.2384mg/L	500uL	1		TC-CURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 4:20:24 PM

Mean Area 10.43
Mean Conc. -0.2384mg/L



Sample

Sample Name: WG632221-03 LCSDUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.35mg/L TC:26.11mg/L IC:-0.2426mg/L

23/56

10/4/2017 3:19:22 PM

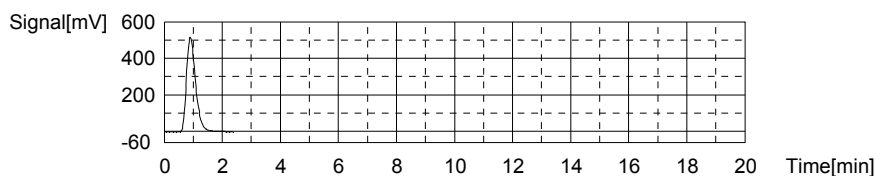
10-03-2017-DIH-TOC.i32

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_51	10/3/2017 4:28:14 PM

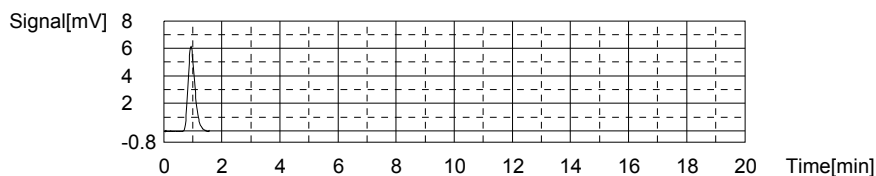
Mean Area 1122
Mean Conc. 26.11mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.29	-0.2426mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 4:32:40 PM

Mean Area 10.29
Mean Conc. -0.2426mg/L



Sample

Sample Name: L17100056-14
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

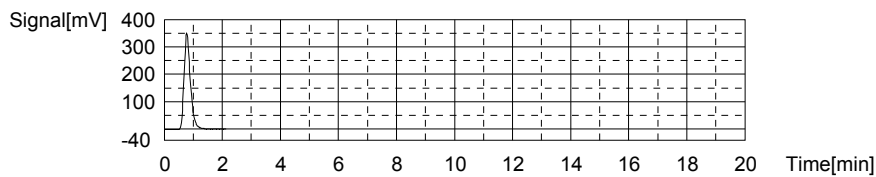
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.734mg/L TC:12.11mg/L IC:10.38mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	529.6	12.11mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 4:40:14 PM

Mean Area 529.6
Mean Conc. 12.11mg/L

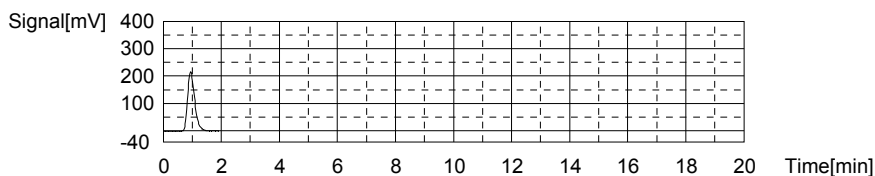


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	366.0	10.38mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 4:45:06 PM

24/56

Mean Area 366.0
 Mean Conc. 10.38mg/L



Sample

Sample Name: L17100056-15
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

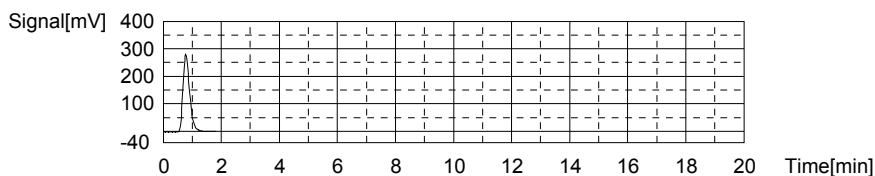
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.627mg/L TC:10.11mg/L IC:8.481mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	444.7	10.11mg/L	500uL	1		TC	10/3/2017 4:52:23 PM

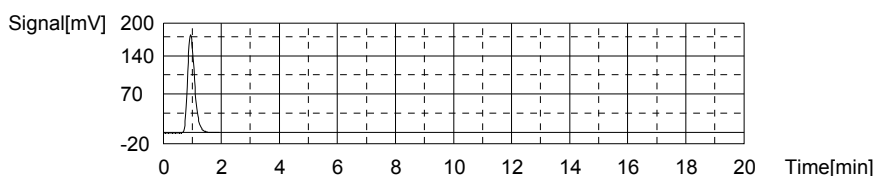
Mean Area 444.7
 Mean Conc. 10.11mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	302.4	8.481mg/L	500uL	1		IC	10/3/2017 4:57:14 PM

Mean Area 302.4
 Mean Conc. 8.481mg/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:24.42mg/L TC:24.20mg/L IC:-0.2187mg/L

10/4/2017 3:19:22 PM

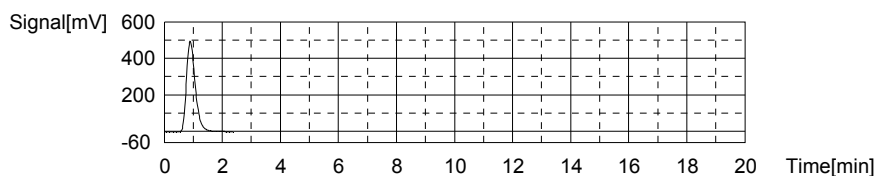
10-03-2017-DIH-TOC.i32

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_51	10/3/2017 5:05:03 PM

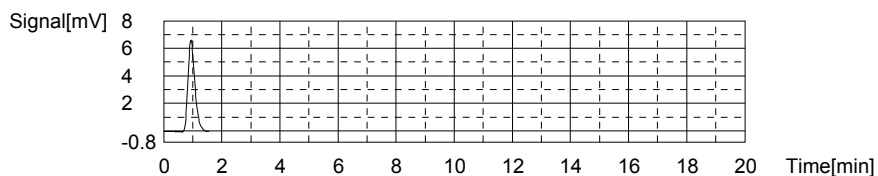
Mean Area 1041
Mean Conc. 24.20mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.09	-0.2187mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 5:09:26 PM

Mean Area 11.09
Mean Conc. -0.2187mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

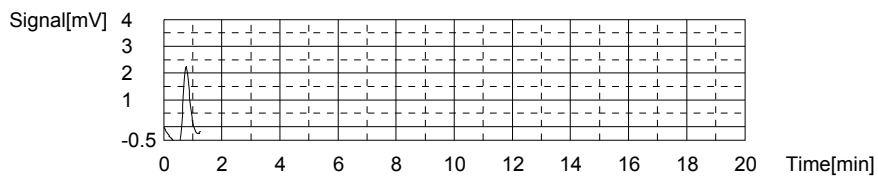
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06666mg/L TC:-0.2991mg/L IC:-0.3657mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	4.207	-0.2991mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 5:14:21 PM

Mean Area 4.207
Mean Conc. -0.2991mg/L

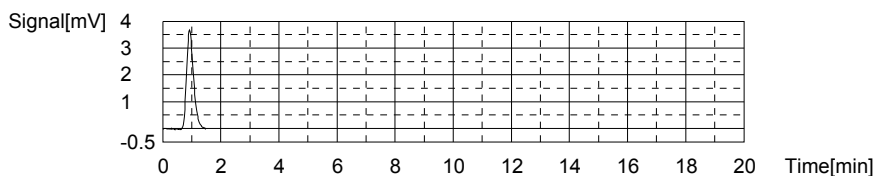


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.168	-0.3657mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 5:18:14 PM

26/56

Mean Area 6.168
 Mean Conc. -0.3657mg/L



Sample

Sample Name: L17100056-16
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

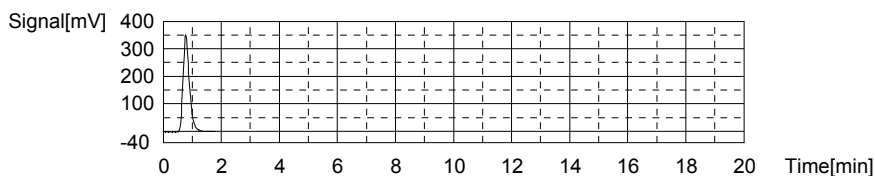
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.133mg/L TC:12.04mg/L IC:9.905mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	526.4	12.04mg/L	500uL	1		TC	10/3/2017 5:25:29 PM

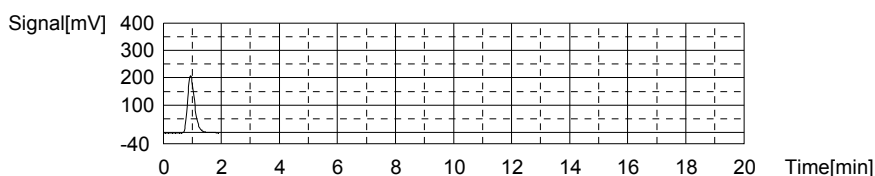
Mean Area 526.4
 Mean Conc. 12.04mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	350.1	9.905mg/L	500uL	1		IC	10/3/2017 5:30:19 PM

Mean Area 350.1
 Mean Conc. 9.905mg/L



Sample

Sample Name: L17100056-17
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.656mg/L TC:11.04mg/L IC:9.386mg/L

10/4/2017 3:19:22 PM

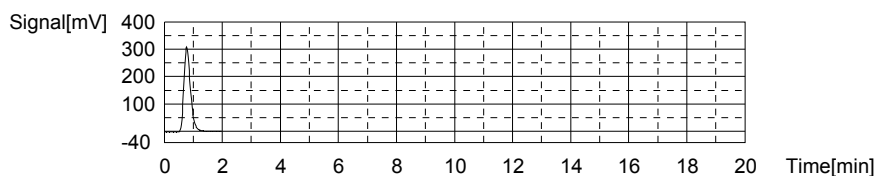
10-03-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	484.2	11.04mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 5:37:45 PM

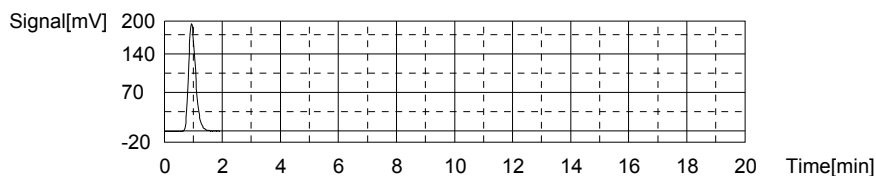
Mean Area 484.2
Mean Conc. 11.04mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	332.7	9.386mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 5:42:34 PM

Mean Area 332.7
Mean Conc. 9.386mg/L



Sample

Sample Name: L17100056-18
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

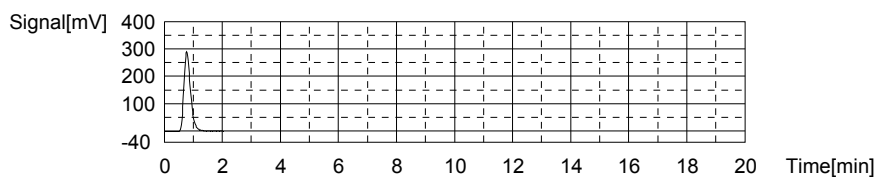
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.639mg/L TC:10.45mg/L IC:8.812mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	459.2	10.45mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 5:50:02 PM

Mean Area 459.2
Mean Conc. 10.45mg/L

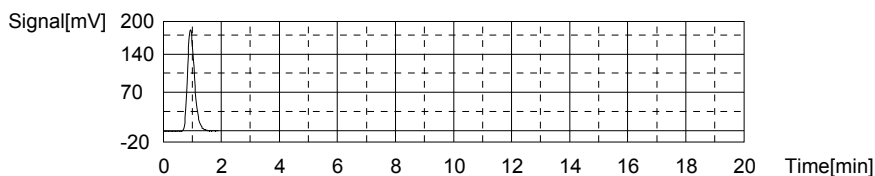


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	313.5	8.812mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 5:54:46 PM

28/56

Mean Area 313.5
Mean Conc. 8.812mg/L



Sample

Sample Name: L17091700-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

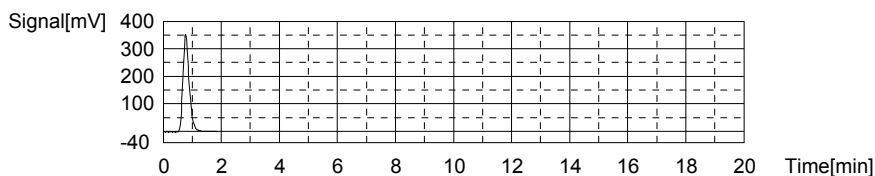
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.153mg/L TC:11.94mg/L IC:10.79mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	522.2	11.94mg/L	500uL	1		TC	10/3/2017 6:02:07 PM

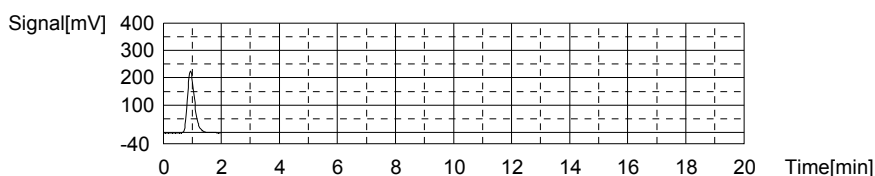
Mean Area 522.2
Mean Conc. 11.94mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	379.6	10.79mg/L	500uL	1		IC	10/3/2017 6:07:02 PM

Mean Area 379.6
Mean Conc. 10.79mg/L



Sample

Sample Name: L17091700-04
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

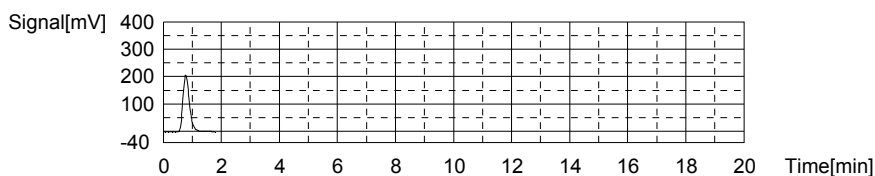
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.8756mg/L TC:7.164mg/L IC:6.289mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	320.1	7.164mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	10/3/2017 6:14:16 PM

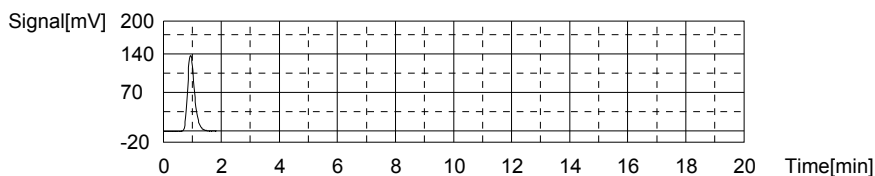
Mean Area 320.1
Mean Conc. 7.164mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	229.0	6.289mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/3/2017 6:19:02 PM

Mean Area 229.0
Mean Conc. 6.289mg/L



Sample

Sample Name: WG632221-05 DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

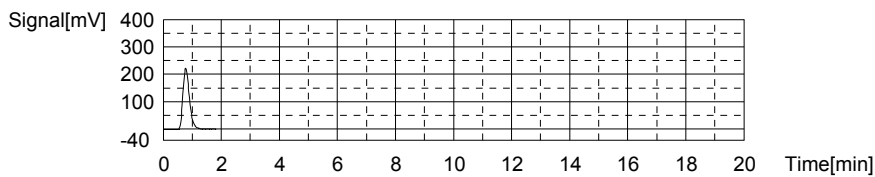
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.098mg/L TC:7.826mg/L IC:6.728mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	348.1	7.826mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	10/3/2017 6:26:18 PM

Mean Area 348.1
Mean Conc. 7.826mg/L



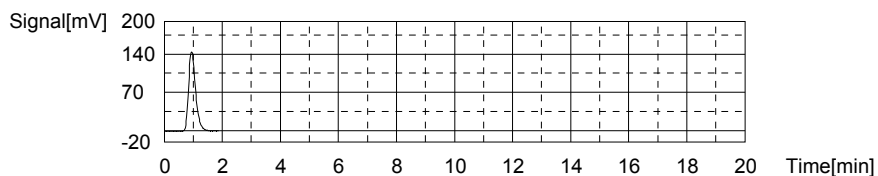
Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	243.7	6.728mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/3/2017 6:31:05 PM

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

Mean Area 243.7
Mean Conc. 6.728mg/L



Sample

Sample Name: L17091700-05 MS
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

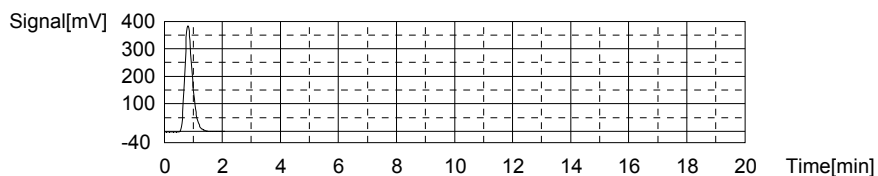
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:11.00mg/L TC:16.26mg/L IC:5.262mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	705.1	16.26mg/L	500uL	1		TC	10/3/2017 6:38:38 PM

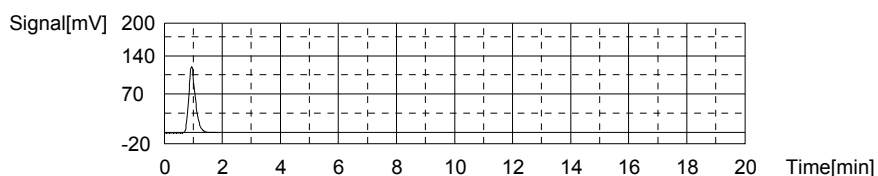
Mean Area 705.1
Mean Conc. 16.26mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	194.6	5.262mg/L	500uL	1		IC	10/3/2017 6:43:24 PM

Mean Area 194.6
Mean Conc. 5.262mg/L



Sample

Sample Name: L17091700-06 MSD
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:10.94mg/L TC:18.07mg/L IC:7.134mg/L

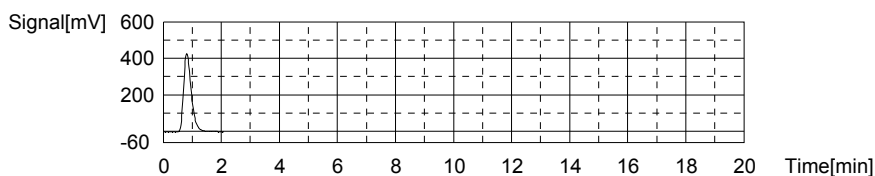
31/56

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	781.7	18.07mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	10/3/2017 6:50:57 PM

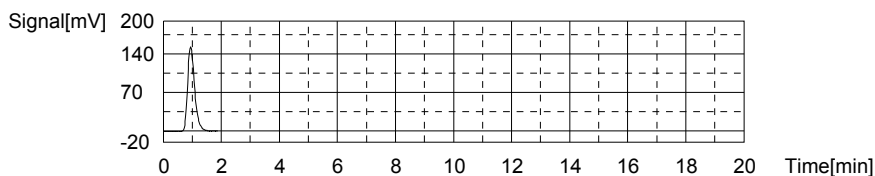
Mean Area 781.7
Mean Conc. 18.07mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	257.3	7.134mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/3/2017 6:55:43 PM

Mean Area 257.3
Mean Conc. 7.134mg/L



Sample

Sample Name: L17091700-13
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

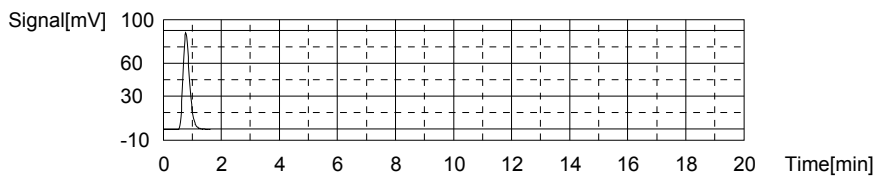
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.7114mg/L TC:2.855mg/L IC:2.143mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	137.7	2.855mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_5	10/3/2017 7:02:49 PM

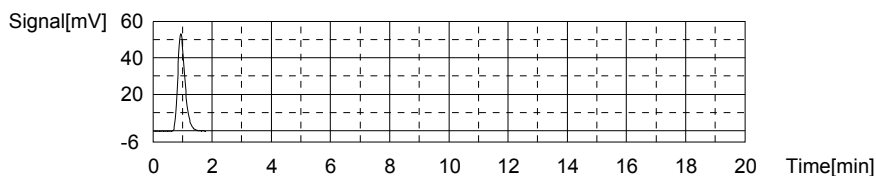
Mean Area 137.7
Mean Conc. 2.855mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	90.19	2.143mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/3/2017 7:07:27 PM

Mean Area 90.19
Mean Conc. 2.143mg/L



Sample

Sample Name: L17091700-16
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

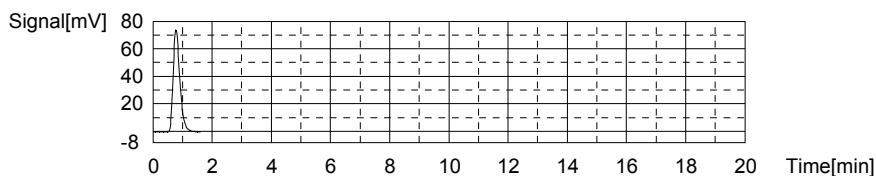
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.6927mg/L TC:2.368mg/L IC:1.676mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	117.1	2.368mg/L	500uL	1	1	TC-CURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 7:14:32 PM

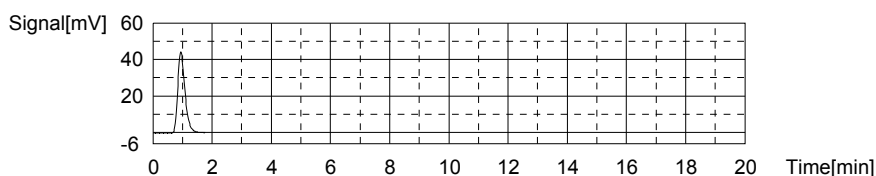
Mean Area 117.1
Mean Conc. 2.368mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	74.52	1.676mg/L	500uL	1	1	IC-CURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 7:19:10 PM

Mean Area 74.52
Mean Conc. 1.676mg/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:25.36mg/L TC:25.12mg/L IC:-0.2447mg/L

10/4/2017 3:19:22 PM

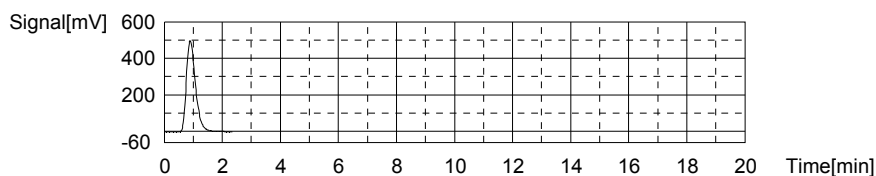
10-03-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1080	25.12mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 7:26:58 PM

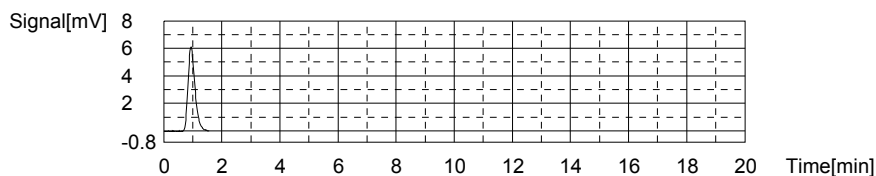
Mean Area 1080
Mean Conc. 25.12mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.22	-0.2447mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 7:31:21 PM

Mean Area 10.22
Mean Conc. -0.2447mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

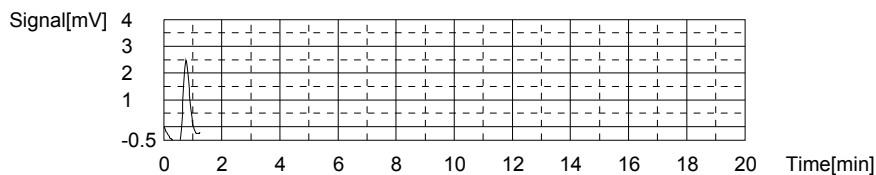
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06355mg/L TC:-0.2912mg/L IC:-0.3547mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	4.542	-0.2912mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 7:36:15 PM

Mean Area 4.542
Mean Conc. -0.2912mg/L



Anal.: IC

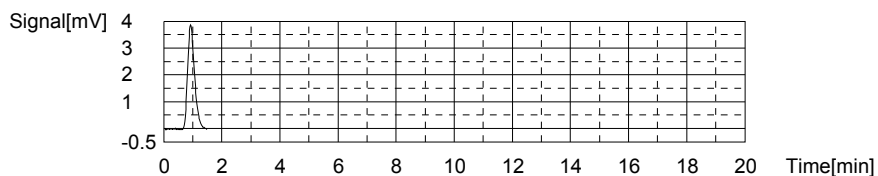
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.537	-0.3547mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 7:40:07 PM

34/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

Mean Area 6.537
Mean Conc. -0.3547mg/L



Sample

Sample Name: L17091700-19
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

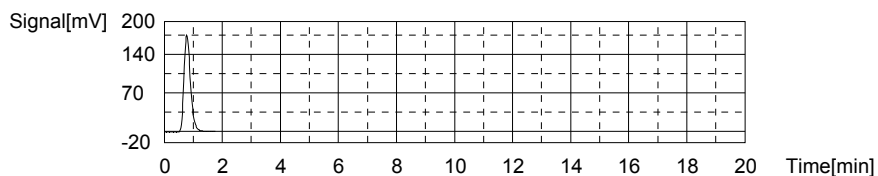
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.9863mg/L TC:6.078mg/L IC:5.091mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	274.1	6.078mg/L	500uL	1		TC	10/3/2017 7:47:21 PM

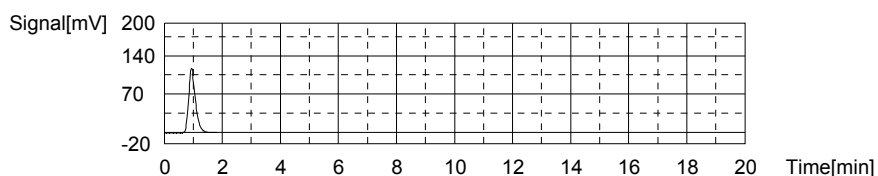
Mean Area 274.1
Mean Conc. 6.078mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	188.9	5.091mg/L	500uL	1		IC	10/3/2017 7:52:05 PM

Mean Area 188.9
Mean Conc. 5.091mg/L



Sample

Sample Name: L17091700-22
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.8521mg/L TC:4.832mg/L IC:3.980mg/L

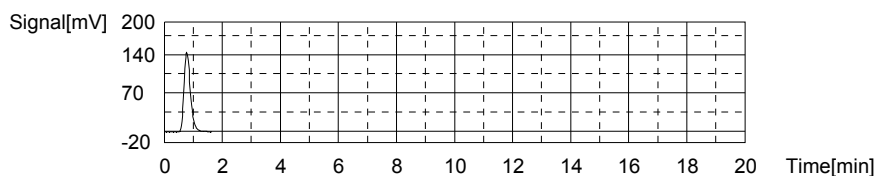
35/56

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	221.4	4.832mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 7:59:11 PM

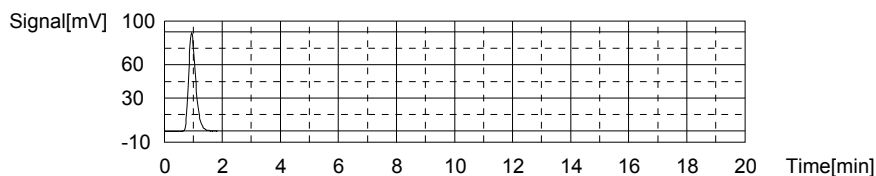
Mean Area 221.4
Mean Conc. 4.832mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	151.7	3.980mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 8:03:53 PM

Mean Area 151.7
Mean Conc. 3.980mg/L



Sample

Sample Name: L17091700-25
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

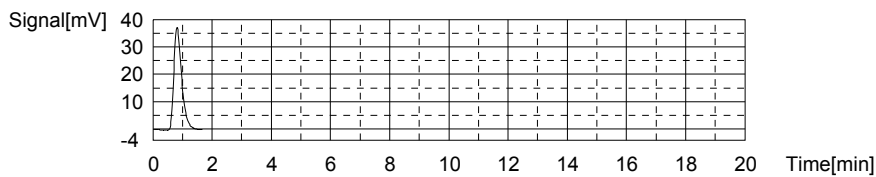
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:1.289mg/L TC:1.225mg/L IC:-0.06434mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	68.71	1.225mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 8:11:02 PM

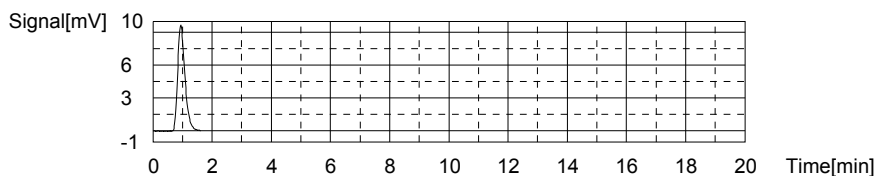
Mean Area 68.71
Mean Conc. 1.225mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	16.26	-0.06434mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 8:15:28 PM

Mean Area 16.26
 Mean Conc. -0.06434mg/L



Sample

Sample Name: L17091700-28
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

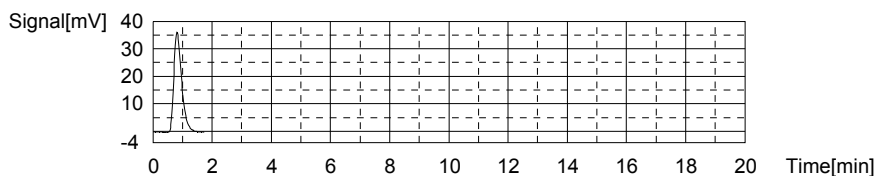
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:1.258mg/L TC:1.183mg/L IC:-0.07539mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	66.94	1.183mg/L	500uL	1		TC	10/3/2017 8:22:40 PM

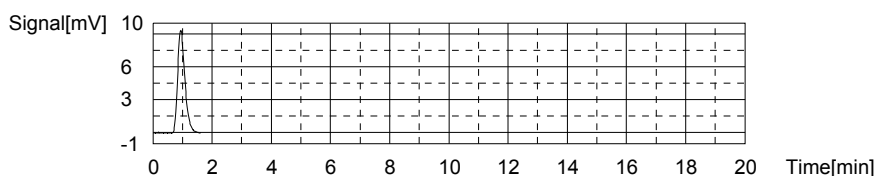
Mean Area 66.94
 Mean Conc. 1.183mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	15.89	-0.07539mg/L	500uL	1		IC	10/3/2017 8:27:08 PM

Mean Area 15.89
 Mean Conc. -0.07539mg/L



Sample

Sample Name: <Untitled>
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.8192mg/L TC:0.7203mg/L IC:-0.09898mg/L

10/4/2017 3:19:22 PM

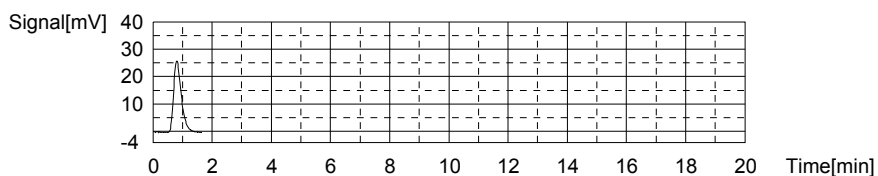
10-03-2017-DIH-TOC.i32

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	47.35	0.7203mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 8:34:15 PM

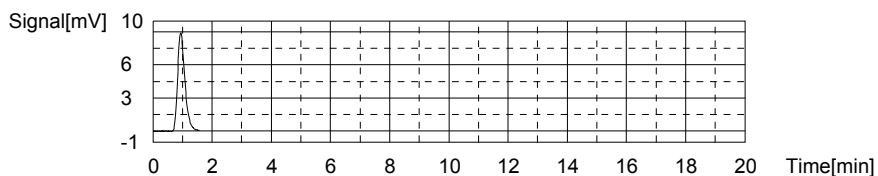
Mean Area 47.35
Mean Conc. 0.7203mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	15.10	-0.09898mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 8:38:40 PM

Mean Area 15.10
Mean Conc. -0.09898mg/L



Sample

Sample Name:
Sample ID:
Origin:
Status
Chk. Result

<Untitled>
TOC-02-10-2017.met
Completed

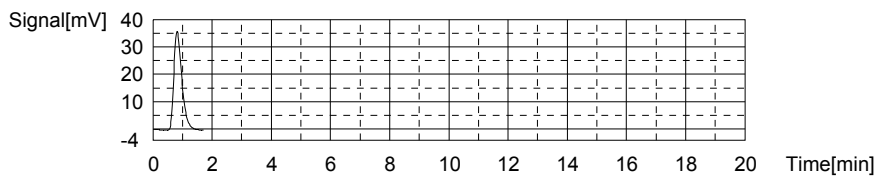
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:1.325mg/L TC:1.201mg/L IC:-0.1238mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	67.71	1.201mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 8:45:51 PM

Mean Area 67.71
Mean Conc. 1.201mg/L

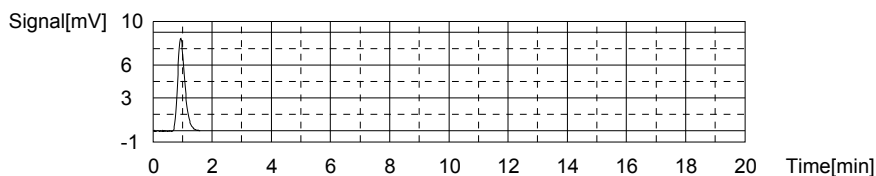


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	14.27	-0.1238mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 8:50:16 PM

38/56

Mean Area 14.27
 Mean Conc. -0.1238mg/L



Sample

Sample Name: WG632222-01 BLK
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

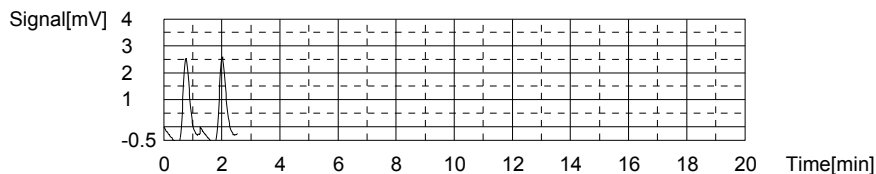
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06285mg/L TC:-0.2871mg/L IC:-0.3500mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	4.617	-0.2894mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 8:55:11 PM
2	4.808	-0.2849mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 8:58:39 PM

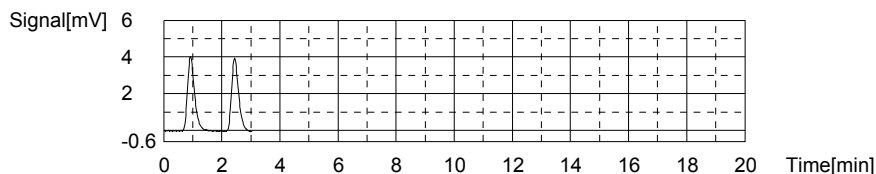
Mean Area 4.713
 Mean Conc. -0.2871mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.743	-0.3486mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 9:02:32 PM
2	6.648	-0.3514mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 9:06:28 PM

Mean Area 6.696
 Mean Conc. -0.3500mg/L



Sample

Sample Name: WG632222-02 LCS
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

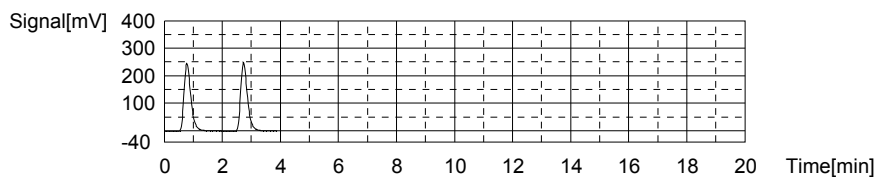
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.364mg/L TC:9.181mg/L IC:6.817mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	402.0	9.099mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 9:13:54 PM
2	408.9	9.262mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 9:18:08 PM

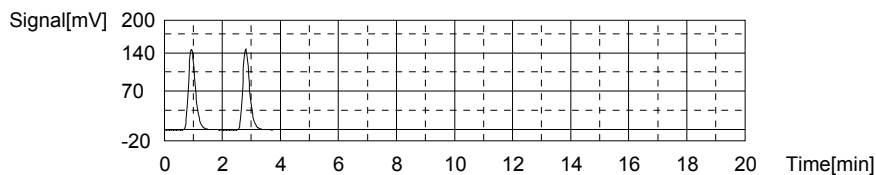
Mean Area 405.5
Mean Conc. 9.181mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	246.4	6.808mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 9:22:55 PM
2	247.0	6.826mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 9:27:26 PM

Mean Area 246.7
Mean Conc. 6.817mg/L



Sample

Sample Name: WG632222-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

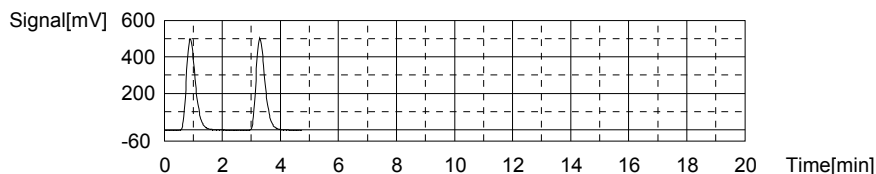
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.50mg/L TC:25.25mg/L IC:-0.2482mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1085	25.24mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 9:35:19 PM
2	1086	25.26mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 9:39:55 PM

Mean Area 1086
Mean Conc. 25.25mg/L



Anal.: IC

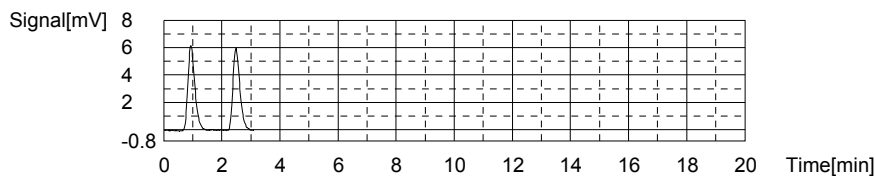
40/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

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	10/3/2017 9:44:17 PM
2	9.855	-0.2556mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	10/3/2017 9:48:27 PM

Mean Area 10.10
Mean Conc. -0.2482mg/L



Sample

Sample Name: L17091704-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

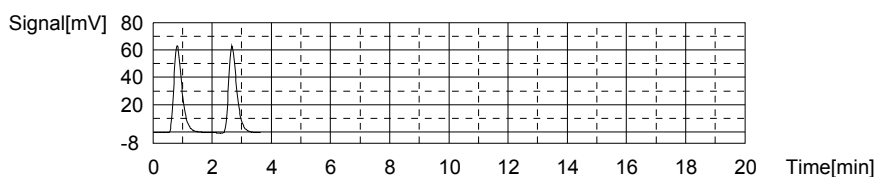
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.175mg/L TC:2.466mg/L IC:0.2916mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	121.8	2.479mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 9:55:48 PM
2	120.7	2.453mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 9:59:51 PM

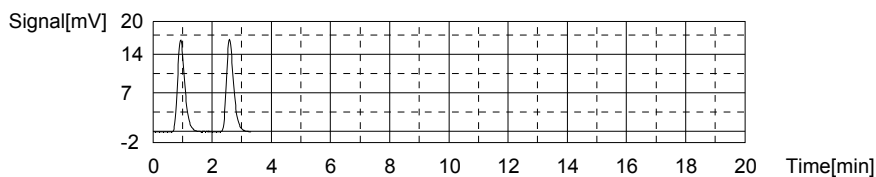
Mean Area 121.3
Mean Conc. 2.466mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	28.19	0.2919mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	10/3/2017 10:04:20 PM
2	28.17	0.2913mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	10/3/2017 10:08:35 PM

Mean Area 28.18
Mean Conc. 0.2916mg/L



Sample

41/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

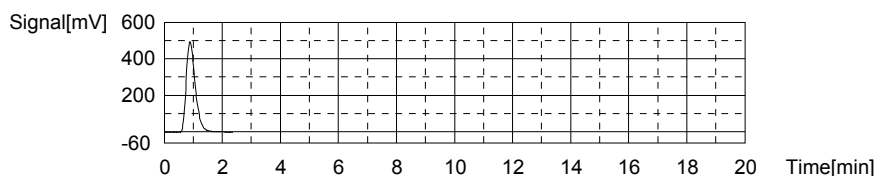
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:25.04mg/L TC:24.79mg/L IC:-0.2552mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1066	24.79mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 10:16:25 PM

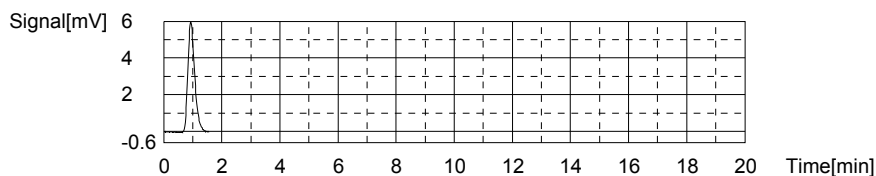
Mean Area 1066
 Mean Conc. 24.79mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.868	-0.2552mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 10:20:50 PM

Mean Area 9.868
 Mean Conc. -0.2552mg/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:0.07012mg/L TC:-0.2766mg/L IC:-0.3467mg/L

1. Det

Anal.: TC

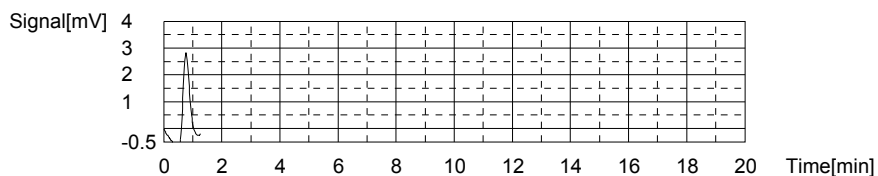
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	5.160	-0.2766mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 10:25:45 PM

42/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

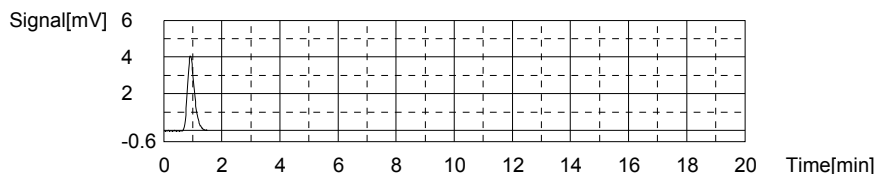
Mean Area 5.160
Mean Conc. -0.2766mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.806	-0.3467mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	110/3/2017 10:29:38 PM

Mean Area 6.806
Mean Conc. -0.3467mg/L



Sample

Sample Name: L17091704-02
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result:

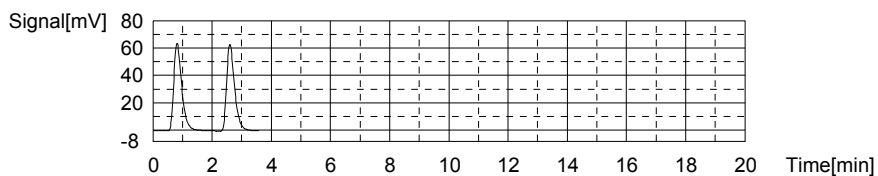
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.087mg/L TC:2.399mg/L IC:0.3124mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	118.6	2.404mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 10:36:56 PM
2	118.2	2.394mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 10:41:00 PM

Mean Area 118.4
Mean Conc. 2.399mg/L

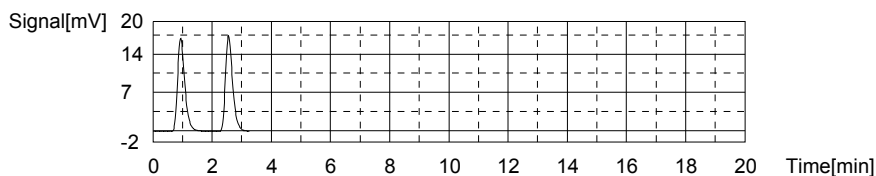


Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	28.43	0.2991mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	110/3/2017 10:45:29 PM
2	29.32	0.3257mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	110/3/2017 10:49:43 PM

43/56

Mean Area 28.88
 Mean Conc. 0.3124mg/L



Sample

Sample Name: WG632222-05 DUP
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

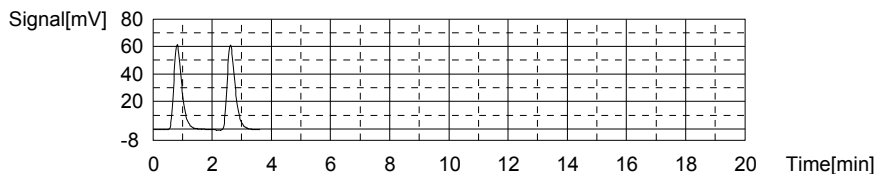
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.081mg/L TC:2.349mg/L IC:0.2683mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	115.7	2.335mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 10:57:01 PM
2	116.9	2.363mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 11:01:07 PM

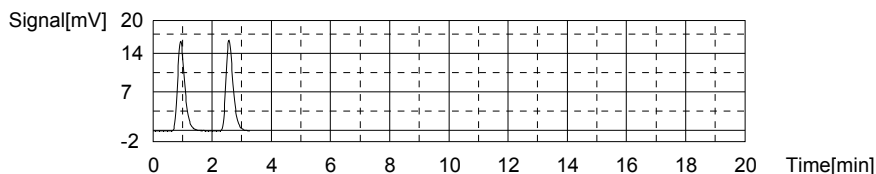
Mean Area 116.3
 Mean Conc. 2.349mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	27.16	0.2612mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 11:05:36 PM
2	27.64	0.2755mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 11:09:51 PM

Mean Area 27.40
 Mean Conc. 0.2683mg/L



Sample

Sample Name: WG632222-06 MS
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

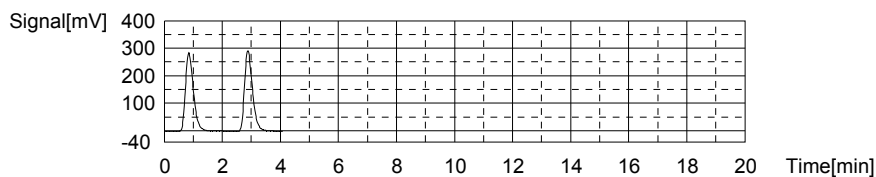
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.30mg/L TC:12.54mg/L IC:0.2379mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	538.1	12.31mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 11:17:22 PM
2	556.9	12.76mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 11:21:41 PM

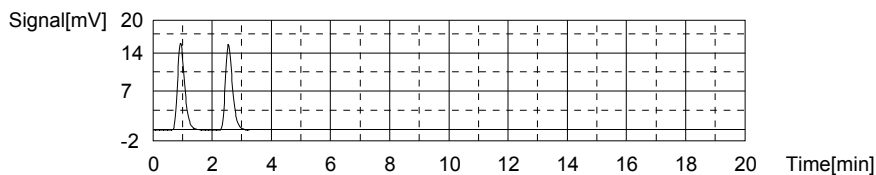
Mean Area 547.5
Mean Conc. 12.54mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	26.46	0.2403mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 11:26:10 PM
2	26.30	0.2355mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/3/2017 11:30:25 PM

Mean Area 26.38
Mean Conc. 0.2379mg/L



Sample

Sample Name: L17100140-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

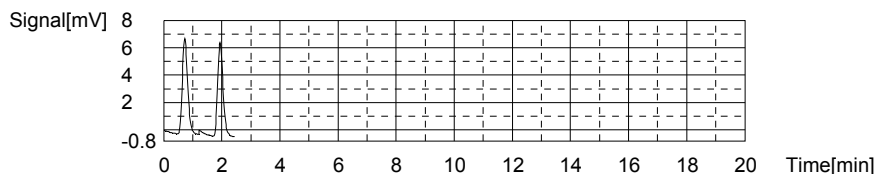
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06196mg/L TC:-0.1910mg/L IC:-0.2530mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.829	-0.1899mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 11:37:08 PM
2	8.729	-0.1922mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/3/2017 11:40:38 PM

Mean Area 8.779
Mean Conc. -0.1910mg/L



Anal.: IC

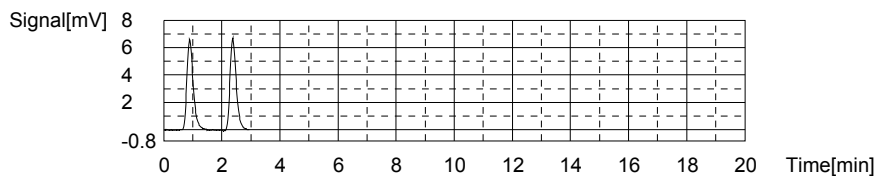
45/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.946	-0.2529mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	110/3/2017 11:44:57 PM
2	9.939	-0.2531mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	110/3/2017 11:48:59 PM

Mean Area 9.942
Mean Conc. -0.2530mg/L



Sample

Sample Name: L17100143-07
Sample ID: <Untitled>
Origin: TOC-02-10-2017A.met
Status: Completed
Chk. Result

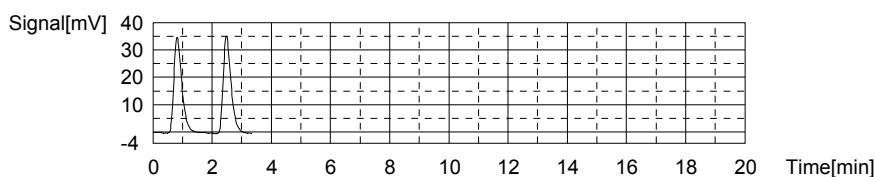
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:1.350mg/L TC:1.148mg/L IC:-0.2019mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	65.05	1.138mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	110/3/2017 11:56:08 PM
2	65.83	1.157mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	110/4/2017 12:00:10 AM

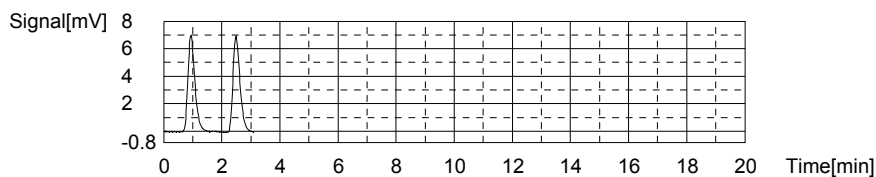
Mean Area 65.44
Mean Conc. 1.148mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	11.61	-0.2032mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	110/4/2017 12:04:33 AM
2	11.70	-0.2005mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	110/4/2017 12:08:44 AM

Mean Area 11.66
Mean Conc. -0.2019mg/L



Sample

46/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

Sample Name:
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

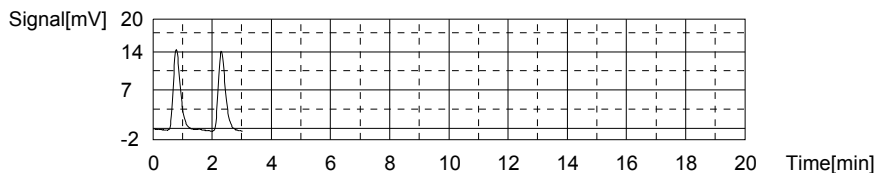
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.3087mg/L TC:0.1803mg/L IC:-0.1284mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	24.52	0.1809mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 12:15:47 AM
2	24.47	0.1797mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 12:19:35 AM

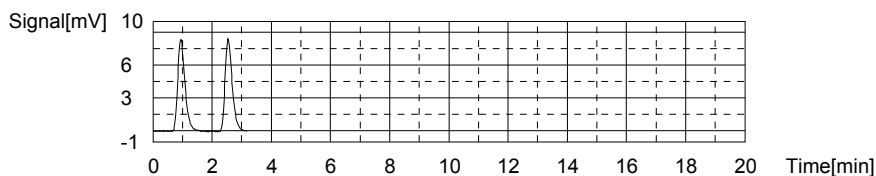
Mean Area 24.50
 Mean Conc. 0.1803mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	14.08	-0.1294mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/4/2017 12:24:02 AM
2	14.15	-0.1274mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_11	10/4/2017 12:28:13 AM

Mean Area 14.12
 Mean Conc. -0.1284mg/L



Sample

Sample Name: L17100056-06 (10)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:18.47mg/L TC:19.11mg/L IC:0.6363mg/L

1. Det

Anal.: TC

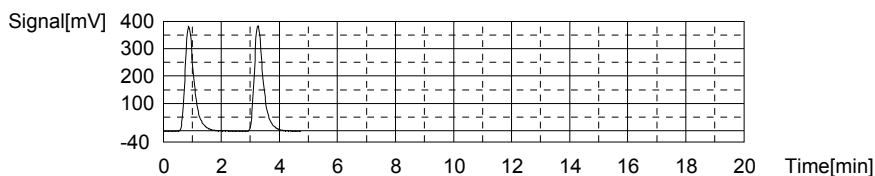
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	824.1	19.07mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 12:36:10 AM
2	827.4	19.15mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 12:40:49 AM

47/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

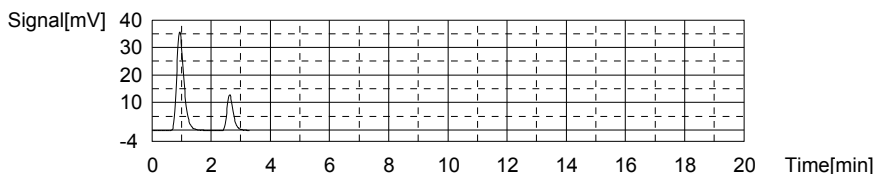
Mean Area 825.8
Mean Conc. 19.11mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	60.18	1.247mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	10/4/2017 12:45:25 AM
2	19.26	0.02525mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	10/4/2017 12:49:36 AM

Mean Area 39.72
Mean Conc. 0.6363mg/L



Sample

Sample Name: L17091719-03 (4)
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result

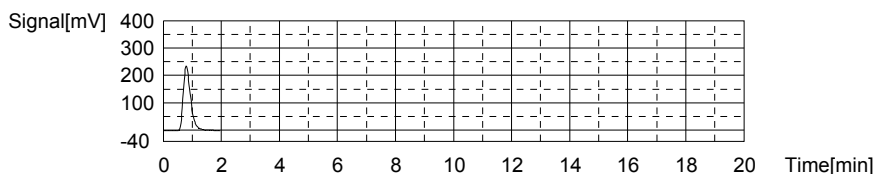
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.776mg/L TC:9.324mg/L IC:5.548mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	411.5	9.324mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 12:57:09 AM

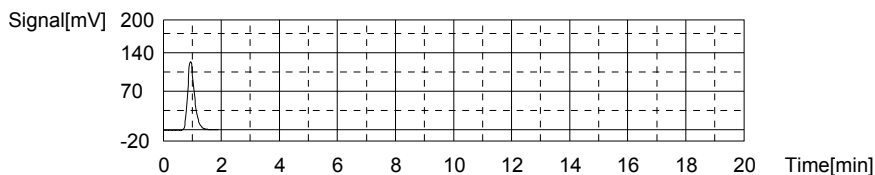
Mean Area 411.5
Mean Conc. 9.324mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	204.2	5.548mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45	10/4/2017 1:01:55 AM

Mean Area 204.2
Mean Conc. 5.548mg/L



Sample

Sample Name: L17100056-02 (10)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

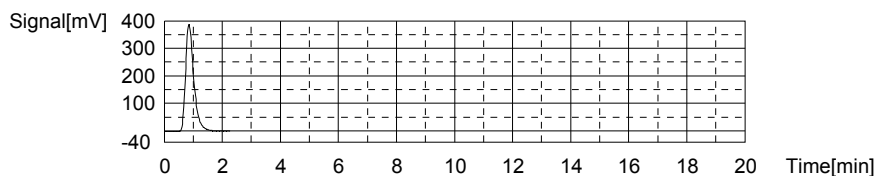
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:15.90mg/L TC:17.58mg/L IC:1.684mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	761.0	17.58mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 1:09:43 AM

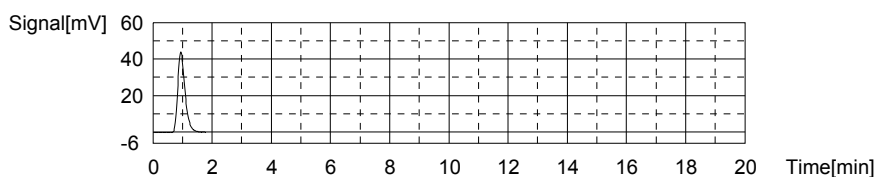
Mean Area 761.0
 Mean Conc. 17.58mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	74.80	1.684mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/4/2017 1:14:22 AM

Mean Area 74.80
 Mean Conc. 1.684mg/L



Sample

Sample Name: L17100056-03 (2)
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result

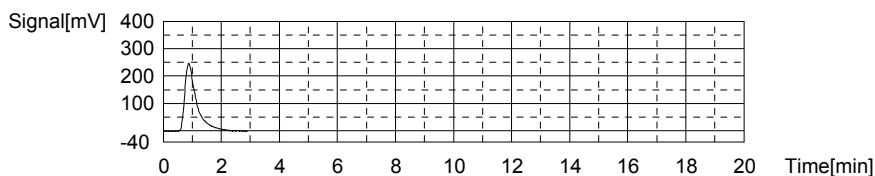
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.72mg/L TC:16.00mg/L IC:1.272mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	693.9	16.00mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 1:22:50 AM

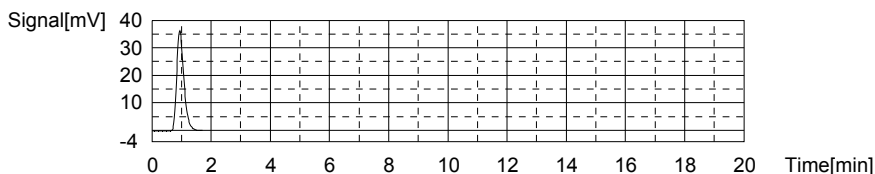
Mean Area 693.9
Mean Conc. 16.00mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	61.02	1.272mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/4/2017 1:27:26 AM

Mean Area 61.02
Mean Conc. 1.272mg/L



Sample

Sample Name: CCV
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

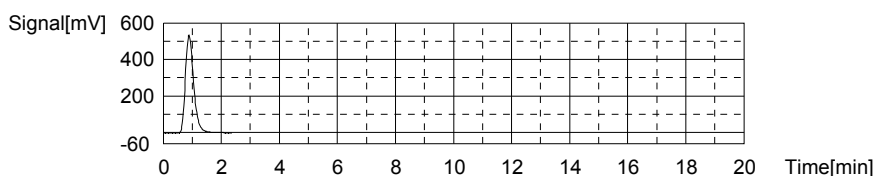
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.74mg/L TC:24.48mg/L IC:-0.2576mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1053	24.48mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 1:35:24 AM

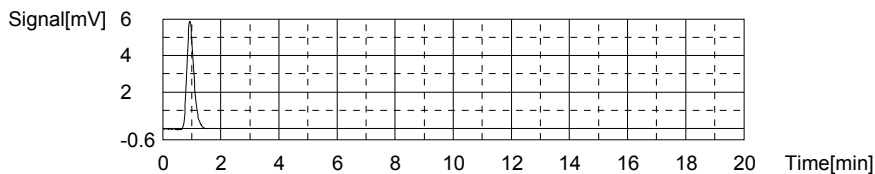
Mean Area 1053
Mean Conc. 24.48mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.789	-0.2576mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/4/2017 1:39:50 AM

Mean Area 9.789
Mean Conc. -0.2576mg/L



Sample

Sample Name: CCB
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

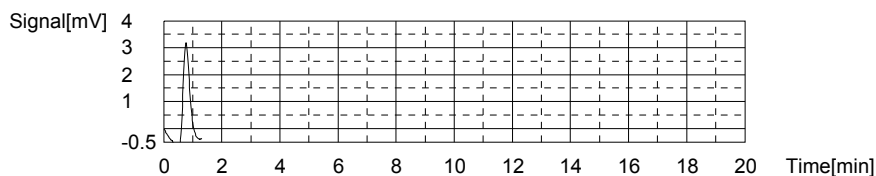
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.07195mg/L TC:-0.2602mg/L IC:-0.3322mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	5.852	-0.2602mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 1:44:48 AM

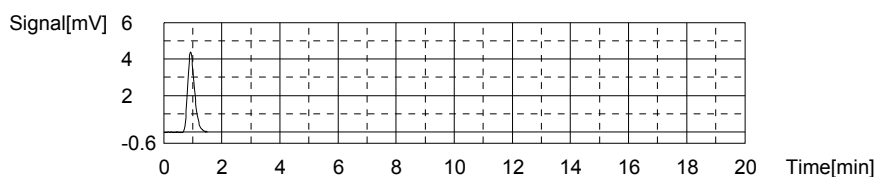
Mean Area 5.852
 Mean Conc. -0.2602mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.292	-0.3322mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/4/2017 1:48:43 AM

Mean Area 7.292
 Mean Conc. -0.3322mg/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:25.30mg/L TC:25.07mg/L IC:-0.2286mg/L

1. Det

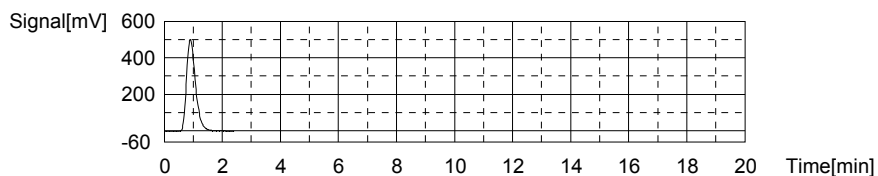
Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1078	25.07mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 1:53:50 PM

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

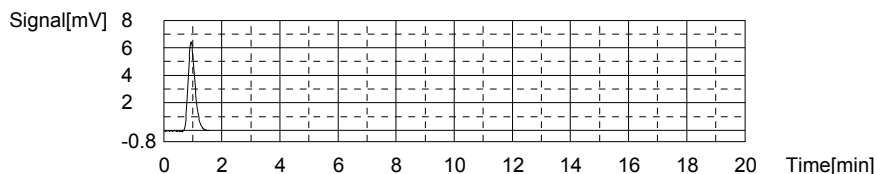
Mean Area 1078
Mean Conc. 25.07mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.76	-0.2286mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/4/2017 1:58:12 PM

Mean Area 10.76
Mean Conc. -0.2286mg/L



Sample

Sample Name: CCB
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

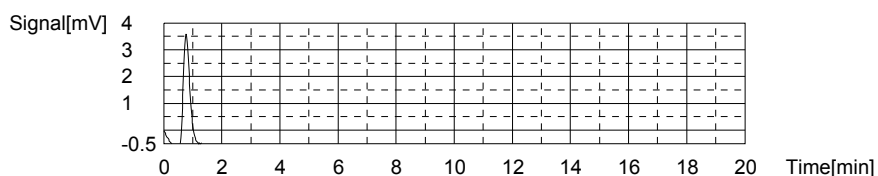
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.06660mg/L TC:-0.2435mg/L IC:-0.3101mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.558	-0.2435mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 2:03:09 PM

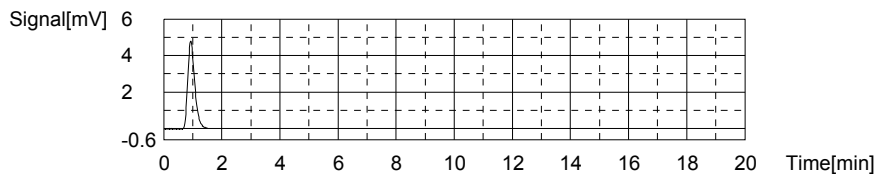
Mean Area 6.558
Mean Conc. -0.2435mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.030	-0.3101mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/4/2017 2:07:01 PM

Mean Area 8.030
Mean Conc. -0.3101mg/L



52/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

Sample

Sample Name: WG632222-02 LCS
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017A.met
 Status: Completed
 Chk. Result:

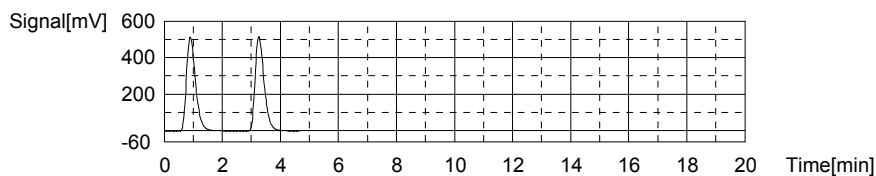
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:26.10mg/L TC:25.86mg/L IC:-0.2362mg/L

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_51	10/4/2017 2:14:53 PM
2	1109	25.80mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 2:19:27 PM

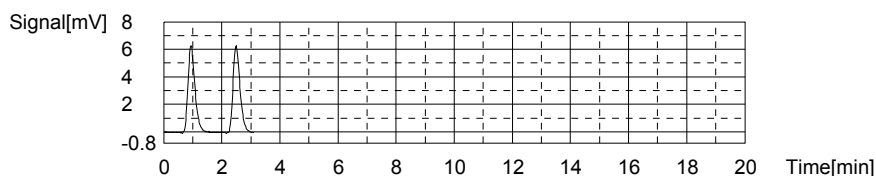
Mean Area 1112
 Mean Conc. 25.86mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.50	-0.2364mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/4/2017 2:23:50 PM
2	10.51	-0.2361mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/4/2017 2:27:58 PM

Mean Area 10.50
 Mean Conc. -0.2362mg/L



Sample

Sample Name: L17100001-01
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.6974mg/L TC:0.6050mg/L IC:-0.09241mg/L

1. Det

Anal.: TC

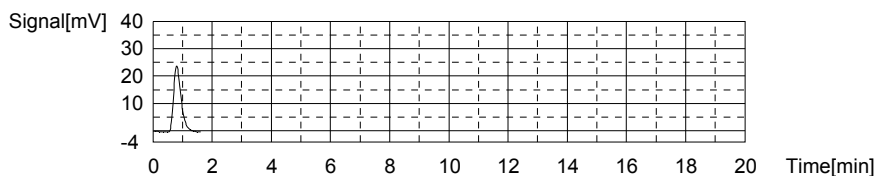
No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	42.47	0.6050mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 2:35:09 PM

53/56

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

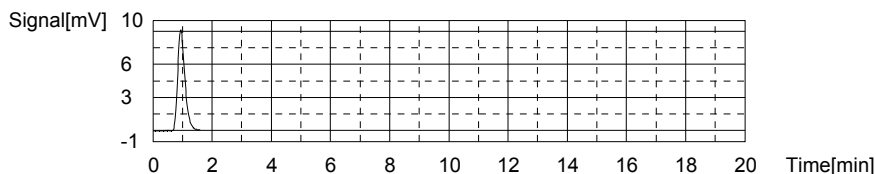
Mean Area 42.47
Mean Conc. 0.6050mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	15.32	-0.09241mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/4/2017 2:39:35 PM

Mean Area 15.32
Mean Conc. -0.09241mg/L



Sample

Sample Name: L17100003-01
Sample ID: <Untitled>
Origin: TOC-02-10-2017.met
Status: Completed
Chk. Result:

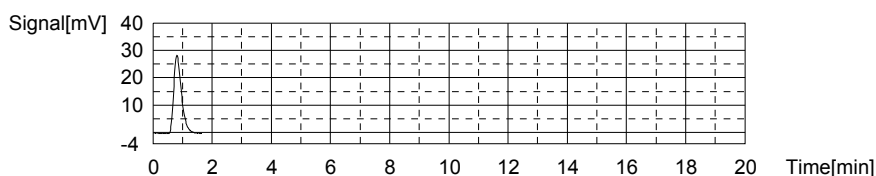
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:0.9338mg/L TC:0.8247mg/L IC:-0.1091mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	51.77	0.8247mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 2:46:42 PM

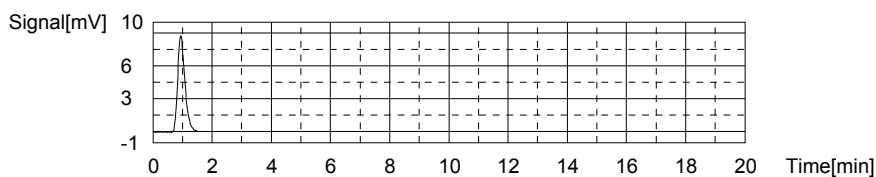
Mean Area 51.77
Mean Conc. 0.8247mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	14.76	-0.1091mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/4/2017 2:51:07 PM

Mean Area 14.76
Mean Conc. -0.1091mg/L



Sample

Sample Name: CCV
 Sample ID: <Untitled>
 Origin: TOC-02-10-2017.met
 Status: Completed
 Chk. Result:

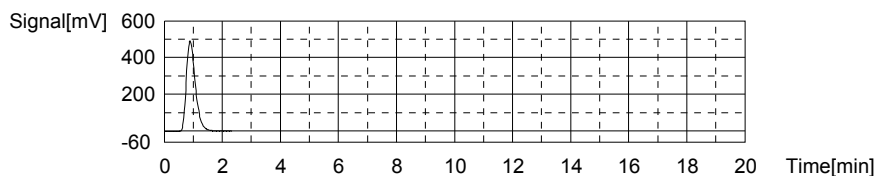
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:24.89mg/L TC:24.67mg/L IC:-0.2241mg/L

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_51	10/4/2017 2:59:08 PM

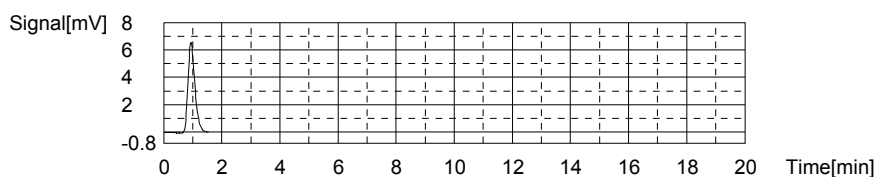
Mean Area 1061
 Mean Conc. 24.67mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.91	-0.2241mg/L	500uL	1		TICURVE-02-10-2017.2017_02_10_14_45_11	10/4/2017 3:03:31 PM

Mean Area 10.91
 Mean Conc. -0.2241mg/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:0.06130mg/L TC:-0.2474mg/L IC:-0.3087mg/L

1. Det

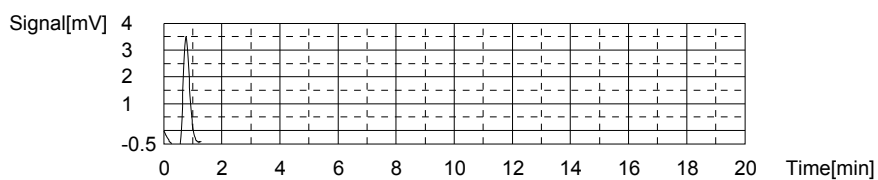
Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.392	-0.2474mg/L	500uL	1		TCCURVE-02-10-2017.2017_02_10_09_32_51	10/4/2017 3:08:27 PM

10/4/2017 3:19:22 PM

10-03-2017-DIH-TOC.i32

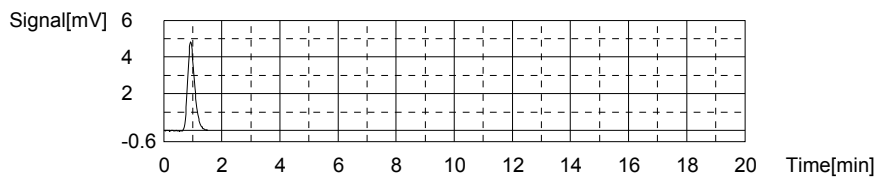
Mean Area 6.392
Mean Conc. -0.2474mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.076	-0.3087mg/L	500uL	1		TICCURVE-02-10-2017.2017_02_10_14_45_1	10/4/2017 3:12:23 PM

Mean Area 8.076
Mean Conc. -0.3087mg/L



56/56

3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
October 9, 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	BLR - BRANDON L. RICHARDS
BNB - Brandi N. Bentley	BRG - BRENDA R. GREGORY
CAS - Craig A. Smith	CEB - CHAD E. BARNES
CLC - CHRYS L. CRAWFORD	CLG - CARA L. GREENWOOD
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

October 09, 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

October 09, 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
WEEKLY SAMPLES

Prepared By:
P.O. Number

Scott Beesinger

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	NO. OF CONTAINERS	Analyses				Remarks (Preservatives, etc.)	Lab I.D.#
					AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE		
LH18/24-SP650-6473	Water	09/27/17 / 15:00		2	X				H2SO4	
LH18/24-SP650-6473	Water	09/27/17 / 15:00		2		X	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>	09/27/17	15:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

Microbac OVD
 Received: 09/28/2017 09:49
 By: GARA STRICKLER
 221000106686
Cara Strickler

(Word) S:\1-cas\Forms\Chain of Custody - BiWeekly

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17091609

Account: 2551

Project: 2551.096

Samples: 1

Due Date: 09-OCT-2017

Samplenum **Container ID** **Products**
L17091609-01 972540 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	28-SEP-2017 13:02	CLS		
2	ANALYZ	W1	WET	28-SEP-2017 16:13	TMM	BRG	

Samplenum **Container ID** **Products**
L17091609-01 972541 6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	28-SEP-2017 13:02	CLS		
2	ANALYZ	W1	SEM	04-OCT-2017 15:10	JWR	CLS	
3	STORE	SEM	A1	05-OCT-2017 14:43	BRG	JWR	

Samplenum **Container ID** **Products**
L17091609-01 972542 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	WET	28-SEP-2017 13:02	CLS		<2
2	STORE	WET	A1	04-OCT-2017 13:51	BRG	DIH	

Samplenum **Container ID** **Products**
L17091609-01 972543 NH3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	WET	28-SEP-2017 13:02	CLS		<2
2	STORE	WET	A1	04-OCT-2017 08:11	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)