



Laboratory Report Number: L16120352

Shane Lowe
CH2MHILL, Inc
CH2MHILL
Richmond Heights, MO 63117

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:
Michelle Taylor – Client Services Specialist
(740) 373-4071
Michelle.Taylor@microbac.com

I certify that all test results meet all of the requirements of the accrediting authority listed below. 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. The reported results are related only to the samples analyzed as received.

This report was certified on December 28 2016

Leslie Bucina – Managing Director

State of Origin: NY
Accrediting Authority: Department of Health ID:10861
QAPP: WATERLOO



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: MW02-120616-MS. 1 of 3 voa vials received broken. BRG	Please proceed. MRT

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
00114313	I	1.0		1002239570910004575000809948944300	X
00113332	I	1.0		1015923870910004575000784892452378	X
00114491	I	0.0		1015923870910004575000784892452389	X
00113668	I	0.0		1015923801190004575000784892452367	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?	No
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

Samples Received

Client ID	Laboratory ID	Date Collected	Date Received
MW23-120616	L16120352-01	12/06/2016 10:57	12/07/2016 10:59
MW23-120616	L16120352-02	12/06/2016 10:57	12/07/2016 10:59
MW23-120616-MS	L16120352-03	12/06/2016 10:57	12/07/2016 10:59
MW23-120616-MS	L16120352-04	12/06/2016 10:57	12/07/2016 10:59
MW23-120616-MSD	L16120352-05	12/06/2016 10:57	12/07/2016 10:59
MW23-120616-MSD	L16120352-06	12/06/2016 10:57	12/07/2016 10:59
MW02-120616	L16120352-07	12/06/2016 11:10	12/07/2016 10:59
MW02-120616	L16120352-08	12/06/2016 11:10	12/07/2016 10:59
MW02-120616-MS	L16120352-09	12/06/2016 11:10	12/07/2016 10:59
MW02-120616-MS	L16120352-10	12/06/2016 11:10	12/07/2016 10:59
MW02-120616-MSD	L16120352-11	12/06/2016 11:10	12/07/2016 10:59
MW02-120616-MSD	L16120352-12	12/06/2016 11:10	12/07/2016 10:59
MW09R-120616	L16120352-13	12/06/2016 14:00	12/07/2016 10:59
MW09R-120616	L16120352-14	12/06/2016 14:00	12/07/2016 10:59
MW01-120616	L16120352-15	12/06/2016 14:38	12/07/2016 10:59
MW01-120616	L16120352-16	12/06/2016 14:38	12/07/2016 10:59
MW16I-120616	L16120352-17	12/06/2016 13:15	12/07/2016 10:59
MW16I-120616	L16120352-18	12/06/2016 13:15	12/07/2016 10:59
MW16I-120616-MS	L16120352-19	12/06/2016 13:15	12/07/2016 10:59
MW16I-120616-MSD	L16120352-20	12/06/2016 13:15	12/07/2016 10:59
MW26-120616	L16120352-21	12/06/2016 14:45	12/07/2016 10:59
MW26-120616	L16120352-22	12/06/2016 14:45	12/07/2016 10:59
MW17-120616	L16120352-23	12/06/2016 11:10	12/07/2016 10:59
MW17-120616	L16120352-24	12/06/2016 11:10	12/07/2016 10:59
TB-120616	L16120352-25	12/06/2016 08:00	12/07/2016 10:59
DUP-GW-120616	L16120352-26	12/06/2016 12:30	12/07/2016 10:59
DUP-GW-120616	L16120352-27	12/06/2016 12:30	12/07/2016 10:59



Login Number: L16120352
Department: Semivolatiles
Analyst: Sarah Bogolin

METHOD

Preparation 3520C

Analysis SW-846 8270C

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

Alternate Source Standards: The percent difference was out of range for the following analyte: Benzoic Acid. Please see the applicable QC report for a detailed presentation of the failure.

Continuing Calibration and Tune: Recoveries out of range were observed for the following analyte: Benzoic Acid. Please see the applicable QC report for a detailed presentation of the failure.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: Recoveries out of range were observed for the following analyte/surrogate: 2,4,6-Tribromophenol failed high in the LCS but was acceptable in the LCSD. Benzoic Acid failed high in the LCSD but was acceptable in the LCS and was non-detect in the associated sample. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
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WG594170-02	2,4,6-Tribromophenol	2016-12-12 12:54:00	125	10	123	Recovery
WG594170-03	Benzoic Acid	2016-12-12 13:26:00	106	10	100	Recovery

Matrix Spikes: There were no MS/MSD results associated with this sample delivery group, due to insufficient volume of sample. The laboratory included an LCS and LCS duplicate in the preparation batch in lieu of the NELAC prescribed MS/MSD. Microbac recommends site specific MS/MSD samples to avoid possible data qualification.

SAMPLES

Samples: All acceptance criteria were met.

Internal Standards: All acceptance criteria were met.

Surrogates: All acceptance criteria were met.

Manual Integration Reason Codes

Reason #1: Data System Fails to Select Correct Peak In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low areacounts for the target compound.

Reason #3: Improperly Integrated Isomers and/or coeluting compounds. This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

Reason #4: System Establishes Incorrect Baseline There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

Reason #5: Miscellaneous Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Managing Director or the QAO will be required.

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Narrative ID: 120382
Approved By: Eric Lawson





Login Number: L16120352
Department: Semivolatiles
Analyst: Sarah Bogolin

METHOD

Preparation 3510C

Analysis SW-846 8270 SIM

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Continuing Calibration and Tune: All acceptance criteria were met.

BATCH QA/QC

Method Blank: Analytes were detected above the applicable reporting limit for the following analyte: Naphthalene. The associated samples were non-detect. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
WG594260-01	Naphthalene	2016-12-12 15:16:00	0.254	0.0250	0.0500	RL

Laboratory Control Sample: Recoveries out of range were observed for the following analyte: Naphthalene failed high but the associated samples were non-detect. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
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WG594260-02	Naphthalene	2016-12-12 15:42:00	115	30	100	Recovery
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Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: Sample 13 was analyzed at a dilution to confirm sample matrix interference in the Internal Standard.

Internal Standards: The initial analysis of sample 13 yielded areas beyond the acceptance limit for one or more internal standards. The sample was reanalyzed at a dilution and yielded acceptable areas, indicating sample matrix interference; only the dilution analysis was reported.

Surrogates: All acceptance criteria were met.

Manual Integration Reason Codes

Reason #1: Data System Fails to Select Correct Peak In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low areacounts for the target compound.

Reason #3: Improperly Integrated Isomers and/or coeluting compounds. This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

Reason #4: System Establishes Incorrect Baseline There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

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Reason #5: Miscellaneous Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Managing Director or the QAO will be required.

Narrative ID: 120478

Approved By: Mary Schilling





Login Number: L16120352
Department: Metals
Analyst: Kerri Buck

METHOD

Preparation: SW-846 3015

Analysis: SW-846 6010

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Interference Check Standards: All acceptance criteria were met.

Continuing Calibration Verification: WG594313 - Due to low level calibration check failure for manganese on 09-Dec-2016 at 14:59, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for manganese.

WG594316 - Due to low level calibration check failure for manganese on 09-Dec-2016 at 14:59 and 20:13, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for manganese.

WG594644 - Due to low level calibration check failure for iron on 14-Dec-2016 at 12:06, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for iron.

WG594872 - Due to low level calibration check failure for iron on 16-Dec-2016 at 00:44, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for iron. Due to low level calibration check failure for sodium on 16-Dec-2016 at 02:54, client samples 17 and 21 along with the batch QA/QC samples were

reanalyzed on a later calibration which was compliant for sodium. Due to continuing calibration verification failure for iron on 18-DEC-2016 at 18:14, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration for iron.

Continuing Calibration Blank: WG594644 - The continuing calibration blank analyzed on 14-Dec-2016 at 20:05, which bracketed the closing ISCA/ICSAB samples, failed high for sodium. However, all client samples were bracketed by compliant CCBs, therefore, no further action was taken.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Serial Dilution/Post Digestion Spikes: WG594313 - All acceptance criteria were met.

WG594316 - All acceptance criteria were met.

WG594644 - All acceptance criteria were met.

WG594872 - All acceptance criteria were met.

Matrix Spikes: WG594313 - Sample 07 was chosen by the client for MS/MSD analysis. Samples 09(MS) and 11(MSD) yielded a noncompliant recovery for one analyte.

WG594644 - Sample 01 was chosen by the client for MS/MSD analysis. Samples 03(MS) and 05(MSD) yielded a noncompliant recovery for two analytes. Sample 02 was chosen by the client for MS/MSD analysis. Samples 04(MS) and 06(MSD) met all acceptance criteria.

WG594872 - Sample 08 was chosen by the client for MS/MSD analysis. Samples 10(MS) and 12(MSD) met all acceptance criteria.

SAMPLES

Samples: WG594313 - Client sample 13 required dilution analysis in order to obtain a result for sodium within the linear range.

WG594644 - Client samples 01, 03, and 05 required dilution analysis in order to obtain a result for sodium within the linear range.

Narrative ID: 120257
Approved By: Kerri Buck

K: K Buck



Login Number: L16120352
Department: Metals
Analyst: Ji Hu

METHOD

Preparation: SW-846 3015

Analysis: SW-846 6020

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Interference Check Standards: All acceptance criteria were met.

Continuing Calibration: WG595999 - Due to continuing calibration verification failure for chromium on 21-DEC-2016 at 22:26, client samples 07,08,09,10,11,12,15,16 and the QC/QA samples were reanalyzed on a later calibration which was compliant for chromium.

Continuing Calibration Blank: All acceptance criteria were met.

Low Level Check: All acceptance criteria were met.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Serial Dilution/Post Digestion Spikes: WG594630 - All acceptance criteria were met.

WG595999 - Due to post digestion spike failure, the post digestion spike was reanalyzed on a later calibration for all analytes.

Matrix Spikes: WG594630 - Sample 01 was chosen by the client for MS/MSD analysis. Samples 03(MS) and 05(MSD) met all acceptance criteria.
Sample 02 was chosen by the client for MS/MSD analysis. Samples 04(MS) and 06(MSD) met all acceptance criteria.

WG595999 - Sample 07 was chosen by the client for MS/MSD analysis. Samples 09(MS) and 11(MSD) met all acceptance criteria. Sample 08 was chosen by the client for MS/MSD analysis. Samples 10(MS) and 12(MSD) met all acceptance criteria.

SAMPLES

Samples: All acceptance criteria were met.

Narrative ID: 120424
Approved By: Kerri Buck

K: K Buck



Login Number: L16120352
Department: General Chromatography
Analyst: Craig Smith

METHOD

Analysis EPA300.0/SW846 9056

HOLDING TIMES

Sample Analysis: Hold times for NO₂ and NO₃ are 48 hours and the hold times for F, Cl, Br, and SO₄ are 28 days. The hold time forms calculate the hold time based on 48 hours. All samples were analyzed in hold.

CALIBRATION

Initial Calibration: All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Continuing Calibration Verification: All acceptance criteria were met.

Continuing Calibration Blank: All acceptance criteria were met.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: The MS/MSD results were not associated with this sample delivery group.

SAMPLES

Samples: Samples 01, 07, and 15 were analyzed at dilutions only due to their pre-run screen results SO₄ which were greater than 200 ppm. Any sample that has a single anion load greater than 200 ppm will be diluted in order to prevent damage to the ion chromatograph, which is caused by repeated overloading of the analytical column and oversaturation of the conductivity suppressor and/or detector.

MANUAL INTEGRATION: No manual integrations were required.

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Narrative ID: 120249

Approved By: Eric Lawson

A handwritten signature in black ink, appearing to read "Eric Lawson", is written over a light gray rectangular background.



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis EPA 310.2 (Alkalinity)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

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Narrative ID: 120650
Approved By: Deanna Hesson

A handwritten signature in black ink that reads "Deanna Hesson".



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis EPA 350.1/SM4500-NH3 B(NH3)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

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Narrative ID: 120651
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis EPA 353.2/SM4500-NO3 F (Nitrate)

HOLDING TIMES

Sample Analysis: The instrument used for the analysis of nitrate only analyzes for nitrate-nitrite (NO₃NO₂) which is the amount of total nitrate (NO₃) and nitrite (NO₂) combined. The NO₃ concentration is determined by analyzing for NO₃NO₂ and NO₂ and calculating NO₃ by the difference. An unpreserved bottle only has a 48 hour hold time for NO₃ and NO₂ separately. However if the bottle is preserved with sulfuric acid, the hold time for NO₃NO₂ is 28 days. The NO₂ was analyzed within 48 hours. The NO₃NO₂ was analyzed from a preserved container within 28 days..

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

SAMPLES

Samples: The sample(s) were diluted to reduce color/matrix interference. The reporting limits are elevated accordingly.

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Narrative ID: 120375
Approved By: Deanna Hesson

Danna Hesson



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis EPA 365.4 (Phosphorus)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

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Narrative ID: 120652
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".



Login Number: L16120352
Department: Conventionals
Analyst: Tammy Morris

METHOD

Analysis EPA 365.2/SM4500-P E (Orthophosphate)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

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Narrative ID: 120654
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".



Login Number: L16120352
Department: Conventionals
Analyst: Todd Boyle

METHOD

Analysis SW-846 9030/EPA 376.1/SM4500-S(-2) F (Sulfide)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

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Narrative ID: 120656
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".



Login Number: L16120352
Department: Conventionals
Analyst: Andrew Essig

METHOD

Analysis EPA 160.1/SM2540 C(Total Dissolved Solids)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

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Narrative ID: 120657
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis EPA 351.2(TKN)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

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Narrative ID: 120653
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis Water: EPA 415.1/SM5310C/SW846 9060 (Total Organic Carbon)
Soil: Lloyd-Khan Methodology

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

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Narrative ID: 120655
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 18:59
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.185927
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.200		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 13:36
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.133635
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	169		0.500	0.250
Magnesium, Total	7439-95-4	22.9		0.500	0.250
Manganese, Total	7439-96-5	0.0781		0.0100	0.00500
Potassium, Total	7440-09-7	11.4		1.00	0.500
Silica, Calculated as SiO2		41.6		2.14	1.07
Silicon, Total	7440-21-3	19.5		1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/21/2016 18:22
Collect Date: 12/06/2016 10:57	Dilution: 10	File ID: T4.122116.182225
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	909		5.00	2.50
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 16:55
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.165518
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.0373		0.00100	0.000500

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: IC3
Client ID: MW23-120616	Prep Method: 300.0	Prep Date: 12/08/2016 18:18
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG594194	Analyst: CAS	Run Date: 12/08/2016 20:00
Collect Date: 12/06/2016 10:57	Dilution: 25	File ID: I3_120816-08
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	289		5.00	2.50
Sulfate	14808-79-8	1240		25.0	12.5

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW23-120616	Prep Method: 310.2	Prep Date: N/A
Matrix: Water	Analytical Method: 310.2	Cal Date: 12/15/2016 15:09
Workgroup #: WG595115	Analyst: DCM	Run Date: 12/15/2016 15:14
Collect Date: 12/06/2016 10:57	Dilution: 5	File ID: S2161215002.015
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	738		100	50.0

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW23-120616	Prep Method: 310.2	Prep Date: N/A
Matrix: Water	Analytical Method: 310.2	Cal Date: 12/12/2016 12:37
Workgroup #: WG594496	Analyst: DCM	Run Date: 12/12/2016 12:43
Collect Date: 12/06/2016 10:57	Dilution: 10	File ID: S2161212004.016
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	775		200	100

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Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW23-120616	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 12/16/2016 08:28
Workgroup #: WG595181	Analyst: DCM	Run Date: 12/16/2016 09:16
Collect Date: 12/06/2016 10:57	Dilution: 2	File ID: S2161216001.054
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	3.32		0.200	0.100

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW23-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 10:57	Dilution: 25	File ID: S216121314554801
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		3.08		1.25	0.625

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW23-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 10:57	Dilution: 25	File ID: S216121314552201
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	3.08		1.25	0.625

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW23-120616	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/09/2016 10:30
Workgroup #: WG594246	Analyst: DCM	Run Date: 12/09/2016 10:38
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: SC161209002.018
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0	0.701		0.200	0.100

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Sample #: L16120352-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: MW23-120616	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 09/13/2016 11:30
Workgroup #: WG593844	Analyst: TMM	Run Date: 12/07/2016 09:00
Collect Date: 12/06/2016 10:57	Dilution: 5	File ID: 00.1612070900-07
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2	0.638		0.250	0.125

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: BURET
Client ID: MW23-120616	Prep Method: SM4500-S(-2)-F-2000	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-S(-2)-F-2000	Cal Date:
Workgroup #: WG594108	Analyst: TB	Run Date: 12/09/2016 10:30
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: ET.1612091030-04
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	8.86		1.00	0.500

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: OVEN
Client ID: MW23-120616	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594068	Analyst: AWE	Run Date: 12/08/2016 11:52
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: EN.1612081152-04
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		3110		20.0	10.0

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW23-120616	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/09/2016 07:55
Workgroup #: WG594210	Analyst: DCM	Run Date: 12/09/2016 08:16
Collect Date: 12/06/2016 10:57	Dilution: 2	File ID: SC161209001.030
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	3.68		0.400	0.200

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Sample #: L16120352-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: MW23-120616	Prep Method: SM5310-C-2011	Prep Date: N/A
Matrix: Water	Analytical Method: SM5310-C-2011	Cal Date:
Workgroup #: WG595004	Analyst: DCM	Run Date: 12/16/2016 08:55
Collect Date: 12/06/2016 10:57	Dilution: 5	File ID: TC12152016.066
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	132		5.00	2.50

Sample #: L16120352-02	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 19:03
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.190328
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	0.0754	J	0.100	0.0500
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-02	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 14:14
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.141430
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Manganese, Dissolved	7439-96-5	0.0805		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-02	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:26
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.172616
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.0351		0.00100	0.000500

Sample #: L16120352-03	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 13:40
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.134030
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	5.57		0.200	0.100
Calcium, Total	7440-70-2	172		0.500	0.250
Magnesium, Total	7439-95-4	28.4		0.500	0.250
Manganese, Total	7439-96-5	0.365		0.0100	0.00500
Potassium, Total	7440-09-7	43.0		1.00	0.500
E	Semiquantitative result (out of calibration range)				

Sample #: L16120352-03	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 19:07
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.190730
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	2.62		0.100	0.0500
E	Semiquantitative result (out of calibration range)				

Sample #: L16120352-03	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/21/2016 18:26
Collect Date: 12/06/2016 10:57	Dilution: 10	File ID: T4.122116.182611
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	930		5.00	2.50

Certificate of Analysis

Sample #: L16120352-03	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 16:58
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.165824
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.171		0.00100	0.000500

Sample #: L16120352-04	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 19:11
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.191117
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	2.47		0.100	0.0500

Sample #: L16120352-04	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 14:18
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.141824
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5	5.66		0.200	0.100
Manganese, Dissolved	7439-96-5	0.374		0.0100	0.00500

Sample #: L16120352-04	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:29
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.172921
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.171		0.00100	0.000500

Certificate of Analysis

Sample #: L16120352-05	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 13:44
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.134417
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	5.60		0.200	0.100
Calcium, Total	7440-70-2	171		0.500	0.250
Magnesium, Total	7439-95-4	28.2		0.500	0.250
Manganese, Total	7439-96-5	0.362		0.0100	0.00500
Potassium, Total	7440-09-7	43.5		1.00	0.500
E	Semiquantitative result (out of calibration range)				

Sample #: L16120352-05	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 19:15
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.191504
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	2.58		0.100	0.0500
E	Semiquantitative result (out of calibration range)				

Sample #: L16120352-05	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/21/2016 18:29
Collect Date: 12/06/2016 10:57	Dilution: 10	File ID: T4.122116.182956
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	913		5.00	2.50

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Sample #: L16120352-05	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:01
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.170130
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.173		0.00100	0.000500

Sample #: L16120352-06	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 14:22
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.142211
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5	5.66		0.200	0.100
Manganese, Dissolved	7439-96-5	0.365		0.0100	0.00500

Sample #: L16120352-06	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 19:18
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.191850
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	2.49		0.100	0.0500

Sample #: L16120352-06	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:32
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.173227
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.170		0.00100	0.000500

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Sample #: L16120352-07	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW02-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 22:11
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 9M977637
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfur dioxide		118		0.000	0.000
n-Butyl ether		9.29		0.000	0.000
unknown		25.0		0.000	0.000
unknown		10.4		0.000	0.000
1-Butanol, 2,2-dimethyl-		8.15		0.000	0.000
Heptane, 4-methyl-		9.07		0.000	0.000
Pentane, 1,1'-oxybis-		6.96		0.000	0.000

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW02-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 22:11
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 9M977637
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,2,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500

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Analyte	CAS #	Result	Qual	RL	MDL
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1	2.97	J	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0	1.99		1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	89.8	80	120		
Dibromofluoromethane	95.8	86	118		
p-Bromofluorobenzene	106	86	115		

Certificate of Analysis

Toluene-d8	102	88	110	
J	The analyte was positively identified, but the quantitation was below the RL.			
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:19
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121416.161950
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.0919		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 15:32
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.120916.153203
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	117		0.500	0.250
Iron, Total	7439-89-6	0.781		0.100	0.0500
Magnesium, Total	7439-95-4	13.1		0.500	0.250
Potassium, Total	7440-09-7	4.61		1.00	0.500
Silica, Calculated as SiO2		14.9		2.14	1.07
Silicon, Total	7440-21-3	6.95		1.00	0.500
Sodium, Total	7440-23-5	153		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 09:41
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.094101
Sample Tag: 02	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.00252		0.00200	0.00100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 17:56
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.175656
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.000736	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: IC3
Client ID: MW02-120616	Prep Method: 300.0	Prep Date: 12/08/2016 18:18
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG594194	Analyst: CAS	Run Date: 12/08/2016 20:20
Collect Date: 12/06/2016 11:10	Dilution: 5	File ID: I3_120816-09
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	110		1.00	0.500
Sulfate	14808-79-8	313		5.00	2.50

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW02-120616	Prep Method: 310.2	Prep Date: N/A
Matrix: Water	Analytical Method: 310.2	Cal Date: 12/12/2016 12:37
Workgroup #: WG594496	Analyst: DCM	Run Date: 12/12/2016 12:54
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: S2161212004.032
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	214		20.0	10.0

Certificate of Analysis

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW02-120616	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 12/16/2016 08:28
Workgroup #: WG595181	Analyst: DCM	Run Date: 12/16/2016 09:18
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: S2161216001.055
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	1.03		0.100	0.0500

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW02-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 11:10	Dilution: 50	File ID: S216121315025601
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		6.10		2.50	1.25

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW02-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 11:10	Dilution: 50	File ID: S216121314562301
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	6.10		2.50	1.25

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW02-120616	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/09/2016 10:30
Workgroup #: WG594246	Analyst: DCM	Run Date: 12/09/2016 10:39
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: SC161209002.021
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0		U	0.200	0.100
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: UV-2600
Client ID: MW02-120616	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 09/13/2016 11:30
Workgroup #: WG593844	Analyst: TMM	Run Date: 12/07/2016 09:00
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 00.1612070900-08
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2	0.0989		0.0500	0.0250

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: BURET
Client ID: MW02-120616	Prep Method: SM4500-S(-2)-F-2000	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-S(-2)-F-2000	Cal Date:
Workgroup #: WG594108	Analyst: TB	Run Date: 12/09/2016 10:30
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: ET.1612091030-05
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	3.44		1.00	0.500

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: OVEN
Client ID: MW02-120616	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594068	Analyst: AWE	Run Date: 12/08/2016 11:52
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: EN.1612081152-05
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		872		20.0	10.0

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW02-120616	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/09/2016 07:55
Workgroup #: WG594210	Analyst: DCM	Run Date: 12/09/2016 08:17
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: SC161209001.031
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	1.14		0.200	0.100

Certificate of Analysis

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: MW02-120616	Prep Method: SM5310-C-2011	Prep Date: N/A
Matrix: Water	Analytical Method: SM5310-C-2011	Cal Date:
Workgroup #: WG595004	Analyst: DCM	Run Date: 12/15/2016 20:19
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: TC12152016.043
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	6.02		1.00	0.500

Sample #: L16120352-08	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 00:59
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121616.005947
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Manganese, Dissolved	7439-96-5	0.0919		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-08	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 17:35
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T3.122216.173507
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	0.701		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-08	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:00
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.180002
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000597	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120352-08	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 10:11
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.101159
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.00246		0.00200	0.00100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120352-09	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW02-120616-MS	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 18:04
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 9M977629
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
No Searchable Peaks				0.000	0.000

Sample #: L16120352-09	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW02-120616-MS	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 18:04
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 9M977629
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6	17.1		1.00	0.500
1,1,2,2-Tetrachloroethane	79-34-5	20.3		1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	18.8		5.00	2.00
1,1,2-Trichloroethane	79-00-5	18.2		1.00	0.500
1,1-Dichloroethane	75-34-3	17.3		1.00	0.500
1,1-Dichloroethene	75-35-4	16.1		1.00	0.500
1,2,3-Trichlorobenzene	87-61-6	18.8		1.00	0.500
1,2,4-Trichlorobenzene	120-82-1	19.4		1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
1,2-Dibromo-3-chloropropane	96-12-8	19.0		5.00	1.00
1,2-Dibromoethane	106-93-4	17.8		1.00	0.500
1,2-Dichlorobenzene	95-50-1	18.8		1.00	0.500
1,2-Dichloroethane	107-06-2	16.9		1.00	0.500
cis-1,2-Dichloroethene	156-59-2	17.5		1.00	0.500
trans-1,2-Dichloroethene	156-60-5	17.2		1.00	0.500
1,2-Dichloropropane	78-87-5	17.7		1.00	0.500
1,3-Dichlorobenzene	541-73-1	18.1		1.00	0.500
1,4-Dichlorobenzene	106-46-7	18.7		1.00	0.500
2-Butanone	78-93-3	19.1		10.0	2.50
2-Hexanone	591-78-6	18.1		10.0	2.50
4-Methyl-2-pentanone	108-10-1	18.3		10.0	2.50
Acetone	67-64-1	18.8		10.0	2.50
Benzene	71-43-2	18.4		1.00	0.500
Bromochloromethane	74-97-5	18.1		1.00	0.500
Bromodichloromethane	75-27-4	17.2		1.00	0.500
Bromoform	75-25-2	19.2		1.00	0.500
Bromomethane	74-83-9	13.1		1.00	0.500
Carbon disulfide	75-15-0	24.5		1.00	0.500
Carbon tetrachloride	56-23-5	17.5		1.00	0.500
Chlorobenzene	108-90-7	18.1		1.00	0.500
Chloroethane	75-00-3	17.5		1.00	0.500
Chloroform	67-66-3	18.6		1.00	0.500
Chloromethane	74-87-3	14.0		1.00	0.500
cis-1,3-Dichloropropene	10061-01-5	17.8		1.00	0.500
Cyclohexane	110-82-7	14.0		5.00	1.00
Dibromochloromethane	124-48-1	17.9		1.00	0.500
Dichlorodifluoromethane	75-71-8	13.5		1.00	0.500
Ethyl benzene	100-41-4	17.8		1.00	0.500
Isopropylbenzene	98-82-8	17.9		1.00	0.500
Methyl acetate	79-20-9	15.8		5.00	1.00
Methyl tert-butyl ether	1634-04-4	17.1		1.00	0.500
Methylcyclohexane	108-87-2	15.8		5.00	1.00
Methylene chloride	75-09-2	17.3		5.00	0.500
m,p-Xylene	179601-23-1	37.6		1.00	0.500
o-Xylene	95-47-6	17.4		1.00	0.500
Styrene	100-42-5	17.9		1.00	0.500
Tetrachloroethene	127-18-4	18.3		1.00	0.500
Toluene	108-88-3	17.1		1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
trans-1,3-Dichloropropene	10061-02-6	17.2		1.00	0.500
Trichloroethene	79-01-6	16.8		1.00	0.500
Trichlorofluoromethane	75-69-4	15.9		1.00	0.500
Vinyl chloride	75-01-4	15.3		1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	87.9	80	120	
Dibromofluoromethane	94.1	86	118	
p-Bromofluorobenzene	103	86	115	
Toluene-d8	101	88	110	

Sample #: L16120352-09	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 15:35
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.120916.153547
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	5.97		0.200	0.100
Calcium, Total	7440-70-2	124		0.500	0.250
Iron, Total	7439-89-6	3.21		0.100	0.0500
Magnesium, Total	7439-95-4	19.3		0.500	0.250
Potassium, Total	7440-09-7	34.5		1.00	0.500
Sodium, Total	7440-23-5	182		0.500	0.250

Sample #: L16120352-09	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:23
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121416.162336
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.385		0.0100	0.00500

Certificate of Analysis

Sample #: L16120352-09	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:03
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.180307
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.129		0.00100	0.000500

Sample #: L16120352-09	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 09:44
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.094406
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.128		0.00200	0.00100

Sample #: L16120352-10	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/12/2016 12:09
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:03
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121616.010332
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5	5.88		0.200	0.100
Manganese, Dissolved	7439-96-5	0.392		0.0100	0.00500

Sample #: L16120352-10	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/12/2016 12:09
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 17:38
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T3.122216.173859
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	3.13		0.100	0.0500

Certificate of Analysis

Sample #: L16120352-10	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 10:15
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.101504
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.129		0.00200	0.00100

Sample #: L16120352-10	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:09
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.180918
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.132		0.00100	0.000500

Sample #: L16120352-11	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW02-120616-MSD	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 18:34
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 9M977630
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
No Searchable Peaks				0.000	0.000

Sample #: L16120352-11	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW02-120616-MSD	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 18:34
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 9M977630
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6	17.4		1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5	22.1		1.00	0.500
1,1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	15.9		5.00	2.00

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Analyte	CAS #	Result	Qual	RL	MDL
1,1,2-Trichloroethane	79-00-5	19.8		1.00	0.500
1,1-Dichloroethane	75-34-3	18.1		1.00	0.500
1,1-Dichloroethene	75-35-4	15.9		1.00	0.500
1,2,3-Trichlorobenzene	87-61-6	20.5		1.00	0.500
1,2,4-Trichlorobenzene	120-82-1	20.7		1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8	21.4		5.00	1.00
1,2-Dibromoethane	106-93-4	19.6		1.00	0.500
1,2-Dichlorobenzene	95-50-1	20.0		1.00	0.500
1,2-Dichloroethane	107-06-2	18.0		1.00	0.500
cis-1,2-Dichloroethene	156-59-2	18.6		1.00	0.500
trans-1,2-Dichloroethene	156-60-5	17.8		1.00	0.500
1,2-Dichloropropane	78-87-5	18.7		1.00	0.500
1,3-Dichlorobenzene	541-73-1	19.3		1.00	0.500
1,4-Dichlorobenzene	106-46-7	19.7		1.00	0.500
2-Butanone	78-93-3	20.2		10.0	2.50
2-Hexanone	591-78-6	19.1		10.0	2.50
4-Methyl-2-pentanone	108-10-1	18.9		10.0	2.50
Acetone	67-64-1	20.1		10.0	2.50
Benzene	71-43-2	19.4		1.00	0.500
Bromochloromethane	74-97-5	19.6		1.00	0.500
Bromodichloromethane	75-27-4	18.3		1.00	0.500
Bromoform	75-25-2	21.5		1.00	0.500
Bromomethane	74-83-9	6.84		1.00	0.500
Carbon disulfide	75-15-0	22.8		1.00	0.500
Carbon tetrachloride	56-23-5	17.1		1.00	0.500
Chlorobenzene	108-90-7	19.2		1.00	0.500
Chloroethane	75-00-3	16.1		1.00	0.500
Chloroform	67-66-3	19.9		1.00	0.500
Chloromethane	74-87-3	12.1		1.00	0.500
cis-1,3-Dichloropropene	10061-01-5	19.2		1.00	0.500
Cyclohexane	110-82-7	11.8		5.00	1.00
Dibromochloromethane	124-48-1	19.3		1.00	0.500
Dichlorodifluoromethane	75-71-8	11.2		1.00	0.500
Ethyl benzene	100-41-4	18.5		1.00	0.500
Isopropylbenzene	98-82-8	18.6		1.00	0.500
Methyl acetate	79-20-9	16.6		5.00	1.00
Methyl tert-butyl ether	1634-04-4	17.2		1.00	0.500
Methylcyclohexane	108-87-2	13.1		5.00	1.00
Methylene chloride	75-09-2	18.1		5.00	0.500

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Analyte	CAS #	Result	Qual	RL	MDL
m,p-Xylene	179601-23-1	39.6		1.00	0.500
o-Xylene	95-47-6	18.2		1.00	0.500
Styrene	100-42-5	19.1		1.00	0.500
Tetrachloroethene	127-18-4	18.3		1.00	0.500
Toluene	108-88-3	17.9		1.00	0.500
trans-1,3-Dichloropropene	10061-02-6	18.6		1.00	0.500
Trichloroethene	79-01-6	17.2		1.00	0.500
Trichlorofluoromethane	75-69-4	13.8		1.00	0.500
Vinyl chloride	75-01-4	13.5		1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	90.5	80	120		
Dibromofluoromethane	96.6	86	118		
p-Bromofluorobenzene	103	86	115		
Toluene-d8	103	88	110		

Sample #: L16120352-11	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:27
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121416.162712
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.379		0.0100	0.00500

Sample #: L16120352-11	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 15:50
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.120916.155033
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	5.85		0.200	0.100
Calcium, Total	7440-70-2	126		0.500	0.250
Iron, Total	7439-89-6	3.17		0.100	0.0500
Magnesium, Total	7439-95-4	19.2		0.500	0.250
Potassium, Total	7440-09-7	33.7		1.00	0.500
Sodium, Total	7440-23-5	183		0.500	0.250

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Sample #: L16120352-11	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:06
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.180612
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.129		0.00100	0.000500

Sample #: L16120352-11	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 09:47
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.094711
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.127		0.00200	0.00100

Sample #: L16120352-12	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/12/2016 12:09
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:07
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121616.010707
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5	5.90		0.200	0.100
Manganese, Dissolved	7439-96-5	0.388		0.0100	0.00500

Sample #: L16120352-12	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/12/2016 12:09
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 17:42
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T3.122216.174238
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	2.99		0.100	0.0500

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Sample #: L16120352-12	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:12
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.181223
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.128		0.00100	0.000500

Sample #: L16120352-12	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 10:18
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.101809
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.127		0.00200	0.00100

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW09R-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 22:42
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: 9M977638
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfur dioxide		21.2		0.000	0.000
n-Butyl ether		14.7		0.000	0.000
[1,4,5]Oxadithiepane		11.4		0.000	0.000

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW09R-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 22:42
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: 9M977638
Sample Tag: 01	Units: ug/L	

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Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500

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Analyte	CAS #	Result	Qual	RL	MDL
1,1,1,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500

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Analyte	CAS #	Result	Qual	RL	MDL
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	90.1	80	120		
Dibromofluoromethane	96.3	86	118		
p-Bromofluorobenzene	108	86	115		
Toluene-d8	101	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: HPMS4
Client ID: MW09R-120616	Prep Method: 3520C	Prep Date: 12/08/2016 15:40
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/23/2016 14:59
Workgroup #: WG594505	Analyst: SCB	Run Date: 12/12/2016 18:16
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: 4M81320
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	22.2	2.78
1,3,5-Trinitrobenzene	99-35-4		U	5.56	2.78
1,3-Dinitrobenzene	99-65-0		U	5.56	2.78
1,4-Dioxane	123-91-1		U	11.1	5.56
2,4,5-Trichlorophenol	95-95-4		U	5.56	2.78
2,4,6-Trichlorophenol	88-06-2		U	5.56	2.78
2,4-Dichlorophenol	120-83-2		U	5.56	2.78
2,4-Dimethylphenol	105-67-9		U	5.56	2.78
2,4-Dinitrophenol	51-28-5		U	27.8	13.9
2,4-Dinitrotoluene	121-14-2		U	5.56	2.78
2,6-Dinitrotoluene	606-20-2		U	5.56	2.78
2-Chloronaphthalene	91-58-7		U	5.56	2.78
2-Chlorophenol	95-57-8		U	5.56	2.78

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Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	5.56	2.78
2-Methylphenol	95-48-7		U	5.56	2.78
2-Nitroaniline	88-74-4		U	27.8	13.9
2-Nitrophenol	88-75-5		U	5.56	2.78
3-Nitroaniline	99-09-2		U	27.8	13.9
3,3'-Dichlorobenzidine	91-94-1		U	5.56	2.78
3-,4-Methylphenol	65794-96-9		U	5.56	2.78
4-Bromophenyl-phenylether	101-55-3		U	5.56	2.78
4-Chloroaniline	106-47-8		U	5.56	2.78
4-Nitrophenol	100-02-7		U	27.8	13.9
Acenaphthene	83-32-9		U	5.56	2.78
Acenaphthylene	208-96-8		U	5.56	2.78
Anthracene	120-12-7		U	5.56	2.78
Benzo(a)anthracene	56-55-3		U	5.56	2.78
Benzo(a)pyrene	50-32-8		U	5.56	2.78
Benzo(b)fluoranthene	205-99-2		U	5.56	2.78
Benzo(g,h,i)Perylene	191-24-2		U	5.56	2.78
Benzo(k)fluoranthene	207-08-9		U	5.56	2.78
Benzoic acid	65-85-0		U	22.2	11.1
Benzyl alcohol	100-51-6		U	5.56	2.78
Bis(2-Chloroethyl)ether	111-44-4		U	5.56	2.78
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.56	2.78
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.56	2.78
Butylbenzylphthalate	85-68-7		U	5.56	2.78
Carbazole	86-74-8		U	22.2	2.78
Chrysene	218-01-9		U	5.56	2.78
Di-N-Butylphthalate	84-74-2		U	5.56	2.78
Di-n-octylphthalate	117-84-0		U	5.56	2.78
Dibenzo(a,h)Anthracene	53-70-3		U	5.56	2.78
Dibenzofuran	132-64-9		U	5.56	2.78
Diethylphthalate	84-66-2		U	5.56	2.78
Dimethylphthalate	131-11-3		U	5.56	2.78
Fluoranthene	206-44-0		U	5.56	2.78
Fluorene	86-73-7		U	5.56	2.78
Hexachlorobenzene	118-74-1		U	5.56	2.78
Hexachlorobutadiene	87-68-3		U	5.56	2.78
Hexachlorocyclopentadiene	77-47-4		U	5.56	2.78
Hexachloroethane	67-72-1		U	5.56	2.78
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.56	2.78

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Isophorone	78-59-1		U	5.56	2.78
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.56	2.78
Naphthalene	91-20-3		U	5.56	2.78
Nitrobenzene	98-95-3		U	5.56	2.78
Pentachlorophenol	87-86-5		U	27.8	13.9
Phenanthrene	85-01-8		U	5.56	2.78
Phenol	108-95-2		U	5.56	2.78
Pyrene	129-00-0		U	5.56	2.78

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2,4,6-Tribromophenol	106	10	123	
2-Fluorobiphenyl	75.7	43	116	
2-Fluorophenol	57.8	21	100	
Nitrobenzene-d5	82.1	35	114	
p-Terphenyl-d14	60.3	33	141	
Phenol-d5	64.5	10	94	

U Not detected at or above adjusted sample detection limit.

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: HPMS4
Client ID: MW09R-120616	Prep Method: 3520C	Prep Date: 12/08/2016 15:40
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/23/2016 14:59
Workgroup #: WG594505	Analyst: SCB	Run Date: 12/12/2016 18:16
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: 4M81320
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
Trichloroethylene		248		0.000	0.000
Ethane, 1,1,2-trichloro-		48.9		0.000	0.000
3-Hexen-2-one		15.0		0.000	0.000
Tetrachloroethylene		14.0		0.000	0.000
1-Propene, 1,2,3-trichloro-, (Z)-		41.9		0.000	0.000
1,4-Oxathiane		31.3		0.000	0.000
Ethane, 1,1,2,2-tetrachloro-		749		0.000	0.000
1-Propene, 1,1,2,3-tetrachloro-		441		0.000	0.000
Ethane, pentachloro-		138		0.000	0.000
1-Propene, 1,2,3,3-tetrachloro-		21.6		0.000	0.000
UNKNOWN		18.8		0.000	0.000
UNKNOWN2		17.1		0.000	0.000
[1,4,5]Oxadithiepane		344		0.000	0.000
UNKNOWN3		17.6		0.000	0.000
UNKNOWN4		29.8		0.000	0.000

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN5		24.4		0.000	0.000
UNKNOWN6		23.7		0.000	0.000
UNKNOWN7		10.1		0.000	0.000
UNKNOWN8		15.2		0.000	0.000
n-Hexadecanoic acid		9.91		0.000	0.000

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW09R-120616	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/13/2016 12:46
Collect Date: 12/06/2016 14:00	Dilution: 10	File ID: 7M68299
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.538	0.269
Acenaphthene	83-32-9		U	0.538	0.269
Acenaphthylene	208-96-8		U	0.538	0.269
Anthracene	120-12-7		U	0.538	0.269
Benzo(a)anthracene	56-55-3		U	0.538	0.269
Benzo(a)pyrene	50-32-8		U	0.538	0.269
Benzo(b)fluoranthene	205-99-2		U	0.538	0.269
Benzo(g,h,i)perylene	191-24-2		U	0.538	0.269
Benzo(k)fluoranthene	207-08-9		U	0.538	0.269
Chrysene	218-01-9		U	0.538	0.269
Dibenzo(a,h)anthracene	53-70-3		U	0.538	0.269
Fluoranthene	206-44-0		U	0.538	0.269
Fluorene	86-73-7		U	0.538	0.269
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.538	0.269
Naphthalene	91-20-3		U	0.538	0.269
Phenanthrene	85-01-8		U	0.538	0.269
Pyrene	129-00-0		U	0.538	0.269

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2-Fluorobiphenyl	78.1	43	116	
Nitrobenzene-d5	78.4	35	114	
p-Terphenyl-d14	81.9	33	141	
U	Not detected at or above adjusted sample detection limit.			

Certificate of Analysis

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:30
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: T4.121416.163047
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.735		0.0100	0.00500
E	Semiquantitative result (out of calibration range)				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 16:35
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: T4.120916.163529
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	319		0.500	0.250
Iron, Total	7439-89-6	7.02		0.100	0.0500
Magnesium, Total	7439-95-4	96.4		0.500	0.250
Potassium, Total	7440-09-7	10.9		1.00	0.500
E	Semiquantitative result (out of calibration range)				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 17:21
Collect Date: 12/06/2016 14:00	Dilution: 5	File ID: T4.120916.172140
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	732		2.50	1.25
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:15
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: NI.122116.181529
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00688		0.00100	0.000500

Sample #: L16120352-14	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:34
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: T4.121416.163440
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Dissolved	7439-96-5	0.700		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-14	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 16:39
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: T4.120916.163921
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Iron, Dissolved	7439-89-6	6.64		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-14	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:30
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: NI.122116.183059
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00536		0.00100	0.000500

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW01-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 23:13
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: 9M977639
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfur dioxide		12.6		0.000	0.000

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW01-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 23:13
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: 9M977639
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,2,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50

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Analyte	CAS #	Result	Qual	RL	MDL
Acetone	67-64-1	2.58	J	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3	1.32		1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000

J	The analyte was positively identified, but the quantitation was below the RL.
U	Not detected at or above adjusted sample detection limit.

Certificate of Analysis

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 16:43
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: T4.120916.164314
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	98.6		0.500	0.250
Iron, Total	7439-89-6	2.55		0.100	0.0500
Magnesium, Total	7439-95-4	12.0		0.500	0.250
Potassium, Total	7440-09-7	4.79		1.00	0.500
Silica, Calculated as SiO2		10.9		2.14	1.07
Silicon, Total	7440-21-3	5.07		1.00	0.500
Sodium, Total	7440-23-5	244		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:46
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: T4.121416.164606
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.155		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 09:50
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: NI.122316.095017
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.00235		0.00200	0.00100

Certificate of Analysis

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:34
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: NI.122116.183404
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00711		0.00100	0.000500

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: IC3
Client ID: MW01-120616	Prep Method: 300.0	Prep Date: 12/08/2016 18:18
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG594194	Analyst: CAS	Run Date: 12/08/2016 20:41
Collect Date: 12/06/2016 14:38	Dilution: 5	File ID: I3_120816-10
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	379	E	1.00	0.500
Sulfate	14808-79-8	82.3		5.00	2.50
E	Semiquantitative result (out of calibration range)				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: IC3
Client ID: MW01-120616	Prep Method: 300.0	Prep Date: 12/08/2016 18:18
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG594194	Analyst: CAS	Run Date: 12/08/2016 21:01
Collect Date: 12/06/2016 14:38	Dilution: 25	File ID: I3_120816-11
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	427		5.00	2.50
Sulfate	14808-79-8	81.2		25.0	12.5

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW01-120616	Prep Method: 310.2	Prep Date: N/A
Matrix: Water	Analytical Method: 310.2	Cal Date: 12/12/2016 12:37
Workgroup #: WG594496	Analyst: DCM	Run Date: 12/12/2016 12:44
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: S2161212004.018
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	186		20.0	10.0

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW01-120616	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 12/16/2016 08:28
Workgroup #: WG595181	Analyst: DCM	Run Date: 12/16/2016 08:38
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: S2161216001.017
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	0.595		0.100	0.0500

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW01-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 14:38	Dilution: 4	File ID: S216121315033201
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		0.908		0.200	0.100

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW01-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 14:38	Dilution: 4	File ID: S216121315030801
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	0.908		0.200	0.100

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW01-120616	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/09/2016 10:30
Workgroup #: WG594246	Analyst: DCM	Run Date: 12/09/2016 10:40
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: SC161209002.022
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0	0.127	J	0.200	0.100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: UV-2600
Client ID: MW01-120616	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 09/13/2016 11:30
Workgroup #: WG593844	Analyst: TMM	Run Date: 12/07/2016 09:00
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: 00.1612070900-09
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2		U	0.0500	0.0250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: BURET
Client ID: MW01-120616	Prep Method: SM4500-S-(-2)-F-2000	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-S-(-2)-F-2000	Cal Date:
Workgroup #: WG594108	Analyst: TB	Run Date: 12/09/2016 10:30
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: ET.1612091030-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	0.571	J	1.00	0.500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: OVEN
Client ID: MW01-120616	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594068	Analyst: AWE	Run Date: 12/08/2016 11:52
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: EN.1612081152-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		1010		20.0	10.0

Certificate of Analysis

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW01-120616	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/09/2016 07:55
Workgroup #: WG594210	Analyst: DCM	Run Date: 12/09/2016 08:20
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: SC161209001.034
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	0.585		0.200	0.100

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: TOC-VVWP
Client ID: MW01-120616	Prep Method: SM5310-C-2011	Prep Date: N/A
Matrix: Water	Analytical Method: SM5310-C-2011	Cal Date:
Workgroup #: WG595004	Analyst: DCM	Run Date: 12/15/2016 20:32
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: TC12152016.044
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	8.21		1.00	0.500

Sample #: L16120352-16	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 17:46
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: T3.122216.174617
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	2.27		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-16	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:10
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: T4.121616.011045
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Manganese, Dissolved	7439-96-5	0.156		0.0100	0.00500

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U	Not detected at or above adjusted sample detection limit.
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Sample #: L16120352-16	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:37
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: NI.122116.183710
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00594		0.00100	0.000500

Sample #: L16120352-16	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 09:53
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: NI.122316.095322
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.00234		0.00200	0.00100

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW161-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/28/2016 17:30
Workgroup #: WG594657	Analyst: ADC	Run Date: 12/13/2016 15:55
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 9M977669
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
No Searchable Peaks				0.000	0.000

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW161-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594657	Analyst: ADC	Run Date: 12/13/2016 15:55
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 9M977669
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500

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Analyte	CAS #	Result	Qual	RL	MDL
1,1,1,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500

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Analyte	CAS #	Result	Qual	RL	MDL
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	88.7	80	120		
Dibromofluoromethane	95.1	86	118		
p-Bromofluorobenzene	106	86	115		
Toluene-d8	101	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW161-120616	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/12/2016 16:36
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 7M68265
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0543	0.0272
Acenaphthene	83-32-9		U	0.0543	0.0272
Acenaphthylene	208-96-8		U	0.0543	0.0272
Anthracene	120-12-7		U	0.0543	0.0272
Benzo(a)anthracene	56-55-3		U	0.0543	0.0272
Benzo(a)pyrene	50-32-8		U	0.0543	0.0272
Benzo(b)fluoranthene	205-99-2		U	0.0543	0.0272
Benzo(g,h,i)perylene	191-24-2		U	0.0543	0.0272
Benzo(k)fluoranthene	207-08-9		U	0.0543	0.0272
Chrysene	218-01-9		U	0.0543	0.0272
Dibenzo(a,h)anthracene	53-70-3		U	0.0543	0.0272
Fluoranthene	206-44-0		U	0.0543	0.0272
Fluorene	86-73-7		U	0.0543	0.0272

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0543	0.0272
Naphthalene	91-20-3		U	0.0543	0.0272
Phenanthrene	85-01-8		U	0.0543	0.0272
Pyrene	129-00-0		U	0.0543	0.0272
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	80.9	43	116		
Nitrobenzene-d5	90.5	35	114		
p-Terphenyl-d14	80.8	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW161-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 17:50
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: T3.122216.175009
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	6.86		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW161-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/18/2016 11:25
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/18/2016 18:51
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: T4.121816.185156
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	75.7		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW161-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:14
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: T4.121616.011431
Sample Tag: 01	Units: mg/L	

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Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	118		0.500	0.250
Magnesium, Total	7439-95-4	22.3		0.500	0.250
Manganese, Total	7439-96-5	0.227		0.0100	0.00500
Potassium, Total	7440-09-7	6.01		1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW161-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:40
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: NI.122116.184015
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00140		0.00100	0.000500

Sample #: L16120352-18	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW161-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:18
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: T4.121616.011817
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Manganese, Dissolved	7439-96-5	0.219		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-18	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW161-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 18:01
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: T3.122216.180132
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	6.26		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-18	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW161-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:43
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: NI.122116.184321
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00150		0.00100	0.000500

Sample #: L16120352-19	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW161-120616-MS	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594657	Analyst: ADC	Run Date: 12/13/2016 13:25
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 9M977664
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6	17.6		1.00	0.500
1,1,2,2-Tetrachloroethane	79-34-5	21.6		1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	17.7		5.00	2.00
1,1,2-Trichloroethane	79-00-5	18.9		1.00	0.500
1,1-Dichloroethane	75-34-3	17.9		1.00	0.500
1,1-Dichloroethene	75-35-4	16.5		1.00	0.500
1,2,3-Trichlorobenzene	87-61-6	20.2		1.00	0.500
1,2,4-Trichlorobenzene	120-82-1	20.5		1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8	19.6		5.00	1.00
1,2-Dibromoethane	106-93-4	18.4		1.00	0.500
1,2-Dichlorobenzene	95-50-1	19.4		1.00	0.500
1,2-Dichloroethane	107-06-2	17.8		1.00	0.500
cis-1,2-Dichloroethene	156-59-2	18.5		1.00	0.500
trans-1,2-Dichloroethene	156-60-5	18.4		1.00	0.500
1,2-Dichloropropane	78-87-5	18.4		1.00	0.500
1,3-Dichlorobenzene	541-73-1	19.0		1.00	0.500
1,4-Dichlorobenzene	106-46-7	19.6		1.00	0.500
2-Butanone	78-93-3	18.7		10.0	2.50
2-Hexanone	591-78-6	17.8		10.0	2.50
4-Methyl-2-pentanone	108-10-1	17.6		10.0	2.50
Acetone	67-64-1	19.6		10.0	2.50
Benzene	71-43-2	19.3		1.00	0.500
Bromochloromethane	74-97-5	18.2		1.00	0.500

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Analyte	CAS #	Result	Qual	RL	MDL
Bromodichloromethane	75-27-4	18.0		1.00	0.500
Bromoform	75-25-2	20.0		1.00	0.500
Bromomethane	74-83-9	12.4		1.00	0.500
Carbon disulfide	75-15-0	14.4		1.00	0.500
Carbon tetrachloride	56-23-5	17.6		1.00	0.500
Chlorobenzene	108-90-7	19.2		1.00	0.500
Chloroethane	75-00-3	16.9		1.00	0.500
Chloroform	67-66-3	18.8		1.00	0.500
Chloromethane	74-87-3	13.6		1.00	0.500
cis-1,3-Dichloropropene	10061-01-5	18.9		1.00	0.500
Cyclohexane	110-82-7	13.3		5.00	1.00
Dibromochloromethane	124-48-1	18.6		1.00	0.500
Dichlorodifluoromethane	75-71-8	12.7		1.00	0.500
Ethyl benzene	100-41-4	18.4		1.00	0.500
Isopropylbenzene	98-82-8	18.4		1.00	0.500
Methyl acetate	79-20-9	16.2		5.00	1.00
Methyl tert-butyl ether	1634-04-4	17.1		1.00	0.500
Methylcyclohexane	108-87-2	15.0		5.00	1.00
Methylene chloride	75-09-2	17.8		5.00	0.500
m,p-Xylene	179601-23-1	38.7		1.00	0.500
o-Xylene	95-47-6	17.9		1.00	0.500
Styrene	100-42-5	18.8		1.00	0.500
Tetrachloroethene	127-18-4	18.6		1.00	0.500
Toluene	108-88-3	17.9		1.00	0.500
trans-1,3-Dichloropropene	10061-02-6	18.3		1.00	0.500
Trichloroethene	79-01-6	17.3		1.00	0.500
Trichlorofluoromethane	75-69-4	15.0		1.00	0.500
Vinyl chloride	75-01-4	15.0		1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	88.9	80	120	
Dibromofluoromethane	94.8	86	118	
p-Bromofluorobenzene	102	86	115	
Toluene-d8	101	88	110	

Certificate of Analysis

Sample #: L16120352-19	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW161-120616-MS	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/12/2016 17:03
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 7M68266
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6	1.01		0.0543	0.0272
Acenaphthene	83-32-9	0.943		0.0543	0.0272
Acenaphthylene	208-96-8	0.976		0.0543	0.0272
Anthracene	120-12-7	1.08		0.0543	0.0272
Benzo(a)anthracene	56-55-3	1.31		0.0543	0.0272
Benzo(a)pyrene	50-32-8	1.26		0.0543	0.0272
Benzo(b)fluoranthene	205-99-2	1.16		0.0543	0.0272
Benzo(g,h,i)perylene	191-24-2	1.11		0.0543	0.0272
Benzo(k)fluoranthene	207-08-9	1.22		0.0543	0.0272
Chrysene	218-01-9	1.26		0.0543	0.0272
Dibenzo(a,h)anthracene	53-70-3	1.08		0.0543	0.0272
Fluoranthene	206-44-0	1.21		0.0543	0.0272
Fluorene	86-73-7	1.03		0.0543	0.0272
Indeno(1,2,3-cd)pyrene	193-39-5	1.12		0.0543	0.0272
Naphthalene	91-20-3	0.947	B	0.0543	0.0272
Phenanthrene	85-01-8	1.11		0.0543	0.0272
Pyrene	129-00-0	1.11		0.0543	0.0272
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	90.2	43	116		
Nitrobenzene-d5	96.5	35	114		
p-Terphenyl-d14	77.7	33	141		
B	Analyte detected in the method blank				

Sample #: L16120352-20	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW161-120616-MSD	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594657	Analyst: ADC	Run Date: 12/13/2016 13:56
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 9M977665
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6	17.6		1.00	0.500
1,1,2,2-Tetrachloroethane	79-34-5	21.8		1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	17.9		5.00	2.00
1,1,2-Trichloroethane	79-00-5	19.1		1.00	0.500
1,1-Dichloroethane	75-34-3	18.0		1.00	0.500
1,1-Dichloroethene	75-35-4	16.5		1.00	0.500
1,2,3-Trichlorobenzene	87-61-6	19.7		1.00	0.500
1,2,4-Trichlorobenzene	120-82-1	20.1		1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8	20.3		5.00	1.00
1,2-Dibromoethane	106-93-4	18.8		1.00	0.500
1,2-Dichlorobenzene	95-50-1	19.3		1.00	0.500
1,2-Dichloroethane	107-06-2	18.0		1.00	0.500
cis-1,2-Dichloroethene	156-59-2	18.5		1.00	0.500
trans-1,2-Dichloroethene	156-60-5	18.1		1.00	0.500
1,2-Dichloropropane	78-87-5	18.7		1.00	0.500
1,3-Dichlorobenzene	541-73-1	18.8		1.00	0.500
1,4-Dichlorobenzene	106-46-7	19.4		1.00	0.500
2-Butanone	78-93-3	19.6		10.0	2.50
2-Hexanone	591-78-6	18.5		10.0	2.50
4-Methyl-2-pentanone	108-10-1	18.7		10.0	2.50
Acetone	67-64-1	20.6		10.0	2.50
Benzene	71-43-2	19.4		1.00	0.500
Bromochloromethane	74-97-5	18.7		1.00	0.500
Bromodichloromethane	75-27-4	18.0		1.00	0.500
Bromoform	75-25-2	19.7		1.00	0.500
Bromomethane	74-83-9	12.7		1.00	0.500
Carbon disulfide	75-15-0	15.0		1.00	0.500
Carbon tetrachloride	56-23-5	17.4		1.00	0.500
Chlorobenzene	108-90-7	18.8		1.00	0.500
Chloroethane	75-00-3	17.6		1.00	0.500
Chloroform	67-66-3	19.1		1.00	0.500
Chloromethane	74-87-3	14.1		1.00	0.500
cis-1,3-Dichloropropene	10061-01-5	19.0		1.00	0.500
Cyclohexane	110-82-7	13.3		5.00	1.00
Dibromochloromethane	124-48-1	18.8		1.00	0.500
Dichlorodifluoromethane	75-71-8	12.8		1.00	0.500
Ethyl benzene	100-41-4	18.0		1.00	0.500
Isopropylbenzene	98-82-8	18.2		1.00	0.500
Methyl acetate	79-20-9	16.8		5.00	1.00
Methyl tert-butyl ether	1634-04-4	17.4		1.00	0.500
Methylcyclohexane	108-87-2	14.8		5.00	1.00

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Analyte	CAS #	Result	Qual	RL	MDL
Methylene chloride	75-09-2	17.9		5.00	0.500
m,p-Xylene	179601-23-1	38.3		1.00	0.500
o-Xylene	95-47-6	17.7		1.00	0.500
Styrene	100-42-5	18.6		1.00	0.500
Tetrachloroethene	127-18-4	18.2		1.00	0.500
Toluene	108-88-3	17.5		1.00	0.500
trans-1,3-Dichloropropene	10061-02-6	18.2		1.00	0.500
Trichloroethene	79-01-6	17.2		1.00	0.500
Trichlorofluoromethane	75-69-4	15.2		1.00	0.500
Vinyl chloride	75-01-4	15.6		1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	89.3	80	120		
Dibromofluoromethane	95.7	86	118		
p-Bromofluorobenzene	103	86	115		
Toluene-d8	101	88	110		

Sample #: L16120352-20	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW161-120616-MSD	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/12/2016 17:30
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 7M68267
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6	0.957		0.0562	0.0281
Acenaphthene	83-32-9	0.896		0.0562	0.0281
Acenaphthylene	208-96-8	0.928		0.0562	0.0281
Anthracene	120-12-7	1.05		0.0562	0.0281
Benzo(a)anthracene	56-55-3	1.36		0.0562	0.0281
Benzo(a)pyrene	50-32-8	1.29		0.0562	0.0281
Benzo(b)fluoranthene	205-99-2	1.20		0.0562	0.0281
Benzo(g,h,i)perylene	191-24-2	1.13		0.0562	0.0281
Benzo(k)fluoranthene	207-08-9	1.24		0.0562	0.0281
Chrysene	218-01-9	1.29		0.0562	0.0281
Dibenzo(a,h)anthracene	53-70-3	1.08		0.0562	0.0281
Fluoranthene	206-44-0	1.27		0.0562	0.0281
Fluorene	86-73-7	0.980		0.0562	0.0281
Indeno(1,2,3-cd)pyrene	193-39-5	1.13		0.0562	0.0281
Naphthalene	91-20-3	0.904	B	0.0562	0.0281

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Analyte	CAS #	Result	Qual	RL	MDL
Phenanthrene	85-01-8	1.07		0.0562	0.0281
Pyrene	129-00-0	1.12		0.0562	0.0281
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	82.3	43	116		
Nitrobenzene-d5	88.6	35	114		
p-Terphenyl-d14	76.7	33	141		
B	Analyte detected in the method blank				

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW26-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 23:45
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: 9M977640
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
No Searchable Peaks				0.000	0.000

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW26-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 23:45
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: 9M977640
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,2,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500

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Analyte	CAS #	Result	Qual	RL	MDL
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	

Certificate of Analysis

1,2-Dichloroethane-d4	88.4	80	120	
Dibromofluoromethane	95.4	86	118	
p-Bromofluorobenzene	105	86	115	
Toluene-d8	100	88	110	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW26-120616	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/12/2016 21:29
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: 7M68276
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0521	0.0260
Acenaphthene	83-32-9		U	0.0521	0.0260
Acenaphthylene	208-96-8		U	0.0521	0.0260
Anthracene	120-12-7		U	0.0521	0.0260
Benzo(a)anthracene	56-55-3		U	0.0521	0.0260
Benzo(a)pyrene	50-32-8		U	0.0521	0.0260
Benzo(b)fluoranthene	205-99-2		U	0.0521	0.0260
Benzo(g,h,i)perylene	191-24-2		U	0.0521	0.0260
Benzo(k)fluoranthene	207-08-9		U	0.0521	0.0260
Chrysene	218-01-9		U	0.0521	0.0260
Dibenzo(a,h)anthracene	53-70-3		U	0.0521	0.0260
Fluoranthene	206-44-0		U	0.0521	0.0260
Fluorene	86-73-7		U	0.0521	0.0260
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0521	0.0260
Naphthalene	91-20-3		U	0.0521	0.0260
Phenanthrene	85-01-8		U	0.0521	0.0260
Pyrene	129-00-0		U	0.0521	0.0260

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2-Fluorobiphenyl	75.9	43	116	
Nitrobenzene-d5	83.5	35	114	
p-Terphenyl-d14	77.4	33	141	
U	Not detected at or above adjusted sample detection limit.			

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Sample #: L16120352-21	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 18:12
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: T3.122216.181258
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	1.49		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/18/2016 11:25
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/18/2016 18:59
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: T4.121816.185927
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	68.8		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:36
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: T4.121616.013650
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	81.4		0.500	0.250
Magnesium, Total	7439-95-4	16.1		0.500	0.250
Manganese, Total	7439-96-5	0.152		0.0100	0.00500
Potassium, Total	7440-09-7	4.31		1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

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Sample #: L16120352-21	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:46
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: NI.122116.184626
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00145		0.00100	0.000500

Sample #: L16120352-22	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/09/2016 20:36
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: T4.120916.203616
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Iron, Dissolved	7439-89-6	1.50		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-22	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/14/2016 17:12
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: T4.121416.171220
Sample Tag: 03	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Dissolved	7439-96-5	0.143		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-22	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:02
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:04
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: NI.121316.170435
Sample Tag: 01	Units: mg/L	

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Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00181		0.00100	0.000500

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW17-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/13/2016 00:17
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 9M977641
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
No Searchable Peaks				0.000	0.000

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW17-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/13/2016 00:17
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 9M977641
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,2,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50

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Analyte	CAS #	Result	Qual	RL	MDL
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000

U	Not detected at or above adjusted sample detection limit.
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Certificate of Analysis

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW17-120616	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/12/2016 21:55
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 7M68277
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0510	0.0255
Acenaphthene	83-32-9		U	0.0510	0.0255
Acenaphthylene	208-96-8		U	0.0510	0.0255
Anthracene	120-12-7		U	0.0510	0.0255
Benzo(a)anthracene	56-55-3		U	0.0510	0.0255
Benzo(a)pyrene	50-32-8		U	0.0510	0.0255
Benzo(b)fluoranthene	205-99-2		U	0.0510	0.0255
Benzo(g,h,i)perylene	191-24-2		U	0.0510	0.0255
Benzo(k)fluoranthene	207-08-9		U	0.0510	0.0255
Chrysene	218-01-9		U	0.0510	0.0255
Dibenzo(a,h)anthracene	53-70-3		U	0.0510	0.0255
Fluoranthene	206-44-0		U	0.0510	0.0255
Fluorene	86-73-7		U	0.0510	0.0255
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0510	0.0255
Naphthalene	91-20-3		U	0.0510	0.0255
Phenanthrene	85-01-8		U	0.0510	0.0255
Pyrene	129-00-0		U	0.0510	0.0255
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	79.7	43	116		
Nitrobenzene-d5	85.9	35	114		
p-Terphenyl-d14	72.0	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/14/2016 17:16
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121416.171605
Sample Tag: 03	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.548		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/09/2016 20:40
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.120916.204002
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	177		0.500	0.250
Iron, Total	7439-89-6	2.56		0.100	0.0500
Magnesium, Total	7439-95-4	34.0		0.500	0.250
Potassium, Total	7440-09-7	8.56		1.00	0.500
Sodium, Total	7440-23-5	73.5		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:02
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:07
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.121316.170740
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00403		0.00100	0.000500

Sample #: L16120352-24	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/14/2016 17:19
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121416.171951
Sample Tag: 03	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Dissolved	7439-96-5	0.566		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-24	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/09/2016 20:43
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.120916.204348
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Iron, Dissolved	7439-89-6	2.33		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-24	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:02
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:35
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.121316.173532
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00520		0.00100	0.000500

Sample #: L16120352-25	PrePrep Method: N/A	Instrument: HPMS9
Client ID: TB-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 19:34
Collect Date: 12/06/2016 08:00	Dilution: 1	File ID: 9M977632
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,2,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	89.2	80	120		
Dibromofluoromethane	95.2	86	118		
p-Bromofluorobenzene	106	86	115		
Toluene-d8	102	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-26	PrePrep Method: N/A	Instrument: HPMS9
Client ID: DUP-GW-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260B	Cal Date: 09/28/2016 17:30
Workgroup #: WG594657	Analyst: ADC	Run Date: 12/13/2016 16:26
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: 9M977670
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
No Searchable Peaks				0.000	0.000

Sample #: L16120352-26	PrePrep Method: N/A	Instrument: HPMS9
Client ID: DUP-GW-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594657	Analyst: ADC	Run Date: 12/13/2016 16:26
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: 9M977670
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000

Certificate of Analysis

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	89.8	80	120	
Dibromofluoromethane	94.8	86	118	
p-Bromofluorobenzene	106	86	115	
Toluene-d8	103	88	110	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120352-26	PrePrep Method: N/A	Instrument: HPMS7
Client ID: DUP-GW-120616	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/12/2016 22:22
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: 7M68278
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0510	0.0255
Acenaphthene	83-32-9		U	0.0510	0.0255
Acenaphthylene	208-96-8		U	0.0510	0.0255
Anthracene	120-12-7		U	0.0510	0.0255
Benzo(a)anthracene	56-55-3		U	0.0510	0.0255
Benzo(a)pyrene	50-32-8		U	0.0510	0.0255
Benzo(b)fluoranthene	205-99-2		U	0.0510	0.0255
Benzo(g,h,i)perylene	191-24-2		U	0.0510	0.0255
Benzo(k)fluoranthene	207-08-9		U	0.0510	0.0255
Chrysene	218-01-9		U	0.0510	0.0255
Dibenzo(a,h)anthracene	53-70-3		U	0.0510	0.0255
Fluoranthene	206-44-0		U	0.0510	0.0255
Fluorene	86-73-7		U	0.0510	0.0255
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0510	0.0255
Naphthalene	91-20-3		U	0.0510	0.0255
Phenanthrene	85-01-8		U	0.0510	0.0255
Pyrene	129-00-0		U	0.0510	0.0255

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2-Fluorobiphenyl	85.2	43	116	
Nitrobenzene-d5	93.3	35	114	
p-Terphenyl-d14	73.7	33	141	
U	Not detected at or above adjusted sample detection limit.			

Certificate of Analysis

Sample #: L16120352-26	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/09/2016 20:47
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: T4.120916.204735
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	179		0.500	0.250
Iron, Total	7439-89-6	2.12		0.100	0.0500
Magnesium, Total	7439-95-4	34.5		0.500	0.250
Potassium, Total	7440-09-7	8.56		1.00	0.500
Sodium, Total	7440-23-5	74.0		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-26	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/14/2016 17:23
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: T4.121416.172337
Sample Tag: 03	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.556		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-26	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:02
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:38
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: NI.121316.173838
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00357		0.00100	0.000500

Certificate of Analysis

Sample #: L16120352-27	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/14/2016 17:27
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: T4.121416.172722
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Dissolved	7439-96-5	0.551		0.0100	0.00500

Sample #: L16120352-27	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/09/2016 21:06
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: T4.120916.210606
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5	0.219		0.200	0.100
Iron, Dissolved	7439-89-6	2.75		0.100	0.0500

Sample #: L16120352-27	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:02
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:41
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: NI.121316.174143
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00385		0.00100	0.000500

Certificate of Analysis

2.1 Volatiles Data

2.1.1 Volatiles GCMS Data (8260)

2.1.1.1 Summary Data



Login Number: L16120352
Department: Volatiles
Analyst: Anthony Canter

METHOD

Preparation SW-846 5030C/5035A

Analysis SW-846 8260C

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

Alternate Source Standards: The percent difference was out of range for the following analytes: Vinyl Chloride was below the LCL in WG585420-11. All other acceptance criteria were met. Please see the applicable QC report for a detailed presentation of the failures.

Continuing Calibration and Tune: Recoveries out of range were observed for the following analytes: Bromomethane and Chloromethane were below the LCL in the CCVs WG594558-02 and WG594656-02 analyzed 12/12/2016 and 12/13/2016 on HPMS9. All other acceptance criteria were met. Please see the applicable QC report for a detailed presentation of the failures.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: Recoveries out of range were observed for the following analytes: Cyclohexane was below the LCL in the LCSS WG594561-02 and WG594657-02. All other acceptance criteria were met. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
WG594561-02	Cyclohexane	2016-12-12 17:34:00	72.0	80	130	Recovery
WG594657-02	Cyclohexane	2016-12-13 12:56:00	74.0	80	130	Recovery

Matrix Spikes: Recoveries out of range were observed for the following analytes: Cyclohexane, Methyl acetate, Methylcyclohexane. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
L16120352-09	Cyclohexane	2016-12-12 18:04:00	69.9	80	130	Recovery
L16120352-09	Methyl acetate	2016-12-12 18:04:00	78.8	80	130	Recovery
L16120352-09	Methylcyclohexane	2016-12-12 18:04:00	78.9	80	130	Recovery

SAMPLES

Internal Standards: All acceptance criteria were met.

Surrogates: All acceptance criteria were met.

Other: None.

Manual Integration Reason Codes

Reason #1: Data System Fails to Select Correct Peak. In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak. This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low areacounts for the target compound.

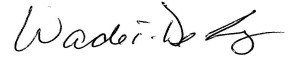
Reason #3: Improperly Integrated Isomers and/or coeluting compounds. This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

Reason #4: System Establishes Incorrect Baseline. There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

Reason #5: Miscellaneous. Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Managing Director or the QAO will be required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120614
Approved By: Wade DeLong



Certificate of Analysis

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW02-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 22:11
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 9M977637
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1	2.97	J	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0	1.99		1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	89.8	80	120		
Dibromofluoromethane	95.8	86	118		
p-Bromofluorobenzene	106	86	115		
Toluene-d8	102	88	110		
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-09

PrePrep Method: N/A

Instrument: HPMS9

Client ID: MW02-120616-MS

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260C

Cal Date: 09/28/2016 17:30

Workgroup #: WG594561

Analyst: ADC

Run Date: 12/12/2016 18:04

Collect Date: 12/06/2016 11:10

Dilution: 1

File ID: 9M977629

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6	17.1		1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5	20.3		1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	18.8		5.00	2.00
1,1,2-Trichloroethane	79-00-5	18.2		1.00	0.500
1,1-Dichloroethane	75-34-3	17.3		1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
1,1-Dichloroethene	75-35-4	16.1		1.00	0.500
1,2,3-Trichlorobenzene	87-61-6	18.8		1.00	0.500
1,2,4-Trichlorobenzene	120-82-1	19.4		1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8	19.0		5.00	1.00
1,2-Dibromoethane	106-93-4	17.8		1.00	0.500
1,2-Dichlorobenzene	95-50-1	18.8		1.00	0.500
1,2-Dichloroethane	107-06-2	16.9		1.00	0.500
cis-1,2-Dichloroethene	156-59-2	17.5		1.00	0.500
trans-1,2-Dichloroethene	156-60-5	17.2		1.00	0.500
1,2-Dichloropropane	78-87-5	17.7		1.00	0.500
1,3-Dichlorobenzene	541-73-1	18.1		1.00	0.500
1,4-Dichlorobenzene	106-46-7	18.7		1.00	0.500
2-Butanone	78-93-3	19.1		10.0	2.50
2-Hexanone	591-78-6	18.1		10.0	2.50
4-Methyl-2-pentanone	108-10-1	18.3		10.0	2.50
Acetone	67-64-1	18.8		10.0	2.50
Benzene	71-43-2	18.4		1.00	0.500
Bromochloromethane	74-97-5	18.1		1.00	0.500
Bromodichloromethane	75-27-4	17.2		1.00	0.500
Bromoform	75-25-2	19.2		1.00	0.500
Bromomethane	74-83-9	13.1		1.00	0.500
Carbon disulfide	75-15-0	24.5		1.00	0.500
Carbon tetrachloride	56-23-5	17.5		1.00	0.500
Chlorobenzene	108-90-7	18.1		1.00	0.500
Chloroethane	75-00-3	17.5		1.00	0.500
Chloroform	67-66-3	18.6		1.00	0.500
Chloromethane	74-87-3	14.0		1.00	0.500
cis-1,3-Dichloropropene	10061-01-5	17.8		1.00	0.500
Cyclohexane	110-82-7	14.0		5.00	1.00
Dibromochloromethane	124-48-1	17.9		1.00	0.500
Dichlorodifluoromethane	75-71-8	13.5		1.00	0.500
Ethyl benzene	100-41-4	17.8		1.00	0.500
Isopropylbenzene	98-82-8	17.9		1.00	0.500
Methyl acetate	79-20-9	15.8		5.00	1.00
Methyl tert-butyl ether	1634-04-4	17.1		1.00	0.500
Methylcyclohexane	108-87-2	15.8		5.00	1.00
Methylene chloride	75-09-2	17.3		5.00	0.500
m,p-Xylene	179601-23-1	37.6		1.00	0.500
o-Xylene	95-47-6	17.4		1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Styrene	100-42-5	17.9		1.00	0.500
Tetrachloroethene	127-18-4	18.3		1.00	0.500
Toluene	108-88-3	17.1		1.00	0.500
trans-1,3-Dichloropropene	10061-02-6	17.2		1.00	0.500
Trichloroethene	79-01-6	16.8		1.00	0.500
Trichlorofluoromethane	75-69-4	15.9		1.00	0.500
Vinyl chloride	75-01-4	15.3		1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	87.9	80	120	
Dibromofluoromethane	94.1	86	118	
p-Bromofluorobenzene	103	86	115	
Toluene-d8	101	88	110	

Sample #: L16120352-11

PrePrep Method: N/A

Instrument: HPMS9

Client ID: MW02-120616-MSD

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260C

Cal Date: 09/28/2016 17:30

Workgroup #: WG594561

Analyst: ADC

Run Date: 12/12/2016 18:34

Collect Date: 12/06/2016 11:10

Dilution: 1

File ID: 9M977630

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6	17.4		1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5	22.1		1.00	0.500
1,1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	15.9		5.00	2.00
1,1,2-Trichloroethane	79-00-5	19.8		1.00	0.500
1,1-Dichloroethane	75-34-3	18.1		1.00	0.500
1,1-Dichloroethene	75-35-4	15.9		1.00	0.500
1,2,3-Trichlorobenzene	87-61-6	20.5		1.00	0.500
1,2,4-Trichlorobenzene	120-82-1	20.7		1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8	21.4		5.00	1.00
1,2-Dibromoethane	106-93-4	19.6		1.00	0.500
1,2-Dichlorobenzene	95-50-1	20.0		1.00	0.500
1,2-Dichloroethane	107-06-2	18.0		1.00	0.500
cis-1,2-Dichloroethene	156-59-2	18.6		1.00	0.500
trans-1,2-Dichloroethene	156-60-5	17.8		1.00	0.500
1,2-Dichloropropane	78-87-5	18.7		1.00	0.500
1,3-Dichlorobenzene	541-73-1	19.3		1.00	0.500
1,4-Dichlorobenzene	106-46-7	19.7		1.00	0.500
2-Butanone	78-93-3	20.2		10.0	2.50

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2-Hexanone	591-78-6	19.1		10.0	2.50
4-Methyl-2-pentanone	108-10-1	18.9		10.0	2.50
Acetone	67-64-1	20.1		10.0	2.50
Benzene	71-43-2	19.4		1.00	0.500
Bromochloromethane	74-97-5	19.6		1.00	0.500
Bromodichloromethane	75-27-4	18.3		1.00	0.500
Bromoform	75-25-2	21.5		1.00	0.500
Bromomethane	74-83-9	6.84		1.00	0.500
Carbon disulfide	75-15-0	22.8		1.00	0.500
Carbon tetrachloride	56-23-5	17.1		1.00	0.500
Chlorobenzene	108-90-7	19.2		1.00	0.500
Chloroethane	75-00-3	16.1		1.00	0.500
Chloroform	67-66-3	19.9		1.00	0.500
Chloromethane	74-87-3	12.1		1.00	0.500
cis-1,3-Dichloropropene	10061-01-5	19.2		1.00	0.500
Cyclohexane	110-82-7	11.8		5.00	1.00
Dibromochloromethane	124-48-1	19.3		1.00	0.500
Dichlorodifluoromethane	75-71-8	11.2		1.00	0.500
Ethyl benzene	100-41-4	18.5		1.00	0.500
Isopropylbenzene	98-82-8	18.6		1.00	0.500
Methyl acetate	79-20-9	16.6		5.00	1.00
Methyl tert-butyl ether	1634-04-4	17.2		1.00	0.500
Methylcyclohexane	108-87-2	13.1		5.00	1.00
Methylene chloride	75-09-2	18.1		5.00	0.500
m,p-Xylene	179601-23-1	39.6		1.00	0.500
o-Xylene	95-47-6	18.2		1.00	0.500
Styrene	100-42-5	19.1		1.00	0.500
Tetrachloroethene	127-18-4	18.3		1.00	0.500
Toluene	108-88-3	17.9		1.00	0.500
trans-1,3-Dichloropropene	10061-02-6	18.6		1.00	0.500
Trichloroethene	79-01-6	17.2		1.00	0.500
Trichlorofluoromethane	75-69-4	13.8		1.00	0.500
Vinyl chloride	75-01-4	13.5		1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	90.5	80	120		
Dibromofluoromethane	96.6	86	118		
p-Bromofluorobenzene	103	86	115		
Toluene-d8	103	88	110		

Certificate of Analysis

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW09R-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 22:42
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: 9M977638
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	90.1	80	120		
Dibromofluoromethane	96.3	86	118		
p-Bromofluorobenzene	108	86	115		
Toluene-d8	101	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW01-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 23:13
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: 9M977639
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1	2.58	J	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3	1.32		1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	90.6	80	120		
Dibromofluoromethane	96.4	86	118		
p-Bromofluorobenzene	107	86	115		
Toluene-d8	102	88	110		
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW16I-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594657	Analyst: ADC	Run Date: 12/13/2016 15:55
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 9M977669
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	88.7	80	120		
Dibromofluoromethane	95.1	86	118		
p-Bromofluorobenzene	106	86	115		

Certificate of Analysis

Toluene-d8	101	88	110	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120352-19	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW16I-120616-MS	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594657	Analyst: ADC	Run Date: 12/13/2016 13:25
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 9M977664
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6	17.6		1.00	0.500
1,1,2,2-Tetrachloroethane	79-34-5	21.6		1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	17.7		5.00	2.00
1,1,2-Trichloroethane	79-00-5	18.9		1.00	0.500
1,1-Dichloroethane	75-34-3	17.9		1.00	0.500
1,1-Dichloroethene	75-35-4	16.5		1.00	0.500
1,2,3-Trichlorobenzene	87-61-6	20.2		1.00	0.500
1,2,4-Trichlorobenzene	120-82-1	20.5		1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8	19.6		5.00	1.00
1,2-Dibromoethane	106-93-4	18.4		1.00	0.500
1,2-Dichlorobenzene	95-50-1	19.4		1.00	0.500
1,2-Dichloroethane	107-06-2	17.8		1.00	0.500
cis-1,2-Dichloroethene	156-59-2	18.5		1.00	0.500
trans-1,2-Dichloroethene	156-60-5	18.4		1.00	0.500
1,2-Dichloropropane	78-87-5	18.4		1.00	0.500
1,3-Dichlorobenzene	541-73-1	19.0		1.00	0.500
1,4-Dichlorobenzene	106-46-7	19.6		1.00	0.500
2-Butanone	78-93-3	18.7		10.0	2.50
2-Hexanone	591-78-6	17.8		10.0	2.50
4-Methyl-2-pentanone	108-10-1	17.6		10.0	2.50
Acetone	67-64-1	19.6		10.0	2.50
Benzene	71-43-2	19.3		1.00	0.500
Bromochloromethane	74-97-5	18.2		1.00	0.500
Bromodichloromethane	75-27-4	18.0		1.00	0.500
Bromoform	75-25-2	20.0		1.00	0.500
Bromomethane	74-83-9	12.4		1.00	0.500
Carbon disulfide	75-15-0	14.4		1.00	0.500
Carbon tetrachloride	56-23-5	17.6		1.00	0.500
Chlorobenzene	108-90-7	19.2		1.00	0.500
Chloroethane	75-00-3	16.9		1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Chloroform	67-66-3	18.8		1.00	0.500
Chloromethane	74-87-3	13.6		1.00	0.500
cis-1,3-Dichloropropene	10061-01-5	18.9		1.00	0.500
Cyclohexane	110-82-7	13.3		5.00	1.00
Dibromochloromethane	124-48-1	18.6		1.00	0.500
Dichlorodifluoromethane	75-71-8	12.7		1.00	0.500
Ethyl benzene	100-41-4	18.4		1.00	0.500
Isopropylbenzene	98-82-8	18.4		1.00	0.500
Methyl acetate	79-20-9	16.2		5.00	1.00
Methyl tert-butyl ether	1634-04-4	17.1		1.00	0.500
Methylcyclohexane	108-87-2	15.0		5.00	1.00
Methylene chloride	75-09-2	17.8		5.00	0.500
m,p-Xylene	179601-23-1	38.7		1.00	0.500
o-Xylene	95-47-6	17.9		1.00	0.500
Styrene	100-42-5	18.8		1.00	0.500
Tetrachloroethene	127-18-4	18.6		1.00	0.500
Toluene	108-88-3	17.9		1.00	0.500
trans-1,3-Dichloropropene	10061-02-6	18.3		1.00	0.500
Trichloroethene	79-01-6	17.3		1.00	0.500
Trichlorofluoromethane	75-69-4	15.0		1.00	0.500
Vinyl chloride	75-01-4	15.0		1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	88.9	80	120	
Dibromofluoromethane	94.8	86	118	
p-Bromofluorobenzene	102	86	115	
Toluene-d8	101	88	110	

Sample #: L16120352-20	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW16I-120616-MSD	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594657	Analyst: ADC	Run Date: 12/13/2016 13:56
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 9M977665
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6	17.6		1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5	21.8		1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	17.9		5.00	2.00
1,1,2-Trichloroethane	79-00-5	19.1		1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
1,1-Dichloroethane	75-34-3	18.0		1.00	0.500
1,1-Dichloroethene	75-35-4	16.5		1.00	0.500
1,2,3-Trichlorobenzene	87-61-6	19.7		1.00	0.500
1,2,4-Trichlorobenzene	120-82-1	20.1		1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8	20.3		5.00	1.00
1,2-Dibromoethane	106-93-4	18.8		1.00	0.500
1,2-Dichlorobenzene	95-50-1	19.3		1.00	0.500
1,2-Dichloroethane	107-06-2	18.0		1.00	0.500
cis-1,2-Dichloroethene	156-59-2	18.5		1.00	0.500
trans-1,2-Dichloroethene	156-60-5	18.1		1.00	0.500
1,2-Dichloropropane	78-87-5	18.7		1.00	0.500
1,3-Dichlorobenzene	541-73-1	18.8		1.00	0.500
1,4-Dichlorobenzene	106-46-7	19.4		1.00	0.500
2-Butanone	78-93-3	19.6		10.0	2.50
2-Hexanone	591-78-6	18.5		10.0	2.50
4-Methyl-2-pentanone	108-10-1	18.7		10.0	2.50
Acetone	67-64-1	20.6		10.0	2.50
Benzene	71-43-2	19.4		1.00	0.500
Bromochloromethane	74-97-5	18.7		1.00	0.500
Bromodichloromethane	75-27-4	18.0		1.00	0.500
Bromoform	75-25-2	19.7		1.00	0.500
Bromomethane	74-83-9	12.7		1.00	0.500
Carbon disulfide	75-15-0	15.0		1.00	0.500
Carbon tetrachloride	56-23-5	17.4		1.00	0.500
Chlorobenzene	108-90-7	18.8		1.00	0.500
Chloroethane	75-00-3	17.6		1.00	0.500
Chloroform	67-66-3	19.1		1.00	0.500
Chloromethane	74-87-3	14.1		1.00	0.500
cis-1,3-Dichloropropene	10061-01-5	19.0		1.00	0.500
Cyclohexane	110-82-7	13.3		5.00	1.00
Dibromochloromethane	124-48-1	18.8		1.00	0.500
Dichlorodifluoromethane	75-71-8	12.8		1.00	0.500
Ethyl benzene	100-41-4	18.0		1.00	0.500
Isopropylbenzene	98-82-8	18.2		1.00	0.500
Methyl acetate	79-20-9	16.8		5.00	1.00
Methyl tert-butyl ether	1634-04-4	17.4		1.00	0.500
Methylcyclohexane	108-87-2	14.8		5.00	1.00
Methylene chloride	75-09-2	17.9		5.00	0.500
m,p-Xylene	179601-23-1	38.3		1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
o-Xylene	95-47-6	17.7		1.00	0.500
Styrene	100-42-5	18.6		1.00	0.500
Tetrachloroethene	127-18-4	18.2		1.00	0.500
Toluene	108-88-3	17.5		1.00	0.500
trans-1,3-Dichloropropene	10061-02-6	18.2		1.00	0.500
Trichloroethene	79-01-6	17.2		1.00	0.500
Trichlorofluoromethane	75-69-4	15.2		1.00	0.500
Vinyl chloride	75-01-4	15.6		1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	89.3	80	120		
Dibromofluoromethane	95.7	86	118		
p-Bromofluorobenzene	103	86	115		
Toluene-d8	101	88	110		

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW26-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 23:45
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: 9M977640
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	88.4	80	120		
Dibromofluoromethane	95.4	86	118		
p-Bromofluorobenzene	105	86	115		

Certificate of Analysis

Toluene-d8	100	88	110	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW17-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/13/2016 00:17
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 9M977641
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,2,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	88.6	80	120	
Dibromofluoromethane	94.9	86	118	
p-Bromofluorobenzene	105	86	115	
Toluene-d8	101	88	110	

U Not detected at or above adjusted sample detection limit.

Sample #: L16120352-25	PrePrep Method: N/A	Instrument: HPMS9
Client ID: TB-120616	Prep Method: 5030B/5030C/5035A	Prep Date: N/A
Matrix: Water	Analytical Method: 8260C	Cal Date: 09/28/2016 17:30
Workgroup #: WG594561	Analyst: ADC	Run Date: 12/12/2016 19:34
Collect Date: 12/06/2016 08:00	Dilution: 1	File ID: 9M977632
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	89.2	80	120		
Dibromofluoromethane	95.2	86	118		
p-Bromofluorobenzene	106	86	115		
Toluene-d8	102	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-26

PrePrep Method: N/A

Instrument: HPMS9

Client ID: DUP-GW-120616

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260C

Cal Date: 09/28/2016 17:30

Workgroup #: WG594657

Analyst: ADC

Run Date: 12/13/2016 16:26

Collect Date: 12/06/2016 12:30

Dilution: 1

File ID: 9M977670

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,1,2-Tetrachloroethane	79-34-5		U	1.00	0.500
1,1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1		U	5.00	2.00
1,1,1,2-Trichloroethane	79-00-5		U	1.00	0.500
1,1-Dichloroethane	75-34-3		U	1.00	0.500
1,1-Dichloroethene	75-35-4		U	1.00	0.500
1,2,3-Trichlorobenzene	87-61-6		U	1.00	0.500
1,2,4-Trichlorobenzene	120-82-1		U	1.00	0.500
1,2-Dibromo-3-chloropropane	96-12-8		U	5.00	1.00
1,2-Dibromoethane	106-93-4		U	1.00	0.500
1,2-Dichlorobenzene	95-50-1		U	1.00	0.500
1,2-Dichloroethane	107-06-2		U	1.00	0.500
cis-1,2-Dichloroethene	156-59-2		U	1.00	0.500
trans-1,2-Dichloroethene	156-60-5		U	1.00	0.500
1,2-Dichloropropane	78-87-5		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
1,3-Dichlorobenzene	541-73-1		U	1.00	0.500
1,4-Dichlorobenzene	106-46-7		U	1.00	0.500
2-Butanone	78-93-3		U	10.0	2.50
2-Hexanone	591-78-6		U	10.0	2.50
4-Methyl-2-pentanone	108-10-1		U	10.0	2.50
Acetone	67-64-1		U	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500
Bromodichloromethane	75-27-4		U	1.00	0.500
Bromoform	75-25-2		U	1.00	0.500
Bromomethane	74-83-9		U	1.00	0.500
Carbon disulfide	75-15-0		U	1.00	0.500
Carbon tetrachloride	56-23-5		U	1.00	0.500
Chlorobenzene	108-90-7		U	1.00	0.500
Chloroethane	75-00-3		U	1.00	0.500
Chloroform	67-66-3		U	1.00	0.500
Chloromethane	74-87-3		U	1.00	0.500
cis-1,3-Dichloropropene	10061-01-5		U	1.00	0.500
Cyclohexane	110-82-7		U	5.00	1.00
Dibromochloromethane	124-48-1		U	1.00	0.500
Dichlorodifluoromethane	75-71-8		U	1.00	0.500
Ethyl benzene	100-41-4		U	1.00	0.500
Isopropylbenzene	98-82-8		U	1.00	0.500
Methyl acetate	79-20-9		U	5.00	1.00
Methyl tert-butyl ether	1634-04-4		U	1.00	0.500
Methylcyclohexane	108-87-2		U	5.00	1.00
Methylene chloride	75-09-2		U	5.00	0.500
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500
Styrene	100-42-5		U	1.00	0.500
Tetrachloroethene	127-18-4		U	1.00	0.500
Toluene	108-88-3		U	1.00	0.500
trans-1,3-Dichloropropene	10061-02-6		U	1.00	0.500
Trichloroethene	79-01-6		U	1.00	0.500
Trichlorofluoromethane	75-69-4		U	1.00	0.500
Vinyl chloride	75-01-4		U	1.00	0.500
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	89.8	80	120		

Certificate of Analysis

Dibromofluoromethane	94.8	86	118	
p-Bromofluorobenzene	106	86	115	
Toluene-d8	103	88	110	
U	Not detected at or above adjusted sample detection limit.			

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: HPMS9 Dataset: 092816
 Analyst1: ADC Analyst2: NA
 Method: 8260C SOP: MSV01-C Rev: 1
 Method: 5035/5030B/5030C SOP: PAT01 Rev: 19

Maintenance Log ID: _____

Internal Standard: STD78176 Surrogate Standard: STD78175
 CCV: STD78143 LCS: STD78078 MS/MSD: STD78078

Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG585303, WG585420(ICAL)

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
9M976391	WG585420-01 BFB 50ng	NA	1	1		09/28/16 10:03
9M976394	WG585420-01 BFB 50ng	NA	1	1		09/28/16 12:34
9M976395	RINSE	NA	1	1	STD78143	09/28/16 12:59
9M976396	WG585420-02 0.5ug/L STD 8260C	NA	1	1	STD78143	09/28/16 13:29
9M976397	WG585420-03 1.0ug/L STD 8260C	NA	1	1	STD78143	09/28/16 13:59
9M976398	WG585420-04 2.0ug/L STD 8260C	NA	1	1	STD78143	09/28/16 14:29
9M976399	WG585420-05 5.0ug/L STD 8260C	NA	1	1	STD78143	09/28/16 14:59
9M976400	WG585420-06 20.0ug/L STD 8260C	NA	1	1	STD78143	09/28/16 15:29
9M976401	WG585420-07 50.0ug/L STD 8260C	NA	1	1	STD78143	09/28/16 16:00
9M976402	WG585420-08 100.0ug/L STD 8260C	NA	1	1	STD78143	09/28/16 16:31
9M976403	WG585420-09 200.0ug/L STD 8260C	NA	1	1	STD78143	09/28/16 17:00
9M976404	WG585420-10 300.0ug/L STD 8260C	NA	1	1	STD78143	09/28/16 17:30
9M976405	RINSE	NA	1	1	STD78143	09/28/16 18:00
9M976406	WG585420-11 50.0ug/L SSCV 8260C	NA	1	1	STD78143	09/28/16 18:30
9M976407	RINSE	NA	1	1		09/28/16 19:00
9M976408	WGXXXXXX-01 100ug/L A9FOO CCV	NA	1	1		09/28/16 19:30
9M976409	WG585303-01 BLANK 8260	NA	1	1		09/28/16 20:00
9M976410	WG585303-02 20ug/L LCS 8260C	NA	1	1	STD78078	09/28/16 20:31
9M976411	WG585303-03 20ug/L LCSDUP 8260C	NA	1	1	STD78078	09/28/16 21:01
9M976412	L16090882-01 A 8260C	<2	1	1		09/28/16 21:31
9M976413	L16090884-01 A 8260C	<2	1	1		09/28/16 22:01
9M976414	L16090884-02 A 8260C	<2	1	1		09/28/16 22:31
9M976415	L16090884-03 A 8260C	<2	1	1		09/28/16 23:01
9M976416	L16090884-04 A 8260C	<2	1	1		09/28/16 23:32
9M976417	RINSE	NA	1	1		09/29/16 00:02
9M976418	RINSE	NA	1	1		09/29/16 00:32

Comments

Seq.	Rerun	Dil.	Reason	Analytes
21	X	10	Over Calibration Range	CIS12
File ID: 9M976413				
L16090884-01				
22	X	10	Over Calibration Range	

Approved: September 29, 2016

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Instrument Run Log

Instrument: HPMS9 Dataset: 092816
 Analyst1: ADC Analyst2: NA
 Method: 8260C SOP: MSV01-C Rev: 1
 Method: 5035/5030B/5030C SOP: PAT01 Rev: 19

Maintenance Log ID: _____

Internal Standard: STD78176 Surrogate Standard: STD78175
 CCV: STD78143 LCS: STD78078 MS/MSD: STD78078
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG585303, WG585420(ICAL)

Comments: **Comments**

Seq.	Rerun	Dil.	Reason	Analytes
File ID: 9M976414				
L16090884-02				
23	X		Carry-over contamination	
File ID: 9M976415				
L16090884-03				
24	X		Carry-over contamination	
File ID: 9M976416				

Approved: September 29, 2016

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Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS9 Dataset: 12126
 Analyst1: ADC Analyst2: NA
 Method: 8260B/8260C SOP: MSV01/MSV01-C Rev: 24/1
 Method: 5035/5030B/ 5030C SOP: PAT01 Rev: 19

Maintenance Log ID: _____

Internal Standard: STD79243 Surrogate Standard: STD79244
 CCV: STD79229 LCS: STD79205 MS/MSD: STD79205

Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG594561

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
9M977624	WG594558-01 50ng BFB STD 8260	NA	1	1	STD78995	12/12/16 15:38
9M977625	WG594558-02 50ug/L CCV STD 8260	NA	1	1	STD79229	12/12/16 16:02
9M977626	WG594767-01 100ug/L A9FOOQC	NA	1	1		12/12/16 16:33
9M977627	WG594561-01 VBLK1212 BLANK STD 826	NA	1	1		12/12/16 17:04
9M977628	WG594561-02 20ug/L LCS STD 8260	NA	1	1	STD79205	12/12/16 17:34
9M977629	L16120352-09 A MS 8260C	<2	1	1	STD79205	12/12/16 18:04
9M977630	L16120352-11 A MSD 8260C	<2	1	1	STD79205	12/12/16 18:34
9M977631	RINSE	NA	1	1		12/12/16 19:04
9M977632	L16120352-25 A 8260C TB	<2	1	1		12/12/16 19:34
9M977633	L16120470-20 A 8260C	<2	1	1		12/12/16 20:05
9M977634	L16120470-22 A 8260C	<2	1	1		12/12/16 20:36
9M977635	L16120470-26 A 8260C	<2	1	1		12/12/16 21:08
9M977636	L16120470-28 A 8260C	<2	1	1		12/12/16 21:39
9M977637	L16120352-07 A 8260C	<2	1	1		12/12/16 22:11
9M977638	L16120352-13 A 8260C	<2	1	1		12/12/16 22:42
9M977639	L16120352-15 A 8260C	<2	1	1		12/12/16 23:13
9M977640	L16120352-21 A 8260C	<2	1	1		12/12/16 23:45
9M977641	L16120352-23 A 8260C	<2	1	1		12/13/16 00:17
9M977642	L16120465-03 A 8260C	<2	1	1		12/13/16 00:47
9M977643	L16120471-02 A 8260C	<2	1	1		12/13/16 01:17
9M977644	L16120471-04 A 8260C	<2	1	1		12/13/16 01:47
9M977645	L16120471-06 A 8260C	<2	1	1		12/13/16 02:18
9M977646	L16120471-08 A 8260C	<2	1	1		12/13/16 02:47
9M977647	L16120471-10 A 8260C	<2	1	1		12/13/16 03:17
9M977648	L16120276-01 A 50X 8260C	5	1	1		12/13/16 03:48
9M977649	RINSE	NA	1	1		12/13/16 04:18
9M977650	SCREEN 100X 0366-01	NA	1	1		12/13/16 04:47
9M977651	SCREEN 100X 0561-01	NA	1	1		12/13/16 05:17
9M977652	SCREEN 100X 0562-01	NA	1	1		12/13/16 05:47
9M977653	SCREEN 100X 0563-01	NA	1	1		12/13/16 06:18
9M977654	RINSE	NA	1	1		12/13/16 06:48
9M977655	RINSE	NA	1	1		12/13/16 07:18
9M977656	RINSE	NA	1	1		12/13/16 07:48
9M977657	RINSE	NA	1	1		12/13/16 08:18

Approved: December 14, 2016

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Sarah Vandenberg

Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS9 Dataset: 12126
 Analyst1: ADC Analyst2: NA
 Method: 8260B/8260C SOP: MSV01/MSV01-C Rev: 24/1
 Method: 5035/5030B/ 5030C SOP: PAT01 Rev: 19

Maintenance Log ID: _____

Internal Standard: STD79243 Surrogate Standard: STD79244
 CCV: STD79229 LCS: STD79205 MS/MSD: STD79205
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG594561

Comments: _____

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
9M977658	RINSE	NA	1	1		12/13/16 08:49

Comments

Seq.	Rerun	Dil.	Reason	Analytes
25	X	50	Missed Tune	
File ID: 9M977648				
L16120276-01 DNR				

Approved: December 14, 2016

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Sarah Vandenberg

Microbac Laboratories Inc.

Instrument Run Log

Instrument: HPMS9 Dataset: 121316
 Analyst1: ADC Analyst2: NA
 Method: 8260B/8260C SOP: MSV01/MSV01-C Rev: 24/1
 Method: 5035/5030B/ 5030C SOP: PAT01 Rev: 19

Maintenance Log ID: _____

Internal Standard: STD79243 Surrogate Standard: STD79244
 CCV: STD79229 LCS: STD79205 MS/MSD: STD79205
 Column 1 ID: RTX502.2 Column 2 ID: NA
 Workgroups: WG594657

Comments:

File ID	Sample Information	pH	Mat	Dil	Reference	Date/Time
9M977659	WG594656-01 50ng BFB STD 8260	NA	1	1	STD78995	12/13/16 11:01
9M977660	WG594656-02 50ug/L CCV STD 8260	NA	1	1	STD79229	12/13/16 11:25
9M977661	WGXXXXXX-01 100ug/L A9FOOQC	NA	1	1		12/13/16 11:55
9M977662	WG594657-01 VBLK1213 BLANK STD 826	NA	1	1		12/13/16 12:25
9M977663	WG594657-02 20ug/L LCS STD 8260	NA	1	1	STD79205	12/13/16 12:56
9M977664	L16120352-19 A MS 8260C	NA	1	1	STD79205	12/13/16 13:25
9M977665	L16120352-20 A MSD 8260C	NA	1	1	STD79205	12/13/16 13:56
9M977666	L16120276-01 C 50X 8260C	5	1	50		12/13/16 14:26
9M977667	L16120425-26 A 8260C	<2	1	1		12/13/16 14:56
9M977668	L16120425-25 A 8260C	<2	1	1		12/13/16 15:26
9M977669	L16120352-17 A 8260C	<2	1	1		12/13/16 15:55
9M977670	L16120352-26 A 8260C	<2	1	1		12/13/16 16:26
9M977671	L16120425-01 A 8260C	<2	1	1		12/13/16 16:56
9M977672	L16120425-03 A 8260C	<2	1	1		12/13/16 17:30
9M977673	L16120425-07 A 8260C	<2	1	1		12/13/16 18:00
9M977674	L16120425-11 A 8260C	<2	1	1		12/13/16 18:31
9M977675	L16120425-13 A 8260C	<2	1	1		12/13/16 19:01
9M977676	L16120425-15 A 8260C	<2	1	1		12/13/16 19:31
9M977677	L16120425-17 A 8260C	<2	1	1		12/13/16 20:01
9M977678	L16120425-19 A 8260C	<2	1	1		12/13/16 20:31
9M977679	L16120425-21 A 8260C	<2	1	1		12/13/16 21:02
9M977680	RINSE	NA	1	1		12/13/16 21:32
9M977681	SCREEN 1000X 684-01	NA	1	500		12/13/16 22:02
9M977682	SCREEN 1000X 685-01	NA	1	500		12/13/16 22:32
9M977683	SCREEN 1000X 608-01	NA	1	500		12/13/16 23:02
9M977684	SCREEN 1000X 608-03	NA	1	500		12/13/16 23:32
9M977685	RINSE	NA	1	500		12/14/16 00:02
9M977686	RINSE	NA	1	500		12/14/16 00:33
9M977694	L16120562-01 A 826-SPE 5.12g	NA	7	1		12/14/16 13:52
9M977695	L16120563-01 A 826-SPE 4.87g	NA	7	1		12/14/16 14:22
9M977696	L16120474-01 A 826-SPE 4.91g	NA	7	1		12/14/16 14:53
9M977697	L16120474-02 A 826-SPE 5.09g	NA	7	1		12/14/16 15:23

Approved: December 16, 2016

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Microbac Laboratories Inc.

Data Checklist

Date: 28-SEP-2016
 Analyst: ADC
 Analyst: NA
 Method: 8260
 Instrument: HPMS9
 Curve Workgroup: WG585420
 Runlog ID: 77764
 Analytical Workgroups: WG585303

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	ADC
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	ADC
Secondary Reviewer	FJB
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
29-SEP-2016



Secondary Reviewer:
29-SEP-2016




Microbac Laboratories Inc.

Data Checklist

Date: 12-DEC-2016
 Analyst: ADC
 Analyst: NA
 Method: 8260
 Instrument: HPMS9
 Curve Workgroup: NA
 Runlog ID: 79207
 Analytical Workgroups: WG594561

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	ADC
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	ADC
Secondary Reviewer	SAV
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Check the reasonableness of the results	X

Primary Reviewer:
13-DEC-2016



Secondary Reviewer:
14-DEC-2016




Microbac Laboratories Inc.

Data Checklist

Date: 13-DEC-2016
 Analyst: ADC
 Analyst: NA
 Method: 8260
 Instrument: HPMS9
 Curve Workgroup: NA
 Runlog ID: 79197
 Analytical Workgroups: WG594657

System Performance Check	NA
BFB	X
Initial Calibration	X
Average RF	X
Linear Reg or Higher Order Curve	X
Second Source standard % Difference	X
Continuing Calibration /Check Standards	X
Project/Client Specific Requirements	X
Special Standards	NA
Blanks	X
TCL's	X
Surrogates	X
LCS (Laboratory Control Sample)	X
Recoveries	X
Surrogates	X
MS/MSD/Duplicates	X
Samples	X
TCL Hits	X
Spectra of TCL Hits	ADC
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	ADC
Secondary Reviewer	LSB
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Check the reasonableness of the results	X

Primary Reviewer:
13-DEC-2016



Secondary Reviewer:
16-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:8260C
 Login Number:L16120352

AAB#:WG594561

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
MW02-120616	07	12/06/16					12/12/2016	6.5	14		12/12/16	6.5	14	
MW02-120616-MS	09	12/06/16					12/12/2016	6.3	14		12/12/16	6.3	14	
MW02-120616-MSD	11	12/06/16					12/12/2016	6.3	14		12/12/16	6.3	14	
MW09R-120616	13	12/06/16					12/12/2016	6.4	14		12/12/16	6.4	14	
MW01-120616	15	12/06/16					12/12/2016	6.4	14		12/12/16	6.4	14	
MW26-120616	21	12/06/16					12/12/2016	6.4	14		12/12/16	6.4	14	
MW17-120616	23	12/06/16					12/13/2016	6.5	14		12/13/16	6.5	14	
TB-120616	25	12/06/16					12/12/2016	6.5	14		12/12/16	6.5	14	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061694
 Report generated 12/16/2016 15:06



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8260C
 Login Number: L16120352

AAB#: WG594657

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
MW16I-120616	17	12/06/16					12/13/2016	7.1	14		12/13/16	7.1	14	
MW16I-120616-MS	19	12/06/16					12/13/2016	7	14		12/13/16	7	14	
MW16I-120616-MSD	20	12/06/16					12/13/2016	7	14		12/13/16	7	14	
DUP-GW-120616	26	12/06/16					12/13/2016	7.2	14		12/13/16	7.2	14	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061694
 Report generated 12/16/2016 15:06



Microbac Laboratories Inc.
SURROGATE STANDARDS

Login Number: L16120352
Instrument Id: HPMS9
Workgroup (AAB#): WG594561

Method: 8260C
CAL ID: HPMS9-28-SEP-16
Matrix: Water

Sample Number	Dilution	Tag	1	2	3	4
L16120352-07	1.00	01	89.8	95.8	106	102
L16120352-09	1.00	01	87.9	94.1	103	101
L16120352-11	1.00	01	90.5	96.6	103	103
L16120352-13	1.00	01	90.1	96.3	108	101
L16120352-15	1.00	01	90.6	96.4	107	102
L16120352-21	1.00	01	88.4	95.4	105	100
L16120352-23	1.00	01	88.6	94.9	105	101
L16120352-25	1.00	01	89.2	95.2	106	102
WG594561-01	1.00	01	88.7	96.0	107	102
WG594561-02	1.00	01	88.2	94.9	93.2	98.7

Surrogates	Surrogate Limits
1 - 1,2-Dichloroethane-d4	80 - 120
2 - Dibromofluoromethane	86 - 118
3 - p-Bromofluorobenzene	86 - 115
4 - Toluene-d8	88 - 110

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



Microbac Laboratories Inc.
 SURROGATE STANDARDS

Login Number: L16120352
 Instrument Id: HPMS9
 Workgroup (AAB#): WG594657

Method: 8260C
 CAL ID: HPMS9 - 28-SEP-16
 Matrix: Water

Sample Number	Dilution	Tag	1	2	3	4
L16120352-17	1.00	01	88.7	95.1	106	101
L16120352-19	1.00	01	88.9	94.8	102	101
L16120352-20	1.00	01	89.3	95.7	103	101
L16120352-26	1.00	01	89.8	94.8	106	103
WG594657-01	1.00	01	88.4	93.7	106	100
WG594657-02	1.00	01	91.0	98.0	103	104

Surrogates	Surrogate Limits		
1 - 1,2-Dichloroethane-d4	80	-	120
2 - Dibromofluoromethane	86	-	118
3 - p-Bromofluorobenzene	86	-	115
4 - Toluene-d8	88	-	110

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594561
 Blank File ID: 9M977627 Blank Sample ID: WG594561-01
 Prep Date: 12/12/16 17:04 Instrument ID: HPMS9
 Analyzed Date: 12/12/16 17:04 Method: 8260C
 Analyst: ADC

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594561-02	9M977628	12/12/16 17:34	01
MW02-120616-MS	L16120352-09	9M977629	12/12/16 18:04	01
MW02-120616-MSD	L16120352-11	9M977630	12/12/16 18:34	01
TB-120616	L16120352-25	9M977632	12/12/16 19:34	01
MW02-120616	L16120352-07	9M977637	12/12/16 22:11	01
MW09R-120616	L16120352-13	9M977638	12/12/16 22:42	01
MW01-120616	L16120352-15	9M977639	12/12/16 23:13	01
MW26-120616	L16120352-21	9M977640	12/12/16 23:45	01
MW17-120616	L16120352-23	9M977641	12/13/16 00:17	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5061695
 Report generated 12/16/2016 15:06



METHOD BLANK SUMMARY

Login Number: L16120352
 Blank File ID: 9M977662
 Prep Date: 12/13/16 12:25
 Analyzed Date: 12/13/16 12:25
 Analyst: ADC

Work Group: WG594657
 Blank Sample ID: WG594657-01
 Instrument ID: HPMS9
 Method: 8260C

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594657-02	9M977663	12/13/16 12:56	01
MW16I-120616-MS	L16120352-19	9M977664	12/13/16 13:25	01
MW16I-120616-MSD	L16120352-20	9M977665	12/13/16 13:56	01
MW16I-120616	L16120352-17	9M977669	12/13/16 15:55	01
DUP-GW-120616	L16120352-26	9M977670	12/13/16 16:26	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5061695
 Report generated 12/16/2016 15:06



METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/12/16 17:04 Sample ID: WG594561-01
Instrument ID: HPMS9 Run Date: 12/12/16 17:04 Prep Method: 5030B/5030C/503
File ID: 9M977627 Analyst: ADC Method: 8260C
Workgroup (AAB#): WG594561 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: HPMS9-28-SEP-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
1,1,1-Trichloroethane	0.500	1.00	0.500	1	U
1,1,2,2-Tetrachloroethane	0.500	1.00	0.500	1	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	2.00	5.00	2.00	1	U
1,1,2-Trichloroethane	0.500	1.00	0.500	1	U
1,1-Dichloroethane	0.500	1.00	0.500	1	U
1,1-Dichloroethene	0.500	1.00	0.500	1	U
1,2,3-Trichlorobenzene	0.500	1.00	0.500	1	U
1,2,4-Trichlorobenzene	0.500	1.00	0.500	1	U
1,2-Dibromo-3-chloropropane	1.00	5.00	1.00	1	U
1,2-Dibromoethane	0.500	1.00	0.500	1	U
1,2-Dichlorobenzene	0.500	1.00	0.500	1	U
1,2-Dichloroethane	0.500	1.00	0.500	1	U
cis-1,2-Dichloroethene	0.500	1.00	0.500	1	U
trans-1,2-Dichloroethene	0.500	1.00	0.500	1	U
1,2-Dichloropropane	0.500	1.00	0.500	1	U
1,3-Dichlorobenzene	0.500	1.00	0.500	1	U
1,4-Dichlorobenzene	0.500	1.00	0.500	1	U
2-Butanone	2.50	10.0	2.50	1	U
2-Hexanone	2.50	10.0	2.50	1	U
4-Methyl-2-pentanone	2.50	10.0	2.50	1	U
Acetone	2.50	10.0	2.50	1	U
Benzene	0.500	1.00	0.500	1	U
Bromochloromethane	0.500	1.00	0.500	1	U
Bromodichloromethane	0.500	1.00	0.500	1	U
Bromoform	0.500	1.00	0.500	1	U
Bromomethane	0.500	1.00	0.500	1	U
Carbon disulfide	0.500	1.00	0.500	1	U
Carbon tetrachloride	0.500	1.00	0.500	1	U
Chlorobenzene	0.500	1.00	0.500	1	U
Chloroethane	0.500	1.00	0.500	1	U
Chloroform	0.500	1.00	0.500	1	U
Chloromethane	0.500	1.00	0.500	1	U
cis-1,3-Dichloropropene	0.500	1.00	0.500	1	U
Cyclohexane	1.00	5.00	1.00	1	U
Dibromochloromethane	0.500	1.00	0.500	1	U
Dichlorodifluoromethane	0.500	1.00	0.500	1	U
Ethyl benzene	0.500	1.00	0.500	1	U
Isopropylbenzene	0.500	1.00	0.500	1	U
Methyl acetate	1.00	5.00	1.00	1	U
Methyl tert-butyl ether	0.500	1.00	0.500	1	U
Methylcyclohexane	1.00	5.00	1.00	1	U
Methylene chloride	0.500	5.00	0.500	1	U

Report Name: BLANK

PDF ID: 5061696

16-DEC-2016 15:06



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/12/16 17:04 Sample ID: WG594561-01
Instrument ID: HPMS9 Run Date: 12/12/16 17:04 Prep Method: 5030B/5030C/503
File ID: 9M977627 Analyst: ADC Method: 8260C
Workgroup (AAB#): WG594561 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: HPMS9-28-SEP-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
m,p-Xylene	0.500	1.00	0.500	1	U
o-Xylene	0.500	1.00	0.500	1	U
Styrene	0.500	1.00	0.500	1	U
Tetrachloroethene	0.500	1.00	0.500	1	U
Toluene	0.500	1.00	0.500	1	U
trans-1,3-Dichloropropene	0.500	1.00	0.500	1	U
Trichloroethene	0.500	1.00	0.500	1	U
Trichlorofluoromethane	0.500	1.00	0.500	1	U
Vinyl chloride	0.500	1.00	0.500	1	U

Surrogates	% Recovery	Surrogate Limits		Qualifier
1,2-Dichloroethane-d4	88.7	80	- 120	PASS
Dibromofluoromethane	96.0	86	- 118	PASS
p-Bromofluorobenzene	107	86	- 115	PASS
Toluene-d8	102	88	- 110	PASS

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

Report Name: BLANK
PDF ID: 5061696
16-DEC-2016 15:06



METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/13/16 12:25 Sample ID: WG594657-01
Instrument ID: HPMS9 Run Date: 12/13/16 12:25 Prep Method: 5030B/5030C/503
File ID: 9M977662 Analyst: ADC Method: 8260C
Workgroup (AAB#): WG594657 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: HPMS9-28-SEP-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
1,1,1-Trichloroethane	0.500	1.00	0.500	1	U
1,1,2,2-Tetrachloroethane	0.500	1.00	0.500	1	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	2.00	5.00	2.00	1	U
1,1,2-Trichloroethane	0.500	1.00	0.500	1	U
1,1-Dichloroethane	0.500	1.00	0.500	1	U
1,1-Dichloroethene	0.500	1.00	0.500	1	U
1,2,3-Trichlorobenzene	0.500	1.00	0.500	1	U
1,2,4-Trichlorobenzene	0.500	1.00	0.500	1	U
1,2-Dibromo-3-chloropropane	1.00	5.00	1.00	1	U
1,2-Dibromoethane	0.500	1.00	0.500	1	U
1,2-Dichlorobenzene	0.500	1.00	0.500	1	U
1,2-Dichloroethane	0.500	1.00	0.500	1	U
cis-1,2-Dichloroethene	0.500	1.00	0.500	1	U
trans-1,2-Dichloroethene	0.500	1.00	0.500	1	U
1,2-Dichloropropane	0.500	1.00	0.500	1	U
1,3-Dichlorobenzene	0.500	1.00	0.500	1	U
1,4-Dichlorobenzene	0.500	1.00	0.500	1	U
2-Butanone	2.50	10.0	2.50	1	U
2-Hexanone	2.50	10.0	2.50	1	U
4-Methyl-2-pentanone	2.50	10.0	2.50	1	U
Acetone	2.50	10.0	2.50	1	U
Benzene	0.500	1.00	0.500	1	U
Bromochloromethane	0.500	1.00	0.500	1	U
Bromodichloromethane	0.500	1.00	0.500	1	U
Bromoform	0.500	1.00	0.500	1	U
Bromomethane	0.500	1.00	0.500	1	U
Carbon disulfide	0.500	1.00	0.500	1	U
Carbon tetrachloride	0.500	1.00	0.500	1	U
Chlorobenzene	0.500	1.00	0.500	1	U
Chloroethane	0.500	1.00	0.500	1	U
Chloroform	0.500	1.00	0.500	1	U
Chloromethane	0.500	1.00	0.500	1	U
cis-1,3-Dichloropropene	0.500	1.00	0.500	1	U
Cyclohexane	1.00	5.00	1.00	1	U
Dibromochloromethane	0.500	1.00	0.500	1	U
Dichlorodifluoromethane	0.500	1.00	0.500	1	U
Ethyl benzene	0.500	1.00	0.500	1	U
Isopropylbenzene	0.500	1.00	0.500	1	U
Methyl acetate	1.00	5.00	1.00	1	U
Methyl tert-butyl ether	0.500	1.00	0.500	1	U
Methylcyclohexane	1.00	5.00	1.00	1	U
Methylene chloride	0.500	5.00	0.500	1	U

Report Name: BLANK

PDF ID: 5061696

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Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/13/16 12:25 Sample ID: WG594657-01
 Instrument ID: HPMS9 Run Date: 12/13/16 12:25 Prep Method: 5030B/5030C/503
 File ID: 9M977662 Analyst: ADC Method: 8260C
 Workgroup (AAB#): WG594657 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS9-28-SEP-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
m,p-Xylene	0.500	1.00	0.500	1	U
o-Xylene	0.500	1.00	0.500	1	U
Styrene	0.500	1.00	0.500	1	U
Tetrachloroethene	0.500	1.00	0.500	1	U
Toluene	0.500	1.00	0.500	1	U
trans-1,3-Dichloropropene	0.500	1.00	0.500	1	U
Trichloroethene	0.500	1.00	0.500	1	U
Trichlorofluoromethane	0.500	1.00	0.500	1	U
Vinyl chloride	0.500	1.00	0.500	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	88.4	80 - 120	PASS
Dibromofluoromethane	93.7	86 - 118	PASS
p-Bromofluorobenzene	106	86 - 115	PASS
Toluene-d8	100	88 - 110	PASS

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

Report Name: BLANK
 PDF ID: 5061696
 16-DEC-2016 15:06



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594561-02
Instrument ID: HPMS9 Run Time: 17:34 Prep Method: 5030B/5030C/503
File ID: 9M977628 Analyst: ADC Method: 8260C
Workgroup (AAB#): WG594561 Matrix: Water Units: ug/L
QC Key: WATERLOO Lot#: STD79205 Cal ID: HPMS9-28-SEP-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
1,1,1-Trichloroethane	20.0	18.5	92.6	80 - 134	
1,1,2,2-Tetrachloroethane	20.0	20.0	100	79 - 125	
1,1,2-Trichloro-1,2,2-Trifluoroethane	20.0	19.0	95.0	80 - 130	
1,1,2-Trichloroethane	20.0	18.9	94.4	80 - 125	
1,1-Dichloroethane	20.0	18.5	92.3	80 - 125	
1,1-Dichloroethene	20.0	17.2	85.9	80 - 132	
1,2,3-Trichlorobenzene	20.0	18.4	92.2	55 - 140	
1,2,4-Trichlorobenzene	20.0	18.5	92.3	65 - 135	
1,2-Dibromo-3-chloropropane	20.0	19.2	96.0	50 - 130	
1,2-Dibromoethane	20.0	18.4	91.9	80 - 125	
1,2-Dichlorobenzene	20.0	18.7	93.4	80 - 125	
1,2-Dichloroethane	20.0	18.0	89.9	80 - 129	
cis-1,2-Dichloroethene	20.0	18.8	93.9	70 - 125	
trans-1,2-Dichloroethene	20.0	18.3	91.6	80 - 127	
1,2-Dichloropropane	20.0	18.8	94.0	80 - 120	
1,3-Dichlorobenzene	20.0	18.1	90.4	80 - 120	
1,4-Dichlorobenzene	20.0	18.5	92.5	80 - 120	
2-Butanone	20.0	20.5	103	30 - 150	
2-Hexanone	20.0	18.5	92.5	55 - 130	
4-Methyl-2-pentanone	20.0	19.0	95.1	64 - 140	
Acetone	20.0	19.6	98.2	40 - 142	
Benzene	20.0	19.9	99.3	80 - 121	
Bromochloromethane	20.0	19.0	95.1	65 - 130	
Bromodichloromethane	20.0	18.4	92.0	80 - 131	
Bromoform	20.0	20.3	102	70 - 130	
Bromomethane	20.0	14.3	71.6	30 - 145	
Carbon disulfide	20.0	14.7	73.6	58 - 138	
Carbon tetrachloride	20.0	19.0	94.8	65 - 140	
Chlorobenzene	20.0	19.0	94.9	80 - 120	
Chloroethane	20.0	17.4	87.2	60 - 135	
Chloroform	20.0	19.0	95.1	80 - 125	
Chloromethane	20.0	14.3	71.4	40 - 125	
cis-1,3-Dichloropropene	20.0	19.3	96.7	70 - 130	
Cyclohexane	20.0	14.4	72.0	80 - 130	*
Dibromochloromethane	20.0	18.7	93.7	60 - 135	
Dichlorodifluoromethane	20.0	13.8	69.1	50 - 133	
Ethyl benzene	20.0	18.7	93.3	80 - 122	
Isopropylbenzene	20.0	18.9	94.3	80 - 122	
Methyl acetate	20.0	19.1	95.6	80 - 130	
Methyl tert-butyl ether	20.0	17.7	88.5	65 - 125	
Methylcyclohexane	20.0	16.1	80.5	80 - 130	

LCS - Modified 03/06/2008
PDF File ID: 5061697
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Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594561-02
 Instrument ID: HPMS9 Run Time: 17:34 Prep Method: 5030B/5030C/503
 File ID: 9M977628 Analyst: ADC Method: 8260C
 Workgroup (AAB#): WG594561 Matrix: Water Units: ug/L
 QC Key: WATERLOO Lot#: STD79205 Cal ID: HPMS9-28-SEP-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Methylene chloride	20.0	17.9	89.3	80 - 123	
m,p-Xylene	40.0	39.1	97.7	80 - 122	
o-Xylene	20.0	18.1	90.5	80 - 122	
Styrene	20.0	18.8	93.9	80 - 123	
Tetrachloroethene	20.0	18.8	94.0	80 - 124	
Toluene	20.0	17.9	89.6	80 - 124	
trans-1,3-Dichloropropene	20.0	18.2	91.2	80 - 130	
Trichloroethene	20.0	17.9	89.6	80 - 122	
Trichlorofluoromethane	20.0	16.3	81.4	62 - 151	
Vinyl chloride	20.0	15.5	77.4	65 - 140	

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	88.2	80 - 120	PASS
Dibromofluoromethane	94.9	86 - 118	PASS
p-Bromofluorobenzene	93.2	86 - 115	PASS
Toluene-d8	98.7	88 - 110	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
 PDF File ID: 5061697
 Report generated: 12/16/2016 15:06



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594657-02
 Instrument ID: HPMS9 Run Time: 12:56 Prep Method: 5030B/5030C/503
 File ID: 9M977663 Analyst: ADC Method: 8260C
 Workgroup (AAB#): WG594657 Matrix: Water Units: ug/L
 QC Key: WATERLOO Lot#: STD79205 Cal ID: HPMS9-28-SEP-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
1,1,1-Trichloroethane	20.0	18.6	93.0	80 - 134	
1,1,2,2-Tetrachloroethane	20.0	20.4	102	79 - 125	
1,1,2-Trichloro-1,2,2-Trifluoroethane	20.0	20.2	101	80 - 130	
1,1,2-Trichloroethane	20.0	19.3	96.7	80 - 125	
1,1-Dichloroethane	20.0	18.9	94.3	80 - 125	
1,1-Dichloroethene	20.0	17.7	88.5	80 - 132	
1,2,3-Trichlorobenzene	20.0	19.5	97.6	55 - 140	
1,2,4-Trichlorobenzene	20.0	20.1	101	65 - 135	
1,2-Dibromo-3-chloropropane	20.0	18.2	91.2	50 - 130	
1,2-Dibromoethane	20.0	18.2	90.9	80 - 125	
1,2-Dichlorobenzene	20.0	19.8	98.9	80 - 125	
1,2-Dichloroethane	20.0	18.3	91.6	80 - 129	
cis-1,2-Dichloroethene	20.0	19.0	95.2	70 - 125	
trans-1,2-Dichloroethene	20.0	18.7	93.3	80 - 127	
1,2-Dichloropropane	20.0	19.1	95.3	80 - 120	
1,3-Dichlorobenzene	20.0	19.0	95.0	80 - 120	
1,4-Dichlorobenzene	20.0	19.8	99.1	80 - 120	
2-Butanone	20.0	19.0	94.9	30 - 150	
2-Hexanone	20.0	17.4	87.1	55 - 130	
4-Methyl-2-pentanone	20.0	18.2	90.8	64 - 140	
Acetone	20.0	19.1	95.5	40 - 142	
Benzene	20.0	20.1	101	80 - 121	
Bromochloromethane	20.0	18.9	94.6	65 - 130	
Bromodichloromethane	20.0	18.4	92.1	80 - 131	
Bromoform	20.0	19.7	98.6	70 - 130	
Bromomethane	20.0	13.3	66.6	30 - 145	
Carbon disulfide	20.0	15.2	76.2	58 - 138	
Carbon tetrachloride	20.0	19.0	94.8	65 - 140	
Chlorobenzene	20.0	19.5	97.5	80 - 120	
Chloroethane	20.0	18.0	89.8	60 - 135	
Chloroform	20.0	19.2	96.1	80 - 125	
Chloromethane	20.0	14.6	73.1	40 - 125	
cis-1,3-Dichloropropene	20.0	19.3	96.6	70 - 130	
Cyclohexane	20.0	14.8	74.2	80 - 130	*
Dibromochloromethane	20.0	18.7	93.4	60 - 135	
Dichlorodifluoromethane	20.0	14.1	70.5	50 - 133	
Ethyl benzene	20.0	18.8	94.1	80 - 122	
Isopropylbenzene	20.0	19.2	95.9	80 - 122	
Methyl acetate	20.0	17.9	89.5	80 - 130	
Methyl tert-butyl ether	20.0	17.4	86.8	65 - 125	
Methylcyclohexane	20.0	16.6	82.8	80 - 130	

LCS - Modified 03/06/2008
 PDF File ID: 5061697
 Report generated: 12/16/2016 15:06



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594657-02
 Instrument ID: HPMS9 Run Time: 12:56 Prep Method: 5030B/5030C/503
 File ID: 9M977663 Analyst: ADC Method: 8260C
 Workgroup (AAB#): WG594657 Matrix: Water Units: ug/L
 QC Key: WATERLOO Lot#: STD79205 Cal ID: HPMS9-28-SEP-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Methylene chloride	20.0	18.1	90.4	80 - 123	
m,p-Xylene	40.0	40.1	100	80 - 122	
o-Xylene	20.0	18.2	91.2	80 - 122	
Styrene	20.0	19.3	96.5	80 - 123	
Tetrachloroethene	20.0	19.2	96.0	80 - 124	
Toluene	20.0	18.3	91.6	80 - 124	
trans-1,3-Dichloropropene	20.0	18.2	91.2	80 - 130	
Trichloroethene	20.0	18.1	90.5	80 - 122	
Trichlorofluoromethane	20.0	16.7	83.6	62 - 151	
Vinyl chloride	20.0	16.0	80.1	65 - 140	

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	91.0	80 - 120	PASS
Dibromofluoromethane	98.0	86 - 118	PASS
p-Bromofluorobenzene	103	86 - 115	PASS
Toluene-d8	104	88 - 110	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
 PDF File ID: 5061697
 Report generated: 12/16/2016 15:06



MS/MSD REPORT

Loginnum: L16120352 Cal ID: HPMS9- 28-SEP-16
 Instrument ID: HPMS9 Contract #: _____
 Parent ID: L16120352-07 File ID: 9M977637 Dil: 1
 Sample ID: L16120352-09 MS File ID: 9M977629 Dil: 1
 Sample ID: L16120352-11 MSD File ID: 9M977630 Dil: 1

Worknum: WG594561
 Prep Method: 5030B/5030C/
 Method: 5035A
 Matrix: 8260B
 Units: Water
ug/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
1,1,1-Trichloroethane	U	20.0	17.1	85.3	20.0	17.4	87.2	2.16	80 - 134	30	
1,1,2,2-Tetrachloroethane	U	20.0	20.3	101	20.0	22.1	110	8.39	79 - 125	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	U	20.0	18.8	94.1	20.0	15.9	79.4	17.0	80 - 130	30	*
1,1,2-Trichloroethane	U	20.0	18.2	90.9	20.0	19.8	98.8	8.34	80 - 125	30	
1,1-Dichloroethane	U	20.0	17.3	86.4	20.0	18.1	90.3	4.49	80 - 125	30	
1,1-Dichloroethene	U	20.0	16.1	80.6	20.0	15.9	79.7	1.22	80 - 132	30	*
1,2,3-Trichlorobenzene	U	20.0	18.8	94.2	20.0	20.5	103	8.62	55 - 140	30	
1,2,4-Trichlorobenzene	U	20.0	19.4	97	20.0	20.7	104	6.59	65 - 135	30	
1,2-Dibromo-3-chloropropane	U	20.0	19.0	95.2	20.0	21.4	107	11.7	50 - 130	30	
1,2-Dibromoethane	U	20.0	17.8	88.9	20.0	19.6	97.9	9.60	80 - 125	30	
1,2-Dichlorobenzene	U	20.0	18.8	94.2	20.0	20.0	100	6.01	80 - 125	30	
1,2-Dichloroethane	U	20.0	16.9	84.4	20.0	18.0	90	6.41	80 - 129	30	
1,2-Dichloropropane	U	20.0	17.7	88.5	20.0	18.7	93.5	5.51	80 - 120	30	
1,3-Dichlorobenzene	U	20.0	18.1	90.4	20.0	19.3	96.4	6.39	80 - 120	30	
1,4-Dichlorobenzene	U	20.0	18.7	93.4	20.0	19.7	98.6	5.42	80 - 120	30	
2-Butanone	U	20.0	19.1	95.7	20.0	20.2	101	5.26	30 - 150	30	
2-Hexanone	U	20.0	18.1	90.7	20.0	19.1	95.3	4.89	55 - 130	30	
4-Methyl-2-pentanone	U	20.0	18.3	91.5	20.0	18.9	94.3	2.96	64 - 140	30	
Acetone	2.97	20.0	18.8	79.3	20.0	20.1	85.5	6.44	40 - 142	30	
Benzene	U	20.0	18.4	91.8	20.0	19.4	97	5.51	80 - 121	30	
Bromochloromethane	U	20.0	18.1	90.4	20.0	19.6	98.1	8.16	65 - 130	30	
Bromodichloromethane	U	20.0	17.2	86.1	20.0	18.3	91.4	6.02	80 - 131	30	
Bromoform	U	20.0	19.2	95.8	20.0	21.5	107	11.4	70 - 130	30	
Bromomethane	U	20.0	13.1	65.4	20.0	6.84	34.2	62.7	30 - 145	30	#
Carbon disulfide	1.99	20.0	24.5	113	20.0	22.8	104	7.26	58 - 138	30	
Carbon tetrachloride	U	20.0	17.5	87.3	20.0	17.1	85.7	1.90	65 - 140	30	
Chlorobenzene	U	20.0	18.1	90.7	20.0	19.2	96	5.71	80 - 120	30	
Chloroethane	U	20.0	17.5	87.6	20.0	16.1	80.6	8.27	60 - 135	30	
Chloroform	U	20.0	18.6	93	20.0	19.9	99.3	6.50	80 - 125	30	
Chloromethane	U	20.0	14.0	69.8	20.0	12.1	60.3	14.7	40 - 125	30	
cis-1,2-Dichloroethene	U	20.0	17.5	87.5	20.0	18.6	93	6.02	70 - 125	30	
cis-1,3-Dichloropropene	U	20.0	17.8	88.9	20.0	19.2	95.8	7.49	70 - 130	30	
Cyclohexane	U	20.0	14.0	69.9	20.0	11.8	59	16.8	80 - 130	30	*
Dibromochloromethane	U	20.0	17.9	89.4	20.0	19.3	96.7	7.80	60 - 135	30	
Dichlorodifluoromethane	U	20.0	13.5	67.4	20.0	11.2	56.1	18.2	50 - 133	30	
Ethyl benzene	U	20.0	17.8	89.2	20.0	18.5	92.5	3.69	80 - 122	30	
Isopropylbenzene	U	20.0	17.9	89.5	20.0	18.6	93	3.83	80 - 122	30	
m,p-Xylene	U	40.0	37.6	93.9	40.0	39.6	99	5.22	80 - 122	30	
Methyl acetate	U	20.0	15.8	78.8	20.0	16.6	82.9	5.06	80 - 130	30	*
Methylcyclohexane	U	20.0	15.8	78.9	20.0	13.1	65.5	18.6	80 - 130	30	*
Methylene chloride	U	20.0	17.3	86.4	20.0	18.1	90.7	4.91	80 - 123	30	

MS_MSD - Modified 03/06/2008
 PDF File ID: 5061698
 Report generated 12/16/2016 15:06



MS/MSD REPORT

Loginum: L16120352 Cal ID: HPMS9 28-SEP-16
 Instrument ID: HPMS9 Contract #: _____
 Parent ID: L16120352-07 File ID: 9M977637 Dil: 1
 Sample ID: L16120352-09 MS File ID: 9M977629 Dil: 1
 Sample ID: L16120352-11 MSD File ID: 9M977630 Dil: 1

Worknum: WG594561
 Prep Method: 5030B/5030C/
 Method: 5035A
 Matrix: 8260B
 Units: Water
ug/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Methyl tert-butyl ether	U	20.0	17.1	85.4	20.0	17.2	86	0.706	65 - 125	30	
o-Xylene	U	20.0	17.4	86.8	20.0	18.2	90.8	4.49	80 - 122	30	
Styrene	U	20.0	17.9	89.5	20.0	19.1	95.4	6.32	80 - 123	30	
Tetrachloroethene	U	20.0	18.3	91.7	20.0	18.3	91.3	0.488	80 - 124	30	
Toluene	U	20.0	17.1	85.4	20.0	17.9	89.5	4.65	80 - 124	30	
trans-1,2-Dichloroethene	U	20.0	17.2	85.9	20.0	17.8	89.1	3.58	80 - 127	30	
trans-1,3-Dichloropropene	U	20.0	17.2	85.8	20.0	18.6	92.8	7.82	80 - 130	30	
Trichloroethene	U	20.0	16.8	83.8	20.0	17.2	85.9	2.50	80 - 122	30	
Trichlorofluoromethane	U	20.0	15.9	79.7	20.0	13.8	69.2	14.2	62 - 151	30	
Vinyl chloride	U	20.0	15.3	76.3	20.0	13.5	67.5	12.2	65 - 140	30	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS/MSD REPORT

Loginnum: L16120352 Cal ID: HPMS9- 28-SEP-16
 Instrument ID: HPMS9 Contract #: _____
 Parent ID: L16120352-17 File ID: 9M977669 Dil: 1
 Sample ID: L16120352-19 MS File ID: 9M977664 Dil: 1
 Sample ID: L16120352-20 MSD File ID: 9M977665 Dil: 1

Worknum: WG594657
 Prep Method: 5030B/5030C/
 Method: 5035A
 Matrix: 8260B
 Units: Water
ug/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
1,1,1-Trichloroethane	U	20.0	17.6	88.2	20.0	17.6	88	0.181	80 - 134	30	
1,1,2,2-Tetrachloroethane	U	20.0	21.6	108	20.0	21.8	109	0.812	79 - 125	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	U	20.0	17.7	88.5	20.0	17.9	89.4	0.930	80 - 130	30	
1,1,2-Trichloroethane	U	20.0	18.9	94.7	20.0	19.1	95.7	1.03	80 - 125	30	
1,1-Dichloroethane	U	20.0	17.9	89.7	20.0	18.0	89.9	0.246	80 - 125	30	
1,1-Dichloroethene	U	20.0	16.5	82.4	20.0	16.5	82.4	0.0066	80 - 132	30	
1,2,3-Trichlorobenzene	U	20.0	20.2	101	20.0	19.7	98.7	2.16	55 - 140	30	
1,2,4-Trichlorobenzene	U	20.0	20.5	102	20.0	20.1	100	2.05	65 - 135	30	
1,2-Dibromo-3-chloropropane	U	20.0	19.6	98	20.0	20.3	101	3.44	50 - 130	30	
1,2-Dibromoethane	U	20.0	18.4	92.1	20.0	18.8	94	2.03	80 - 125	30	
1,2-Dichlorobenzene	U	20.0	19.4	96.9	20.0	19.3	96.6	0.265	80 - 125	30	
1,2-Dichloroethane	U	20.0	17.8	88.8	20.0	18.0	90.1	1.40	80 - 129	30	
1,2-Dichloropropane	U	20.0	18.4	92.2	20.0	18.7	93.3	1.28	80 - 120	30	
1,3-Dichlorobenzene	U	20.0	19.0	95.2	20.0	18.8	93.8	1.48	80 - 120	30	
1,4-Dichlorobenzene	U	20.0	19.6	97.9	20.0	19.4	96.9	1.08	80 - 120	30	
2-Butanone	U	20.0	18.7	93.4	20.0	19.6	97.8	4.56	30 - 150	30	
2-Hexanone	U	20.0	17.8	88.8	20.0	18.5	92.6	4.18	55 - 130	30	
4-Methyl-2-pentanone	U	20.0	17.6	88.2	20.0	18.7	93.3	5.59	64 - 140	30	
Acetone	U	20.0	19.6	98	20.0	20.6	103	4.90	40 - 142	30	
Benzene	U	20.0	19.3	96.3	20.0	19.4	97	0.678	80 - 121	30	
Bromochloromethane	U	20.0	18.2	91.2	20.0	18.7	93.4	2.42	65 - 130	30	
Bromodichloromethane	U	20.0	18.0	89.9	20.0	18.0	89.8	0.0986	80 - 131	30	
Bromoform	U	20.0	20.0	100	20.0	19.7	98.7	1.47	70 - 130	30	
Bromomethane	U	20.0	12.4	62.2	20.0	12.7	63.5	2.04	30 - 145	30	
Carbon disulfide	U	20.0	14.4	72	20.0	15.0	74.9	3.91	58 - 138	30	
Carbon tetrachloride	U	20.0	17.6	88	20.0	17.4	86.8	1.32	65 - 140	30	
Chlorobenzene	U	20.0	19.2	95.8	20.0	18.8	94.2	1.63	80 - 120	30	
Chloroethane	U	20.0	16.9	84.7	20.0	17.6	88.1	3.90	60 - 135	30	
Chloroform	U	20.0	18.8	94	20.0	19.1	95.3	1.34	80 - 125	30	
Chloromethane	U	20.0	13.6	67.9	20.0	14.1	70.7	3.99	40 - 125	30	
cis-1,2-Dichloroethene	U	20.0	18.5	92.7	20.0	18.5	92.6	0.138	70 - 125	30	
cis-1,3-Dichloropropene	U	20.0	18.9	94.4	20.0	19.0	94.9	0.494	70 - 130	30	
Cyclohexane	U	20.0	13.3	66.3	20.0	13.3	66.3	0.0117	80 - 130	30	*
Dibromochloromethane	U	20.0	18.6	93	20.0	18.8	93.9	0.911	60 - 135	30	
Dichlorodifluoromethane	U	20.0	12.7	63.5	20.0	12.8	64.1	0.852	50 - 133	30	
Ethyl benzene	U	20.0	18.4	91.9	20.0	18.0	90.1	2.00	80 - 122	30	
Isopropylbenzene	U	20.0	18.4	91.8	20.0	18.2	90.9	0.889	80 - 122	30	
m,p-Xylene	U	40.0	38.7	96.7	40.0	38.3	95.8	0.864	80 - 122	30	
Methyl acetate	U	20.0	16.2	80.8	20.0	16.8	84	3.94	80 - 130	30	
Methylcyclohexane	U	20.0	15.0	75.1	20.0	14.8	74.1	1.28	80 - 130	30	*
Methylene chloride	U	20.0	17.8	89.1	20.0	17.9	89.4	0.274	80 - 123	30	

MS_MSD - Modified 03/06/2008
 PDF File ID: 5061698
 Report generated 12/16/2016 15:06



MS/MSD REPORT

Loginum: L16120352 Cal ID: HPMS9 28-SEP-16
 Instrument ID: HPMS9 Contract #: _____
 Parent ID: L16120352-17 File ID: 9M977669 Dil: 1
 Sample ID: L16120352-19 MS File ID: 9M977664 Dil: 1
 Sample ID: L16120352-20 MSD File ID: 9M977665 Dil: 1

Worknum: WG594657
 Prep Method: 5030B/5030C/
 Method: 5035A
 Matrix: 8260B
 Units: Water
ug/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Methyl tert-butyl ether	U	20.0	17.1	85.5	20.0	17.4	86.8	1.58	65 - 125	30	
o-Xylene	U	20.0	17.9	89.4	20.0	17.7	88.3	1.33	80 - 122	30	
Styrene	U	20.0	18.8	93.8	20.0	18.6	93.1	0.799	80 - 123	30	
Tetrachloroethene	U	20.0	18.6	92.9	20.0	18.2	90.9	2.12	80 - 124	30	
Toluene	U	20.0	17.9	89.3	20.0	17.5	87.5	2.09	80 - 124	30	
trans-1,2-Dichloroethene	U	20.0	18.4	91.8	20.0	18.1	90.6	1.41	80 - 127	30	
trans-1,3-Dichloropropene	U	20.0	18.3	91.6	20.0	18.2	90.8	0.889	80 - 130	30	
Trichloroethene	U	20.0	17.3	86.5	20.0	17.2	85.9	0.616	80 - 122	30	
Trichlorofluoromethane	U	20.0	15.0	74.9	20.0	15.2	76.1	1.63	62 - 151	30	
Vinyl chloride	U	20.0	15.0	75.2	20.0	15.6	77.9	3.49	65 - 140	30	

* FAILS %REC LIMIT

FAILS RPD LIMIT

Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L16120352

Tune ID: WG585420-01

Instrument: HPMS9

Run Date: 09/28/2016

Analyst: ADC

Run Time: 12:34

Workgroup: WG585420

File ID: 9M976394

Cal ID: HPMS9-28-SEP-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	20.9	5296	PASS
75.0	95.0	30.0	60.0	48.2	12221	PASS
95.0	95.0	100	100	100	25357	PASS
96.0	95.0	5.00	9.00	7.12	1806	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	72.0	18252	PASS
175	174	5.00	9.00	7.60	1388	PASS
176	174	95.0	101	96.9	17693	PASS
177	176	5.00	9.00	6.79	1201	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG585420-02	STD	01	09/28/2016 13:29	
WG585420-03	STD	01	09/28/2016 13:59	
WG585420-04	STD	01	09/28/2016 14:29	
WG585420-05	STD	01	09/28/2016 14:59	
WG585420-06	STD	01	09/28/2016 15:29	
WG585420-07	STD-CCV	01	09/28/2016 16:00	
WG585420-08	STD	01	09/28/2016 16:31	
WG585420-09	STD	01	09/28/2016 17:00	
WG585420-10	STD	01	09/28/2016 17:30	
WG585420-11	SSCV	01	09/28/2016 18:30	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L16120352 Tune ID: WG594558-01
 Instrument: HPMS9 Run Date: 12/12/2016
 Analyst: ADC Run Time: 15:38
 Workgroup: WG594558 File ID: 9M977624
 Cal ID: HPMS9-28-SEP-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	19.2	4232	PASS
75.0	95.0	30.0	60.0	46.9	10359	PASS
95.0	95.0	100	100	100	22091	PASS
96.0	95.0	5.00	9.00	6.85	1513	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	73.7	16286	PASS
175	174	5.00	9.00	7.76	1264	PASS
176	174	95.0	101	98.1	15975	PASS
177	176	5.00	9.00	6.43	1027	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG594558-02	CCV	01	12/12/2016 16:02	
WG594561-01	BLANK	01	12/12/2016 17:04	
WG594561-01	BLANK	01	12/12/2016 17:04	
WG594561-02	LCS	01	12/12/2016 17:34	
L16120352-09	MW02-120616-MS	01	12/12/2016 18:04	
L16120352-11	MW02-120616-MSD	01	12/12/2016 18:34	
L16120352-25	TB-120616	01	12/12/2016 19:34	
L16120352-07	MW02-120616	01	12/12/2016 22:11	
L16120352-13	MW09R-120616	01	12/12/2016 22:42	
L16120352-15	MW01-120616	01	12/12/2016 23:13	
L16120352-21	MW26-120616	01	12/12/2016 23:45	
L16120352-23	MW17-120616	01	12/13/2016 00:17	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L16120352 Tune ID: WG594656-01
 Instrument: HPMS9 Run Date: 12/13/2016
 Analyst: ADC Run Time: 11:01
 Workgroup: WG594656 File ID: 9M977659
 Cal ID: HPMS9-28-SEP-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	18.4	3084	PASS
75.0	95.0	30.0	60.0	46.0	7710	PASS
95.0	95.0	100	100	100	16760	PASS
96.0	95.0	5.00	9.00	6.83	1145	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	73.3	12289	PASS
175	174	5.00	9.00	7.00	860	PASS
176	174	95.0	101	95.7	11763	PASS
177	176	5.00	9.00	6.68	786	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG594656-02	CCV	01	12/13/2016 11:25	
WG594657-01	BLANK	01	12/13/2016 12:25	
WG594657-01	BLANK	01	12/13/2016 12:25	
WG594657-02	LCS	01	12/13/2016 12:56	
L16120352-19	MW16I-120616-MS	01	12/13/2016 13:25	
L16120352-20	MW16I-120616-MSD	01	12/13/2016 13:56	
L16120352-17	MW16I-120616	01	12/13/2016 15:55	
L16120352-26	DUP-GW-120616	01	12/13/2016 16:26	

* Sample past 12 hour tune limit



Calibration Table Report
Method: 8260C.M
Title: 8260C SOP: OVL MSV01-C WATER 09/28/16 HPMS9
Last Calibration: Thu Sep 29 11:27:45 2016
Curve: WGS5420
Calibration Files

Compound	0.5									Avg	%RSD	Linear	Quadratic
	9M976396.D	9M976397.D	9M976398.D	9M976399.D	9M976400.D	9M976401.D	9M976402.D	9M976403.D	9M976404.D				
Fluorobenzene	ISTD												
Dichlorodifluoromethane	0.357	0.338	0.351	0.420	0.433	0.405	0.402	0.419	0.391	9.355			
Chloromethane	0.568	0.492	0.476	0.409	0.431	0.421	0.428	0.449	0.459	11.337			
Vinyl Chloride	0.331	0.325	0.289	0.363	0.374	0.281	0.198		0.309	19.353			
1,3-Butadiene		0.135	0.111	0.130	0.136	0.122	0.086		0.120	15.921			
Bromomethane	0.296	0.269	0.266	0.237	0.235	0.227	0.236	0.257	0.253	9.208			
Chloroethane	0.181	0.187	0.195	0.207	0.214	0.207	0.208	0.222	0.203	6.827			
Trichlorofluoromethane	0.496	0.454	0.454	0.472	0.490	0.470	0.456	0.468	0.470	3.437			
Diethyl ether	0.227	0.231	0.248	0.238	0.248	0.251		0.255	0.243	4.375			
Isoprene	0.393	0.359	0.374	0.364	0.406	0.396	0.393	0.403	0.386	4.653			
Acrolein		0.060	0.064	0.061	0.063	0.063		0.063	0.062	2.600			
1,1,2-Trichloro-1,2,2-Trifluoroet		0.199	0.223	0.230	0.243	0.240	0.237	0.250	0.232	7.220			
Acetone			0.139	0.123	0.128	0.120	0.120	0.124	0.126	5.531			
1,1-Dichloroethene	0.439	0.405	0.433	0.440	0.459	0.440	0.428	0.442	0.436	3.510			
Tert-Butyl Alcohol	0.046	0.045	0.049	0.043	0.045	0.046		0.054	0.047	7.785			
Dimethyl Sulfide	0.306	0.303	0.315	0.301	0.324	0.316	0.309	0.315	0.311	2.503			
Iodomethane	0.167	0.160	0.186	0.255	0.318	0.311	0.297	0.302	0.249	27.261	0.998		
Methyl acetate	0.369	0.338	0.337	0.297	0.319	0.316	0.314	0.320	0.326	6.590			
Methylene Chloride	0.339	0.288	0.301	0.297	0.303	0.289	0.286	0.299	0.300	5.654			
Carbon Disulfide	0.847	0.749	0.747	0.730	0.794	0.758	0.703	0.676	0.751	7.057			
Acrylonitrile	0.135	0.138	0.154	0.147	0.160	0.160		0.176	0.153	9.248			
Methyl Tert Butyl Ether	0.883	0.870	0.909	0.913	0.936	0.895	0.862	0.877	0.893	2.789			
trans-1,2-Dichloroethene	0.399	0.363	0.380	0.388	0.410	0.399	0.387	0.398	0.390	3.736			
n-Hexane			0.302	0.296	0.336	0.327	0.317	0.322	0.317	4.777			
Diisopropyl ether	0.893	0.878	0.929	0.891	0.919	0.873		0.836	0.889	3.479			
Vinyl Acetate			0.423	0.467	0.488	0.507	0.428	0.474	0.464	7.151			
1,1-Dichloroethane	0.521	0.483	0.536	0.539	0.557	0.537	0.516	0.523	0.527	4.137			
Ethyl-Tert-Butyl ether	0.907	0.923	0.973	0.929	0.955	0.906		0.873	0.924	3.608			
2-Butanone		0.157	0.167	0.164	0.178	0.170	0.175	0.183	0.170	5.269			
Propionitrile	0.044	0.050	0.057	0.055	0.058	0.058		0.066	0.055	12.469			
2,2-Dichloropropane	0.420	0.381	0.397	0.406	0.421	0.407	0.395	0.402	0.404	3.212			
cis-1,2-Dichloroethene	0.304	0.275	0.305	0.305	0.322	0.313	0.305	0.318	0.306	4.694			
Chloroform	0.522	0.485	0.510	0.510	0.528	0.506	0.484	0.489	0.504	3.328			
1-Bromopropane			0.048	0.051	0.057	0.055	0.056	0.058	0.054	6.596			
Bromochloromethane	0.186	0.195	0.199	0.206	0.211	0.206	0.204	0.213	0.202	4.363			
Tetrahydrofuran	0.148	0.119	0.125	0.116	0.122	0.118		0.122	0.124	8.650			
Dibromofluoromethane			0.140	0.279	0.280	0.282	0.272		0.250	24.658	0.999		
1,1,1-Trichloroethane	0.464	0.434	0.457	0.464	0.480	0.463	0.456	0.466	0.461	2.825			
Cyclohexane			0.472	0.430	0.479	0.463	0.445	0.451	0.457	3.917			
1,1-Dichloropropene	0.357	0.341	0.364	0.358	0.378	0.362	0.353	0.369	0.360	3.079			
Tert-Amyl-Methyl ether	0.830	0.824	0.873	0.834	0.854	0.812		0.771	0.828	3.922			
Carbon Tetrachloride	0.33524	0.36951	0.38421	0.39295	0.41518	0.39977	0.40069	0.40889	0.3883	6.62889			
1,2-Dichloroethane-d4		0.36448	0.17688	0.35135	0.35678	0.35219	0.33765		0.32322	22.3461	0.999		
Heptane									0	0			
1,2-Dichloroethane	0.41274	0.4237	0.44932	0.46396	0.47149	0.45357	0.4331	0.4336	0.44269	4.57923			
Benzene	1.14576	1.07673	1.10421	1.09992	1.11762	1.04428	0.93114	0.8726	1.04903	9.22188			
Trichloroethene	0.29915	0.27683	0.29018	0.29091	0.31226	0.2979	0.29817	0.30729	0.29659	3.68179			
Methylcyclohexane			0.42557	0.41848	0.45924	0.44236	0.42182	0.42561	0.43218	3.61105			
1,2-Dichloropropane	0.30313	0.27125	0.29267	0.28602	0.29978	0.29006	0.28211	0.29645	0.29018	3.55733			
1,4-Dioxane			0.00473	0.00438	0.00506	0.00534		0.00614	0.00513	13.0189			
Bromodichloromethane	0.3885	0.3555	0.38632	0.38765	0.41311	0.40164	0.39441	0.40782	0.39187	4.51402			
Dibromomethane	0.18283	0.16904	0.18774	0.19505	0.20628	0.20366	0.20017	0.21096	0.19447	7.15716			
2-Chloroethyl Vinyl Ether	0.16582	0.17141	0.2038	0.21981	0.23484	0.22873	0.22272	0.22899	0.20951	12.8379			
4-Methyl-2-Pentanone			0.13145	0.13758	0.15477	0.15131	0.15354	0.16427	0.14882	8.12354			
cis-1,3-Dichloropropene	0.42916	0.41764	0.43853	0.46095	0.47893	0.46333	0.44444	0.45255	0.44819	4.42974			
Dimethyl Disulfide	0.25163	0.24353	0.26495	0.26388	0.29418	0.29444	0.288	0.29674	0.27467	7.72017			
Chlorobenzene-d5	ISTD												
Toluene-d8		1.39014	0.69691	1.36316	1.33826	1.29438			1.21657	24.0536	0.999		
Toluene	2.08299	1.74977	1.67277	1.65439	1.63644	1.51173	1.2336		1.64881	15.5			
Ethyl Methacrylate		0.51138	0.56331	0.58082	0.62482	0.61232	0.56405	0.56022	0.57385	6.5287			
trans-1,3-Dichloropropene	0.50649	0.49624	0.55996	0.60938	0.62022	0.59746	0.54841	0.5447	0.56036	8.19587			
1,1,2-Trichloroethane	0.38107	0.36003	0.36962	0.39346	0.3895	0.3816	0.35574	0.36668	0.37473	3.66746			
2-Hexanone			0.3311	0.34596	0.38041	0.36798	0.35322	0.36203	0.35678	4.85561			
1,3-Dichloropropane	0.60426	0.59506	0.62942	0.63042	0.63994	0.62134	0.56782	0.56808	0.60704	4.63517			
Tetrachloroethene	0.29136	0.27388	0.29747	0.29793	0.31206	0.30152	0.28296	0.28718	0.29305	4.0437			
Dibromochloromethane	0.40251	0.3878	0.42186	0.44105	0.45764	0.45687	0.43762	0.45703	0.4328	6.13566			
1,2-Dibromoethane		0.36219	0.39292	0.40533	0.41481	0.40672	0.38222	0.39106	0.39361	4.50019			
1-Chlorohexane	0.50688	0.44979	0.47957	0.475	0.52732	0.51354	0.47436	0.46657	0.48663	5.42854			
Chlorobenzene	1.07189	1.04999	1.06881	1.06958	1.08117	1.03375	0.90438	0.8393	1.01486	8.98257			
1,1,1,2-Tetrachloroethane	0.37822	0.38267	0.38876	0.40718	0.4136	0.4039	0.37773	0.3937	0.39322	3.49294			
Ethylbenzene		0.5358	0.5457	0.56662	0.58887	0.59172	0.57235	0.52492	0.5235	5.5619	4.93441		
m-,p-Xylene	0.61751	0.70686	0.65763	0.68714	0.70923	0.71145	0.66277	0.55639	0.49396	6.4477	11.7655		
o-Xylene	0.69249	0.6636	0.70327	0.70566	0.71822	0.69706	0.64643	0.64306	0.68372	4.19468			
Styrene	1.13278	1.0748	1.14735	1.19083	1.21301	1.15937	1.01485	0.9364	1.10867	8.48259			
Bromoform	0.25408	0.24475	0.27482	0.29615	0.32094	0.32889	0.33209	0.36121	0.30162	13.6353			
Isopropylbenzene	1.8237	1.69492	1.77605	1.81182	1.80512	1.65833	1.35098	1.1787	1.63745	14.756			
1,4-Dichlorobenzene-d4	ISTD												
1,1,2,2-Tetrachloroethane	1.08573	1.02468	1.09452	1.07605	1.07107	1.02356	0.93549	0.94803	1.03239	5.98805			
p-Bromofluorobenzene		1.20417	0.57162	1.08475	1.06384	1.02497	0.93513		0.98075	22.2952	0.993		
1,2,3-Trichloropropane	0.28266	0.306	0.33308	0.33526	0.33959	0.32355	0.31573	0.32713	0.32038	5.84973			

trans-1,4-Dichloro-2-Butene	0.22945	0.27956	0.32094	0.34906	0.36253	0.34617	0.32886	0.33136	0.31849	13.7187
n-Propylbenzene	4.22424	3.86664	3.97001	4.08292	4.01586	3.46385	2.623		3.7495	14.6906
Bromobenzene	0.85312	0.83687	0.87824	0.89271	0.90383	0.85007	0.79642	0.80662	0.85224	4.52591
1,3,5-Trimethylbenzene	3.13851	2.82263	2.94403	2.97541	2.94142	2.62865	2.14134	1.85399	2.68075	16.866
2-Chlorotoluene	2.75814	2.562	2.62206	2.75108	2.60864	2.38462	1.89504	1.70995	2.41144	16.446
4-Chlorotoluene	2.7975	2.38271	2.50388	2.41937	2.49668	2.1911	1.86651	1.5338	2.27394	17.671
a-Methylstyrene		1.55151	1.58234	1.65802	1.57137	1.41252	1.31895	1.51579	8.26293	
tert-Butylbenzene	0.59815	0.56553	0.59495	0.60966	0.61832	0.57993	0.55055	0.56622	0.58541	4.04923
1,2,4-Trimethylbenzene	3.0588	2.91428	3.02918	3.02731	3.00922	2.70022	2.17013	1.85664	2.72072	16.8681
sec-Butylbenzene	3.77662	3.47881	3.62696	3.68183	3.67396	3.24971	2.56142	2.15612	3.27568	18.2565
p-Isopropyltoluene	3.04357	2.92309	3.00459	3.0986	3.15873	2.81568	2.28057	1.93868	2.78294	15.7439
1,3-Dichlorobenzene	1.63898	1.49575	1.58061	1.61185	1.64501	1.55703	1.4143	1.32659	1.53377	7.43043
1,4-Dichlorobenzene	1.67557	1.57689	1.5577	1.61189	1.64857	1.56527	1.41673	1.31876	1.54642	7.78533
n-Butylbenzene	2.85585	2.57242	2.71297	2.80992	2.89601	2.6198	2.14738	1.8377	2.55651	14.65
1,2-Dichlorobenzene	1.57845	1.53802	1.57381	1.6349	1.66645	1.58846	1.43542	1.33536	1.54386	7.03898
1,2-Dibromo-3-Chloropropane		0.23699	0.25622	0.26994	0.28576	0.27897	0.27594	0.28317	0.26957	6.45347
1,2,4-Trichlorobenzene	1.12272	1.07937	1.06199	1.14305	1.21195	1.16386	1.08458	1.05449	1.11525	4.94611
Hexachlorobutadiene	0.45554	0.44503	0.46528	0.51583	0.54927	0.53598	0.51819	0.53392	0.50238	8.10755
Naphthalene	3.87631	3.5996	3.82987	3.82016	3.91872	3.37217	2.5196		3.56235	13.9818
1,2,3-Trichlorobenzene	1.27147	1.11503	1.14027	1.18363	1.25561	1.17233	1.08067	1.04902	1.1585	6.78723

Thu Sep 29 11:28:43 2016

Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120352 Run Date: 09/28/2016 Sample ID: WG585420-11
 Instrument ID: HPMS9 Run Time: 18:30 Method: 8260C
 File ID: 9M976406 Analyst: ADC QC Key: WATERLOO
 ICal Workgroup: WG585420 Cal ID: HPMS9 - 28-SEP-16

Analyte		Expected	Found	Units	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	50.0	44.8	ug/L	0.391	10.3	25	
1,2-Dichloropropane	CCC	50.0	51.1	ug/L	0.297	2.30	25	
Chloroform	CCC	50.0	49.1	ug/L	0.495	1.80	25	
Ethylbenzene	CCC	50.0	50.3	ug/L	0.559	0.500	25	
Toluene	CCC	50.0	46.6	ug/L	1.54	6.90	25	
Vinyl Chloride	CCC	50.0	36.8	ug/L	0.227	26.4	25	*
1,1,2,2-Tetrachloroethane	SPCC	50.0	52.5	ug/L	1.08	5.00	25	
1,1-Dichloroethane	SPCC	50.0	47.1	ug/L	0.497	5.70	25	
Bromoform	SPCC	50.0	53.6	ug/L	0.324	7.20	25	
Chlorobenzene	SPCC	50.0	52.3	ug/L	1.06	4.50	25	
Chloromethane	SPCC	50.0	54.3	ug/L	0.499	8.60	25	
1,1,1-Trichloroethane		50.0	48.7	ug/L	0.449	2.50	25	
1,1,2-Trichloro-1,2,2-Trifluoroethane		50.0	54.9	ug/L	0.254	9.70	25	
1,1,2-Trichloroethane		50.0	51.1	ug/L	0.383	2.30	25	
1,2,3-Trichlorobenzene		50.0	52.9	ug/L	1.23	5.90	25	
1,2,4-Trichlorobenzene		50.0	54.8	ug/L	1.22	9.50	25	
1,2-Dibromo-3-Chloropropane		50.0	55.0	ug/L	0.296	9.90	25	
1,2-Dibromoethane		50.0	51.6	ug/L	0.406	3.20	25	
1,2-Dichlorobenzene		50.0	55.5	ug/L	1.71	11.0	25	
1,2-Dichloroethane		50.0	51.9	ug/L	0.459	3.70	25	
cis-1,2-Dichloroethene		50.0	50.8	ug/L	0.311	1.70	25	
trans-1,2-Dichloroethene		50.0	49.9	ug/L	0.390	0.100	25	
1,3-Dichlorobenzene		50.0	52.3	ug/L	1.60	4.60	25	
1,4-Dichlorobenzene		50.0	54.1	ug/L	1.67	8.20	25	
2-Butanone		50.0	56.7	ug/L	0.193	13.4	25	
2-Hexanone		50.0	57.5	ug/L	0.410	15.0	25	
4-Methyl-2-Pentanone		50.0	56.4	ug/L	0.168	12.9	25	
Acetone		50.0	55.8	ug/L	0.140	11.5	25	
Benzene		50.0	50.5	ug/L	1.06	1.00	25	
Bromochloromethane		50.0	49.3	ug/L	0.200	1.40	25	
Bromodichloromethane		50.0	51.1	ug/L	0.401	2.20	25	
Bromomethane		50.0	46.7	ug/L	0.236	6.60	25	
Carbon Disulfide		50.0	44.6	ug/L	0.669	10.9	25	
Carbon Tetrachloride		50.0	49.3	ug/L	0.383	1.40	25	
Chloroethane		50.0	57.7	ug/L	0.234	15.5	25	
cis-1,3-Dichloropropene		50.0	56.6	ug/L	0.507	13.2	25	
Cyclohexane		50.0	49.5	ug/L	0.452	1.00	25	
Dibromochloromethane		50.0	52.1	ug/L	0.451	4.20	25	
Dichlorodifluoromethane		50.0	57.5	ug/L	0.449	14.9	25	
Isopropylbenzene		50.0	53.7	ug/L	1.76	7.40	25	
Methyl acetate		50.0	51.9	ug/L	0.339	3.80	25	
Methyl Tert Butyl Ether		50.0	52.9	ug/L	0.945	5.80	25	

ALT - Modified 09/06/2007
 Version 1.5 PDF File ID: 5061699
 Report generated 12/16/2016 15:06



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120352 Run Date: 09/28/2016 Sample ID: WG585420-11
 Instrument ID: HPMS9 Run Time: 18:30 Method: 8260C
 File ID: 9M976406 Analyst: ADC QC Key: WATERLOO
 ICal Workgroup: WG585420 Cal ID: HPMS9 - 28-SEP-16

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Methylcyclohexane	50.0	50.4	ug/L	0.436	0.800	25	
Methylene Chloride	50.0	48.4	ug/L	0.291	3.20	25	
m-,p-Xylene	100	107	ug/L	0.687	6.60	25	
o-Xylene	50.0	52.3	ug/L	0.715	4.60	25	
Styrene	50.0	54.3	ug/L	1.20	8.50	25	
Tetrachloroethene	50.0	48.8	ug/L	0.286	2.40	25	
trans-1,3-Dichloropropene	50.0	54.0	ug/L	0.605	8.00	25	
Trichloroethene	50.0	50.1	ug/L	0.297	0.100	25	
Trichlorofluoromethane	50.0	51.1	ug/L	0.481	2.30	25	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

ALT - Modified 09/06/2007
 Version 1.5 PDF File ID: 5061699
 Report generated 12/16/2016 15:06



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594558-02
Instrument ID: HPMS9 Run Time: 16:02 Method: 8260C
File ID: 9M977625 Analyst: ADC QC Key: WATERLOO
Workgroup (AAB#): WG594561 Cal ID: HPMS9 - 28-SEP-16
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	50.0	45.5	ug/L	0.397	8.90	20	
1,2-Dichloropropane	CCC	50.0	46.9	ug/L	0.272	6.15	20	
Chloroform	CCC	50.0	46.4	ug/L	0.468	7.22	20	
Ethylbenzene	CCC	50.0	49.0	ug/L	0.545	2.06	20	
Toluene	CCC	50.0	46.1	ug/L	1.52	7.76	20	
Vinyl Chloride	CCC	50.0	41.8	ug/L	0.258	16.3	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	51.0	ug/L	1.05	2.04	20	
1,1-Dichloroethane	SPCC	50.0	47.1	ug/L	0.496	5.87	20	
Bromoform	SPCC	50.0	56.2	ug/L	0.339	12.4	20	
Chlorobenzene	SPCC	50.0	50.1	ug/L	1.02	0.106	20	
Chloromethane	SPCC	50.0	38.7	ug/L	0.355	22.6	20	*
Xylenes		150	149	ug/L	0.651	0.417	20	
1,1,1-Trichloroethane		50.0	45.3	ug/L	0.418	9.33	20	
1,1,2-Trichloro-1,2,2-Trifluoroethane		50.0	53.5	ug/L	0.248	7.04	20	
1,1,2-Trichloroethane		50.0	48.7	ug/L	0.365	2.50	20	
1,2,3-Trichlorobenzene		50.0	48.7	ug/L	1.13	2.54	20	
1,2,4-Trichlorobenzene		50.0	52.2	ug/L	1.16	4.42	20	
1,2-Dibromo-3-Chloropropane		50.0	46.7	ug/L	0.252	6.66	20	
1,2-Dibromoethane		50.0	47.4	ug/L	0.373	5.13	20	
1,2-Dichlorobenzene		50.0	49.7	ug/L	1.53	0.681	20	
1,2-Dichloroethane		50.0	44.8	ug/L	0.397	10.4	20	
cis-1,2-Dichloroethene		50.0	48.0	ug/L	0.294	3.99	20	
trans-1,2-Dichloroethene		50.0	46.4	ug/L	0.363	7.14	20	
1,3-Dichlorobenzene		50.0	49.4	ug/L	1.51	1.25	20	
1,4-Dichlorobenzene		50.0	49.4	ug/L	1.53	1.13	20	
2-Butanone		50.0	47.0	ug/L	0.160	5.96	20	
2-Hexanone		50.0	45.5	ug/L	0.324	9.09	20	
4-Methyl-2-Pentanone		50.0	46.9	ug/L	0.140	6.26	20	
Acetone		50.0	43.2	ug/L	0.109	13.6	20	
Benzene		50.0	49.4	ug/L	1.04	1.13	20	
Bromochloromethane		50.0	46.9	ug/L	0.190	6.13	20	
Bromodichloromethane		50.0	47.5	ug/L	0.373	4.92	20	
Bromomethane		50.0	33.2	ug/L	0.168	33.5	20	*
Carbon Disulfide		50.0	46.3	ug/L	0.694	7.47	20	
Carbon Tetrachloride		50.0	47.3	ug/L	0.367	5.40	20	
Chloroethane		50.0	47.0	ug/L	0.190	6.02	20	
cis-1,3-Dichloropropene		50.0	47.2	ug/L	0.423	5.65	20	
Cyclohexane		50.0	49.1	ug/L	0.449	1.78	20	
Dibromochloromethane		50.0	50.4	ug/L	0.436	0.792	20	
Dichlorodifluoromethane		50.0	49.7	ug/L	0.388	0.643	20	
Isopropylbenzene		50.0	50.5	ug/L	1.65	1.05	20	
Methyl acetate		50.0	43.4	ug/L	0.283	13.2	20	

CCV - Modified 03/05/2008
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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594558-02
 Instrument ID: HPMS9 Run Time: 16:02 Method: 8260C
 File ID: 9M977625 Analyst: ADC QC Key: WATERLOO
 Workgroup (AAB#): WG594561 Cal ID: HPMS9 - 28-SEP-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Methyl Tert Butyl Ether	50.0	45.2	ug/L	0.807	9.67	20	
Methylcyclohexane	50.0	52.1	ug/L	0.451	4.27	20	
Methylene Chloride	50.0	44.7	ug/L	0.268	10.6	20	
m-,p-Xylene	100	102	ug/L	0.660	2.42	20	
o-Xylene	50.0	47.0	ug/L	0.642	6.08	20	
Styrene	50.0	50.2	ug/L	1.11	0.419	20	
Tetrachloroethene	50.0	50.3	ug/L	0.295	0.697	20	
trans-1,3-Dichloropropene	50.0	49.5	ug/L	0.554	1.10	20	
Trichloroethene	50.0	46.4	ug/L	0.275	7.17	20	
Trichlorofluoromethane	50.0	46.4	ug/L	0.436	7.18	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
 PDF File ID: 5061701
 Report generated 12/16/2016 15:06



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594656-02
 Instrument ID: HPMS9 Run Time: 11:25 Method: 8260C
 File ID: 9M977660 Analyst: ADC QC Key: WATERLOO
 Workgroup (AAB#): WG594657 Cal ID: HPMS9 - 28-SEP-16
 Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	50.0	45.7	ug/L	0.398	8.67	20	
1,2-Dichloropropane	CCC	50.0	47.1	ug/L	0.274	5.74	20	
Chloroform	CCC	50.0	46.2	ug/L	0.466	7.65	20	
Ethylbenzene	CCC	50.0	49.2	ug/L	0.548	1.57	20	
Toluene	CCC	50.0	46.3	ug/L	1.53	7.46	20	
Vinyl Chloride	CCC	50.0	42.7	ug/L	0.264	14.5	20	
1,1,2,2-Tetrachloroethane	SPCC	50.0	51.2	ug/L	1.06	2.31	20	
1,1-Dichloroethane	SPCC	50.0	47.1	ug/L	0.496	5.76	20	
Bromoform	SPCC	50.0	53.6	ug/L	0.324	7.26	20	
Chlorobenzene	SPCC	50.0	50.3	ug/L	1.02	0.642	20	
Chloromethane	SPCC	50.0	38.8	ug/L	0.357	22.3	20	*
Xylenes		150	152	ug/L	0.661	1.33	20	
1,1,1-Trichloroethane		50.0	45.1	ug/L	0.415	9.89	20	
1,1,2-Trichloro-1,2,2-Trifluoroethane		50.0	53.8	ug/L	0.249	7.53	20	
1,1,2-Trichloroethane		50.0	48.9	ug/L	0.367	2.16	20	
1,2,3-Trichlorobenzene		50.0	50.2	ug/L	1.16	0.440	20	
1,2,4-Trichlorobenzene		50.0	53.7	ug/L	1.20	7.45	20	
1,2-Dibromo-3-Chloropropane		50.0	44.3	ug/L	0.239	11.3	20	
1,2-Dibromoethane		50.0	47.3	ug/L	0.372	5.48	20	
1,2-Dichlorobenzene		50.0	50.7	ug/L	1.56	1.35	20	
1,2-Dichloroethane		50.0	44.7	ug/L	0.395	10.7	20	
cis-1,2-Dichloroethene		50.0	47.4	ug/L	0.290	5.10	20	
trans-1,2-Dichloroethene		50.0	46.7	ug/L	0.365	6.63	20	
1,3-Dichlorobenzene		50.0	51.3	ug/L	1.57	2.63	20	
1,4-Dichlorobenzene		50.0	51.2	ug/L	1.58	2.42	20	
2-Butanone		50.0	46.0	ug/L	0.157	8.05	20	
2-Hexanone		50.0	44.0	ug/L	0.314	12.1	20	
4-Methyl-2-Pentanone		50.0	45.8	ug/L	0.136	8.49	20	
Acetone		50.0	42.9	ug/L	0.108	14.2	20	
Benzene		50.0	49.5	ug/L	1.04	1.00	20	
Bromochloromethane		50.0	46.6	ug/L	0.189	6.75	20	
Bromodichloromethane		50.0	46.7	ug/L	0.366	6.53	20	
Bromomethane		50.0	29.4	ug/L	0.149	41.2	20	*
Carbon Disulfide		50.0	46.9	ug/L	0.704	6.18	20	
Carbon Tetrachloride		50.0	47.5	ug/L	0.369	4.95	20	
Chloroethane		50.0	46.5	ug/L	0.189	6.96	20	
cis-1,3-Dichloropropene		50.0	47.2	ug/L	0.423	5.64	20	
Cyclohexane		50.0	51.2	ug/L	0.468	2.49	20	
Dibromochloromethane		50.0	49.9	ug/L	0.432	0.132	20	
Dichlorodifluoromethane		50.0	50.4	ug/L	0.394	0.817	20	
Isopropylbenzene		50.0	50.7	ug/L	1.66	1.31	20	
Methyl acetate		50.0	42.9	ug/L	0.280	14.1	20	

CCV - Modified 03/05/2008
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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594656-02
 Instrument ID: HPMS9 Run Time: 11:25 Method: 8260C
 File ID: 9M977660 Analyst: ADC QC Key: WATERLOO
 Workgroup (AAB#): WG594657 Cal ID: HPMS9 - 28-SEP-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Methyl Tert Butyl Ether	50.0	44.1	ug/L	0.787	11.9	20	
Methylcyclohexane	50.0	54.0	ug/L	0.467	7.97	20	
Methylene Chloride	50.0	44.3	ug/L	0.266	11.3	20	
m-,p-Xylene	100	105	ug/L	0.674	4.57	20	
o-Xylene	50.0	47.4	ug/L	0.649	5.15	20	
Styrene	50.0	50.0	ug/L	1.11	0.0238	20	
Tetrachloroethene	50.0	50.3	ug/L	0.295	0.520	20	
trans-1,3-Dichloropropene	50.0	49.2	ug/L	0.551	1.65	20	
Trichloroethene	50.0	46.5	ug/L	0.276	7.08	20	
Trichlorofluoromethane	50.0	46.4	ug/L	0.436	7.23	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
 PDF File ID: 5061701
 Report generated 12/16/2016 15:06



Microbac Laboratories Inc.
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

Login Number: L16120352
Instrument ID: HPMS9
Workgroup (AAB#): WG594561

CCV Number: WG594558-02
CAL ID: HPMS9-28-SEP-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG594558-02	NA	NA	242347	439473	601483
Upper Limit	NA	NA	484694	878946	1202966
Lower Limit	NA	NA	121174	219737	300742
<u>L16120352-07</u>	1.00	01	181531	362004	490065
L16120352-09	1.00	01	211012	409014	556202
L16120352-11	1.00	01	212031	402647	544436
L16120352-13	1.00	01	180047	364176	491507
L16120352-15	1.00	01	177775	361251	490056
L16120352-21	1.00	01	174239	356358	482157
L16120352-23	1.00	01	176034	356647	486586
L16120352-25	1.00	01	185643	372857	508268
WG594561-01	1.00	01	187058	380310	519007
WG594561-02	1.00	01	231927	422820	568380

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

Login Number: L16120352
Instrument ID: HPMS9
Workgroup (AAB#): WG594657

CCV Number: WG594656-02
CAL ID: HPMS9-28-SEP-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG594656-02	NA	NA	224437	415043	570757
Upper Limit	NA	NA	448874	830086	1141514
Lower Limit	NA	NA	112219	207522	285379
<u>L16120352-17</u>	1.00	01	184065	372353	506687
L16120352-19	1.00	01	203731	393096	534163
L16120352-20	1.00	01	206820	399540	536942
L16120352-26	1.00	01	175360	351641	482637
WG594657-01	1.00	01	184195	375831	508131
WG594657-02	1.00	01	206992	391046	530735

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 CCV)

Login Number: L16120352
Instrument ID: HPMS9
Workgroup (AAB#): WG594561

CCV Number: WG594558-02
CAL ID: HPMS9-28-SEP-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG594558-02	NA	NA	17.7	14.67	10.8
Upper Limit	NA	NA	18.2	15.17	11.3
Lower Limit	NA	NA	17.2	14.17	10.3
<u>L16120352-07</u>	1.00	01	17.7	14.67	10.81
L16120352-09	1.00	01	17.7	14.67	10.79
L16120352-11	1.00	01	17.7	14.67	10.8
L16120352-13	1.00	01	17.7	14.67	10.81
L16120352-15	1.00	01	17.7	14.67	10.81
L16120352-21	1.00	01	17.7	14.67	10.8
L16120352-23	1.00	01	17.7	14.67	10.8
L16120352-25	1.00	01	17.7	14.67	10.8
WG594561-01	1.00	01	17.7	14.67	10.8
WG594561-02	1.00	01	17.7	14.67	10.8

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 CCV)

Login Number: L16120352
Instrument ID: HPMS9
Workgroup (AAB#): WG594657

CCV Number: WG594656-02
CAL ID: HPMS9-28-SEP-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG594656-02	NA	NA	17.7	14.67	10.79
Upper Limit	NA	NA	18.2	15.17	11.29
Lower Limit	NA	NA	17.2	14.17	10.29
<u>L16120352-17</u>	1.00	01	17.7	14.67	10.79
L16120352-19	1.00	01	17.69	14.67	10.8
L16120352-20	1.00	01	17.7	14.67	10.8
L16120352-26	1.00	01	17.7	14.67	10.8
WG594657-01	1.00	01	17.69	14.67	10.81
WG594657-02	1.00	01	17.69	14.67	10.8

IS-1 - 1,4-Dichlorobenzene-d4
IS-2 - Chlorobenzene-d5
IS-3 - Fluorobenzene

Underline = Response outside limits



2.2 Semivolatiles Data

2.2.1 Semivolatiles GC/MS Data (8270)

2.2.1.1 Summary Data



Login Number: L16120352
Department: Semivolatiles
Analyst: Sarah Bogolin

METHOD

Preparation 3520C

Analysis SW-846 8270C

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

Alternate Source Standards: The percent difference was out of range for the following analyte: Benzoic Acid. Please see the applicable QC report for a detailed presentation of the failure.

Continuing Calibration and Tune: Recoveries out of range were observed for the following analyte: Benzoic Acid. Please see the applicable QC report for a detailed presentation of the failure.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: Recoveries out of range were observed for the following analyte/surrogate: 2,4,6-Tribromophenol failed high in the LCS but was acceptable in the LCSD. Benzoic Acid failed high in the LCSD but was acceptable in the LCS and was non-detect in the associated sample. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
----------	---------	------	--------	-------	-------	------

WG594170-02	2,4,6-Tribromophenol	2016-12-12 12:54:00	125	10	123	Recovery
WG594170-03	Benzoic Acid	2016-12-12 13:26:00	106	10	100	Recovery

Matrix Spikes: There were no MS/MSD results associated with this sample delivery group, due to insufficient volume of sample. The laboratory included an LCS and LCS duplicate in the preparation batch in lieu of the NELAC prescribed MS/MSD. Microbac recommends site specific MS/MSD samples to avoid possible data qualification.

SAMPLES

Samples: All acceptance criteria were met.

Internal Standards: All acceptance criteria were met.

Surrogates: All acceptance criteria were met.

Manual Integration Reason Codes

Reason #1: Data System Fails to Select Correct Peak In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low areacounts for the target compound.

Reason #3: Improperly Integrated Isomers and/or coeluting compounds. This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

Reason #4: System Establishes Incorrect Baseline There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

Reason #5: Miscellaneous Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Managing Director or the QAO will be required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120382
Approved By: Eric Lawson



Certificate of Analysis

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: HPMS4
Client ID: MW09R-120616	Prep Method: 3520C	Prep Date: 12/08/2016 15:40
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/23/2016 14:59
Workgroup #: WG594505	Analyst: SCB	Run Date: 12/12/2016 18:16
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: 4M81320
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	22.2	2.78
1,3,5-Trinitrobenzene	99-35-4		U	5.56	2.78
1,3-Dinitrobenzene	99-65-0		U	5.56	2.78
1,4-Dioxane	123-91-1		U	11.1	5.56
2,4,5-Trichlorophenol	95-95-4		U	5.56	2.78
2,4,6-Trichlorophenol	88-06-2		U	5.56	2.78
2,4-Dichlorophenol	120-83-2		U	5.56	2.78
2,4-Dimethylphenol	105-67-9		U	5.56	2.78
2,4-Dinitrophenol	51-28-5		U	27.8	13.9
2,4-Dinitrotoluene	121-14-2		U	5.56	2.78
2,6-Dinitrotoluene	606-20-2		U	5.56	2.78
2-Chloronaphthalene	91-58-7		U	5.56	2.78
2-Chlorophenol	95-57-8		U	5.56	2.78
2-Methylnaphthalene	91-57-6		U	5.56	2.78
2-Methylphenol	95-48-7		U	5.56	2.78
2-Nitroaniline	88-74-4		U	27.8	13.9
2-Nitrophenol	88-75-5		U	5.56	2.78
3-Nitroaniline	99-09-2		U	27.8	13.9
3,3'-Dichlorobenzidine	91-94-1		U	5.56	2.78
3-,4-Methylphenol	65794-96-9		U	5.56	2.78
4-Bromophenyl-phenylether	101-55-3		U	5.56	2.78
4-Chloroaniline	106-47-8		U	5.56	2.78
4-Nitrophenol	100-02-7		U	27.8	13.9
Acenaphthene	83-32-9		U	5.56	2.78
Acenaphthylene	208-96-8		U	5.56	2.78
Anthracene	120-12-7		U	5.56	2.78
Benzo(a)anthracene	56-55-3		U	5.56	2.78
Benzo(a)pyrene	50-32-8		U	5.56	2.78
Benzo(b)fluoranthene	205-99-2		U	5.56	2.78
Benzo(g,h,i)Perylene	191-24-2		U	5.56	2.78
Benzo(k)fluoranthene	207-08-9		U	5.56	2.78
Benzoic acid	65-85-0		U	22.2	11.1
Benzyl alcohol	100-51-6		U	5.56	2.78

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Bis(2-Chloroethyl)ether	111-44-4		U	5.56	2.78
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.56	2.78
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.56	2.78
Butylbenzylphthalate	85-68-7		U	5.56	2.78
Carbazole	86-74-8		U	22.2	2.78
Chrysene	218-01-9		U	5.56	2.78
Di-N-Butylphthalate	84-74-2		U	5.56	2.78
Di-n-octylphthalate	117-84-0		U	5.56	2.78
Dibenzo(a,h)Anthracene	53-70-3		U	5.56	2.78
Dibenzofuran	132-64-9		U	5.56	2.78
Diethylphthalate	84-66-2		U	5.56	2.78
Dimethylphthalate	131-11-3		U	5.56	2.78
Fluoranthene	206-44-0		U	5.56	2.78
Fluorene	86-73-7		U	5.56	2.78
Hexachlorobenzene	118-74-1		U	5.56	2.78
Hexachlorobutadiene	87-68-3		U	5.56	2.78
Hexachlorocyclopentadiene	77-47-4		U	5.56	2.78
Hexachloroethane	67-72-1		U	5.56	2.78
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.56	2.78
Isophorone	78-59-1		U	5.56	2.78
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.56	2.78
Naphthalene	91-20-3		U	5.56	2.78
Nitrobenzene	98-95-3		U	5.56	2.78
Pentachlorophenol	87-86-5		U	27.8	13.9
Phenanthrene	85-01-8		U	5.56	2.78
Phenol	108-95-2		U	5.56	2.78
Pyrene	129-00-0		U	5.56	2.78
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	106	10	123		
2-Fluorobiphenyl	75.7	43	116		
2-Fluorophenol	57.8	21	100		
Nitrobenzene-d5	82.1	35	114		
p-Terphenyl-d14	60.3	33	141		
Phenol-d5	64.5	10	94		
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: HPMS4
Client ID: MW09R-120616	Prep Method: 3520C	Prep Date: 12/08/2016 15:40
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/23/2016 14:59
Workgroup #: WG594505	Analyst: SCB	Run Date: 12/12/2016 18:16
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: 4M81320
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
Trichloroethylene		248		0.000	0.000
Ethane, 1,1,2-trichloro-		48.9		0.000	0.000
3-Hexen-2-one		15.0		0.000	0.000
Tetrachloroethylene		14.0		0.000	0.000
1-Propene, 1,2,3-trichloro-, (Z)-		41.9		0.000	0.000
1,4-Oxathiane		31.3		0.000	0.000
Ethane, 1,1,2,2-tetrachloro-		749		0.000	0.000
1-Propene, 1,1,2,3-tetrachloro-		441		0.000	0.000
Ethane, pentachloro-		138		0.000	0.000
1-Propene, 1,2,3,3-tetrachloro-		21.6		0.000	0.000
UNKNOWN		18.8		0.000	0.000
UNKNOWN2		17.1		0.000	0.000
[1,4,5]Oxadithiepane		344		0.000	0.000
UNKNOWN3		17.6		0.000	0.000
UNKNOWN4		29.8		0.000	0.000
UNKNOWN5		24.4		0.000	0.000
UNKNOWN6		23.7		0.000	0.000
UNKNOWN7		10.1		0.000	0.000
UNKNOWN8		15.2		0.000	0.000
n-Hexadecanoic acid		9.91		0.000	0.000

2.2.1.2 QC Summary Data

Example 8270 Calculations

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

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

where:

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

Example

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

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

where:

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

Example

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

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

where:

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

Example

Dry weight correction:

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

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

4.0 Concentration from Linear Regression

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

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

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

m = slope from curve plot

b = intercept from curve plot

Step 2: Calculate y from Quantitation Report

y = 16790/784838 = 0.02139

Step 3: Solve for x

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

Step 4: Solve for analyte concentration Cx

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

Example Spreadsheet Calculation:

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

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

Where:

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

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

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

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

Step 2: Calculate y from Quantitation Report

$$y = Ax/Ais$$

Step 3: Solve for x using the quadratic formula

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

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

Step 4: Solve for analyte concentration Cx

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

Example Spreadsheet Calculation:

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

Microbac Laboratories Inc.
Continuous Sample Extract Log

Workgroup: WG594170 TIME ON: 16:20 OFF: 11:20 ON: 14:00 OFF: 11:52
 Analyst: CPD CH2CL2 Lot #: COA19311
 Spike Analyst: CPD Sodium Sulfate, Anhydrous, Granular Lot # COA19291
 Method: 3520C 1:1 H2SO4 Lot #: RGT38550
 Run Date: 12/08/2016 15:40 10N NaOH Lot #: RGT38548
 SOP: EXB01 Revision 20
 Spike Witness: JDH
 Surr Solution: STD78228

	SAMPLE #	Type	Reference	Prod	pH	Init Amnt	Surr Amnt	Spike Amnt	Spike Sol	Final Vol	Color
1	L16120352-13	SAMP		27-SPE-DIO<2>12		900 mL	.5 mL			1 mL	Colored
2	WG594170-01	BLANK		27-SPE-DIO<2>12		1000 mL	.5 mL			1 mL	Transparent
3	WG594170-02	LCS		27-SPE-DIO<2>12		1000 mL	.5 mL	.5 mL	STD78353	1 mL	Colored
4	WG594170-03	LCS2		27-SPE-DIO<2>12		1000 mL	.5 mL	.5 mL	STD78353	1 mL	Colored

Due to insufficient sample volume, this preparation batch failed to include the method prescribed MS and MSD.
 TV1 P5,6
 pH 0-3 Lot#230515
 pH 10-12 Lot#213515

Analyst: *Robert Davis*

Reviewer: *Justin Harrison*



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS4 Dataset: 111816
 Analyst1: MES Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 27
 Method: OVAP SOP: MSS01 Rev: 0

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

Workgroups: _____ Column 1 ID: RXI-5MS Column 2 ID: NA
WG592116, WG591659, WG592379, WG591763
 Internal STD: COA19217 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD78613, STD78967 LCS STD: _____ MS/MSD STD: _____

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	4M81050	WG592233-01 50PPM DFTPP STD	1	1	STD77832	11/18/16 09:39
2	4M81051	WG592233-02 50PPM 8270 STD	1	1	STD78613	11/18/16 09:57
3	4M81052	WG592234-01 50PPM TCL STD	1	1	STD78967	11/18/16 10:29
4	4M81053	WG592234-02 3PPM TCL STD	1	1	STD78967	11/18/16 11:01
5	4M81054	WG592234-04 10 PM TCL STD	1	1	STD78967	11/18/16 11:33
6	4M81055	WG592234-05 25 PM TCL STD	1	1	STD78967	11/18/16 12:05
7	4M81056	WG592234-06 80 PM TCL STD	1	1	STD78967	11/18/16 12:37
8	4M81057	WG592234-07 100 PM TCL STD	1	1	STD78967	11/18/16 13:08
9	4M81058	WG592234-08 50PPM TCL ALT SOURCE	1	1	STD78432	11/18/16 13:40
10	4M81059	WG592318-01 50PPM DFTPP STD	1	1	STD77832	11/18/16 14:11
11	4M81060	WG592318-02 50PPM 8270 STD	1	1	STD78613	11/18/16 14:29
12	4M81061	WG592319-01 50PPM TCL STD	1	1	STD78967	11/18/16 15:01
13	4M81062	WG591731-01 BLANK 11/15/16	1	1		11/18/16 15:31
40	4M81063	L16110002-09 WG591731-02	1	1		11/18/16 16:03
41	4M81064	L16110002-10 WG591731-03 LC	1	1		11/18/16 16:35
16	4M81065	L16110002-11 3520 DOC	1	1		11/18/16 17:07
17	4M81066	L16110002-12 3520 DOC	1	1		11/18/16 17:39
18	4M81067	WG591102-01 BLANK 11/11	1	1		11/18/16 18:11
19	4M81068	WG591102-02 LCS 11/11	1	1		11/18/16 18:43
20	4M81069	WG591102-03 LCSDUP 11/11	1	1		11/18/16 19:15
21	4M81070	L16110161-01 5X 827-SPE-DIOX	1	5		11/18/16 19:47
22	4M81071	L16110590-08 10X	1	10		11/18/16 20:19
23	4M81072	L16110590-10 10X	1	10		11/18/16 20:51
24	4M81073	L16110590-07 10X	1	10		11/18/16 21:24
25	4M81074	L16110590-21 5X	1	5		11/18/16 21:56
26	4M81075	L16110590-17 25X	1	25		11/18/16 22:28
27	4M81076	L16110590-14 10X	1	10		11/18/16 23:00
28	4M81077	L16110590-23 10X	1	10		11/18/16 23:32
29	4M81078	L16110590-20 100X	1	100		11/19/16 00:04
30	4M81079	L16110590-22 100X	1	100		11/19/16 00:36
31	4M81080	L16110462-15	1	1		11/19/16 01:08
32	4M81081	L16110462-18	1	1		11/19/16 01:40
33	4M81082	BAKEOUT	1	1		11/19/16 02:12

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Approved: 21-NOV-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS4 Dataset: 111816
 Analyst1: MES Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 27
 Method: OVAP SOP: MSS01 Rev: 0

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

Workgroups: _____ Column 1 ID: RXI-5MS Column 2 ID: NA
WG592116,WG591659,WG592379,WG591763
 Internal STD: COA19217 Surrogate STD: NA
 CCV STD: STD78613,STD78967 LCS STD: _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	4M81083	L16110591-01	2	1		11/19/16 02:44
35	4M81084	L16110641-05	2	1		11/19/16 03:16
36	4M81085	L16110675-01	2	1		11/19/16 03:48
37	4M81086	BAKEOUT	1	1		11/19/16 04:20
38	4M81087	BAKEOUT	1	1		11/19/16 04:52
39	4M81088	BAKEOUT	1	1		11/19/16 05:24

Comments

Seq.	Rerun	Dil.	Reason	Analytes
21				
			L16110161-01 5X analyzed at a dilution due to foamy sample matrix. Two low base surrogates, one is less than 10%. This confirms low surrogates in the original extraction.	
22	X	50	Over Calibration Range	43
			L16110590-08 10X	
23	X	50	Over Calibration Range	43
			L16110590-10 10X	
24	X	50	Over Calibration Range	43
			L16110590-07 10X	
25	X	25	Over Calibration Range	43
			L16110590-21 5X	
27	X	50	Over Calibration Range	43
			L16110590-14 10X	
28	X	50	Over Calibration Range	43
			L16110590-23 10X	
29	X	200	Over Calibration Range	43
			L16110590-20 100X	

Eri C. Zimm



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS4 Dataset: 112316
 Analyst1: SCB Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 27
 Method: OVAP SOP: MSS01 Rev: 0
 Method: 625 SOP: MSS01 Rev: 27
 Maintenance Log ID: _____ Syringe Filter Lot#: _____
 Eluent ID#: _____

Workgroups: WG562701
 Column 1 ID: RXI-5MS Column 2 ID: NA
 Internal STD: COA19217 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD78613 LCS STD: _____ MS/MSD STD: _____

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	4M81153	RINSE W/IS	1	1		11/23/16 08:49
2	4M81154	RINSE W/IS	1	1		11/23/16 09:21
3	4M81155	RINSE W/IS	1	1		11/23/16 09:53
4	4M81156	WG592701-01 50PPM DFTPP STD	1	1	STD77832	11/23/16 10:24
5	4M81157	WG592701-02 50PPM 8270 STD	1	1	STD78613	11/23/16 10:43
6	4M81158	WG592701-03 1PPM 8270 STD	1	1	STD78613	11/23/16 11:15
7	4M81159	WG592701-04 3PPM 8270 STD	1	1	STD78613	11/23/16 11:46
8	4M81160	WG592701-05 10PPM 8270 STD	1	1	STD78613	11/23/16 12:19
9	4M81161	WG592701-06 15PPM 8270 STD	1	1	STD78613	11/23/16 12:50
10	4M81162	WG592701-07 25PPM 8270 STD	1	1	STD78613	11/23/16 13:23
11	4M81163	WG592701-08 80PPM 8270 STD	1	1	STD78613	11/23/16 13:55
12	4M81164	WG592701-09 100PPM 8270 STD	1	1	STD78613	11/23/16 14:27
13	4M81165	WG592701-10 120PPM 8270 STD	1	1	STD78613	11/23/16 14:59
14	4M81166	WG592701-11 50PPM 8270 ALT SRC	1	1	STD78148	11/23/16 15:47
15	4M81167	WG592701-11 50PPM 8270 ALT SRC	1	1	STD78148	11/23/16 16:20
16	4M81168	BAKE OUT	1	1		11/23/16 16:52

Comments

Seq.	Rerun	Dil.	Reason	Analytes
14				
			WG592701-11 50PPM 8270 ALT SRC several analytes high. Needs reanalyzed. DNR.	

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Approved: 29-NOV-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS4 Dataset: 112816
 Analyst1: SCB Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 27
 Method: OVAP SOP: MSS01 Rev: 0

Maintenance Log ID: _____ Syringe Filter Lot#: _____

Eluent ID#: _____

Workgroups: _____
 Column 1 ID: RXI-5MS Column 2 ID: NA
 WG592934
 Internal STD: COA19217 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD78613 LCS STD: _____ MS/MSD STD: _____

Comments: _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	4M81169	WG592863-01 50PPM DFTPP STD	1	1	STD77832	11/28/16 09:12
2	4M81170	WG592863-02 50PPM 8270 STD	1	1	STD78613	11/28/16 09:30
3	4M81171	WG592863-02 50PPM 8270 STD	1	1	STD78613	11/28/16 10:03
4	4M81172	WG592863-01 50PPM DFTPP STD	1	1	STD77832	11/28/16 11:48
5	4M81173	WG592863-01 50PPM DFTPP STD	1	1	STD77832	11/28/16 12:08
6	4M81174	WG592863-01 50PPM DFTPP STD	1	1	STD77832	11/28/16 14:09
7	4M81175	WG592863-01 50PPM DFTPP STD	1	1	STD77832	11/28/16 14:28
8	4M81176	WG592863-02 50PPM 8270 STD	1	1	STD78613	11/28/16 14:46
9	4M81177	WG592701-12 50PPM 1,4-DIOX ALT SRC	1	1	STD76455	11/28/16 15:18
10	4M81178	WG592701-13 50PPM MP,A9,BENZ ALT SRC	1	1	STD77155	11/28/16 15:50
11	4M81179	WG592701-12 50PPM 1,4-DIOX ALT SRC	1	1	STD76455	11/28/16 16:22
12	4M81180	WG592949-01 50PPM TCL STD	1	1	STD78967	11/28/16 16:54
13	4M81181	WG592857-01 BLANK 11/28	2	1		11/28/16 17:27
14	4M81182	WG592857-02 LCS 11/28	2	1		11/28/16 17:59
15	4M81183	WG592857-03 LCS2 11/28	2	1		11/28/16 18:31
16	4M81184	L16111173-02	2	1		11/28/16 19:03
17	4M81185	L16111176-01	2	1		11/28/16 19:35
18	4M81186	L16111177-01 5X	2	5		11/28/16 20:07
19	4M81187	BAKE OUT	1	1		11/28/16 20:39
20	4M81188	BAKE OUT	1	1		11/28/16 21:11

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2				
			WG592863-02 50PPM 8270 STD high %D, DNR	
3				
			WG592863-02 50PPM 8270 STD high %D, changed liner and septa, tightened nuts-seems to have been a leak in the injection port., DNR	
4				
			WG592863-01 50PPM DFTPP STD benzidene >2, DNR	
5				
			WG592863-01 50PPM DFTPP STD benzidene >2, changed the liner. DNR.	
6				
			WG592863-01 50PPM DFTPP STD benzidene >2, Changed the gold seal. DNR	

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Approved: 30-NOV-16

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS4 Dataset: 112816
 Analyst1: SCB Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 27
 Method: OVAP SOP: MSS01 Rev: 0

Maintenance Log ID: _____ Syringe Filter Lot#: _____

Eluent ID#: _____

Workgroups: _____
 Column 1 ID: RXI-5MS Column 2 ID: NA
WG592934
 Internal STD: COA19217 Surrogate STD: NA
 CCV STD: STD78613 LCS STD: _____

Comments

Seq.	Rerun	Dil.	Reason	Analytes
9				
			WG592701-12 50PPM 1,4-DIOX ALT SRC high %D, DNR	
12				
			WG592949-01 50PPM TCL STD sample list changed, standard not needed, DNR	
16				
			L16111173-02 hexachloroethane has a low %REC in the LCS and nitrobenzene has a low %REC in the LCSdup, sample is non-detect for the high outlier	
18				
			L16111177-01 5X ran at a dilution due to a brown, foamy sample matrix has three low base and two low acid surrogate recoveries, the acids are <10%, hexachloroethane has a low %REC in the LCS and nitrobenzene has a high %REC in the LCSdup, sample is non-detect for the high outlier, needs re-extracted due to the surrogate recoveries	

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Approved: 30-NOV-16

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS4 Dataset: 121216
 Analyst1: SCB Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 27
 Method: OVAP SOP: MSS01 Rev: 0

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

Workgroups: _____ Column 1 ID: RXI-5MS Column 2 ID: NA
WG594505, WG594468, WG594343
 Internal STD: COA19217 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD78613 LCS STD: _____ MS/MSD STD: _____

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	4M81303	WG594455-01 50PPM DFTPP STD	1	1	STD77832	12/12/16 09:13
2	4M81304	WG594455-02 50PPM 8270 STD	1	1	STD78613	12/12/16 09:31
3	4M81305	WG594482-01 50PPM TCL STD	1	1	STD78967	12/12/16 10:13
4	4M81306	WG594281-01 BLANK 12/9	1	1		12/12/16 10:45
5	4M81307	WG594281-02 LCS 12/9	1	1		12/12/16 11:17
6	4M81308	WG594281-03 LCS2 12/9	1	1		12/12/16 11:49
7	4M81309	WG594170-01 BLANK 12/8	1	1		12/12/16 12:22
8	4M81310	WG594170-02 LCS 12/8	1	1		12/12/16 12:54
9	4M81311	WG594170-03 LCS2 12/8	1	1		12/12/16 13:26
10	4M81312	L16120298-01	2	1		12/12/16 13:58
11	4M81313	L16120366-02	17	1		12/12/16 14:31
12	4M81314	L16120454-01	1	1		12/12/16 15:03
13	4M81315	L16120454-02	1	1		12/12/16 15:35
14	4M81316	L16120454-03	1	1		12/12/16 16:07
15	4M81317	L16120454-04	1	1		12/12/16 16:39
16	4M81318	L16120454-05	1	1		12/12/16 17:11
17	4M81319	L16120454-06	1	1		12/12/16 17:43
18	4M81320	L16120352-13	1	1		12/12/16 18:16
19	4M81321	WG594203-01 FBLK1	17	1		12/12/16 18:47
20	4M81322	BLK1 827-SPE 60RPM	1	1		12/12/16 19:19
21	4M81323	BLK2 827-SPE 60RPM	1	1		12/12/16 19:52
22	4M81324	LCS1 827-SPE 60RPM	1	1		12/12/16 20:24
23	4M81325	LCS2 827-SPE 60RPM	1	1		12/12/16 20:56
24	4M81326	LCS1 827-DIOX 60RPM	1	1		12/12/16 21:28
25	4M81327	LCS2 827-DIOX 60RPM	1	1		12/12/16 22:00
26	4M81328	L16120381-04	2	1		12/12/16 22:32
27	4M81329	L16120438-01	2	1		12/12/16 23:04
28	4M81330	L16120438-02	2	1		12/12/16 23:36
29	4M81331	L16120438-04	2	1		12/13/16 00:08
30	4M81332	L16120438-05	2	1		12/13/16 00:40
31	4M81333	L16120501-01	2	1		12/13/16 01:11
32	4M81334	L16120502-01	2	1		12/13/16 01:44
33	4M81335	L16120503-01	2	1		12/13/16 02:16

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Approved: 13-DEC-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS4 Dataset: 121216
 Analyst1: SCB Analyst2: NA
 Method: 8270C/D SOP: MSS01 Rev: 27
 Method: OVAP SOP: MSS01 Rev: 0

Maintenance Log ID: _____ Syringe Filter Lot#: _____

Eluent ID#: _____

Workgroups: Column 1 ID: RXI-5MS Column 2 ID: NA
WG594505, WG594468, WG594343
 Internal STD: COA19217 Surrogate STD: NA
 CCV STD: STD78613 LCS STD: _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	4M81336	L16120373-01 2X	2	2		12/13/16 02:48
35	4M81337	L16120457-01 5X	2	5		12/13/16 03:20
36	4M81338	L16120457-02 5X	2	5		12/13/16 03:51
37	4M81339	L16120500-01 5X	2	5		12/13/16 04:23
38	4M81340	BAKE OUT	1	1		12/13/16 04:55
39	4M81341	BAKE OUT	1	1		12/13/16 05:28
40	4M81342	BAKE OUT	1	1		12/13/16 05:59

Comments

Seq.	Rerun	Dil.	Reason	Analytes
8				
			WG594170-02 LCS 12/8 has one high acid surrogate recovery	
9				
			WG594170-03 LCS2 12/8 benzoic acid has a high %REC, the sample is non-detect for this analyte	
27				
			L16120438-01 has one low base surrogate recovery	
34				
			L16120373-01 2X ran at a dilution due to a foamy sample matrix	
35				
			L16120457-01 5X ran at a dilution due to a yellow, foamy sample matrix	
36				
			L16120457-02 5X ran at a dilution due to a yellow, foamy sample matrix	
37				
			L16120500-01 5X ran at a dilution due to a yellow/green sample matrix	

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Approved: 13-DEC-16

Eri C. Zimm



Microbac Laboratories Inc.

Data Checklist

Date: 18-NOV-2016
 Analyst: MES
 Analyst: NA
 Method: 8270/625
 Instrument: HPMS4
 Curve Workgroup: NA
 Runlog ID: 78836
 Analytical Workgroups: L16110002, 110161, 110462, 110590, 110591, 110641, 110675

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	X
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	X
Blanks	X
TCL hits	X
Surrogate recoveries	X
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	X
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	X
Manual integrations	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	MES
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:
21-NOV-2016

Mary Schilling

Secondary Reviewer:
21-NOV-2016

Eric C. Zimm

CHECKLIST1 - Modified 03/05/2008

Generated: NOV-21-2016 16:05:45



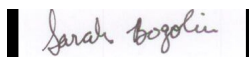
Microbac Laboratories Inc.

Data Checklist

Date: 23-NOV-2016
 Analyst: SCB
 Analyst: NA
 Method: 8270/625
 Instrument: HPMS4
 Curve Workgroup: NA
 Runlog ID: 78957
 Analytical Workgroups: WG592701

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	X
Average RF	X
Linear regression or higher order curve	X
Alternate source standard (ICV) % Difference	X
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	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	SCB
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	MES

Primary Reviewer:
29-NOV-2016



Secondary Reviewer:
29-NOV-2016





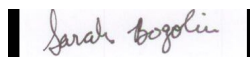
Microbac Laboratories Inc.

Data Checklist


Date: 28-NOV-2016
 Analyst: SCB
 Analyst: NA
 Method: 8270/625
 Instrument: HPMS4
 Curve Workgroup: NA
 Runlog ID: 78961
 Analytical Workgroups: L16111173, L16111176, L16111177

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

Primary Reviewer:
29-NOV-2016



Secondary Reviewer:
30-NOV-2016





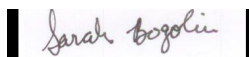
Microbac Laboratories Inc.

Data Checklist


Date: 12-DEC-2016
 Analyst: SCB
 Analyst: NA
 Method: 8270/625
 Instrument: HPMS4
 Curve Workgroup: NA
 Runlog ID: 79194
 Analytical Workgroups: L16120298, 366, 454, 352, 381, 438, 501, 502, 503, 373, 457, 500

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

Primary Reviewer:
13-DEC-2016



Secondary Reviewer:
13-DEC-2016





Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8270D
 Login Number: L16120352

AAB#: WG594505

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
MW09R-120616	13	12/06/16					12/08/2016	2.1	7		12/12/16	4.1	40	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061198
 Report generated 12/14/2016 09:20



Microbac Laboratories Inc.
 SURROGATE STANDARDS

Login Number: L16120352
 Instrument Id: HPMS4
 Workgroup (AAB#): WG594505

Method: 8270
 CAL ID: HPMS4-23-NOV-16
 Matrix: Water

Sample Number	Dilution	Tag	1	2	3	4	5	6
L16120352-13	1.00	01	106	75.7	57.8	82.1	60.3	64.5
WG594170-01	1.00	01	111	87.3	80.7	94.0	94.4	85.8
WG594170-02	1.00	01	<u>125</u>	84.0	80.0	91.4	89.3	85.6
WG594170-03	1.00	01	114	77.0	71.1	82.3	88.3	76.9

Surrogates	Surrogate Limits		
1 - 2,4,6-Tribromophenol	10	-	123
2 - 2-Fluorobiphenyl	43	-	116
3 - 2-Fluorophenol	21	-	100
4 - Nitrobenzene-d5	35	-	114
5 - p-Terphenyl-d14	33	-	141
6 - Phenol-d5	10	-	94

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/08/16 15:40 Sample ID: WG594170-01
Instrument ID: HPMS4 Run Date: 12/12/16 12:22 Prep Method: 3520C
File ID: 4M81309 Analyst: SCB Method: 8270D
Workgroup (AAB#): WG594505 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: HPMS4-23-NOV-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
1,1'-Biphenyl	2.50	20.0	2.50	1	U
1,3,5-Trinitrobenzene	2.50	5.00	2.50	1	U
1,3-Dinitrobenzene	2.50	5.00	2.50	1	U
1,4-Dioxane	5.00	10.0	5.00	1	U
2,4,5-Trichlorophenol	2.50	5.00	2.50	1	U
2,4,6-Trichlorophenol	2.50	5.00	2.50	1	U
2,4-Dichlorophenol	2.50	5.00	2.50	1	U
2,4-Dimethylphenol	2.50	5.00	2.50	1	U
2,4-Dinitrophenol	12.5	25.0	12.5	1	U
2,4-Dinitrotoluene	2.50	5.00	2.50	1	U
2,6-Dinitrotoluene	2.50	5.00	2.50	1	U
2-Chloronaphthalene	2.50	5.00	2.50	1	U
2-Chlorophenol	2.50	5.00	2.50	1	U
2-Methylnaphthalene	2.50	5.00	2.50	1	U
2-Methylphenol	2.50	5.00	2.50	1	U
2-Nitroaniline	12.5	25.0	12.5	1	U
2-Nitrophenol	2.50	5.00	2.50	1	U
3-Nitroaniline	12.5	25.0	12.5	1	U
3,3'-Dichlorobenzidine	2.50	5.00	2.50	1	U
3-,4-Methylphenol	2.50	5.00	2.50	1	U
4-Bromophenyl-phenylether	2.50	5.00	2.50	1	U
4-Chloroaniline	2.50	5.00	2.50	1	U
4-Nitrophenol	12.5	25.0	12.5	1	U
Acenaphthene	2.50	5.00	2.50	1	U
Acenaphthylene	2.50	5.00	2.50	1	U
Anthracene	2.50	5.00	2.50	1	U
Benzo(a)anthracene	2.50	5.00	2.50	1	U
Benzo(a)pyrene	2.50	5.00	2.50	1	U
Benzo(b)fluoranthene	2.50	5.00	2.50	1	U
Benzo(g,h,i)Perylene	2.50	5.00	2.50	1	U
Benzo(k)fluoranthene	2.50	5.00	2.50	1	U
Benzoic acid	10.0	20.0	10.0	1	U
Benzyl alcohol	2.50	5.00	2.50	1	U
Bis(2-Chloroethyl)ether	2.50	5.00	2.50	1	U
Bis(2-Chloroethoxy)Methane	2.50	5.00	2.50	1	U
bis(2-Ethylhexyl)phthalate	2.50	5.00	2.50	1	U
Butylbenzylphthalate	2.50	5.00	2.50	1	U
Carbazole	2.50	20.0	2.50	1	U
Chrysene	2.50	5.00	2.50	1	U
Di-N-Butylphthalate	2.50	5.00	2.50	1	U
Di-n-octylphthalate	2.50	5.00	2.50	1	U
Dibenzo(a,h)Anthracene	2.50	5.00	2.50	1	U

Report Name: BLANK

PDF ID: 5061200

14-DEC-2016 09:20



METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/08/16 15:40 Sample ID: WG594170-01
Instrument ID: HPMS4 Run Date: 12/12/16 12:22 Prep Method: 3520C
File ID: 4M81309 Analyst: SCB Method: 8270D
Workgroup (AAB#): WG594505 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: HPMS4-23-NOV-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Dibenzofuran	2.50	5.00	2.50	1	U
Diethylphthalate	2.50	5.00	2.50	1	U
Dimethylphthalate	2.50	5.00	2.50	1	U
Fluoranthene	2.50	5.00	2.50	1	U
Fluorene	2.50	5.00	2.50	1	U
Hexachlorobenzene	2.50	5.00	2.50	1	U
Hexachlorobutadiene	2.50	5.00	2.50	1	U
Hexachlorocyclopentadiene	2.50	5.00	2.50	1	U
Hexachloroethane	2.50	5.00	2.50	1	U
Indeno(1,2,3-cd)pyrene	2.50	5.00	2.50	1	U
Isophorone	2.50	5.00	2.50	1	U
Diphenylamine/n-Nitrosodiphenylamine	2.50	5.00	2.50	1	U
Naphthalene	2.50	5.00	2.50	1	U
Nitrobenzene	2.50	5.00	2.50	1	U
Pentachlorophenol	12.5	25.0	12.5	1	U
Phenanthrene	2.50	5.00	2.50	1	U
Phenol	2.50	5.00	2.50	1	U
Pyrene	2.50	5.00	2.50	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4,6-Tribromophenol	111	10 - 123	PASS
2-Fluorobiphenyl	87.3	43 - 116	PASS
2-Fluorophenol	80.7	21 - 100	PASS
Nitrobenzene-d5	94.0	35 - 114	PASS
p-Terphenyl-d14	94.4	33 - 141	PASS
Phenol-d5	85.8	10 - 94	PASS

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

Report Name: BLANK
PDF ID: 5061200
14-DEC-2016 09:20



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Analyst: SCB Prep Method: 3520C
 Instrument ID: HPMS4 Matrix: Water Method: 8270D
 Workgroup (AAB#): WG594505 Units: ug/L
 QC Key: WATERLOO Lot #: STD78353

Sample ID: WG594170-02 LCS File ID: 4M81310 Run Date: 12/12/2016 12:54
 Sample ID: WG594170-03 LCS2 File ID: 4M81311 Run Date: 12/12/2016 13:26

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
1,1'-Biphenyl	50.0	40.1	80.3	50.0	38.0	76.0	5.50	40 - 140	30	
1,4-Dioxane	50.0	31.3	62.6	50.0	28.5	56.9	9.45	50 - 150	30	
2,4,5-Trichlorophenol	50.0	43.9	87.8	50.0	41.1	82.2	6.59	35 - 120	30	
2,4,6-Trichlorophenol	50.0	44.0	88.1	50.0	40.4	80.9	8.52	30 - 120	30	
2,4-Dichlorophenol	50.0	42.5	84.9	50.0	39.8	79.5	6.56	20 - 110	30	
2,4-Dimethylphenol	50.0	43.0	86.0	50.0	40.2	80.4	6.78	20 - 120	30	
2,4-Dinitrophenol	50.0	58.4	117	50.0	59.7	119	2.07	20 - 140	30	
2,4-Dinitrotoluene	50.0	58.0	116	50.0	56.2	112	3.24	50 - 139	30	
2,6-Dinitrotoluene	50.0	52.6	105	50.0	49.6	99.1	5.84	50 - 120	30	
2-Chloronaphthalene	50.0	39.5	78.9	50.0	36.9	73.9	6.62	25 - 120	30	
2-Chlorophenol	50.0	39.8	79.6	50.0	36.0	71.9	10.2	25 - 110	30	
2-Methylnaphthalene	50.0	39.2	78.3	50.0	36.9	73.8	5.88	25 - 120	30	
2-Methylphenol	50.0	41.8	83.6	50.0	38.0	76.0	9.54	20 - 110	30	
2-Nitroaniline	50.0	55.5	111	50.0	51.8	104	6.90	45 - 115	30	
2-Nitrophenol	50.0	45.8	91.6	50.0	42.7	85.4	7.04	20 - 115	30	
3,3'-Dichlorobenzidine	50.0	53.4	107	50.0	53.6	107	0.321	30 - 140	30	
3-,4-Methylphenol	50.0	43.0	86.0	50.0	39.9	79.9	7.36	20 - 110	30	
3-Nitroaniline	50.0	52.5	105	50.0	50.5	101	3.91	40 - 120	30	
4-Bromophenyl-phenylether	50.0	50.2	100	50.0	47.8	95.6	4.82	40 - 115	30	
4-Chloroaniline	50.0	41.7	83.4	50.0	39.9	79.7	4.56	25 - 120	30	
4-Nitrophenol	50.0	57.7	115	50.0	58.1	116	0.723	10 - 132	30	
Acenaphthene	50.0	45.1	90.2	50.0	42.1	84.2	6.79	30 - 120	30	
Acenaphthylene	50.0	43.2	86.5	50.0	40.5	80.9	6.59	30 - 120	30	
Anthracene	50.0	49.4	98.8	50.0	48.9	97.8	1.02	55 - 130	30	
Benzoic acid	50.0	49.7	99.5	50.0	52.8	106	5.97	10 - 100	30	*
Benzo(a)anthracene	50.0	51.2	102	50.0	52.0	104	1.51	60 - 130	30	
Benzo(a)pyrene	50.0	53.2	106	50.0	53.7	107	0.878	55 - 135	30	
Benzo(b)fluoranthene	50.0	49.1	98.2	50.0	49.4	98.9	0.691	45 - 125	30	
Benzo(g,h,i)Perylene	50.0	53.0	106	50.0	53.3	107	0.677	45 - 140	30	
Benzo(k)fluoranthene	50.0	56.2	112	50.0	52.0	104	7.89	55 - 140	30	
Benzyl alcohol	50.0	44.1	88.3	50.0	40.5	81.1	8.51	20 - 110	30	
Bis(2-Chloroethoxy)Methane	50.0	34.3	68.6	50.0	32.2	64.4	6.27	20 - 105	30	
Bis(2-Chloroethyl)ether	50.0	42.4	84.8	50.0	39.0	77.9	8.48	25 - 110	30	
bis(2-Ethylhexyl)phthalate	50.0	56.7	113	50.0	57.3	115	1.20	50 - 150	30	
Butylbenzylphthalate	50.0	53.7	107	50.0	54.8	110	2.00	55 - 150	30	
Carbazole	50.0	51.9	104	50.0	52.2	104	0.738	50 - 130	30	
Chrysene	50.0	54.8	110	50.0	55.1	110	0.547	55 - 130	30	
Di-N-Butylphthalate	50.0	52.0	104	50.0	52.6	105	1.08	55 - 118	30	
Di-n-octylphthalate	50.0	55.8	112	50.0	56.4	113	0.954	40 - 146	30	
Dibenzofuran	50.0	43.7	87.5	50.0	40.7	81.4	7.17	35 - 115	30	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5061201
 Report generated: 12/14/2016 09:34



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Analyst: SCB Prep Method: 3520C
 Instrument ID: HPMS4 Matrix: Water Method: 8270D
 Workgroup (AAB#): WG594505 Units: ug/L
 QC Key: WATERLOO Lot #: STD78353

Sample ID: WG594170-02 LCS File ID: 4M81310 Run Date: 12/12/2016 12:54
 Sample ID: WG594170-03 LCS2 File ID: 4M81311 Run Date: 12/12/2016 13:26

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Dibenzo(a,h)Anthracene	50.0	59.5	119	50.0	55.2	110	7.52	45 - 125	30	
Diethylphthalate	50.0	51.2	102	50.0	49.7	99.4	3.03	45 - 120	30	
Dimethylphthalate	50.0	49.2	98.5	50.0	46.5	93.1	5.63	25 - 112	30	
Fluoranthene	50.0	50.5	101	50.0	51.2	102	1.33	50 - 137	30	
Fluorene	50.0	46.6	93.1	50.0	43.5	87.0	6.80	40 - 120	30	
Hexachlorobenzene	50.0	51.2	102	50.0	49.9	99.8	2.58	50 - 130	30	
Hexachlorobutadiene	50.0	36.8	73.7	50.0	33.4	66.8	9.83	24 - 105	30	
Hexachlorocyclopentadiene	50.0	21.6	43.3	50.0	20.6	41.3	4.65	20 - 143	30	
Hexachloroethane	50.0	29.3	58.7	50.0	25.5	51.0	14.0	25 - 95	30	
Indeno(1,2,3-cd)pyrene	50.0	54.6	109	50.0	54.1	108	0.971	50 - 135	30	
Isophorone	50.0	44.3	88.6	50.0	42.4	84.7	4.48	30 - 110	30	
Diphenylamine/n-Nitrosodiphenylamine	50.0	49.6	99.1	50.0	46.2	92.4	7.03	40 - 110	30	
Naphthalene	50.0	39.9	79.8	50.0	36.2	72.5	9.65	25 - 110	30	
Nitrobenzene	50.0	45.5	91.0	50.0	42.1	84.2	7.77	30 - 110	30	
Pentachlorophenol	50.0	58.7	117	50.0	60.0	120	2.16	40 - 140	30	
Phenanthrene	50.0	50.2	100	50.0	49.8	99.7	0.672	55 - 120	30	
Phenol	50.0	41.4	82.7	50.0	38.4	76.9	7.34	10 - 120	30	
Pyrene	50.0	50.9	102	50.0	51.6	103	1.38	55 - 130	30	

Surogates	LCS	LCS2	Surrogate Limits	Qualifier
	% Recovery	% Recovery		
2,4,6-Tribromophenol	125	114	10 - 123	FAIL
2-Fluorobiphenyl	84.0	77.0	43 - 116	PASS
2-Fluorophenol	80.0	71.1	21 - 100	PASS
Nitrobenzene-d5	91.4	82.3	35 - 114	PASS
p-Terphenyl-d14	89.3	88.3	33 - 141	PASS
Phenol-d5	85.6	76.9	10 - 94	PASS

* EXCEEDS %REC LIMIT
 # EXCEEDS RPD LIMIT

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5061201
 Report generated: 12/14/2016 09:34



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120352 Tune ID: WG592233-01
 Instrument: HPMS4 Run Date: 11/18/2016
 Analyst: MES Run Time: 09:39
 Workgroup: WG592233 File ID: 4M81050
 Cal ID: HPMS4-17-NOV-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	33.1	42552	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	47.9	61581	PASS
70.0	69.0	0	2.00	0	0	PASS
127	198	40.0	60.0	50.3	64632	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	128480	PASS
199	198	5.00	9.00	6.76	8689	PASS
275	198	10.0	30.0	28.6	36805	PASS
365	198	1.00	100	3.57	4588	PASS
441	443	0.0100	100	75.9	12666	PASS
442	198	40.0	100	65.5	84168	PASS
443	442	17.0	23.0	19.8	16677	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG592234-01	STD-CCV	01	11/18/2016 10:29	
WG592234-02	STD	01	11/18/2016 11:01	
WG592234-04	STD	01	11/18/2016 11:33	
WG592234-05	STD	01	11/18/2016 12:05	
WG592234-06	STD	01	11/18/2016 12:37	
WG592234-07	STD	01	11/18/2016 13:08	
WG592234-08	SSCV	01	11/18/2016 13:40	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120352
Instrument: HPMS4
Analyst: SCB
Workgroup: WG592701

Tune ID: WG592701-01
Run Date: 11/23/2016
Run Time: 10:24
File ID: 4M81156
Cal ID: HPMS4-23-NOV-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	32.2	32594	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	48.9	49410	PASS
70.0	69.0	0	2.00	0	0	PASS
127	198	40.0	60.0	52.3	52882	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	101133	PASS
199	198	5.00	9.00	6.88	6960	PASS
275	198	10.0	30.0	25.9	26178	PASS
365	198	1.00	100	3.12	3154	PASS
441	443	0.0100	100	80.8	11867	PASS
442	198	40.0	100	75.7	76533	PASS
443	442	17.0	23.0	19.2	14684	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG592701-02	STD-CCV	01	11/23/2016 10:43	
WG592701-03	STD	01	11/23/2016 11:15	
WG592701-04	STD	01	11/23/2016 11:46	
WG592701-05	STD	01	11/23/2016 12:19	
WG592701-06	STD	01	11/23/2016 12:50	
WG592701-07	STD	01	11/23/2016 13:23	
WG592701-08	STD	01	11/23/2016 13:55	
WG592701-09	STD	01	11/23/2016 14:27	
WG592701-10	STD	01	11/23/2016 14:59	
WG592701-11	SSCV	01	11/23/2016 16:20	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120352 Tune ID: WG592863-01
 Instrument: HPMS4 Run Date: 11/28/2016
 Analyst: SCB Run Time: 14:28
 Workgroup: WG592863 File ID: 4M81175
 Cal ID: HPMS4-23-NOV-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	32.9	31058	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	49.5	46741	PASS
70.0	69.0	0	2.00	0	0	PASS
127	198	40.0	60.0	52.5	49480	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	94336	PASS
199	198	5.00	9.00	6.70	6317	PASS
275	198	10.0	30.0	25.8	24325	PASS
365	198	1.00	100	3.24	3054	PASS
441	443	0.0100	100	76.3	10509	PASS
442	198	40.0	100	74.7	70466	PASS
443	442	17.0	23.0	19.5	13776	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG592701-13	SSCV	01	11/28/2016 15:50	
WG592701-12	SSCV	01	11/28/2016 16:22	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120352

Tune ID: WG594455-01

Instrument: HPMS4

Run Date: 12/12/2016

Analyst: SCB

Run Time: 09:13

Workgroup: WG594455

File ID: 4M81303

Cal ID: HPMS4-23-NOV-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	36.9	44864	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	53.4	64837	PASS
70.0	69.0	0	2.00	0.316	205	PASS
127	198	40.0	60.0	54.1	65789	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	121530	PASS
199	198	5.00	9.00	6.93	8417	PASS
275	198	10.0	30.0	26.7	32488	PASS
365	198	1.00	100	2.91	3541	PASS
441	443	0.0100	100	79.9	13087	PASS
442	198	40.0	100	70.3	85496	PASS
443	442	17.0	23.0	19.2	16385	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG594455-02	CCV	01	12/12/2016 09:31	
WG594482-01	CCV	01	12/12/2016 10:13	
WG594170-01	BLANK	01	12/12/2016 12:22	
WG594170-01	BLANK	01	12/12/2016 12:22	
WG594170-02	LCS	01	12/12/2016 12:54	
WG594170-03	LCS2	01	12/12/2016 13:26	
L16120352-13	MW09R-120616	01	12/12/2016 18:16	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

Login Number: L16120352
Analytical Method: 8270D
ICAL Workgroup: WG592234

Instrument ID: HPMS4
Initial Calibration Date: 18-NOV-16 13:08
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
1,1'-Biphenyl	1.452	9.70		

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

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Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

Login Number: L16120352
 Analytical Method: 8270D
 ICAL Workgroup: WG592701

Instrument ID: HPMS4
 Initial Calibration Date: 23-NOV-16 14:59
 Column ID: F

Analyte		AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
2,4,6-Trichlorophenol	CCC	0.4097	5.56		
2,4-Dichlorophenol	CCC	0.2970	4.94		
2-Nitrophenol	CCC	0.1828	11.0		
Acenaphthene	CCC	1.199	3.31		
Benzo[a]pyrene	CCC	1.162	4.62		
Di-n-Octyl Phthalate	CCC	1.445	4.84		
Fluoranthene	CCC	1.217	7.43		
Hexachlorobutadiene	CCC	0.1994	2.86		
Pentachlorophenol	CCC	0.1331	20.7		1.00000
Phenol	CCC	1.578	3.45		
2,4-Dinitrophenol	SPCC	0.1408	39.8		1.00000
4-Nitrophenol	SPCC	0.2585	6.39		
Hexachlorocyclopentadiene	SPCC	0.3151	7.03		
n-Nitrosodipropylamine	SPCC	1.008	4.83		
1,3-Dinitrobenzene		0.2191	17.9	0.99800	
1,4-Dioxane		0.5647	9.81		
2,4,5-Trichlorophenol		0.4140	6.91		
2,4-Dimethylphenol		0.3241	1.92		
2,4-Dinitrotoluene		0.4145	14.0		
2,6-Dinitrotoluene		0.3248	9.12		
2-Chloronaphthalene		1.203	4.39		
2-Chlorophenol		1.345	2.38		
2-Methylnaphthalene		0.7088	4.05		
2-Methylphenol		1.081	4.03		
2-Nitroaniline		0.3325	3.05		
3,3'-Dichlorobenzidine		0.3751	4.14		
3-Nitroaniline		0.3253	8.25		
4-Bromophenyl Phenyl Ether		0.2311	4.72		
4-Chloroaniline		0.1312	4.32		
Acenaphthylene		1.808	8.77		
Anthracene		1.080	6.62		
Benzo[a]anthracene		1.150	5.46		
Benzo[b]fluoranthene		1.364	4.29		
Benzo[ghi]perylene		0.9876	5.11		
Benzo[k]fluoranthene		1.138	6.32		
Benzoic Acid		0.1087	46.1		0.99200
Benzyl Alcohol		0.8633	5.25		
Butyl Benzyl Phthalate		0.6014	4.53		
Carbazole		0.9911	5.16		
Chrysene		1.037	4.82		
Di-n-Butyl Phthalate		1.249	9.68		
Dibenz[ah]anthracene		1.018	9.06		
Dibenzofuran		1.654	6.89		
Diethylphthalate		1.360	6.25		
Dimethylphthalate		1.375	6.46		

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Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

Login Number: L16120352
 Analytical Method: 8270D
 ICAL Workgroup: WG592701

Instrument ID: HPMS4
 Initial Calibration Date: 23-NOV-16 14:59
 Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Fluorene	1.421	4.21		
Hexachlorobenzene	0.2327	4.62		
Hexachloroethane	0.6040	2.85		
Indeno[1,2,3-cd]pyrene	1.213	7.54		
Isophorone	0.6927	6.27		
Naphthalene	1.002	7.60		
Nitrobenzene	0.3742	2.97		
Phenanthrene	1.046	6.26		
Pyrene	1.181	8.04		
Sym-Trinitrobenzene	0.1696	25.5		1.00000
bis(2-Chloroethoxy)methane	0.5261	4.30		
bis(2-Chloroethyl)ether	0.9267	3.04		
bis(2-Ethylhexyl)phthalate	0.7803	8.79		

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

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Microbac Laboratories Inc.
INITIAL CALIBRATION DATA

Login Number: L16120352
Analytical Method: 8270D

Instrument ID: HPMS4
Initial Calibration Date: 18-NOV-16 13:08
Column ID: F

Analyte	WG592234-01			WG592234-02			WG592234-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1'-Biphenyl	50.0	857778.000	1.461	3.00	56594.0000	1.576	10.0	177900.000	1.543

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INITIAL CALIBRATION DATA

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Analytical Method: 8270D

Instrument ID: HPMS4
Initial Calibration Date: 18-NOV-16 13:08
Column ID: F

Analyte	WG592234-05			WG592234-06			WG592234-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1'-Biphenyl	25.0	470000.000	1.568	80.0	1257566.00	1.329	100	1492769.00	1.235

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INITIAL CALIBRATION DATA

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Analytical Method: 8270D

Instrument ID: HPMS4
Initial Calibration Date: 23-NOV-16 14:59
Column ID: F

Analyte	WG592701-02			WG592701-03			WG592701-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
2,4,6-Trichlorophenol	50.0	184606.000	0.4278	NA	NA	NA	3.00	9350.00000	0.3722
2,4-Dichlorophenol	50.0	233605.000	0.3140	NA	NA	NA	3.00	12918.0000	0.2760
2-Nitrophenol	50.0	142748.000	0.1919	NA	NA	NA	3.00	6786.00000	0.1450
Acenaphthene	50.0	539786.000	1.251	NA	NA	NA	3.00	31370.0000	1.249
Benzo[a]pyrene	50.0	952064.000	1.269	NA	NA	NA	3.00	46706.0000	1.116
Di-n-Octyl Phthalate	50.0	1192008.00	1.589	NA	NA	NA	3.00	59717.0000	1.427
Fluoranthene	50.0	1016129.00	1.263	NA	NA	NA	3.00	58626.0000	1.307
Hexachlorobutadiene	50.0	154931.000	0.2083	NA	NA	NA	3.00	9214.00000	0.1968
Pentachlorophenol	50.0	118306.000	0.1470	NA	NA	NA	NA	NA	NA
Phenol	50.0	329974.000	1.682	NA	NA	NA	3.00	20683.0000	1.602
2,4-Dinitrophenol	50.0	60572.0000	0.1404	NA	NA	NA	NA	NA	NA
4-Nitrophenol	50.0	121518.000	0.2816	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	50.0	144464.000	0.3348	NA	NA	NA	3.00	6664.00000	0.2652
n-Nitrosodipropylamine	50.0	216861.000	1.106	NA	NA	NA	3.00	13310.0000	1.031
1,3-Dinitrobenzene	50.0	102339.000	0.2372	NA	NA	NA	3.00	3628.00000	0.1444
1,4-Dioxane	50.0	121484.000	0.6193	NA	NA	NA	3.00	5665.00000	0.4387
2,4,5-Trichlorophenol	50.0	186660.000	0.4326	NA	NA	NA	3.00	9158.00000	0.3645
2,4-Dimethylphenol	50.0	250818.000	0.3372	NA	NA	NA	3.00	15155.0000	0.3238
2,4-Dinitrotoluene	50.0	194120.000	0.4498	NA	NA	NA	3.00	7462.00000	0.2970
2,6-Dinitrotoluene	50.0	147513.000	0.3418	NA	NA	NA	3.00	6560.00000	0.2611
2-Chloronaphthalene	50.0	533054.000	1.235	NA	NA	NA	3.00	31930.0000	1.271
2-Chlorophenol	50.0	277290.000	1.414	NA	NA	NA	3.00	17341.0000	1.343
2-Methylnaphthalene	50.0	555757.000	0.7471	NA	NA	NA	3.00	34676.0000	0.7408
2-Methylphenol	50.0	228003.000	1.162	NA	NA	NA	3.00	13494.0000	1.045
2-Nitroaniline	50.0	151343.000	0.3507	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	50.0	333959.000	0.3888	NA	NA	NA	3.00	16708.0000	0.3653
3-Nitroaniline	50.0	146571.000	0.3397	NA	NA	NA	NA	NA	NA
4-Bromophenyl Phenyl Ether	50.0	192939.000	0.2398	NA	NA	NA	3.00	10088.0000	0.2250
4-Chloroaniline	50.0	106341.000	0.1429	NA	NA	NA	3.00	5753.00000	0.1229
Acenaphthylene	50.0	807041.000	1.870	NA	NA	NA	3.00	49899.0000	1.986
Anthracene	50.0	911638.000	1.133	NA	NA	NA	3.00	51981.0000	1.159
Benzo[a]anthracene	50.0	1015271.00	1.182	NA	NA	NA	3.00	56329.0000	1.232
Benzo[b]fluoranthene	50.0	1051819.00	1.402	NA	NA	NA	3.00	57719.0000	1.379
Benzo[ghi]perylene	50.0	816244.000	1.088	NA	NA	NA	3.00	38122.0000	0.9110
Benzo[k]fluoranthene	50.0	917466.000	1.223	NA	NA	NA	3.00	51104.0000	1.221
Benzoic Acid	50.0	104872.000	0.1410	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	50.0	183868.000	0.9374	NA	NA	NA	3.00	10259.0000	0.7945
Butyl Benzyl Phthalate	50.0	537792.000	0.6262	NA	NA	NA	3.00	28469.0000	0.6225
Carbazole	50.0	839115.000	1.043	NA	NA	NA	3.00	46494.0000	1.037
Chrysene	50.0	924818.000	1.077	NA	NA	NA	3.00	49582.0000	1.084
Di-n-Butyl Phthalate	50.0	1049100.00	1.304	NA	NA	NA	3.00	60530.0000	1.350
Dibenz[ah]anthracene	50.0	855674.000	1.141	NA	NA	NA	3.00	36275.0000	0.8669

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Microbac Laboratories Inc.
INITIAL CALIBRATION DATA

Login Number: L16120352
Analytical Method: 8270D

Instrument ID: HPMS4
Initial Calibration Date: 23-NOV-16 14:59
Column ID: F

Analyte	WG592701-02			WG592701-03			WG592701-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Dibenzofuran	50.0	740331.000	1.716	NA	NA	NA	3.00	45079.0000	1.794
Diethylphthalate	50.0	609336.000	1.412	NA	NA	NA	3.00	36355.0000	1.447
Dimethylphthalate	50.0	610841.000	1.416	NA	NA	NA	3.00	37668.0000	1.499
Fluorene	50.0	649795.000	1.506	NA	NA	NA	3.00	36589.0000	1.456
Hexachlorobenzene	50.0	193134.000	0.2400	NA	NA	NA	3.00	10206.0000	0.2276
Hexachloroethane	50.0	124533.000	0.6349	NA	NA	NA	3.00	7590.00000	0.5878
Indeno[1,2,3-cd]pyrene	50.0	1013059.00	1.350	NA	NA	NA	3.00	44439.0000	1.062
Isophorone	50.0	538735.000	0.7242	NA	NA	NA	3.00	34725.0000	0.7418
Naphthalene	50.0	778745.000	1.047	NA	NA	NA	3.00	51147.0000	1.093
Nitrobenzene	50.0	290345.000	0.3903	NA	NA	NA	3.00	17484.0000	0.3735
Phenanthrene	50.0	877052.000	1.090	NA	NA	NA	3.00	50120.0000	1.118
Pyrene	50.0	1039748.00	1.211	NA	NA	NA	3.00	59221.0000	1.295
Sym-Trinitrobenzene	50.0	149794.000	0.1861	NA	NA	NA	3.00	4149.00000	0.09250
bis(2-Chloroethoxy)methane	50.0	416058.000	0.5593	NA	NA	NA	3.00	25551.0000	0.5458
bis(2-Chloroethyl)ether	50.0	192911.000	0.9835	NA	NA	NA	3.00	12162.0000	0.9418
bis(2-Ethylhexyl)phthalate	50.0	720242.000	0.8386	1.00	10092.0000	0.6174	3.00	36595.0000	0.8002

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Instrument ID: HPMS4
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Column ID: F

Analyte	WG592701-05			WG592701-06			WG592701-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
2,4,6-Trichlorophenol	10.0	31658.0000	0.3953	15.0	48961.0000	0.3999	25.0	80982.0000	0.3945
2,4-Dichlorophenol	10.0	41915.0000	0.2840	15.0	63810.0000	0.2862	25.0	106756.0000	0.2895
2-Nitrophenol	10.0	24462.0000	0.1658	15.0	39339.0000	0.1765	25.0	66947.0000	0.1815
Acenaphthene	10.0	98589.0000	1.231	15.0	145850.0000	1.191	25.0	242723.0000	1.182
Benzo[a]pyrene	10.0	153606.0000	1.109	15.0	244218.0000	1.128	25.0	413200.0000	1.125
Di-n-Octyl Phthalate	10.0	201816.0000	1.457	15.0	317597.0000	1.467	25.0	536144.0000	1.460
Fluoranthene	10.0	189274.0000	1.301	15.0	285065.0000	1.279	25.0	468367.0000	1.245
Hexachlorobutadiene	10.0	28485.0000	0.1930	15.0	44097.0000	0.1978	25.0	70598.0000	0.1914
Pentachlorophenol	10.0	13437.0000	0.09240	15.0	23347.0000	0.1047	25.0	44682.0000	0.1187
Phenol	10.0	64971.0000	1.598	15.0	97419.0000	1.576	25.0	158647.0000	1.567
2,4-Dinitrophenol	10.0	5253.00000	0.06560	15.0	10388.0000	0.08490	25.0	22862.0000	0.1114
4-Nitrophenol	10.0	19179.0000	0.2395	15.0	29556.0000	0.2414	25.0	50169.0000	0.2444
Hexachlorocyclopentadiene	10.0	24535.0000	0.3064	15.0	38405.0000	0.3137	25.0	66354.0000	0.3232
n-Nitrosodipropylamine	10.0	40994.0000	1.009	15.0	61385.0000	0.9929	25.0	101227.0000	0.9996
1,3-Dinitrobenzene	10.0	15087.0000	0.1884	15.0	25398.0000	0.2075	25.0	43759.0000	0.2132
1,4-Dioxane	10.0	23097.0000	0.5682	15.0	34255.0000	0.5541	25.0	56647.0000	0.5594
2,4,5-Trichlorophenol	10.0	31309.0000	0.3910	15.0	49182.0000	0.4017	25.0	82924.0000	0.4039
2,4-Dimethylphenol	10.0	46619.0000	0.3159	15.0	71406.0000	0.3203	25.0	119394.0000	0.3238
2,4-Dinitrotoluene	10.0	29869.0000	0.3730	15.0	49114.0000	0.4012	25.0	84579.0000	0.4120
2,6-Dinitrotoluene	10.0	25040.0000	0.3127	15.0	39038.0000	0.3189	25.0	66008.0000	0.3215
2-Chloronaphthalene	10.0	100069.0000	1.250	15.0	151149.0000	1.235	25.0	245663.0000	1.197
2-Chlorophenol	10.0	54539.0000	1.342	15.0	83318.0000	1.348	25.0	133237.0000	1.316
2-Methylnaphthalene	10.0	107083.0000	0.7257	15.0	158815.0000	0.7124	25.0	258395.0000	0.7007
2-Methylphenol	10.0	42541.0000	1.047	15.0	65088.0000	1.053	25.0	105005.0000	1.037
2-Nitroaniline	10.0	25731.0000	0.3213	15.0	39721.0000	0.3245	25.0	66620.0000	0.3245
3,3'-Dichlorobenzidine	10.0	53807.0000	0.3576	15.0	83287.0000	0.3590	25.0	142169.0000	0.3617
3-Nitroaniline	10.0	23197.0000	0.2897	15.0	36270.0000	0.2963	25.0	63082.0000	0.3073
4-Bromophenyl Phenyl Ether	10.0	32195.0000	0.2214	15.0	49003.0000	0.2198	25.0	82323.0000	0.2188
4-Chloroaniline	10.0	19501.0000	0.1321	15.0	28962.0000	0.1299	25.0	47059.0000	0.1276
Acenaphthylene	10.0	155502.0000	1.942	15.0	234923.0000	1.919	25.0	382969.0000	1.866
Anthracene	10.0	164147.0000	1.129	15.0	250251.0000	1.122	25.0	411844.0000	1.094
Benzo[a]anthracene	10.0	179777.0000	1.195	15.0	276586.0000	1.192	25.0	452838.0000	1.152
Benzo[b]fluoranthene	10.0	182656.0000	1.318	15.0	278824.0000	1.288	25.0	476201.0000	1.297
Benzo[ghi]perylene	10.0	134655.0000	0.9718	15.0	208615.0000	0.9637	25.0	354163.0000	0.9644
Benzo[k]fluoranthene	10.0	160915.0000	1.161	15.0	254632.0000	1.176	25.0	416668.0000	1.135
Benzoic Acid	10.0	6192.00000	0.04200	15.0	14342.0000	0.06430	25.0	34531.0000	0.09360
Benzyl Alcohol	10.0	33577.0000	0.8260	15.0	51982.0000	0.8408	25.0	85803.0000	0.8473
Butyl Benzyl Phthalate	10.0	93641.0000	0.6223	15.0	143749.0000	0.6197	25.0	240291.0000	0.6113
Carbazole	10.0	149278.0000	1.026	15.0	227318.0000	1.020	25.0	375917.0000	0.9990
Chrysene	10.0	161852.0000	1.076	15.0	249755.0000	1.077	25.0	409746.0000	1.042
Di-n-Butyl Phthalate	10.0	196189.0000	1.349	15.0	301057.0000	1.350	25.0	492583.0000	1.309
Dibenz[ah]anthracene	10.0	131929.0000	0.9521	15.0	207788.0000	0.9598	25.0	359393.0000	0.9786

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Analytical Method: 8270D

Instrument ID: HPMS4
Initial Calibration Date: 23-NOV-16 14:59
Column ID: F

Analyte	WG592701-05			WG592701-06			WG592701-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Dibenzofuran	10.0	138479.000	1.729	15.0	212450.000	1.735	25.0	345667.000	1.684
Diethylphthalate	10.0	115559.000	1.443	15.0	173253.000	1.415	25.0	282154.000	1.374
Dimethylphthalate	10.0	116219.000	1.451	15.0	173807.000	1.420	25.0	283283.000	1.380
Fluorene	10.0	116488.000	1.455	15.0	176880.000	1.445	25.0	293832.000	1.431
Hexachlorobenzene	10.0	32599.0000	0.2241	15.0	49339.0000	0.2213	25.0	82577.0000	0.2194
Hexachloroethane	10.0	24297.0000	0.5977	15.0	36107.0000	0.5840	25.0	60078.0000	0.5932
Indeno[1,2,3-cd]pyrene	10.0	160591.000	1.159	15.0	251363.000	1.161	25.0	429187.000	1.169
Isophorone	10.0	107397.000	0.7278	15.0	160971.000	0.7221	25.0	256307.000	0.6950
Naphthalene	10.0	155935.000	1.057	15.0	234882.000	1.054	25.0	375470.000	1.018
Nitrobenzene	10.0	55980.0000	0.3794	15.0	85967.0000	0.3856	25.0	138977.000	0.3769
Phenanthrene	10.0	159829.000	1.099	15.0	241077.000	1.081	25.0	399156.000	1.061
Pyrene	10.0	190308.000	1.265	15.0	289899.000	1.250	25.0	474648.000	1.208
Sym-Trinitrobenzene	10.0	19357.0000	0.1331	15.0	33316.0000	0.1494	25.0	61923.0000	0.1646
bis(2-Chloroethoxy)methane	10.0	79773.0000	0.5406	15.0	117806.000	0.5284	25.0	193516.000	0.5248
bis(2-Chloroethyl)ether	10.0	37925.0000	0.9330	15.0	56518.0000	0.9142	25.0	92868.0000	0.9170
bis(2-Ethylhexyl)phthalate	10.0	124976.000	0.8305	15.0	192211.000	0.8286	25.0	319678.000	0.8132

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Analytical Method: 8270D

Instrument ID: HPMS4
Initial Calibration Date: 23-NOV-16 14:59
Column ID: F

Analyte	WG592701-08			WG592701-09			WG592701-10		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
2,4,6-Trichlorophenol	80.0	296546.000	0.4192	100	384168.000	0.4286	120	471153.000	0.4400
2,4-Dichlorophenol	80.0	371813.000	0.3063	100	482815.000	0.3116	120	579504.000	0.3086
2-Nitrophenol	80.0	240672.000	0.1982	100	312147.000	0.2015	120	379966.000	0.2023
Acenaphthene	80.0	833396.000	1.178	100	1045078.000	1.166	120	1225463.000	1.144
Benzo[a]pyrene	80.0	1467862.000	1.176	100	1855380.000	1.183	120	2211753.000	1.186
Di-n-Octyl Phthalate	80.0	1767134.000	1.416	100	2179570.000	1.390	120	2522246.000	1.353
Fluoranthene	80.0	1492624.000	1.155	100	1833305.000	1.117	120	2104933.000	1.070
Hexachlorobutadiene	80.0	244314.000	0.2012	100	316638.000	0.2044	120	379655.000	0.2022
Pentachlorophenol	80.0	196206.000	0.1518	100	255706.000	0.1558	120	317541.000	0.1614
Phenol	80.0	501796.000	1.577	100	637467.000	1.523	120	753679.000	1.502
2,4-Dinitrophenol	80.0	124181.000	0.1756	100	176932.000	0.1974	120	224911.000	0.2100
4-Nitrophenol	80.0	187886.000	0.2656	100	238998.000	0.2666	120	289323.000	0.2702
Hexachlorocyclopentadiene	80.0	235486.000	0.3329	100	289352.000	0.3228	120	344535.000	0.3217
n-Nitrosodipropylamine	80.0	323934.000	1.018	100	403759.000	0.9643	120	472994.000	0.9428
1,3-Dinitrobenzene	80.0	175111.000	0.2476	100	227841.000	0.2542	120	278319.000	0.2599
1,4-Dioxane	80.0	191127.000	0.6007	100	244146.000	0.5831	120	297907.000	0.5938
2,4,5-Trichlorophenol	80.0	302889.000	0.4282	100	396330.000	0.4422	120	479739.000	0.4480
2,4-Dimethylphenol	80.0	391300.000	0.3223	100	506899.000	0.3272	120	604423.000	0.3219
2,4-Dinitrotoluene	80.0	318055.000	0.4496	100	415062.000	0.4630	120	503615.000	0.4703
2,6-Dinitrotoluene	80.0	241920.000	0.3420	100	311752.000	0.3478	120	377727.000	0.3527
2-Chloronaphthalene	80.0	823311.000	1.164	100	1025734.000	1.144	120	1207782.000	1.128
2-Chlorophenol	80.0	433360.000	1.362	100	553209.000	1.321	120	661316.000	1.318
2-Methylnaphthalene	80.0	845920.000	0.6968	100	1062046.000	0.6855	120	1242501.000	0.6616
2-Methylphenol	80.0	354736.000	1.115	100	457450.000	1.093	120	548711.000	1.094
2-Nitroaniline	80.0	236504.000	0.3344	100	300234.000	0.3349	120	361177.000	0.3373
3,3'-Dichlorobenzidine	80.0	531958.000	0.3872	100	681152.000	0.3869	120	824800.000	0.3943
3-Nitroaniline	80.0	240670.000	0.3402	100	312653.000	0.3488	120	380575.000	0.3554
4-Bromophenyl Phenyl Ether	80.0	306779.000	0.2374	100	399725.000	0.2436	120	478555.000	0.2433
4-Chloroaniline	80.0	160745.000	0.1324	100	203061.000	0.1311	120	244974.000	0.1304
Acenaphthylene	80.0	1193517.000	1.687	100	1457186.000	1.626	120	1676107.000	1.565
Anthracene	80.0	1347171.000	1.043	100	1637566.000	0.9978	120	1890109.000	0.9609
Benzo[a]anthracene	80.0	1529162.000	1.113	100	1895291.000	1.077	120	2204089.000	1.054
Benzo[b]fluoranthene	80.0	1700626.000	1.363	100	2222092.000	1.417	120	2700280.000	1.448
Benzo[ghi]perylene	80.0	1247596.000	0.9999	100	1574594.000	1.004	120	1861296.000	0.9982
Benzo[k]fluoranthene	80.0	1331633.000	1.067	100	1600386.000	1.021	120	2055540.000	1.102
Benzoic Acid	80.0	170577.000	0.1405	100	264204.000	0.1705	NA	NA	NA
Benzyl Alcohol	80.0	285763.000	0.8982	100	365538.000	0.8730	120	446258.000	0.8895
Butyl Benzyl Phthalate	80.0	800696.000	0.5829	100	997571.000	0.5667	120	1171185.000	0.5599
Carbazole	80.0	1248884.000	0.9665	100	1533053.000	0.9341	120	1777910.000	0.9038
Chrysene	80.0	1384211.000	1.008	100	1721415.000	0.9778	120	2003948.000	0.9579
Di-n-Butyl Phthalate	80.0	1515481.000	1.173	100	1821284.000	1.110	120	2062271.000	1.048
Dibenz[ah]anthracene	80.0	1341742.000	1.075	100	1699157.000	1.084	120	2028811.000	1.088

INT_CAL - Modified 03/06/2008
PDF File ID: 5061202
Report generated 12/14/2016 09:20



Microbac Laboratories Inc.
INITIAL CALIBRATION DATA

Login Number: L16120352
Analytical Method: 8270D

Instrument ID: HPMS4
Initial Calibration Date: 23-NOV-16 14:59
Column ID: F

Analyte	WG592701-08			WG592701-09			WG592701-10		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Dibenzofuran	80.0	1110258.00	1.570	100	1366849.00	1.525	120	1584353.00	1.480
Diethylphthalate	80.0	912459.000	1.290	100	1132659.00	1.264	120	1321094.00	1.234
Dimethylphthalate	80.0	920238.000	1.301	100	1146176.00	1.279	120	1339178.00	1.251
Fluorene	80.0	983727.000	1.391	100	1220246.00	1.361	120	1412896.00	1.319
Hexachlorobenzene	80.0	308245.000	0.2386	100	400612.000	0.2441	120	484503.000	0.2463
Hexachloroethane	80.0	196814.000	0.6186	100	252461.000	0.6030	120	307567.000	0.6131
Indeno[1,2,3-cd]pyrene	80.0	1565566.00	1.255	100	1995255.00	1.272	120	2381366.00	1.277
Isophorone	80.0	799114.000	0.6582	100	998970.000	0.6448	120	1178843.00	0.6277
Naphthalene	80.0	1153544.00	0.9502	100	1425173.00	0.9198	120	1651220.00	0.8793
Nitrobenzene	80.0	446024.000	0.3674	100	562865.000	0.3633	120	671461.000	0.3575
Phenanthrene	80.0	1302697.00	1.008	100	1595973.00	0.9725	120	1843632.00	0.9372
Pyrene	80.0	1531270.00	1.115	100	1881140.00	1.069	120	2175456.00	1.040
Sym-Trinitrobenzene	80.0	262566.000	0.2032	100	346004.000	0.2108	120	427339.000	0.2172
bis(2-Chloroethoxy)methane	80.0	623701.000	0.5137	100	784400.000	0.5063	120	919697.000	0.4897
bis(2-Chloroethyl)ether	80.0	296013.000	0.9304	100	375019.000	0.8957	120	450472.000	0.8979
bis(2-Ethylhexyl)phthalate	80.0	1076969.00	0.7840	100	1342725.00	0.7627	120	1564177.00	0.7477

INT_CAL - Modified 03/06/2008
PDF File ID: 5061202
Report generated 12/14/2016 09:20



Calibration Table Report
 Method: TCL.M
 Title: OVD MSS01 827-TCL INITIAL CALIBRATION 11/18/16
 Last Calibration: Fri Nov 18 14:02:42 2016
 Curve:WG592234
 Calibration Files

Compound	Linear						Avg	%RSD	
	3 4M81053.D	10 4M81054.D	25 4M81055.D	50 4M81052.D	80 4M81056.D	100 4M81057.D			
1,4-Dichlorobenzene-d4	ISTD								
Benzaldehyde	0.920	0.937	0.992	0.994	0.989	0.981	0.969	3.295	1.000
Naphthalene-d8	ISTD								
Caprolactam	0.082	0.091	0.104	0.109	0.113	0.115	0.102	12.671	
Acenaphthene-d10	ISTD								
1,1'-Biphenyl	1.576	1.543	1.568	1.461	1.329	1.235	1.452	9.703	
Phenanthrene-d10	ISTD								
Atrazine	0.217	0.220	0.243	0.248	0.245	0.244	0.236	5.767	

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Fluorene	1.456	1.455	1.445	1.431	1.506	1.391	1.361	1.319	1.42054	4.21077	
4-Chlorophenyl Phenyl Ether	0.697	0.72	0.706	0.705	0.768	0.733	0.736	0.737	0.7252	3.1832	
4-Nitroaniline		0.32	0.333	0.35	0.393	0.38	0.382	0.386	0.3634	7.91257	
5-Nitro-o-Toluidine	0.303	0.342	0.361	0.384	0.432	0.431	0.438	0.447	0.39235	13.5121	
1,2-Diphenylhydrazine	1.552	1.523	1.489	1.442	1.498	1.321	1.273	1.224	1.41522	8.83495	
2,4,6-Tribromophenol	0.122	0.146	0.152	0.153	0.178	0.179	0.189		0.16	14.7018	
Phenanthrene-d10	ISTD										
4,6-Dinitro-2-Methylphenol		0.076	0.092	0.103	0.121	0.144	0.155	0.163	0.12182	27.2985	0.992
Diphenylamine/n-Nitrosodiphenyl	0.675	0.679	0.667	0.658	0.689	0.656	0.648	0.631	0.66308	2.79534	
Sulfotepp	0.119	0.119	0.124	0.122	0.137	0.139	0.144	0.148	0.13157	9.06982	
Sym-Trinitrobenzene	0.093	0.133	0.149	0.165	0.186	0.203	0.211	0.217	0.16963	25.4829	1
Diallate	0.305	0.304	0.298	0.291	0.313	0.301	0.299	0.297	0.30104	2.19247	
Phenacetin	0.364	0.387	0.39	0.392	0.414	0.4	0.395	0.39	0.39149	3.54462	
Phorate	0.477	0.469	0.459	0.445	0.474	0.439	0.433	0.422	0.4522	4.54294	
4-Bromophenyl Phenyl Ether	0.225	0.221	0.22	0.219	0.24	0.237	0.244	0.243	0.23111	4.71577	
Hexachlorobenzene	0.228	0.224	0.221	0.219	0.24	0.239	0.244	0.246	0.23268	4.61799	
Dimethoate	0.274	0.281	0.279	0.269	0.261	0.226	0.217	0.207	0.25176	12.0451	
4-Aminobiphenyl	0.731	0.656	0.658	0.696	0.763	0.731	0.718	0.703	0.70708	5.2028	
Pentachlorophenol		0.092	0.105	0.119	0.147	0.152	0.156	0.161	0.13313	20.6452	1
Pronamide	0.351	0.362	0.361	0.356	0.379	0.366	0.364	0.361	0.36261	2.26496	
Pentachloronitrobenzene	0.082	0.099	0.096	0.096	0.106	0.105	0.104	0.105	0.09913	8.03336	
Disulfoton	0.383	0.385	0.378	0.37	0.394	0.374	0.37	0.368	0.37778	2.41436	
Phenanthrene	1.118	1.099	1.081	1.061	1.09	1.008	0.972	0.937	1.04579	6.25846	
Anthracene	1.159	1.129	1.122	1.094	1.133	1.043	0.998	0.961	1.07984	6.62031	
Carbazole	1.037	1.026	1.02	0.999	1.043	0.967	0.934	0.904	0.99112	5.16377	
Parathion Methyl	0.171	0.208	0.218	0.224	0.234	0.215	0.209	0.2	0.21016	8.97671	
Di-n-Butyl Phthalate	1.35	1.349	1.35	1.309	1.304	1.173	1.11	1.048	1.24908	9.68381	
Parathion Ethyl	0.103	0.128	0.14	0.143	0.16	0.161	0.161	0.161	0.14463	14.3583	
4-Nitroquinoline 1-Oxide	0.016	0.042	0.057	0.069	0.086	0.094	0.096	0.096	0.06954	42.1044	1
Methapyrilene	0.369	0.399	0.392	0.356	0.298	0.216	0.216	0.201	0.3061	27.5726	0.999
Isodrin	0.137	0.138	0.14	0.139	0.146	0.143	0.144	0.145	0.14156	2.51812	
Fluoranthene	1.307	1.301	1.279	1.245	1.263	1.155	1.117	1.07	1.21712	7.43445	
Chrysene-d12	ISTD										
Benzidine		0.161	0.151	0.208	0.266	0.292	0.294	0.299	0.23885	26.97	0.999
Pyrene	1.295	1.265	1.25	1.207	1.211	1.115	1.069	1.04	1.18132	8.04426	
Aramite	0.061	0.068	0.069	0.07	0.071	0.068	0.067	0.066	0.06734	4.62486	
p-Terphenyl-d14	0.859	0.855	0.844	0.823	0.852	0.811	0.791	0.777	0.82654	3.77871	
p-(Dimethylamino)azobenzene	0.262	0.262	0.268	0.262	0.282	0.274	0.277	0.28	0.27081	3.17362	
Chlorobenzilate	0.321	0.33	0.333	0.338	0.356	0.353	0.356	0.362	0.34385	4.33793	
Famphur					0.025				0.02477	0	
Butyl Benzyl Phthalate	0.622	0.622	0.62	0.611	0.626	0.583	0.567	0.56	0.60141	4.53288	
3,3'-Dimethylbenzidine	0.847	0.789	0.881	0.912	0.873	0.887	0.879	0.878	0.86806	4.20107	
2-Acetylaminofluorene	0.34	0.417	0.437	0.456	0.5	0.501	0.498	0.504	0.4567	12.6084	
bis(2-Ethylhexyl)phthalate	0.8	0.831	0.829	0.813	0.839	0.784	0.763	0.748	0.6170	7.8033	8.79248
3,3'-Dichlorobenzidine	0.365	0.358	0.359	0.362	0.389	0.387	0.387	0.394	0.37511	4.13645	
Benzo[a]anthracene	1.232	1.195	1.192	1.152	1.182	1.113	1.077	1.054	1.14952	5.45524	
Chrysene	1.084	1.076	1.077	1.042	1.077	1.008	0.978	0.958	1.03737	4.82091	
Perylene-d12	ISTD										
Di-n-Octyl Phthalate	1.427	1.456	1.467	1.46	1.589	1.416	1.39	1.353	1.44476	4.84041	
7,12-Dimethylbenz[a]anthracene	0.602	0.585	0.584	0.595	0.685	0.648	0.669	0.68	0.63095	6.99022	
Benzo[b]fluoranthene	1.379	1.318	1.288	1.297	1.402	1.363	1.417	1.448	1.36402	4.28821	
Benzo[k]fluoranthene	1.221	1.161	1.176	1.135	1.223	1.067	1.02	1.102	1.13829	6.3199	
Benzo[a]pyrene	1.116	1.109	1.128	1.125	1.269	1.176	1.183	1.186	1.16157	4.61741	
3-Methylcholanthrene	0.568	0.561	0.562	0.566	0.65	0.607	0.615	0.618	0.59329	5.66174	
Indeno[1,2,3-cd]pyrene	1.062	1.159	1.161	1.169	1.35	1.255	1.272	1.277	1.21314	7.5413	
Dibenz[ah]anthracene	0.867	0.952	0.96	0.979	1.14	1.075	1.083	1.088	1.0181	9.06286	
Benzo[ghi]perylene	0.911	0.972	0.964	0.964	1.088	1	1.004	0.998	0.98761	5.10955	

Mon Nov 28 11:19:04 2016

Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120352 Run Date: 11/18/2016 Sample ID: WG592234-08
 Instrument ID: HPMS4 Run Time: 13:40 Method: 8270D
 File ID: 4M81058 Analyst: MES QC Key: WATERLOO
 ICal Workgroup: WG592234 Cal ID: HPMS4 - 18-NOV-16

Analyte	Expected	Found	Units	RF	%D	UCL	Q
1,1'-Biphenyl	50000	54900	ug/L	1.59	9.80	25	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

ALT - Modified 09/06/2007
 Version 1.5 PDF File ID: 5061203
 Report generated 12/14/2016 09:21



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120352 Run Date: 11/23/2016 Sample ID: WG592701-11
 Instrument ID: HPMS4 Run Time: 16:20 Method: 8270D
 File ID: 4M81167 Analyst: SCB QC Key: WATERLOO
 ICal Workgroup: WG592701 Cal ID: HPMS4 - 23-NOV-16

Analyte		Expected	Found	Units	RF	%D	UCL	Q
2,4,6-Trichlorophenol	CCC	50000	44300	ug/L	0.363	11.4	25	
2,4-Dichlorophenol	CCC	50000	45600	ug/L	0.271	8.90	25	
2-Nitrophenol	CCC	50000	53200	ug/L	0.195	6.50	25	
Acenaphthene	CCC	50000	45100	ug/L	1.08	9.80	25	
Benzo[a]pyrene	CCC	50000	43300	ug/L	1.01	13.4	25	
Di-n-Octyl Phthalate	CCC	50000	45500	ug/L	1.32	9.00	25	
Fluoranthene	CCC	50000	44400	ug/L	1.08	11.2	25	
Hexachlorobutadiene	CCC	50000	50800	ug/L	0.203	1.60	25	
Diphenylamine/n-Nitrosodiphenylamine	CCC	50000	46400	ug/L	0.616	7.10	25	
Pentachlorophenol	CCC	50000	55000	ug/L	0.159	10.0	25	
Phenol	CCC	50000	46000	ug/L	1.45	7.90	25	
n-Nitrosodipropylamine	SPCC	50000	43500	ug/L	0.878	12.9	25	
2,4-Dinitrophenol	SPCC	50000	56500	ug/L	0.171	13.1	25	
4-Nitrophenol	SPCC	50000	44300	ug/L	0.229	11.4	25	
Hexachlorocyclopentadiene	SPCC	50000	46400	ug/L	0.293	7.20	25	
Sym-Trinitrobenzene		50000	54700	ug/L	0.204	9.30	25	
1,3-Dinitrobenzene		50000	41500	ug/L	0.202	16.9	25	
2,4,5-Trichlorophenol		50000	43300	ug/L	0.359	13.3	25	
2,4-Dimethylphenol		50000	46400	ug/L	0.301	7.30	25	
2,4-Dinitrotoluene		50000	47500	ug/L	0.394	5.00	25	
2,6-Dinitrotoluene		50000	45900	ug/L	0.298	8.10	25	
2-Chloronaphthalene		50000	49800	ug/L	1.20	0.300	25	
2-Chlorophenol		50000	45600	ug/L	1.23	8.80	25	
2-Methylnaphthalene		50000	44300	ug/L	0.629	11.3	25	
2-Methylphenol		50000	44600	ug/L	0.964	10.8	25	
2-Nitroaniline		50000	47700	ug/L	0.317	4.60	25	
3-Nitroaniline		50000	41700	ug/L	0.271	16.6	25	
3-,4-Methylphenol		50000	45600	ug/L	1.24	8.70	25	
4-Bromophenyl Phenyl Ether		50000	46700	ug/L	0.216	6.70	25	
4-Chloroaniline		50000	41600	ug/L	0.109	16.8	25	
Acenaphthylene		50000	44300	ug/L	1.60	11.4	25	
Anthracene		50000	44700	ug/L	0.966	10.6	25	
Benzo[a]anthracene		50000	44300	ug/L	1.02	11.5	25	
Benzo[b]fluoranthene		50000	44900	ug/L	1.22	10.2	25	
Benzo[ghi]perylene		50000	43900	ug/L	0.868	12.2	25	
Benzo[k]fluoranthene		50000	43600	ug/L	1.03	12.9	25	
Benzoic Acid		50000	63100	ug/L	0.177	26.3	25	*
Benzyl Alcohol		50000	46000	ug/L	0.794	8.00	25	
bis(2-Chloroethyl)ether		50000	45400	ug/L	0.842	9.20	25	
bis(2-Chloroethoxy)methane		50000	48500	ug/L	0.511	3.00	25	
bis(2-Ethylhexyl)phthalate		50000	46800	ug/L	0.731	6.40	25	
Butyl Benzyl Phthalate		50000	45500	ug/L	0.548	9.00	25	

ALT - Modified 09/06/2007
 Version 1.5 PDF File ID: 5061203
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Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120352 Run Date: 11/23/2016 Sample ID: WG592701-11
 Instrument ID: HPMS4 Run Time: 16:20 Method: 8270D
 File ID: 4M81167 Analyst: SCB QC Key: WATERLOO
 ICal Workgroup: WG592701 Cal ID: HPMS4 - 23-NOV-16

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Carbazole	50000	45300	ug/L	0.898	9.40	25	
Chrysene	50000	46000	ug/L	0.955	8.00	25	
Di-n-Butyl Phthalate	50000	46900	ug/L	1.17	6.20	25	
Dibenz[ah]anthracene	50000	44100	ug/L	0.898	11.8	25	
Dibenzofuran	50000	44100	ug/L	1.46	11.7	25	
Diethylphthalate	50000	44900	ug/L	1.22	10.1	25	
Dimethylphthalate	50000	45200	ug/L	1.24	9.50	25	
Fluorene	50000	44400	ug/L	1.26	11.1	25	
Hexachlorobenzene	50000	44300	ug/L	0.206	11.3	25	
Hexachloroethane	50000	43300	ug/L	0.523	13.3	25	
Indeno[1,2,3-cd]pyrene	50000	43300	ug/L	1.05	13.5	25	
Isophorone	50000	45900	ug/L	0.636	8.20	25	
Naphthalene	50000	45100	ug/L	0.904	9.80	25	
Nitrobenzene	50000	47100	ug/L	0.353	5.80	25	
Phenanthrene	50000	44800	ug/L	0.937	10.4	25	
Pyrene	50000	45000	ug/L	1.06	9.90	25	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120352 Run Date: 11/28/2016 Sample ID: WG592701-13
Instrument ID: HPMS4 Run Time: 15:50 Method: 8270D
File ID: 4M81178 Analyst: SCB QC Key: WATERLOO
ICal Workgroup: WG592701 Cal ID: HPMS4 - 23-NOV-16

Analyte	Expected	Found	Units	RF	%D	UCL	Q
3,3'-Dichlorobenzidine	50000	52300	ug/L	0.392	4.50	25	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

ALT - Modified 09/06/2007
Version 1.5 PDF File ID: 5061203
Report generated 12/14/2016 09:21



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120352 Run Date: 11/28/2016 Sample ID: WG592701-12
Instrument ID: HPMS4 Run Time: 16:22 Method: 8270D
File ID: 4M81179 Analyst: SCB QC Key: WATERLOO
ICal Workgroup: WG592701 Cal ID: HPMS4 - 23-NOV-16

Analyte	Expected	Found	Units	RF	%D	UCL	Q
1,4-Dioxane	50000	46300	ug/L	0.523	7.40	25	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

ALT - Modified 09/06/2007
Version 1.5 PDF File ID: 5061203
Report generated 12/14/2016 09:21



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594455-02
Instrument ID: HPMS4 Run Time: 09:31 Method: 8270D
File ID: 4M81304 Analyst: SCB QC Key: WATERLOO
Workgroup (AAB#): WG594505 Cal ID: HPMS4 - 23-NOV-16
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,4-Dichlorobenzene	CCC	50000	48200	ug/L	1.41	3.51	20	
4-Chloro-3-Methylphenol	CCC	50000	52000	ug/L	0.338	3.99	20	
2,4,6-Trichlorophenol	CCC	50000	49100	ug/L	0.402	1.78	20	
2,4-Dichlorophenol	CCC	50000	49100	ug/L	0.292	1.75	20	
2-Nitrophenol	CCC	50000	53900	ug/L	0.197	7.88	20	
Acenaphthene	CCC	50000	48700	ug/L	1.17	2.65	20	
Benzo[a]pyrene	CCC	50000	48900	ug/L	1.14	2.23	20	
Di-n-Octyl Phthalate	CCC	50000	48700	ug/L	1.41	2.62	20	
Fluoranthene	CCC	50000	47100	ug/L	1.15	5.88	20	
Hexachlorobutadiene	CCC	50000	48400	ug/L	0.193	3.29	20	
Diphenylamine/n-Nitrosodiphenylamine	CCC	50000	48300	ug/L	0.641	3.33	20	
Pentachlorophenol	CCC	50000	45200	ug/L	0.127	9.52	20	
Phenol	CCC	50000	50900	ug/L	1.61	1.83	20	
n-Nitrosodipropylamine	SPCC	50000	53000	ug/L	1.07	6.05	20	
2,4-Dinitrophenol	SPCC	50000	50400	ug/L	0.146	0.853	20	
4-Nitrophenol	SPCC	50000	53800	ug/L	0.278	7.51	20	
Hexachlorocyclopentadiene	SPCC	50000	44600	ug/L	0.281	10.8	20	
Sym-Trinitrobenzene		50000	57500	ug/L	0.216	15.0	20	
1,3-Dinitrobenzene		50000	50300	ug/L	0.247	0.660	20	
1,4-Dioxane		50000	53300	ug/L	0.602	6.67	20	
2,4,5-Trichlorophenol		50000	49000	ug/L	0.406	2.05	20	
2,4-Dimethylphenol		50000	48900	ug/L	0.317	2.21	20	
2,4-Dinitrotoluene		50000	55200	ug/L	0.457	10.3	20	
2,6-Dinitrotoluene		50000	52000	ug/L	0.338	4.10	20	
2-Chloronaphthalene		50000	47600	ug/L	1.15	4.74	20	
2-Chlorophenol		50000	49200	ug/L	1.32	1.60	20	
2-Methylnaphthalene		50000	48400	ug/L	0.686	3.21	20	
2-Methylphenol		50000	50700	ug/L	1.10	1.43	20	
2-Nitroaniline		50000	54700	ug/L	0.364	9.41	20	
3-Nitroaniline		50000	51100	ug/L	0.332	2.14	20	
3,3'-Dichlorobenzidine		50000	48600	ug/L	0.365	2.75	20	
3-,4-Methylphenol		50000	50900	ug/L	1.38	1.85	20	
4-Bromophenyl Phenyl Ether		50000	48800	ug/L	0.225	2.49	20	
4-Chloroaniline		50000	52900	ug/L	0.139	5.75	20	
Acenaphthylene		50000	47300	ug/L	1.71	5.50	20	
Anthracene		50000	48000	ug/L	1.04	3.95	20	
Benzo[a]anthracene		50000	47000	ug/L	1.08	5.93	20	
Benzo[b]fluoranthene		50000	47300	ug/L	1.29	5.43	20	
Benzo[ghi]perylene		50000	48200	ug/L	0.951	3.69	20	
Benzo[k]fluoranthene		50000	45200	ug/L	1.03	9.66	20	
Benzoic Acid		50000	31900	ug/L	0.0697	36.3	20	*
Benzyl Alcohol		50000	51600	ug/L	0.891	3.22	20	

CCV - Modified 03/05/2008
PDF File ID: 5061205
Report generated 12/14/2016 09:21



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594455-02
Instrument ID: HPMS4 Run Time: 09:31 Method: 8270D
File ID: 4M81304 Analyst: SCB QC Key: WATERLOO
Workgroup (AAB#): WG594505 Cal ID: HPMS4 - 23-NOV-16
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
bis(2-Chloroethyl)ether	50000	52900	ug/L	0.980	5.70	20	
bis(2-Chloroethoxy)methane	50000	50200	ug/L	0.529	0.492	20	
bis(2-Ethylhexyl)phthalate	50000	49600	ug/L	0.774	0.775	20	
Butyl Benzyl Phthalate	50000	47200	ug/L	0.567	5.66	20	
Carbazole	50000	48700	ug/L	0.966	2.53	20	
Chrysene	50000	47700	ug/L	0.991	4.51	20	
Di-n-Butyl Phthalate	50000	47500	ug/L	1.19	5.06	20	
Dibenz[ah]anthracene	50000	50800	ug/L	1.03	1.57	20	
Dibenzofuran	50000	47900	ug/L	1.58	4.23	20	
Diethylphthalate	50000	48200	ug/L	1.31	3.59	20	
Dimethylphthalate	50000	47000	ug/L	1.29	6.06	20	
Fluorene	50000	48200	ug/L	1.37	3.54	20	
Hexachlorobenzene	50000	48800	ug/L	0.227	2.39	20	
Hexachloroethane	50000	50300	ug/L	0.608	0.663	20	
Indeno[1,2,3-cd]pyrene	50000	49700	ug/L	1.21	0.515	20	
Isophorone	50000	50000	ug/L	0.692	0.0396	20	
Naphthalene	50000	47800	ug/L	0.958	4.42	20	
Nitrobenzene	50000	52200	ug/L	0.391	4.40	20	
Phenanthrene	50000	47700	ug/L	0.998	4.60	20	
Pyrene	50000	46000	ug/L	1.09	8.06	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
PDF File ID: 5061205
Report generated 12/14/2016 09:21



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594482-01
 Instrument ID: HPMS4 Run Time: 10:13 Method: 8270D
 File ID: 4M81305 Analyst: SCB QC Key: WATERLOO
 Workgroup (AAB#): WG594505 Cal ID: HPMS4 - 18-NOV-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
1,1'-Biphenyl	50000	49300	ug/L	1.43	1.38	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
 PDF File ID: 5061205
 Report generated 12/14/2016 09:21



Microbac Laboratories Inc.
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

Login Number: L16120352
Instrument ID: HPMS4
Workgroup (AAB#): WG594505

CCV Number: WG594455-02
CAL ID: HPMS4-23-NOV-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3	IS-4	IS-5	IS-6
WG594455-02	NA	NA	199681	439118	881188	755970	798412	820232
Upper Limit	NA	NA	399362	878236	1762376	1511940	1596824	1640464
Lower Limit	NA	NA	99841	219559	440594	377985	399206	410116
<u>L16120352-13</u>	1.00	01	219416	459305	799483	800469	589016	812317
WG594170-01	1.00	01	208553	425576	754107	776630	640465	753052
WG594170-02	1.00	01	202142	419835	806852	733167	708820	776482
WG594170-03	1.00	01	210058	430712	813684	751197	720485	783457

- IS-1 - 1,4-Dichlorobenzene-d4
- IS-2 - Acenaphthene-d10
- IS-3 - Chrysene-d12
- IS-4 - Naphthalene-D8
- IS-5 - Perylene-d12
- IS-6 - Phenanthrene-d10

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

Login Number: L16120352
Instrument ID: HPMS4
Workgroup (AAB#): WG594505

CCV Number: WG594455-02
CAL ID: HPMS4 - 23-NOV-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3	IS-4	IS-5	IS-6
WG594455-02	NA	NA	7.81	10.9	16.17	9.09	18.94	12.5
Upper Limit	NA	NA	8.31	11.4	16.67	9.59	19.44	13
Lower Limit	NA	NA	7.31	10.4	15.67	8.59	18.44	12
<u>L16120352-13</u>	1.00	01	7.81	10.89	16.16	9.1	18.93	12.49
WG594170-01	1.00	01	7.81	10.89	16.16	9.09	18.93	12.49
WG594170-02	1.00	01	7.81	10.9	16.17	9.1	18.94	12.5
WG594170-03	1.00	01	7.81	10.9	16.16	9.1	18.94	12.49

- IS-1 - 1,4-Dichlorobenzene-d4
- IS-2 - Acenaphthene-d10
- IS-3 - Chrysene-d12
- IS-4 - Naphthalene-D8
- IS-5 - Perylene-d12
- IS-6 - Phenanthrene-d10

Underline = Response outside limits



2.2 Semivolatiles Data

2.2.2 Semivolatiles GC/MS Data (827-PAHL)

2.2.2.1 Summary Data



Login Number: L16120352
Department: Semivolatiles
Analyst: Sarah Bogolin

METHOD

Preparation 3510C

Analysis SW-846 8270 SIM

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Continuing Calibration and Tune: All acceptance criteria were met.

BATCH QA/QC

Method Blank: Analytes were detected above the applicable reporting limit for the following analyte: Naphthalene. The associated samples were non-detect. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
WG594260-01	Naphthalene	2016-12-12 15:16:00	0.254	0.0250	0.0500	RL

Laboratory Control Sample: Recoveries out of range were observed for the following analyte: Naphthalene failed high but the associated samples were non-detect. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
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WG594260-02	Naphthalene	2016-12-12 15:42:00	115	30	100	Recovery
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Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: Sample 13 was analyzed at a dilution to confirm sample matrix interference in the Internal Standard.

Internal Standards: The initial analysis of sample 13 yielded areas beyond the acceptance limit for one or more internal standards. The sample was reanalyzed at a dilution and yielded acceptable areas, indicating sample matrix interference; only the dilution analysis was reported.

Surrogates: All acceptance criteria were met.

Manual Integration Reason Codes

Reason #1: Data System Fails to Select Correct Peak In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low areacounts for the target compound.

Reason #3: Improperly Integrated Isomers and/or coeluting compounds. This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

Reason #4: System Establishes Incorrect Baseline There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Reason #5: Miscellaneous Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Managing Director or the QAO will be required.

Narrative ID: 120478

Approved By: Mary Schilling



Certificate of Analysis

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW09R-120616	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/13/2016 12:46
Collect Date: 12/06/2016 14:00	Dilution: 10	File ID: 7M68299
Sample Tag: DL01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.538	0.269
Acenaphthene	83-32-9		U	0.538	0.269
Acenaphthylene	208-96-8		U	0.538	0.269
Anthracene	120-12-7		U	0.538	0.269
Benzo(a)anthracene	56-55-3		U	0.538	0.269
Benzo(a)pyrene	50-32-8		U	0.538	0.269
Benzo(b)fluoranthene	205-99-2		U	0.538	0.269
Benzo(g,h,i)perylene	191-24-2		U	0.538	0.269
Benzo(k)fluoranthene	207-08-9		U	0.538	0.269
Chrysene	218-01-9		U	0.538	0.269
Dibenzo(a,h)anthracene	53-70-3		U	0.538	0.269
Fluoranthene	206-44-0		U	0.538	0.269
Fluorene	86-73-7		U	0.538	0.269
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.538	0.269
Naphthalene	91-20-3		U	0.538	0.269
Phenanthrene	85-01-8		U	0.538	0.269
Pyrene	129-00-0		U	0.538	0.269
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	78.1	43	116		
Nitrobenzene-d5	78.4	35	114		
p-Terphenyl-d14	81.9	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW16I-120616	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/12/2016 16:36
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 7M68265
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0543	0.0272
Acenaphthene	83-32-9		U	0.0543	0.0272

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Acenaphthylene	208-96-8		U	0.0543	0.0272
Anthracene	120-12-7		U	0.0543	0.0272
Benzo(a)anthracene	56-55-3		U	0.0543	0.0272
Benzo(a)pyrene	50-32-8		U	0.0543	0.0272
Benzo(b)fluoranthene	205-99-2		U	0.0543	0.0272
Benzo(g,h,i)perylene	191-24-2		U	0.0543	0.0272
Benzo(k)fluoranthene	207-08-9		U	0.0543	0.0272
Chrysene	218-01-9		U	0.0543	0.0272
Dibenzo(a,h)anthracene	53-70-3		U	0.0543	0.0272
Fluoranthene	206-44-0		U	0.0543	0.0272
Fluorene	86-73-7		U	0.0543	0.0272
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0543	0.0272
Naphthalene	91-20-3		U	0.0543	0.0272
Phenanthrene	85-01-8		U	0.0543	0.0272
Pyrene	129-00-0		U	0.0543	0.0272
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	80.9	43	116		
Nitrobenzene-d5	90.5	35	114		
p-Terphenyl-d14	80.8	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-19

PrePrep Method: N/A

Instrument: HPMS7

Client ID: MW16I-120616-MS

Prep Method: 3510C

Prep Date: 12/09/2016 11:00

Matrix: Water

Analytical Method: 8270D_SIM

Cal Date: 12/09/2016 14:03

Workgroup #: WG594466

Analyst: SCB

Run Date: 12/12/2016 17:03

Collect Date: 12/06/2016 13:15

Dilution: 1

File ID: 7M68266

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6	1.01		0.0543	0.0272
Acenaphthene	83-32-9	0.943		0.0543	0.0272
Acenaphthylene	208-96-8	0.976		0.0543	0.0272
Anthracene	120-12-7	1.08		0.0543	0.0272
Benzo(a)anthracene	56-55-3	1.31		0.0543	0.0272
Benzo(a)pyrene	50-32-8	1.26		0.0543	0.0272
Benzo(b)fluoranthene	205-99-2	1.16		0.0543	0.0272
Benzo(g,h,i)perylene	191-24-2	1.11		0.0543	0.0272
Benzo(k)fluoranthene	207-08-9	1.22		0.0543	0.0272
Chrysene	218-01-9	1.26		0.0543	0.0272
Dibenzo(a,h)anthracene	53-70-3	1.08		0.0543	0.0272

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Fluoranthene	206-44-0	1.21		0.0543	0.0272
Fluorene	86-73-7	1.03		0.0543	0.0272
Indeno(1,2,3-cd)pyrene	193-39-5	1.12		0.0543	0.0272
Naphthalene	91-20-3	0.947	B	0.0543	0.0272
Phenanthrene	85-01-8	1.11		0.0543	0.0272
Pyrene	129-00-0	1.11		0.0543	0.0272
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	90.2	43	116		
Nitrobenzene-d5	96.5	35	114		
p-Terphenyl-d14	77.7	33	141		
B	Analyte detected in the method blank				

Sample #: L16120352-20	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW16I-120616-MSD	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/12/2016 17:30
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: 7M68267
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6	0.957		0.0562	0.0281
Acenaphthene	83-32-9	0.896		0.0562	0.0281
Acenaphthylene	208-96-8	0.928		0.0562	0.0281
Anthracene	120-12-7	1.05		0.0562	0.0281
Benzo(a)anthracene	56-55-3	1.36		0.0562	0.0281
Benzo(a)pyrene	50-32-8	1.29		0.0562	0.0281
Benzo(b)fluoranthene	205-99-2	1.20		0.0562	0.0281
Benzo(g,h,i)perylene	191-24-2	1.13		0.0562	0.0281
Benzo(k)fluoranthene	207-08-9	1.24		0.0562	0.0281
Chrysene	218-01-9	1.29		0.0562	0.0281
Dibenzo(a,h)anthracene	53-70-3	1.08		0.0562	0.0281
Fluoranthene	206-44-0	1.27		0.0562	0.0281
Fluorene	86-73-7	0.980		0.0562	0.0281
Indeno(1,2,3-cd)pyrene	193-39-5	1.13		0.0562	0.0281
Naphthalene	91-20-3	0.904	B	0.0562	0.0281
Phenanthrene	85-01-8	1.07		0.0562	0.0281
Pyrene	129-00-0	1.12		0.0562	0.0281
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	82.3	43	116		
Nitrobenzene-d5	88.6	35	114		

Certificate of Analysis

p-Terphenyl-d14	76.7	33	141	
B	Analyte detected in the method blank			

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW26-120616	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/12/2016 21:29
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: 7M68276
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0521	0.0260
Acenaphthene	83-32-9		U	0.0521	0.0260
Acenaphthylene	208-96-8		U	0.0521	0.0260
Anthracene	120-12-7		U	0.0521	0.0260
Benzo(a)anthracene	56-55-3		U	0.0521	0.0260
Benzo(a)pyrene	50-32-8		U	0.0521	0.0260
Benzo(b)fluoranthene	205-99-2		U	0.0521	0.0260
Benzo(g,h,i)perylene	191-24-2		U	0.0521	0.0260
Benzo(k)fluoranthene	207-08-9		U	0.0521	0.0260
Chrysene	218-01-9		U	0.0521	0.0260
Dibenzo(a,h)anthracene	53-70-3		U	0.0521	0.0260
Fluoranthene	206-44-0		U	0.0521	0.0260
Fluorene	86-73-7		U	0.0521	0.0260
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0521	0.0260
Naphthalene	91-20-3		U	0.0521	0.0260
Phenanthrene	85-01-8		U	0.0521	0.0260
Pyrene	129-00-0		U	0.0521	0.0260

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2-Fluorobiphenyl	75.9	43	116	
Nitrobenzene-d5	83.5	35	114	
p-Terphenyl-d14	77.4	33	141	

U Not detected at or above adjusted sample detection limit.

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW17-120616	Prep Method: 3510C	Prep Date: 12/09/2016 11:00
Matrix: Water	Analytical Method: 8270D_SIM	Cal Date: 12/09/2016 14:03
Workgroup #: WG594466	Analyst: SCB	Run Date: 12/12/2016 21:55
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 7M68277
Sample Tag: 01	Units: ug/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0510	0.0255
Acenaphthene	83-32-9		U	0.0510	0.0255
Acenaphthylene	208-96-8		U	0.0510	0.0255
Anthracene	120-12-7		U	0.0510	0.0255
Benzo(a)anthracene	56-55-3		U	0.0510	0.0255
Benzo(a)pyrene	50-32-8		U	0.0510	0.0255
Benzo(b)fluoranthene	205-99-2		U	0.0510	0.0255
Benzo(g,h,i)perylene	191-24-2		U	0.0510	0.0255
Benzo(k)fluoranthene	207-08-9		U	0.0510	0.0255
Chrysene	218-01-9		U	0.0510	0.0255
Dibenzo(a,h)anthracene	53-70-3		U	0.0510	0.0255
Fluoranthene	206-44-0		U	0.0510	0.0255
Fluorene	86-73-7		U	0.0510	0.0255
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0510	0.0255
Naphthalene	91-20-3		U	0.0510	0.0255
Phenanthrene	85-01-8		U	0.0510	0.0255
Pyrene	129-00-0		U	0.0510	0.0255

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2-Fluorobiphenyl	79.7	43	116	
Nitrobenzene-d5	85.9	35	114	
p-Terphenyl-d14	72.0	33	141	

U Not detected at or above adjusted sample detection limit.

Sample #: L16120352-26

PrePrep Method: N/A

Instrument: HPMS7

Client ID: DUP-GW-120616

Prep Method: 3510C

Prep Date: 12/09/2016 11:00

Matrix: Water

Analytical Method: 8270D_SIM

Cal Date: 12/09/2016 14:03

Workgroup #: WG594466

Analyst: SCB

Run Date: 12/12/2016 22:22

Collect Date: 12/06/2016 12:30

Dilution: 1

File ID: 7M68278

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0510	0.0255
Acenaphthene	83-32-9		U	0.0510	0.0255
Acenaphthylene	208-96-8		U	0.0510	0.0255
Anthracene	120-12-7		U	0.0510	0.0255
Benzo(a)anthracene	56-55-3		U	0.0510	0.0255
Benzo(a)pyrene	50-32-8		U	0.0510	0.0255
Benzo(b)fluoranthene	205-99-2		U	0.0510	0.0255
Benzo(g,h,i)perylene	191-24-2		U	0.0510	0.0255
Benzo(k)fluoranthene	207-08-9		U	0.0510	0.0255

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Chrysene	218-01-9		U	0.0510	0.0255
Dibenzo(a,h)anthracene	53-70-3		U	0.0510	0.0255
Fluoranthene	206-44-0		U	0.0510	0.0255
Fluorene	86-73-7		U	0.0510	0.0255
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0510	0.0255
Naphthalene	91-20-3		U	0.0510	0.0255
Phenanthrene	85-01-8		U	0.0510	0.0255
Pyrene	129-00-0		U	0.0510	0.0255
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	85.2	43	116		
Nitrobenzene-d5	93.3	35	114		
p-Terphenyl-d14	73.7	33	141		
U	Not detected at or above adjusted sample detection limit.				

2.2.2.2 QC Summary Data

Example 8270 Calculations

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

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

where:

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

Example

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

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

where:

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

Example

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

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

where:

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

Example

Dry weight correction:

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

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

4.0 Concentration from Linear Regression

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

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

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

m = slope from curve plot

b = intercept from curve plot

Step 2: Calculate y from Quantitation Report

y = 16790/784838 = 0.02139

Step 3: Solve for x

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

Step 4: Solve for analyte concentration Cx

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

Example Spreadsheet Calculation:

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

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

Where:

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

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

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

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

Step 2: Calculate y from Quantitation Report

$$y = Ax/Ais$$

Step 3: Solve for x using the quadratic formula

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

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

Step 4: Solve for analyte concentration Cx

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

Example Spreadsheet Calculation:

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

Microbac Laboratories Inc.
Sample Extract Log

Workgroup: WG594260
 Analyst: JDH
 Spike Analyst: JDH
 Method: 3510C
 Run Date: 12/09/2016 11:00
 SOP: EXA01 Revision 19
 Spike Witness: JLD
 Surr Solution: STD78670

CH2CL2 Lot #: COA19311
 Sodium Sulfate, Anhydrous, Granular Lot # COA19291

	SAMPLE #	Type	Reference	pH	Prod	Init Amnt	Surr Amnt	Spike Amnt	Spike Sol	Final Vol	Color
1	L16120352-13	SAMP		N	827-PAHL	930 mL	.25 mL			1 mL	Transparent
2	L16120352-17	RS05		N	827-PAHL	920 mL	.25 mL			1 mL	Transparent
3	L16120352-19	MS05	L16120352-17	N	827-PAHL	920 mL	.25 mL	1 mL	STD77017	1 mL	Transparent
4	L16120352-20	SD05	L16120352-17	N	827-PAHL	890 mL	.25 mL	1 mL	STD77017	1 mL	Transparent
5	L16120352-21	SAMP		N	827-PAHL	960 mL	.25 mL			1 mL	Transparent
6	L16120352-23	SAMP		N	827-PAHL	980 mL	.25 mL			1 mL	Transparent
7	L16120352-26	SAMP		N	827-PAHL	980 mL	.25 mL			1 mL	Transparent
8	L16120425-03	SAMP		N	827-PAHL	830 mL	.25 mL			1 mL	Colored
9	L16120425-07	SAMP		N	827-PAHL	920 mL	.25 mL			1 mL	Transparent
10	L16120425-11	RS01		N	827-PAHL	930 mL	.25 mL			1 mL	Colored
11	L16120425-13	SAMP		N	827-PAHL	920 mL	.25 mL			1 mL	Transparent
12	L16120425-15	SAMP		N	827-PAHL	920 mL	.25 mL			1 mL	Transparent
13	L16120425-17	SAMP		N	827-PAHL	980 mL	.25 mL			1 mL	Transparent
14	L16120425-21	SAMP		N	827-PAHL	970 mL	.25 mL			1 mL	Transparent
15	WG594260-01	BLANK		N	827-PAHL	1000 mL	.25 mL			1 mL	Transparent
16	WG594260-02	LCS		N	827-PAHL	1000 mL	.25 mL	1 mL	STD77017	1 mL	Transparent
17	WG594260-03	REF	L16120352-17	N	827-PAHL	920 mL	.25 mL			1 mL	Transparent
18	WG594260-04	MS	L16120352-17	N	827-PAHL	920 mL	.25 mL	1 mL	STD77017	1 mL	Transparent
19	WG594260-05	MSD	L16120352-17	N	827-PAHL	890 mL	.25 mL	1 mL	STD77017	1 mL	Transparent

TV1 P5
pH 0-13 Lot#209314

Analyst: Justin Hesson

Reviewer: Charles Davis



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS7 Dataset: 120916
 Analyst1: SCB Analyst2: NA
 Method: 8270L SOP: MSS03 Rev: 13
 Method: OVAP SOP: MSS03 Rev: 0

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

Workgroups: Column 1 ID: RXI-5MS Column 2 ID: NA
WG594055, WG594224, WG594257, WG594258
 Internal STD: STD78997 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD79207 LCS STD: _____ MS/MSD STD: _____

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	7M68230	BAKE OUT	1	1		12/09/16 08:32
2	7M68231	WG594224-01 5PPM DFTPP STD	1	1	STD77832	12/09/16 08:57
3	7M68232	WG594224-01 5PPM DFTPP STD	1	1	STD77832	12/09/16 09:13
4	7M68233	WG594224-02 1PPM PAHL STD	1	1	STD79207	12/09/16 09:29
5	7M68234	WG594224-01 5PPM DFTPP STD	1	1	STD77832	12/09/16 09:58
6	7M68235	WG594224-01 5PPM DFTPP STD	1	1	STD77832	12/09/16 10:13
7	7M68236	WG594224-02 1PPM PAHL STD	1	1	STD79207	12/09/16 10:29
8	7M68237	WG594224-03 10PPM PAHL STD	1	1	STD79207	12/09/16 10:56
9	7M68238	WG594224-04 5PPM PAHL STD	1	1	STD79207	12/09/16 11:23
10	7M68239	WG594224-05 2.5PPM PAHL STD	1	1	STD79207	12/09/16 11:49
11	7M68240	WG594224-06 0.5PPM PAHL STD	1	1	STD79207	12/09/16 12:16
12	7M68241	WG594224-07 0.1PPM PAHL STD	1	1	STD79207	12/09/16 12:43
13	7M68242	WG594224-08 0.05PPM PAHL STD	1	1	STD79207	12/09/16 13:10
14	7M68243	WG594224-02 1PPM PAHL STD	1	1	STD79207	12/09/16 13:36
15	7M68244	WG594224-03 10PPM PAHL STD	1	1	STD79207	12/09/16 14:03
16	7M68245	WG594224-09 1PPM PAHL ALT SRC	1	1	STD79129	12/09/16 14:30
17	7M68246	WG593902-01 BLANK 12/7	7	1	SOIL	12/09/16 14:56
18	7M68247	WG594047-01 BLANK 12/8	7	1	SOIL	12/09/16 15:23
29	7M68248	L16120333-01 JDH DOC	7	1	SOIL	12/09/16 15:50
30	7M68249	L16120333-02 JDH DOC	7	1	SOIL	12/09/16 16:17
31	7M68250	L16120333-03 JDH DOC	7	1	SOIL	12/09/16 16:43
32	7M68251	L16120333-04 JDH DOC	7	1	SOIL	12/09/16 17:10
23	7M68252	WG594045-01 BLANK 12/8	7	1	SOIL	12/09/16 17:36
24	7M68253	L16120331-01 JDL DOC	7	1	SOIL	12/09/16 18:03
25	7M68254	L16120331-02 JDL DOC	7	1	SOIL	12/09/16 18:30
26	7M68255	L16120331-03 JDL DOC	7	1	SOIL	12/09/16 18:56
27	7M68256	L16120331-04 JDL DOC	7	1	SOIL	12/09/16 19:23
28	7M68257	BAKE OUT	1	1		12/09/16 19:49

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2				
			WG594224-01 5PPM DFTPP STD has an ion failure, DNR	

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Approved: 12-DEC-16

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS7 Dataset: 120916
 Analyst1: SCB Analyst2: NA
 Method: 8270L SOP: MSS03 Rev: 13
 Method: OVAP SOP: MSS03 Rev: 0

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

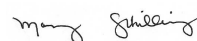
Workgroups: Column 1 ID: RXI-5MS Column 2 ID: NA
WG594055, WG594224, WG594257, WG594258
 Internal STD: STD78997 Surrogate STD: NA
 CCV STD: STD79207 LCS STD: _____

Comments

Seq.	Rerun	Dil.	Reason	Analytes
4				
			WG594224-02 1PPM PAHL STD IS low, raised voltage 30, DNR	
5				
			WG594224-01 5PPM DFTPP STD benzidine tailing is >2, DNR	
7				
			WG594224-02 1PPM PAHL STD IS high, DNR	
8				
			WG594224-03 10PPM PAHL STD IS high, DNR	

Page: 2

Approved: 12-DEC-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS7 Dataset: 121216
 Analyst1: SCB Analyst2: NA
 Method: 8270L SOP: MSS03 Rev: 14
 Method: OVAP SOP: MSS03 Rev: 0

Maintenance Log ID: _____ Syringe Filter Lot#: _____

Eluent ID#: _____

Workgroups: _____ Column 1 ID: RXI-5MS Column 2 ID: NA
WG594466, WG594055
 Internal STD: STD78997 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD79207 LCS STD: _____ MS/MSD STD: _____

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	7M68258	BAKE OUT	1	1		12/12/16 13:36
2	7M68259	WG594523-01 5PPM DFTPP STD	1	1	STD77832	12/12/16 14:14
3	7M68260	WG594523-01 5PPM DFTPP STD	1	1	STD77832	12/12/16 14:29
4	7M68261	WG594523-02 1PPM PAHL STD	1	1	STD79207	12/12/16 14:45
5	7M68262	WG594260-01 BLANK 12/9	1	1		12/12/16 15:16
6	7M68263	WG594260-02 LCS 12/9	1	1		12/12/16 15:42
7	7M68264	L16120352-13 827-PAHL	1	1		12/12/16 16:09
35	7M68265	L16120352-17 REF	1	1		12/12/16 16:36
36	7M68266	L16120352-19 MS	1	1		12/12/16 17:03
37	7M68267	L16120352-20 MSD	1	1		12/12/16 17:30
38	7M68268	L16120217-13	7	1	SOIL	12/12/16 17:57
12	7M68269	L16120217-01 3546 MDL	7	1	SOIL	12/12/16 18:23
13	7M68270	L16120217-02 3546 MDL	7	1	SOIL	12/12/16 18:50
14	7M68271	L16120217-03 3546 MDL	7	1	SOIL	12/12/16 19:16
15	7M68272	L16120217-04 3546 MDL	7	1	SOIL	12/12/16 19:43
16	7M68273	L16120217-05 3546 MDL	7	1	SOIL	12/12/16 20:09
17	7M68274	L16120217-06 3546 MDL	7	1	SOIL	12/12/16 20:36
18	7M68275	L16120217-07 3546 MDL	7	1	SOIL	12/12/16 21:02
19	7M68276	L16120352-21	1	1		12/12/16 21:29
20	7M68277	L16120352-23	1	1		12/12/16 21:55
21	7M68278	L16120352-26	1	1		12/12/16 22:22
22	7M68279	L16120425-03	1	1		12/12/16 22:48
23	7M68280	L16120425-07	1	1		12/12/16 23:15
24	7M68281	L16120425-11	1	1		12/12/16 23:41
25	7M68282	L16120425-13	1	1		12/13/16 00:08
26	7M68283	L16120425-15	1	1		12/13/16 00:34
27	7M68284	L16120425-17	1	1		12/13/16 01:00
28	7M68285	L16120425-21	1	1		12/13/16 01:27
29	7M68286	L16120217-08 3546 LOQ MDL	7	1	SOIL	12/13/16 01:53
30	7M68287	L16120217-09 3546 LOQ MDL	7	1	SOIL	12/13/16 02:20
31	7M68288	L16120217-10 3546 LOQ MDL	7	1	SOIL	12/13/16 02:46
32	7M68289	L16120217-11 3546 LOQ MDL	7	1	SOIL	12/13/16 03:13
33	7M68290	L16120217-14 3546 LOD MDL	7	1	SOIL	12/13/16 03:39

Page: 1

Approved: 14-DEC-16

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS7 Dataset: 121216
 Analyst1: SCB Analyst2: NA
 Method: 8270L SOP: MSS03 Rev: 14
 Method: OVAP SOP: MSS03 Rev: 0

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

Workgroups: _____ Column 1 ID: RXI-5MS Column 2 ID: NA
WG594466, WG594055
 Internal STD: STD78997 Surrogate STD: NA
 CCV STD: STD79207 LCS STD: _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	7M68291	BAKE OUT	1	1		12/13/16 04:06

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2				
			WG594523-01 5PPM DFTPP STD benzidine tailing >2, DNR	
5	X		Blank Failure	
			WG594260-01 BLANK 12/9 naphthalene is >RL. Samples are non-detect.	
6				
			WG594260-02 LCS 12/9 naphthalene has a high %REC no samples have a hit of this analyte other than the MS and MSD	
7	X	10	Internal standard failure	
			L16120352-13 827-PAHL IS NPT is low and a surrogate recovery is high, re-running to check for SMI. DNR	
38				
			L16120217-13 also reported as WG593902-02 Blank.	
22				
			L16120425-03 has one low surrogate recovery. OK not to re-extract per the client.	
31	X		Missed Tune	
			L16120217-10 3546 LOQ MDL, DNR	
32	X		Missed Tune	
			L16120217-11 3546 LOQ MDL DNR	
33	X		Missed Tune	
			L16120217-14 3546 LOD MDL DNR	

Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS7 Dataset: 121316
 Analyst1: SCB Analyst2: NA
 Method: 8270L SOP: MSS03 Rev: 14
 Method: OVAP SOP: MSS03 Rev: 0

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

Workgroups: _____ Column 1 ID: RXI-5MS Column 2 ID: NA
WG594466, WG594055
 Internal STD: STD78997 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD79207 LCS STD: _____ MS/MSD STD: _____

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	7M68292	BAKE OUT	1	1		12/13/16 09:51
2	7M68293	WG594637-01 5PPM DFTPP STD	1	1	STD77832	12/13/16 10:16
3	7M68294	WG594637-01 5PPM DFTPP STD	1	1	STD77832	12/13/16 10:33
4	7M68295	WG594637-02 1PPM PAHL STD	1	1	STD79207	12/13/16 10:49
5	7M68296	L16120217-10 3546 LOQ MDL	7	1	SOIL	12/13/16 11:25
6	7M68297	L16120217-11 3546 LOQ MDL	7	1	SOIL	12/13/16 11:52
7	7M68298	L16120217-14 3546 LOD MDL	7	1	SOIL	12/13/16 12:19
8	7M68299	L16120352-13 10X 827-PAHL	1	10		12/13/16 12:46
9	7M68300	BAKE OUT	1	1		12/13/16 13:13
10	7M68301	BAKE OUT	1	1		12/13/16 13:39

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2				
			WG594637-01 5PPM DFTPP STD benzidine tailing >2, DNR	
8				
			L16120352-13 10X 827-PAHL reporting the 10X dilution only due to IS outliers in the straight run.	

Page: 1

Approved: 14-DEC-16

Mary Schilling



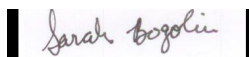
Microbac Laboratories Inc.

Data Checklist

Date: 09-DEC-2016
 Analyst: SCB
 Analyst: NA
 Method: 8270L
 Instrument: HPMS7
 Curve Workgroup: NA
 Runlog ID: 79173
 Analytical Workgroups: WG594224, L16120333, L16120331

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

Primary Reviewer:
12-DEC-2016



Secondary Reviewer:
12-DEC-2016





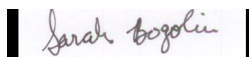
Microbac Laboratories Inc.

Data Checklist

Date: 12-DEC-2016
 Analyst: SCB
 Analyst: NA
 Method: 8270L
 Instrument: HPMS7
 Curve Workgroup: NA
 Runlog ID: 79206
 Analytical Workgroups: L16120352, L16120217, L16120425

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

Primary Reviewer:
13-DEC-2016



Secondary Reviewer:
14-DEC-2016





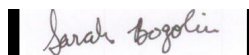
Microbac Laboratories Inc.

Data Checklist

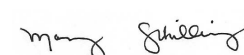
Date: 13-DEC-2016
 Analyst: SCB
 Analyst: NA
 Method: 8270L
 Instrument: HPMS7
 Curve Workgroup: NA
 Runlog ID: 79213
 Analytical Workgroups: L16120217. L16120352

ANALYTICAL	
System Performance Check	X
DFTPP (MS)	X
Endrin/DDT breakdown (8081/MS)	X
Pentachlorophenol/benzidine tailing (MS)	X
Eluent check (IC)/system pressure (HPLC)	NA
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	X
Continuing calibration blank (CCB) (IC)	NA
Special standards	NA
Blanks	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	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	X
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	NA
Reruns	X
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	SCB
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	MES

Primary Reviewer:
14-DEC-2016



Secondary Reviewer:
14-DEC-2016





Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8270D_SIM
 Login Number: L16120352

AAB#: WG594466

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
MW09R-120616	13	12/06/16					12/09/2016	2.9	7		12/13/16	4.1	40	
MW16I-120616	17	12/06/16					12/09/2016	2.9	7		12/12/16	3.2	40	
MW16I-120616-MS	19	12/06/16					12/09/2016	2.9	7		12/12/16	3.3	40	
MW16I-120616-MSD	20	12/06/16					12/09/2016	2.9	7		12/12/16	3.3	40	
MW26-120616	21	12/06/16					12/09/2016	2.8	7		12/12/16	3.4	40	
MW17-120616	23	12/06/16					12/09/2016	3	7		12/12/16	3.5	40	
DUP-GW-120616	26	12/06/16					12/09/2016	2.9	7		12/12/16	3.5	40	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061647
 Report generated 12/15/2016 11:37



Microbac Laboratories Inc.
SURROGATE STANDARDS

Login Number: L16120352
Instrument Id: HPMS7
Workgroup (AAB#): WG594466

Method: 8270L
CAL ID: HPMS7-09-DEC-16
Matrix: Water

Sample Number	Dilution	Tag	1	2	3
L16120352-13	10.0	DL01	78.1	78.4	81.9
L16120352-17	1.00	01	80.9	90.5	80.8
L16120352-19	1.00	01	90.2	96.5	77.7
L16120352-20	1.00	01	82.3	88.6	76.7
L16120352-21	1.00	01	75.9	83.5	77.4
L16120352-23	1.00	01	79.7	85.9	72.0
L16120352-26	1.00	01	85.2	93.3	73.7
WG594260-01	1.00	01	82.1	87.0	75.9
WG594260-02	1.00	01	89.1	92.2	78.2

Surrogates	Surrogate Limits		
1 - 2-Fluorobiphenyl	43	-	116
2 - Nitrobenzene-d5	35	-	114
3 - p-Terphenyl-d14	33	-	141

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594466
 Blank File ID: 7M68262 Blank Sample ID: WG594260-01
 Prep Date: 12/09/16 11:00 Instrument ID: HPMS7
 Analyzed Date: 12/12/16 15:16 Method: 8270D SIM
 Analyst: SCB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594260-02	7M68263	12/12/16 15:42	01
MW16I-120616	L16120352-17	7M68265	12/12/16 16:36	01
MW16I-120616-MS	L16120352-19	7M68266	12/12/16 17:03	01
MW16I-120616-MSD	L16120352-20	7M68267	12/12/16 17:30	01
MW26-120616	L16120352-21	7M68276	12/12/16 21:29	01
MW17-120616	L16120352-23	7M68277	12/12/16 21:55	01
DUP-GW-120616	L16120352-26	7M68278	12/12/16 22:22	01
MW09R-120616	L16120352-13	7M68299	12/13/16 12:46	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5061648
 Report generated 12/15/2016 11:37



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/09/16 11:00 Sample ID: WG594260-01
Instrument ID: HPMS7 Run Date: 12/12/16 15:16 Prep Method: 3510C
File ID: 7M68262 Analyst: SCB Method: 8270D SIM
Workgroup (AAB#): WG594466 Matrix: Water Units: ug/L
Contract #: _____ Cal ID: HPMS7-09-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
2-Methylnaphthalene	0.0250	0.0500	0.0250	1	U
Acenaphthene	0.0250	0.0500	0.0250	1	U
Acenaphthylene	0.0250	0.0500	0.0250	1	U
Anthracene	0.0250	0.0500	0.0250	1	U
Benzo(a)anthracene	0.0250	0.0500	0.0250	1	U
Benzo(a)pyrene	0.0250	0.0500	0.0250	1	U
Benzo(b)fluoranthene	0.0250	0.0500	0.0250	1	U
Benzo(g,h,i)perylene	0.0250	0.0500	0.0250	1	U
Benzo(k)fluoranthene	0.0250	0.0500	0.0250	1	U
Chrysene	0.0250	0.0500	0.0250	1	U
Dibenzo(a,h)anthracene	0.0250	0.0500	0.0250	1	U
Fluoranthene	0.0250	0.0500	0.0250	1	U
Fluorene	0.0250	0.0500	0.0250	1	U
Indeno(1,2,3-cd)pyrene	0.0250	0.0500	0.0250	1	U
Naphthalene	0.0250	0.0500	0.254	1	*
Phenanthrene	0.0250	0.0500	0.0250	1	U
Pyrene	0.0250	0.0500	0.0250	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
2-Fluorobiphenyl	82.1	43 - 116	PASS
Nitrobenzene-d5	87.0	35 - 114	PASS
p-Terphenyl-d14	75.9	33 - 141	PASS

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

Report Name: BLANK
PDF ID: 5061649
15-DEC-2016 11:37



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594260-02
 Instrument ID: HPMS7 Run Time: 15:42 Prep Method: 3510C
 File ID: 7M68263 Analyst: SCB Method: 8270D SIM
 Workgroup (AAB#): WG594466 Matrix: Water Units: ug/L
 QC Key: WATERLOO Lot#: STD77017 Cal ID: HPMS7-09-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
2-Methylnaphthalene	1.00	0.890	89.0	30 - 105	
Acenaphthene	1.00	0.855	85.5	30 - 110	
Acenaphthylene	1.00	0.888	88.8	30 - 115	
Anthracene	1.00	1.08	108	30 - 130	
Benzo(a)anthracene	1.00	1.19	119	50 - 150	
Benzo(a)pyrene	1.00	1.18	118	50 - 140	
Benzo(b)fluoranthene	1.00	1.07	107	40 - 150	
Benzo(g,h,i)perylene	1.00	0.926	92.6	30 - 150	
Benzo(k)fluoranthene	1.00	1.14	114	40 - 150	
Chrysene	1.00	1.12	112	45 - 145	
Dibenzo(a,h)anthracene	1.00	0.672	67.2	25 - 155	
Fluoranthene	1.00	1.16	116	40 - 150	
Fluorene	1.00	0.961	96.1	30 - 120	
Indeno(1,2,3-cd)pyrene	1.00	1.04	104	35 - 150	
Naphthalene	1.00	1.15	115	30 - 100	*
Phenanthrene	1.00	1.11	111	30 - 130	
Pyrene	1.00	1.04	104	50 - 150	

Surrogates	% Recovery	Surrogate Limits	Qualifier
2-Fluorobiphenyl	89.1	43 - 116	PASS
Nitrobenzene-d5	92.2	35 - 114	PASS
p-Terphenyl-d14	78.2	33 - 141	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
 PDF File ID: 5061650
 Report generated: 12/15/2016 11:37



MS/MSD REPORT

Loginnum: L16120352 Cal ID: HPMS7- 09-DEC-16 Worknum: WG594466
 Instrument ID: HPMS7 Contract #: _____ Prep Method: 3510C
 Parent ID: L16120352-17 File ID: 7M68265 Dil: 1 Method: 8270C
 Sample ID: L16120352-19 MS File ID: 7M68266 Dil: 1 Matrix: Water
 Sample ID: L16120352-20 MSD File ID: 7M68267 Dil: 1 Units: ug/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
2-Methylnaphthalene	U	1.09	1.01	92.6	1.12	0.957	85.2	5.12	30 - 105	30	
Acenaphthene	U	1.09	0.943	86.7	1.12	0.896	79.8	5.03	30 - 110	30	
Acenaphthylene	U	1.09	0.976	89.8	1.12	0.928	82.6	5.06	30 - 115	30	
Anthracene	U	1.09	1.08	98.9	1.12	1.05	93.4	2.48	30 - 130	30	
Benzo(a)anthracene	U	1.09	1.31	120	1.12	1.36	121	3.77	50 - 150	30	
Benzo(a)pyrene	U	1.09	1.26	116	1.12	1.29	115	2.40	50 - 140	30	
Benzo(b)fluoranthene	U	1.09	1.16	107	1.12	1.20	106	2.78	40 - 150	30	
Benzo(g,h,i)perylene	U	1.09	1.11	102	1.12	1.13	101	2.03	30 - 150	30	
Benzo(k)fluoranthene	U	1.09	1.22	113	1.12	1.24	110	1.13	40 - 150	30	
Chrysene	U	1.09	1.26	116	1.12	1.29	115	2.75	45 - 145	30	
Dibenzo(a,h)anthracene	U	1.09	1.08	99	1.12	1.08	96.3	0.548	25 - 155	30	
Fluoranthene	U	1.09	1.21	111	1.12	1.27	113	5.28	40 - 150	30	
Fluorene	U	1.09	1.03	94.8	1.12	0.980	87.2	5.08	30 - 120	30	
Indeno(1,2,3-cd)pyrene	U	1.09	1.12	103	1.12	1.13	101	0.956	35 - 150	30	
Naphthalene	U	1.09	0.947	87.2	1.12	0.904	80.4	4.74	30 - 100	30	
Phenanthrene	U	1.09	1.11	102	1.12	1.07	95.4	3.32	30 - 130	30	
Pyrene	U	1.09	1.11	102	1.12	1.12	100	1.37	50 - 150	30	

* FAILS %REC LIMIT

FAILS RPD LIMIT

Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120352
Instrument: HPMS7
Analyst: SCB
Workgroup: WG594224

Tune ID: WG594224-01
Run Date: 12/09/2016
Run Time: 10:13
File ID: 7M68235
Cal ID: HPMS7-09-DEC-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	45.4	17194	PASS
68.0	69.0	0	2.00	0.757	138	PASS
69.0	198	0	100	48.1	18222	PASS
70.0	69.0	0	2.00	0.905	165	PASS
127	198	40.0	60.0	52.4	19841	PASS
197	198	0	1.00	0.396	150	PASS
198	198	100	100	100	37877	PASS
199	198	5.00	9.00	8.24	3120	PASS
275	198	10.0	30.0	29.1	11026	PASS
365	198	1.00	100	4.98	1888	PASS
441	443	0.0100	100	74.0	4532	PASS
442	198	40.0	100	80.8	30621	PASS
443	442	17.0	23.0	20.0	6122	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG594224-04	STD	01	12/09/2016 11:23	
WG594224-05	STD	01	12/09/2016 11:49	
WG594224-06	STD	01	12/09/2016 12:16	
WG594224-07	STD	01	12/09/2016 12:43	
WG594224-08	STD	01	12/09/2016 13:10	
WG594224-02	STD-CCV	01	12/09/2016 13:36	
WG594224-03	STD	01	12/09/2016 14:03	
WG594224-09	SSCV	01	12/09/2016 14:30	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120352 Tune ID: WG594523-01
 Instrument: HPMS7 Run Date: 12/12/2016
 Analyst: SCB Run Time: 14:29
 Workgroup: WG594523 File ID: 7M68260
 Cal ID: HPMS7-09-DEC-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	46.1	12886	PASS
68.0	69.0	0	2.00	1.20	162	PASS
69.0	198	0	100	48.1	13463	PASS
70.0	69.0	0	2.00	0	0	PASS
127	198	40.0	60.0	52.1	14583	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	27976	PASS
199	198	5.00	9.00	6.37	1781	PASS
275	198	10.0	30.0	28.3	7913	PASS
365	198	1.00	100	4.15	1162	PASS
441	443	0.0100	100	81.4	3246	PASS
442	198	40.0	100	71.0	19850	PASS
443	442	17.0	23.0	20.1	3990	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG594523-02	CCV	01	12/12/2016 14:45	
WG594260-01	BLANK	01	12/12/2016 15:16	
WG594260-02	LCS	01	12/12/2016 15:42	
L16120352-17	MW16I-120616	01	12/12/2016 16:36	
L16120352-19	MW16I-120616-MS	01	12/12/2016 17:03	
L16120352-20	MW16I-120616-MSD	01	12/12/2016 17:30	
L16120352-21	MW26-120616	01	12/12/2016 21:29	
L16120352-23	MW17-120616	01	12/12/2016 21:55	
L16120352-26	DUP-GW-120616	01	12/12/2016 22:22	

* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008
 PDF File ID: 5061654
 Report generated 12/15/2016 11:38



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120352 Tune ID: WG594637-01
 Instrument: HPMS7 Run Date: 12/13/2016
 Analyst: SCB Run Time: 10:33
 Workgroup: WG594637 File ID: 7M68294
 Cal ID: HPMS7-09-DEC-16

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
51.0	198	30.0	60.0	44.5	14827	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	47.2	15709	PASS
70.0	69.0	0	2.00	0	0	PASS
127	198	40.0	60.0	51.2	17031	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	33285	PASS
199	198	5.00	9.00	6.36	2118	PASS
275	198	10.0	30.0	29.4	9801	PASS
365	198	1.00	100	5.39	1793	PASS
441	443	0.0100	100	90.5	4106	PASS
442	198	40.0	100	70.6	23487	PASS
443	442	17.0	23.0	19.3	4539	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG594637-02	CCV	01	12/13/2016 10:49	
L16120352-13	MW09R-120616	DL01	12/13/2016 12:46	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
 INITIAL CALIBRATION SUMMARY

Login Number: L16120352
 Analytical Method: 8270D_SIM
 ICAL Workgroup: WG594224

Instrument ID: HPMS7
 Initial Calibration Date: 09-DEC-16 14:03
 Column ID: F

Analyte		AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Acenaphthene	CCC	1.467	7.96		
Benzo[a]pyrene	CCC	1.206	11.2		
Fluoranthene	CCC	1.365	7.40		
2-Methylnaphthalene		0.7075	8.33		
Acenaphthylene		2.446	6.56		
Anthracene		1.169	10.9		
Benzo[a]anthracene		1.148	8.84		
Benzo[b]fluoranthene		1.186	15.9	0.99600	
Benzo[ghi]perylene		1.212	7.94		
Benzo[k]fluoranthene		1.335	8.47		
Chrysene		1.203	5.39		
Dibenz[ah]anthracene		1.215	13.8		
Fluorene		1.577	9.92		
Indeno[1,2,3-cd]pyrene		1.476	12.7		
Naphthalene		1.091	4.14		
Phenanthrene		1.135	9.05		
Pyrene		1.478	4.79		

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

INT_CAL - Modified 03/06/2008
 PDF File ID: 5061652
 Report generated 12/15/2016 11:37



Login Number: L16120352
Analytical Method: 8270D SIM

Instrument ID: HPMS7
Initial Calibration Date: 09-DEC-16 14:03
Column ID: F

Analyte	WG594224-02			WG594224-03			WG594224-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Acenaphthene	1.00	51366.0000	1.365	10.0	619238.000	1.661	5.00	326834.000	1.525
Benzo[a]pyrene	1.00	81141.0000	1.147	10.0	987755.000	1.396	5.00	525516.000	1.298
Fluoranthene	1.00	98384.0000	1.302	10.0	1182876.00	1.540	5.00	616411.000	1.416
2-Methylnaphthalene	1.00	48984.0000	0.6744	10.0	595274.000	0.7930	5.00	314798.000	0.7512
Acenaphthylene	1.00	85162.0000	2.264	10.0	1007866.00	2.703	5.00	540709.000	2.523
Anthracene	1.00	84356.0000	1.117	10.0	1040729.00	1.355	5.00	551374.000	1.267
Benzo[a]anthracene	1.00	81878.0000	1.054	10.0	1082464.00	1.313	5.00	542001.000	1.224
Benzo[b]fluoranthene	1.00	76504.0000	1.082	10.0	1014701.00	1.434	5.00	550431.000	1.360
Benzo[ghi]perylene	1.00	82347.0000	1.164	10.0	951209.000	1.345	5.00	515894.000	1.274
Benzo[k]fluoranthene	1.00	83782.0000	1.185	10.0	1083150.00	1.531	5.00	537315.000	1.327
Chrysene	1.00	86698.0000	1.116	10.0	1071364.00	1.299	5.00	540845.000	1.221
Dibenz[ah]anthracene	1.00	80737.0000	1.142	10.0	1049488.00	1.484	5.00	540025.000	1.334
Fluorene	1.00	56462.0000	1.501	10.0	680330.000	1.825	5.00	361192.000	1.685
Indeno[1,2,3-cd]pyrene	1.00	98521.0000	1.393	10.0	1254940.00	1.774	5.00	649585.000	1.605
Naphthalene	1.00	75620.0000	1.041	10.0	860215.000	1.146	5.00	464335.000	1.108
Phenanthrene	1.00	81214.0000	1.075	10.0	997181.000	1.298	5.00	524310.000	1.205
Pyrene	1.00	106685.000	1.373	10.0	1281301.00	1.554	5.00	661289.000	1.493

INT_CAL - Modified 03/06/2008
PDF File ID: 5061652
Report generated 12/15/2016 11:37



Login Number: L16120352
 Analytical Method: 8270D SIM

Instrument ID: HPMS7
 Initial Calibration Date: 09-DEC-16 14:03
 Column ID: F

Analyte	WG594224-05			WG594224-06			WG594224-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Acenaphthene	2.50	152544.000	1.481	0.500	27951.0000	1.481	0.100	4791.00000	1.292
Benzo[a]pyrene	2.50	243104.000	1.267	0.500	42985.0000	1.250	0.100	6770.00000	1.017
Fluoranthene	2.50	289883.000	1.383	0.500	51944.0000	1.378	0.100	8792.00000	1.225
2-Methylnaphthalene	2.50	146360.000	0.7346	0.500	25892.0000	0.7219	0.100	4357.00000	0.6247
Acenaphthylene	2.50	253038.000	2.457	0.500	45684.0000	2.421	0.100	8292.00000	2.235
Anthracene	2.50	256364.000	1.223	0.500	44668.0000	1.185	0.100	7178.00000	1.000
Benzo[a]anthracene	2.50	248815.000	1.186	0.500	42579.0000	1.144	0.100	7314.00000	1.021
Benzo[b]fluoranthene	2.50	248923.000	1.297	0.500	40956.0000	1.191	0.100	6135.00000	0.9214
Benzo[ghi]perylene	2.50	241799.000	1.260	0.500	42738.0000	1.242	0.100	7061.00000	1.061
Benzo[k]fluoranthene	2.50	251669.000	1.311	0.500	46967.0000	1.365	0.100	8209.00000	1.233
Chrysene	2.50	251633.000	1.200	0.500	45834.0000	1.231	0.100	8038.00000	1.122
Dibenz[ah]anthracene	2.50	245788.000	1.281	0.500	41728.0000	1.213	0.100	6674.00000	1.002
Fluorene	2.50	168616.000	1.637	0.500	30091.0000	1.594	0.100	5061.00000	1.364
Indeno[1,2,3-cd]pyrene	2.50	297506.000	1.550	0.500	50979.0000	1.482	0.100	8193.00000	1.231
Naphthalene	2.50	219330.000	1.101	0.500	40365.0000	1.125	0.100	7093.00000	1.017
Phenanthrene	2.50	245048.000	1.169	0.500	43052.0000	1.143	0.100	7065.00000	0.9846
Pyrene	2.50	310256.000	1.479	0.500	55829.0000	1.500	0.100	9984.00000	1.394

INT_CAL - Modified 03/06/2008
 PDF File ID: 5061652
 Report generated 12/15/2016 11:37



Login Number: L16120352
 Analytical Method: 8270D SIM

Instrument ID: HPMS7
 Initial Calibration Date: 09-DEC-16 14:03
 Column ID: F

Analyte	WG594224-08		
	CONC	RESP	RF
Acenaphthene	0.0500	2699.00000	1.465
Benzo[a]pyrene	0.0500	3463.00000	1.065
Fluoranthene	0.0500	4601.00000	1.307
2-Methylnaphthalene	0.0500	2249.00000	0.6528
Acenaphthylene	0.0500	4638.00000	2.517
Anthracene	0.0500	3653.00000	1.037
Benzo[a]anthracene	0.0500	3859.00000	1.097
Benzo[b]fluoranthene	0.0500	3301.00000	1.015
Benzo[ghi]perylene	0.0500	3695.00000	1.137
Benzo[k]fluoranthene	0.0500	4532.00000	1.394
Chrysene	0.0500	4328.00000	1.230
Dibenz[ah]anthracene	0.0500	3403.00000	1.047
Fluorene	0.0500	2644.00000	1.435
Indeno[1,2,3-cd]pyrene	0.0500	4211.00000	1.295
Naphthalene	0.0500	3785.00000	1.099
Phenanthrene	0.0500	3776.00000	1.072
Pyrene	0.0500	5463.00000	1.553

INT_CAL - Modified 03/06/2008
 PDF File ID: 5061652
 Report generated 12/15/2016 11:37



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594224-09
 Instrument ID: HPMS7 Run Time: 14:30 Method: 8270D_SIM
 File ID: 7M68245 Analyst: SCB QC Key: WATERLOO
 ICal Workgroup: WG594224 Cal ID: HPMS7 - 09-DEC-16

Analyte		Expected	Found	Units	RF	%D	UCL	Q
Acenaphthene	CCC	1000	1000	ug/L	1.47	0.500	25	
Benzo[a]pyrene	CCC	1000	1030	ug/L	1.24	3.00	25	
Fluoranthene	CCC	1000	1020	ug/L	1.39	1.60	25	
2-Methylnaphthalene		1000	1050	ug/L	0.741	4.80	25	
Acenaphthylene		1000	1000	ug/L	2.46	0.400	25	
Anthracene		1000	1050	ug/L	1.22	4.70	25	
Benzo[a]anthracene		1000	1000	ug/L	1.15	0.400	25	
Benzo[b]fluoranthene		1000	902	ug/L	1.21	9.80	25	
Benzo[ghi]perylene		1000	1030	ug/L	1.25	2.70	25	
Benzo[k]fluoranthene		1000	1030	ug/L	1.38	3.10	25	
Chrysene		1000	1020	ug/L	1.24	2.40	25	
Dibenz[ah]anthracene		1000	1010	ug/L	1.22	0.600	25	
Fluorene		1000	1030	ug/L	1.62	2.80	25	
Indeno[1,2,3-cd]pyrene		1000	1020	ug/L	1.50	1.50	25	
Naphthalene		1000	1040	ug/L	1.13	3.70	25	
Phenanthrene		1000	1010	ug/L	1.15	1.30	25	
Pyrene		1000	1010	ug/L	1.49	0.900	25	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594523-02
 Instrument ID: HPMS7 Run Time: 14:45 Method: 8270D_SIM
 File ID: 7M68261 Analyst: SCB QC Key: WATERLOO
 Workgroup (AAB#): WG594466 Cal ID: HPMS7 - 09-DEC-16
 Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Acenaphthene	CCC	1000	938	ug/L	1.38	6.22	20	
Benzo[a]pyrene	CCC	1000	952	ug/L	1.15	4.77	20	
Fluoranthene	CCC	1000	955	ug/L	1.30	4.48	20	
2-Methylnaphthalene		1000	949	ug/L	0.671	5.11	20	
Acenaphthylene		1000	925	ug/L	2.26	7.53	20	
Anthracene		1000	960	ug/L	1.12	3.98	20	
Benzo[a]anthracene		1000	933	ug/L	1.07	6.68	20	
Benzo[b]fluoranthene		1000	841	ug/L	1.12	15.9	20	
Benzo[ghi]perylene		1000	969	ug/L	1.18	3.07	20	
Benzo[k]fluoranthene		1000	906	ug/L	1.21	9.43	20	
Chrysene		1000	913	ug/L	1.10	8.75	20	
Dibenz[ah]anthracene		1000	959	ug/L	1.17	4.08	20	
Fluorene		1000	940	ug/L	1.48	6.00	20	
Indeno[1,2,3-cd]pyrene		1000	961	ug/L	1.42	3.88	20	
Naphthalene		1000	952	ug/L	1.04	4.81	20	
Phenanthrene		1000	934	ug/L	1.06	6.56	20	
Pyrene		1000	925	ug/L	1.37	7.52	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
 PDF File ID: 5061655
 Report generated 12/15/2016 11:38



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594637-02
Instrument ID: HPMS7 Run Time: 10:49 Method: 8270D_SIM
File ID: 7M68295 Analyst: SCB QC Key: WATERLOO
Workgroup (AAB#): WG594466 Cal ID: HPMS7 - 09-DEC-16
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Acenaphthene	CCC	1000	868	ug/L	1.27	13.2	20	
Benzo[a]pyrene	CCC	1000	953	ug/L	1.15	4.69	20	
Fluoranthene	CCC	1000	931	ug/L	1.27	6.94	20	
2-Methylnaphthalene		1000	952	ug/L	0.674	4.79	20	
Acenaphthylene		1000	861	ug/L	2.11	13.9	20	
Anthracene		1000	957	ug/L	1.12	4.31	20	
Benzo[a]anthracene		1000	924	ug/L	1.06	7.62	20	
Benzo[b]fluoranthene		1000	839	ug/L	1.12	16.1	20	
Benzo[ghi]perylene		1000	951	ug/L	1.15	4.93	20	
Benzo[k]fluoranthene		1000	902	ug/L	1.20	9.78	20	
Chrysene		1000	926	ug/L	1.12	7.44	20	
Dibenz[ah]anthracene		1000	946	ug/L	1.15	5.38	20	
Fluorene		1000	882	ug/L	1.39	11.8	20	
Indeno[1,2,3-cd]pyrene		1000	942	ug/L	1.39	5.85	20	
Naphthalene		1000	945	ug/L	1.03	5.52	20	
Phenanthrene		1000	936	ug/L	1.06	6.43	20	
Pyrene		1000	928	ug/L	1.37	7.24	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
PDF File ID: 5061655
Report generated 12/15/2016 11:38



Microbac Laboratories Inc.
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

Login Number: L16120352
Instrument ID: HPMS7
Workgroup (AAB#): WG594466

CCV Number: WG594523-02
CAL ID: HPMS7-09-DEC-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3	IS-4	IS-5
WG594523-02	NA	NA	34466	69950	66224	66092	68441
Upper Limit	NA	NA	68932	139900	132448	132184	136882
Lower Limit	NA	NA	17233	34975	33112	33046	34221
<u>L16120352-17</u>	1.00	01	<u>25837</u>	<u>54674</u>	<u>49096</u>	<u>55137</u>	<u>50482</u>
L16120352-19	1.00	01	26014	56634	50188	55777	50471
L16120352-20	1.00	01	25795	57280	49327	56546	49742
L16120352-21	1.00	01	32939	69971	62146	69648	64445
L16120352-23	1.00	01	30481	65706	57596	64794	59007
L16120352-26	1.00	01	29275	62313	55468	60663	56315
WG594260-01	1.00	01	30200	61525	57427	60161	59029
WG594260-02	1.00	01	28259	60625	54046	58506	54551

- IS-1 - Acenaphthene-d10
- IS-2 - Chrysene-d12
- IS-3 - Naphthalene-d8
- IS-4 - Perylene-d12
- IS-5 - Phenanthrene-d10

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

Login Number: L16120352
Instrument ID: HPMS7
Workgroup (AAB#): WG594466

CCV Number: WG594637-02
CAL ID: HPMS7-09-DEC-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3	IS-4	IS-5
WG594637-02	NA	NA	41385	76490	73643	74176	77149
Upper Limit	NA	NA	82770	152980	147286	148352	154298
Lower Limit	NA	NA	20693	38245	36822	37088	38575
<u>L16120352-13</u>	<u>10.0</u>	<u>DL01</u>	<u>35125</u>	<u>67668</u>	<u>72842</u>	<u>67246</u>	<u>67922</u>

IS-1 - Acenaphthene-d10
IS-2 - Chrysene-d12
IS-3 - Naphthalene-d8
IS-4 - Perylene-d12
IS-5 - Phenanthrene-d10

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

Login Number: L16120352
Instrument ID: HPMS7
Workgroup (AAB#): WG594466

CCV Number: WG594523-02
CAL ID: HPMS7-09-DEC-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3	IS-4	IS-5
WG594523-02	NA	NA	8.42	13.68	6.22	16.07	10.29
Upper Limit	NA	NA	8.92	14.18	6.72	16.57	10.79
Lower Limit	NA	NA	7.92	13.18	5.72	15.57	9.79
<u>L16120352-17</u>	1.00	01	8.42	13.68	6.21	16.07	10.29
L16120352-19	1.00	01	8.42	13.68	6.22	16.06	10.29
L16120352-20	1.00	01	8.42	13.68	6.21	16.07	10.29
L16120352-21	1.00	01	8.41	13.68	6.21	16.06	10.29
L16120352-23	1.00	01	8.42	13.68	6.21	16.06	10.29
L16120352-26	1.00	01	8.42	13.68	6.21	16.06	10.29
WG594260-01	1.00	01	8.42	13.68	6.22	16.07	10.29
WG594260-02	1.00	01	8.42	13.68	6.22	16.07	10.29

- IS-1 - Acenaphthene-d10
- IS-2 - Chrysene-d12
- IS-3 - Naphthalene-d8
- IS-4 - Perylene-d12
- IS-5 - Phenanthrene-d10

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO CCV)

Login Number: L16120352
Instrument ID: HPMS7
Workgroup (AAB#): WG594466

CCV Number: WG594637-02
CAL ID: HPMS7-09-DEC-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3	IS-4	IS-5
WG594637-02	NA	NA	8.42	13.68	6.21	16.07	10.29
Upper Limit	NA	NA	8.92	14.18	6.71	16.57	10.79
Lower Limit	NA	NA	7.92	13.18	5.71	15.57	9.79
<u>L16120352-13</u>	10.0	DL01	8.41	13.68	6.22	16.07	10.29

- IS-1 - Acenaphthene-d10
- IS-2 - Chrysene-d12
- IS-3 - Naphthalene-d8
- IS-4 - Perylene-d12
- IS-5 - Phenanthrene-d10

Underline = Response outside limits



2.3 Metals Data

2.3.1 Metals I C P Data

2.3.1.1 Summary Data



Login Number: L16120352
Department: Metals
Analyst: Kerri Buck

METHOD

Preparation: SW-846 3015

Analysis: SW-846 6010

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Interference Check Standards: All acceptance criteria were met.

Continuing Calibration Verification: WG594313 - Due to low level calibration check failure for manganese on 09-Dec-2016 at 14:59, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for manganese.

WG594316 - Due to low level calibration check failure for manganese on 09-Dec-2016 at 14:59 and 20:13, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for manganese.

WG594644 - Due to low level calibration check failure for iron on 14-Dec-2016 at 12:06, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for iron.

WG594872 - Due to low level calibration check failure for iron on 16-Dec-2016 at 00:44, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for iron. Due to low level calibration check failure for sodium on 16-Dec-2016 at 02:54, client samples 17 and 21 along with the batch QA/QC samples were

reanalyzed on a later calibration which was compliant for sodium. Due to continuing calibration verification failure for iron on 18-DEC-2016 at 18:14, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration for iron.

Continuing Calibration Blank: WG594644 - The continuing calibration blank analyzed on 14-Dec-2016 at 20:05, which bracketed the closing ISCA/ICSAB samples, failed high for sodium. However, all client samples were bracketed by compliant CCBs, therefore, no further action was taken.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Serial Dilution/Post Digestion Spikes: WG594313 - All acceptance criteria were met.

WG594316 - All acceptance criteria were met.

WG594644 - All acceptance criteria were met.

WG594872 - All acceptance criteria were met.

Matrix Spikes: WG594313 - Sample 07 was chosen by the client for MS/MSD analysis. Samples 09(MS) and 11(MSD) yielded a noncompliant recovery for one analyte.

WG594644 - Sample 01 was chosen by the client for MS/MSD analysis. Samples 03(MS) and 05(MSD) yielded a noncompliant recovery for two analytes. Sample 02 was chosen by the client for MS/MSD analysis. Samples 04(MS) and 06(MSD) met all acceptance criteria.

WG594872 - Sample 08 was chosen by the client for MS/MSD analysis. Samples 10(MS) and 12(MSD) met all acceptance criteria.

SAMPLES

Samples: WG594313 - Client sample 13 required dilution analysis in order to obtain a result for sodium within the linear range.

WG594644 - Client samples 01, 03, and 05 required dilution analysis in order to obtain a result for sodium within the linear range.

Narrative ID: 120257
Approved By: Kerri Buck

K: K Buck

Certificate of Analysis

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 18:59
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.185927
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.200		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 13:36
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.133635
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	169		0.500	0.250
Magnesium, Total	7439-95-4	22.9		0.500	0.250
Manganese, Total	7439-96-5	0.0781		0.0100	0.00500
Potassium, Total	7440-09-7	11.4		1.00	0.500
Silica, Calculated as SiO2		41.6		2.14	1.07
Silicon, Total	7440-21-3	19.5		1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/21/2016 18:22
Collect Date: 12/06/2016 10:57	Dilution: 10	File ID: T4.122116.182225
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	909		5.00	2.50
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-02	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 14:14
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.141430
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Manganese, Dissolved	7439-96-5	0.0805		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-02	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 19:03
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.190328
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	0.0754	J	0.100	0.0500
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-03	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 13:40
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.134030
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	5.57		0.200	0.100
Calcium, Total	7440-70-2	172		0.500	0.250
Magnesium, Total	7439-95-4	28.4		0.500	0.250
Manganese, Total	7439-96-5	0.365		0.0100	0.00500
Potassium, Total	7440-09-7	43.0		1.00	0.500
E	Semiquantitative result (out of calibration range)				

Certificate of Analysis

Sample #: L16120352-03	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 19:07
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.190730
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	2.62		0.100	0.0500
E	Semiquantitative result (out of calibration range)				

Sample #: L16120352-03	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/21/2016 18:26
Collect Date: 12/06/2016 10:57	Dilution: 10	File ID: T4.122116.182611
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	930		5.00	2.50

Sample #: L16120352-04	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 19:11
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.191117
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	2.47		0.100	0.0500

Sample #: L16120352-04	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 14:18
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.141824
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5	5.66		0.200	0.100
Manganese, Dissolved	7439-96-5	0.374		0.0100	0.00500

Certificate of Analysis

Sample #: L16120352-05	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 19:15
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.191504
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	2.58		0.100	0.0500
E	Semiquantitative result (out of calibration range)				

Sample #: L16120352-05	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 13:44
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.134417
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	5.60		0.200	0.100
Calcium, Total	7440-70-2	171		0.500	0.250
Magnesium, Total	7439-95-4	28.2		0.500	0.250
Manganese, Total	7439-96-5	0.362		0.0100	0.00500
Potassium, Total	7440-09-7	43.5		1.00	0.500
E	Semiquantitative result (out of calibration range)				

Sample #: L16120352-05	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 08:23
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/21/2016 18:29
Collect Date: 12/06/2016 10:57	Dilution: 10	File ID: T4.122116.182956
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	913		5.00	2.50

Certificate of Analysis

Sample #: L16120352-06	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594644	Analyst: KKB	Run Date: 12/14/2016 14:22
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T4.121416.142211
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5	5.66		0.200	0.100
Manganese, Dissolved	7439-96-5	0.365		0.0100	0.00500

Sample #: L16120352-06	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 08:24
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594644	Analyst: JYH	Run Date: 12/22/2016 19:18
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: T3.122216.191850
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	2.49		0.100	0.0500

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 15:32
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.120916.153203
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	117		0.500	0.250
Iron, Total	7439-89-6	0.781		0.100	0.0500
Magnesium, Total	7439-95-4	13.1		0.500	0.250
Potassium, Total	7440-09-7	4.61		1.00	0.500
Silica, Calculated as SiO2		14.9		2.14	1.07
Silicon, Total	7440-21-3	6.95		1.00	0.500
Sodium, Total	7440-23-5	153		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:19
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121416.161950
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.0919		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-08	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 00:59
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121616.005947
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Manganese, Dissolved	7439-96-5	0.0919		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-08	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 17:35
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T3.122216.173507
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	0.701		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-09	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:23
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121416.162336
Sample Tag: 02	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.385		0.0100	0.00500

Sample #: L16120352-09	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 15:35
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.120916.153547
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	5.97		0.200	0.100
Calcium, Total	7440-70-2	124		0.500	0.250
Iron, Total	7439-89-6	3.21		0.100	0.0500
Magnesium, Total	7439-95-4	19.3		0.500	0.250
Potassium, Total	7440-09-7	34.5		1.00	0.500
Sodium, Total	7440-23-5	182		0.500	0.250

Sample #: L16120352-10	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/12/2016 12:09
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 17:38
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T3.122216.173859
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	3.13		0.100	0.0500

Sample #: L16120352-10	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/12/2016 12:09
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:03
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121616.010332
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5	5.88		0.200	0.100
Manganese, Dissolved	7439-96-5	0.392		0.0100	0.00500

Certificate of Analysis

Sample #: L16120352-11	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:27
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121416.162712
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.379		0.0100	0.00500

Sample #: L16120352-11	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 15:50
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.120916.155033
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	5.85		0.200	0.100
Calcium, Total	7440-70-2	126		0.500	0.250
Iron, Total	7439-89-6	3.17		0.100	0.0500
Magnesium, Total	7439-95-4	19.2		0.500	0.250
Potassium, Total	7440-09-7	33.7		1.00	0.500
Sodium, Total	7440-23-5	183		0.500	0.250

Sample #: L16120352-12	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/12/2016 12:09
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:07
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121616.010707
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5	5.90		0.200	0.100
Manganese, Dissolved	7439-96-5	0.388		0.0100	0.00500

Certificate of Analysis

Sample #: L16120352-12	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/12/2016 12:09
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 17:42
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T3.122216.174238
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	2.99		0.100	0.0500

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 16:35
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: T4.120916.163529
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	319		0.500	0.250
Iron, Total	7439-89-6	7.02		0.100	0.0500
Magnesium, Total	7439-95-4	96.4		0.500	0.250
Potassium, Total	7440-09-7	10.9		1.00	0.500
E	Semiquantitative result (out of calibration range)				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:30
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: T4.121416.163047
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.735		0.0100	0.00500
E	Semiquantitative result (out of calibration range)				
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 17:21
Collect Date: 12/06/2016 14:00	Dilution: 5	File ID: T4.120916.172140
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	732		2.50	1.25
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-14	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 16:39
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: T4.120916.163921
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Iron, Dissolved	7439-89-6	6.64		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-14	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:34
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: T4.121416.163440
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Dissolved	7439-96-5	0.700		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/09/2016 16:43
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: T4.120916.164314
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	98.6		0.500	0.250
Iron, Total	7439-89-6	2.55		0.100	0.0500
Magnesium, Total	7439-95-4	12.0		0.500	0.250
Potassium, Total	7440-09-7	4.79		1.00	0.500
Silica, Calculated as SiO2		10.9		2.14	1.07
Silicon, Total	7440-21-3	5.07		1.00	0.500
Sodium, Total	7440-23-5	244		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:22
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594313	Analyst: KKB	Run Date: 12/14/2016 16:46
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: T4.121416.164606
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.155		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-16	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:10
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: T4.121616.011045
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Manganese, Dissolved	7439-96-5	0.156		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-16	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 17:46
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: T3.122216.174617
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	2.27		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW16I-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 17:50
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: T3.122216.175009
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	6.86		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW16I-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:14
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: T4.121616.011431
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	118		0.500	0.250
Magnesium, Total	7439-95-4	22.3		0.500	0.250
Manganese, Total	7439-96-5	0.227		0.0100	0.00500
Potassium, Total	7440-09-7	6.01		1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW16I-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/18/2016 11:25
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/18/2016 18:51
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: T4.121816.185156
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	75.7		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-18	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW16I-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 18:01
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: T3.122216.180132
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	6.26		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-18	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW16I-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:18
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: T4.121616.011817
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Manganese, Dissolved	7439-96-5	0.219		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/15/2016 18:27
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/16/2016 01:36
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: T4.121616.013650
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	81.4		0.500	0.250
Magnesium, Total	7439-95-4	16.1		0.500	0.250
Manganese, Total	7439-96-5	0.152		0.0100	0.00500
Potassium, Total	7440-09-7	4.31		1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594872	Analyst: JYH	Run Date: 12/22/2016 18:12
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: T3.122216.181258
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	1.49		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/12/2016 12:12
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/18/2016 11:25
Workgroup #: WG594872	Analyst: KKB	Run Date: 12/18/2016 18:59
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: T4.121816.185927
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	68.8		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-22	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/14/2016 17:12
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: T4.121416.171220
Sample Tag: 03	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Dissolved	7439-96-5	0.143		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-22	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/09/2016 20:36
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: T4.120916.203616
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Iron, Dissolved	7439-89-6	1.50		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/09/2016 20:40
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.120916.204002
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	177		0.500	0.250
Iron, Total	7439-89-6	2.56		0.100	0.0500
Magnesium, Total	7439-95-4	34.0		0.500	0.250
Potassium, Total	7440-09-7	8.56		1.00	0.500
Sodium, Total	7440-23-5	73.5		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/14/2016 17:16
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121416.171605
Sample Tag: 03	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.548		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-24	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/14/2016 17:19
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.121416.171951
Sample Tag: 03	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Dissolved	7439-96-5	0.566		0.0100	0.00500

Certificate of Analysis

U	Not detected at or above adjusted sample detection limit.
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Sample #: L16120352-24	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/09/2016 20:43
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: T4.120916.204348
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5		U	0.200	0.100
Iron, Dissolved	7439-89-6	2.33		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-26	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/14/2016 17:23
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: T4.121416.172337
Sample Tag: 03	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Total	7439-96-5	0.556		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-26	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/09/2016 20:47
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: T4.120916.204735
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2	179		0.500	0.250
Iron, Total	7439-89-6	2.12		0.100	0.0500
Magnesium, Total	7439-95-4	34.5		0.500	0.250
Potassium, Total	7440-09-7	8.56		1.00	0.500
Sodium, Total	7440-23-5	74.0		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120352-27	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/09/2016 12:53
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/09/2016 21:06
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: T4.120916.210606
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Dissolved	7429-90-5	0.219		0.200	0.100
Iron, Dissolved	7439-89-6	2.75		0.100	0.0500

Sample #: L16120352-27	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:57
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/14/2016 11:46
Workgroup #: WG594316	Analyst: KKB	Run Date: 12/14/2016 17:27
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: T4.121416.172722
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Manganese, Dissolved	7439-96-5	0.551		0.0100	0.00500

2.3.1.2 QC Summary Data

Example 6010 Calculations
Thermo Scientific iCAP

1.0 Initial Calibration (ICAL) Parameters

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

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

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

Where:

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

Vf = Final volume (mL)

Vi = Initial volume (mL)

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

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

Example:

0.1

50

50

1

0.1

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

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

Where:

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

Vf = Final volume (mL)

Vi = Initial weight (g)

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

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

Example:

0.1

50

1

1

5

4.0 Adjusting the concentration to dry weight:

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

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

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

Example:

5

80

6.25

Example 6010 Calculations
Thermo Scientific iCAP

1.0 Initial Calibration (ICAL) Parameters

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

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

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

Where:

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

Vf = Final volume (mL)

Vi = Initial volume (mL)

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

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

Example:

0.1

50

50

1

0.1

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

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

Where:

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

Vf = Final volume (mL)

Vi = Initial weight (g)

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

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

Example:

0.1

50

1

1

5

4.0 Adjusting the concentration to dry weight:

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

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

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

Example:

5

80

6.25

Microbac Laboratories Inc.
Microwave Digestion Log

Workgroup: WG594498
Analyst: AC
Spike Analyst: AC
Run Date: 12/12/2016 12:12
Method: 3015
Balance: BAL019
Instrument: MW-4
Instrument Start: 12/12/2016 12:12

SOP: ME407 Revision 19
Spike Solution: STD79117
Spike Witness: VC
HNO3 Lot #: COA19324
HCL Lot #: COA19265
ICP FILTERS LOT# R6EA4780RGT38286
40 & 50 ML. DIGESTION TU COA19282

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG594498-02	BLANK	1	40 mL	50 mL	207.043 g	207.037 g	
2	WG594498-03	LCS	1	40 mL	50 mL	212.43 g	212.419 g	5 mL
3	WG594498-01	REF	1	40 mL	50 mL	206.783 g	206.773 g	
4	L16120352-08	RS04	1	40 mL	50 mL	206.783 g	206.773 g	12/21/16
5	WG594498-04	MS	1	40 mL	50 mL	209.834 g	209.809 g	5 mL
6	L16120352-10	MS04	1	40 mL	50 mL	209.834 g	209.809 g	5 mL 12/21/16
7	WG594498-05	MSD	1	40 mL	50 mL	212.321 g	212.304 g	5 mL
8	L16120352-12	SD04	1	40 mL	50 mL	212.321 g	212.304 g	5 mL 12/21/16
9	L16120352-16	SAMP	1	40 mL	50 mL	206.484 g	206.471 g	12/21/16
10	L16120352-17	RS05	1	40 mL	50 mL	205.373 g	205.354 g	12/21/16
11	L16120352-18	SAMP	1	40 mL	50 mL	204.271 g	204.229 g	12/21/16
12	L16120352-21	SAMP	1	40 mL	50 mL	205.848 g	205.824 g	12/21/16
13	L16120425-21	SAMP	1	40 mL	50 mL	206.564 g	206.544 g	12/22/16
14	L16120425-22	SAMP	1	40 mL	50 mL	206.897 g	206.865 g	12/22/16
15	L16120425-23	SAMP	1	40 mL	50 mL	204.511 g	204.473 g	12/22/16
16	L16120425-24	SAMP	1	40 mL	50 mL	206.279 g	206.235 g	12/22/16
17	L16120484-01	SAMP	1	40 mL	50 mL	210.877 g	210.855 g	12/19/16
18	L16120484-02	SAMP	1	40 mL	50 mL	207.617 g	207.6 g	12/19/16
19	L16120484-03	SAMP	1	40 mL	50 mL	212.119 g	212.086 g	12/19/16
20	L16120484-04	SAMP	1	40 mL	50 mL	210.968 g	210.933 g	12/19/16
21	L16120484-05	SAMP	1	40 mL	50 mL	208.957 g	208.924 g	12/19/16
22	L16120484-09	SAMP	1	40 mL	50 mL	212.154 g	212.122 g	12/19/16
23	L16120484-10	SAMP	1	40 mL	50 mL	212.585 g	212.51 g	12/19/16
24	L16120484-11	SAMP	1	40 mL	50 mL	210.342 g	210.3 g	12/19/16
25	L16120568-01	SAMP	1	40 mL	50 mL	207.548 g	207.463 g	12/23/16
26	L16120591-01	SAMP	1	40 mL	50 mL	205.323 g	205.238 g	12/16/16
27	L16120591-02	SAMP	1	40 mL	50 mL	206.073 g	205.997 g	12/16/16

L16120484-01	Filtered Digestate
L16120484-02	Filtered Digestate
L16120484-03	Filtered Digestate
L16120484-04	Filtered Digestate
L16120484-05	Filtered Digestate
L16120484-09	Filtered Digestate
L16120484-10	Filtered Digestate
L16120484-11	Filtered Digestate

MW_DIG - Modified 09/30/2009
PDF ID: 5059061
Report generated: 12/12/2016 14:20



Microbac Laboratories Inc.
Microwave Digestion Log

L16120591-01	Filtered Digestate	SOP:
L16120591-02	Filtered Digestate	Spike Solution:
		Spike Witness:

Analyst: M. Amber R. Cochran
Balance: _____
Instrument: _____

Reviewer: [Signature]

Instrument Start:



TCLP Non-Volatile

Analyst(s): BNB
 Date: 12-7-16
 Filter Lot #: 9486030
 Microbac SOP: TCLP01 Rev #: 12

Balance ID: BAL020
 pH Probe ID: T3
 Temp probe ID: 1025 1023

Analyst / Date		Analyst / Date	
Time	Temp	Time	Temp
On	On °C	Off	Off °C
15:59	22.4	8:01	22.9

Agitator Speed 30 ± 2 rpm

Jug #	Sample #	Tests	Method	Fluid #	Matrix *	% Solid	Pretest pH		Int. Wt. (g)	Fluid Vol. (mL)	Final extract pH
							Initial	Final			
D	12-0353-01	Me	1311	F-199	S	100	8.62	2.24	25.28	505	6.19
NA	FB1K-1	Mu	L	L	NA	NA	NA	NA	100	900	4.94
<p style="font-size: 2em; opacity: 0.5;">BNB 12-8-16</p>											

*Matrix Code: (S = solid, sand, soil or sludge) (P = paint) (O = organic) (W = water or aqueous waste)
 D = Disposable plastic jug
 TCLP Pretest weight will be 5.0 g (± 0.1) unless otherwise noted.
 Temperature shall be maintained at 23° ± 2 for 18 ± 2 hours unless otherwise noted.

Comments: NA

Peer Review By: Chick Davis

Microbac Laboratories Inc.
Microwave Digestion Log

Workgroup: WG594037
Analyst: ERP
Spike Analyst: ERP
Run Date: 12/08/2016 08:24
Method: 3015
Balance: BAL019
Instrument: MW-1
Instrument Start: 12/08/2016 08:43

SOP: ME407 Revison 19
Spike Solution: STD79117
Spike Witness: VC
HNO3 Lot #: COA19297
HCL Lot #: COA19265
40 & 50 ML. DIGESTION TU
ICP FILTERS LOT#R6EA4780RGT38286

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG594037-03	BLANK	1	40 mL	50 mL	204.12 g	204.107 g	
2	WG594037-04	LCS	1	40 mL	50 mL	211.249 g	211.232 g	5 mL
3	L16120317-01	SAMP	1	40 mL	50 mL	206.101 g	206.087 g	12/14/16
4	L16120317-02	SAMP	1	40 mL	50 mL	205.329 g	205.318 g	12/14/16
5	L16120317-03	SAMP	1	40 mL	50 mL	206.259 g	206.244 g	12/14/16
6	L16120321-01	SAMP	1	40 mL	50 mL	206.703 g	206.684 g	12/14/16
7	L16120321-02	SAMP	1	40 mL	50 mL	206.872 g	206.846 g	12/14/16
8	L16120323-01	SAMP	1	40 mL	50 mL	205.12 g	205.109 g	12/14/16
9	L16120323-02	SAMP	1	40 mL	50 mL	206.301 g	206.278 g	12/14/16
10	L16120342-02	SAMP	1	40 mL	50 mL	206.213 g	206.188 g	12/16/16
11	L16120342-03	SAMP	1	40 mL	50 mL	205.885 g	205.871 g	12/16/16
12	L16120342-04	SAMP	1	40 mL	50 mL	207.481 g	207.476 g	12/16/16
13	WG594037-01	REF	1	40 mL	50 mL	207.15 g	207.138 g	
14	L16120352-01	RS01	1	40 mL	50 mL	207.15 g	207.138 g	12/21/16
15	WG594037-02	REF	1	40 mL	50 mL	207.396 g	207.38 g	
16	L16120352-02	RS02	1	40 mL	50 mL	207.396 g	207.38 g	12/21/16
17	WG594037-05	MS	1	40 mL	50 mL	212.109 g	212.094 g	5 mL
18	L16120352-03	MS01	1	40 mL	50 mL	212.109 g	212.094 g	5 mL
19	WG594037-07	MS	1	40 mL	50 mL	209.893 g	209.877 g	5 mL
20	L16120352-04	MS02	1	40 mL	50 mL	209.893 g	209.877 g	5 mL
21	WG594037-06	MSD	1	40 mL	50 mL	211.251 g	211.248 g	5 mL
22	L16120352-05	SD01	1	40 mL	50 mL	211.251 g	211.248 g	5 mL
23	WG594037-08	MSD	1	40 mL	50 mL	210.262 g	210.249 g	5 mL
24	L16120352-06	SD02	1	40 mL	50 mL	210.262 g	210.249 g	5 mL
25	L16120360-01	SAMP	1	40 mL	50 mL	204.251 g	204.242 g	12/14/16
26	L16120360-02	SAMP	1	40 mL	50 mL	204.752 g	204.749 g	12/14/16
27	L16120360-03	SAMP	1	40 mL	50 mL	205.512 g	205.501 g	12/14/16
28	L16120360-04	SAMP	1	40 mL	50 mL	206.967 g	206.975 g	12/14/16
29	L16120360-05	SAMP	1	40 mL	50 mL	205.535 g	205.53 g	12/14/16
30	L16120360-06	SAMP	1	40 mL	50 mL	206.484 g	206.473 g	12/14/16

Analyst: Eun Pstun

Reviewer: Vicki Collier



Microbac Laboratories Inc.
Microwave Digestion Log

Workgroup: WG594106
Analyst: ERP
Spike Analyst: ERP
Run Date: 12/08/2016 11:22
Method: 3015
Balance: BAL019
Instrument: MW-1
Instrument Start: 12/08/2016 11:42

SOP: ME407 Revision 19
Spike Solution: STD79117
Spike Witness: VC
HNO3 Lot #: COA19297
HCL Lot #: COA19265
40 & 50 ML. DIGESTION TUCOA19282
ICP FILTERS LOT#R6EA4780RGT38286

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG594106-02	BLANK	1	40 mL	50 mL	204.287 g	204.257 g	
2	WG593987-01	FBLK1	17	5 mL	50 mL	206.346 g	206.324 g	
3	WG594106-03	LCS	1	40 mL	50 mL	211.96 g	211.943 g	5 mL
4	L16120339-02	SAMP	1	40 mL	1 mL	205.96 g	205.94 g	12/14/16
5	L16120339-04	SAMP	1	40 mL	1 mL	207.051 g	207.014 g	12/14/16
6	L16120339-06	SAMP	1	40 mL	1 mL	206.717 g	206.694 g	12/14/16
7	WG594106-01	REF	1	40 mL	50 mL	205.687 g	205.674 g	
8	L16120352-07	RS03	1	40 mL	50 mL	205.687 g	205.674 g	12/21/16
9	WG594106-04	MS	1	40 mL	50 mL	210.345 g	210.322 g	5 mL
10	L16120352-09	MS03	1	40 mL	50 mL	210.345 g	210.322 g	5 mL
11	WG594106-05	MSD	1	40 mL	50 mL	211.608 g	211.598 g	5 mL
12	L16120352-11	SD03	1	40 mL	50 mL	211.608 g	211.598 g	5 mL
13	L16120352-13	SAMP	1	40 mL	50 mL	208.725 g	208.713 g	12/21/16
14	L16120352-14	SAMP	1	40 mL	50 mL	206.78 g	206.764 g	12/21/16
15	L16120352-15	SAMP	1	40 mL	50 mL	207.41 g	207.399 g	12/21/16
16	L16120353-01	SAMP	17	5 mL	50 mL	205.365 g	205.361 g	12/12/16
17	L16120385-01	SAMP	1	40 mL	50 mL	204.334 g	204.327 g	12/15/16
18	L16120385-02	SAMP	1	40 mL	50 mL	206.472 g	206.465 g	12/15/16
19	L16120386-01	SAMP	1	40 mL	50 mL	206.38 g	206.377 g	12/15/16
20	L16120386-02	SAMP	1	40 mL	50 mL	206.686 g	206.684 g	12/15/16
21	L16120386-03	SAMP	1	40 mL	50 mL	207.238 g	207.234 g	12/15/16
22	L16120387-01	SAMP	1	40 mL	50 mL	205.899 g	205.899 g	12/15/16
23	L16120388-01	SAMP	1	40 mL	50 mL	206.651 g	206.646 g	12/15/16
24	L16120412-01	SAMP	12	1 mL	50 mL	204.883 g	204.119 g	12/09/16
25	L16120412-02	SAMP	12	1 mL	50 mL	208.171 g	207.585 g	12/09/16
26	L16120412-03	SAMP	12	1 mL	50 mL	205.412 g	204.967 g	12/09/16
27	L16120412-04	SAMP	12	1 mL	50 mL	205.332 g	204.735 g	12/09/16

L16120339-04	filtered digestate
L16120412-01	expect <600ppm
L16120412-02	expect <250ppm
L16120412-03	expect <100ppm
L16120412-04	expect <100ppm

Analyst: Evan Potten

Reviewer: Verde Collier



TCLP Non-Volatile

Analyst(s): BUB
 Date: 12-8-16
 Filter Lot #: 9486030
 Microbac SOP: TCLP01 Rev #: 12

Balance ID: BAL020
 pH Probe ID: T3
 Temp probe ID: 1025 1023

Analyst / Date		Analyst / Date	
<u>BUB</u>	<u>12-8-16</u>	<u>CPD</u>	<u>12-9-16</u>
Time On	Temp On °C	Time Off	Temp Off °C
<u>14:53</u>	<u>22.5</u>	<u>0822</u>	<u>22.8</u>

Agitator Speed 30 ± 2 rpm

Jug #	Sample #	Tests	Method	Fluid #	Matrix *	% Solid	Pretest pH		Int. Wt. (g)	Fluid Vol. (mL)	Final extract pH
							Initial	Final			
D	12-0316-02	Mo	1311	F-199	S	100	6.29	1.90	25.16	503	4.96
D	12-0376-01	Mo	L	F-387	L	L	12.62	12.46	25.24	504	6.85
NA	FBIK-1	Mo	1311	F-199	NA	NA	NA	NA	100	100	4.97
NA	FBIK-2	Mo	L	F-387	L	L	L	L	L	L	2.92
33	12-0316-02	SV, Pest, Herb	1311	F-199	S	100	6.29	1.90	50.48	1009	4.94
<div style="border: 1px solid black; width: 100%; height: 100%; transform: rotate(45deg); position: relative;"> CPD 12-9-16 </div>											

*Matrix Code: (S = solid, sand, soil or sludge) (P = paint) (O = organic) (W = water or aqueous waste)
 D = Disposable plastic jug
 TCLP Pretest weight will be 5.0 g (± 0.1) unless otherwise noted.
 Temperature shall be maintained at $23^\circ \pm 2$ for 18 ± 2 hours unless otherwise noted.

Comments: NA

Peer Review By: Cherick Davis

Microbac Laboratories Inc.
Microwave Digestion Log

Workgroup: WG594234
 Analyst: ERP
 Spike Analyst: ERP
 Run Date: 12/09/2016 08:57
 Method: 3015
 Balance: BAL019
 Instrument: MW-1
 Instrument Start: 12/09/2016 09:16

SOP: ME407 Revision 19
 Spike Solution: STD79117
 Spike Witness: VC
 HNO3 Lot #: COA19297
 HCL Lot #: COA19265
 40 & 50 ML. DIGESTION TUCOA19282
 ICP FILTERS LOT#R6EA4780RGT38286

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG594234-02	BLANK	1	40 mL	50 mL	205.054 g	205.055 g	
2	WG594044-01	FBLK1	17	5 mL	50 mL	205.783 g	205.764 g	
3	WG594044-02	FBLK2	17	5 mL	50 mL	204.468 g	204.453 g	
4	WG594234-03	LCS	1	40 mL	50 mL	210.325 g	210.287 g	5 mL
5	L16120352-22	SAMP	1	40 mL	50 mL	208.092 g	208.056 g	12/21/16
6	L16120352-23	SAMP	1	40 mL	50 mL	207.103 g	207.066 g	12/21/16
7	L16120352-24	SAMP	1	40 mL	50 mL	203.846 g	203.817 g	12/21/16
8	L16120352-26	SAMP	1	40 mL	50 mL	206.799 g	206.785 g	12/21/16
9	L16120352-27	SAMP	1	40 mL	50 mL	205.34 g	205.324 g	12/21/16
10	L16120366-02	SAMP	17	5 mL	50 mL	206.042 g	206.015 g	12/14/16
11	L16120376-01	SAMP	17	5 mL	50 mL	205.757 g	205.736 g	12/14/16
12	L16120424-02	SAMP	1	40 mL	50 mL	205.861 g	205.841 g	12/19/16
13	WG594234-01	REF	1	40 mL	50 mL	207.698 g	207.687 g	
14	L16120424-03	RS01	1	40 mL	50 mL	207.698 g	207.687 g	12/19/16
15	WG594234-04	MS	1	40 mL	50 mL	212.06 g	212.036 g	5 mL
16	L16120424-04	MS01	1	40 mL	50 mL	212.06 g	212.036 g	5 mL
17	WG594234-05	MSD	1	40 mL	50 mL	209.89 g	209.872 g	5 mL
18	L16120424-05	SD01	1	40 mL	50 mL	209.89 g	209.872 g	5 mL
19	L16120424-06	SAMP	1	40 mL	50 mL	206.438 g	206.431 g	12/19/16
20	L16120424-07	SAMP	1	40 mL	50 mL	204.166 g	204.159 g	12/19/16
21	L16120454-01	SAMP	1	40 mL	50 mL	208.477 g	208.465 g	12/13/16
22	L16120454-02	SAMP	1	40 mL	50 mL	207.01 g	207.001 g	12/13/16
23	L16120454-03	SAMP	1	40 mL	50 mL	205.832 g	205.826 g	12/13/16
24	L16120454-04	SAMP	1	40 mL	50 mL	208.714 g	208.705 g	12/13/16
25	L16120454-05	SAMP	1	40 mL	50 mL	207.719 g	207.716 g	12/13/16
26	L16120454-06	SAMP	1	40 mL	50 mL	208.066 g	208.064 g	12/13/16
27	L16120646-01	SAMP	1	40 mL	50 mL	206.153 g	206.133 g	12/19/16

Analyst: Evan Potten

Reviewer: Verde Collier



Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 120916T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD78273 ICSAB: STD78274 Int. Std: RG737691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 593600,594313,594314,593662,594316

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.120916.123834	WG594361-01	Calibration Point		1		12/09/16 12:38
2	T4.120916.124222	WG594361-02	Calibration Point		1		12/09/16 12:42
3	T4.120916.124611	WG594361-03	Calibration Point		1		12/09/16 12:46
4	T4.120916.125001	WG594361-04	Calibration Point		1		12/09/16 12:50
5	T4.120916.125332	WG594361-05	Calibration Point		1		12/09/16 12:53
6	T4.120916.125701	WG594361-06	Initial Calibration Verification		1		12/09/16 12:57
7	T4.120916.130231	WG594361-07	Initial Calib Blank		1		12/09/16 13:02
8	T4.120916.130620	WG594361-08	Low Level Initial Calibration V		1		12/09/16 13:06
9	T4.120916.132630	WG594361-09	Low Level Initial Calibration V		1		12/09/16 13:26
10	T4.120916.133056	WG594361-10	Interference Check		1		12/09/16 13:30
11	T4.120916.133451	WG594361-11	Interference Check		1		12/09/16 13:34
12	T4.120916.133834	WG594361-12	CCV		1		12/09/16 13:38
13	T4.120916.134205	WG594361-13	CCB		1		12/09/16 13:42
14	T4.120916.141126	WG593193-02	Method/Prep Blank	40/50	1		12/09/16 14:11
15	T4.120916.141515	WG593193-03	Laboratory Control S	40/50	1		12/09/16 14:15
16	T4.120916.141851	L16111248-01	LH18/24-SP650-6412-GRAB	40/50	1		12/09/16 14:18
17	T4.120916.142243	WG593600-03	Post Digestion Spike		1	L16111248-01	12/09/16 14:22
18	T4.120916.142627	WG593600-04	Serial Dilution		5	L16111248-01	12/09/16 14:26
19	T4.120916.143013	L16111248-02	LH18/24-SP650-6412-COMP	40/50	1		12/09/16 14:30
20	T4.120916.143407	WG593193-01	Reference Sample		1	L16111283-01	12/09/16 14:34
21	T4.120916.143751	WG593193-04	Matrix Spike	40/50	1	L16111283-01	12/09/16 14:37
22	T4.120916.144126	WG593193-05	Matrix Spike Duplica	40/50	1	L16111283-01	12/09/16 14:41
23	T4.120916.144501	WG594361-14	CCV		1		12/09/16 14:45
24	T4.120916.144834	WG594361-15	CCB		1		12/09/16 14:48
25	T4.120916.145935	WG594361-16	Low Level Continuing Calibra		1		12/09/16 14:59
26	T4.120916.151134	WG594361-18	LLCCV		1		12/09/16 15:11
27	T4.120916.151627	WG594361-50	LLCCV		1		12/09/16 15:16
28	T4.120916.152050	WG594106-02	Method/Prep Blank	40/50	1		12/09/16 15:20
29	T4.120916.152438	WG594106-03	Laboratory Control S	40/50	1		12/09/16 15:24
30	T4.120916.152814	WG593987-01	Fluid Blank 1		1		12/09/16 15:28
31	T4.120916.153203	WG594106-01	Reference Sample		1	L16120352-07	12/09/16 15:32
32	T4.120916.153547	WG594106-04	Matrix Spike	40/50	1	L16120352-07	12/09/16 15:35
33	T4.120916.153925	L16120386-03	45-11-10.01 W1	40/50	1		12/09/16 15:39
34	T4.120916.154310	WG594313-01	Post Digestion Spike		1	L16120386-03	12/09/16 15:43

Page: 1 Approved: December 13, 2016

K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 120916T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD78273 ICSAB: STD78274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 593600,594313,594314,593662,594316

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.120916.154646	WG594313-02	Serial Dilution		5	L16120386-03	12/09/16 15:46
36	T4.120916.155033	WG594106-05	Matrix Spike Duplica	40/50	1	L16120352-07	12/09/16 15:50
37	T4.120916.155410	WG594361-19	CCV		1		12/09/16 15:54
38	T4.120916.155742	WG594361-20	CCB		1		12/09/16 15:57
39	T4.120916.160133	L16120412-01	553-2A	1/50	1		12/09/16 16:01
40	T4.120916.160520	L16120412-02	553-3A	1/50	1		12/09/16 16:05
41	T4.120916.160908	L16120412-03	548-64-8	1/50	1		12/09/16 16:09
42	T4.120916.161257	L16120412-04	LOT \#64040236W	1/50	1		12/09/16 16:12
43	T4.120916.161647	WG594361-21	CCV		1		12/09/16 16:16
44	T4.120916.162017	WG594361-22	CCB		1		12/09/16 16:20
45	T4.120916.162408	L16120339-02	PERMEATE	40/1	1		12/09/16 16:24
46	T4.120916.162756	L16120339-04	BLEED	40/1	1		12/09/16 16:27
47	T4.120916.163139	L16120339-06	N. DOCK FLUME	40/1	1		12/09/16 16:31
48	T4.120916.163529	L16120352-13	MW09R-120616	40/50	1		12/09/16 16:35
49	T4.120916.163921	L16120352-14	MW09R-120616	40/50	1		12/09/16 16:39
50	T4.120916.164314	L16120352-15	MW01-120616	40/50	1		12/09/16 16:43
51	T4.120916.164659	L16120353-01	SAMPLE NO. 1	5/50	1		12/09/16 16:46
52	T4.120916.165046	WG594361-23	CCV		1		12/09/16 16:50
53	T4.120916.165418	WG594361-24	CCB		1		12/09/16 16:54
54	T4.120916.165808	L16120385-01	27-2-5 W1	40/50	1		12/09/16 16:58
55	T4.120916.170154	L16120385-02	27-2-5 W1	40/50	1		12/09/16 17:01
56	T4.120916.170540	L16120386-01	45-11-12.01 W1	40/50	1		12/09/16 17:05
57	T4.120916.170925	L16120386-02	45-11-10.01 S1	40/50	1		12/09/16 17:09
58	T4.120916.171312	L16120387-01	1802-136 S10	40/50	1		12/09/16 17:13
59	T4.120916.171658	L16120388-01	15-13-13 P1	40/50	1		12/09/16 17:16
60	T4.120916.172140	L16120352-13	MW09R-120616	40/50	5		12/09/16 17:21
61	T4.120916.175144	WG594361-25	CCV		1		12/09/16 17:51
62	T4.120916.175516	WG594361-26	CCB		1		12/09/16 17:55
63	T4.120916.175908	WG594361-27	Low Level Continuing Calibra		1		12/09/16 17:59
64	T4.120916.180255	WG594361-28	Low Level Continuing Calibra		1		12/09/16 18:02
65	T4.120916.180816	WG593907-02	Method/Prep Blank	40/50	1		12/09/16 18:08
66	T4.120916.181203	WG593907-03	Laboratory Control S	40/50	1		12/09/16 18:12
67	T4.120916.181539	WG593718-01	Fluid Blank 1		1		12/09/16 18:15
68	T4.120916.181928	WG593718-02	Fluid Blank 2		1		12/09/16 18:19

Page: 2 Approved: December 13, 2016

K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 120916T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD78273 ICSAB: STD78274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 593600,594313,594314,593662,594316

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.120916.182315	L16120200-01	T6L0349-01	5/50	1		12/09/16 18:23
70	T4.120916.182700	L16120201-01	FRN SALTCAKE	5/50	1		12/09/16 18:27
71	T4.120916.183056	L16120201-02	FRN FURNACE BAGHOUSE	5/50	1		12/09/16 18:30
72	T4.120916.183443	L16120201-03	FRN MILL FINES (SCREW 1	5/50	1		12/09/16 18:34
73	T4.120916.183834	WG594314-01	Post Digestion Spike		1	L16120201-03	12/09/16 18:38
74	T4.120916.184218	WG594314-02	Serial Dilution		5	L16120201-03	12/09/16 18:42
75	T4.120916.184606	WG594361-29	CCV		1		12/09/16 18:46
76	T4.120916.184938	WG594361-30	CCB		1		12/09/16 18:49
77	T4.120916.185329	L16120201-04	FRN MILL FINES (SCREW 8	5/50	1		12/09/16 18:53
78	T4.120916.185722	L16120203-01	J6L0266-01	5/50	1		12/09/16 18:57
79	T4.120916.190106	L16120231-01	2016PRE-91 SOUTH ST	40/50	1		12/09/16 19:01
80	T4.120916.190451	L16120236-01	W5A-GW-120216	40/50	1		12/09/16 19:04
81	T4.120916.190834	L16120249-01	27-11-3.01 RW1 (T)	40/50	1		12/09/16 19:08
82	T4.120916.191219	L16120249-02	27-11-3.01 RW1 (U)	40/50	1		12/09/16 19:12
83	T4.120916.191605	L16120249-03	27-5-8.03 RW1 (T)	40/50	1		12/09/16 19:16
84	T4.120916.191951	L16120267-02	A09-MW10-Y1S4	40/50	1		12/09/16 19:19
85	T4.120916.192338	L16120267-03	A09-MW11-Y1S4	40/50	1		12/09/16 19:23
86	T4.120916.192724	L16120267-04	A09-MW12-Y1S4	40/50	1		12/09/16 19:27
87	T4.120916.193111	WG594361-31	CCV		1		12/09/16 19:31
88	T4.120916.193442	WG594361-32	CCB		1		12/09/16 19:34
89	T4.120916.193832	L16120275-01	LH18/24-SP140-7414-GRAB	40/50	1		12/09/16 19:38
90	T4.120916.194225	L16120315-03	TCF-EB01-120516	40/50	1		12/09/16 19:42
91	T4.120916.194613	WG593907-01	Reference Sample		1	L16120315-04	12/09/16 19:46
92	T4.120916.195032	WG593907-04	Matrix Spike	40/50	1	L16120315-04	12/09/16 19:50
93	T4.120916.195443	WG593907-05	Matrix Spike Duplica	40/50	1	L16120315-04	12/09/16 19:54
94	T4.120916.195852	L16120322-01	0101-0138 S3	40/50	1		12/09/16 19:58
95	T4.120916.200238	L16120143-03	T1363	40/50	5		12/09/16 20:02
96	T4.120916.200618	WG594361-33	CCV		1		12/09/16 20:06
97	T4.120916.200950	WG594361-34	CCB		1		12/09/16 20:09
98	T4.120916.201339	WG594361-35	Low Level Continuing Calibra		1		12/09/16 20:13
99	T4.120916.201727	WG594361-36	Low Level Continuing Calibra		1		12/09/16 20:17
100	T4.120916.202113	WG594234-02	Method/Prep Blank	40/50	1		12/09/16 20:21
101	T4.120916.202501	WG594234-03	Laboratory Control S	40/50	1		12/09/16 20:25
102	T4.120916.202837	WG594044-01	Fluid Blank 1		1		12/09/16 20:28

Page: 3 Approved: December 13, 2016

K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 120916T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD78273 ICSAB: STD78274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 593600,594313,594314,593662,594316

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T4.120916.203226	WG594044-02	Fluid Blank 2		1		12/09/16 20:32
104	T4.120916.203616	L16120352-22	MW26-120616	40/50	1		12/09/16 20:36
105	T4.120916.204002	L16120352-23	MW17-120616	40/50	1		12/09/16 20:40
106	T4.120916.204348	L16120352-24	MW17-120616	40/50	1		12/09/16 20:43
107	T4.120916.204735	L16120352-26	DUP-GW-120616	40/50	1		12/09/16 20:47
108	T4.120916.205121	WG594316-01	Post Digestion Spike		1	L16120352-26	12/09/16 20:51
109	T4.120916.205458	WG594316-02	Serial Dilution		5	L16120352-26	12/09/16 20:54
110	T4.120916.205845	WG594361-37	CCV		1		12/09/16 20:58
111	T4.120916.210217	WG594361-38	CCB		1		12/09/16 21:02
112	T4.120916.210606	L16120352-27	DUP-GW-120616	40/50	1		12/09/16 21:06
113	T4.120916.210952	L16120366-02	J6L0288-01	5/50	1		12/09/16 21:09
114	T4.120916.211340	L16120376-01	T6L0483-01	5/50	1		12/09/16 21:13
115	T4.120916.211727	L16120424-02	A08-MW02-Y1S4	40/50	1		12/09/16 21:17
116	T4.120916.212113	WG594234-01	Reference Sample		1	L16120424-03	12/09/16 21:21
117	T4.120916.212459	WG594234-04	Matrix Spike	40/50	1	L16120424-03	12/09/16 21:24
118	T4.120916.212835	WG594234-05	Matrix Spike Duplica	40/50	1	L16120424-03	12/09/16 21:28
119	T4.120916.213211	L16120424-06	A08-MW06-Y1S4	40/50	1		12/09/16 21:32
120	T4.120916.213556	L16120424-07	A08-TM03-Y1S4	40/50	1		12/09/16 21:35
121	T4.120916.213941	L16120454-01	T6L0596-01	40/50	1		12/09/16 21:39
122	T4.120916.214328	WG594361-39	CCV		1		12/09/16 21:43
123	T4.120916.214659	WG594361-40	CCB		1		12/09/16 21:46
124	T4.120916.215048	L16120454-02	T6L0596-02	40/50	1		12/09/16 21:50
125	T4.120916.215434	L16120454-03	T6L0596-03	40/50	1		12/09/16 21:54
126	T4.120916.215820	L16120454-04	T6L0596-04	40/50	1		12/09/16 21:58
127	T4.120916.220206	L16120454-05	T6L0596-05	40/50	1		12/09/16 22:02
128	T4.120916.220553	L16120454-06	T6L0596-06	40/50	1		12/09/16 22:05
129	T4.120916.220938	L16120646-01	INS-WL01-120616	40/50	1		12/09/16 22:09
130	T4.120916.221322	WG594361-41	CCV		1		12/09/16 22:13
131	T4.120916.221653	WG594361-42	CCB		1		12/09/16 22:16
132	T4.120916.222042	WG594361-43	Low Level Continuing Calibra		1		12/09/16 22:20
133	T4.120916.222430	WG594361-44	Low Level Continuing Calibra		1		12/09/16 22:24
134	T4.120916.222817	WG594361-45	Interference Check		1		12/09/16 22:28
135	T4.120916.223211	WG594361-46	Interference Check		1		12/09/16 22:32
136	T4.120916.223557	WG594361-47	CCV		1		12/09/16 22:35

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K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 120916T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD78273 ICSAB: STD78274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 593600,594313,594314,593662,594316

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
137	T4.120916.223928	WG594361-48	CCB		1		12/09/16 22:39

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K: K Buck



Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 121216T4.1
 Analyst1: JYH Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____

Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD78273 ICSAB: STD78274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 594316,594313,594314

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.121216.154016	WG594704-01	Calibration Point		1		12/12/16 15:40
2	T4.121216.154404	WG594704-02	Calibration Point		1		12/12/16 15:44
3	T4.121216.154753	WG594704-03	Calibration Point		1		12/12/16 15:47
4	T4.121216.155143	WG594704-04	Calibration Point		1		12/12/16 15:51
5	T4.121216.155516	WG594704-05	Calibration Point		1		12/12/16 15:55
6	T4.121216.155845	WG594704-06	Initial Calibration Verification		1		12/12/16 15:58
7	T4.121216.160219	WG594704-07	Initial Calib Blank		1		12/12/16 16:02
8	T4.121216.160608	WG594704-08	Low Level Initial Calibration V		1		12/12/16 16:06
9	T4.121216.160955	WG594704-09	Low Level Initial Calibration V		1		12/12/16 16:09
10	T4.121216.161340	WG594704-10	Interference Check		1		12/12/16 16:13
11	T4.121216.161734	WG594704-11	Interference Check		1		12/12/16 16:17
12	T4.121216.162119	WG594704-12	CCV		1		12/12/16 16:21
13	T4.121216.162451	WG594704-13	CCB		1		12/12/16 16:24
14	T4.121216.162842	WG594234-02	Method/Prep Blank	40/50	1		12/12/16 16:28
15	T4.121216.163230	WG594234-03	Laboratory Control S	40/50	1		12/12/16 16:32
16	T4.121216.163607	WG594044-01	Fluid Blank 1		1		12/12/16 16:36
17	T4.121216.163955	WG594044-02	Fluid Blank 2		1		12/12/16 16:39
18	T4.121216.164343	WG594234-01	Reference Sample		1	L16120424-03	12/12/16 16:43
19	T4.121216.164730	WG594234-04	Matrix Spike	40/50	1	L16120424-03	12/12/16 16:47
20	T4.121216.165107	WG594234-05	Matrix Spike Duplica	40/50	1	L16120424-03	12/12/16 16:51
21	T4.121216.165444	L16120366-02	J6L0288-01	5/50	1		12/12/16 16:54
22	T4.121216.165833	WG594704-14	CCV		1		12/12/16 16:58
23	T4.121216.170206	WG594704-15	CCB		1		12/12/16 17:02
24	T4.121216.170557	L16120352-22	MW26-120616	40/50	1		12/12/16 17:05
25	T4.121216.170943	L16120352-23	MW17-120616	40/50	1		12/12/16 17:09
26	T4.121216.171328	L16120352-24	MW17-120616	40/50	1		12/12/16 17:13
27	T4.121216.171714	L16120352-26	DUP-GW-120616	40/50	1		12/12/16 17:17
28	T4.121216.172059	WG594316-01	Post Digestion Spike		1	L16120352-26	12/12/16 17:20
29	T4.121216.172435	WG594316-02	Serial Dilution		5	L16120352-26	12/12/16 17:24
30	T4.121216.172821	WG594316-02	Serial Dilution		25	L16120352-26	12/12/16 17:28
31	T4.121216.173209	L16120424-02	A08-MW02-Y1S4	40/50	50		12/12/16 17:32
32	T4.121216.173558	L16120424-06	A08-MW06-Y1S4	40/50	10		12/12/16 17:35
33	T4.121216.173945	L16120424-07	A08-TM03-Y1S4	40/50	20		12/12/16 17:39
34	T4.121216.174334	WG594704-16	CCV		1		12/12/16 17:43

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K: K Buck

Microbac Laboratories Inc.
Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 121216T4.1
 Analyst1: JYH Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD78273 IC SAB: STD78274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 594316,594313,594314Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.121216.174706	WG594704-17	CCB		1		12/12/16 17:47
36	T4.121216.175057	WG594704-18	Low Level Continuing Calibra		1		12/12/16 17:50
37	T4.121216.175444	WG594704-19	Low Level Continuing Calibra		1		12/12/16 17:54
38	T4.121216.175828	WG594106-02	Method/Prep Blank	40/50	1		12/12/16 17:58
39	T4.121216.180217	WG594106-03	Laboratory Control S	40/50	1		12/12/16 18:02
40	T4.121216.180553	WG594106-01	Reference Sample		1	L16120352-07	12/12/16 18:05
41	T4.121216.180938	WG594106-04	Matrix Spike	40/50	1	L16120352-07	12/12/16 18:09
42	T4.121216.181315	WG594106-05	Matrix Spike Duplica	40/50	1	L16120352-07	12/12/16 18:13
43	T4.121216.181651	L16120352-13	MW09R-120616	40/50	1		12/12/16 18:16
44	T4.121216.182045	L16120352-14	MW09R-120616	40/50	1		12/12/16 18:20
45	T4.121216.182438	L16120352-15	MW01-120616	40/50	1		12/12/16 18:24
46	T4.121216.182823	WG594313-03	Post Digestion Spike		1	L16120352-15	12/12/16 18:28
47	T4.121216.183200	WG594313-04	Serial Dilution		5	L16120352-15	12/12/16 18:32
48	T4.121216.183548	WG594704-20	CCV		1		12/12/16 18:35
49	T4.121216.183920	WG594704-21	CCB		1		12/12/16 18:39
50	T4.121216.184310	L16120201-01	FRN SALTCAKE	5/50	100		12/12/16 18:43
51	T4.121216.184700	L16120201-02	FRN FURNACE BAGHOUSE	5/50	100		12/12/16 18:47
52	T4.121216.185047	L16120201-03	FRN MILL FINES (SCREW 1	5/50	100		12/12/16 18:50
53	T4.121216.185436	L16120201-04	FRN MILL FINES (SCREW 8	5/50	100		12/12/16 18:54
54	T4.121216.185825	WG594314-01	Post Digestion Spike		100	L16120201-03	12/12/16 18:58
55	T4.121216.190201	WG594314-02	Serial Dilution		500	L16120201-03	12/12/16 19:02
56	T4.121216.190551	WG594704-22	CCV		1		12/12/16 19:05
57	T4.121216.190924	WG594704-23	CCB		1		12/12/16 19:09
58	T4.121216.191315	WG594704-24	Low Level Continuing Calibra		1		12/12/16 19:13
59	T4.121216.191703	WG594704-25	Low Level Continuing Calibra		1		12/12/16 19:17

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K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

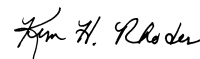
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 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594644,594644,594313,594316,594871

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.121416.113150	WG594926-01	Calibration Point		1		12/14/16 11:31
2	T4.121416.113538	WG594926-02	Calibration Point		1		12/14/16 11:35
3	T4.121416.113927	WG594926-03	Calibration Point		1		12/14/16 11:39
4	T4.121416.114317	WG594926-04	Calibration Point		1		12/14/16 11:43
5	T4.121416.114650	WG594926-05	Calibration Point		1		12/14/16 11:46
6	T4.121416.115019	WG594926-06	Initial Calibration Verification		1		12/14/16 11:50
7	T4.121416.115414	WG594926-07	Initial Calib Blank		1		12/14/16 11:54
8	T4.121416.115802	WG594926-20	LLICV		1		12/14/16 11:58
9	T4.121416.120649	WG594926-09	Low Level Initial Calibration V		1		12/14/16 12:06
10	T4.121416.121320	WG594926-10	Interference Check		1		12/14/16 12:13
11	T4.121416.121706	WG594926-11	Interference Check		1		12/14/16 12:17
12	T4.121416.122044	WG594926-12	CCV		1		12/14/16 12:20
13	T4.121416.122416	WG594926-13	CCB		1		12/14/16 12:24
14	T4.121416.124802	WG594037-03	Method/Prep Blank	40/50	1		12/14/16 12:48
15	T4.121416.125151	WG594037-04	Laboratory Control S	40/50	1		12/14/16 12:51
16	T4.121416.125528	L16120317-01	27-6-14.04 RW1(T)	40/50	1		12/14/16 12:55
17	T4.121416.125912	L16120317-02	27-6-11.10 RW1(T)	40/50	1		12/14/16 12:59
18	T4.121416.130259	L16120317-03	27-5-8.03 RW2(T)	40/50	1		12/14/16 13:02
19	T4.121416.130644	L16120321-01	0101-128-AW1	40/50	1		12/14/16 13:06
20	T4.121416.131031	L16120321-02	0101-128-AW2	40/50	1		12/14/16 13:10
21	T4.121416.131417	L16120323-01	0101-0130 W1	40/50	1		12/14/16 13:14
22	T4.121416.131803	WG594644-01	Post Digestion Spike		1	L16120323-01	12/14/16 13:18
23	T4.121416.132139	WG594644-02	Serial Dilution		5	L16120323-01	12/14/16 13:21
24	T4.121416.132527	WG594926-14	CCV		1		12/14/16 13:25
25	T4.121416.132858	WG594926-15	CCB		1		12/14/16 13:28
26	T4.121416.133249	L16120323-02	0101-0130 W2	40/50	1		12/14/16 13:32
27	T4.121416.133635	WG594037-01	Reference Sample		1	L16120352-01	12/14/16 13:36
28	T4.121416.134030	WG594037-05	Matrix Spike	40/50	1	L16120352-01	12/14/16 13:40
29	T4.121416.134417	WG594037-06	Matrix Spike Duplica	40/50	1	L16120352-01	12/14/16 13:44
30	T4.121416.134804	L16120360-02	12204-F01-WQ-W0008	40/50	1		12/14/16 13:48
31	T4.121416.135153	L16120360-03	19305-D02-WQ-W0011	40/50	1		12/14/16 13:51
32	T4.121416.135542	L16120360-04	19305-R01-WQ-W0107	40/50	1		12/14/16 13:55
33	T4.121416.135930	L16120360-05	20003-C19-WQ-W0172	40/50	1		12/14/16 13:59
34	T4.121416.140318	L16120360-06	20003-C31-WQ-W0191	40/50	1		12/14/16 14:03

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Microbac Laboratories Inc.

Instrument Run Log

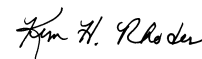
Instrument: ICP-THERMO4 Dataset: 121416T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 594644,594644,594313,594316,594871

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.121416.140707	WG594926-16	CCV		1		12/14/16 14:07
36	T4.121416.141039	WG594926-17	CCB		1		12/14/16 14:10
37	T4.121416.141430	WG594037-02	Reference Sample		1	L16120352-02	12/14/16 14:14
38	T4.121416.141824	WG594037-07	Matrix Spike	40/50	1	L16120352-02	12/14/16 14:18
39	T4.121416.142211	WG594037-08	Matrix Spike Duplica	40/50	1	L16120352-02	12/14/16 14:22
40	T4.121416.142557	L16120342-02	A09-MW02-Y1S4	40/50	1		12/14/16 14:25
41	T4.121416.142943	L16120342-03	A09-MW07-Y1S4	40/50	1		12/14/16 14:29
42	T4.121416.143328	L16120342-04	A09-TM02-Y1S4	40/50	1		12/14/16 14:33
43	T4.121416.143716	L16120360-01	12002-F01-WQ-W0011	40/50	1		12/14/16 14:37
44	T4.121416.144105	WG594926-18	CCV		1		12/14/16 14:41
45	T4.121416.144436	WG594926-19	CCB		1		12/14/16 14:44
46	T4.121416.144827	WG594926-26	LLCCV		1		12/14/16 14:48
47	T4.121416.150240	WG594926-21	Low Level Continuing Calibra		1		12/14/16 15:02
48	T4.121416.160504	WG594926-22	CCV		1		12/14/16 16:05
49	T4.121416.160835	WG594926-23	CCB		1		12/14/16 16:08
50	T4.121416.161224	WG594106-02	Method/Prep Blank	40/50	1		12/14/16 16:12
51	T4.121416.161613	WG594106-03	Laboratory Control S	40/50	1		12/14/16 16:16
52	T4.121416.161950	WG594106-01	Reference Sample		1	L16120352-07	12/14/16 16:19
53	T4.121416.162336	WG594106-04	Matrix Spike	40/50	1	L16120352-07	12/14/16 16:23
54	T4.121416.162712	WG594106-05	Matrix Spike Duplica	40/50	1	L16120352-07	12/14/16 16:27
55	T4.121416.163047	L16120352-13	MW09R-120616	40/50	1		12/14/16 16:30
56	T4.121416.163440	L16120352-14	MW09R-120616	40/50	1		12/14/16 16:34
57	T4.121416.163834	WG594313-03	Post Digestion Spike		1	L16120352-14	12/14/16 16:38
58	T4.121416.164220	WG594313-04	Serial Dilution		5	L16120352-14	12/14/16 16:42
59	T4.121416.164606	L16120352-15	MW01-120616	40/50	1		12/14/16 16:46
60	T4.121416.164954	WG594926-24	CCV		1		12/14/16 16:49
61	T4.121416.165326	WG594926-25	CCB		1		12/14/16 16:53
62	T4.121416.165717	WG594926-32	LLCCV		1		12/14/16 16:57
63	T4.121416.170106	WG594926-27	Low Level Continuing Calibra		1		12/14/16 17:01
64	T4.121416.170454	WG594234-02	Method/Prep Blank	40/50	1		12/14/16 17:04
65	T4.121416.170843	WG594234-03	Laboratory Control S	40/50	1		12/14/16 17:08
66	T4.121416.171220	L16120352-22	MW26-120616	40/50	1		12/14/16 17:12
67	T4.121416.171605	L16120352-23	MW17-120616	40/50	1		12/14/16 17:16
68	T4.121416.171951	L16120352-24	MW17-120616	40/50	1		12/14/16 17:19

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Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 121416T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594644,594644,594313,594316,594871

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.121416.172337	L16120352-26	DUP-GW-120616	40/50	1		12/14/16 17:23
70	T4.121416.172722	L16120352-27	DUP-GW-120616	40/50	1		12/14/16 17:27
71	T4.121416.173107	WG594316-03	Post Digestion Spike		1	L16120352-27	12/14/16 17:31
72	T4.121416.173444	WG594316-04	Serial Dilution		5	L16120352-27	12/14/16 17:34
73	T4.121416.173833	WG594926-28	CCV		1		12/14/16 17:38
74	T4.121416.174204	WG594926-29	CCB		1		12/14/16 17:42
75	T4.121416.174554	WG594234-01	Reference Sample		1	L16120424-03	12/14/16 17:45
76	T4.121416.174941	WG594234-04	Matrix Spike	40/50	1	L16120424-03	12/14/16 17:49
77	T4.121416.175318	WG594234-05	Matrix Spike Duplica	40/50	1	L16120424-03	12/14/16 17:53
78	T4.121416.175655	WG594926-30	CCV		1		12/14/16 17:56
79	T4.121416.180027	WG594926-31	CCB		1		12/14/16 18:00
80	T4.121416.180416	WG594926-40	LLCCV		1		12/14/16 18:04
81	T4.121416.180804	WG594926-33	Low Level Continuing Calibra		1		12/14/16 18:08
82	T4.121416.181153	WG594816-02	Method/Prep Blank	40/50	1		12/14/16 18:11
83	T4.121416.181541	WG594816-03	Laboratory Control S	40/50	1		12/14/16 18:15
84	T4.121416.181918	WG594701-01	Fluid Blank 1		1		12/14/16 18:19
85	T4.121416.182306	L16120608-02	120716-IN-DIRT	5/50	1		12/14/16 18:23
86	T4.121416.182701	L16120648-02	J6L0692-01	5/50	1		12/14/16 18:27
87	T4.121416.183048	L16120650-01	27-19-1 RW3 (T)	40/50	1		12/14/16 18:30
88	T4.121416.183435	L16120650-02	27-19-1 RW3 (U)	40/50	1		12/14/16 18:34
89	T4.121416.183821	L16120650-03	27-6-11.18 RW1 (T)	40/50	1		12/14/16 18:38
90	T4.121416.184207	WG594871-01	Post Digestion Spike		1	L16120650-03	12/14/16 18:42
91	T4.121416.184544	WG594871-02	Serial Dilution		5	L16120650-03	12/14/16 18:45
92	T4.121416.184935	WG594926-34	CCV		1		12/14/16 18:49
93	T4.121416.185306	WG594926-35	CCB		1		12/14/16 18:53
94	T4.121416.185658	L16120666-01	6-7-32 W1	40/50	1		12/14/16 18:56
95	T4.121416.190044	L16120666-02	6-8-22.01 W1	40/50	1		12/14/16 19:00
96	T4.121416.190429	L16120666-03	59-10-35 W1	40/50	1		12/14/16 19:04
97	T4.121416.190814	L16120666-04	59-11-11.03 W1	40/50	1		12/14/16 19:08
98	T4.121416.191200	L16120666-05	59-11-11.09 W1	40/50	1		12/14/16 19:12
99	T4.121416.191546	L16120666-06	6-11-19 S5	40/50	1		12/14/16 19:15
100	T4.121416.191932	L16120682-01	13837-SSP0561	5/50	1		12/14/16 19:19
101	T4.121416.192317	L16120684-02	SCF-WS02-121216	5/50	1		12/14/16 19:23
102	T4.121416.192706	WG594926-36	CCV		1		12/14/16 19:27

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Instrument Run Log

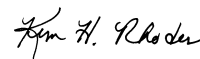
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 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594644,594644,594313,594316,594871

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T4.121416.193037	WG594926-37	CCB		1		12/14/16 19:30
104	T4.121416.193428	WG594816-01	Reference Sample		1	L16120685-02	12/14/16 19:34
105	T4.121416.193817	WG594816-04	Matrix Spike	5/50	1	L16120685-02	12/14/16 19:38
106	T4.121416.194154	WG594816-05	Matrix Spike Duplica	5/50	1	L16120685-02	12/14/16 19:41
107	T4.121416.194533	L16120692-01	WVOG	40/50	10		12/14/16 19:45
108	T4.121416.194944	L16120692-01	WVOG		5		12/14/16 19:49
109	T4.121416.195357	L16120692-01	WVOG		2		12/14/16 19:53
110	T4.121416.195802	L16120702-01	59-11-11-25 W2	40/50	1		12/14/16 19:58
111	T4.121416.200148	WG594926-38	CCV		1		12/14/16 20:01
112	T4.121416.200521	WG594926-39	CCB		1		12/14/16 20:05
113	T4.121416.200911	WG594926-42	LLCCV		1		12/14/16 20:09
114	T4.121416.201258	WG594926-41	Low Level Continuing Calibra		1		12/14/16 20:12
115	T4.121416.201647	WG594926-43	Interference Check		1		12/14/16 20:16
116	T4.121416.202041	WG594926-44	Interference Check		1		12/14/16 20:20
117	T4.121416.202429	WG594926-45	CCV		1		12/14/16 20:24
118	T4.121416.202801	WG594926-46	CCB		1		12/14/16 20:28

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Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 121516T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594871,594869,594866,594872

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.121516.181207	WG595250-01	Calibration Point		1		12/15/16 18:12
2	T4.121516.181555	WG595250-02	Calibration Point		1		12/15/16 18:15
3	T4.121516.181944	WG595250-03	Calibration Point		1		12/15/16 18:19
4	T4.121516.182333	WG595250-04	Calibration Point		1		12/15/16 18:23
5	T4.121516.182706	WG595250-05	Calibration Point		1		12/15/16 18:27
6	T4.121516.183036	WG595250-06	Initial Calibration Verification		1		12/15/16 18:30
7	T4.121516.183409	WG595250-07	Initial Calib Blank		1		12/15/16 18:34
8	T4.121516.183757	WG595250-08	Low Level Initial Calibration V		1		12/15/16 18:37
9	T4.121516.184424	WG595250-09	Low Level Initial Calibration V		1		12/15/16 18:44
10	T4.121516.185114	WG595250-10	Interference Check		1		12/15/16 18:51
11	T4.121516.185504	WG595250-11	Interference Check		1		12/15/16 18:55
12	T4.121516.185843	WG595250-12	CCV		1		12/15/16 18:58
13	T4.121516.190215	WG595250-13	CCB		1		12/15/16 19:02
14	T4.121516.195149	WG594816-02	Method/Prep Blank	40/50	1		12/15/16 19:51
15	T4.121516.195538	WG594816-03	Laboratory Control S	40/50	1		12/15/16 19:55
16	T4.121516.195916	WG594701-01	Fluid Blank 1		1		12/15/16 19:59
17	T4.121516.200304	L16120608-02	120716-IN-DIRT	5/50	1		12/15/16 20:03
18	T4.121516.200659	WG594871-03	Post Digestion Spike		1	L16120608-02	12/15/16 20:06
19	T4.121516.201045	WG594871-04	Serial Dilution		5	L16120608-02	12/15/16 20:10
20	T4.121516.201432	L16120648-02	J6L0692-01	5/50	1		12/15/16 20:14
21	T4.121516.201819	WG594816-01	Reference Sample		1	L16120685-02	12/15/16 20:18
22	T4.121516.202207	WG594816-04	Matrix Spike	5/50	1	L16120685-02	12/15/16 20:22
23	T4.121516.202544	WG594816-05	Matrix Spike Duplica	5/50	1	L16120685-02	12/15/16 20:25
24	T4.121516.202922	WG595250-14	CCV		1		12/15/16 20:29
25	T4.121516.203254	WG595250-15	CCB		1		12/15/16 20:32
26	T4.121516.203646	L16120692-01	WVOG	40/50	100		12/15/16 20:36
27	T4.121516.204050	WG595250-16	CCV		1		12/15/16 20:40
28	T4.121516.204422	WG595250-17	CCB		1		12/15/16 20:44
29	T4.121516.204814	WG595250-18	Low Level Continuing Calibra		1		12/15/16 20:48
30	T4.121516.205202	WG595250-19	LLCCV		1		12/15/16 20:52
31	T4.121516.205551	WG594606-02	Method/Prep Blank	40/50	1		12/15/16 20:55
32	T4.121516.205939	WG594606-03	Laboratory Control S	40/50	1		12/15/16 20:59
33	T4.121516.210316	L16120520-02	A08-MW03-Y1S4	40/50	1		12/15/16 21:03
34	T4.121516.210703	L16120520-03	A08-MW09-Y1S4	40/50	1		12/15/16 21:07

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Instrument Run Log

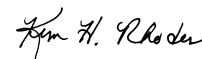
Instrument: ICP-THERMO4 Dataset: 121516T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594871,594869,594866,594872

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.121516.211050	L16120520-04	A08-MW10-Y1S4	40/50	1		12/15/16 21:10
36	T4.121516.211436	L16120520-11	A08-TM01-Y1S4	40/50	1		12/15/16 21:14
37	T4.121516.211822	L16120521-07	MW21-120816	40/50	10		12/15/16 21:18
38	T4.121516.212219	L16120521-08	MW21-120816	40/50	10		12/15/16 21:22
39	T4.121516.212614	L16120521-09	MW31-120816	40/50	10		12/15/16 21:26
40	T4.121516.213003	L16120521-10	MW31-120816	40/50	10		12/15/16 21:30
41	T4.121516.213352	WG595250-20	CCV		1		12/15/16 21:33
42	T4.121516.213725	WG595250-21	CCB		1		12/15/16 21:37
43	T4.121516.214116	L16120564-01	MW34-GW-120816	40/50	1		12/15/16 21:41
44	T4.121516.214535	L16120564-02	SW01-120816	40/50	1		12/15/16 21:45
45	T4.121516.214928	L16120564-03	MW31-GW-120916	40/50	1		12/15/16 21:49
46	T4.121516.215312	L16120564-04	MW32-GW-120916	40/50	1		12/15/16 21:53
47	T4.121516.215659	L16120618-02	SCF-WL01-120916	40/50	1		12/15/16 21:56
48	T4.121516.220043	L16120619-01	INS-WL01-120816	40/50	1		12/15/16 22:00
49	T4.121516.220427	L16120620-01	INS-WL02-120816	40/50	1		12/15/16 22:04
50	T4.121516.220810	L16120621-01	INS-WL03-120816	40/50	1		12/15/16 22:08
51	T4.121516.221155	WG595250-22	CCV		1		12/15/16 22:11
52	T4.121516.221527	WG595250-23	CCB		1		12/15/16 22:15
53	T4.121516.221917	WG594606-01	Reference Sample		1	L16120641-04	12/15/16 22:19
54	T4.121516.222306	WG594869-01	Post Digestion Spike		1	L16120641-04	12/15/16 22:23
55	T4.121516.222643	WG594869-02	Serial Dilution		5	L16120641-04	12/15/16 22:26
56	T4.121516.223032	WG594606-04	Matrix Spike	40/50	1	L16120641-04	12/15/16 22:30
57	T4.121516.223409	WG594606-05	Matrix Spike Duplica	40/50	1	L16120641-04	12/15/16 22:34
58	T4.121516.223747	WG595250-24	CCV		1		12/15/16 22:37
59	T4.121516.224119	WG595250-25	CCB		1		12/15/16 22:41
60	T4.121516.224510	WG595250-26	LLCCV		1		12/15/16 22:45
61	T4.121516.224859	WG595250-27	Low Level Continuing Calibra		1		12/15/16 22:48
62	T4.121516.225247	WG594495-02	Method/Prep Blank	40/50	1		12/15/16 22:52
63	T4.121516.225636	WG594495-03	Laboratory Control S	40/50	1		12/15/16 22:56
64	T4.121516.230012	L16120455-02	18CPTMW22DW-120616	40/50	1		12/15/16 23:00
65	T4.121516.230357	L16120455-04	18CPTMW22RF-120616	40/50	1		12/15/16 23:03
66	T4.121516.230741	L16120455-07	18CPTMW12SW-120616	40/50	1		12/15/16 23:07
67	T4.121516.231126	L16120455-08	18CPTMW12SWFD-120616	40/50	1		12/15/16 23:11
68	T4.121516.231511	L16120455-10	18CPTMW26SW-120716	40/50	1		12/15/16 23:15

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Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 121516T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 594871,594869,594866,594872

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.121516.231856	L16120455-12	MW10-120716	40/50	1		12/15/16 23:18
70	T4.121516.232241	WG594866-01	Post Digestion Spike		1	L16120455-12	12/15/16 23:22
71	T4.121516.232616	WG594866-02	Serial Dilution		5	L16120455-12	12/15/16 23:26
72	T4.121516.233004	WG595250-28	CCV		1		12/15/16 23:30
73	T4.121516.233336	WG595250-29	CCB		1		12/15/16 23:33
74	T4.121516.233726	L16120455-15	18CPTMW23SWF-120716	40/50	1		12/15/16 23:37
75	T4.121516.234112	L16120472-01	MW26-GW-120616	40/50	1		12/15/16 23:41
76	T4.121516.234530	L16120472-02	MW23-GW-120716	40/50	1		12/15/16 23:45
77	T4.121516.234948	L16120472-03	MW21-GW-120716	40/50	1		12/15/16 23:49
78	T4.121516.235406	L16120472-04	MW35-GW-120716	40/50	1		12/15/16 23:54
79	T4.121516.235823	WG594495-01	Reference Sample		1	L16120472-05	12/15/16 23:58
80	T4.121616.000241	WG594495-04	Matrix Spike	40/50	1	L16120472-05	12/16/16 00:02
81	T4.121616.000649	WG594495-05	Matrix Spike Duplica	40/50	1	L16120472-05	12/16/16 00:06
82	T4.121616.001059	WG595250-30	CCV		1		12/16/16 00:10
83	T4.121616.001430	WG595250-31	CCB		1		12/16/16 00:14
84	T4.121616.001819	L16120481-02	ANNUAL HEAVY METALS	40/50	1		12/16/16 00:18
85	T4.121616.002208	L16120593-01	10207-G02-WQ-W0007	40/50	1		12/16/16 00:22
86	T4.121616.002556	L16120593-02	16014-G03-WQ-W0013	40/50	1		12/16/16 00:25
87	T4.121616.002945	L16120593-03	16014-G04-WQ-W0018	40/50	1		12/16/16 00:29
88	T4.121616.003333	L16120593-04	19305-G35-WQ-W0078	40/50	1		12/16/16 00:33
89	T4.121616.003724	WG595250-32	CCV		1		12/16/16 00:37
90	T4.121616.004055	WG595250-33	CCB		1		12/16/16 00:40
91	T4.121616.004446	WG595250-34	LLCCV		1		12/16/16 00:44
92	T4.121616.004834	WG595250-35	Low Level Continuing Calibra		1		12/16/16 00:48
93	T4.121616.005222	WG594498-02	Method/Prep Blank	40/50	1		12/16/16 00:52
94	T4.121616.005610	WG594498-03	Laboratory Control S	40/50	1		12/16/16 00:56
95	T4.121616.005947	WG594498-01	Reference Sample		1	L16120352-08	12/16/16 00:59
96	T4.121616.010332	WG594498-04	Matrix Spike	40/50	1	L16120352-08	12/16/16 01:03
97	T4.121616.010707	WG594498-05	Matrix Spike Duplica	40/50	1	L16120352-08	12/16/16 01:07
98	T4.121616.011045	L16120352-16	MW01-120616	40/50	1		12/16/16 01:10
99	T4.121616.011431	L16120352-17	MW16I-120616	40/50	1		12/16/16 01:14
100	T4.121616.011817	L16120352-18	MW16I-120616	40/50	1		12/16/16 01:18
101	T4.121616.012202	WG594872-01	Post Digestion Spike		1	L16120352-18	12/16/16 01:22
102	T4.121616.012539	WG594872-02	Serial Dilution		5	L16120352-18	12/16/16 01:25

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Sam H. Rhodes

Microbac Laboratories Inc.
Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 121516T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594871,594869,594866,594872

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T4.121616.012928	WG595250-36	CCV		1		12/16/16 01:29
104	T4.121616.013259	WG595250-37	CCB		1		12/16/16 01:32
105	T4.121616.013650	L16120352-21	MW26-120616	40/50	1		12/16/16 01:36
106	T4.121616.014036	L16120425-21	DUP-GW-120716-1	40/50	1		12/16/16 01:40
107	T4.121616.014423	L16120425-22	DUP-GW-120716-1	40/50	1		12/16/16 01:44
108	T4.121616.014808	L16120425-23	DUP-GW-120716-2	40/50	1		12/16/16 01:48
109	T4.121616.015203	L16120425-24	DUP-GW-120716-2	40/50	1		12/16/16 01:52
110	T4.121616.015556	L16120484-01	CENTRIFUGE OVERFLOW		10		12/16/16 01:55
111	T4.121616.020007	L16120484-02	INFLECTION FLOW BACK		10		12/16/16 02:00
112	T4.121616.020413	L16120484-03	KAYDEN OVERFLOW		10		12/16/16 02:04
113	T4.121616.020823	L16120484-04	DIFFUSER		10		12/16/16 02:08
114	T4.121616.021225	L16120484-05	PRODUCTION		10		12/16/16 02:12
115	T4.121616.021632	WG595250-38	CCV		1		12/16/16 02:16
116	T4.121616.022004	WG595250-39	CCB		1		12/16/16 02:20
117	T4.121616.022353	L16120484-09	EFFLUENT FROM DIFFUSE		10		12/16/16 02:23
118	T4.121616.022755	L16120484-10	KAYDEN MIX		10		12/16/16 02:27
119	T4.121616.023205	L16120484-11	KAYDEN BLOW BACK		10		12/16/16 02:32
120	T4.121616.023615	L16120568-01	A08/09-120516-RB01-Y1S4	40/50	1		12/16/16 02:36
121	T4.121616.024002	L16120591-01	FQC-WW04-W0011	40/50	1		12/16/16 02:40
122	T4.121616.024339	L16120591-02	FQC-WW05-W0012	40/50	1		12/16/16 02:43
123	T4.121616.024718	WG595250-40	CCV		1		12/16/16 02:47
124	T4.121616.025051	WG595250-41	CCB		1		12/16/16 02:50
125	T4.121616.025441	WG595250-42	Low Level Continuing Calibra		1		12/16/16 02:54
126	T4.121616.025829	WG595250-43	LLCCV		1		12/16/16 02:58
127	T4.121616.030217	WG595250-44	Interference Check		1		12/16/16 03:02
128	T4.121616.030611	WG595250-45	Interference Check		1		12/16/16 03:06
129	T4.121616.030959	WG595250-46	CCV		1		12/16/16 03:09
130	T4.121616.031331	WG595250-47	CCB		1		12/16/16 03:13

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Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 121816T4.1R.TXT
 Analyst1: KKB Analyst2: PDM
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RG737691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594866,594869,594871,594872

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.121816.111053	WG595477-01	Calibration Point		1		12/18/16 11:10
2	T4.121816.111442	WG595477-02	Calibration Point		1		12/18/16 11:14
3	T4.121816.111831	WG595477-03	Calibration Point		1		12/18/16 11:18
4	T4.121816.112222	WG595477-04	Calibration Point		1		12/18/16 11:22
5	T4.121816.112555	WG595477-05	Calibration Point		1		12/18/16 11:25
6	T4.121816.112927	WG595477-06	Initial Calibration Verification		1		12/18/16 11:29
7	T4.121816.113300	WG595477-07	Initial Calib Blank		1		12/18/16 11:33
8	T4.121816.113649	WG595477-08	Low Level Initial Calibration V		1		12/18/16 11:36
9	T4.121816.114037	WG595477-09	Low Level Initial Calibration V		1		12/18/16 11:40
10	T4.121816.114425	WG595477-10	Interference Check		1		12/18/16 11:44
11	T4.121816.114812	WG595477-11	Interference Check		1		12/18/16 11:48
12	T4.121816.115614	WG595477-12	CCV		1		12/18/16 11:56
13	T4.121816.120006	WG595477-13	CCB		1		12/18/16 12:00
14	T4.121816.123755	WG594495-02	Method/Prep Blank	40/50	1		12/18/16 12:37
15	T4.121816.124145	WG594495-03	Laboratory Control S	40/50	1		12/18/16 12:41
16	T4.121816.124522	L16120455-02	18CPTMW22DW-120616	40/50	1		12/18/16 12:45
17	T4.121816.124907	L16120455-02	18CPTMW22DW-120616	40/50	5		12/18/16 12:49
18	T4.121816.125255	L16120455-04	18CPTMW22RF-120616	40/50	1		12/18/16 12:52
19	T4.121816.125639	L16120455-07	18CPTMW12SW-120616	40/50	1		12/18/16 12:56
20	T4.121816.130024	L16120455-07	18CPTMW12SW-120616	40/50	5		12/18/16 13:00
21	T4.121816.130410	L16120455-08	18CPTMW12SWFD-120616	40/50	1		12/18/16 13:04
22	T4.121816.130756	L16120455-08	18CPTMW12SWFD-120616	40/50	5		12/18/16 13:07
23	T4.121816.131141	L16120455-10	18CPTMW26SW-120716	40/50	10		12/18/16 13:11
24	T4.121816.131530	WG595477-14	CCV		1		12/18/16 13:15
25	T4.121816.131902	WG595477-15	CCB		1		12/18/16 13:19
26	T4.121816.132253	L16120455-12	MW10-120716	40/50	10		12/18/16 13:22
27	T4.121816.132641	WG594866-01	Post Digestion Spike		10	L16120455-12	12/18/16 13:26
28	T4.121816.133017	WG594866-02	Serial Dilution		50	L16120455-12	12/18/16 13:30
29	T4.121816.133405	L16120455-15	18CPTMW23SWF-120716	40/50	1		12/18/16 13:34
30	T4.121816.133751	L16120455-15	18CPTMW23SWF-120716	40/50	10		12/18/16 13:37
31	T4.121816.134137	L16120472-01	MW26-GW-120616	40/50	1		12/18/16 13:41
32	T4.121816.134554	L16120472-01	MW26-GW-120616	40/50	5		12/18/16 13:45
33	T4.121816.134941	L16120472-02	MW23-GW-120716	40/50	1		12/18/16 13:49
34	T4.121816.135400	L16120472-03	MW21-GW-120716	40/50	1		12/18/16 13:54

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Instrument Run Log

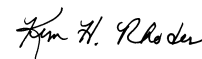
Instrument: ICP-THERMO4 Dataset: 121816T4.1R.TXT
 Analyst1: KKB Analyst2: PDM
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594866,594869,594871,594872

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.121816.135817	L16120472-04	MW35-GW-120716	40/50	1		12/18/16 13:58
36	T4.121816.140235	WG595477-16	CCV		1		12/18/16 14:02
37	T4.121816.140607	WG595477-17	CCB		1		12/18/16 14:06
38	T4.121816.140958	L16120472-04	MW35-GW-120716	40/50	5		12/18/16 14:09
39	T4.121816.141344	WG594495-01	Reference Sample		1	L16120472-05	12/18/16 14:13
40	T4.121816.141801	WG594495-04	Matrix Spike	40/50	1	L16120472-05	12/18/16 14:18
41	T4.121816.142209	WG594495-05	Matrix Spike Duplica	40/50	1	L16120472-05	12/18/16 14:22
42	T4.121816.142618	WG595477-18	CCV		1		12/18/16 14:26
43	T4.121816.142951	WG595477-19	CCB		1		12/18/16 14:29
44	T4.121816.143342	WG595477-20	Low Level Continuing Calibra		1		12/18/16 14:33
45	T4.121816.143730	WG595477-21	Low Level Continuing Calibra		1		12/18/16 14:37
46	T4.121816.154018	WG595477-22	CCV		1		12/18/16 15:40
47	T4.121816.154349	WG595477-23	CCB		1		12/18/16 15:43
48	T4.121816.154740	WG594606-02	Method/Prep Blank	40/50	1		12/18/16 15:47
49	T4.121816.155128	WG594606-03	Laboratory Control S	40/50	1		12/18/16 15:51
50	T4.121816.155506	L16120520-02	A08-MW03-Y1S4	40/50	1		12/18/16 15:55
51	T4.121816.155854	L16120520-03	A08-MW09-Y1S4	40/50	1		12/18/16 15:58
52	T4.121816.160241	L16120520-04	A08-MW10-Y1S4	40/50	1		12/18/16 16:02
53	T4.121816.160627	L16120520-11	A08-TM01-Y1S4	40/50	1		12/18/16 16:06
54	T4.121816.161014	L16120521-07	MW21-120816	40/50	100		12/18/16 16:10
55	T4.121816.161402	L16120564-01	MW34-GW-120816	40/50	1		12/18/16 16:14
56	T4.121816.161821	WG594869-03	Post Digestion Spike		1	L16120564-01	12/18/16 16:18
57	T4.121816.162231	WG594869-04	Serial Dilution		5	L16120564-01	12/18/16 16:22
58	T4.121816.162619	WG595477-24	CCV		1		12/18/16 16:26
59	T4.121816.162952	WG595477-25	CCB		1		12/18/16 16:29
60	T4.121816.163343	L16120564-02	SW01-120816	40/50	1		12/18/16 16:33
61	T4.121816.163736	L16120564-03	MW31-GW-120916	40/50	1		12/18/16 16:37
62	T4.121816.164121	L16120564-04	MW32-GW-120916	40/50	1		12/18/16 16:41
63	T4.121816.164507	L16120618-02	SCF-WL01-120916	40/50	1		12/18/16 16:45
64	T4.121816.164852	L16120619-01	INS-WL01-120816	40/50	1		12/18/16 16:48
65	T4.121816.165236	L16120620-01	INS-WL02-120816	40/50	1		12/18/16 16:52
66	T4.121816.165618	L16120621-01	INS-WL03-120816	40/50	1		12/18/16 16:56
67	T4.121816.170003	L16120641-04	13202-F01-WQ-W0010		1	WG594606-01	12/18/16 17:00
68	T4.121816.170352	WG594606-04	Matrix Spike	40/50	1	L16120641-04	12/18/16 17:03

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Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 121816T4.1R.TXT
 Analyst1: KKB Analyst2: PDM
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594866,594869,594871,594872

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.121816.170730	WG594606-05	Matrix Spike Duplica	40/50	1	L16120641-04	12/18/16 17:07
70	T4.121816.171107	WG595477-26	CCV		1		12/18/16 17:11
71	T4.121816.171439	WG595477-27	CCB		1		12/18/16 17:14
72	T4.121816.171830	WG595477-28	Low Level Continuing Calibra		1		12/18/16 17:18
73	T4.121816.172218	WG595477-29	Low Level Continuing Calibra		1		12/18/16 17:22
74	T4.121816.172606	WG594816-02	Method/Prep Blank	40/50	1		12/18/16 17:26
75	T4.121816.172956	WG594816-03	Laboratory Control S	40/50	1		12/18/16 17:29
76	T4.121816.173332	WG594701-01	Fluid Blank 1		1		12/18/16 17:33
77	T4.121816.173720	L16120608-02	120716-IN-DIRT	5/50	1		12/18/16 17:37
78	T4.121816.174114	L16120648-02	J6L0692-01	5/50	1		12/18/16 17:41
79	T4.121816.174502	WG594871-03	Post Digestion Spike		1	L16120648-02	12/18/16 17:45
80	T4.121816.174839	WG594871-04	Serial Dilution		5	L16120648-02	12/18/16 17:48
81	T4.121816.175228	WG594816-01	Reference Sample		1	L16120685-02	12/18/16 17:52
82	T4.121816.175616	WG594816-04	Matrix Spike	5/50	1	L16120685-02	12/18/16 17:56
83	T4.121816.175954	WG594816-05	Matrix Spike Duplica	5/50	1	L16120685-02	12/18/16 17:59
84	T4.121816.180333	WG595477-30	CCV		1		12/18/16 18:03
85	T4.121816.180705	WG595477-31	CCB		1		12/18/16 18:07
86	T4.121816.181055	L16120692-01	WVOG	40/50	1000		12/18/16 18:10
87	T4.121816.181445	WG595477-32	CCV		1		12/18/16 18:14
88	T4.121816.181817	WG595477-33	CCB		1		12/18/16 18:18
89	T4.121816.182208	WG595477-34	Low Level Continuing Calibra		1		12/18/16 18:22
90	T4.121816.182557	WG595477-35	Low Level Continuing Calibra		1		12/18/16 18:25
91	T4.121816.182945	WG594498-02	Method/Prep Blank	40/50	1		12/18/16 18:29
92	T4.121816.183334	WG594498-03	Laboratory Control S	40/50	1		12/18/16 18:33
93	T4.121816.183711	WG594498-01	Reference Sample		1	L16120352-08	12/18/16 18:37
94	T4.121816.184056	WG594498-04	Matrix Spike	40/50	1	L16120352-08	12/18/16 18:40
95	T4.121816.184433	WG594498-05	Matrix Spike Duplica	40/50	1	L16120352-08	12/18/16 18:44
96	T4.121816.184810	L16120352-16	MW01-120616	40/50	1		12/18/16 18:48
97	T4.121816.185156	L16120352-17	MW16I-120616	40/50	1		12/18/16 18:51
98	T4.121816.185541	L16120352-18	MW16I-120616	40/50	1		12/18/16 18:55
99	T4.121816.185927	L16120352-21	MW26-120616	40/50	1		12/18/16 18:59
100	T4.121816.190313	L16120425-21	DUP-GW-120716-1	40/50	1		12/18/16 19:03
101	T4.121816.190701	WG595477-36	CCV		1		12/18/16 19:07
102	T4.121816.191034	WG595477-37	CCB		1		12/18/16 19:10

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Sam H. Rhodes

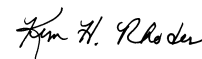
Microbac Laboratories Inc.
Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 121816T4.1R.TXT
 Analyst1: KKB Analyst2: PDM
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RG737691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594866,594869,594871,594872Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T4.121816.191425	L16120425-22	DUP-GW-120716-1	40/50	1		12/18/16 19:14
104	T4.121816.191811	L16120425-23	DUP-GW-120716-2	40/50	1		12/18/16 19:18
105	T4.121816.192205	L16120425-23	DUP-GW-120716-2	40/50	10		12/18/16 19:22
106	T4.121816.192553	L16120425-24	DUP-GW-120716-2	40/50	1		12/18/16 19:25
107	T4.121816.192947	L16120484-01	CENTRIFUGE OVERFLOW	40/50	100		12/18/16 19:29
108	T4.121816.193400	L16120484-02	INFLECTION FLOW BACK	40/50	100		12/18/16 19:34
109	T4.121816.193805	L16120484-03	KAYDEN OVERFLOW	40/50	100		12/18/16 19:38
110	T4.121816.194218	L16120484-04	DIFFUSER	40/50	100		12/18/16 19:42
111	T4.121816.194622	L16120484-05	PRODUCTION	40/50	100		12/18/16 19:46
112	T4.121816.195026	L16120484-09	EFFLUENT FROM DIFFUSE	40/50	100		12/18/16 19:50
113	T4.121816.195432	WG595477-38	CCV		1		12/18/16 19:54
114	T4.121816.195804	WG595477-39	CCB		1		12/18/16 19:58
115	T4.121816.200154	L16120484-10	KAYDEN MIX	40/50	100		12/18/16 20:01
116	T4.121816.200606	L16120484-11	KAYDEN BLOW BACK	40/50	100		12/18/16 20:06
117	T4.121816.201019	L16120568-01	A08/09-120516-RB01-Y1S4	40/50	1		12/18/16 20:10
118	T4.121816.201408	WG594872-03	Post Digestion Spike		1	L16120568-01	12/18/16 20:14
119	T4.121816.201745	WG594872-04	Serial Dilution		5	L16120568-01	12/18/16 20:17
120	T4.121816.202134	WG595477-40	CCV		1		12/18/16 20:21
121	T4.121816.202506	WG595477-41	CCB		1		12/18/16 20:25
122	T4.121816.202855	WG595477-42	Low Level Continuing Calibra		1		12/18/16 20:28
123	T4.121816.203243	WG595477-43	Low Level Continuing Calibra		1		12/18/16 20:32
124	T4.121816.203630	WG595477-44	Interference Check		1		12/18/16 20:36
125	T4.121816.204026	WG595477-45	Interference Check		1		12/18/16 20:40
126	T4.121816.204412	WG595477-46	CCV		1		12/18/16 20:44
127	T4.121816.204743	WG595477-47	CCB		1		12/18/16 20:47

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Instrument Run Log

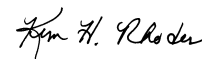
Instrument: ICP-THERMO4 Dataset: 122116T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594869,595141,594644,594975

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T4.122116.114705	WG596008-01	Calibration Point		1		12/21/16 11:47
2	T4.122116.115053	WG596008-02	Calibration Point		1		12/21/16 11:50
3	T4.122116.115442	WG596008-03	Calibration Point		1		12/21/16 11:54
4	T4.122116.115832	WG596008-04	Calibration Point		1		12/21/16 11:58
5	T4.122116.120205	WG596008-05	Calibration Point		1		12/21/16 12:02
6	T4.122116.120534	WG596008-06	Initial Calibration Verification		1		12/21/16 12:05
7	T4.122116.121004	WG596008-07	Initial Calib Blank		1		12/21/16 12:10
8	T4.122116.121353	WG596008-08	LLICV		1		12/21/16 12:13
9	T4.122116.121742	WG596008-09	Low Level Initial Calibration V		1		12/21/16 12:17
10	T4.122116.123354	WG596008-10	Low Level Initial Calibration V		1		12/21/16 12:33
11	T4.122116.123919	WG596008-11	Interference Check		1		12/21/16 12:39
12	T4.122116.124308	WG596008-12	Interference Check		1		12/21/16 12:43
13	T4.122116.124647	WG596008-13	CCV		1		12/21/16 12:46
14	T4.122116.125019	WG596008-14	CCB		1		12/21/16 12:50
15	T4.122116.131720	WG594606-02	Method/Prep Blank	40/50	1		12/21/16 13:17
16	T4.122116.132109	WG594606-03	Laboratory Control S	40/50	1		12/21/16 13:21
17	T4.122116.132447	L16120520-02	A08-MW03-Y1S4	40/50	1		12/21/16 13:24
18	T4.122116.132834	L16120520-03	A08-MW09-Y1S4	40/50	1		12/21/16 13:28
19	T4.122116.133220	L16120520-04	A08-MW10-Y1S4	40/50	1		12/21/16 13:32
20	T4.122116.133607	L16120520-11	A08-TM01-Y1S4	40/50	1		12/21/16 13:36
21	T4.122116.133955	WG594869-05	Post Digestion Spike		1	L16120520-11	12/21/16 13:39
22	T4.122116.134332	WG594869-06	Serial Dilution		5	L16120520-11	12/21/16 13:43
23	T4.122116.134722	WG596008-15	CCV		1		12/21/16 13:47
24	T4.122116.135054	WG596008-16	CCB		1		12/21/16 13:50
25	T4.122116.135446	WG594606-01	Reference Sample		1	L16120641-04	12/21/16 13:54
26	T4.122116.135835	WG594606-04	Matrix Spike	40/50	1	L16120641-04	12/21/16 13:58
27	T4.122116.140211	WG594606-05	Matrix Spike Duplica	40/50	1	L16120641-04	12/21/16 14:02
28	T4.122116.140549	WG596008-17	CCV		1		12/21/16 14:05
29	T4.122116.140921	WG596008-18	CCB		1		12/21/16 14:09
30	T4.122116.141312	WG596008-19	LLCCV		1		12/21/16 14:13
31	T4.122116.141700	WG596008-20	Low Level Continuing Calibra		1		12/21/16 14:17
32	T4.122116.142213	WG594996-02	Method/Prep Blank	40/50	1		12/21/16 14:22
33	T4.122116.142602	WG594996-03	Laboratory Control S	40/50	1		12/21/16 14:26
34	T4.122116.142939	L16120719-03	120F-120916	40/50	1		12/21/16 14:29

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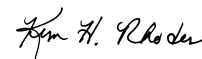

Microbac Laboratories Inc.
Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 122116T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RG737691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594869,595141,594644,594975Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T4.122116.143325	L16120719-04	109-120916	40/50	1		12/21/16 14:33
36	T4.122116.143710	WG595141-01	Post Digestion Spike		1	L16120719-04	12/21/16 14:37
37	T4.122116.144047	WG595141-02	Serial Dilution		5	L16120719-04	12/21/16 14:40
38	T4.122116.144434	WG594996-01	Reference Sample		1	L16120719-08	12/21/16 14:44
39	T4.122116.144819	WG594996-04	Matrix Spike	40/50	1	L16120719-08	12/21/16 14:48
40	T4.122116.145156	WG594996-05	Matrix Spike Duplica	40/50	1	L16120719-08	12/21/16 14:51
41	T4.122116.145533	L16120719-16	18WW25F-120916	40/50	1		12/21/16 14:55
42	T4.122116.145920	WG596008-21	CCV		1		12/21/16 14:59
43	T4.122116.150252	WG596008-22	CCB		1		12/21/16 15:02
44	T4.122116.150643	L16120719-18	18WW02-121216	40/50	1		12/21/16 15:06
45	T4.122116.151029	L16120719-19	MW16-121216	40/50	1		12/21/16 15:10
46	T4.122116.151414	L16120719-21	18CPTMW19SW-121216	40/50	1		12/21/16 15:14
47	T4.122116.151800	L16120768-01	0101-0131A-S7	40/50	1		12/21/16 15:18
48	T4.122116.152146	L16120768-02	0101-0131A-S14	40/50	1		12/21/16 15:21
49	T4.122116.152532	L16120768-03	0101-0131A-S3	40/50	1		12/21/16 15:25
50	T4.122116.152918	L16120768-04	0101-0131A-S2	40/50	1		12/21/16 15:29
51	T4.122116.153305	L16120768-05	0101-0131A-S4	40/50	1		12/21/16 15:33
52	T4.122116.153651	L16120768-06	0101-0131A-S5	40/50	1		12/21/16 15:36
53	T4.122116.154037	L16120768-07	0101-0131A-S12	40/50	1		12/21/16 15:40
54	T4.122116.154425	WG596008-23	CCV		1		12/21/16 15:44
55	T4.122116.154758	WG596008-24	CCB		1		12/21/16 15:47
56	T4.122116.155149	L16120768-08	0101-0131A-S6	40/50	1		12/21/16 15:51
57	T4.122116.155535	L16120768-09	0101-0131A-S18	40/50	1		12/21/16 15:55
58	T4.122116.155922	L16120768-10	0101-0131A-S8	40/50	1		12/21/16 15:59
59	T4.122116.160308	L16120768-11	0101-0131A-S9	40/50	1		12/21/16 16:03
60	T4.122116.160655	L16120773-01	0101-129-S2	40/50	1		12/21/16 16:06
61	T4.122116.161041	L16120719-03	120F-120916	40/50	2		12/21/16 16:10
62	T4.122116.161429	WG596008-25	CCV		1		12/21/16 16:14
63	T4.122116.161802	WG596008-26	CCB		1		12/21/16 16:18
64	T4.122116.162154	WG596008-27	Low Level Continuing Calibra		1		12/21/16 16:21
65	T4.122116.162542	WG596008-28	Low Level Continuing Calibra		1		12/21/16 16:25
66	T4.122116.162934	WG595274-02	Method/Prep Blank		1		12/21/16 16:29
67	T4.122116.163323	WG595274-03	Laboratory Control S		1		12/21/16 16:33
68	T4.122116.163700	WG595020-01	Fluid Blank 1		1		12/21/16 16:37

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Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO4 Dataset: 122116T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 594869,595141,594644,594975

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T4.122116.164048	WG595020-02	Fluid Blank 2		1		12/21/16 16:40
70	T4.122116.164436	L16120748-02	INS-WS01-121216		1		12/21/16 16:44
71	T4.122116.164824	WG595274-01	Reference Sample		1	L16120834-01	12/21/16 16:48
72	T4.122116.165210	WG595274-04	Matrix Spike		1	L16120834-01	12/21/16 16:52
73	T4.122116.165549	WG595274-05	Matrix Spike Duplica		1	L16120834-01	12/21/16 16:55
74	T4.122116.165936	WG596008-29	CCV		1		12/21/16 16:59
75	T4.122116.170308	WG596008-30	CCB		1		12/21/16 17:03
76	T4.122116.170658	L16120957-01	TNK-WW121516EL-001		1		12/21/16 17:06
77	T4.122116.171051	WG595380-03	Post Digestion Spike		1	L16120748-02	12/21/16 17:10
78	T4.122116.171437	WG595380-04	Serial Dilution		5	L16120748-02	12/21/16 17:14
79	T4.122116.171827	WG596008-31	CCV		1		12/21/16 17:18
80	T4.122116.172159	WG596008-32	CCB		1		12/21/16 17:21
81	T4.122116.172550	WG596008-33	LLCCV		1		12/21/16 17:25
82	T4.122116.172938	WG596008-34	Low Level Continuing Calibra		1		12/21/16 17:29
83	T4.122116.173327	WG594037-03	Method/Prep Blank		1		12/21/16 17:33
84	T4.122116.173715	WG594037-04	Laboratory Control S		1		12/21/16 17:37
85	T4.122116.174052	L16120342-04	A09-TM02-Y1S4		1		12/21/16 17:40
86	T4.122116.174439	WG594644-03	Post Digestion Spike		1	L16120360-01	12/21/16 17:44
87	T4.122116.174816	WG594644-04	Serial Dilution		5	L16120360-01	12/21/16 17:48
88	T4.122116.175204	WG594037-01	Reference Sample		1	L16120352-01	12/21/16 17:52
89	T4.122116.175559	WG594037-02	Reference Sample		1	L16120352-02	12/21/16 17:55
90	T4.122116.175953	WG594037-05	Matrix Spike		1	L16120352-01	12/21/16 17:59
91	T4.122116.180340	WG594037-07	Matrix Spike		1	L16120352-02	12/21/16 18:03
92	T4.122116.180727	WG596008-35	CCV		1		12/21/16 18:07
93	T4.122116.181100	WG596008-36	CCB		1		12/21/16 18:11
94	T4.122116.181450	WG594037-06	Matrix Spike Duplica		1	L16120352-01	12/21/16 18:14
95	T4.122116.181838	WG594037-08	Matrix Spike Duplica		1	L16120352-02	12/21/16 18:18
96	T4.122116.182225	WG594037-01	Reference Sample		10	L16120352-01	12/21/16 18:22
97	T4.122116.182611	WG594037-05	Matrix Spike	40/50	10	L16120352-01	12/21/16 18:26
98	T4.122116.182956	WG594037-06	Matrix Spike Duplica	40/50	10	L16120352-01	12/21/16 18:29
99	T4.122116.183341	WG596008-37	CCV		1		12/21/16 18:33
100	T4.122116.183714	WG596008-38	CCB		1		12/21/16 18:37
101	T4.122116.184102	WG596008-39	LLCCV		1		12/21/16 18:41
102	T4.122116.184451	WG596008-40	Low Level Continuing Calibra		1		12/21/16 18:44

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Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

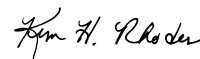
Instrument: ICP-THERMO4 Dataset: 122116T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594869,595141,594644,594975

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T4.122116.184841	WG594498-02	Method/Prep Blank		1		12/21/16 18:48
104	T4.122116.185229	WG594498-03	Laboratory Control S		1		12/21/16 18:52
105	T4.122116.185608	WG594498-01	Reference Sample		1	L16120352-08	12/21/16 18:56
106	T4.122116.185954	WG594498-04	Matrix Spike		1	L16120352-08	12/21/16 18:59
107	T4.122116.190332	WG594498-05	Matrix Spike Duplica		1	L16120352-08	12/21/16 19:03
108	T4.122116.190709	L16120352-16	MW01-120616		1		12/21/16 19:07
109	T4.122116.191054	WG594872-05	Post Digestion Spike		1	L16120352-17	12/21/16 19:10
110	T4.122116.191433	WG594872-06	Serial Dilution		5	L16120352-17	12/21/16 19:14
111	T4.122116.191820	L16120352-17	MW16I-120616		1		12/21/16 19:18
112	T4.122116.192206	L16120352-18	MW16I-120616		1		12/21/16 19:22
113	T4.122116.192554	WG596008-41	CCV		1		12/21/16 19:25
114	T4.122116.192927	WG596008-42	CCB		1		12/21/16 19:29
115	T4.122116.193316	L16120352-21	MW26-120616		1		12/21/16 19:33
116	T4.122116.193703	L16120425-21	DUP-GW-120716-1		1		12/21/16 19:37
117	T4.122116.194048	L16120425-22	DUP-GW-120716-1		1		12/21/16 19:40
118	T4.122116.194434	L16120425-23	DUP-GW-120716-2		1		12/21/16 19:44
119	T4.122116.194828	L16120425-24	DUP-GW-120716-2		1		12/21/16 19:48
120	T4.122116.195222	L16120568-01	A08/09-120516-RB01-Y1S4		1		12/21/16 19:52
121	T4.122116.195612	WG596008-43	CCV		1		12/21/16 19:56
122	T4.122116.195945	WG596008-44	CCB		1		12/21/16 19:59
123	T4.122116.200335	WG596008-45	LLCCV		1		12/21/16 20:03
124	T4.122116.200724	WG596008-46	Low Level Continuing Calibra		1		12/21/16 20:07
125	T4.122116.201113	WG594634-02	Method/Prep Blank	40/50	1		12/21/16 20:11
126	T4.122116.201501	WG594634-03	Laboratory Control S	40/50	1		12/21/16 20:15
127	T4.122116.201839	L16120425-01	PZ06-120616	40/50	1		12/21/16 20:18
128	T4.122116.202225	L16120425-02	PZ06-120616	40/50	1		12/21/16 20:22
129	T4.122116.202612	L16120425-03	MW18-120616	40/50	1		12/21/16 20:26
130	T4.122116.202956	L16120425-04	MW18-120616	40/50	1		12/21/16 20:29
131	T4.122116.203342	L16120425-05	MW11S-120716	40/50	1		12/21/16 20:33
132	T4.122116.203737	L16120425-06	MW11S-120716	40/50	1		12/21/16 20:37
133	T4.122116.204132	WG594875-01	Post Digestion Spike		1	L16120425-06	12/21/16 20:41
134	T4.122116.204518	WG594875-02	Serial Dilution		5	L16120425-06	12/21/16 20:45
135	T4.122116.204909	WG596008-47	CCV		1		12/21/16 20:49
136	T4.122116.205242	WG596008-48	CCB		1		12/21/16 20:52

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Instrument Run Log

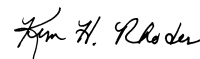
Instrument: ICP-THERMO4 Dataset: 122116T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 594869,595141,594644,594975

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
137	T4.122116.205633	L16120425-07	MW05I-120716	40/50	1		12/21/16 20:56
138	T4.122116.210018	L16120425-08	MW05I-120716	40/50	1		12/21/16 21:00
139	T4.122116.210405	L16120425-09	MW30-120716	40/50	1		12/21/16 21:04
140	T4.122116.210759	L16120425-10	MW30-120716	40/50	1		12/21/16 21:07
141	T4.122116.211144	L16120425-11	MW07-120716	40/50	1		12/21/16 21:11
142	T4.122116.211530	L16120425-12	MW07-120716	40/50	1		12/21/16 21:15
143	T4.122116.211914	L16120425-13	MW20-120716	40/50	1		12/21/16 21:19
144	T4.122116.212300	L16120425-14	MW20-120716	40/50	1		12/21/16 21:23
145	T4.122116.212646	L16120425-15	MW06-120716	40/50	1		12/21/16 21:26
146	T4.122116.213032	L16120425-16	MW06-120716	40/50	1		12/21/16 21:30
147	T4.122116.213421	WG596008-49	CCV		1		12/21/16 21:34
148	T4.122116.213754	WG596008-50	CCB		1		12/21/16 21:37
149	T4.122116.214144	L16120425-17	MW10-120716	40/50	1		12/21/16 21:41
150	T4.122116.214530	L16120425-18	MW10-120716	40/50	1		12/21/16 21:45
151	T4.122116.214916	L16120425-19	PZ03-120716	40/50	1		12/21/16 21:49
152	T4.122116.215310	WG594634-01	Reference Sample		1	L16120425-20	12/21/16 21:53
153	T4.122116.215705	WG594634-04	Matrix Spike	40/50	1	L16120425-20	12/21/16 21:57
154	T4.122116.220052	WG594634-05	Matrix Spike Duplica	40/50	1	L16120425-20	12/21/16 22:00
155	T4.122116.220439	WG596008-51	CCV		1		12/21/16 22:04
156	T4.122116.220812	WG596008-52	CCB		1		12/21/16 22:08
157	T4.122116.221202	WG596008-53	LLCCV		1		12/21/16 22:12
158	T4.122116.221552	WG596008-54	Low Level Continuing Calibra		1		12/21/16 22:15
159	T4.122116.221940	WG596008-55	Interference Check		1		12/21/16 22:19
160	T4.122116.222335	WG596008-56	Interference Check		1		12/21/16 22:23
161	T4.122116.222724	WG596008-57	CCV		1		12/21/16 22:27
162	T4.122116.223056	WG596008-58	CCB		1		12/21/16 22:30

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Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO3 Dataset: 122216T3.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD79328 ICV Std: STD79359 Post Spike: STD77272
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RG31668
 CCV: STD79360 LLCCV: STD79605 Tuning Sol: _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594872,594644,594875,595139,595141,595175,595976

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	T3.122216.155910	WG596231-01	Calibration Point		1		12/22/16 15:59
2	T3.122216.160305	WG596231-02	Calibration Point		1		12/22/16 16:03
3	T3.122216.160701	WG596231-03	Calibration Point		1		12/22/16 16:07
4	T3.122216.161058	WG596231-04	Calibration Point		1		12/22/16 16:10
5	T3.122216.161433	WG596231-05	Calibration Point		1		12/22/16 16:14
6	T3.122216.161808	WG596231-06	Initial Calibration Verification		1		12/22/16 16:18
7	T3.122216.162132	WG596231-07	Initial Calib Blank		1		12/22/16 16:21
8	T3.122216.162528	WG596231-08	Low Level Initial Calibration V		1		12/22/16 16:25
9	T3.122216.162911	WG596231-09	Low Level Initial Calibration V		1		12/22/16 16:29
10	T3.122216.163303	WG596231-10	Interference Check		1		12/22/16 16:33
11	T3.122216.163656	WG596231-11	Interference Check		1		12/22/16 16:36
12	T3.122216.164038	WG596231-12	CCV		1		12/22/16 16:40
13	T3.122216.164412	WG596231-13	CCB		1		12/22/16 16:44
14	T3.122216.172732	WG594498-02	Method/Prep Blank	40/50	1		12/22/16 17:27
15	T3.122216.173128	WG594498-03	Laboratory Control S	40/50	1		12/22/16 17:31
16	T3.122216.173507	WG594498-01	Reference Sample		1	L16120352-08	12/22/16 17:35
17	T3.122216.173859	WG594498-04	Matrix Spike	40/50	1	L16120352-08	12/22/16 17:38
18	T3.122216.174238	WG594498-05	Matrix Spike Duplica	40/50	1	L16120352-08	12/22/16 17:42
19	T3.122216.174617	L16120352-16	MW01-120616	40/50	1		12/22/16 17:46
20	T3.122216.175009	L16120352-17	MW16I-120616	40/50	1		12/22/16 17:50
21	T3.122216.175401	WG594872-05	Post Digestion Spike		1	L16120352-17	12/22/16 17:54
22	T3.122216.175739	WG594872-06	Serial Dilution		5	L16120352-17	12/22/16 17:57
23	T3.122216.180132	L16120352-18	MW16I-120616	40/50	1		12/22/16 18:01
24	T3.122216.180525	WG596231-14	CCV		1		12/22/16 18:05
25	T3.122216.180900	WG596231-15	CCB		1		12/22/16 18:09
26	T3.122216.181258	L16120352-21	MW26-120616	40/50	1		12/22/16 18:12
27	T3.122216.181649	L16120425-21	DUP-GW-120716-1	40/50	1		12/22/16 18:16
28	T3.122216.182041	L16120425-22	DUP-GW-120716-1	40/50	1		12/22/16 18:20
29	T3.122216.182434	L16120425-23	DUP-GW-120716-2	40/50	1		12/22/16 18:24
30	T3.122216.182835	L16120425-24	DUP-GW-120716-2	40/50	1		12/22/16 18:28
31	T3.122216.183237	L16120568-01	A08/09-120516-RB01-Y1S4	40/50	1		12/22/16 18:32
32	T3.122216.183634	WG596231-16	CCV		1		12/22/16 18:36
33	T3.122216.184009	WG596231-17	CCB		1		12/22/16 18:40
34	T3.122216.184408	WG596231-18	Low Level Continuing Calibra		1		12/22/16 18:44

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Instrument Run Log

Instrument: ICP-THERMO3 Dataset: 122216T3.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD79328 ICV Std: STD79359 Post Spike: STD77272
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT31668
 CCV: STD79360 LLCCV: STD79605 Tuning Sol: _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594872,594644,594875,595139,595141,595175,595976Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	T3.122216.184802	WG596231-19	Low Level Continuing Calibra		1		12/22/16 18:48
36	T3.122216.185154	WG594037-03	Method/Prep Blank	40/50	1		12/22/16 18:51
37	T3.122216.185549	WG594037-04	Laboratory Control S	40/50	1		12/22/16 18:55
38	T3.122216.185927	WG594037-01	Reference Sample		1	L16120352-01	12/22/16 18:59
39	T3.122216.190328	WG594037-02	Reference Sample		1	L16120352-02	12/22/16 19:03
40	T3.122216.190730	WG594037-05	Matrix Spike	40/50	1	L16120352-01	12/22/16 19:07
41	T3.122216.191117	WG594037-07	Matrix Spike	40/50	1	L16120352-02	12/22/16 19:11
42	T3.122216.191504	WG594037-06	Matrix Spike Duplica	40/50	1	L16120352-01	12/22/16 19:15
43	T3.122216.191850	WG594037-08	Matrix Spike Duplica	40/50	1	L16120352-02	12/22/16 19:18
44	T3.122216.192238	WG596231-20	CCV		1		12/22/16 19:22
45	T3.122216.192613	WG596231-21	CCB		1		12/22/16 19:26
46	T3.122216.193011	L16120360-01	12002-F01-WQ-W0011	40/50	1		12/22/16 19:30
47	T3.122216.193406	WG594644-03	Post Digestion Spike		1	L16120360-01	12/22/16 19:34
48	T3.122216.193744	WG594644-04	Serial Dilution		5	L16120360-01	12/22/16 19:37
49	T3.122216.194142	WG596231-22	CCV		1		12/22/16 19:41
50	T3.122216.194517	WG596231-23	CCB		1		12/22/16 19:45
51	T3.122216.194915	WG596231-24	Low Level Continuing Calibra		1		12/22/16 19:49
52	T3.122216.195308	WG596231-25	Low Level Continuing Calibra		1		12/22/16 19:53
53	T3.122216.195701	WG594634-02	Method/Prep Blank	40/50	1		12/22/16 19:57
54	T3.122216.200057	WG594634-03	Laboratory Control S	40/50	1		12/22/16 20:00
55	T3.122216.200436	L16120425-01	PZ06-120616	40/50	1		12/22/16 20:04
56	T3.122216.200831	L16120425-01	PZ06-120616	40/50	5		12/22/16 20:08
57	T3.122216.201226	L16120425-02	PZ06-120616	40/50	1		12/22/16 20:12
58	T3.122216.201618	L16120425-03	MW18-120616	40/50	1		12/22/16 20:16
59	T3.122216.202007	L16120425-04	MW18-120616	40/50	1		12/22/16 20:20
60	T3.122216.202359	WG594875-03	Post Digestion Spike		1	L16120425-04	12/22/16 20:23
61	T3.122216.202736	WG594875-04	Serial Dilution		5	L16120425-04	12/22/16 20:27
62	T3.122216.203129	L16120425-05	MW11S-120716	40/50	1		12/22/16 20:31
63	T3.122216.203533	WG596231-26	CCV		1		12/22/16 20:35
64	T3.122216.203908	WG596231-27	CCB		1		12/22/16 20:39
65	T3.122216.204305	L16120425-05	MW11S-120716	40/50	5		12/22/16 20:43
66	T3.122216.204701	L16120425-06	MW11S-120716	40/50	1		12/22/16 20:47
67	T3.122216.205104	L16120425-07	MW05I-120716	40/50	1		12/22/16 20:51
68	T3.122216.205457	L16120425-08	MW05I-120716	40/50	1		12/22/16 20:54

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K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO3 Dataset: 122216T3.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD79328 ICV Std: STD79359 Post Spike: STD77272
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT31668
 CCV: STD79360 LLCCV: STD79605 Tuning Sol: _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594872,594644,594875,595139,595141,595175,595976

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	T3.122216.205850	L16120425-09	MW30-120716	40/50	1		12/22/16 20:58
70	T3.122216.210251	L16120425-09	MW30-120716	40/50	5		12/22/16 21:02
71	T3.122216.210645	L16120425-10	MW30-120716	40/50	1		12/22/16 21:06
72	T3.122216.211038	L16120425-11	MW07-120716	40/50	1		12/22/16 21:10
73	T3.122216.211433	L16120425-12	MW07-120716	40/50	1		12/22/16 21:14
74	T3.122216.211826	L16120425-13	MW20-120716	40/50	1		12/22/16 21:18
75	T3.122216.212219	WG596231-28	CCV		1		12/22/16 21:22
76	T3.122216.212553	WG596231-29	CCB		1		12/22/16 21:25
77	T3.122216.212950	L16120425-14	MW20-120716	40/50	1		12/22/16 21:29
78	T3.122216.213342	L16120425-15	MW06-120716	40/50	1		12/22/16 21:33
79	T3.122216.213735	L16120425-16	MW06-120716	40/50	1		12/22/16 21:37
80	T3.122216.214127	L16120425-17	MW10-120716	40/50	1		12/22/16 21:41
81	T3.122216.214520	L16120425-18	MW10-120716	40/50	1		12/22/16 21:45
82	T3.122216.214913	L16120425-19	PZ03-120716	40/50	1		12/22/16 21:49
83	T3.122216.215314	L16120425-19	PZ03-120716	40/50	5		12/22/16 21:53
84	T3.122216.215715	WG594634-01	Reference Sample		1	L16120425-20	12/22/16 21:57
85	T3.122216.220100	WG594634-04	Matrix Spike	40/50	1	L16120425-20	12/22/16 22:01
86	T3.122216.220446	WG594634-05	Matrix Spike Duplica	40/50	1	L16120425-20	12/22/16 22:04
87	T3.122216.220840	WG596231-30	CCV		1		12/22/16 22:08
88	T3.122216.221215	WG596231-31	CCB		1		12/22/16 22:12
89	T3.122216.221611	WG596231-32	Low Level Continuing Calibra		1		12/22/16 22:16
90	T3.122216.222005	WG596231-33	Low Level Continuing Calibra		1		12/22/16 22:20
91	T3.122216.222358	WG594999-02	Method/Prep Blank	40/50	1		12/22/16 22:23
92	T3.122216.222755	WG594999-03	Laboratory Control S	40/50	1		12/22/16 22:27
93	T3.122216.223133	WG594999-01	Reference Sample		1	L16120639-15	12/22/16 22:31
94	T3.122216.223526	WG594999-04	Matrix Spike	40/50	1	L16120639-15	12/22/16 22:35
95	T3.122216.223903	WG594999-05	Matrix Spike Duplica	40/50	1	L16120639-15	12/22/16 22:39
96	T3.122216.224240	L16120680-01	6-10-23 W1	40/50	1		12/22/16 22:42
97	T3.122216.224633	WG595139-03	Post Digestion Spike		1	L16120680-01	12/22/16 22:46
98	T3.122216.225011	WG595139-04	Serial Dilution		5	L16120680-01	12/22/16 22:50
99	T3.122216.225406	WG596231-34	CCV		1		12/22/16 22:54
100	T3.122216.225741	WG596231-35	CCB		1		12/22/16 22:57
101	T3.122216.230137	WG596231-36	Low Level Continuing Calibra		1		12/22/16 23:01
102	T3.122216.230531	WG596231-37	Low Level Continuing Calibra		1		12/22/16 23:05

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K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO3 Dataset: 122216T3.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD79328 ICV Std: STD79359 Post Spike: STD77272
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT31668
 CCV: STD79360 LLCCV: STD79605 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 594872,594644,594875,595139,595141,595175,595976

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	T3.122216.230923	L16120719-03	120F-120916	40/50	10		12/22/16 23:09
104	T3.122216.231316	WG594996-01	Reference Sample		5	L16120719-08	12/22/16 23:13
105	T3.122216.231710	WG594996-04	Matrix Spike	40/50	5	L16120719-08	12/22/16 23:17
106	T3.122216.232100	WG594996-05	Matrix Spike Duplica	40/50	5	L16120719-08	12/22/16 23:21
107	T3.122216.232451	L16120719-16	18WW25F-120916	40/50	5		12/22/16 23:24
108	T3.122216.232845	L16120719-19	MW16-121216	40/50	10		12/22/16 23:28
109	T3.122216.233240	WG596231-38	CCV		1		12/22/16 23:32
110	T3.122216.233615	WG596231-39	CCB		1		12/22/16 23:36
111	T3.122216.234011	WG596231-40	Low Level Continuing Calibra		1		12/22/16 23:40
112	T3.122216.234405	WG596231-41	Low Level Continuing Calibra		1		12/22/16 23:44
113	T3.122216.234759	WG594906-02	Method/Prep Blank	40/50	1		12/22/16 23:47
114	T3.122216.235155	WG594906-03	Laboratory Control S	40/50	1		12/22/16 23:51
115	T3.122216.235533	L16120521-01	MW36-120816	40/50	1		12/22/16 23:55
116	T3.122216.235925	L16120521-02	MW36-120816	40/50	1		12/22/16 23:59
117	T3.122316.000317	L16120521-03	MW37-120816	40/50	1		12/23/16 00:03
118	T3.122316.000717	L16120521-04	MW37-120816	40/50	1		12/23/16 00:07
119	T3.122316.001120	L16120521-05	MW35-120816	40/50	1		12/23/16 00:11
120	T3.122316.001512	L16120521-06	MW35-120816	40/50	1		12/23/16 00:15
121	T3.122316.001904	WG595175-01	Post Digestion Spike		1	L16120521-06	12/23/16 00:19
122	T3.122316.002231	WG595175-02	Serial Dilution		5	L16120521-06	12/23/16 00:22
123	T3.122316.002637	WG596231-42	CCV		1		12/23/16 00:26
124	T3.122316.003012	WG596231-43	CCB		1		12/23/16 00:30
125	T3.122316.003409	L16120521-11	MW24-120816	40/50	1		12/23/16 00:34
126	T3.122316.003811	L16120521-12	MW24-120816	40/50	1		12/23/16 00:38
127	T3.122316.004211	WG594906-01	Reference Sample		1	L16120639-14	12/23/16 00:42
128	T3.122316.004604	L16120639-16	MW6AC	40/50	1		12/23/16 00:46
129	T3.122316.004956	L16120639-17	MW6AC	40/50	1		12/23/16 00:49
130	T3.122316.005349	WG594906-04	Matrix Spike	40/50	1	L16120639-14	12/23/16 00:53
131	T3.122316.005727	WG594906-05	Matrix Spike Duplica	40/50	1	L16120639-14	12/23/16 00:57
132	T3.122316.010105	L16120639-22	RINSATE 02	40/50	1		12/23/16 01:01
133	T3.122316.010500	L16120747-01	PTO-EB01-121116	40/50	1		12/23/16 01:05
134	T3.122316.010856	L16120747-02	PTO-EB02-121116	40/50	1		12/23/16 01:08
135	T3.122316.011254	WG596231-44	CCV		1		12/23/16 01:12
136	T3.122316.011628	WG596231-45	CCB		1		12/23/16 01:16

Page: 4 Approved: December 23, 2016

K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO3 Dataset: 122216T3.1R.TXT

Analyst1: KKB Analyst2: N/A

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

Maintenance Log ID: _____

Calibration Std: STD79328 ICV Std: STD79359 Post Spike: STD77272

ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT31668

CCV: STD79360 LLCCV: STD79605 Tuning Sol: _____

Stannous: _____ Hydroxylamine: _____

Workgroups: 594872,594644,594875,595139,595141,595175,595976

Comments:

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Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
137	T3.122316.012024	L16120747-03	PTO-EB03-121116	40/50	1		12/23/16 01:20
138	T3.122316.012420	L16120747-04	MW854B-GW-121216	40/50	1		12/23/16 01:24
139	T3.122316.012811	L16120747-05	MW107-GW-121216	40/50	1		12/23/16 01:28
140	T3.122316.013203	L16120775-02	PERMEATE	1/50	1		12/23/16 01:32
141	T3.122316.013557	L16120775-04	BLEED	1/50	1		12/23/16 01:35
142	T3.122316.013950	L16120775-06	N. DOCK FLUME	1/50	1		12/23/16 01:39
143	T3.122316.014346	WG596231-46	CCV		1		12/23/16 01:43
144	T3.122316.014721	WG596231-47	CCB		1		12/23/16 01:47
145	T3.122316.015117	WG596231-48	Low Level Continuing Calibra		1		12/23/16 01:51
146	T3.122316.015511	WG596231-49	Low Level Continuing Calibra		1		12/23/16 01:55
147	T3.122316.015905	WG595481-02	Method/Prep Blank	40/50	1		12/23/16 01:59
148	T3.122316.020300	WG595481-03	Laboratory Control S	40/50	1		12/23/16 02:03
149	T3.122316.020639	L16120975-02	AWD4F-121316	40/50	1		12/23/16 02:06
150	T3.122316.021030	L16120975-04	AWD4FDF-121316	40/50	1		12/23/16 02:10
151	T3.122316.021420	L16120975-06	18CPTMW24-121316	40/50	1		12/23/16 02:14
152	T3.122316.021819	L16120975-07	MW8-121516	40/50	1		12/23/16 02:18
153	T3.122316.022212	L16120975-08	MW8FD-121516	40/50	1		12/23/16 02:22
154	T3.122316.022605	L16120975-10	MW18F-121516	40/50	1		12/23/16 02:26
155	T3.122316.022957	WG595976-01	Post Digestion Spike		1	L16120975-10	12/23/16 02:29
156	T3.122316.023335	WG595976-02	Serial Dilution		5	L16120975-10	12/23/16 02:33
157	T3.122316.023729	WG596231-50	CCV		1		12/23/16 02:37
158	T3.122316.024104	WG596231-51	CCB		1		12/23/16 02:41
159	T3.122316.024500	L16120975-11	18WW20-121516	40/50	1		12/23/16 02:45
160	T3.122316.024854	L16120975-13	18CPTMW14F-121516	40/50	1		12/23/16 02:48
161	T3.122316.025254	L16120975-15	18CPTMW18F-121516	40/50	1		12/23/16 02:52
162	T3.122316.025653	L16120989-02	SW1A-328-14	40/50	1		12/23/16 02:56
163	T3.122316.030047	L16120989-05	SW1B-328-14	40/50	1		12/23/16 03:00
164	T3.122316.030441	L16120989-08	SW2A-328-14	40/50	1		12/23/16 03:04
165	T3.122316.030837	WG595481-01	Reference Sample		1	L16120989-13	12/23/16 03:08
166	T3.122316.031231	WG595481-04	Matrix Spike	40/50	1	L16120989-13	12/23/16 03:12
167	T3.122316.031608	WG595481-05	Matrix Spike Duplica	40/50	1	L16120989-13	12/23/16 03:16
168	T3.122316.031945	L16120989-20	SW4A-328-14	40/50	1		12/23/16 03:19
169	T3.122316.032341	WG596231-52	CCV		1		12/23/16 03:23
170	T3.122316.032717	WG596231-53	CCB		1		12/23/16 03:27

Page: 5 Approved: December 23, 2016

K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-THERMO3 Dataset: 122216T3.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD79328 ICV Std: STD79359 Post Spike: STD77272
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RG31668
 CCV: STD79360 LLCCV: STD79605 Tuning Sol: _____
 Stannous: _____ Hydroxylamine: _____

Workgroups: 594872,594644,594875,595139,595141,595175,595976

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
171	T3.122316.033113	L16120989-23	SW5A-328-14	40/50	1		12/23/16 03:31
172	T3.122316.033508	L16121003-01	DEC 2016 PAINT PREP WA	40/50	1		12/23/16 03:35
173	T3.122316.033844	L16121034-01	10206-D01-WQ-W0008	40/50	1		12/23/16 03:38
174	T3.122316.034240	L16121034-02	15105-D04-WQ-W0016	40/50	1		12/23/16 03:42
175	T3.122316.034637	L16121034-03	15105-D09-WQ-W0039	40/50	1		12/23/16 03:46
176	T3.122316.035032	L16121034-04	15105-G07-WQ-W0109	40/50	1		12/23/16 03:50
177	T3.122316.035432	WG596231-54	CCV		1		12/23/16 03:54
178	T3.122316.035807	WG596231-55	CCB		1		12/23/16 03:58
179	T3.122316.040204	WG596231-56	Low Level Continuing Calibra		1		12/23/16 04:02
180	T3.122316.040556	WG596231-57	Low Level Continuing Calibra		1		12/23/16 04:05
181	T3.122316.040949	WG596231-58	Interference Check		1		12/23/16 04:09
182	T3.122316.041342	WG596231-59	Interference Check		1		12/23/16 04:13
183	T3.122316.041726	WG596231-60	CCV		1		12/23/16 04:17
184	T3.122316.042100	WG596231-61	CCB		1		12/23/16 04:21
185	T3.122316.042458	STD79561	STD79561		1		12/23/16 04:24
186	T3.122316.042857	WG596231-62	CCV		1		12/23/16 04:28
187	T3.122316.043232	WG596231-63	CCB		1		12/23/16 04:32

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K: K Buck

Microbac Laboratories Inc.

Data Checklist

Date: 09-DEC-2016
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 594361
 Runlog ID: 79148
 Analytical Workgroups: 593600,594313,594314,593662,594316

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	236,315,231,473
Level 4	1248,352,267,275,424,
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:
12-DEC-2016

Secondary Reviewer:
13-DEC-2016



Microbac Laboratories Inc.

Data Checklist

Date: 12-DEC-2016
 Analyst: JYH
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 594704
 Runlog ID: 79191
 Analytical Workgroups: 594316,594313,594314

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	
Level 4	352
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:
13-DEC-2016

Secondary Reviewer:
13-DEC-2016



Microbac Laboratories Inc.

Data Checklist

Date: 14-DEC-2016
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 594926
 Runlog ID: 79229
 Analytical Workgroups: 594644,594644,594313,594316,594871

Add'l WGs	
STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	
Level 4	360,352,342,682
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KKB
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
14-DEC-2016

Secondary Reviewer:
14-DEC-2016

Ki K Buck

Lyn H. Rhodes



Microbac Laboratories Inc.

Data Checklist

Date: 15-DEC-2016
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 595250
 Runlog ID: 79270
 Analytical Workgroups: 594871,594869,594866,594872

Add'l WGs	
STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	564,618,619,620,621,472
Level 4	520,521,641,455,593,352,425,568,591
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KKB
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
16-DEC-2016

Secondary Reviewer:
16-DEC-2016

Ki K Beck

Lyn H. Rhodes



Microbac Laboratories Inc.

Data Checklist

Date: 18-DEC-2016
 Analyst: KKB
 Analyst: PDM
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 595477
 Runlog ID: 79311
 Analytical Workgroups: 594866,594869,594871,594872

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	0455,0472,0520,0521,0564,0618,0619 0620,0621,0641,0608,0648,0692,0352 0425,0484,0568,
Client Forms	
Level X	
Level 3	0564,0618,0619,0620,0621,0472
Level 4	0568,0520,0521,0641,0455
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	PDM
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
19-DEC-2016

Secondary Reviewer:
19-DEC-2016

Pierce Morris *Kym H. Rhodes*



Microbac Laboratories Inc.

Data Checklist

Date: 21-DEC-2016
 Analyst: KKB
 Analyst: NA
 Method: 6010B/6010C/200.7
 Instrument: ICP-THERMO4
 Curve Workgroup: 596008
 Runlog ID: 79399
 Analytical Workgroups: 594869,595141,594644,594975

Add'l WGs	
STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	
Level 4	520,719,352,425
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KKB
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
22-DEC-2016

Secondary Reviewer:
22-DEC-2016

Ki K Beck

Lyn H. Rhodes



Microbac Laboratories Inc.

Data Checklist

Date: 22-DEC-2016
 Analyst: KKB
 Analyst: NA
 Method: 200.7/6010B/6010C
 Instrument: ICP-THERMO3
 Curve Workgroup: 596231
 Runlog ID: 79436
 Analytical Workgroups: 594872,594644,594875,595139,595141,595175,595976

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	X
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	747
Level 4	352,425,568,639,719,521,639
	975,1034
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:
23-DEC-2016

Secondary Reviewer:
23-DEC-2016



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6010C
 Login Number:L16120352

AAB#:WG594644

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
MW23-120616	01	12/06/16					12/08/2016	1.9	180		12/22/16	16.3	180	
MW23-120616	02	12/06/16					12/08/2016	1.9	180		12/22/16	16.3	180	
MW23-120616-MS	03	12/06/16					12/08/2016	1.9	180		12/22/16	16.3	180	
MW23-120616-MS	04	12/06/16					12/08/2016	1.9	180		12/22/16	16.3	180	
MW23-120616-MSD	05	12/06/16					12/08/2016	1.9	180		12/22/16	16.3	180	
MW23-120616-MSD	06	12/06/16					12/08/2016	1.9	180		12/22/16	16.3	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5080537
 Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6010C
 Login Number:L16120352

AAB#:WG594872

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
MW02-120616	08	12/06/16					12/12/2016	6	180		12/22/16	16.3	180	
MW02-120616-MS	10	12/06/16					12/12/2016	6	180		12/22/16	16.3	180	
MW02-120616-MSD	12	12/06/16					12/12/2016	6	180		12/22/16	16.3	180	
MW01-120616	16	12/06/16					12/12/2016	5.9	180		12/22/16	16.1	180	
MW16I-120616	17	12/06/16					12/12/2016	6	180		12/22/16	16.2	180	
MW16I-120616	18	12/06/16					12/12/2016	6	180		12/22/16	16.2	180	
MW26-120616	21	12/06/16					12/12/2016	5.9	180		12/22/16	16.1	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5080537
 Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6010C
 Login Number:L16120352

AAB#:WG594313

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
MW02-120616	07	12/06/16					12/08/2016	2	180		12/09/16	3.2	180	
MW02-120616	07	12/06/16					12/08/2016	2	180		12/14/16	8.2	180	
MW02-120616-MS	09	12/06/16					12/08/2016	2	180		12/09/16	3.2	180	
MW02-120616-MS	09	12/06/16					12/08/2016	2	180		12/14/16	8.2	180	
MW02-120616-MSD	11	12/06/16					12/08/2016	2	180		12/14/16	8.2	180	
MW02-120616-MSD	11	12/06/16					12/08/2016	2	180		12/09/16	3.2	180	
MW09R-120616	13	12/06/16					12/08/2016	1.9	180		12/14/16	8.1	180	
MW09R-120616	13	12/06/16					12/08/2016	1.9	180		12/09/16	3.1	180	
MW09R-120616	13	12/06/16					12/08/2016	1.9	180		12/09/16	3.1	180	
MW09R-120616	14	12/06/16					12/08/2016	1.9	180		12/09/16	3.1	180	
MW09R-120616	14	12/06/16					12/08/2016	1.9	180		12/14/16	8.1	180	
MW01-120616	15	12/06/16					12/08/2016	1.9	180		12/14/16	8.1	180	
MW01-120616	15	12/06/16					12/08/2016	1.9	180		12/09/16	3.1	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5056949
 Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6010C
 Login Number:L16120352

AAB#:WG594316

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
MW26-120616	22	12/06/16					12/09/2016	2.8	180		12/14/16	8.1	180	
MW26-120616	22	12/06/16					12/09/2016	2.8	180		12/09/16	3.2	180	
MW17-120616	23	12/06/16					12/09/2016	2.9	180		12/14/16	8.3	180	
MW17-120616	23	12/06/16					12/09/2016	2.9	180		12/09/16	3.4	180	
MW17-120616	24	12/06/16					12/09/2016	2.9	180		12/09/16	3.4	180	
MW17-120616	24	12/06/16					12/09/2016	2.9	180		12/14/16	8.3	180	
DUP-GW-120616	26	12/06/16					12/09/2016	2.9	180		12/14/16	8.2	180	
DUP-GW-120616	26	12/06/16					12/09/2016	2.9	180		12/09/16	3.3	180	
DUP-GW-120616	27	12/06/16					12/09/2016	2.9	180		12/14/16	8.2	180	
DUP-GW-120616	27	12/06/16					12/09/2016	2.9	180		12/09/16	3.4	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5056949
 Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6010C
 Login Number:L16120352

AAB#:WG594644

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
MW23-120616	01	12/06/16					12/08/2016	1.9	180		12/14/16	8.1	180	
MW23-120616	01	12/06/16					12/08/2016	1.9	180		12/21/16	15.3	180	
MW23-120616	02	12/06/16					12/08/2016	1.9	180		12/14/16	8.1	180	
MW23-120616-MS	03	12/06/16					12/08/2016	1.9	180		12/21/16	15.3	180	
MW23-120616-MS	03	12/06/16					12/08/2016	1.9	180		12/14/16	8.1	180	
MW23-120616-MS	04	12/06/16					12/08/2016	1.9	180		12/14/16	8.1	180	
MW23-120616-MSD	05	12/06/16					12/08/2016	1.9	180		12/14/16	8.1	180	
MW23-120616-MSD	05	12/06/16					12/08/2016	1.9	180		12/21/16	15.3	180	
MW23-120616-MSD	06	12/06/16					12/08/2016	1.9	180		12/14/16	8.1	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5056949
 Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6010C
 Login Number:L16120352

AAB#:WG594872

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
MW02-120616	08	12/06/16					12/12/2016	6	180		12/16/16	9.6	180	
MW02-120616-MS	10	12/06/16					12/12/2016	6	180		12/16/16	9.6	180	
MW02-120616-MSD	12	12/06/16					12/12/2016	6	180		12/16/16	9.6	180	
MW01-120616	16	12/06/16					12/12/2016	5.9	180		12/16/16	9.4	180	
MW16I-120616	17	12/06/16					12/12/2016	6	180		12/18/16	12.2	180	
MW16I-120616	17	12/06/16					12/12/2016	6	180		12/16/16	9.5	180	
MW16I-120616	18	12/06/16					12/12/2016	6	180		12/16/16	9.5	180	
MW26-120616	21	12/06/16					12/12/2016	5.9	180		12/16/16	9.5	180	
MW26-120616	21	12/06/16					12/12/2016	5.9	180		12/18/16	12.2	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5056949
 Report generated 12/22/2016 10:47



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594872
 Blank File ID: T3.122216.172732 Blank Sample ID: WG594498-02
 Prep Date: 12/12/16 12:12 Instrument ID: ICP-THERMO3
 Analyzed Date: 12/22/16 17:27 Method: 6010C
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594498-03	T3.122216.173128	12/22/16 17:31	01
MW02-120616	L16120352-08	T3.122216.173507	12/22/16 17:35	01
MW02-120616-MS	L16120352-10	T3.122216.173859	12/22/16 17:38	01
MW02-120616-MSD	L16120352-12	T3.122216.174238	12/22/16 17:42	01
MW01-120616	L16120352-16	T3.122216.174617	12/22/16 17:46	01
MW16I-120616	L16120352-17	T3.122216.175009	12/22/16 17:50	01
MW16I-120616	L16120352-18	T3.122216.180132	12/22/16 18:01	01
MW26-120616	L16120352-21	T3.122216.181258	12/22/16 18:12	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5080588
 Report generated 12/23/2016 09:42



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594644
 Blank File ID: T3.122216.185154 Blank Sample ID: WG594037-03
 Prep Date: 12/08/16 08:24 Instrument ID: ICP-THERMO3
 Analyzed Date: 12/22/16 18:51 Method: 6010C
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594037-04	T3.122216.185549	12/22/16 18:55	01
MW23-120616	L16120352-01	T3.122216.185927	12/22/16 18:59	01
MW23-120616	L16120352-02	T3.122216.190328	12/22/16 19:03	01
MW23-120616-MS	L16120352-03	T3.122216.190730	12/22/16 19:07	01
MW23-120616-MS	L16120352-04	T3.122216.191117	12/22/16 19:11	01
MW23-120616-MSD	L16120352-05	T3.122216.191504	12/22/16 19:15	01
MW23-120616-MSD	L16120352-06	T3.122216.191850	12/22/16 19:18	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5080588
 Report generated 12/23/2016 09:42



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594313
 Blank File ID: T4.120916.152050 Blank Sample ID: WG594106-02
 Prep Date: 12/08/16 11:22 Instrument ID: ICP-THERMO4
 Analyzed Date: 12/09/16 15:20 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594106-03	T4.120916.152438	12/09/16 15:24	01
MW02-120616	L16120352-07	T4.120916.153203	12/09/16 15:32	01
MW02-120616-MS	L16120352-09	T4.120916.153547	12/09/16 15:35	01
MW02-120616-MSD	L16120352-11	T4.120916.155033	12/09/16 15:50	01
MW09R-120616	L16120352-13	T4.120916.163529	12/09/16 16:35	01
MW09R-120616	L16120352-14	T4.120916.163921	12/09/16 16:39	01
MW01-120616	L16120352-15	T4.120916.164314	12/09/16 16:43	01
MW09R-120616	L16120352-13	T4.120916.172140	12/09/16 17:21	DL01
LCS	WG594106-03	T4.121416.161613	12/14/16 16:16	02
MW02-120616	L16120352-07	T4.121416.161950	12/14/16 16:19	02
MW02-120616-MS	L16120352-09	T4.121416.162336	12/14/16 16:23	02
MW02-120616-MSD	L16120352-11	T4.121416.162712	12/14/16 16:27	02
MW09R-120616	L16120352-13	T4.121416.163047	12/14/16 16:30	02
MW09R-120616	L16120352-14	T4.121416.163440	12/14/16 16:34	02
MW01-120616	L16120352-15	T4.121416.164606	12/14/16 16:46	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5056950
 Report generated 12/22/2016 11:16



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594316
 Blank File ID: T4.120916.202113 Blank Sample ID: WG594234-02
 Prep Date: 12/09/16 08:57 Instrument ID: ICP-THERMO4
 Analyzed Date: 12/09/16 20:21 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594234-03	T4.120916.202501	12/09/16 20:25	01
MW26-120616	L16120352-22	T4.120916.203616	12/09/16 20:36	01
MW17-120616	L16120352-23	T4.120916.204002	12/09/16 20:40	01
MW17-120616	L16120352-24	T4.120916.204348	12/09/16 20:43	01
DUP-GW-120616	L16120352-26	T4.120916.204735	12/09/16 20:47	01
DUP-GW-120616	L16120352-27	T4.120916.210606	12/09/16 21:06	01
LCS	WG594234-03	T4.121216.163230	12/12/16 16:32	02
LCS	WG594234-03	T4.121416.170843	12/14/16 17:08	03
MW26-120616	L16120352-22	T4.121416.171220	12/14/16 17:12	03
MW17-120616	L16120352-23	T4.121416.171605	12/14/16 17:16	03
MW17-120616	L16120352-24	T4.121416.171951	12/14/16 17:19	03
DUP-GW-120616	L16120352-26	T4.121416.172337	12/14/16 17:23	03
DUP-GW-120616	L16120352-27	T4.121416.172722	12/14/16 17:27	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5056950
 Report generated 12/22/2016 11:16



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594316
 Blank File ID: T4.121216.162842 Blank Sample ID: WG594234-02
 Prep Date: 12/09/16 08:57 Instrument ID: ICP-THERMO4
 Analyzed Date: 12/12/16 16:28 Method: 6010C
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594234-03	T4.120916.202501	12/09/16 20:25	01
MW26-120616	L16120352-22	T4.120916.203616	12/09/16 20:36	01
MW17-120616	L16120352-23	T4.120916.204002	12/09/16 20:40	01
MW17-120616	L16120352-24	T4.120916.204348	12/09/16 20:43	01
DUP-GW-120616	L16120352-26	T4.120916.204735	12/09/16 20:47	01
DUP-GW-120616	L16120352-27	T4.120916.210606	12/09/16 21:06	01
LCS	WG594234-03	T4.121216.163230	12/12/16 16:32	02
LCS	WG594234-03	T4.121416.170843	12/14/16 17:08	03
MW26-120616	L16120352-22	T4.121416.171220	12/14/16 17:12	03
MW17-120616	L16120352-23	T4.121416.171605	12/14/16 17:16	03
MW17-120616	L16120352-24	T4.121416.171951	12/14/16 17:19	03
DUP-GW-120616	L16120352-26	T4.121416.172337	12/14/16 17:23	03
DUP-GW-120616	L16120352-27	T4.121416.172722	12/14/16 17:27	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5056950
 Report generated 12/22/2016 11:16



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594644
 Blank File ID: T4.121416.124802 Blank Sample ID: WG594037-03
 Prep Date: 12/08/16 08:24 Instrument ID: ICP-THERMO4
 Analyzed Date: 12/14/16 12:48 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594037-04	T4.121416.125151	12/14/16 12:51	01
MW23-120616	L16120352-01	T4.121416.133635	12/14/16 13:36	01
MW23-120616-MS	L16120352-03	T4.121416.134030	12/14/16 13:40	01
MW23-120616-MSD	L16120352-05	T4.121416.134417	12/14/16 13:44	01
MW23-120616	L16120352-02	T4.121416.141430	12/14/16 14:14	01
MW23-120616-MS	L16120352-04	T4.121416.141824	12/14/16 14:18	01
MW23-120616-MSD	L16120352-06	T4.121416.142211	12/14/16 14:22	01
MW23-120616	L16120352-01	T4.122116.182225	12/21/16 18:22	DL01
MW23-120616-MS	L16120352-03	T4.122116.182611	12/21/16 18:26	DL01
MW23-120616-MSD	L16120352-05	T4.122116.182956	12/21/16 18:29	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5056950
 Report generated 12/22/2016 11:16



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594313
 Blank File ID: T4.121416.161224 Blank Sample ID: WG594106-02
 Prep Date: 12/08/16 11:22 Instrument ID: ICP-THERMO4
 Analyzed Date: 12/14/16 16:12 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594106-03	T4.120916.152438	12/09/16 15:24	01
MW02-120616	L16120352-07	T4.120916.153203	12/09/16 15:32	01
MW02-120616-MS	L16120352-09	T4.120916.153547	12/09/16 15:35	01
MW02-120616-MSD	L16120352-11	T4.120916.155033	12/09/16 15:50	01
MW09R-120616	L16120352-13	T4.120916.163529	12/09/16 16:35	01
MW09R-120616	L16120352-14	T4.120916.163921	12/09/16 16:39	01
MW01-120616	L16120352-15	T4.120916.164314	12/09/16 16:43	01
MW09R-120616	L16120352-13	T4.120916.172140	12/09/16 17:21	DL01
LCS	WG594106-03	T4.121416.161613	12/14/16 16:16	02
MW02-120616	L16120352-07	T4.121416.161950	12/14/16 16:19	02
MW02-120616-MS	L16120352-09	T4.121416.162336	12/14/16 16:23	02
MW02-120616-MSD	L16120352-11	T4.121416.162712	12/14/16 16:27	02
MW09R-120616	L16120352-13	T4.121416.163047	12/14/16 16:30	02
MW09R-120616	L16120352-14	T4.121416.163440	12/14/16 16:34	02
MW01-120616	L16120352-15	T4.121416.164606	12/14/16 16:46	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5056950
 Report generated 12/22/2016 11:16



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594316
 Blank File ID: T4.121416.170454 Blank Sample ID: WG594234-02
 Prep Date: 12/09/16 08:57 Instrument ID: ICP-THERMO4
 Analyzed Date: 12/14/16 17:04 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594234-03	T4.120916.202501	12/09/16 20:25	01
MW26-120616	L16120352-22	T4.120916.203616	12/09/16 20:36	01
MW17-120616	L16120352-23	T4.120916.204002	12/09/16 20:40	01
MW17-120616	L16120352-24	T4.120916.204348	12/09/16 20:43	01
DUP-GW-120616	L16120352-26	T4.120916.204735	12/09/16 20:47	01
DUP-GW-120616	L16120352-27	T4.120916.210606	12/09/16 21:06	01
LCS	WG594234-03	T4.121216.163230	12/12/16 16:32	02
LCS	WG594234-03	T4.121416.170843	12/14/16 17:08	03
MW26-120616	L16120352-22	T4.121416.171220	12/14/16 17:12	03
MW17-120616	L16120352-23	T4.121416.171605	12/14/16 17:16	03
MW17-120616	L16120352-24	T4.121416.171951	12/14/16 17:19	03
DUP-GW-120616	L16120352-26	T4.121416.172337	12/14/16 17:23	03
DUP-GW-120616	L16120352-27	T4.121416.172722	12/14/16 17:27	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5056950
 Report generated 12/22/2016 11:16



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594872
 Blank File ID: T4.121616.005222 Blank Sample ID: WG594498-02
 Prep Date: 12/12/16 12:12 Instrument ID: ICP-THERMO4
 Analyzed Date: 12/16/16 00:52 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594498-03	T4.121616.005610	12/16/16 00:56	01
MW02-120616	L16120352-08	T4.121616.005947	12/16/16 00:59	01
MW02-120616-MS	L16120352-10	T4.121616.010332	12/16/16 01:03	01
MW02-120616-MSD	L16120352-12	T4.121616.010707	12/16/16 01:07	01
MW01-120616	L16120352-16	T4.121616.011045	12/16/16 01:10	01
MW16I-120616	L16120352-17	T4.121616.011431	12/16/16 01:14	01
MW16I-120616	L16120352-18	T4.121616.011817	12/16/16 01:18	01
MW26-120616	L16120352-21	T4.121616.013650	12/16/16 01:36	01
LCS	WG594498-03	T4.121816.183334	12/18/16 18:33	02
MW16I-120616	L16120352-17	T4.121816.185156	12/18/16 18:51	02
MW26-120616	L16120352-21	T4.121816.185927	12/18/16 18:59	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5056950
 Report generated 12/22/2016 11:16



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594872
 Blank File ID: T4.121816.182945 Blank Sample ID: WG594498-02
 Prep Date: 12/12/16 12:12 Instrument ID: ICP-THERMO4
 Analyzed Date: 12/18/16 18:29 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594498-03	T4.121616.005610	12/16/16 00:56	01
MW02-120616	L16120352-08	T4.121616.005947	12/16/16 00:59	01
MW02-120616-MS	L16120352-10	T4.121616.010332	12/16/16 01:03	01
MW02-120616-MSD	L16120352-12	T4.121616.010707	12/16/16 01:07	01
MW01-120616	L16120352-16	T4.121616.011045	12/16/16 01:10	01
MW16I-120616	L16120352-17	T4.121616.011431	12/16/16 01:14	01
MW16I-120616	L16120352-18	T4.121616.011817	12/16/16 01:18	01
MW26-120616	L16120352-21	T4.121616.013650	12/16/16 01:36	01
LCS	WG594498-03	T4.121816.183334	12/18/16 18:33	02
MW16I-120616	L16120352-17	T4.121816.185156	12/18/16 18:51	02
MW26-120616	L16120352-21	T4.121816.185927	12/18/16 18:59	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5056950
 Report generated 12/22/2016 11:16



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/12/16 12:12 Sample ID: WG594498-02
Instrument ID: ICP-THERMO3 Run Date: 12/22/16 17:27 Prep Method: 3015
File ID: T3.122216.172732 Analyst: JYH Method: 6010C
Workgroup (AAB#): WG594872 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-TH-22-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Iron, Total	0.0500	0.100	0.0500	1	U

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

Report Name: BLANK
PDF ID: 5080589
23-DEC-2016 09:42



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/08/16 08:24 Sample ID: WG594037-03
Instrument ID: ICP-THERMO3 Run Date: 12/22/16 18:51 Prep Method: 3015
File ID: T3.122216.185154 Analyst: JYH Method: 6010C
Workgroup (AAB#): WG594644 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-TH-22-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Iron, Total	0.0500	0.100	0.0500	1	U

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

Report Name: BLANK
PDF ID: 5080589
23-DEC-2016 09:42



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/08/16 11:22 Sample ID: WG594106-02
 Instrument ID: ICP-THERMO4 Run Date: 12/09/16 15:20 Prep Method: 3015
 File ID: T4.120916.152050 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG594313 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-TH-09-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Aluminum, Total	0.100	0.200	0.100	1	U
Calcium, Total	0.250	0.500	0.250	1	U
Iron, Total	0.0500	0.100	0.0500	1	U
Magnesium, Total	0.250	0.500	0.250	1	U
Manganese, Total	0.00500	0.0100	0.00500	1	U
Potassium, Total	0.500	1.00	0.500	1	U
Silica, Calculated as SiO2	1.07	2.14	1.07	1	U
Silicon, Total	0.500	1.00	0.500	1	U
Sodium, Total	0.250	0.500	0.250	1	U

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

Report Name: BLANK
 PDF ID: 5056951
 22-DEC-2016 10:47



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/09/16 08:57 Sample ID: WG594234-02
 Instrument ID: ICP-THERMO4 Run Date: 12/09/16 20:21 Prep Method: 3015
 File ID: T4.120916.202113 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG594316 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-TH-09-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Aluminum, Total	0.100	0.200	0.100	1	U
Calcium, Total	0.250	0.500	0.250	1	U
Iron, Total	0.0500	0.100	0.0500	1	U
Magnesium, Total	0.250	0.500	0.250	1	U
Potassium, Total	0.500	1.00	0.500	1	U
Sodium, Total	0.250	0.500	0.250	1	U

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

Report Name: BLANK
 PDF ID: 5056951
 22-DEC-2016 10:47



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/08/16 08:24 Sample ID: WG594037-03
 Instrument ID: ICP-THERMO4 Run Date: 12/14/16 12:48 Prep Method: 3015
 File ID: T4.121416.124802 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG594644 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-TH-14-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Aluminum, Total	0.100	0.200	0.100	1	U
Calcium, Total	0.250	0.500	0.250	1	U
Magnesium, Total	0.250	0.500	0.250	1	U
Manganese, Total	0.00500	0.0100	0.00500	1	U
Potassium, Total	0.500	1.00	0.500	1	U
Silica, Calculated as SiO2	1.07	2.14	1.07	1	U
Silicon, Total	0.500	1.00	0.500	1	U
Sodium, Total	0.250	0.500	0.250	1	U

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

Report Name: BLANK
 PDF ID: 5056951
 22-DEC-2016 10:47



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/08/16 11:22 Sample ID: WG594106-02
Instrument ID: ICP-THERMO4 Run Date: 12/14/16 16:12 Prep Method: 3015
File ID: T4.121416.161224 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG594313 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-TH-14-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Manganese, Total	0.00500	0.0100	0.00500	1	U

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

Report Name: BLANK
PDF ID: 5056951
22-DEC-2016 10:47



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/09/16 08:57 Sample ID: WG594234-02
Instrument ID: ICP-THERMO4 Run Date: 12/14/16 17:04 Prep Method: 3015
File ID: T4.121416.170454 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG594316 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-TH-14-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Manganese, Total	0.00500	0.0100	0.00500	1	U

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

Report Name: BLANK
PDF ID: 5056951
22-DEC-2016 10:47



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/12/16 12:12 Sample ID: WG594498-02
 Instrument ID: ICP-THERMO4 Run Date: 12/16/16 00:52 Prep Method: 3015
 File ID: T4.121616.005222 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG594872 Matrix: Water Units: mg/L
 Contract #: _____ Cal ID: ICP-TH-15-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Aluminum, Total	0.100	0.200	0.100	1	U
Calcium, Total	0.250	0.500	0.250	1	U
Magnesium, Total	0.250	0.500	0.250	1	U
Manganese, Total	0.00500	0.0100	0.00500	1	U
Potassium, Total	0.500	1.00	0.500	1	U

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

Report Name: BLANK
 PDF ID: 5056951
 22-DEC-2016 10:47



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/12/16 12:12 Sample ID: WG594498-02
Instrument ID: ICP-THERMO4 Run Date: 12/18/16 18:29 Prep Method: 3015
File ID: T4.121816.182945 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG594872 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-TH-18-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Sodium, Total	0.250	0.500	0.250	1	U

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

Report Name: BLANK
PDF ID: 5056951
22-DEC-2016 10:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG594498-03
Instrument ID: ICP-THERMO3 Run Time: 17:31 Prep Method: 3015
File ID: T3.122216.173128 Analyst: JYH Method: 6010C
Workgroup (AAB#): WG594872 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD79117 Cal ID: ICP-TH-22-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Iron, Total	2.50	2.44	97.8	85 - 115	

LCS - Modified 03/06/2008
PDF File ID: 5080591
Report generated: 12/23/2016 09:42



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG594037-04
Instrument ID: ICP-THERMO3 Run Time: 18:55 Prep Method: 3015
File ID: T3.122216.185549 Analyst: JYH Method: 6010C
Workgroup (AAB#): WG594644 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD79117 Cal ID: ICP-TH-22-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Iron, Total	2.50	2.47	98.8	85 - 115	

LCS - Modified 03/06/2008
PDF File ID: 5080591
Report generated: 12/23/2016 09:42



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594106-03
 Instrument ID: ICP-THERMO4 Run Time: 15:24 Prep Method: 3015
 File ID: T4.120916.152438 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG594313 Matrix: Water Units: mg/L
 QC Key: WATERLOO Lot#: STD79117 Cal ID: ICP-TH-09-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Total	6.25	6.26	100	85 - 115	
Calcium, Total	6.25	6.16	98.6	85 - 115	
Iron, Total	2.50	2.47	98.6	85 - 115	
Magnesium, Total	6.25	6.16	98.5	85 - 115	
Manganese, Total	0.313	0.306	98.1	85 - 115	
Potassium, Total	31.3	30.0	95.9	85 - 115	
Silicon, Total	3.13	3.02	96.5	85 - 115	
Sodium, Total	31.3	30.2	96.8	85 - 115	

LCS - Modified 03/06/2008
 PDF File ID: 5056952
 Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594234-03
 Instrument ID: ICP-THERMO4 Run Time: 20:25 Prep Method: 3015
 File ID: T4.120916.202501 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG594316 Matrix: Water Units: mg/L
 QC Key: WATERLOO Lot#: STD79117 Cal ID: ICP-TH-09-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Total	6.25	6.17	98.8	85 - 115	
Calcium, Total	6.25	6.07	97.2	85 - 115	
Iron, Total	2.50	2.47	98.6	85 - 115	
Magnesium, Total	6.25	6.14	98.3	85 - 115	
Potassium, Total	31.3	30.3	97.1	85 - 115	
Sodium, Total	31.3	30.0	96.0	85 - 115	

LCS - Modified 03/06/2008
 PDF File ID: 5056952
 Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594037-04
 Instrument ID: ICP-THERMO4 Run Time: 12:51 Prep Method: 3015
 File ID: T4.121416.125151 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG594644 Matrix: Water Units: mg/L
 QC Key: WATERLOO Lot#: STD79117 Cal ID: ICP-TH-14-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Total	6.25	6.34	101	85 - 115	
Calcium, Total	6.25	6.09	97.5	85 - 115	
Magnesium, Total	6.25	6.17	98.7	85 - 115	
Manganese, Total	0.313	0.300	95.9	85 - 115	
Potassium, Total	31.3	29.4	94.1	85 - 115	
Silicon, Total	3.13	3.02	96.7	85 - 115	
Sodium, Total	31.3	30.1	96.4	85 - 115	

LCS - Modified 03/06/2008
 PDF File ID: 5056952
 Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594106-03
Instrument ID: ICP-THERMO4 Run Time: 16:16 Prep Method: 3015
File ID: T4.121416.161613 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG594313 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD79117 Cal ID: ICP-TH-14-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Manganese, Total	0.313	0.292	93.3	85 - 115	

LCS - Modified 03/06/2008
PDF File ID: 5056952
Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594234-03
Instrument ID: ICP-THERMO4 Run Time: 17:08 Prep Method: 3015
File ID: T4.121416.170843 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG594316 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD79117 Cal ID: ICP-TH-14-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Manganese, Total	0.313	0.289	92.4	85 - 115	

LCS - Modified 03/06/2008
PDF File ID: 5056952
Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG594498-03
 Instrument ID: ICP-THERMO4 Run Time: 00:56 Prep Method: 3015
 File ID: T4.121616.005610 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG594872 Matrix: Water Units: mg/L
 QC Key: WATERLOO Lot#: STD79117 Cal ID: ICP-TH-15-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Total	6.25	6.27	100	85 - 115	
Calcium, Total	6.25	6.22	99.4	85 - 115	
Magnesium, Total	6.25	5.95	95.3	85 - 115	
Manganese, Total	0.313	0.308	98.4	85 - 115	
Potassium, Total	31.3	31.2	100	85 - 115	

LCS - Modified 03/06/2008
 PDF File ID: 5056952
 Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG594498-03
Instrument ID: ICP-THERMO4 Run Time: 18:33 Prep Method: 3015
File ID: T4.121816.183334 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG594872 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD79117 Cal ID: ICP-TH-18-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Sodium, Total	31.3	31.6	101	85 - 115	

LCS - Modified 03/06/2008
PDF File ID: 5056952
Report generated: 12/22/2016 10:47



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-THERMO3- 22-DEC-16 Worknum: WG594644
 Instrument ID: ICP-THERMO3 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-01 File ID: T3.122216.185927 Dil: 1 Method: 6010B
 Sample ID: L16120352-03 MS File ID: T3.122216.190730 Dil: 1 Matrix: Water
 Sample ID: L16120352-05 MSD File ID: T3.122216.191504 Dil: 1 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Iron, Total	0.200	2.50	2.62	96.9	2.50	2.58	95	1.79	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008
 PDF File ID: 5080592
 Report generated 12/23/2016 09:42



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-THERMO3- 22-DEC-16 Worknum: WG594644
 Instrument ID: ICP-THERMO3 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-02 File ID: T3.122216.190328 Dil: 1 Method: 6010B
 Sample ID: L16120352-04 MS File ID: T3.122216.191117 Dil: 1 Matrix: Water
 Sample ID: L16120352-06 MSD File ID: T3.122216.191850 Dil: 1 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Iron, Dissolved	0.0754	2.50	2.47	95.6	2.50	2.49	96.7	1.08	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-THERMO3- 22-DEC-16 Worknum: WG594872
 Instrument ID: ICP-THERMO3 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-08 File ID: T3.122216.173507 Dil: 1 Method: 6010B
 Sample ID: L16120352-10 MS File ID: T3.122216.173859 Dil: 1 Matrix: Water
 Sample ID: L16120352-12 MSD File ID: T3.122216.174238 Dil: 1 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Iron, Dissolved	0.701	2.50	3.13	97.3	2.50	2.99	91.5	4.71	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



MS/MSD REPORT

Loginnum: L16120352 Cal ID: ICP-THERMO4- 09-DEC-16
 Instrument ID: ICP-THERMO4 Contract #: _____
 Parent ID: L16120352-07 File ID: T4.120916.153203 Dil: 1
 Sample ID: L16120352-09 MS File ID: T4.120916.153547 Dil: 1
 Sample ID: L16120352-11 MSD File ID: T4.120916.155033 Dil: 1

Worknum: WG594313
 Prep Method: 3015
 Method: 6010B
 Matrix: Water
 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum, Total	U	6.25	5.97	95.5	6.25	5.85	93.6	1.99	85 - 115	20	
Calcium, Total	117	6.25	124	105	6.25	126	132	1.33	85 - 115	20	*
Iron, Total	0.781	2.50	3.21	97.1	2.50	3.17	95.4	1.28	85 - 115	20	
Magnesium, Total	13.1	6.25	19.3	98	6.25	19.2	97.7	0.110	85 - 115	20	
Potassium, Total	4.61	31.3	34.5	95.5	31.3	33.7	93.3	2.09	85 - 115	20	
Sodium, Total	153	31.3	182	91.9	31.3	183	95.1	0.555	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-THERMO4- 14-DEC-16 Worknum: WG594313
 Instrument ID: ICP-THERMO4 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-07 File ID: T4.121416.161950 Dil: 1 Method: 6010B
 Sample ID: L16120352-09 MS File ID: T4.121416.162336 Dil: 1 Matrix: Water
 Sample ID: L16120352-11 MSD File ID: T4.121416.162712 Dil: 1 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Manganese, Total	0.0919	0.313	0.385	93.7	0.313	0.379	91.7	1.57	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-THERMO4- 14-DEC-16
 Instrument ID: ICP-THERMO4 Contract #: _____
 Parent ID: L16120352-01 File ID: T4.121416.133635 Dil: 1
 Sample ID: L16120352-03 MS File ID: T4.121416.134030 Dil: 1
 Sample ID: L16120352-05 MSD File ID: T4.121416.134417 Dil: 1

Worknum: WG594644
 Prep Method: 3015
 Method: 6010B
 Matrix: Water
 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum, Total	U	6.25	5.57	89.1	6.25	5.60	89.6	0.539	85 - 115	20	
Calcium, Total	169	6.25	172	58.8	6.25	171	42.6	0.589	85 - 115	20	*
Magnesium, Total	22.9	6.25	28.4	88.9	6.25	28.2	85.8	0.684	85 - 115	20	
Manganese, Total	0.0781	0.313	0.365	91.8	0.313	0.362	91	0.660	85 - 115	20	
Potassium, Total	11.4	31.3	43.0	101	31.3	43.5	103	1.14	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-THERMO4- 14-DEC-16 Worknum: WG594644
 Instrument ID: ICP-THERMO4 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-02 File ID: T4.121416.141430 Dil: 1 Method: 6010B
 Sample ID: L16120352-04 MS File ID: T4.121416.141824 Dil: 1 Matrix: Water
 Sample ID: L16120352-06 MSD File ID: T4.121416.142211 Dil: 1 Units: mg/L

Analyte	Parent	MS	MS	MS	MSD	MSD	MSD	%RPD	%Rec Limits	RPD Limit	Q
		Spiked	Found	%Rec	Spiked	Found	%Rec				
Aluminum, Dissolved	U	6.25	5.66	90.6	6.25	5.66	90.5	0.0707	85 - 115	20	
Manganese, Dissolved	0.0805	0.313	0.374	93.8	0.313	0.365	91.1	2.29	85 - 115	20	

* FAILS %REC LIMIT
 # FAILS RPD LIMIT



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-THERMO4- 21-DEC-16 Worknum: WG594644
 Instrument ID: ICP-THERMO4 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-01 File ID: T4.122116.182225 Dil: 10 Method: 6010B
 Sample ID: L16120352-03 MS File ID: T4.122116.182611 Dil: 10 Matrix: Water
 Sample ID: L16120352-05 MSD File ID: T4.122116.182956 Dil: 10 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Sodium, Total	909	31.3	930	66.2	31.3	913	14	1.77	85 - 115	20	*

* FAILS %REC LIMIT

FAILS RPD LIMIT



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-THERMO4- 15-DEC-16 Worknum: WG594872
 Instrument ID: ICP-THERMO4 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-08 File ID: T4.121616.005947 Dil: 1 Method: 6010B
 Sample ID: L16120352-10 MS File ID: T4.121616.010332 Dil: 1 Matrix: Water
 Sample ID: L16120352-12 MSD File ID: T4.121616.010707 Dil: 1 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum, Dissolved	U	6.25	5.88	94	6.25	5.90	94.4	0.386	85 - 115	20	
Manganese, Dissolved	0.0919	0.313	0.392	96.1	0.313	0.388	94.8	1.00	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



Microbac Laboratories Inc.
MS REPORT

Loginum: <u>L16120352</u>	Cal ID: <u>ICP-THERMO - 09-DEC-16</u>	Worknum: <u>WG594313</u>
Instrument ID: <u>ICP-THERMO</u>	Contract #: _____	Method: <u>6010B</u>
Parent ID: <u>L16120352-07</u>	File ID: <u>T4.120916.153203</u> Dil: <u>1</u>	Matrix: <u>Water</u>
Sample ID: <u>L16120352-09 MS</u>	File ID: <u>T4.120916.153547</u> Dil: <u>1</u>	Units: <u>mg/L</u>
Sample ID: <u>L16120352-11 MSD</u>	File ID: <u>T4.120916.155033</u> Dil: <u>1</u>	

Analyte	Parent	MS Spiked	MS Found	MS %Rec
Aluminum, Total	ND	6.25	5.97	95.5
Calcium, Total	117	6.25	124	112
Iron, Total	0.781	2.50	3.21	97.2
Magnesium, Total	13.1	6.25	19.3	99.2
Potassium, Total	4.61	31.3	34.5	95.5
Sodium, Total	153	31.3	182	92.7

* EXCEEDS %REC LIMIT

EXCEEDS RPD LIMIT

SAMPLE_MS - Modified 06/27/2008
PDF File ID: 5060447
Report generated: 12/13/2016 11:13



Microbac Laboratories Inc.
MS REPORT

Loginum: L16120352 Cal ID: ICP-THERMO 09-DEC-16
 Instrument ID: ICP-THERMO Contract #: _____
 Parent ID: L16120352-07 File ID: T4.120916.153203 Dil: 1
 Sample ID: L16120352-09 MS File ID: T4.120916.153547 Dil: 1
 Sample ID: L16120352-11 MSD File ID: T4.120916.155033 Dil: 1

Worknum: WG594313
 Method: 6010B
 Matrix: Water
 Units: mg/L

Analyte	Parent	MSD Spiked	MSD Found	MSD %Rec	%Rec Limits	Q
Aluminum, Total		6.25	5.85	93.6	85 - 115	
Calcium, Total		6.25	126	144	85 - 115	*
Iron, Total		2.50	3.17	95.6	85 - 115	
Magnesium, Total		6.25	19.2	97.6	85 - 115	
Potassium, Total		31.3	33.7	92.9	85 - 115	
Sodium, Total		31.3	183	95.8	85 - 115	

* EXCEEDS %REC LIMIT

EXCEEDS RPD LIMIT



MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L16120352 Cal ID: ICP-THERMO3- Worknum: WG594644
 Instrument ID: ICP-THERMO3 Contract #: _____ Method: 6010C
 Parent ID: WG594037-01 File ID: T3.122216.185927 Dil: 1 Matrix: WATER
 Sample ID: WG594037-05 MS File ID: T3.122216.190730 Dil: 1 Units: mg/L
 Sample ID: WG594037-06 MSD File ID: T3.122216.191504 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Iron, Total	0.200	2.50	2.62	96.9	2.50	2.58	95.0	3.48	85 - 115	20	
		2.50	2.53	92.5	2.50	2.53	92.6				

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L16120352 Cal ID: ICP-THERMO3- Worknum: WG594644
 Instrument ID: ICP-THERMO3 Contract #: _____ Method: 6010C
 Parent ID: WG594037-02 File ID: T3.122216.190328 Dil: 1 Matrix: WATER
 Sample ID: WG594037-07 MS File ID: T4.121416.141824 Dil: 1 Units: mg/L
 Sample ID: WG594037-08 MSD File ID: T3.122216.191850 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Iron, Dissolved	0.125	2.50	2.44	92.4	2.50	2.49	96.7	0.494	85 - 115	20	
		2.50	2.47	95.6	2.50	2.42	91.9				

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L16120352 Cal ID: ICP-THERMO3- Worknum: WG594872
 Instrument ID: ICP-THERMO3 Contract #: _____ Method: 6010C
 Parent ID: WG594498-01 File ID: T3.122216.173507 Dil: 1 Matrix: WATER
 Sample ID: WG594498-04 MS File ID: T3.122216.173859 Dil: 1 Units: mg/L
 Sample ID: WG594498-05 MSD File ID: T3.122216.174238 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Iron, Dissolved	0.701	2.50	3.13	97.3	2.50	2.99	91.5	4.71	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L16120352 Cal ID: ICP-THERMO4 - Worknum: WG594316
 Instrument ID: ICP-THERMO4 Contract #: _____ Method: 6010C
 Parent ID: WG594234-01 File ID: T4.120916.212113 Dil: 1 Matrix: WATER
 Sample ID: WG594234-04 MS File ID: T4.120916.212459 Dil: 1 Units: mg/L
 Sample ID: WG594234-05 MSD File ID: T4.120916.212835 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum, Total	ND	6.25	6.16	98.5	6.25	6.17	98.7	0.185	85 - 115	20	
Calcium, Total	3.89	6.25	10.0	97.9	6.25	9.90	96.1	1.17	85 - 115	20	
Iron, Total	1.65	2.50	3.50	74.2	2.50	2.68	41.4	26.5	85 - 115	20	*#
Magnesium, Total	3.38	6.25	9.35	95.5	6.25	9.40	96.3	0.484	85 - 115	20	
Potassium, Total	3.90	31.3	34.7	98.5	31.3	34.5	97.9	0.589	85 - 115	20	
Sodium, Total	8.98	31.3	39.2	96.5	31.3	39.1	96.3	0.157	85 - 115	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L16120352 Cal ID: ICP-THERMO4- Worknum: WG594316
 Instrument ID: ICP-THERMO4 Contract #: _____ Method: 6010C
 Parent ID: WG594234-01 File ID: T4.121416.174554 Dil: 1 Matrix: WATER
 Sample ID: WG594234-04 MS File ID: T4.121416.174941 Dil: 1 Units: mg/L
 Sample ID: WG594234-05 MSD File ID: T4.121416.175318 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Manganese, Total	0.220	0.313	0.491	86.6	0.313	0.478	82.7	2.56	85 - 115	20	*

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 **Worknum:** WG594872
Instrument: ICP-THERMO3 **Method:** 6010C
Serial Dil: WG594872-06 **File ID:** T3.122216.175739 **Dil:** 5 **Units:** ug/L
Sample: L16120352-17 **File ID:** T3.122216.175009 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	6.73		ND	U		
Calcium	92300		93500		1.28	
Iron	5490		5460		0.50	
Magnesium	18000		18600		3.19	
Manganese	174		177		1.59	
Potassium	4470		5080		13.70	E
Silicon	4780		ND			
Sodium	56700		56200		0.76	

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.

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Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 **Worknum:** WG594644
Instrument: ICP-THERMO3 **Method:** 6010C
Serial Dil: WG594644-04 **File ID:** T3.122216.193744 **Dil:** 5 **Units:** ug/L
Sample: L16120360-01 **File ID:** T3.122216.193011 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	44.1		65.2		48.00	E
Calcium	554		490		11.60	E
Iron	53.8		54.8		1.78	
Magnesium	94.3		124		31.80	E
Manganese	4.76		7.95		67.00	E
Potassium	198		814		311.00	E
Silicon	43.6		ND	U		
Sodium	186		206		11.00	E

U = Result is below MDL.
F = Result is greater than or equal to MDL and less than the RL.
X = Result is greater than or equal to RL and less than 25 times the MDL.
E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 25 times the MDL.



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 **Worknum:** WG594872
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG594872-02 **File ID:** T4.121616.012539 **Dil:** 5 **Units:** ug/L
Sample: L16120352-18 **File ID:** T4.121616.011817 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	ND	U	ND	U		
Calcium	92500		96800		4.56	
Iron	5030		5270		4.73	
Magnesium	17400		17700		2.22	
Manganese	175		173		1.30	
Potassium	4610		5370		16.70	E
Silicon	4500		ND			
Sodium	57900		59700		3.12	

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
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Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 **Worknum:** WG594313
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG594313-02 **File ID:** T4.120916.154646 **Dil:** 5 **Units:** ug/L
Sample: L16120386-03 **File ID:** T4.120916.153925 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	6.05		ND	U		
Calcium	38500		39500		2.70	
Iron	11.5		ND	U		
Magnesium	8890		9010		1.37	
Manganese	3.39		8.55		152.00	E
Potassium	840		789		6.13	
Silicon	4310		4430		2.72	
Sodium	58800		60300		2.63	

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.

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Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 **Worknum:** WG594316
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG594316-04 **File ID:** T4.121416.173444 **Dil:** 5 **Units:** ug/L
Sample: L16120352-27 **File ID:** T4.121416.172722 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	178		161		9.53	
Calcium	144000		148000		2.43	
Iron	2080		2010		3.48	
Magnesium	26500		27100		2.09	
Manganese	441		449		1.85	
Potassium	6860		7700		12.20	E
Silicon	5750		ND			
Sodium	59800		59700		0.14	

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.

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Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 **Worknum:** WG594644
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG594644-02 **File ID:** T4.121416.132139 **Dil:** 5 **Units:** ug/L
Sample: L16120323-01 **File ID:** T4.121416.131417 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	4.48		17.8		297.00	E
Calcium	41300		41800		1.23	
Iron	272		325		19.80	E
Magnesium	7170		7950		10.80	E
Manganese	261		270		3.79	
Potassium	1200		1700		41.00	E
Silicon	4940		5040		1.88	
Sodium	21700		21900		1.05	

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.

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Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 **Worknum:** WG594316
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG594316-02 **File ID:** T4.120916.205458 **Dil:** 5 **Units:** ug/L
Sample: L16120352-26 **File ID:** T4.120916.204735 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	9.46		ND	U		
Calcium	143000		153000		6.47	
Iron	1690		1660		2.15	
Magnesium	27600		28300		2.45	
Manganese	459		466		1.46	
Potassium	6850		7530		10.10	E
Silicon	5860		ND			
Sodium	59200		61000		3.00	

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.



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 **Worknum:** WG594872
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG594872-04 **File ID:** T4.121816.201745 **Dil:** 5 **Units:** ug/L
Sample: L16120568-01 **File ID:** T4.121816.201019 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	ND	U	ND	U		
Calcium	37.7		ND	U		
Iron	5.85		85.7		1360.00	E
Magnesium	53.4		ND	U		
Manganese	3.60		ND	U		
Potassium	9.36	X	76.0		711.00	
Silicon	19.6		ND			
Sodium	269		364		35.30	E

U = Result is below MDL.
F = Result is greater than or equal to MDL and less than the RL.
X = Result is greater than or equal to RL and less than 25 times the MDL.
E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 25 times the MDL.



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 Worknum: WG594313
Instrument: ICP-THERMO4 Method: 6010C
Serial Dil: WG594313-04 File ID: T4.121416.164220 Dil: 5 Units: ug/L
Sample: L16120352-14 File ID: T4.121416.163440 Dil: 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	9.91		5.30		46.50	E
Calcium	245000		273000		11.80	E
Iron	4970		5190		4.46	
Magnesium	71700		75300		4.94	
Manganese	560		576		2.79	
Potassium	8620		10100		17.70	E
Silicon	10300		10500		1.90	
Sodium	512000		580000		13.30	E

U = Result is below MDL.
F = Result is greater than or equal to MDL and less than the RL.
X = Result is greater than or equal to RL and less than 25 times the MDL.
E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 25 times the MDL.



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352

Worknum: WG594644

Instrument ID: ICP-THERMO3

Method: 6010C

Post Spike ID: WG594644-03

File ID: T3.122216.193406

Dil: 1

Units: ug/L

Sample ID: L16120360-01

File ID: T3.122216.193011

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4870		0	U	5000	97.4	75 - 125	
CALCIUM	5430		554		5000	98.6	75 - 125	
IRON	2010		53.8	F	2000	98.3	75 - 125	
MAGNESIUM	5110		0	U	5000	102.2	75 - 125	
MANGANESE	250		4.76	F	250	98.3	75 - 125	
POTASSIUM	24000		0	U	25000	96.0	75 - 125	
SILICON	2380		0	U	2500	95.3	75 - 125	
SODIUM	24200		0	U	25000	96.8	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

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Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352

Worknum: WG594872

Instrument ID: ICP-THERMO3

Method: 6010C

Post Spike ID: WG594872-05

File ID: T3.122216.175401

Dil: 1

Units: ug/L

Sample ID: L16120352-17

File ID: T3.122216.175009

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4790		0	U	5000	95.8	75 - 125	
CALCIUM	88000		92300		5000	98.0	75 - 125	
IRON	6850		5490		2000	95.8	75 - 125	
MAGNESIUM	21000		18000		5000	96.1	75 - 125	
MANGANESE	395		174		250	95.4	75 - 125	
POTASSIUM	28100		4470		25000	96.3	75 - 125	
SILICON	6720		4780		2500	96.7	75 - 125	
SODIUM	74700		56700		25000	95.0	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

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Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352

Worknum: WG594313

Instrument ID: ICP-THERMO4

Method: 6010C

Post Spike ID: WG594313-01

File ID: T4.120916.154310

Dil: 1

Units: ug/L

Sample ID: L16120386-03

File ID: T4.120916.153925

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4840		0	U	5000	96.7	75 - 125	
CALCIUM	39500		38500		5000	98.2	75 - 125	
IRON	1950		0	U	2000	97.5	75 - 125	
MAGNESIUM	12700		8890		5000	93.0	75 - 125	
MANGANESE	246		0	U	250	98.3	75 - 125	
POTASSIUM	25000		840		25000	97.0	75 - 125	
SILICON	6330		4310		2500	98.0	75 - 125	
SODIUM	76500		58800		25000	94.6	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

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Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352

Worknum: WG594313

Instrument ID: ICP-THERMO4

Method: 6010C

Post Spike ID: WG594313-03

File ID: T4.121416.163834

Dil: 1

Units: ug/L

Sample ID: L16120352-14

File ID: T4.121416.163440

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4570		0	U	5000	91.5	75 - 125	
CALCIUM	228000		245000		5000	150.1	75 - 125	N
IRON	6360		4970		2000	94.3	75 - 125	
MAGNESIUM	69800		71700		5000	103.9	75 - 125	
MANGANESE	740		560		250	94.2	75 - 125	
POTASSIUM	33700		8620		25000	104.0	75 - 125	
SILICON	11800		10300		2500	102.9	75 - 125	
SODIUM	491000		512000		25000	121.1	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

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Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352

Worknum: WG594316

Instrument ID: ICP-THERMO4

Method: 6010C

Post Spike ID: WG594316-01

File ID: T4.120916.205121

Dil: 1

Units: ug/L

Sample ID: L16120352-26

File ID: T4.120916.204735

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4680		0	U	5000	93.6	75 - 125	
CALCIUM	136000		143000		5000	135.4	75 - 125	N
IRON	3560		1690		2000	101.6	75 - 125	
MAGNESIUM	29900		27600		5000	101.6	75 - 125	
MANGANESE	667		459		250	101.6	75 - 125	
POTASSIUM	31600		6850		25000	101.6	75 - 125	
SILICON	7800		5860		2500	101.1	75 - 125	
SODIUM	77900		59200		25000	98.5	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

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Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352

Worknum: WG594316

Instrument ID: ICP-THERMO4

Method: 6010C

Post Spike ID: WG594316-03

File ID: T4.121416.173107

Dil: 1

Units: ug/L

Sample ID: L16120352-27

File ID: T4.121416.172722

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4900		178		5000	94.8	75 - 125	
CALCIUM	133000		144000		5000	63.2	75 - 125	N
IRON	3670		2080		2000	89.6	75 - 125	
MAGNESIUM	28100		26500		5000	85.2	75 - 125	
MANGANESE	622		441		250	90.3	75 - 125	
POTASSIUM	30800		6860		25000	98.6	75 - 125	
SILICON	7530		5750		2500	94.0	75 - 125	
SODIUM	77500		59800		25000	94.5	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

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Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352

Worknum: WG594644

Instrument ID: ICP-THERMO4

Method: 6010C

Post Spike ID: WG594644-01

File ID: T4.121416.131803

Dil: 1

Units: ug/L

Sample ID: L16120323-01

File ID: T4.121416.131417

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4820		0	U	5000	96.5	75 - 125	
CALCIUM	41600		41300		5000	89.2	75 - 125	
IRON	2100		272		2000	92.9	75 - 125	
MAGNESIUM	11000		7170		5000	91.0	75 - 125	
MANGANESE	462		261		250	91.0	75 - 125	
POTASSIUM	24600		1200		25000	94.0	75 - 125	
SILICON	6830		4940		2500	95.3	75 - 125	
SODIUM	42700		21700		25000	92.8	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

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Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352

Worknum: WG594872

Instrument ID: ICP-THERMO4

Method: 6010C

Post Spike ID: WG594872-01

File ID: T4.121616.012202

Dil: 1

Units: ug/L

Sample ID: L16120352-18

File ID: T4.121616.011817

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4780		0	U	5000	95.6	75 - 125	
CALCIUM	89000		92500		5000	115.2	75 - 125	
IRON	6530		5030		2000	99.9	75 - 125	
MAGNESIUM	20300		17400		5000	93.7	75 - 125	
MANGANESE	407		175		250	99.5	75 - 125	
POTASSIUM	29800		4610		25000	102.7	75 - 125	
SILICON	6510		4500		2500	98.2	75 - 125	
SODIUM	77000		57900		25000	99.7	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

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Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352

Worknum: WG594872

Instrument ID: ICP-THERMO4

Method: 6010C

Post Spike ID: WG594872-03

File ID: T4.121816.201408

Dil: 1

Units: ug/L

Sample ID: L16120568-01

File ID: T4.121816.201019

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	5050		0	U	5000	101.0	75 - 125	
CALCIUM	4970		0	U	5000	99.5	75 - 125	
IRON	1730		0	U	2000	86.4	75 - 125	
MAGNESIUM	4420		0	U	5000	88.4	75 - 125	
MANGANESE	209		0	U	250	83.7	75 - 125	
POTASSIUM	25500		0	U	25000	102.1	75 - 125	
SILICON	2410		19.6		2500	95.9	75 - 125	
SODIUM	25400		269	F	25000	100.5	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

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Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594644
 Analytical Method: 6010C Instrument ID: ICP-THERMO3
 ICAL Worknum: WG596231 Initial Calibration Date: 22-DEC-2016 16:14

	WG596231-01		WG596231-02		WG596231-03		WG596231-04		WG596231-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
IRON	0	-0.000260	.04	0.000650	.08	0.00147	4	0.116	8	0.234	.999981	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594872
Analytical Method: 6010C Instrument ID: ICP-THERMO3
ICAL Worknum: WG596231 Initial Calibration Date: 22-DEC-2016 16:14

	WG596231-01		WG596231-02		WG596231-03		WG596231-04		WG596231-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
IRON	0	-0.000260	.04	0.000650	.08	0.00147	4	0.116	8	0.234	.999981	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594313
Analytical Method: 6010C Instrument ID: ICP-THERMO4
ICAL Worknum: WG594361 Initial Calibration Date: 09-DEC-2016 12:53

	WG594361-01		WG594361-02		WG594361-03		WG594361-04		WG594361-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ALUMINUM	0	0.000850	.1	0.00166	.2	0.00242	10	0.0901	20	0.176	.999887	
CALCIUM	0	0.000410	.1	0.00282	.2	0.00624	10	0.384	20	0.763	.99993	
IRON	0	-0.0000100	.04	0.000360	.08	0.000740	4	0.0314	8	0.0627	.999055	
MAGNESIUM	0	-0.000160	NA	NA	.2	0.000370	10	0.0213	20	0.0425	.999231	
MANGANESE	0	0.000530	.005	0.000920	.01	0.00136	.5	0.0413	1	0.0817	.999746	
POTASSIUM	0	0.00471	.5	0.0153	1	0.0289	50	1.60	100	3.19	.999955	
SILICON	0	0.000550	.05	0.00186	.1	0.00317	5	0.159	10	0.316	.999991	
SODIUM	0	-0.00199	.5	0.0368	1	0.0719	50	4.61	100	9.14	.999986	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594316
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG594361 Initial Calibration Date: 09-DEC-2016 12:53

	WG594361-01		WG594361-02		WG594361-03		WG594361-04		WG594361-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ALUMINUM	0	0.000850	.1	0.00166	.2	0.00242	10	0.0901	20	0.176	.999887	
CALCIUM	0	0.000410	.1	0.00282	.2	0.00624	10	0.384	20	0.763	.99993	
IRON	0	-0.0000100	.04	0.000360	.08	0.000740	4	0.0314	8	0.0627	.999055	
MAGNESIUM	0	-0.000160	NA	NA	.2	0.000370	10	0.0213	20	0.0425	.999231	
MANGANESE	0	0.000530	.005	0.000920	.01	0.00136	.5	0.0413	1	0.0817	.999746	
POTASSIUM	0	0.00471	.5	0.0153	1	0.0289	50	1.60	100	3.19	.999955	
SILICON	0	0.000550	.05	0.00186	.1	0.00317	5	0.159	10	0.316	.999991	
SODIUM	0	-0.00199	.5	0.0368	1	0.0719	50	4.61	100	9.14	.999986	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594313
Analytical Method: 6010C Instrument ID: ICP-THERMO4
ICAL Worknum: WG594926 Initial Calibration Date: 14-DEC-2016 11:46

	WG594926-01		WG594926-02		WG594926-03		WG594926-04		WG594926-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ALUMINUM	0	0.000900	.1	0.00187	.2	0.00281	10	0.106	20	0.205	.999783	
CALCIUM	0	-0.0000500	.1	0.00297	.2	0.00609	10	0.382	20	0.763	.999999	
IRON	0	-0.0000500	.04	0.000190	.08	0.000490	4	0.0360	8	0.0710	.999933	
MAGNESIUM	0	-0.000340	NA	NA	.2	0.000190	10	0.0230	20	0.0461	.999531	
MANGANESE	0	0.000550	.005	0.00102	.01	0.00134	.5	0.0483	1	0.0955	.999917	
POTASSIUM	0	0.00389	.5	0.0185	1	0.0308	50	1.52	100	3.05	.999919	
SILICON	0	0.000190	.05	0.00161	.1	0.00289	5	0.156	10	0.311	.999953	
SODIUM	0	-0.00366	.5	0.0373	1	0.0711	50	4.49	100	8.94	.999966	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594316
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG594926 Initial Calibration Date: 14-DEC-2016 11:46

	WG594926-01		WG594926-02		WG594926-03		WG594926-04		WG594926-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ALUMINUM	0	0.000900	.1	0.00187	.2	0.00281	10	0.106	20	0.205	.999783	
CALCIUM	0	-0.0000500	.1	0.00297	.2	0.00609	10	0.382	20	0.763	.999999	
IRON	0	-0.0000500	.04	0.000190	.08	0.000490	4	0.0360	8	0.0710	.999933	
MAGNESIUM	0	-0.000340	NA	NA	.2	0.000190	10	0.0230	20	0.0461	.999531	
MANGANESE	0	0.000550	.005	0.00102	.01	0.00134	.5	0.0483	1	0.0955	.999917	
POTASSIUM	0	0.00389	.5	0.0185	1	0.0308	50	1.52	100	3.05	.999919	
SILICON	0	0.000190	.05	0.00161	.1	0.00289	5	0.156	10	0.311	.999953	
SODIUM	0	-0.00366	.5	0.0373	1	0.0711	50	4.49	100	8.94	.999966	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594644
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG594926 Initial Calibration Date: 14-DEC-2016 11:46

	WG594926-01		WG594926-02		WG594926-03		WG594926-04		WG594926-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ALUMINUM	0	0.000900	.1	0.00187	.2	0.00281	10	0.106	20	0.205	.999783	
CALCIUM	0	-0.0000500	.1	0.00297	.2	0.00609	10	0.382	20	0.763	.999999	
IRON	0	-0.0000500	.04	0.000190	.08	0.000490	4	0.0360	8	0.0710	.999933	
MAGNESIUM	0	-0.000340	NA	NA	.2	0.000190	10	0.0230	20	0.0461	.999531	
MANGANESE	0	0.000550	.005	0.00102	.01	0.00134	.5	0.0483	1	0.0955	.999917	
POTASSIUM	0	0.00389	.5	0.0185	1	0.0308	50	1.52	100	3.05	.999919	
SILICON	0	0.000190	.05	0.00161	.1	0.00289	5	0.156	10	0.311	.999953	
SODIUM	0	-0.00366	.5	0.0373	1	0.0711	50	4.49	100	8.94	.999966	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594872
Analytical Method: 6010C Instrument ID: ICP-THERMO4
ICAL Worknum: WG595250 Initial Calibration Date: 15-DEC-2016 18:27

	WG595250-01		WG595250-02		WG595250-03		WG595250-04		WG595250-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ALUMINUM	0	0.000960	.1	0.00190	.2	0.00283	10	0.106	20	0.205	.999838	
CALCIUM	0	0.000120	.1	0.00309	.2	0.00551	10	0.378	20	0.759	.999966	
IRON	0	-0.0000700	.04	0.000190	.08	0.000480	4	0.0320	8	0.0647	.999976	
MAGNESIUM	0	-0.000210	NA	NA	.2	0.000380	10	0.0211	20	0.0422	.998619	
MANGANESE	0	0.000780	.005	0.000900	.01	0.00122	.5	0.0421	1	0.0844	.999128	
POTASSIUM	0	0.00519	.5	0.0176	1	0.0317	50	1.59	100	3.19	.999993	
SILICON	0	0.000260	.05	0.00151	.1	0.00278	5	0.154	10	0.306	.999997	
SODIUM	0	-0.000320	.5	0.0377	1	0.0728	50	4.55	100	9.09	.999997	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594872
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG595477 Initial Calibration Date: 18-DEC-2016 11:25

	WG595477-01		WG595477-02		WG595477-03		WG595477-04		WG595477-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ALUMINUM	0	0.00167	.1	0.00255	.2	0.00339	10	0.100	20	0.192	.999825	
CALCIUM	0	-0.0000600	.1	0.00327	.2	0.00587	10	0.356	20	0.711	.999957	
IRON	0	0.0000100	.04	0.000290	.08	0.000610	4	0.0319	8	0.0635	.999881	
MAGNESIUM	0	-0.000130	NA	NA	.2	-0.0000400	10	0.0205	20	0.0411	.998682	
MANGANESE	0	0.000460	.005	0.000990	.01	0.00130	.5	0.0429	1	0.0849	.998682	
POTASSIUM	0	0.00509	.5	0.0164	1	0.0278	50	1.41	100	2.82	.999999	
SILICON	0	0.000150	.05	0.00145	.1	0.00260	5	0.146	10	0.290	.99997	
SODIUM	0	0.00245	.5	0.0350	1	0.0707	50	4.14	100	8.22	.999994	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594644
 Analytical Method: 6010C Instrument ID: ICP-THERMO4
 ICAL Worknum: WG596008 Initial Calibration Date: 21-DEC-2016 12:02

	WG596008-01		WG596008-02		WG596008-03		WG596008-04		WG596008-05		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ALUMINUM	0	0.000890	.1	0.00178	.2	0.00264	10	0.0968	20	0.188	.999828	
CALCIUM	0	0.000100	.1	0.00274	.2	0.00612	10	0.356	20	0.720	.999972	
IRON	0	0.000100	.04	0.000320	.08	0.000440	4	0.0286	8	0.0572	.999819	
MAGNESIUM	0	-0.000180	NA	NA	.2	0.000170	10	0.0191	20	0.0384	.999944	
MANGANESE	0	0.000530	.005	0.000960	.01	0.00136	.5	0.0377	1	0.0752	.999359	
POTASSIUM	0	0.00988	.5	0.0221	1	0.0356	50	1.49	100	3.01	.999961	
SILICON	0	0.000340	.05	0.00140	.1	0.00261	5	0.141	10	0.283	.999994	
SODIUM	0	0.00101	.5	0.0361	1	0.0702	50	4.32	100	8.70	.999993	

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



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-07
Instrument ID: ICP-THERMO3 Run Time: 16:21 Method: 6010C
File ID: T3.122216.162132 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594644 Cal ID: ICP-THERI - 22-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
IRON	.04	.08	.04	U

ICB - Modified 07/14/2009
PDF File ID: 5080547
Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-07
Instrument ID: ICP-THERMO3 Run Time: 16:21 Method: 6010C
File ID: T3.122216.162132 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594872 Cal ID: ICP-THERI - 22-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
IRON	.04	.08	.04	U

ICB - Modified 07/14/2009
PDF File ID: 5080547
Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-07
 Instrument ID: ICP-THERMO4 Run Time: 13:02 Method: 6010C
 File ID: T4.120916.130231 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-THERM - 09-DEC-16
 Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	U
IRON	.04	.08	.04	U
MAGNESIUM	.2	.4	.2	U
MANGANESE	.004	.008	.004	U
POTASSIUM	.4	.8	.4	U
SILICON	.4	.8	.4	U
SODIUM	.2	.4	.2	U

ICB - Modified 07/14/2009
 PDF File ID: 5056958
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Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-07
Instrument ID: ICP-THERMO4 Run Time: 11:54 Method: 6010C
File ID: T4.121416.115414 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG594313 Cal ID: ICP-THERM - 14-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	U
IRON	.04	.08	.04	U
MAGNESIUM	.2	.4	.2	U
MANGANESE	.004	.008	.004	U
POTASSIUM	.4	.8	.4	U
SILICON	.4	.8	.4	U
SODIUM	.2	.4	.2	U

ICB - Modified 07/14/2009
PDF File ID: 5056958
Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-07
 Instrument ID: ICP-THERMO4 Run Time: 13:02 Method: 6010C
 File ID: T4.120916.130231 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-THERM - 09-DEC-16
 Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	U
IRON	.04	.08	.04	U
MAGNESIUM	.2	.4	.2	U
MANGANESE	.004	.008	.004	U
POTASSIUM	.4	.8	.4	U
SODIUM	.2	.4	.2	U

ICB - Modified 07/14/2009
 PDF File ID: 5056958
 Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-07
Instrument ID: ICP-THERMO4 Run Time: 11:54 Method: 6010C
File ID: T4.121416.115414 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG594316 Cal ID: ICP-THERM - 14-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	U
IRON	.04	.08	.04	U
MAGNESIUM	.2	.4	.2	U
MANGANESE	.004	.008	.004	U
POTASSIUM	.4	.8	.4	U
SODIUM	.2	.4	.2	U

ICB - Modified 07/14/2009
PDF File ID: 5056958
Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-07
Instrument ID: ICP-THERMO4 Run Time: 11:54 Method: 6010C
File ID: T4.121416.115414 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG594644 Cal ID: ICP-THERM - 14-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	U
IRON	.04	.08	.04	U
MAGNESIUM	.2	.4	.2	U
MANGANESE	.004	.008	.004	U
POTASSIUM	.4	.8	.4	U
SILICON	.4	.8	.4	U
SODIUM	.2	.4	.2	U

ICB - Modified 07/14/2009
PDF File ID: 5056958
Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-07
Instrument ID: ICP-THERMO4 Run Time: 12:10 Method: 6010C
File ID: T4.122116.121004 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG594644 Cal ID: ICP-THERM - 21-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	U
IRON	.04	.08	.04	U
MAGNESIUM	.2	.4	.2	U
MANGANESE	.004	.008	.004	U
POTASSIUM	.4	.8	.4	U
SILICON	.4	.8	.4	U
SODIUM	.2	.4	.2	U

ICB - Modified 07/14/2009
PDF File ID: 5056958
Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/15/2016 Sample ID: WG595250-07
 Instrument ID: ICP-THERMO4 Run Time: 18:34 Method: 6010C
 File ID: T4.121516.183409 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-THERM - 15-DEC-16
 Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	U
IRON	.04	.08	.04	U
MAGNESIUM	.2	.4	.2	U
MANGANESE	.004	.008	.004	U
POTASSIUM	.4	.8	.4	U
SODIUM	.2	.4	.2	U

ICB - Modified 07/14/2009
 PDF File ID: 5056958
 Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-07
 Instrument ID: ICP-THERMO4 Run Time: 11:33 Method: 6010C
 File ID: T4.121816.113300 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-THERM - 18-DEC-16
 Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	U
IRON	.04	.08	.04	U
MAGNESIUM	.2	.4	.2	U
MANGANESE	.004	.008	.004	U
POTASSIUM	.4	.8	.4	U
SODIUM	.2	.4	.2	U

ICB - Modified 07/14/2009
 PDF File ID: 5056958
 Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-13
Instrument ID: ICP-THERMO3 Run Time: 16:44 Method: 6010C
File ID: T3.122216.164412 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	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: 5080550
Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-17
Instrument ID: ICP-THERMO3 Run Time: 18:40 Method: 6010C
File ID: T3.122216.184009 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	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: 5080550
Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
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Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-21
 Instrument ID: ICP-THERMO3 Run Time: 19:26 Method: 6010C
 File ID: T3.122216.192613 Analyst: JYH Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-23
Instrument ID: ICP-THERMO3 Run Time: 19:45 Method: 6010C
File ID: T3.122216.194517 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	U

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

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Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596231-55
Instrument ID: ICP-THERMO3 Run Time: 03:58 Method: 6010C
File ID: T3.122316.035807 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	U

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

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Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596231-61
Instrument ID: ICP-THERMO3 Run Time: 04:21 Method: 6010C
File ID: T3.122316.042100 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	U

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

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Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-13
Instrument ID: ICP-THERMO3 Run Time: 16:44 Method: 6010C
File ID: T3.122216.164412 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	U

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

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Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-15
Instrument ID: ICP-THERMO3 Run Time: 18:09 Method: 6010C
File ID: T3.122216.180900 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	U

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

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Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-17
Instrument ID: ICP-THERMO3 Run Time: 18:40 Method: 6010C
File ID: T3.122216.184009 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596231-55
Instrument ID: ICP-THERMO3 Run Time: 03:58 Method: 6010C
File ID: T3.122316.035807 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	U

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

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Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596231-61
Instrument ID: ICP-THERMO3 Run Time: 04:21 Method: 6010C
File ID: T3.122316.042100 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	U

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

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Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-13
 Instrument ID: ICP-THERMO4 Run Time: 13:42 Method: 6010C
 File ID: T4.120916.134205 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-15
 Instrument ID: ICP-THERMO4 Run Time: 14:48 Method: 6010C
 File ID: T4.120916.144834 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-20
 Instrument ID: ICP-THERMO4 Run Time: 15:57 Method: 6010C
 File ID: T4.120916.155742 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-22
 Instrument ID: ICP-THERMO4 Run Time: 16:20 Method: 6010C
 File ID: T4.120916.162017 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-24
 Instrument ID: ICP-THERMO4 Run Time: 16:54 Method: 6010C
 File ID: T4.120916.165418 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-26
 Instrument ID: ICP-THERMO4 Run Time: 17:55 Method: 6010C
 File ID: T4.120916.175516 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-42
 Instrument ID: ICP-THERMO4 Run Time: 22:16 Method: 6010C
 File ID: T4.120916.221653 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-48
 Instrument ID: ICP-THERMO4 Run Time: 22:39 Method: 6010C
 File ID: T4.120916.223928 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-13
 Instrument ID: ICP-THERMO4 Run Time: 12:24 Method: 6010C
 File ID: T4.121416.122416 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-23
 Instrument ID: ICP-THERMO4 Run Time: 16:08 Method: 6010C
 File ID: T4.121416.160835 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-25
 Instrument ID: ICP-THERMO4 Run Time: 16:53 Method: 6010C
 File ID: T4.121416.165326 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-39
 Instrument ID: ICP-THERMO4 Run Time: 20:05 Method: 6010C
 File ID: T4.121416.200521 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.530	*

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-46
 Instrument ID: ICP-THERMO4 Run Time: 20:28 Method: 6010C
 File ID: T4.121416.202801 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.211	F
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-13
 Instrument ID: ICP-THERMO4 Run Time: 13:42 Method: 6010C
 File ID: T4.120916.134205 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-34
 Instrument ID: ICP-THERMO4 Run Time: 20:09 Method: 6010C
 File ID: T4.120916.200950 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-38
 Instrument ID: ICP-THERMO4 Run Time: 21:02 Method: 6010C
 File ID: T4.120916.210217 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-40
 Instrument ID: ICP-THERMO4 Run Time: 21:46 Method: 6010C
 File ID: T4.120916.214659 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-42
 Instrument ID: ICP-THERMO4 Run Time: 22:16 Method: 6010C
 File ID: T4.120916.221653 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-48
 Instrument ID: ICP-THERMO4 Run Time: 22:39 Method: 6010C
 File ID: T4.120916.223928 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-13
 Instrument ID: ICP-THERMO4 Run Time: 12:24 Method: 6010C
 File ID: T4.121416.122416 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-25
 Instrument ID: ICP-THERMO4 Run Time: 16:53 Method: 6010C
 File ID: T4.121416.165326 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-29
 Instrument ID: ICP-THERMO4 Run Time: 17:42 Method: 6010C
 File ID: T4.121416.174204 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-39
 Instrument ID: ICP-THERMO4 Run Time: 20:05 Method: 6010C
 File ID: T4.121416.200521 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.530	*

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-46
 Instrument ID: ICP-THERMO4 Run Time: 20:28 Method: 6010C
 File ID: T4.121416.202801 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.211	F
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-13
 Instrument ID: ICP-THERMO4 Run Time: 12:24 Method: 6010C
 File ID: T4.121416.122416 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-15
 Instrument ID: ICP-THERMO4 Run Time: 13:28 Method: 6010C
 File ID: T4.121416.132858 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-17
 Instrument ID: ICP-THERMO4 Run Time: 14:10 Method: 6010C
 File ID: T4.121416.141039 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-19
 Instrument ID: ICP-THERMO4 Run Time: 14:44 Method: 6010C
 File ID: T4.121416.144436 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.243	F

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

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Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-39
 Instrument ID: ICP-THERMO4 Run Time: 20:05 Method: 6010C
 File ID: T4.121416.200521 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.530	*

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-46
 Instrument ID: ICP-THERMO4 Run Time: 20:28 Method: 6010C
 File ID: T4.121416.202801 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.211	F
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-14
 Instrument ID: ICP-THERMO4 Run Time: 12:50 Method: 6010C
 File ID: T4.122116.125019 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-36
 Instrument ID: ICP-THERMO4 Run Time: 18:11 Method: 6010C
 File ID: T4.122116.181100 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-38
 Instrument ID: ICP-THERMO4 Run Time: 18:37 Method: 6010C
 File ID: T4.122116.183714 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-52
 Instrument ID: ICP-THERMO4 Run Time: 22:08 Method: 6010C
 File ID: T4.122116.220812 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-58
 Instrument ID: ICP-THERMO4 Run Time: 22:30 Method: 6010C
 File ID: T4.122116.223056 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Silicon	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/15/2016 Sample ID: WG595250-13
 Instrument ID: ICP-THERMO4 Run Time: 19:02 Method: 6010C
 File ID: T4.121516.190215 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-33
 Instrument ID: ICP-THERMO4 Run Time: 00:40 Method: 6010C
 File ID: T4.121616.004055 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-37
 Instrument ID: ICP-THERMO4 Run Time: 01:32 Method: 6010C
 File ID: T4.121616.013259 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-39
 Instrument ID: ICP-THERMO4 Run Time: 02:20 Method: 6010C
 File ID: T4.121616.022004 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.450	*

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

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Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-41
 Instrument ID: ICP-THERMO4 Run Time: 02:50 Method: 6010C
 File ID: T4.121616.025051 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	1.07	*
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-47
 Instrument ID: ICP-THERMO4 Run Time: 03:13 Method: 6010C
 File ID: T4.121616.031331 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-13
 Instrument ID: ICP-THERMO4 Run Time: 12:00 Method: 6010C
 File ID: T4.121816.120006 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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 PDF File ID: 5056961
 Report generated 12/22/2016 10:48



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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-33
 Instrument ID: ICP-THERMO4 Run Time: 18:18 Method: 6010C
 File ID: T4.121816.181817 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-37
 Instrument ID: ICP-THERMO4 Run Time: 19:10 Method: 6010C
 File ID: T4.121816.191034 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-39
Instrument ID: ICP-THERMO4 Run Time: 19:58 Method: 6010C
File ID: T4.121816.195804 Analyst: KKB Units: mg/L
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-41
 Instrument ID: ICP-THERMO4 Run Time: 20:25 Method: 6010C
 File ID: T4.121816.202506 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Magnesium	0.200	0.400	0.200	U
Manganese	0.00400	0.00800	0.00400	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U

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

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INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-06
Instrument ID: ICP-THERMO3 Run Time: 16:18 Method: 6010C
File ID: T3.122216.161808 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Iron	4	3.86	96.5	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-06
Instrument ID: ICP-THERMO3 Run Time: 16:18 Method: 6010C
File ID: T3.122216.161808 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Iron	4	3.86	96.5	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-06
 Instrument ID: ICP-THERMO4 Run Time: 12:57 Method: 6010C
 File ID: T4.120916.125701 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Aluminum	10	9.81	98.1	90 - 110	
Calcium	10	9.88	98.8	90 - 110	
Iron	4	3.89	97.4	90 - 110	
Magnesium	10	9.74	97.4	90 - 110	
Manganese	.5	0.486	97.2	90 - 110	
Potassium	50	48.2	96.5	90 - 110	
Silicon	5	4.86	97.2	90 - 110	
Sodium	50	48.3	96.7	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-06
 Instrument ID: ICP-THERMO4 Run Time: 11:50 Method: 6010C
 File ID: T4.121416.115019 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Aluminum	10	9.84	98.4	90 - 110	
Calcium	10	9.88	98.8	90 - 110	
Iron	4	3.93	98.4	90 - 110	
Magnesium	10	9.69	96.9	90 - 110	
Manganese	.5	0.489	97.7	90 - 110	
Potassium	50	48.2	96.5	90 - 110	
Silicon	5	4.82	96.5	90 - 110	
Sodium	50	48.2	96.3	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-06
 Instrument ID: ICP-THERMO4 Run Time: 11:50 Method: 6010C
 File ID: T4.121416.115019 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Aluminum	10	9.84	98.4	90 - 110	
Calcium	10	9.88	98.8	90 - 110	
Iron	4	3.93	98.4	90 - 110	
Magnesium	10	9.69	96.9	90 - 110	
Manganese	.5	0.489	97.7	90 - 110	
Potassium	50	48.2	96.5	90 - 110	
Sodium	50	48.2	96.3	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-06
 Instrument ID: ICP-THERMO4 Run Time: 12:57 Method: 6010C
 File ID: T4.120916.125701 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Aluminum	10	9.81	98.1	90 - 110	
Calcium	10	9.88	98.8	90 - 110	
Iron	4	3.89	97.4	90 - 110	
Magnesium	10	9.74	97.4	90 - 110	
Manganese	.5	0.486	97.2	90 - 110	
Potassium	50	48.2	96.5	90 - 110	
Sodium	50	48.3	96.7	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-06
 Instrument ID: ICP-THERMO4 Run Time: 12:05 Method: 6010C
 File ID: T4.122116.120534 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Aluminum	10	9.77	97.7	90 - 110	
Calcium	10	9.81	98.1	90 - 110	
Magnesium	10	9.53	95.3	90 - 110	
Manganese	.5	0.479	95.7	90 - 110	
Potassium	50	48.1	96.3	90 - 110	
Silicon	5	4.82	96.4	90 - 110	
Sodium	50	48.5	97.0	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-06
 Instrument ID: ICP-THERMO4 Run Time: 11:50 Method: 6010C
 File ID: T4.121416.115019 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Aluminum	10	9.84	98.4	90 - 110	
Calcium	10	9.88	98.8	90 - 110	
Magnesium	10	9.69	96.9	90 - 110	
Manganese	.5	0.489	97.7	90 - 110	
Potassium	50	48.2	96.5	90 - 110	
Silicon	5	4.82	96.5	90 - 110	
Sodium	50	48.2	96.3	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-06
 Instrument ID: ICP-THERMO4 Run Time: 11:29 Method: 6010C
 File ID: T4.121816.112927 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Aluminum	10	9.74	97.4	90 - 110	
Calcium	10	9.79	97.9	90 - 110	
Magnesium	10	9.69	96.9	90 - 110	
Manganese	.5	0.479	95.8	90 - 110	
Potassium	50	48.0	96.0	90 - 110	
Sodium	50	48.3	96.6	90 - 110	

* Exceeds LIMITS Limit

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 Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120352 Run Date: 12/15/2016 Sample ID: WG595250-06
 Instrument ID: ICP-THERMO4 Run Time: 18:30 Method: 6010C
 File ID: T4.121516.183036 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Aluminum	10	9.77	97.7	90 - 110	
Calcium	10	9.80	98.0	90 - 110	
Magnesium	10	9.50	95.0	90 - 110	
Manganese	.5	0.483	96.5	90 - 110	
Potassium	50	48.2	96.4	90 - 110	
Sodium	50	48.0	96.0	90 - 110	

* Exceeds LIMITS Limit

ICV - Modified 03/06/2008
 PDF File ID: 5056957
 Report generated 12/22/2016 10:47



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-12
 Instrument ID: ICP-THERMO3 Run Time: 16:40 Method: 6010C
 File ID: T3.122216.164038 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	3.91	mg/L	97.8	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5080549
 Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-16
 Instrument ID: ICP-THERMO3 Run Time: 18:36 Method: 6010C
 File ID: T3.122216.183634 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	3.86	mg/L	96.5	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5080549
 Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-20
 Instrument ID: ICP-THERMO3 Run Time: 19:22 Method: 6010C
 File ID: T3.122216.192238 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	3.95	mg/L	98.8	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5080549
 Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-22
 Instrument ID: ICP-THERMO3 Run Time: 19:41 Method: 6010C
 File ID: T3.122216.194142 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	3.99	mg/L	99.7	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5080549
 Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596231-54
Instrument ID: ICP-THERMO3 Run Time: 03:54 Method: 6010C
File ID: T3.122316.035432 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	4.06	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596231-60
Instrument ID: ICP-THERMO3 Run Time: 04:17 Method: 6010C
File ID: T3.122316.041726 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	4.03	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

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Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-12
 Instrument ID: ICP-THERMO3 Run Time: 16:40 Method: 6010C
 File ID: T3.122216.164038 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	3.91	mg/L	97.8	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-14
 Instrument ID: ICP-THERMO3 Run Time: 18:05 Method: 6010C
 File ID: T3.122216.180525 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	3.90	mg/L	97.4	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5080549
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-16
Instrument ID: ICP-THERMO3 Run Time: 18:36 Method: 6010C
File ID: T3.122216.183634 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	3.86	mg/L	96.5	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5080549
Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596231-54
 Instrument ID: ICP-THERMO3 Run Time: 03:54 Method: 6010C
 File ID: T3.122316.035432 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	4.06	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5080549
 Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596231-60
 Instrument ID: ICP-THERMO3 Run Time: 04:17 Method: 6010C
 File ID: T3.122316.041726 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	4.03	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5080549
 Report generated 12/23/2016 08:52



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-12
 Instrument ID: ICP-THERMO4 Run Time: 13:38 Method: 6010C
 File ID: T4.120916.133834 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.0	mg/L	100	90 - 110	
Calcium	10.0	9.84	mg/L	98.4	90 - 110	
Iron	4.00	3.95	mg/L	98.8	90 - 110	
Magnesium	10.0	9.79	mg/L	97.9	90 - 110	
Manganese	0.500	0.491	mg/L	98.2	90 - 110	
Potassium	50.0	49.5	mg/L	98.9	90 - 110	
Silicon	5.00	4.94	mg/L	98.8	90 - 110	
Sodium	50.0	49.7	mg/L	99.4	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5056960
 Report generated 12/22/2016 10:48



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-14
 Instrument ID: ICP-THERMO4 Run Time: 14:45 Method: 6010C
 File ID: T4.120916.144501 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.0	mg/L	100	90 - 110		
Calcium	10.0	9.95	mg/L	99.5	90 - 110		
Iron	4.00	3.96	mg/L	98.9	90 - 110		
Magnesium	10.0	9.92	mg/L	99.2	90 - 110		
Manganese	0.500	0.499	mg/L	99.9	90 - 110		
Potassium	50.0	50.0	mg/L	100	90 - 110		
Silicon	5.00	4.95	mg/L	99.0	90 - 110		
Sodium	50.0	50.4	mg/L	101	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5056960
 Report generated 12/22/2016 10:48



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-19
 Instrument ID: ICP-THERMO4 Run Time: 15:54 Method: 6010C
 File ID: T4.120916.155410 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	10.0	mg/L	100	90 - 110	
Iron	4.00	4.05	mg/L	101	90 - 110	
Magnesium	10.0	10.1	mg/L	101	90 - 110	
Manganese	0.500	0.502	mg/L	100	90 - 110	
Potassium	50.0	50.6	mg/L	101	90 - 110	
Silicon	5.00	4.96	mg/L	99.2	90 - 110	
Sodium	50.0	50.7	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-21
 Instrument ID: ICP-THERMO4 Run Time: 16:16 Method: 6010C
 File ID: T4.120916.161647 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	9.98	mg/L	99.8	90 - 110	
Iron	4.00	4.02	mg/L	101	90 - 110	
Magnesium	10.0	9.91	mg/L	99.1	90 - 110	
Manganese	0.500	0.497	mg/L	99.5	90 - 110	
Potassium	50.0	50.0	mg/L	100	90 - 110	
Silicon	5.00	4.99	mg/L	99.7	90 - 110	
Sodium	50.0	50.0	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-23
 Instrument ID: ICP-THERMO4 Run Time: 16:50 Method: 6010C
 File ID: T4.120916.165046 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	10.0	mg/L	100	90 - 110	
Iron	4.00	4.03	mg/L	101	90 - 110	
Magnesium	10.0	10.0	mg/L	100	90 - 110	
Manganese	0.500	0.508	mg/L	102	90 - 110	
Potassium	50.0	50.6	mg/L	101	90 - 110	
Silicon	5.00	4.98	mg/L	99.5	90 - 110	
Sodium	50.0	50.6	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-25
 Instrument ID: ICP-THERMO4 Run Time: 17:51 Method: 6010C
 File ID: T4.120916.175144 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.0	mg/L	100	90 - 110	
Calcium	10.0	9.85	mg/L	98.5	90 - 110	
Iron	4.00	4.00	mg/L	100	90 - 110	
Magnesium	10.0	10.1	mg/L	101	90 - 110	
Manganese	0.500	0.497	mg/L	99.4	90 - 110	
Potassium	50.0	49.8	mg/L	99.5	90 - 110	
Silicon	5.00	4.94	mg/L	98.7	90 - 110	
Sodium	50.0	49.9	mg/L	99.9	90 - 110	

* Exceeds LIMITS Criteria



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-41
Instrument ID: ICP-THERMO4 Run Time: 22:13 Method: 6010C
File ID: T4.120916.221322 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.0	mg/L	100	90 - 110	
Calcium	10.0	9.94	mg/L	99.4	90 - 110	
Iron	4.00	4.03	mg/L	101	90 - 110	
Magnesium	10.0	9.88	mg/L	98.8	90 - 110	
Manganese	0.500	0.501	mg/L	100	90 - 110	
Potassium	50.0	51.0	mg/L	102	90 - 110	
Silicon	5.00	4.96	mg/L	99.2	90 - 110	
Sodium	50.0	50.2	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-47
 Instrument ID: ICP-THERMO4 Run Time: 22:35 Method: 6010C
 File ID: T4.120916.223557 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	9.83	mg/L	98.3	90 - 110	
Calcium	10.0	9.90	mg/L	99.0	90 - 110	
Iron	4.00	4.02	mg/L	101	90 - 110	
Magnesium	10.0	9.79	mg/L	97.9	90 - 110	
Manganese	0.500	0.500	mg/L	100	90 - 110	
Potassium	50.0	51.3	mg/L	103	90 - 110	
Silicon	5.00	4.99	mg/L	99.8	90 - 110	
Sodium	50.0	50.0	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria



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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-12
 Instrument ID: ICP-THERMO4 Run Time: 12:20 Method: 6010C
 File ID: T4.121416.122044 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	9.90	mg/L	99.0	90 - 110	
Calcium	10.0	9.75	mg/L	97.5	90 - 110	
Iron	4.00	3.87	mg/L	96.7	90 - 110	
Magnesium	10.0	9.81	mg/L	98.1	90 - 110	
Manganese	0.500	0.483	mg/L	96.5	90 - 110	
Potassium	50.0	49.2	mg/L	98.3	90 - 110	
Silicon	5.00	4.84	mg/L	96.7	90 - 110	
Sodium	50.0	49.3	mg/L	98.6	90 - 110	

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-22
 Instrument ID: ICP-THERMO4 Run Time: 16:05 Method: 6010C
 File ID: T4.121416.160504 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.2	mg/L	102	90 - 110		
Calcium	10.0	10.0	mg/L	100	90 - 110		
Iron	4.00	3.86	mg/L	96.5	90 - 110		
Magnesium	10.0	9.83	mg/L	98.3	90 - 110		
Manganese	0.500	0.486	mg/L	97.1	90 - 110		
Potassium	50.0	50.9	mg/L	102	90 - 110		
Silicon	5.00	4.97	mg/L	99.3	90 - 110		
Sodium	50.0	51.2	mg/L	102	90 - 110		

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-24
 Instrument ID: ICP-THERMO4 Run Time: 16:49 Method: 6010C
 File ID: T4.121416.164954 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.0	mg/L	100	90 - 110	
Calcium	10.0	9.87	mg/L	98.7	90 - 110	
Iron	4.00	3.77	mg/L	94.3	90 - 110	
Magnesium	10.0	9.62	mg/L	96.2	90 - 110	
Manganese	0.500	0.470	mg/L	93.9	90 - 110	
Potassium	50.0	50.3	mg/L	101	90 - 110	
Silicon	5.00	4.89	mg/L	97.8	90 - 110	
Sodium	50.0	50.2	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-38
Instrument ID: ICP-THERMO4 Run Time: 20:01 Method: 6010C
File ID: T4.121416.200148 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	10.1	mg/L	101	90 - 110	
Iron	4.00	3.73	mg/L	93.3	90 - 110	
Magnesium	10.0	9.37	mg/L	93.7	90 - 110	
Manganese	0.500	0.465	mg/L	93.1	90 - 110	
Potassium	50.0	51.8	mg/L	104	90 - 110	
Silicon	5.00	4.91	mg/L	98.2	90 - 110	
Sodium	50.0	49.7	mg/L	99.4	90 - 110	

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-45
 Instrument ID: ICP-THERMO4 Run Time: 20:24 Method: 6010C
 File ID: T4.121416.202429 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	9.97	mg/L	99.7	90 - 110	
Iron	4.00	3.59	mg/L	89.6	90 - 110	*
Magnesium	10.0	9.16	mg/L	91.6	90 - 110	
Manganese	0.500	0.453	mg/L	90.6	90 - 110	
Potassium	50.0	52.0	mg/L	104	90 - 110	
Silicon	5.00	4.92	mg/L	98.5	90 - 110	
Sodium	50.0	51.1	mg/L	102	90 - 110	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-12
 Instrument ID: ICP-THERMO4 Run Time: 13:38 Method: 6010C
 File ID: T4.120916.133834 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.0	mg/L	100	90 - 110		
Calcium	10.0	9.84	mg/L	98.4	90 - 110		
Iron	4.00	3.95	mg/L	98.8	90 - 110		
Magnesium	10.0	9.79	mg/L	97.9	90 - 110		
Manganese	0.500	0.491	mg/L	98.2	90 - 110		
Potassium	50.0	49.5	mg/L	98.9	90 - 110		
Sodium	50.0	49.7	mg/L	99.4	90 - 110		

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-33
 Instrument ID: ICP-THERMO4 Run Time: 20:06 Method: 6010C
 File ID: T4.120916.200618 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	9.91	mg/L	99.1	90 - 110		
Calcium	10.0	9.87	mg/L	98.7	90 - 110		
Iron	4.00	4.02	mg/L	101	90 - 110		
Magnesium	10.0	9.86	mg/L	98.6	90 - 110		
Manganese	0.500	0.499	mg/L	99.8	90 - 110		
Potassium	50.0	50.7	mg/L	101	90 - 110		
Sodium	50.0	49.8	mg/L	99.5	90 - 110		

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-37
 Instrument ID: ICP-THERMO4 Run Time: 20:58 Method: 6010C
 File ID: T4.120916.205845 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	9.89	mg/L	98.9	90 - 110	
Calcium	10.0	9.90	mg/L	99.0	90 - 110	
Iron	4.00	4.01	mg/L	100	90 - 110	
Magnesium	10.0	9.80	mg/L	98.0	90 - 110	
Manganese	0.500	0.498	mg/L	99.6	90 - 110	
Potassium	50.0	50.6	mg/L	101	90 - 110	
Sodium	50.0	49.9	mg/L	99.8	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-39
 Instrument ID: ICP-THERMO4 Run Time: 21:43 Method: 6010C
 File ID: T4.120916.214328 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	9.88	mg/L	98.8	90 - 110		
Calcium	10.0	9.94	mg/L	99.4	90 - 110		
Iron	4.00	4.05	mg/L	101	90 - 110		
Magnesium	10.0	9.85	mg/L	98.5	90 - 110		
Manganese	0.500	0.497	mg/L	99.4	90 - 110		
Potassium	50.0	51.2	mg/L	102	90 - 110		
Sodium	50.0	50.3	mg/L	101	90 - 110		

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-41
 Instrument ID: ICP-THERMO4 Run Time: 22:13 Method: 6010C
 File ID: T4.120916.221322 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.0	mg/L	100	90 - 110		
Calcium	10.0	9.94	mg/L	99.4	90 - 110		
Iron	4.00	4.03	mg/L	101	90 - 110		
Magnesium	10.0	9.88	mg/L	98.8	90 - 110		
Manganese	0.500	0.501	mg/L	100	90 - 110		
Potassium	50.0	51.0	mg/L	102	90 - 110		
Sodium	50.0	50.2	mg/L	100	90 - 110		

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-47
 Instrument ID: ICP-THERMO4 Run Time: 22:35 Method: 6010C
 File ID: T4.120916.223557 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	9.83	mg/L	98.3	90 - 110	
Calcium	10.0	9.90	mg/L	99.0	90 - 110	
Iron	4.00	4.02	mg/L	101	90 - 110	
Magnesium	10.0	9.79	mg/L	97.9	90 - 110	
Manganese	0.500	0.500	mg/L	100	90 - 110	
Potassium	50.0	51.3	mg/L	103	90 - 110	
Sodium	50.0	50.0	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-12
 Instrument ID: ICP-THERMO4 Run Time: 12:20 Method: 6010C
 File ID: T4.121416.122044 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	9.90	mg/L	99.0	90 - 110		
Calcium	10.0	9.75	mg/L	97.5	90 - 110		
Iron	4.00	3.87	mg/L	96.7	90 - 110		
Magnesium	10.0	9.81	mg/L	98.1	90 - 110		
Manganese	0.500	0.483	mg/L	96.5	90 - 110		
Potassium	50.0	49.2	mg/L	98.3	90 - 110		
Sodium	50.0	49.3	mg/L	98.6	90 - 110		

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-24
 Instrument ID: ICP-THERMO4 Run Time: 16:49 Method: 6010C
 File ID: T4.121416.164954 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.0	mg/L	100	90 - 110	
Calcium	10.0	9.87	mg/L	98.7	90 - 110	
Iron	4.00	3.77	mg/L	94.3	90 - 110	
Magnesium	10.0	9.62	mg/L	96.2	90 - 110	
Manganese	0.500	0.470	mg/L	93.9	90 - 110	
Potassium	50.0	50.3	mg/L	101	90 - 110	
Sodium	50.0	50.2	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-28
 Instrument ID: ICP-THERMO4 Run Time: 17:38 Method: 6010C
 File ID: T4.121416.173833 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	9.99	mg/L	99.9	90 - 110		
Calcium	10.0	9.85	mg/L	98.5	90 - 110		
Iron	4.00	3.72	mg/L	92.9	90 - 110		
Magnesium	10.0	9.39	mg/L	93.9	90 - 110		
Manganese	0.500	0.474	mg/L	94.8	90 - 110		
Potassium	50.0	50.4	mg/L	101	90 - 110		
Sodium	50.0	50.3	mg/L	101	90 - 110		

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-38
 Instrument ID: ICP-THERMO4 Run Time: 20:01 Method: 6010C
 File ID: T4.121416.200148 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	10.1	mg/L	101	90 - 110	
Iron	4.00	3.73	mg/L	93.3	90 - 110	
Magnesium	10.0	9.37	mg/L	93.7	90 - 110	
Manganese	0.500	0.465	mg/L	93.1	90 - 110	
Potassium	50.0	51.8	mg/L	104	90 - 110	
Sodium	50.0	49.7	mg/L	99.4	90 - 110	

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-45
 Instrument ID: ICP-THERMO4 Run Time: 20:24 Method: 6010C
 File ID: T4.121416.202429 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	9.97	mg/L	99.7	90 - 110	
Iron	4.00	3.59	mg/L	89.6	90 - 110	*
Magnesium	10.0	9.16	mg/L	91.6	90 - 110	
Manganese	0.500	0.453	mg/L	90.6	90 - 110	
Potassium	50.0	52.0	mg/L	104	90 - 110	
Sodium	50.0	51.1	mg/L	102	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-12
 Instrument ID: ICP-THERMO4 Run Time: 12:20 Method: 6010C
 File ID: T4.121416.122044 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	9.90	mg/L	99.0	90 - 110	
Calcium	10.0	9.75	mg/L	97.5	90 - 110	
Magnesium	10.0	9.81	mg/L	98.1	90 - 110	
Manganese	0.500	0.483	mg/L	96.5	90 - 110	
Potassium	50.0	49.2	mg/L	98.3	90 - 110	
Silicon	5.00	4.84	mg/L	96.7	90 - 110	
Sodium	50.0	49.3	mg/L	98.6	90 - 110	

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-14
 Instrument ID: ICP-THERMO4 Run Time: 13:25 Method: 6010C
 File ID: T4.121416.132527 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.1	mg/L	101	90 - 110		
Calcium	10.0	9.90	mg/L	99.0	90 - 110		
Magnesium	10.0	9.71	mg/L	97.1	90 - 110		
Manganese	0.500	0.484	mg/L	96.9	90 - 110		
Potassium	50.0	49.8	mg/L	99.7	90 - 110		
Silicon	5.00	4.92	mg/L	98.4	90 - 110		
Sodium	50.0	49.9	mg/L	99.9	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-16
 Instrument ID: ICP-THERMO4 Run Time: 14:07 Method: 6010C
 File ID: T4.121416.140707 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.0	mg/L	100	90 - 110	
Calcium	10.0	9.87	mg/L	98.7	90 - 110	
Magnesium	10.0	9.67	mg/L	96.7	90 - 110	
Manganese	0.500	0.476	mg/L	95.2	90 - 110	
Potassium	50.0	50.0	mg/L	100	90 - 110	
Silicon	5.00	4.92	mg/L	98.3	90 - 110	
Sodium	50.0	50.1	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-18
Instrument ID: ICP-THERMO4 Run Time: 14:41 Method: 6010C
File ID: T4.121416.144105 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	9.89	mg/L	98.9	90 - 110	
Magnesium	10.0	9.78	mg/L	97.8	90 - 110	
Manganese	0.500	0.478	mg/L	95.5	90 - 110	
Potassium	50.0	50.5	mg/L	101	90 - 110	
Silicon	5.00	4.94	mg/L	98.9	90 - 110	
Sodium	50.0	50.3	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-38
Instrument ID: ICP-THERMO4 Run Time: 20:01 Method: 6010C
File ID: T4.121416.200148 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	10.1	mg/L	101	90 - 110	
Magnesium	10.0	9.37	mg/L	93.7	90 - 110	
Manganese	0.500	0.465	mg/L	93.1	90 - 110	
Potassium	50.0	51.8	mg/L	104	90 - 110	
Silicon	5.00	4.91	mg/L	98.2	90 - 110	
Sodium	50.0	49.7	mg/L	99.4	90 - 110	

* Exceeds LIMITS Criteria

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Report generated 12/22/2016 10:48



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-45
 Instrument ID: ICP-THERMO4 Run Time: 20:24 Method: 6010C
 File ID: T4.121416.202429 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	9.97	mg/L	99.7	90 - 110	
Magnesium	10.0	9.16	mg/L	91.6	90 - 110	
Manganese	0.500	0.453	mg/L	90.6	90 - 110	
Potassium	50.0	52.0	mg/L	104	90 - 110	
Silicon	5.00	4.92	mg/L	98.5	90 - 110	
Sodium	50.0	51.1	mg/L	102	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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 Report generated 12/22/2016 10:48



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-13
Instrument ID: ICP-THERMO4 Run Time: 12:46 Method: 6010C
File ID: T4.122116.124647 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	9.92	mg/L	99.2	90 - 110	
Calcium	10.0	9.81	mg/L	98.1	90 - 110	
Magnesium	10.0	9.51	mg/L	95.1	90 - 110	
Manganese	0.500	0.471	mg/L	94.1	90 - 110	
Potassium	50.0	49.7	mg/L	99.4	90 - 110	
Silicon	5.00	4.89	mg/L	97.8	90 - 110	
Sodium	50.0	50.0	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-35
 Instrument ID: ICP-THERMO4 Run Time: 18:07 Method: 6010C
 File ID: T4.122116.180727 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.0	mg/L	100	90 - 110		
Calcium	10.0	9.91	mg/L	99.1	90 - 110		
Magnesium	10.0	9.17	mg/L	91.7	90 - 110		
Manganese	0.500	0.459	mg/L	91.9	90 - 110		
Potassium	50.0	52.0	mg/L	104	90 - 110		
Silicon	5.00	4.90	mg/L	97.9	90 - 110		
Sodium	50.0	51.2	mg/L	102	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5056960
 Report generated 12/22/2016 10:48



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-37
Instrument ID: ICP-THERMO4 Run Time: 18:33 Method: 6010C
File ID: T4.122116.183341 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.0	mg/L	100	90 - 110	
Calcium	10.0	9.97	mg/L	99.7	90 - 110	
Magnesium	10.0	9.05	mg/L	90.5	90 - 110	
Manganese	0.500	0.459	mg/L	91.9	90 - 110	
Potassium	50.0	52.1	mg/L	104	90 - 110	
Silicon	5.00	4.91	mg/L	98.1	90 - 110	
Sodium	50.0	51.4	mg/L	103	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5056960
Report generated 12/22/2016 10:48



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-51
Instrument ID: ICP-THERMO4 Run Time: 22:04 Method: 6010C
File ID: T4.122116.220439 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.0	mg/L	100	90 - 110		
Calcium	10.0	10.1	mg/L	101	90 - 110		
Magnesium	10.0	9.19	mg/L	91.9	90 - 110		
Manganese	0.500	0.471	mg/L	94.1	90 - 110		
Potassium	50.0	53.9	mg/L	108	90 - 110		
Silicon	5.00	4.92	mg/L	98.5	90 - 110		
Sodium	50.0	52.6	mg/L	105	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Report generated 12/22/2016 10:48



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-57
Instrument ID: ICP-THERMO4 Run Time: 22:27 Method: 6010C
File ID: T4.122116.222724 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.0	mg/L	100	90 - 110	
Calcium	10.0	10.2	mg/L	102	90 - 110	
Magnesium	10.0	9.23	mg/L	92.3	90 - 110	
Manganese	0.500	0.469	mg/L	93.9	90 - 110	
Potassium	50.0	53.6	mg/L	107	90 - 110	
Silicon	5.00	4.90	mg/L	98.0	90 - 110	
Sodium	50.0	52.8	mg/L	106	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/15/2016 Sample ID: WG595250-12
 Instrument ID: ICP-THERMO4 Run Time: 18:58 Method: 6010C
 File ID: T4.121516.185843 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	9.99	mg/L	99.9	90 - 110	
Calcium	10.0	9.81	mg/L	98.1	90 - 110	
Magnesium	10.0	9.65	mg/L	96.5	90 - 110	
Manganese	0.500	0.493	mg/L	98.6	90 - 110	
Potassium	50.0	50.0	mg/L	99.9	90 - 110	
Sodium	50.0	49.5	mg/L	99.1	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-32
 Instrument ID: ICP-THERMO4 Run Time: 00:37 Method: 6010C
 File ID: T4.121616.003724 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.2	mg/L	102	90 - 110		
Calcium	10.0	10.2	mg/L	102	90 - 110		
Magnesium	10.0	9.75	mg/L	97.5	90 - 110		
Manganese	0.500	0.502	mg/L	100	90 - 110		
Potassium	50.0	53.1	mg/L	106	90 - 110		
Sodium	50.0	51.6	mg/L	103	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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 Report generated 12/22/2016 10:48



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-36
 Instrument ID: ICP-THERMO4 Run Time: 01:29 Method: 6010C
 File ID: T4.121616.012928 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.2	mg/L	102	90 - 110		
Calcium	10.0	10.2	mg/L	102	90 - 110		
Magnesium	10.0	9.89	mg/L	98.9	90 - 110		
Manganese	0.500	0.500	mg/L	100	90 - 110		
Potassium	50.0	53.3	mg/L	107	90 - 110		
Sodium	50.0	52.0	mg/L	104	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-38
 Instrument ID: ICP-THERMO4 Run Time: 02:16 Method: 6010C
 File ID: T4.121616.021632 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.3	mg/L	103	90 - 110		
Calcium	10.0	10.4	mg/L	104	90 - 110		
Magnesium	10.0	9.71	mg/L	97.1	90 - 110		
Manganese	0.500	0.507	mg/L	101	90 - 110		
Potassium	50.0	54.1	mg/L	108	90 - 110		
Sodium	50.0	52.2	mg/L	104	90 - 110		

* Exceeds LIMITS Criteria

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 PDF File ID: 5056960
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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-40
Instrument ID: ICP-THERMO4 Run Time: 02:47 Method: 6010C
File ID: T4.121616.024718 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.3	mg/L	103	90 - 110		
Calcium	10.0	10.3	mg/L	103	90 - 110		
Magnesium	10.0	9.87	mg/L	98.7	90 - 110		
Manganese	0.500	0.498	mg/L	99.6	90 - 110		
Potassium	50.0	54.5	mg/L	109	90 - 110		
Sodium	50.0	52.7	mg/L	105	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-46
 Instrument ID: ICP-THERMO4 Run Time: 03:09 Method: 6010C
 File ID: T4.121616.030959 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.3	mg/L	103	90 - 110	
Calcium	10.0	10.3	mg/L	103	90 - 110	
Magnesium	10.0	9.68	mg/L	96.8	90 - 110	
Manganese	0.500	0.495	mg/L	98.9	90 - 110	
Potassium	50.0	55.3	mg/L	111	90 - 110	*
Sodium	50.0	52.8	mg/L	106	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-12
 Instrument ID: ICP-THERMO4 Run Time: 11:56 Method: 6010C
 File ID: T4.121816.115614 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	9.95	mg/L	99.5	90 - 110		
Calcium	10.0	9.77	mg/L	97.7	90 - 110		
Magnesium	10.0	9.80	mg/L	98.0	90 - 110		
Manganese	0.500	0.481	mg/L	96.2	90 - 110		
Potassium	50.0	49.6	mg/L	99.2	90 - 110		
Sodium	50.0	49.9	mg/L	99.7	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-32
 Instrument ID: ICP-THERMO4 Run Time: 18:14 Method: 6010C
 File ID: T4.121816.181445 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.0	mg/L	100	90 - 110		
Calcium	10.0	10.0	mg/L	100	90 - 110		
Magnesium	10.0	9.22	mg/L	92.2	90 - 110		
Manganese	0.500	0.427	mg/L	85.4	90 - 110		*
Potassium	50.0	53.3	mg/L	107	90 - 110		
Sodium	50.0	52.0	mg/L	104	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5056960
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-36
 Instrument ID: ICP-THERMO4 Run Time: 19:07 Method: 6010C
 File ID: T4.121816.190701 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.1	mg/L	101	90 - 110	
Calcium	10.0	10.0	mg/L	100	90 - 110	
Magnesium	10.0	9.03	mg/L	90.3	90 - 110	
Manganese	0.500	0.423	mg/L	84.5	90 - 110	*
Potassium	50.0	53.2	mg/L	106	90 - 110	
Sodium	50.0	52.2	mg/L	104	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5056960
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-38
 Instrument ID: ICP-THERMO4 Run Time: 19:54 Method: 6010C
 File ID: T4.121816.195432 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	10.0	10.1	mg/L	101	90 - 110		
Calcium	10.0	10.1	mg/L	101	90 - 110		
Magnesium	10.0	9.12	mg/L	91.2	90 - 110		
Manganese	0.500	0.421	mg/L	84.2	90 - 110		*
Potassium	50.0	53.7	mg/L	107	90 - 110		
Sodium	50.0	52.7	mg/L	105	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5056960
 Report generated 12/22/2016 10:48



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-40
Instrument ID: ICP-THERMO4 Run Time: 20:21 Method: 6010C
File ID: T4.121816.202134 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	10.0	10.2	mg/L	102	90 - 110	
Calcium	10.0	10.2	mg/L	102	90 - 110	
Magnesium	10.0	9.17	mg/L	91.7	90 - 110	
Manganese	0.500	0.429	mg/L	85.8	90 - 110	*
Potassium	50.0	54.0	mg/L	108	90 - 110	
Sodium	50.0	53.2	mg/L	106	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5056960
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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-08
Instrument ID: ICP-THERMO3 Run Time: 16:25 Method: 6010C
File ID: T3.122216.162528 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	0.0800	0.0778	mg/L	97.2	70 - 130	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 5080594
Report generated 12/23/2016 13:35



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-18
Instrument ID: ICP-THERMO3 Run Time: 18:44 Method: 6010C
File ID: T3.122216.184408 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	0.0800	0.0691	mg/L	86.4	70 - 130	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 5080594
Report generated 12/23/2016 13:35



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-24
Instrument ID: ICP-THERMO3 Run Time: 19:49 Method: 6010C
File ID: T3.122216.194915 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	0.0800	0.0846	mg/L	106	70 - 130	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 5080594
Report generated 12/23/2016 13:35



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-08
Instrument ID: ICP-THERMO3 Run Time: 16:25 Method: 6010C
File ID: T3.122216.162528 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	0.0800	0.0778	mg/L	97.2	70 - 130	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 5080594
Report generated 12/23/2016 13:35



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/22/2016 Sample ID: WG596231-18
 Instrument ID: ICP-THERMO3 Run Time: 18:44 Method: 6010C
 File ID: T3.122216.184408 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	0.0800	0.0691	mg/L	86.4	70 - 130	

* Exceeds LIMITS Criteria

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 PDF File ID: 5080594
 Report generated 12/23/2016 13:35



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-08
 Instrument ID: ICP-THERMO4 Run Time: 13:06 Method: 6010C
 File ID: T4.120916.130620 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.179	mg/L	112	70 - 130	
Calcium	0.400	0.412	mg/L	103	70 - 130	
Iron	0.0800	0.0650	mg/L	81.3	70 - 130	
Magnesium	0.400	0.346	mg/L	86.5	70 - 130	
Manganese	0.00800	0.00841	mg/L	105	70 - 130	
Potassium	0.800	0.735	mg/L	91.9	70 - 130	
Silicon	0.800	0.795	mg/L	99.4	70 - 130	
Sodium	0.400	0.378	mg/L	94.6	70 - 130	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
 LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-16
 Instrument ID: ICP-THERMO4 Run Time: 14:59 Method: 6010C
 File ID: T4.120916.145935 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.169	mg/L	106	70 - 130	
Calcium	0.400	0.427	mg/L	107	70 - 130	
Iron	0.0800	0.0734	mg/L	91.8	70 - 130	
Magnesium	0.400	0.310	mg/L	77.6	70 - 130	
Manganese	0.00800	0.0108	mg/L	134	70 - 130	*
Potassium	0.800	0.620	mg/L	77.5	70 - 130	
Silicon	0.800	0.781	mg/L	97.7	70 - 130	
Sodium	0.400	0.429	mg/L	107	70 - 130	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-27
 Instrument ID: ICP-THERMO4 Run Time: 17:59 Method: 6010C
 File ID: T4.120916.175908 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.166	mg/L	104	70 - 130	
Calcium	0.400	0.419	mg/L	105	70 - 130	
Iron	0.0800	0.100	mg/L	125	70 - 130	
Magnesium	0.400	0.493	mg/L	123	70 - 130	
Manganese	0.00800	0.0103	mg/L	129	70 - 130	
Potassium	0.800	0.699	mg/L	87.4	70 - 130	
Silicon	0.800	0.796	mg/L	99.5	70 - 130	
Sodium	0.400	0.394	mg/L	98.5	70 - 130	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-09
 Instrument ID: ICP-THERMO4 Run Time: 12:06 Method: 6010C
 File ID: T4.121416.120649 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.179	mg/L	112	70 - 130	
Calcium	0.400	0.413	mg/L	103	70 - 130	
Iron	0.0800	0.112	mg/L	139	70 - 130	*
Magnesium	0.400	0.502	mg/L	126	70 - 130	
Manganese	0.00800	0.00939	mg/L	117	70 - 130	
Potassium	0.800	0.914	mg/L	114	70 - 130	
Silicon	0.800	0.782	mg/L	97.8	70 - 130	
Sodium	0.400	0.419	mg/L	105	70 - 130	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-21
 Instrument ID: ICP-THERMO4 Run Time: 15:02 Method: 6010C
 File ID: T4.121416.150240 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.170	mg/L	106	70 - 130	
Calcium	0.400	0.395	mg/L	98.7	70 - 130	
Iron	0.0800	0.0628	mg/L	78.5	70 - 130	
Magnesium	0.400	0.416	mg/L	104	70 - 130	
Manganese	0.00800	0.00768	mg/L	96.0	70 - 130	
Potassium	0.800	0.812	mg/L	102	70 - 130	
Silicon	0.800	0.764	mg/L	95.4	70 - 130	
Sodium	0.400	0.441	mg/L	110	70 - 130	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-27
 Instrument ID: ICP-THERMO4 Run Time: 17:01 Method: 6010C
 File ID: T4.121416.170106 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594313 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Manganese	0.00800	0.00767	mg/L	95.9	70 - 130	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-08
 Instrument ID: ICP-THERMO4 Run Time: 13:06 Method: 6010C
 File ID: T4.120916.130620 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.179	mg/L	112	70 - 130	
Calcium	0.400	0.412	mg/L	103	70 - 130	
Iron	0.0800	0.0650	mg/L	81.3	70 - 130	
Magnesium	0.400	0.346	mg/L	86.5	70 - 130	
Manganese	0.00800	0.00841	mg/L	105	70 - 130	
Potassium	0.800	0.735	mg/L	91.9	70 - 130	
Sodium	0.400	0.378	mg/L	94.6	70 - 130	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-16
 Instrument ID: ICP-THERMO4 Run Time: 14:59 Method: 6010C
 File ID: T4.120916.145935 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.169	mg/L	106	70 - 130	
Calcium	0.400	0.427	mg/L	107	70 - 130	
Iron	0.0800	0.0734	mg/L	91.8	70 - 130	
Magnesium	0.400	0.310	mg/L	77.6	70 - 130	
Manganese	0.00800	0.0108	mg/L	134	70 - 130	*
Potassium	0.800	0.620	mg/L	77.5	70 - 130	
Sodium	0.400	0.429	mg/L	107	70 - 130	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594361-43
 Instrument ID: ICP-THERMO4 Run Time: 22:20 Method: 6010C
 File ID: T4.120916.222042 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 09-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	0.160	0.166	mg/L	104	70 - 130		
Calcium	0.400	0.403	mg/L	101	70 - 130		
Iron	0.0800	0.0839	mg/L	105	70 - 130		
Magnesium	0.400	0.391	mg/L	97.6	70 - 130		
Manganese	0.00800	0.00959	mg/L	120	70 - 130		
Potassium	0.800	0.800	mg/L	100	70 - 130		
Sodium	0.400	0.402	mg/L	101	70 - 130		

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594704-08
 Instrument ID: ICP-THERMO4 Run Time: 16:06 Method: 6010C
 File ID: T4.121216.160608 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 12-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Manganese	0.00800	0.00691	mg/L	86.4	70 - 130	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/12/2016 Sample ID: WG594704-18
 Instrument ID: ICP-THERMO4 Run Time: 17:50 Method: 6010C
 File ID: T4.121216.175057 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 12-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Manganese	0.00800	0.00657	mg/L	82.1	70 - 130	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-09
 Instrument ID: ICP-THERMO4 Run Time: 12:06 Method: 6010C
 File ID: T4.121416.120649 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.179	mg/L	112	70 - 130	
Calcium	0.400	0.413	mg/L	103	70 - 130	
Iron	0.0800	0.112	mg/L	139	70 - 130	*
Magnesium	0.400	0.502	mg/L	126	70 - 130	
Manganese	0.00800	0.00939	mg/L	117	70 - 130	
Potassium	0.800	0.914	mg/L	114	70 - 130	
Sodium	0.400	0.419	mg/L	105	70 - 130	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-21
 Instrument ID: ICP-THERMO4 Run Time: 15:02 Method: 6010C
 File ID: T4.121416.150240 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	0.160	0.170	mg/L	106	70 - 130		
Calcium	0.400	0.395	mg/L	98.7	70 - 130		
Iron	0.0800	0.0628	mg/L	78.5	70 - 130		
Magnesium	0.400	0.416	mg/L	104	70 - 130		
Manganese	0.00800	0.00768	mg/L	96.0	70 - 130		
Potassium	0.800	0.812	mg/L	102	70 - 130		
Sodium	0.400	0.441	mg/L	110	70 - 130		

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-27
 Instrument ID: ICP-THERMO4 Run Time: 17:01 Method: 6010C
 File ID: T4.121416.170106 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Manganese	0.00800	0.00767	mg/L	95.9	70 - 130	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-33
 Instrument ID: ICP-THERMO4 Run Time: 18:08 Method: 6010C
 File ID: T4.121416.180804 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594316 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Manganese	0.00800	0.00821	mg/L	103	70 - 130	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
 LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-09
 Instrument ID: ICP-THERMO4 Run Time: 12:06 Method: 6010C
 File ID: T4.121416.120649 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	0.160	0.179	mg/L	112	70 - 130		
Calcium	0.400	0.413	mg/L	103	70 - 130		
Magnesium	0.400	0.502	mg/L	126	70 - 130		
Manganese	0.00800	0.00939	mg/L	117	70 - 130		
Potassium	0.800	0.914	mg/L	114	70 - 130		
Silicon	0.800	0.782	mg/L	97.8	70 - 130		
Sodium	0.400	0.419	mg/L	105	70 - 130		

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/14/2016 Sample ID: WG594926-21
 Instrument ID: ICP-THERMO4 Run Time: 15:02 Method: 6010C
 File ID: T4.121416.150240 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 14-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	0.160	0.170	mg/L	106	70 - 130		
Calcium	0.400	0.395	mg/L	98.7	70 - 130		
Magnesium	0.400	0.416	mg/L	104	70 - 130		
Manganese	0.00800	0.00768	mg/L	96.0	70 - 130		
Potassium	0.800	0.812	mg/L	102	70 - 130		
Silicon	0.800	0.764	mg/L	95.4	70 - 130		
Sodium	0.400	0.441	mg/L	110	70 - 130		

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-10
 Instrument ID: ICP-THERMO4 Run Time: 12:33 Method: 6010C
 File ID: T4.122116.123354 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	0.160	0.181	mg/L	113	70 - 130		
Calcium	0.400	0.414	mg/L	104	70 - 130		
Magnesium	0.400	0.348	mg/L	87.1	70 - 130		
Potassium	0.800	0.712	mg/L	89.0	70 - 130		
Sodium	0.400	0.382	mg/L	95.6	70 - 130		

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-20
 Instrument ID: ICP-THERMO4 Run Time: 14:17 Method: 6010C
 File ID: T4.122116.141700 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	0.160	0.186	mg/L	116	70 - 130		
Calcium	0.400	0.424	mg/L	106	70 - 130		
Magnesium	0.400	0.470	mg/L	118	70 - 130		
Potassium	0.800	0.750	mg/L	93.8	70 - 130		
Sodium	0.400	0.408	mg/L	102	70 - 130		

* Exceeds LIMITS Criteria

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 PDF File ID: 5056962
 Report generated 12/27/2016 16:51



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-34
 Instrument ID: ICP-THERMO4 Run Time: 17:29 Method: 6010C
 File ID: T4.122116.172938 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Sodium	0.400	0.445	mg/L	111	70 - 130	

* Exceeds LIMITS Criteria

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 Report generated 12/27/2016 16:51



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-40
Instrument ID: ICP-THERMO4 Run Time: 18:44 Method: 6010C
File ID: T4.122116.184451 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Sodium	0.400	0.463	mg/L	116	70 - 130	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596008-54
 Instrument ID: ICP-THERMO4 Run Time: 22:15 Method: 6010C
 File ID: T4.122116.221552 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594644 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.155	mg/L	96.9	70 - 130	
Calcium	0.400	0.407	mg/L	102	70 - 130	
Magnesium	0.400	0.301	mg/L	75.2	70 - 130	
Manganese	0.00800	0.00921	mg/L	115	70 - 130	
Potassium	0.800	0.977	mg/L	122	70 - 130	
Silicon	0.800	0.822	mg/L	103	70 - 130	
Sodium	0.400	0.494	mg/L	123	70 - 130	

* Exceeds LIMITS Criteria

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 PDF File ID: 5056962
 Report generated 12/27/2016 16:51



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/15/2016 Sample ID: WG595250-08
 Instrument ID: ICP-THERMO4 Run Time: 18:37 Method: 6010C
 File ID: T4.121516.183757 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	0.160	0.173	mg/L	108	70 - 130		
Calcium	0.400	0.400	mg/L	100	70 - 130		
Magnesium	0.400	0.385	mg/L	96.3	70 - 130		
Manganese	0.00800	0.00789	mg/L	98.6	70 - 130		
Potassium	0.800	0.771	mg/L	96.3	70 - 130		
Sodium	0.400	0.410	mg/L	103	70 - 130		

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
 PDF File ID: 5056962
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Microbac Laboratories Inc.
 LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/15/2016 Sample ID: WG595250-18
 Instrument ID: ICP-THERMO4 Run Time: 20:48 Method: 6010C
 File ID: T4.121516.204814 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	0.160	0.164	mg/L	103	70 - 130		
Calcium	0.400	0.394	mg/L	98.4	70 - 130		
Magnesium	0.400	0.284	mg/L	71.0	70 - 130		
Manganese	0.00800	0.00854	mg/L	107	70 - 130		
Potassium	0.800	0.783	mg/L	97.9	70 - 130		
Sodium	0.400	0.391	mg/L	97.7	70 - 130		

* Exceeds LIMITS Criteria

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 PDF File ID: 5056962
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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-35
 Instrument ID: ICP-THERMO4 Run Time: 00:48 Method: 6010C
 File ID: T4.121616.004834 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	0.160	0.143	mg/L	89.6	70 - 130		
Calcium	0.400	0.381	mg/L	95.4	70 - 130		
Magnesium	0.400	0.435	mg/L	109	70 - 130		
Manganese	0.00800	0.00967	mg/L	121	70 - 130		
Potassium	0.800	0.943	mg/L	118	70 - 130		
Sodium	0.400	0.421	mg/L	105	70 - 130		

* Exceeds LIMITS Criteria

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 Report generated 12/27/2016 16:51



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595250-42
 Instrument ID: ICP-THERMO4 Run Time: 02:54 Method: 6010C
 File ID: T4.121616.025441 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 15-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum	0.160	0.136	mg/L	84.9	70 - 130		
Calcium	0.400	0.390	mg/L	97.6	70 - 130		
Magnesium	0.400	0.468	mg/L	117	70 - 130		
Manganese	0.00800	0.0104	mg/L	130	70 - 130		
Potassium	0.800	1.04	mg/L	130	70 - 130		
Sodium	0.400	0.578	mg/L	144	70 - 130		*

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
 LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-08
 Instrument ID: ICP-THERMO4 Run Time: 11:36 Method: 6010C
 File ID: T4.121816.113649 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Sodium	0.400	0.380	mg/L	95.0	70 - 130	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-09
 Instrument ID: ICP-THERMO4 Run Time: 11:40 Method: 6010C
 File ID: T4.121816.114037 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Calcium	0.400	0.492	mg/L	123	70 - 130	
Magnesium	0.400	0.439	mg/L	110	70 - 130	
Potassium	0.800	0.969	mg/L	121	70 - 130	
Sodium	0.400	0.488	mg/L	122	70 - 130	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
 LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-20
 Instrument ID: ICP-THERMO4 Run Time: 14:33 Method: 6010C
 File ID: T4.121816.143342 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Sodium	0.400	0.464	mg/L	116	70 - 130	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
 PDF File ID: 5056962
 Report generated 12/27/2016 16:51



Microbac Laboratories Inc.
 LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-21
 Instrument ID: ICP-THERMO4 Run Time: 14:37 Method: 6010C
 File ID: T4.121816.143730 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.100	0.207	mg/L	207	70 - 130	*
Calcium	0.200	0.504	mg/L	252	70 - 130	*
Magnesium	0.500	0.461	mg/L	92.1	70 - 130	
Manganese	0.0100	0.0117	mg/L	117	70 - 130	
Potassium	1.00	1.20	mg/L	120	70 - 130	
Sodium	0.500	0.520	mg/L	104	70 - 130	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-42
Instrument ID: ICP-THERMO4 Run Time: 20:28 Method: 6010C
File ID: T4.121816.202855 Analyst: KKB QC Key: WATERLOO
Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Sodium	0.400	0.427	mg/L	107	70 - 130	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 5056962
Report generated 12/27/2016 16:51



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/18/2016 Sample ID: WG595477-43
 Instrument ID: ICP-THERMO4 Run Time: 20:32 Method: 6010C
 File ID: T4.121816.203243 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594872 Cal ID: ICP-TH - 18-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.100	0.213	mg/L	213	70 - 130	*
Calcium	0.200	0.479	mg/L	239	70 - 130	*
Magnesium	0.500	0.507	mg/L	101	70 - 130	
Manganese	0.0100	0.00810	mg/L	81.0	70 - 130	
Potassium	1.00	1.03	mg/L	103	70 - 130	
Sodium	0.500	0.526	mg/L	105	70 - 130	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO3
Sol. A: WG596231-10
Sol. AB: WG596231-11

File ID: T3.122216.163303
File ID: T3.122216.163656

Workgroup (AAB#): WG594644
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	256	102	250	259	104	
Calcium	250	234	93.6	250	231	92.4	
Iron	100	93.5	93.5	100	92.7	92.7	
Magnesium	250	246	98.4	250	241	96.4	
Manganese	NS	0.000960	NS	0.250	0.236	94.4	
Potassium	NS	0.0333	NS	5.00	5.02	100	
Silicon	NS	0.0366	NS	NS	-0.0428	NS	
Sodium	NS	-0.00510	NS	5.00	5.05	101	

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.



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO3
Sol. A : WG596231-58
Sol. AB : WG596231-59

File ID: T3.122316.040949
File ID: T3.122316.041342

Workgroup (AAB#): WG594644
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	260	104	250	259	104	
Calcium	250	234	93.6	250	234	93.6	
Iron	100	93.1	93.1	100	93.2	93.2	
Magnesium	250	256	102	250	250	100	
Manganese	NS	0.00227	NS	0.250	0.247	98.8	
Potassium	NS	0.195	NS	5.00	5.07	101	
Silicon	NS	0.0445	NS	NS	-0.0413	NS	
Sodium	NS	0.00433	NS	5.00	5.10	102	

NS = Not spiked

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO3
Sol. A: WG596231-10
Sol. AB: WG596231-11

File ID: T3.122216.163303
File ID: T3.122216.163656

Workgroup (AAB#): WG594872
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	256	102	250	259	104	
Calcium	250	234	93.6	250	231	92.4	
Iron	100	93.5	93.5	100	92.7	92.7	
Magnesium	250	246	98.4	250	241	96.4	
Manganese	NS	0.000960	NS	0.250	0.236	94.4	
Potassium	NS	0.0333	NS	5.00	5.02	100	
Sodium	NS	-0.00510	NS	5.00	5.05	101	

NS = Not spiked

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO3
Sol. A: WG596231-58
Sol. AB: WG596231-59

File ID: T3.122316.040949
File ID: T3.122316.041342

Workgroup (AAB#): WG594872
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	260	104	250	259	104	
Calcium	250	234	93.6	250	234	93.6	
Iron	100	93.1	93.1	100	93.2	93.2	
Magnesium	250	256	102	250	250	100	
Manganese	NS	0.00227	NS	0.250	0.247	98.8	
Potassium	NS	0.195	NS	5.00	5.07	101	
Sodium	NS	0.00433	NS	5.00	5.10	102	

NS = Not spiked

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

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG594926-10
Sol. AB: WG594926-11

File ID: T4.121416.121320
File ID: T4.121416.121706

Workgroup (AAB#): WG594644
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	243	97.2	250	244	97.6	
Calcium	250	224	89.6	250	222	88.8	
Iron	100	94.4	94.4	100	94.5	94.5	
Magnesium	250	241	96.4	250	240	96.0	
Manganese	NS	-0.000230	NS	0.250	0.236	94.4	
Potassium	NS	0.158	NS	5.00	5.26	105	
Silicon	NS	0.775	NS	NS	0.0182	NS	
Sodium	NS	0.0994	NS	5.00	5.11	102	

NS = Not spiked

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

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A : WG594926-43
Sol. AB : WG594926-44

File ID: T4.121416.201647
File ID: T4.121416.202041

Workgroup (AAB#): WG594644
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	242	96.8	250	240	96.0	
Calcium	250	224	89.6	250	224	89.6	
Iron	100	86.6	86.6	100	86.3	86.3	
Magnesium	250	222	88.8	250	224	89.6	
Manganese	NS	0.00158	NS	0.250	0.219	87.6	
Potassium	NS	0.431	NS	5.00	5.65	113	
Silicon	NS	0.787	NS	NS	0.0177	NS	
Sodium	NS	0.417	NS	5.00	5.44	109	

NS = Not spiked

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG596008-11
Sol. AB: WG596008-12

File ID: T4.122116.123919
File ID: T4.122116.124308

Workgroup (AAB#): WG594644
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	241	96.4	250	240	96.0	
Calcium	250	223	89.2	250	226	90.4	
Iron	100	92.9	92.9	100	93.1	93.1	
Magnesium	250	238	95.2	250	237	94.8	
Manganese	NS	-0.000380	NS	0.250	0.233	93.2	
Potassium	NS	0.0805	NS	5.00	5.21	104	
Silicon	NS	0.0541	NS	NS	0.0117	NS	
Sodium	NS	0.0206	NS	5.00	5.14	103	

NS = Not spiked

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A : WG596008-55
Sol. AB : WG596008-56

File ID: T4.122116.221940
File ID: T4.122116.222335

Workgroup (AAB#): WG594644
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	237	94.8	250	241	96.4	
Calcium	250	228	91.2	250	227	90.8	
Iron	100	88.0	88.0	100	87.8	87.8	
Magnesium	250	226	90.4	250	223	89.2	
Manganese	NS	0.0000800	NS	0.250	0.228	91.2	
Potassium	NS	0.137	NS	5.00	5.63	113	
Silicon	NS	0.0640	NS	NS	0.0126	NS	
Sodium	NS	0.0737	NS	5.00	5.35	107	

NS = Not spiked

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG594361-10
Sol. AB: WG594361-11

File ID: T4.120916.133056
File ID: T4.120916.133451

Workgroup (AAB#): WG594313
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	245	98.0	250	244	97.6	
Calcium	250	224	89.6	250	225	90.0	
Iron	100	96.2	96.2	100	96.5	96.5	
Magnesium	250	244	97.6	250	245	98.0	
Manganese	NS	0.00160	NS	0.250	0.240	96.0	
Potassium	NS	0.0463	NS	5.00	5.24	105	
Silicon	NS	0.550	NS	NS	0.00836	NS	
Sodium	NS	0.0494	NS	5.00	5.12	102	

NS = Not spiked

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

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG594361-45
Sol. AB: WG594361-46

File ID: T4.120916.222817
File ID: T4.120916.223211

Workgroup (AAB#): WG594313
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	238	95.2	250	238	95.2	
Calcium	250	222	88.8	250	223	89.2	
Iron	100	98.1	98.1	100	97.5	97.5	
Magnesium	250	243	97.2	250	244	97.6	
Manganese	NS	0.00152	NS	0.250	0.239	95.6	
Potassium	NS	0.0875	NS	5.00	5.40	108	
Silicon	NS	0.564	NS	NS	0.00802	NS	
Sodium	NS	0.0693	NS	5.00	5.14	103	

NS = Not spiked

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG594926-10
Sol. AB: WG594926-11

File ID: T4.121416.121320
File ID: T4.121416.121706

Workgroup (AAB#): WG594313
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	243	97.2	250	244	97.6	
Calcium	250	224	89.6	250	222	88.8	
Iron	100	94.4	94.4	100	94.5	94.5	
Magnesium	250	241	96.4	250	240	96.0	
Manganese	NS	-0.000230	NS	0.250	0.236	94.4	
Potassium	NS	0.158	NS	5.00	5.26	105	
Silicon	NS	0.775	NS	NS	0.0182	NS	
Sodium	NS	0.0994	NS	5.00	5.11	102	

NS = Not spiked

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

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

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A : WG594926-43
Sol. AB : WG594926-44

File ID: T4.121416.201647
File ID: T4.121416.202041

Workgroup (AAB#): WG594313
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	242	96.8	250	240	96.0	
Calcium	250	224	89.6	250	224	89.6	
Iron	100	86.6	86.6	100	86.3	86.3	
Magnesium	250	222	88.8	250	224	89.6	
Manganese	NS	0.00158	NS	0.250	0.219	87.6	
Potassium	NS	0.431	NS	5.00	5.65	113	
Silicon	NS	0.787	NS	NS	0.0177	NS	
Sodium	NS	0.417	NS	5.00	5.44	109	

NS = Not spiked

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG594361-10
Sol. AB: WG594361-11

File ID: T4.120916.133056
File ID: T4.120916.133451

Workgroup (AAB#): WG594316
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	245	98.0	250	244	97.6	
Calcium	250	224	89.6	250	225	90.0	
Iron	100	96.2	96.2	100	96.5	96.5	
Magnesium	250	244	97.6	250	245	98.0	
Manganese	NS	0.00160	NS	0.250	0.240	96.0	
Potassium	NS	0.0463	NS	5.00	5.24	105	
Sodium	NS	0.0494	NS	5.00	5.12	102	

NS = Not spiked

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

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG594361-45
Sol. AB: WG594361-46

File ID: T4.120916.222817
File ID: T4.120916.223211

Workgroup (AAB#): WG594316
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	238	95.2	250	238	95.2	
Calcium	250	222	88.8	250	223	89.2	
Iron	100	98.1	98.1	100	97.5	97.5	
Magnesium	250	243	97.2	250	244	97.6	
Manganese	NS	0.00152	NS	0.250	0.239	95.6	
Potassium	NS	0.0875	NS	5.00	5.40	108	
Sodium	NS	0.0693	NS	5.00	5.14	103	

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.



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG594926-10
Sol. AB: WG594926-11

File ID: T4.121416.121320
File ID: T4.121416.121706

Workgroup (AAB#): WG594316
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	243	97.2	250	244	97.6	
Calcium	250	224	89.6	250	222	88.8	
Iron	100	94.4	94.4	100	94.5	94.5	
Magnesium	250	241	96.4	250	240	96.0	
Manganese	NS	-0.000230	NS	0.250	0.236	94.4	
Potassium	NS	0.158	NS	5.00	5.26	105	
Sodium	NS	0.0994	NS	5.00	5.11	102	

NS = Not spiked

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

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

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



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A : WG594926-43
Sol. AB : WG594926-44

File ID: T4.121416.201647
File ID: T4.121416.202041

Workgroup (AAB#): WG594316
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	242	96.8	250	240	96.0	
Calcium	250	224	89.6	250	224	89.6	
Iron	100	86.6	86.6	100	86.3	86.3	
Magnesium	250	222	88.8	250	224	89.6	
Manganese	NS	0.00158	NS	0.250	0.219	87.6	
Potassium	NS	0.431	NS	5.00	5.65	113	
Sodium	NS	0.417	NS	5.00	5.44	109	

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.



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG595250-10
Sol. AB: WG595250-11

File ID: T4.121516.185114
File ID: T4.121516.185504

Workgroup (AAB#): WG594872
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	239	95.6	250	242	96.8	
Calcium	250	225	90.0	250	224	89.6	
Iron	100	96.0	96.0	100	96.5	96.5	
Magnesium	250	242	96.8	250	242	96.8	
Manganese	NS	0	NS	0.250	0.248	99.2	
Potassium	NS	0.0812	NS	5.00	5.21	104	
Sodium	NS	0.0921	NS	5.00	5.10	102	

NS = Not spiked

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

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

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



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG595250-44
Sol. AB: WG595250-45

File ID: T4.121616.030217
File ID: T4.121616.030611

Workgroup (AAB#): WG594872
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	241	96.4	250	243	97.2	
Calcium	250	231	92.4	250	231	92.4	
Iron	100	91.1	91.1	100	90.9	90.9	
Magnesium	250	232	92.8	250	234	93.6	
Manganese	NS	0.00531	NS	0.250	0.241	96.4	
Potassium	NS	0.204	NS	5.00	5.74	115	
Sodium	NS	0.294	NS	5.00	5.47	109	

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.



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG595477-10
Sol. AB: WG595477-11

File ID: T4.121816.114425
File ID: T4.121816.114812

Workgroup (AAB#): WG594872
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	242	96.8	250	242	96.8	
Calcium	250	222	88.8	250	222	88.8	
Iron	100	95.0	95.0	100	94.9	94.9	
Magnesium	250	246	98.4	250	244	97.6	
Manganese	NS	0	NS	0.250	0.235	94.0	
Potassium	NS	0.136	NS	5.00	5.17	103	
Sodium	NS	0.00614	NS	5.00	5.13	103	

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.



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-THERMO4
Sol. A: WG595477-44
Sol. AB: WG595477-45

File ID: T4.121816.203630
File ID: T4.121816.204026

Workgroup (AAB#): WG594872
Method: 6010C
Units: mg/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Aluminum	250	241	96.4	250	242	96.8	
Calcium	250	227	90.8	250	227	90.8	
Iron	100	84.3	84.3	100	84.8	84.8	
Magnesium	250	226	90.4	250	224	89.6	
Manganese	NS	0.00280	NS	0.250	0.207	82.8	
Potassium	NS	0.0581	NS	5.00	5.66	113	
Sodium	NS	0.0402	NS	5.00	5.40	108	

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.



Microbac Laboratories Inc.
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

Login Number: L16120352
Instrument ID: ICP-THERMO4
Workgroup (AAB#): WG594313

CCV Number: WG594361-14
CAL ID: ICP - - 09-DEC-16
Matrix: THERMO4
TCLP

Sample Number	Dilution	Tag	IS-1
WG594361-14	NA	NA	6976.9
Upper Limit	NA	NA	13953.8
Lower Limit	NA	NA	3488
<u>WG593987-01</u>	1.00	01	6908.4
<u>WG594106-02</u>	1.00	01	7020.2
<u>WG594106-03</u>	1.00	01	6967.3
<u>WG594313-01</u>	1.00	01	6853.2
<u>WG594313-02</u>	5.00	01	7161.6

IS-1 - Yttrium

Underline = Response outside limits



Microbac Laboratories Inc.
INTERNAL STANDARD AREA SUMMARY
(COMPARED TO CCV)

Login Number: L16120352
Instrument ID: ICP-THERMO4
Workgroup (AAB#): WG594316

CCV Number: WG594361-33
CAL ID: ICP - - 09-DEC-16
Matrix: THERMO4
TCLP

Sample Number	Dilution	Tag	IS-1
WG594361-33	NA	NA	6879.4
Upper Limit	NA	NA	13758.8
Lower Limit	NA	NA	3440
WG594044-01	1.00	01	6839.2
WG594044-02	1.00	01	7062.3
WG594234-02	1.00	01	7093.3
WG594234-03	1.00	01	6956.9
WG594316-01	1.00	01	6724.5
WG594316-02	5.00	01	6986.8

IS-1 - Yttrium

Underline = Response outside limits



Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 01/04/2016

Instrument ID: ICP-THERMO3

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	0.0115	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	0.000260	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	-0.0000490	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	0.0000300	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

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Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 01/04/2016

Instrument ID: ICP-THERMO3

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	0.0200
ARSENIC	189.00	0	0	0	0	-0.00190
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	-0.00480
ZINC	206.20	0	0	0	0	-0.00180
ZIRCONIUM	339.10	0	0	0	0	0

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Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352
 Instrument ID: ICP-THERMO3

Date: 01/04/2016
 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	-0.0000500	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	0.000300	0	0	0
CADMIUM	228.80	0	-0.0000190	0	0	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0.0000500	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0	0.00160	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	0.00000300
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0.0000420	0	0	0
PHOSPHORUS	214.90	-0.323	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	-0.000270	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	-0.000400	0	0	0
VANADIUM	292.40	0	0.00000700	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	-0.0000300	0	0	0

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Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 01/04/2016

Instrument ID: ICP-THERMO3

Method: 6010C

Analyte	Wave Length	MN	MO	NA	NI	P
ALUMINUM	308.20	0	0.0163	0	0	0
ANTIMONY	206.80	0	-0.00310	0	-0.00350	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	-0.00210	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	-0.0000430	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	-0.00830	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

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Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 01/04/2016

Instrument ID: ICP-THERMO3

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	-0.0220
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

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Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 01/04/2016

Instrument ID: ICP-THERMO3

Method: 6010C

Analyte	Wave Length	SR	TI	TL	V	ZN
ALUMINUM	308.20	0	0	0	0.0950	0
ANTIMONY	206.80	0	0.00110	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	0.00210	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	-0.000800	0	-0.00490	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

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Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352
 Instrument ID: ICP-THERMO3

Date: 01/04/2016
 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
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Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 07/25/2016

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	AG	AL	AS	B	BA
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0.00000900	0	0	0
ARSENIC	189.00	0	0	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0.00000100	0	0	0
BORON	249.60	0	0	0	0	0
CADMIUM	228.80	0	0	0.00200	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	-0.000130	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	-0.000130	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0	-0.0000490	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	0.0000180	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	0.0000180	0	0	0
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5056955
 Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 07/25/2016

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	BE	CA	CD	CO	CR
ALUMINUM	308.20	0	0	0	-0.000820	0
ANTIMONY	206.80	0	0	0	0	0.0138
ARSENIC	189.00	0	0	0	0	-0.00190
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	-0.00210	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
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	-0.0000920
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0	0	-0.000500	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	0.00300	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	-0.00138
ZINC	206.20	0	0	0	0	-0.000800
ZIRCONIUM	339.10	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5056955
 Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 07/25/2016

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	CU	FE	K	LI	MG
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0.0000560	0	0	0
ARSENIC	189.00	0	0.0000120	0	0	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	0	0	0	0
BORON	249.60	0	-0.000619	0	0	0
CADMIUM	228.80	0	0.00000400	0	0	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0	0.00000500	0	0	0
COBALT	228.60	0	0	0	0	0
COPPER	224.70	0	0.000830	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	0.00000300
MOLYBDENUM	202.00	0	0	0	0	0
NICKEL	231.60	0	0.0000470	0	0	0
PHOSPHORUS	214.90	-0.323	-0.000530	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	0.0000300	0	0	0
ZINC	206.20	0	0	0	0	0
ZIRCONIUM	339.10	0	-0.0000100	0	0	0

CORR_FACTORS - Modified 03/05/2008
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 Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352
 Instrument ID: ICP-THERMO4

Date: 07/25/2016
 Method: 6010C

Analyte	Wave Length	MN	MO	NA	NI	P
ALUMINUM	308.20	0	0.0163	0	0	0
ANTIMONY	206.80	0	0.000670	0	0	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	-0.000128	0
CALCIUM	422.60	0	0	0	0	0
CHROMIUM	267.70	0.000330	0	0	0	0
COBALT	228.60	0	-0.000983	0	0.000175	0
COPPER	224.70	0	0.00200	0	-0.0120	0
IRON	261.10	0	0	0	0	0
LEAD	220.30	0	-0.00280	0	0.000110	0
LITHIUM	670.70	0	0	0	0	0
MAGNESIUM	279.10	-0.00190	-0.0130	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	0.00710	0	0	0
POTASSIUM	766.40	0	0	0	0	0
SELENIUM	196.10	0.000800	0.000156	0	0	0
SILICON	212.40	0	0.0187	0	0	0
SILVER	328.10	0	-0.0000440	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	-0.000153	0	0	0
VANADIUM	292.40	-0.000110	-0.00778	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
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 Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 07/25/2016

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	PB	SB	SE	SI	SN
ALUMINUM	308.20	0	0	0	0	0
ANTIMONY	206.80	0	0	0	0	-0.00840
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	0.00300	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
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 Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 07/25/2016

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	SR	TI	TL	V	ZN
ALUMINUM	308.20	0	0	0	0.00300	0
ANTIMONY	206.80	0	-0.00400	0	-0.00138	0
ARSENIC	189.00	0	0	0	0.000107	0
BARIUM	455.40	0	0	0	0	0
BERYLLIUM	313.10	0	-0.000770	0	0.000800	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	0.00158	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	-0.00620	0	-0.00617	0
SODIUM	589.50	0	0	0	0	0
STRONTIUM	407.70	0	0	0	0	0
THALLIUM	190.80	0	-0.000700	0	0.000660	0
TIN	189.90	0	-0.00260	0	0	0
TITANIUM	337.20	0	0	0	0	0
VANADIUM	292.40	0	0.000600	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: 5056955
 Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120352

Date: 07/25/2016

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: 5056955
Report generated: 12/22/2016 10:47



Microbac Laboratories Inc.
LINEAR RANGE (QUARTERLY)

Login Number: L16120352 Date: 07/29/2016
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	1.8
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	720.0
Lead	20.00	225.0
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	450.0
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.

LINEAR_RANGE - Modified 03/06/2008
PDF File ID: 5080543
Report generated: 12/23/2016 08:52



Microbac Laboratories Inc.
LINEAR RANGE (QUARTERLY)

Login Number: L16120352 Date: 10/25/0016
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	27.0
Nickel	20.00	90.0
Phosphorus	20.00	180.0
Potassium	8.00	360.0
Selenium	20.00	90.0
Silicon	20.00	36.0
Silver	10.00	4.5
Sodium	8.00	270.0
Strontium	8.00	9.0
Thallium	20.00	18.0
Tin	20.00	45.0
Titanium	8.00	45.0
Vanadium	20.00	27.0
Zinc	20.00	45.0
Zirconium	10.00	45.0

Comments:

All analytes passed acceptance criteria at the specified concentration.

LINEAR_RANGE - Modified 03/06/2008
PDF File ID: 5056954
Report generated: 12/22/2016 10:47



2.3 Metals Data

2.3.2 Metals ICP-MS Data

2.3.2.1 Summary Data



Login Number: L16120352
Department: Metals
Analyst: Ji Hu

METHOD

Preparation: SW-846 3015

Analysis: SW-846 6020

HOLDING TIMES

Sample Preparation: All holding times were met.

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

CALIBRATION

Initial Calibration: All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Interference Check Standards: All acceptance criteria were met.

Continuing Calibration: WG595999 - Due to continuing calibration verification failure for chromium on 21-DEC-2016 at 22:26, client samples 07,08,09,10,11,12,15,16 and the QC/QA samples were reanalyzed on a later calibration which was compliant for chromium.

Continuing Calibration Blank: All acceptance criteria were met.

Low Level Check: All acceptance criteria were met.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Serial Dilution/Post Digestion Spikes: WG594630 - All acceptance criteria were met.

WG595999 - Due to post digestion spike failure, the post digestion spike was reanalyzed on a later calibration for all analytes.

Matrix Spikes: WG594630 - Sample 01 was chosen by the client for MS/MSD analysis. Samples 03(MS) and 05(MSD) met all acceptance criteria.

Sample 02 was chosen by the client for MS/MSD analysis. Samples 04(MS) and 06(MSD) met all acceptance criteria.

WG595999 - Sample 07 was chosen by the client for MS/MSD analysis. Samples 09(MS) and 11(MSD) met all acceptance criteria. Sample 08 was chosen by the client for MS/MSD analysis. Samples 10(MS) and 12(MSD) met all acceptance criteria.

SAMPLES

Samples: All acceptance criteria were met.

Narrative ID: 120424

Approved By: Kerri Buck

K: K Buck

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 16:55
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.165518
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.0373		0.00100	0.000500

Sample #: L16120352-02	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:26
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.172616
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.0351		0.00100	0.000500

Sample #: L16120352-03	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 16:58
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.165824
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.171		0.00100	0.000500

Sample #: L16120352-04	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616-MS	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:29
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.172921
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.171		0.00100	0.000500

Certificate of Analysis

Sample #: L16120352-05	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:01
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.170130
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.173		0.00100	0.000500

Sample #: L16120352-06	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW23-120616-MSD	Prep Method: 3015	Prep Date: 12/08/2016 09:15
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:32
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: NI.121316.173227
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.170		0.00100	0.000500

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 17:56
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.175656
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.000736	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 09:41
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.094101
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.00252		0.00200	0.00100
J	The analyte was positively identified, but the quantitation was below the RL.				

Certificate of Analysis

Sample #: L16120352-08	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 10:11
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.101159
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.00246		0.00200	0.00100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120352-08	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:00
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.180002
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000597	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120352-09	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:03
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.180307
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.129		0.00100	0.000500

Sample #: L16120352-09	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 09:44
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.094406
Sample Tag: 02	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.128		0.00200	0.00100

Sample #: L16120352-10	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:09
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.180918
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.132		0.00100	0.000500

Sample #: L16120352-10	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MS	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 10:15
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.101504
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.129		0.00200	0.00100

Sample #: L16120352-11	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:06
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.180612
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.129		0.00100	0.000500

Sample #: L16120352-11	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/09/2016 08:48
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 09:47
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.094711
Sample Tag: 02	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.127		0.00200	0.00100

Sample #: L16120352-12	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 10:18
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122316.101809
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.127		0.00200	0.00100

Sample #: L16120352-12	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW02-120616-MSD	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:12
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.122116.181223
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.128		0.00100	0.000500

Sample #: L16120352-13	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:15
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: NI.122116.181529
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00688		0.00100	0.000500

Sample #: L16120352-14	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW09R-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:30
Collect Date: 12/06/2016 14:00	Dilution: 1	File ID: NI.122116.183059
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00536		0.00100	0.000500

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:34
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: NI.122116.183404
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00711		0.00100	0.000500

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 09:50
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: NI.122316.095017
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.00235		0.00200	0.00100

Sample #: L16120352-16	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/23/2016 07:30
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/23/2016 09:53
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: NI.122316.095322
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.00234		0.00200	0.00100

Sample #: L16120352-16	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW01-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:37
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: NI.122116.183710
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00594		0.00100	0.000500

Sample #: L16120352-17	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW16I-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:40
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: NI.122116.184015
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00140		0.00100	0.000500

Sample #: L16120352-18	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW16I-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:43
Collect Date: 12/06/2016 13:15	Dilution: 1	File ID: NI.122116.184321
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00150		0.00100	0.000500

Sample #: L16120352-21	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/09/2016 08:49
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG595999	Analyst: JYH	Run Date: 12/21/2016 18:46
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: NI.122116.184626
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00145		0.00100	0.000500

Sample #: L16120352-22	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW26-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:02
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:04
Collect Date: 12/06/2016 14:45	Dilution: 1	File ID: NI.121316.170435
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00181		0.00100	0.000500

Sample #: L16120352-23	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:02
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:07
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.121316.170740
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00403		0.00100	0.000500

Sample #: L16120352-24	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW17-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:02
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:35
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: NI.121316.173532
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00520		0.00100	0.000500

Sample #: L16120352-26	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:02
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:38
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: NI.121316.173838
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00357		0.00100	0.000500

Sample #: L16120352-27	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120616	Prep Method: 3015	Prep Date: 12/08/2016 11:02
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/13/2016 16:24
Workgroup #: WG594630	Analyst: JYH	Run Date: 12/13/2016 17:41
Collect Date: 12/06/2016 12:30	Dilution: 1	File ID: NI.121316.174143
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00385		0.00100	0.000500

2.3.2.2 QC Summary Data

Example 6020 Calculations
Perkin Elmer ELAN 6100

1.0 Initial Calibration (ICAL) Parameters

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

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

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

Where:

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

Vf = Final volume

Vi = Initial volume

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

Cx = Concentration of element in (ug/L)

Example:

0.1

100

40

1

0.25

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

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

Where:

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

Vf = Final volume

Vi = Initial volume

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

Cx = Concentration of element in (ug/kg)

Example:

0.1

200

0.5

1

40

4.0 Adjusting the concentration to dry weight:

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

Where:

Cx = Concentration calculated as received (wet basis)

Px = Percent solids of sample (%wt)

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

Example:

40

80

50

50 ug/kg = 0.050 mg/kg

Perkin Elmer ELAN ICP/MS

STANDARDS KEY

- QC Std 1 - ICV
- QC Std 2 - ICB
- QC Std 3 - LLICV
- QC Std 4 - ICSA
- QC Std 5 - ICSAB
- QC Std 6 - CCV
- QC Std 7 - CCB
- QC Std 8 - LLCCV

Calibration Solutions

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

Microbac Laboratories Inc.
Microwave Digestion Log

Workgroup: WG594231
 Analyst: VC
 Spike Analyst: VC
 Run Date: 12/09/2016 08:49
 Method: 3015
 Balance: BAL016
 Instrument: MW-3
 Instrument Start: 12/09/2016 08:56

SOP: ME407 Revision 19
 Spike Solution: STD78216
 Spike Witness: ERP
 HNO3 Lot #: COA19297
 40 & 50 ML. DIGESTION TU COA19282
 MS Filters- fisher-Lot# RRGT38288

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG594231-03	BLANK	1	20 mL	50 mL	180.532 g	180.552 g	
2	WG594231-04	LCS	1	20 mL	50 mL	183.169 g	183.171 g	.25 mL
3	WG594231-01	REF	1	20 mL	50 mL	181.004 g	181.004 g	
4	L16120352-07	RS03	1	20 mL	50 mL	181.004 g	181.004 g	12/21/16
5	WG594231-02	REF	1	20 mL	50 mL	182.998 g	182.99 g	
6	L16120352-08	RS04	1	20 mL	50 mL	182.998 g	182.99 g	12/21/16
7	WG594231-05	MS	1	20 mL	50 mL	182.839 g	182.815 g	.25 mL
8	L16120352-09	MS03	1	20 mL	50 mL	182.839 g	182.815 g	.25 mL
9	WG594231-07	MS	1	20 mL	50 mL	183.489 g	183.471 g	.25 mL
10	L16120352-10	MS04	1	20 mL	50 mL	183.489 g	183.471 g	.25 mL
11	WG594231-06	MSD	1	20 mL	50 mL	184.263 g	184.248 g	.25 mL
12	L16120352-11	SD03	1	20 mL	50 mL	184.263 g	184.248 g	.25 mL
13	WG594231-08	MSD	1	20 mL	50 mL	183.158 g	183.189 g	.25 mL
14	L16120352-12	SD04	1	20 mL	50 mL	183.158 g	183.189 g	.25 mL
15	L16120352-13	SAMP	1	20 mL	50 mL	183.068 g	183.064 g	12/21/16
16	L16120352-14	SAMP	1	20 mL	50 mL	182.87 g	182.869 g	12/21/16
17	L16120352-15	SAMP	1	20 mL	50 mL	182.419 g	182.426 g	12/21/16
18	L16120352-16	SAMP	1	20 mL	50 mL	183.638 g	183.63 g	12/21/16
19	L16120352-17	RS05	1	20 mL	50 mL	182.997 g	182.995 g	12/21/16
20	L16120352-18	SAMP	1	20 mL	50 mL	182.161 g	182.138 g	12/21/16
21	L16120352-21	SAMP	1	20 mL	50 mL	183.039 g	183.029 g	12/21/16
22	L16120425-01	SAMP	1	20 mL	50 mL	184.053 g	184.055 g	12/22/16
23	L16120425-02	SAMP	1	20 mL	50 mL	182.563 g	182.543 g	12/22/16
24	L16120425-03	SAMP	1	20 mL	50 mL	184.303 g	184.3 g	12/22/16
25	L16120425-04	SAMP	1	20 mL	50 mL	184.839 g	184.838 g	12/22/16
26	L16120425-05	SAMP	1	20 mL	50 mL	183.492 g	183.487 g	12/22/16
27	L16120425-06	SAMP	1	20 mL	50 mL	185.028 g	185.012 g	12/22/16
28	L16120425-07	SAMP	1	20 mL	50 mL	185.152 g	185.156 g	12/22/16
29	L16120425-08	SAMP	1	20 mL	50 mL	181.9 g	181.898 g	12/22/16
30	L16120425-09	SAMP	1	20 mL	50 mL	182.907 g	182.904 g	12/22/16

L16120425-03 FILTERED DIGESTATE

Analyst: Vicki Collier

Reviewer: Erin Pottin



Microbac Laboratories Inc.
Microwave Digestion Log

Workgroup: WG594059
 Analyst: VC
 Spike Analyst: VC
 Run Date: 12/08/2016 09:15
 Method: 3015
 Balance: BAL019
 Instrument: BAL014
 Instrument Start: 12/08/2016 11:01

SOP: ME407 Revison 19
 Spike Solution: STD78216
 Spike Witness: ERP
 HNO3 Lot #: COA19297
 40 & 50 ML. DIGESTION TUCOA19282
 MS Filters- fisher-Lot#RRGT38288

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG594059-03	BLANK	1	20 mL	50 mL	184.282 g	184.237 g	
2	WG594059-04	LCS	1	20 mL	50 mL	184.852 g	184.855 g	.25 mL
3	L16120236-01	SAMP	1	20 mL	50 mL	183.6 g	183.601 g	
4	L16120267-02	SAMP	1	20 mL	50 mL	184.737 g	184.75 g	
5	L16120267-03	SAMP	1	20 mL	50 mL	181.469 g	181.471 g	
6	L16120267-04	SAMP	1	20 mL	50 mL	184.911 g	184.913 g	
7	L16120275-01	SAMP	1	20 mL	50 mL	182.203 g	182.209 g	
8	L16120275-03	SAMP	1	20 mL	50 mL	182.203 g	182.209 g	
9	L16120299-01	SAMP	1	20 mL	50 mL	182.195 g	182.184 g	
10	L16120315-03	SAMP	1	20 mL	50 mL	182.942 g	182.958 g	
11	L16120315-04	SAMP	1	20 mL	50 mL	183.913 g	183.914 g	
12	L16120342-02	SAMP	1	20 mL	50 mL	181.752 g	181.735 g	
13	L16120342-03	SAMP	1	20 mL	50 mL	185.063 g	185.051 g	
14	L16120342-04	SAMP	1	20 mL	50 mL	180.446 g	180.422 g	
15	WG594059-01	REF	1	20 mL	50 mL	181.911 g	181.905 g	
16	L16120352-01	RS01	1	20 mL	50 mL	181.911 g	181.905 g	12/21/16
17	WG594059-02	REF	1	20 mL	50 mL	182.765 g	182.758 g	
18	L16120352-02	RS02	1	20 mL	50 mL	182.765 g	182.758 g	12/21/16
19	WG594059-05	MS	1	20 mL	50 mL	185.21 g	185.199 g	.25 mL
20	L16120352-03	MS01	1	20 mL	50 mL	185.21 g	185.199 g	.25 mL
21	WG594059-07	MS	1	20 mL	50 mL	182.959 g	182.926 g	.25 mL
22	L16120352-04	MS02	1	20 mL	50 mL	182.959 g	182.926 g	.25 mL
23	WG594059-06	MSD	1	20 mL	50 mL	182.123 g	182.055 g	.25 mL
24	L16120352-05	SD01	1	20 mL	50 mL	182.123 g	182.055 g	.25 mL
25	WG594059-08	MSD	1	20 mL	50 mL	183.402 g	183.388 g	.25 mL
26	L16120352-06	SD02	1	20 mL	50 mL	183.402 g	183.388 g	.25 mL
27	L16120352-22	SAMP	1	20 mL	50 mL	183.847 g	183.86 g	
28	L16120352-23	SAMP	1	20 mL	50 mL	182.284 g	182.274 g	
29	L16120352-24	SAMP	1	20 mL	50 mL	189.4 g	189.402 g	
30	L16120352-26	SAMP	1	20 mL	50 mL	182.232 g	182.224 g	
31	L16120352-27	SAMP	1	20 mL	50 mL	184.145 g	184.152 g	

L16120275-01 FILTERED DIGESTATE

Analyst: Vicki Collier

Reviewer: Erin Poston



Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 121316B.REP
 Analyst1: JYH Analyst2: N/A
 Method: 200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD78743 ICV Std: STD78745 Post Spike: STD76567
 ICSA: STD79065 ICSAB: STD79066 Int. Std: RGT38094
 CCV: STD78744 LLCCV: STD79064 Tuning Sol : STD78941
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594630Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.121316.161155	Blank	Blank		1		12/13/16 16:11
2	NI.121316.161500	WG594874-01	Calibration Point		1		12/13/16 16:15
3	NI.121316.161806	WG594874-02	Calibration Point		1		12/13/16 16:18
4	NI.121316.162111	WG594874-03	Calibration Point		1		12/13/16 16:21
5	NI.121316.162416	WG594874-04	Calibration Point		1		12/13/16 16:24
6	NI.121316.162724	WG594874-05	Initial Calibration Verification		1		12/13/16 16:27
7	NI.121316.163031	WG594874-06	Initial Calib Blank		1		12/13/16 16:30
8	NI.121316.163338	WG594874-07	Low Level Initial Calibration V		1		12/13/16 16:33
9	NI.121316.163643	WG594874-08	Interference Check		1		12/13/16 16:36
10	NI.121316.163949	WG594874-09	Interference Check		1		12/13/16 16:39
11	NI.121316.164256	WG594874-10	CCV		1		12/13/16 16:42
12	NI.121316.164602	WG594874-11	CCB		1		12/13/16 16:46
13	NI.121316.164908	WG594059-03	Method/Prep Blank	20/50	1		12/13/16 16:49
14	NI.121316.165213	WG594059-04	Laboratory Control S	20/50	1		12/13/16 16:52
15	NI.121316.165518	WG594059-01	Reference Sample		1	L16120352-01	12/13/16 16:55
16	NI.121316.165824	WG594059-05	Matrix Spike	20/50	1	L16120352-01	12/13/16 16:58
17	NI.121316.170130	WG594059-06	Matrix Spike Duplica	20/50	1	L16120352-01	12/13/16 17:01
18	NI.121316.170435	L16120352-22	MW26-120616	20/50	1		12/13/16 17:04
19	NI.121316.170740	L16120352-23	MW17-120616	20/50	1		12/13/16 17:07
20	NI.121316.171046	WG594630-01	Post Digestion Spike		1	L16120352-23	12/13/16 17:10
21	NI.121316.171351	WG594630-02	Serial Dilution		5	L16120352-23	12/13/16 17:13
22	NI.121316.171657	WG594630-02	Serial Dilution		25	L16120352-23	12/13/16 17:16
23	NI.121316.172004	WG594874-12	CCV		1		12/13/16 17:20
24	NI.121316.172309	WG594874-13	CCB		1		12/13/16 17:23
25	NI.121316.172616	WG594059-02	Reference Sample		1	L16120352-02	12/13/16 17:26
26	NI.121316.172921	WG594059-07	Matrix Spike	20/50	1	L16120352-02	12/13/16 17:29
27	NI.121316.173227	WG594059-08	Matrix Spike Duplica	20/50	1	L16120352-02	12/13/16 17:32
28	NI.121316.173532	L16120352-24	MW17-120616	20/50	1		12/13/16 17:35
29	NI.121316.173838	L16120352-26	DUP-GW-120616	20/50	1		12/13/16 17:38
30	NI.121316.174143	L16120352-27	DUP-GW-120616	20/50	1		12/13/16 17:41
31	NI.121316.174449	L16120236-01	W5A-GW-120216	20/50	1		12/13/16 17:44
32	NI.121316.174754	L16120267-02	A09-MW10-Y1S4	20/50	1		12/13/16 17:47
33	NI.121316.175100	L16120267-03	A09-MW11-Y1S4	20/50	1		12/13/16 17:51
34	NI.121316.175405	L16120267-04	A09-MW12-Y1S4	20/50	1		12/13/16 17:54

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Sam H. Rhodes

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Instrument Run Log

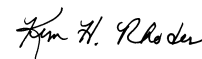
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 Analyst1: JYH Analyst2: N/A
 Method: 200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD78743 ICV Std: STD78745 Post Spike: STD76567
 ICSA: STD79065 ICSAB: STD79066 Int. Std: RGT38094
 CCV: STD78744 LLCCV: STD79064 Tuning Sol: STD78941
 Stannous: _____ Hydroxylamine: _____

Workgroups: 594630

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.121316.175711	WG594874-14	CCV		1		12/13/16 17:57
36	NI.121316.180017	WG594874-15	CCB		1		12/13/16 18:00
37	NI.121316.180324	L16120275-03	LH18/24-SP650-6414-GRAB	20/50	1		12/13/16 18:03
38	NI.121316.180630	L16120299-01	DET-003-SPLIT	20/50	1		12/13/16 18:06
39	NI.121316.180935	L16120315-03	TCF-EB01-120516	20/50	1		12/13/16 18:09
40	NI.121316.181240	L16120315-04	MW28-GW-120516	20/50	1	WG593907-01	12/13/16 18:12
41	NI.121316.181546	L16120342-02	A09-MW02-Y1S4	20/50	1		12/13/16 18:15
42	NI.121316.181852	L16120342-03	A09-MW07-Y1S4	20/50	1		12/13/16 18:18
43	NI.121316.182157	L16120342-04	A09-TM02-Y1S4	20/50	1		12/13/16 18:21
44	NI.121316.182502	L16120342-04	A09-TM02-Y1S4		50		12/13/16 18:25
45	NI.121316.182809	WG594874-16	Interference Check		1		12/13/16 18:28
46	NI.121316.183113	WG594874-17	Interference Check		1		12/13/16 18:31
47	NI.121316.183420	WG594874-18	CCV		1		12/13/16 18:34
48	NI.121316.183726	WG594874-19	CCB		1		12/13/16 18:37
49	NI.121316.184033	WG594874-20	Low Level Continuing Calibra		1		12/13/16 18:40

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Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122116C.REP
 Analyst1: PDM Analyst2: N/A
 Method: 6020A/6020 SOP: ME700A Rev: 3
 Maintenance Log ID: _____

Calibration Std: STD79556 ICV Std: STD79554 Post Spike: STD76567
 ICSA: STD79552 ICSAB: STD79553 Int. Std: RGT38094
 CCV: STD79555 LLCCV: STD79064 Tuning Sol : STD78941
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594630,595999,596004,596006Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.122116.150315	Blank	Blank		1		12/21/16 15:03
2	NI.122116.150621	WG596009-01	Calibration Point		1		12/21/16 15:06
3	NI.122116.150926	WG596009-02	Calibration Point		1		12/21/16 15:09
4	NI.122116.151232	WG596009-03	Calibration Point		1		12/21/16 15:12
5	NI.122116.151537	WG596009-04	Calibration Point		1		12/21/16 15:15
6	NI.122116.151844	WG596009-05	Initial Calibration Verification		1		12/21/16 15:18
7	NI.122116.152151	WG596009-06	Initial Calib Blank		1		12/21/16 15:21
8	NI.122116.152457	WG596009-07	Low Level Initial Calibration V		1		12/21/16 15:24
9	NI.122116.152803	WG596009-08	Interference Check		1		12/21/16 15:28
10	NI.122116.153108	WG596009-09	Interference Check		1		12/21/16 15:31
11	NI.122116.153416	WG596009-10	CCV		1		12/21/16 15:34
12	NI.122116.153720	WG596009-11	CCB		1		12/21/16 15:37
13	NI.122116.154027	WG596009-12	Low Level Continuing Calibra		1		12/21/16 15:40
14	NI.122116.154333	L16120299-01	DET-003-SPLIT	20/50	1		12/21/16 15:43
15	NI.122116.154638	WG594630-03	Post Digestion Spike		1	L16120299-01	12/21/16 15:46
16	NI.122116.154944	WG594630-04	Serial Dilution		5	L16120299-01	12/21/16 15:49
17	NI.122116.155251	WG596009-13	CCV		1		12/21/16 15:52
18	NI.122116.155556	WG596009-14	CCB		1		12/21/16 15:55
19	NI.122116.155903	WG596009-15	Low Level Continuing Calibra		1		12/21/16 15:59
20	NI.122116.171337	WG595274-02	Method/Prep Blank	40/50	50		12/21/16 17:13
21	NI.122116.171642	WG595274-03	Laboratory Control S	40/50	50		12/21/16 17:16
22	NI.122116.171948	WG595020-01	Fluid Blank 1		50		12/21/16 17:19
23	NI.122116.172253	WG595020-02	Fluid Blank 2		50		12/21/16 17:22
24	NI.122116.172559	WG595274-01	Reference Sample		50	L16120834-01	12/21/16 17:25
25	NI.122116.172904	WG595274-04	Matrix Spike	5/50	50	L16120834-01	12/21/16 17:29
26	NI.122116.173209	WG595274-05	Matrix Spike Duplica	5/50	50	L16120834-01	12/21/16 17:32
27	NI.122116.173514	L16120835-01	AWV 48 BAGS	5/50	50		12/21/16 17:35
28	NI.122116.173820	WG596141-01	Post Digestion Spike		50	L16120835-01	12/21/16 17:38
29	NI.122116.174125	WG596141-02	Serial Dilution		250	L16120835-01	12/21/16 17:41
30	NI.122116.174433	WG596009-16	CCV		1		12/21/16 17:44
31	NI.122116.174738	WG596009-17	CCB		1		12/21/16 17:47
32	NI.122116.175045	WG594231-03	Method/Prep Blank	20/50	1		12/21/16 17:50
33	NI.122116.175351	WG594231-04	Laboratory Control S	20/50	1		12/21/16 17:53
34	NI.122116.175656	WG594231-01	Reference Sample		1	L16120352-07	12/21/16 17:56

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Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 _____ Dataset: 122116C.REP _____
Analyst1: PDM _____ Analyst2: N/A _____
Method: 6020A/6020 _____ SOP: ME700A _____ Rev: 3 _____
Maintenance Log ID: _____

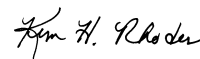
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ICSA: STD79552 _____ IC SAB: STD79553 _____ Int. Std: RGT38094 _____
CCV: STD79555 _____ LLCCV: STD79064 _____ Tuning Sol : STD78941 _____
Stannous : _____ Hydroxylamine : _____

Workgroups: 594630,595999,596004,596006

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.122116.180002	WG594231-02	Reference Sample		1	L16120352-08	12/21/16 18:00
36	NI.122116.180307	WG594231-05	Matrix Spike	20/50	1	L16120352-07	12/21/16 18:03
37	NI.122116.180612	WG594231-06	Matrix Spike Duplica	20/50	1	L16120352-07	12/21/16 18:06
38	NI.122116.180918	WG594231-07	Matrix Spike	20/50	1	L16120352-08	12/21/16 18:09
39	NI.122116.181223	WG594231-08	Matrix Spike Duplica	20/50	1	L16120352-08	12/21/16 18:12
40	NI.122116.181529	L16120352-13	MW09R-120616	20/50	1		12/21/16 18:15
41	NI.122116.181834	WG595999-01	Post Digestion Spike		1	L16120352-13	12/21/16 18:18
42	NI.122116.182141	WG596009-18	CCV		1		12/21/16 18:21
43	NI.122116.182446	WG596009-19	CCB		1		12/21/16 18:24
44	NI.122116.182753	WG595999-02	Serial Dilution		5	L16120352-13	12/21/16 18:27
45	NI.122116.183059	L16120352-14	MW09R-120616	20/50	1		12/21/16 18:30
46	NI.122116.183404	L16120352-15	MW01-120616	20/50	1		12/21/16 18:34
47	NI.122116.183710	L16120352-16	MW01-120616	20/50	1		12/21/16 18:37
48	NI.122116.184015	L16120352-17	MW16I-120616	20/50	1		12/21/16 18:40
49	NI.122116.184321	L16120352-18	MW16I-120616	20/50	1		12/21/16 18:43
50	NI.122116.184626	L16120352-21	MW26-120616	20/50	1		12/21/16 18:46
51	NI.122116.184931	L16120425-01	PZ06-120616	20/50	1		12/21/16 18:49
52	NI.122116.185237	L16120425-02	PZ06-120616	20/50	1		12/21/16 18:52
53	NI.122116.185542	L16120425-03	MW18-120616	20/50	1		12/21/16 18:55
54	NI.122116.185849	WG596009-20	CCV		1		12/21/16 18:58
55	NI.122116.190154	WG596009-21	CCB		1		12/21/16 19:01
56	NI.122116.190501	L16120425-04	MW18-120616	20/50	1		12/21/16 19:05
57	NI.122116.190806	L16120425-05	MW11S-120716	20/50	1		12/21/16 19:08
58	NI.122116.191112	L16120425-06	MW11S-120716	20/50	1		12/21/16 19:11
59	NI.122116.191417	L16120425-07	MW05I-120716	20/50	1		12/21/16 19:14
60	NI.122116.191722	L16120425-08	MW05I-120716	20/50	1		12/21/16 19:17
61	NI.122116.192028	L16120425-09	MW30-120716	20/50	1		12/21/16 19:20
62	NI.122116.192334	L16120425-10	MW30-120716	20/50	1		12/21/16 19:23
63	NI.122116.192641	WG596009-22	CCV		1		12/21/16 19:26
64	NI.122116.192946	WG596009-23	CCB		1		12/21/16 19:29
65	NI.122116.193253	WG596009-24	Low Level Continuing Calibra		1		12/21/16 19:32
66	NI.122116.193600	WG594796-02	Method/Prep Blank	20/50	1		12/21/16 19:36
67	NI.122116.193905	WG594796-03	Laboratory Control S	20/50	1		12/21/16 19:39
68	NI.122116.194211	L16120425-10	MW30-120716	20/50	1		12/21/16 19:42

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Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122116C.REP
 Analyst1: PDM Analyst2: N/A
 Method: 6020A/6020 SOP: ME700A Rev: 3
 Maintenance Log ID: _____

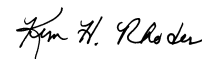
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 ICSA: STD79552 ICSAB: STD79553 Int. Std: RGT38094
 CCV: STD79555 LLCCV: STD79064 Tuning Sol : STD78941
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594630,595999,596004,596006

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	NI.122116.194517	L16120425-11	MW07-120716	20/50	1		12/21/16 19:45
70	NI.122116.194822	L16120425-12	MW07-120716	20/50	1		12/21/16 19:48
71	NI.122116.195128	L16120425-13	MW20-120716	20/50	1		12/21/16 19:51
72	NI.122116.195433	L16120425-14	MW20-120716	20/50	1		12/21/16 19:54
73	NI.122116.195739	L16120425-15	MW06-120716	20/50	1		12/21/16 19:57
74	NI.122116.200044	WG596004-01	Post Digestion Spike		1	L16120425-15	12/21/16 20:00
75	NI.122116.200351	WG596009-25	CCV		1		12/21/16 20:03
76	NI.122116.200657	WG596009-26	CCB		1		12/21/16 20:06
77	NI.122116.201004	WG596004-02	Serial Dilution		5	L16120425-15	12/21/16 20:10
78	NI.122116.201309	L16120425-16	MW06-120716	20/50	1		12/21/16 20:13
79	NI.122116.201614	L16120425-17	MW10-120716	20/50	1		12/21/16 20:16
80	NI.122116.201920	L16120425-18	MW10-120716	20/50	1		12/21/16 20:19
81	NI.122116.202225	L16120425-19	PZ03-120716	20/50	1		12/21/16 20:22
82	NI.122116.202531	L16120425-20	PZ03-120716	20/50	1		12/21/16 20:25
83	NI.122116.202836	L16120425-21	DUP-GW-120716-1	20/50	1		12/21/16 20:28
84	NI.122116.203141	L16120425-22	DUP-GW-120716-1	20/50	1		12/21/16 20:31
85	NI.122116.203447	L16120425-23	DUP-GW-120716-2	20/50	1		12/21/16 20:34
86	NI.122116.203752	L16120425-24	DUP-GW-120716-2	20/50	1		12/21/16 20:37
87	NI.122116.204059	WG596009-27	CCV		1		12/21/16 20:40
88	NI.122116.204404	WG596009-28	CCB		1		12/21/16 20:44
89	NI.122116.204711	L16120564-01	MW34-GW-120816		1		12/21/16 20:47
90	NI.122116.205017	L16120564-02	SW01-120816		1		12/21/16 20:50
91	NI.122116.205322	L16120564-03	MW31-GW-120916		1		12/21/16 20:53
92	NI.122116.205627	L16120564-04	MW32-GW-120916		1		12/21/16 20:56
93	NI.122116.205933	WG594796-01	Reference Sample		1	L16120568-01	12/21/16 20:59
94	NI.122116.210238	WG594796-04	Matrix Spike	20/50	1	L16120568-01	12/21/16 21:02
95	NI.122116.210544	WG594796-05	Matrix Spike Duplica	20/50	1	L16120568-01	12/21/16 21:05
96	NI.122116.210851	WG596009-29	CCV		1		12/21/16 21:08
97	NI.122116.211156	WG596009-30	CCB		1		12/21/16 21:11
98	NI.122116.211503	WG596009-31	Low Level Continuing Calibra		1		12/21/16 21:15
99	NI.122116.211810	WG595668-02	Method/Prep Blank	20/50	1		12/21/16 21:18
100	NI.122116.212116	WG595668-03	Laboratory Control S	20/50	1		12/21/16 21:21
101	NI.122116.212421	L16120957-01	TNK-WW121516EL-001	20/50	1		12/21/16 21:24
102	NI.122116.212727	L16120989-02	SW1A-328-14	20/50	1		12/21/16 21:27

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Microbac Laboratories Inc.

Instrument Run Log

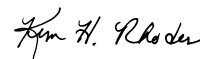
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 Maintenance Log ID: _____
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 ICSA: STD79552 ICSAB: STD79553 Int. Std: RGT38094
 CCV: STD79555 LLCCV: STD79064 Tuning Sol : STD78941
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594630,595999,596004,596006

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	NI.122116.213033	L16120989-05	SW1B-328-14	20/50	1		12/21/16 21:30
104	NI.122116.213338	L16120989-08	SW2A-328-14	20/50	1		12/21/16 21:33
105	NI.122116.213644	WG596006-01	Post Digestion Spike		1	L16120989-08	12/21/16 21:36
106	NI.122116.213949	WG596006-02	Serial Dilution		5	L16120989-08	12/21/16 21:39
107	NI.122116.214254	L16120989-13	SW3A-328-14		1	WG595668-01	12/21/16 21:42
108	NI.122116.214600	L16120989-14	SW3A-328-14	20/50	1	WG595668-04	12/21/16 21:46
109	NI.122116.214906	WG596009-32	CCV		1		12/21/16 21:49
110	NI.122116.215211	WG596009-33	CCB		1		12/21/16 21:52
111	NI.122116.215517	L16120989-15	SW3A-328-14	20/50	1	WG595668-05	12/21/16 21:55
112	NI.122116.215823	L16120989-20	SW4A-328-14	20/50	1		12/21/16 21:58
113	NI.122116.220128	L16120989-23	SW5A-328-14	20/50	1		12/21/16 22:01
114	NI.122116.220434	L16121025-01	6121222-01	20/50	1		12/21/16 22:04
115	NI.122116.220740	L16121025-02	6121222-02	20/50	1		12/21/16 22:07
116	NI.122116.221044	L16121025-03	6121222-03	20/50	1		12/21/16 22:10
117	NI.122116.221350	L16121025-04	6121222-04	20/50	1		12/21/16 22:13
118	NI.122116.221655	L16121025-05	6121222-05	20/50	1		12/21/16 22:16
119	NI.122116.222000	L16121025-06	6121222-06	20/50	1		12/21/16 22:20
120	NI.122116.222306	L16121025-07	6121222-07	20/50	1		12/21/16 22:23
121	NI.122116.222613	WG596009-34	CCV		1		12/21/16 22:26
122	NI.122116.222919	WG596009-35	CCB		1		12/21/16 22:29
123	NI.122116.223225	L16121025-08	6121222-08	20/50	1		12/21/16 22:32
124	NI.122116.223531	L16121025-09	6121222-09	20/50	1		12/21/16 22:35
125	NI.122116.223836	L16121025-10	6121222-10	20/50	1		12/21/16 22:38
126	NI.122116.224142	L16121025-11	6121222-11	20/50	1		12/21/16 22:41
127	NI.122116.224447	L16121025-12	6121222-12	20/50	1		12/21/16 22:44
128	NI.122116.224752	L16121082-01	SCF-WL02-121616		1		12/21/16 22:47
129	NI.122116.225059	WG596009-36	Interference Check		1		12/21/16 22:50
130	NI.122116.225405	WG596009-37	Interference Check		1		12/21/16 22:54
131	NI.122116.225712	WG596009-38	CCV		1		12/21/16 22:57
132	NI.122116.230018	WG596009-39	CCB		1		12/21/16 23:00

Page: 4 Approved: December 21, 2016




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122316A.REP
 Analyst1: JYH Analyst2: N/A
 Method: 200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD79556 ICV Std: STD79554 Post Spike: STD76567
 ICSA: STD79552 ICSAB: STD79553 Int. Std: RGT38094
 CCV: STD79555 LLCCV: STD79550 Tuning Sol : STD78941
 Stannous : _____ Hydroxylamine : _____

Workgroups: 596006,595999,594633

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.122316.071820	Blank	Blank		1		12/23/16 07:18
2	NI.122316.072126	WG596294-01	Calibration Point		1		12/23/16 07:21
3	NI.122316.072431	WG596294-02	Calibration Point		1		12/23/16 07:24
4	NI.122316.072737	WG596294-03	Calibration Point		1		12/23/16 07:27
5	NI.122316.073042	WG596294-04	Calibration Point		1		12/23/16 07:30
6	NI.122316.073349	WG596294-05	Initial Calibration Verification		1		12/23/16 07:33
7	NI.122316.073656	WG596294-06	Initial Calib Blank		1		12/23/16 07:36
8	NI.122316.074003	WG596294-07	Low Level Initial Calibration V		1		12/23/16 07:40
9	NI.122316.074308	WG596294-08	Interference Check		1		12/23/16 07:43
10	NI.122316.074614	WG596294-09	Interference Check		1		12/23/16 07:46
11	NI.122316.074921	WG596294-10	CCV		1		12/23/16 07:49
12	NI.122316.075227	WG596294-11	CCB		1		12/23/16 07:52
13	NI.122316.075534	WG595668-02	Method/Prep Blank	20/50	1		12/23/16 07:55
14	NI.122316.075839	WG595668-03	Laboratory Control S	20/50	1		12/23/16 07:58
15	NI.122316.080144	WG595668-01	Reference Sample		1	L16120989-13	12/23/16 08:01
16	NI.122316.080449	WG595668-04	Matrix Spike	20/50	1	L16120989-13	12/23/16 08:04
17	NI.122316.080756	WG595668-05	Matrix Spike Duplica	20/50	1	L16120989-13	12/23/16 08:07
18	NI.122316.081101	L16121082-01	SCF-WL02-121616	20/50	1		12/23/16 08:11
19	NI.122316.081408	WG596006-03	Post Digestion Spike		1	L16121082-01	12/23/16 08:14
20	NI.122316.081714	WG596006-04	Serial Dilution		5	L16121082-01	12/23/16 08:17
21	NI.122316.082019	WG596006-04	Serial Dilution		25	L16121082-01	12/23/16 08:20
22	NI.122316.082326	WG596294-12	CCV		1		12/23/16 08:23
23	NI.122316.082631	WG596294-13	CCB		1		12/23/16 08:26
24	NI.122316.082938	L16121025-01	6121222-01	20/50	1		12/23/16 08:29
25	NI.122316.083243	L16121025-02	6121222-02	20/50	1		12/23/16 08:32
26	NI.122316.083548	L16121025-03	6121222-03	20/50	1		12/23/16 08:35
27	NI.122316.083853	L16121025-04	6121222-04	20/50	1		12/23/16 08:38
28	NI.122316.084159	L16121025-05	6121222-05	20/50	1		12/23/16 08:41
29	NI.122316.084505	L16121025-06	6121222-06	20/50	1		12/23/16 08:45
30	NI.122316.084810	L16121025-07	6121222-07	20/50	1		12/23/16 08:48
31	NI.122316.085114	L16121025-08	6121222-08	20/50	1		12/23/16 08:51
32	NI.122316.085420	L16121025-09	6121222-09	20/50	1		12/23/16 08:54
33	NI.122316.085725	L16121025-10	6121222-10	20/50	1		12/23/16 08:57
34	NI.122316.090033	WG596294-14	CCV		1		12/23/16 09:00

Page: 1 Approved: December 27, 2016

K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122316A.REP
 Analyst1: JYH Analyst2: N/A
 Method: 200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD79556 ICV Std: STD79554 Post Spike: STD76567
 ICSA: STD79552 ICSAB: STD79553 Int. Std: RG738094
 CCV: STD79555 LLCV: STD79550 Tuning Sol : STD78941
 Stannous : _____ Hydroxylamine : _____

Workgroups: 596006,595999,594633

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.122316.090338	WG596294-15	CCB		1		12/23/16 09:03
36	NI.122316.090646	L16121025-11	6121222-11	20/50	1		12/23/16 09:06
37	NI.122316.091029	L16121025-12	6121222-12	20/50	1		12/23/16 09:10
38	NI.122316.091336	WG596294-16	CCV		1		12/23/16 09:13
39	NI.122316.091641	WG596294-17	CCB		1		12/23/16 09:16
40	NI.122316.092104	WG596294-18	Interference Check		1		12/23/16 09:21
41	NI.122316.092409	WG596294-19	Interference Check		1		12/23/16 09:24
42	NI.122316.092725	WG596294-20	CCV		1		12/23/16 09:27
43	NI.122316.093030	WG596294-21	CCB		1		12/23/16 09:30
44	NI.122316.093450	WG594231-03	Method/Prep Blank	20/50	1		12/23/16 09:34
45	NI.122316.093756	WG594231-04	Laboratory Control S	20/50	1		12/23/16 09:37
46	NI.122316.094101	WG594231-01	Reference Sample		1	L16120352-07	12/23/16 09:41
47	NI.122316.094406	WG594231-05	Matrix Spike	20/50	1	L16120352-07	12/23/16 09:44
48	NI.122316.094711	WG594231-06	Matrix Spike Duplica	20/50	1	L16120352-07	12/23/16 09:47
49	NI.122316.095017	L16120352-15	MW01-120616	20/50	1		12/23/16 09:50
50	NI.122316.095322	L16120352-16	MW01-120616	20/50	1		12/23/16 09:53
51	NI.122316.095628	WG595999-03	Post Digestion Spike		1	L16120352-16	12/23/16 09:56
52	NI.122316.095933	WG595999-04	Serial Dilution		5	L16120352-16	12/23/16 09:59
53	NI.122316.100238	WG595999-04	Serial Dilution		25	L16120352-16	12/23/16 10:02
54	NI.122316.100546	WG596294-22	CCV		1		12/23/16 10:05
55	NI.122316.100852	WG596294-23	CCB		1		12/23/16 10:08
56	NI.122316.101159	WG594231-02	Reference Sample		1	L16120352-08	12/23/16 10:11
57	NI.122316.101504	WG594231-07	Matrix Spike	20/50	1	L16120352-08	12/23/16 10:15
58	NI.122316.101809	WG594231-08	Matrix Spike Duplica	20/50	1	L16120352-08	12/23/16 10:18
59	NI.122316.102115	L16120425-01	PZ06-120616	20/50	1		12/23/16 10:21
60	NI.122316.102420	L16120425-02	PZ06-120616	20/50	1		12/23/16 10:24
61	NI.122316.102726	L16120425-05	MW11S-120716	20/50	100		12/23/16 10:27
62	NI.122316.103031	L16120425-06	MW11S-120716	20/50	100		12/23/16 10:30
63	NI.122316.103338	WG596294-24	CCV		1		12/23/16 10:33
64	NI.122316.103644	WG596294-25	CCB		1		12/23/16 10:36
65	NI.122316.103955	WG596294-26	Interference Check		1		12/23/16 10:39
66	NI.122316.104300	WG596294-27	Interference Check		1		12/23/16 10:43
67	NI.122316.104612	WG596294-28	CCV		1		12/23/16 10:46
68	NI.122316.104917	WG596294-29	CCB		1		12/23/16 10:49

Page: 2 Approved: December 27, 2016

K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122316A.REP
 Analyst1: JYH Analyst2: N/A
 Method: 200.8 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD79556 ICV Std: STD79554 Post Spike: STD76567
 ICSA: STD79552 ICSAB: STD79553 Int. Std: RG738094
 CCV: STD79555 LLCCV: STD79550 Tuning Sol : STD78941
 Stannous : _____ Hydroxylamine : _____

Workgroups: 596006,595999,594633

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	NI.122316.105224	WG596294-30	Low Level Continuing Calibra		1		12/23/16 10:52
70	NI.122316.105928	WG594444-03	Method/Prep Blank	20/50	1		12/23/16 10:59
71	NI.122316.110234	WG594444-04	Laboratory Control S	20/50	1		12/23/16 11:02
72	NI.122316.110539	L16120424-03	A08-MW05-Y1S4		1	WG594444-01	12/23/16 11:05
73	NI.122316.110844	L16120424-04	A08-MW05-Y1S4-MS	20/50	1	WG594444-05	12/23/16 11:08
74	NI.122316.111149	L16120424-05	A08-MW05-Y1S4-MSD	20/50	1	WG594444-06	12/23/16 11:11
75	NI.122316.111455	L16120455-02	18CPTMW22DW-120616	20/50	1		12/23/16 11:14
76	NI.122316.111800	WG594633-03	Post Digestion Spike		1	L16120455-02	12/23/16 11:18
77	NI.122316.112106	WG594633-04	Serial Dilution		5	L16120455-02	12/23/16 11:21
78	NI.122316.112411	WG594633-04	Serial Dilution		25	L16120455-02	12/23/16 11:24
79	NI.122316.112719	WG596294-31	CCV		1		12/23/16 11:27
80	NI.122316.113024	WG596294-32	CCB		1		12/23/16 11:30
81	NI.122316.113331	L16120455-04	18CPTMW22RF-120616	20/50	1		12/23/16 11:33
82	NI.122316.113637	L16120455-07	18CPTMW12SW-120616	20/50	1		12/23/16 11:36
83	NI.122316.113942	L16120455-08	18CPTMW12SWFD-120616	20/50	1		12/23/16 11:39
84	NI.122316.114247	L16120455-10	18CPTMW26SW-120716	20/50	1		12/23/16 11:42
85	NI.122316.114553	L16120455-12	MW10-120716	20/50	1		12/23/16 11:45
86	NI.122316.114858	L16120455-15	18CPTMW23SWF-120716	20/50	1		12/23/16 11:48
87	NI.122316.115204	L16120455-04	18CPTMW22RF-120616	20/50	10		12/23/16 11:52
88	NI.122316.115509	L16120455-07	18CPTMW12SW-120616	20/50	100		12/23/16 11:55
89	NI.122316.115814	L16120455-08	18CPTMW12SWFD-120616	20/50	100		12/23/16 11:58
90	NI.122316.120120	L16120455-10	18CPTMW26SW-120716	20/50	100		12/23/16 12:01
91	NI.122316.120427	WG596294-33	CCV		1		12/23/16 12:04
92	NI.122316.120732	WG596294-34	CCB		1		12/23/16 12:07
93	NI.122316.121038	L16120455-12	MW10-120716	20/50	100		12/23/16 12:10
94	NI.122316.121343	L16120455-15	18CPTMW23SWF-120716	20/50	100		12/23/16 12:13
95	NI.122316.121952	L16121025-03	6121222-03	20/50	100		12/23/16 12:19
96	NI.122316.122259	WG596294-35	CCV		1		12/23/16 12:22
97	NI.122316.122604	WG596294-36	CCB		1		12/23/16 12:26
98	NI.122316.122911	WG596294-37	Low Level Continuing Calibra		1		12/23/16 12:29

Page: 3 Approved: December 27, 2016

K: K Buck

Microbac Laboratories Inc.

Data Checklist

Date: 13-DEC-2016
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A
 Instrument: ICP-MS2
 Curve Workgroup: 594874
 Runlog ID: 79220
 Analytical Workgroups: 594630

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	236,267,275,299,315,342,352
Client Forms	X
Level X	
Level 3	236,315
Level 4	267,275,299,342,352
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:
15-DEC-2016



Microbac Laboratories Inc.

Data Checklist

Date: 21-DEC-2016
 Analyst: PDM
 Analyst: NA
 Method: 6020/6020A
 Instrument: ICP-MS2
 Curve Workgroup: 596009
 Runlog ID: 79394
 Analytical Workgroups: 594630,595999,596004,596006

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	0299,0352,0425,0568,0957,1025
Client Forms	X
Level X	
Level 3	
Level 4	0299,0352,0425,0568,0957
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	PDM
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
21-DEC-2016

Secondary Reviewer:
21-DEC-2016

Pierce Morris *Ken H. Rhodes*



Microbac Laboratories Inc.

Data Checklist

Date: 23-DEC-2016
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A
 Instrument: ICP-MS2
 Curve Workgroup: 596294
 Runlog ID: 79447
 Analytical Workgroups: 596006,595999,594633

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	1082
Level 4	352,425,455
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:
27-DEC-2016

Secondary Reviewer:
27-DEC-2016



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6020A
 Login Number:L16120352

AAB#:WG594630

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
MW23-120616	01	12/06/16					12/08/2016	1.9	180		12/13/16	7.2	180	
MW23-120616	02	12/06/16					12/08/2016	1.9	180		12/13/16	7.3	180	
MW23-120616-MS	03	12/06/16					12/08/2016	1.9	180		12/13/16	7.3	180	
MW23-120616-MS	04	12/06/16					12/08/2016	1.9	180		12/13/16	7.3	180	
MW23-120616-MSD	05	12/06/16					12/08/2016	1.9	180		12/13/16	7.3	180	
MW23-120616-MSD	06	12/06/16					12/08/2016	1.9	180		12/13/16	7.3	180	
MW26-120616	22	12/06/16					12/08/2016	1.8	180		12/13/16	7.1	180	
MW17-120616	23	12/06/16					12/08/2016	2	180		12/13/16	7.2	180	
MW17-120616	24	12/06/16					12/08/2016	2	180		12/13/16	7.3	180	
DUP-GW-120616	26	12/06/16					12/08/2016	1.9	180		12/13/16	7.2	180	
DUP-GW-120616	27	12/06/16					12/08/2016	1.9	180		12/13/16	7.2	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5063309
 Report generated 12/27/2016 10:44



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6020A
 Login Number:L16120352

AAB#:WG595999

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
MW02-120616	07	12/06/16					12/09/2016	2.9	180		12/21/16	15.3	180	
MW02-120616	07	12/06/16					12/09/2016	2.9	180		12/23/16	16.9	180	
MW02-120616	08	12/06/16					12/09/2016	2.9	180		12/21/16	15.3	180	
MW02-120616	08	12/06/16					12/09/2016	2.9	180		12/23/16	17	180	
MW02-120616-MS	09	12/06/16					12/09/2016	2.9	180		12/23/16	16.9	180	
MW02-120616-MS	09	12/06/16					12/09/2016	2.9	180		12/21/16	15.3	180	
MW02-120616-MS	10	12/06/16					12/09/2016	2.9	180		12/21/16	15.3	180	
MW02-120616-MS	10	12/06/16					12/09/2016	2.9	180		12/23/16	17	180	
MW02-120616-MSD	11	12/06/16					12/09/2016	2.9	180		12/23/16	16.9	180	
MW02-120616-MSD	11	12/06/16					12/09/2016	2.9	180		12/21/16	15.3	180	
MW02-120616-MSD	12	12/06/16					12/09/2016	2.9	180		12/23/16	17	180	
MW02-120616-MSD	12	12/06/16					12/09/2016	2.9	180		12/21/16	15.3	180	
MW09R-120616	13	12/06/16					12/09/2016	2.8	180		12/21/16	15.2	180	
MW09R-120616	14	12/06/16					12/09/2016	2.8	180		12/21/16	15.2	180	
MW01-120616	15	12/06/16					12/09/2016	2.8	180		12/23/16	16.8	180	
MW01-120616	15	12/06/16					12/09/2016	2.8	180		12/21/16	15.2	180	
MW01-120616	16	12/06/16					12/09/2016	2.8	180		12/21/16	15.2	180	
MW01-120616	16	12/06/16					12/09/2016	2.8	180		12/23/16	16.8	180	
MW16I-120616	17	12/06/16					12/09/2016	2.8	180		12/21/16	15.2	180	
MW16I-120616	18	12/06/16					12/09/2016	2.8	180		12/21/16	15.2	180	
MW26-120616	21	12/06/16					12/09/2016	2.8	180		12/21/16	15.2	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5063309
 Report generated 12/27/2016 10:44



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594630
 Blank File ID: NI.121316.164908 Blank Sample ID: WG594059-03
 Prep Date: 12/08/16 09:15 Instrument ID: ICP-MS2
 Analyzed Date: 12/13/16 16:49 Method: 6020A
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594059-04	NI.121316.165213	12/13/16 16:52	01
MW23-120616	L16120352-01	NI.121316.165518	12/13/16 16:55	01
MW23-120616-MS	L16120352-03	NI.121316.165824	12/13/16 16:58	01
MW23-120616-MSD	L16120352-05	NI.121316.170130	12/13/16 17:01	01
MW26-120616	L16120352-22	NI.121316.170435	12/13/16 17:04	01
MW17-120616	L16120352-23	NI.121316.170740	12/13/16 17:07	01
MW23-120616	L16120352-02	NI.121316.172616	12/13/16 17:26	01
MW23-120616-MS	L16120352-04	NI.121316.172921	12/13/16 17:29	01
MW23-120616-MSD	L16120352-06	NI.121316.173227	12/13/16 17:32	01
MW17-120616	L16120352-24	NI.121316.173532	12/13/16 17:35	01
DUP-GW-120616	L16120352-26	NI.121316.173838	12/13/16 17:38	01
DUP-GW-120616	L16120352-27	NI.121316.174143	12/13/16 17:41	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5063310
 Report generated 12/27/2016 10:44



METHOD BLANK SUMMARY

Login Number: L16120352
 Blank File ID: NI.122116.175045
 Prep Date: 12/09/16 08:49
 Analyzed Date: 12/21/16 17:50
 Analyst: JYH

Work Group: WG595999
 Blank Sample ID: WG594231-03
 Instrument ID: ICP-MS2
 Method: 6020A

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594231-04	NI.122116.175351	12/21/16 17:53	01
MW02-120616	L16120352-07	NI.122116.175656	12/21/16 17:56	01
MW02-120616	L16120352-08	NI.122116.180002	12/21/16 18:00	01
MW02-120616-MS	L16120352-09	NI.122116.180307	12/21/16 18:03	01
MW02-120616-MSD	L16120352-11	NI.122116.180612	12/21/16 18:06	01
MW02-120616-MS	L16120352-10	NI.122116.180918	12/21/16 18:09	01
MW02-120616-MSD	L16120352-12	NI.122116.181223	12/21/16 18:12	01
MW09R-120616	L16120352-13	NI.122116.181529	12/21/16 18:15	01
MW09R-120616	L16120352-14	NI.122116.183059	12/21/16 18:30	01
MW01-120616	L16120352-15	NI.122116.183404	12/21/16 18:34	01
MW01-120616	L16120352-16	NI.122116.183710	12/21/16 18:37	01
MW16I-120616	L16120352-17	NI.122116.184015	12/21/16 18:40	01
MW16I-120616	L16120352-18	NI.122116.184321	12/21/16 18:43	01
MW26-120616	L16120352-21	NI.122116.184626	12/21/16 18:46	01
LCS	WG594231-04	NI.122316.093756	12/23/16 09:37	02
MW02-120616	L16120352-07	NI.122316.094101	12/23/16 09:41	02
MW02-120616-MS	L16120352-09	NI.122316.094406	12/23/16 09:44	02
MW02-120616-MSD	L16120352-11	NI.122316.094711	12/23/16 09:47	02
MW01-120616	L16120352-15	NI.122316.095017	12/23/16 09:50	02
MW01-120616	L16120352-16	NI.122316.095322	12/23/16 09:53	02
MW02-120616	L16120352-08	NI.122316.101159	12/23/16 10:11	02
MW02-120616-MS	L16120352-10	NI.122316.101504	12/23/16 10:15	02
MW02-120616-MSD	L16120352-12	NI.122316.101809	12/23/16 10:18	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5063310
 Report generated 12/27/2016 10:44



METHOD BLANK SUMMARY

Login Number: L16120352
 Blank File ID: NI.122316.093450
 Prep Date: 12/09/16 08:49
 Analyzed Date: 12/23/16 09:34
 Analyst: JYH

Work Group: WG595999
 Blank Sample ID: WG594231-03
 Instrument ID: ICP-MS2
 Method: 6020A

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594231-04	NI.122116.175351	12/21/16 17:53	01
MW02-120616	L16120352-07	NI.122116.175656	12/21/16 17:56	01
MW02-120616	L16120352-08	NI.122116.180002	12/21/16 18:00	01
MW02-120616-MS	L16120352-09	NI.122116.180307	12/21/16 18:03	01
MW02-120616-MSD	L16120352-11	NI.122116.180612	12/21/16 18:06	01
MW02-120616-MS	L16120352-10	NI.122116.180918	12/21/16 18:09	01
MW02-120616-MSD	L16120352-12	NI.122116.181223	12/21/16 18:12	01
MW09R-120616	L16120352-13	NI.122116.181529	12/21/16 18:15	01
MW09R-120616	L16120352-14	NI.122116.183059	12/21/16 18:30	01
MW01-120616	L16120352-15	NI.122116.183404	12/21/16 18:34	01
MW01-120616	L16120352-16	NI.122116.183710	12/21/16 18:37	01
MW16I-120616	L16120352-17	NI.122116.184015	12/21/16 18:40	01
MW16I-120616	L16120352-18	NI.122116.184321	12/21/16 18:43	01
MW26-120616	L16120352-21	NI.122116.184626	12/21/16 18:46	01
LCS	WG594231-04	NI.122316.093756	12/23/16 09:37	02
MW02-120616	L16120352-07	NI.122316.094101	12/23/16 09:41	02
MW02-120616-MS	L16120352-09	NI.122316.094406	12/23/16 09:44	02
MW02-120616-MSD	L16120352-11	NI.122316.094711	12/23/16 09:47	02
MW01-120616	L16120352-15	NI.122316.095017	12/23/16 09:50	02
MW01-120616	L16120352-16	NI.122316.095322	12/23/16 09:53	02
MW02-120616	L16120352-08	NI.122316.101159	12/23/16 10:11	02
MW02-120616-MS	L16120352-10	NI.122316.101504	12/23/16 10:15	02
MW02-120616-MSD	L16120352-12	NI.122316.101809	12/23/16 10:18	02

Report Name: BLANK_SUMMARY
 PDF File ID: 5063310
 Report generated 12/27/2016 10:44



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/08/16 09:15 Sample ID: WG594059-03
Instrument ID: ICP-MS2 Run Date: 12/13/16 16:49 Prep Method: 3015
File ID: NI.121316.164908 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG594630 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-MS - 13-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Arsenic, Total	0.000500	0.00100	0.000500	1	U

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

Report Name: BLANK
PDF ID: 5063311
27-DEC-2016 10:44



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/09/16 08:49 Sample ID: WG594231-03
Instrument ID: ICP-MS2 Run Date: 12/21/16 17:50 Prep Method: 3015
File ID: NI.122116.175045 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG595999 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-MS - 21-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Arsenic, Total	0.000500	0.00100	0.000500	1	U

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

Report Name: BLANK
PDF ID: 5063311
27-DEC-2016 10:44



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/09/16 08:49 Sample ID: WG594231-03
Instrument ID: ICP-MS2 Run Date: 12/23/16 09:34 Prep Method: 3015
File ID: NI.122316.093450 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG595999 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-MS - 23-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Chromium, Total	0.00100	0.00200	0.00100	1	U

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

Report Name: BLANK
PDF ID: 5063311
27-DEC-2016 10:44



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594059-04
Instrument ID: ICP-MS2 Run Time: 16:52 Prep Method: 3015
File ID: NI.121316.165213 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG594630 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD78216 Cal ID: ICP-MS - 13-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Arsenic, Total	0.125	0.126	101	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5063312
Report generated: 12/27/2016 10:44



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG594231-04
Instrument ID: ICP-MS2 Run Time: 17:53 Prep Method: 3015
File ID: NI.122116.175351 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG595999 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD78216 Cal ID: ICP-MS - 21-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Arsenic, Total	0.125	0.125	99.8	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5063312
Report generated: 12/27/2016 10:44



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG594231-04
Instrument ID: ICP-MS2 Run Time: 09:37 Prep Method: 3015
File ID: NI.122316.093756 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG595999 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD78216 Cal ID: ICP-MS - 23-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Chromium, Total	0.125	0.126	101	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5063312
Report generated: 12/27/2016 10:44



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-MS2- 13-DEC-16 Worknum: WG594630
 Instrument ID: ICP-MS2 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-01 File ID: NI.121316.165518 Dil: 1 Method: 6020
 Sample ID: L16120352-03 MS File ID: NI.121316.165824 Dil: 1 Matrix: Water
 Sample ID: L16120352-05 MSD File ID: NI.121316.170130 Dil: 1 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, Total	0.0373	0.125	0.171	107	0.125	0.173	108	1.11	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-MS2- 13-DEC-16 Worknum: WG594630
 Instrument ID: ICP-MS2 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-02 File ID: NI.121316.172616 Dil: 1 Method: 6020
 Sample ID: L16120352-04 MS File ID: NI.121316.172921 Dil: 1 Matrix: Water
 Sample ID: L16120352-06 MSD File ID: NI.121316.173227 Dil: 1 Units: mg/L

Analyte	Parent	MS	MS	MS	MSD	MSD	MSD	%RPD	%Rec Limits	RPD Limit	Q
		Spiked	Found	%Rec	Spiked	Found	%Rec				
Arsenic, Dissolved	0.0351	0.125	0.171	109	0.125	0.170	108	0.641	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-MS2- 21-DEC-16 Worknum: WG595999
 Instrument ID: ICP-MS2 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-07 File ID: NI.122116.175656 Dil: 1 Method: 6020
 Sample ID: L16120352-09 MS File ID: NI.122116.180307 Dil: 1 Matrix: Water
 Sample ID: L16120352-11 MSD File ID: NI.122116.180612 Dil: 1 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, Total	0.000736	0.125	0.129	103	0.125	0.129	102	0.248	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-MS2- 21-DEC-16 Worknum: WG595999
 Instrument ID: ICP-MS2 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-08 File ID: NI.122116.180002 Dil: 1 Method: 6020
 Sample ID: L16120352-10 MS File ID: NI.122116.180918 Dil: 1 Matrix: Water
 Sample ID: L16120352-12 MSD File ID: NI.122116.181223 Dil: 1 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, Dissolved	0.000597	0.125	0.132	105	0.125	0.128	102	2.93	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-MS2- 23-DEC-16 Worknum: WG595999
 Instrument ID: ICP-MS2 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-07 File ID: NI.122316.094101 Dil: 1 Method: 6020
 Sample ID: L16120352-09 MS File ID: NI.122316.094406 Dil: 1 Matrix: Water
 Sample ID: L16120352-11 MSD File ID: NI.122316.094711 Dil: 1 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Chromium, Total	0.00252	0.125	0.128	100	0.125	0.127	100	0.202	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



MS/MSD REPORT

Loginum: L16120352 Cal ID: ICP-MS2- 23-DEC-16 Worknum: WG595999
 Instrument ID: ICP-MS2 Contract #: _____ Prep Method: 3015
 Parent ID: L16120352-08 File ID: NI.122316.101159 Dil: 1 Method: 6020
 Sample ID: L16120352-10 MS File ID: NI.122316.101504 Dil: 1 Matrix: Water
 Sample ID: L16120352-12 MSD File ID: NI.122316.101809 Dil: 1 Units: mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Chromium, Dissolved	0.00246	0.125	0.129	101	0.125	0.127	99.7	1.28	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT



MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L16120352 Cal ID: ICP-MS2- Worknum: WG594630
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG594059-01 File ID: NI.121316.165518 Dil: 1 Matrix: WATER
 Sample ID: WG594059-05 MS File ID: NI.121316.165824 Dil: 1 Units: mg/L
 Sample ID: WG594059-06 MSD File ID: NI.121316.170130 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, Total	0.0373	0.125	0.171	107	0.125	0.173	108	1.11	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L16120352 Cal ID: ICP-MS2- Worknum: WG594630
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG594059-02 File ID: NI.121316.172616 Dil: 1 Matrix: WATER
 Sample ID: WG594059-07 MS File ID: NI.121316.172921 Dil: 1 Units: mg/L
 Sample ID: WG594059-08 MSD File ID: NI.121316.173227 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, Dissolved	0.0351	0.125	0.171	109	0.125	0.170	108	0.641	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 Worknum: WG595999
Instrument: ICP-MS2 Method: 6020A
Serial Dil: WG595999-04 File ID: NI.122316.095933 Dil: 5 Units: ug/L
Sample: L16120352-16 File ID: NI.122316.095322 Dil: 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Arsenic	2.64	X	2.73	X	3.22	
Chromium	0.937	X	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: 5063307

12/27/2016 10:44



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 Worknum: WG595999
Instrument: ICP-MS2 Method: 6020A
Serial Dil: WG595999-02 File ID: NI.122116.182753 Dil: 5 Units: ug/L
Sample: L16120352-13 File ID: NI.122116.181529 Dil: 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Arsenic	2.75	X	2.98	X	8.39	
Chromium	0.902	X	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: 5063307

12/27/2016 10:44



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 Worknum: WG594630
Instrument: ICP-MS2 Method: 6020A
Serial Dil: WG594630-02 File ID: NI.121316.171351 Dil: 5 Units: ug/L
Sample: L16120352-23 File ID: NI.121316.170740 Dil: 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Arsenic	1.61	X	2.00	X	24.10	
Chromium	0.615		ND			

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: 5063307

12/27/2016 10:44



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120352 Worknum: WG594630
Instrument: ICP-MS2 Method: 6020A
Serial Dil: WG594630-04 File ID: NI.122116.154944 Dil: 5 Units: ug/L
Sample: L16120299-01 File ID: NI.122116.154333 Dil: 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Arsenic	4.76	X	4.41	X	7.30	
Chromium	0.592		ND			

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: 5063307

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Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352 Worknum: WG594630
 Instrument ID: ICP-MS2 Method: 6020A
 Post Spike ID: WG594630-01 File ID: NI.121316.171046 Dil: 1 Units: ug/L
 Sample ID: L16120352-23 File ID: NI.121316.170740 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ARSENIC	48.3		1.61		50	93.4	75 - 125	
CHROMIUM	46.6		0.615	F	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

POST_SPIKE - Modified 03/06/2008
 PDF File ID: 5063308
 Report generated: 12/27/2016 10:44



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352 Worknum: WG594630
 Instrument ID: ICP-MS2 Method: 6020A
 Post Spike ID: WG594630-03 File ID: NI.122116.154638 Dil: 1 Units: ug/L
 Sample ID: L16120299-01 File ID: NI.122116.154333 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ARSENIC	56.6		4.76		50	103.7	75 - 125	
CHROMIUM	51.2		0.592	F	50	101.3	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

POST_SPIKE - Modified 03/06/2008
 PDF File ID: 5063308
 Report generated: 12/27/2016 10:44



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352 Worknum: WG595999
 Instrument ID: ICP-MS2 Method: 6020A
 Post Spike ID: WG595999-01 File ID: NI.122116.181834 Dil: 1 Units: ug/L
 Sample ID: L16120352-13 File ID: NI.122116.181529 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ARSENIC	204		2.75		50	403.1	75 - 125	N
CHROMIUM	202		0.902		50	402.4	75 - 125	N

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

POST_SPIKE - Modified 03/06/2008
 PDF File ID: 5063308
 Report generated: 12/27/2016 10:44



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120352
Instrument ID: ICP-MS2
Post Spike ID: WG595999-03
Sample ID: L16120352-16

Worknum: WG595999
Method: 6020A
Units: ug/L
Matrix: Water

File ID: NI.122316.095628 Dil: 1
File ID: NI.122316.095322 Dil: 1

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ARSENIC	54.9		2.64		50	104.5	75 - 125	
CHROMIUM	52.4		0.937		50	102.9	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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594630
 Analytical Method: 6020A Instrument ID: ICP-MS2
 ICAL Worknum: WG594874 Initial Calibration Date: 13-DEC-2016 16:24

	WG594874-01		WG594874-02		WG594874-03		WG594874-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ARSENIC	0	-74.2	.4	-57.5	50	74000	100	144000	.999947	
CHROMIUM	0	15800	.4	16500	50	553000	100	1050000	.999987	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG594630
 Analytical Method: 6020A Instrument ID: ICP-MS2
 ICAL Worknum: WG596009 Initial Calibration Date: 21-DEC-2016 15:15

	WG596009-01		WG596009-02		WG596009-03		WG596009-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ARSENIC	0	85.4	.4	21.7	50	63200	100	127000	.99987	
CHROMIUM	0	4930	.4	11300	50	452000	100	882000	.999966	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG595999
 Analytical Method: 6020A Instrument ID: ICP-MS2
 ICAL Worknum: WG596009 Initial Calibration Date: 21-DEC-2016 15:15

	WG596009-01		WG596009-02		WG596009-03		WG596009-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ARSENIC	0	85.4	.4	21.7	50	63200	100	127000	.99987	
CHROMIUM	0	4930	.4	11300	50	452000	100	882000	.999966	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120352 Workgroup (AAB#): WG595999
 Analytical Method: 6020A Instrument ID: ICP-MS2
 ICAL Worknum: WG596294 Initial Calibration Date: 23-DEC-2016 07:30

	WG596294-01		WG596294-02		WG596294-03		WG596294-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ARSENIC	0	-63.6	.4	-15.6	50	57900	100	119000	.999971	
CHROMIUM	0	11100	.4	12200	50	410000	100	825000	.999964	

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



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-06
Instrument ID: ICP-MS2 Run Time: 16:30 Method: 6020A
File ID: NI.121316.163031 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS2 - 13-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ARSENIC	.2	.4	.2	U

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Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-06
Instrument ID: ICP-MS2 Run Time: 15:21 Method: 6020A
File ID: NI.122116.152151 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS2 - 21-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ARSENIC	.2	.4	.2	U

ICB - Modified 07/14/2009
PDF File ID: 5063318
Report generated 12/27/2016 10:44



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-06
Instrument ID: ICP-MS2 Run Time: 15:21 Method: 6020A
File ID: NI.122116.152151 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS2 - 21-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ARSENIC	.2	.4	.2	U
CHROMIUM	.4	.8	.4	U

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Report generated 12/27/2016 10:44



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-06
Instrument ID: ICP-MS2 Run Time: 07:36 Method: 6020A
File ID: NI.122316.073656 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS2 - 23-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ARSENIC	.2	.4	.2	U
CHROMIUM	.4	.8	.4	U

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-11
Instrument ID: ICP-MS2 Run Time: 16:46 Method: 6020A
File ID: NI.121316.164602 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	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: 5063321
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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-13
Instrument ID: ICP-MS2 Run Time: 17:23 Method: 6020A
File ID: NI.121316.172309 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-15
Instrument ID: ICP-MS2 Run Time: 18:00 Method: 6020A
File ID: NI.121316.180017 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-19
Instrument ID: ICP-MS2 Run Time: 18:37 Method: 6020A
File ID: NI.121316.183726 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-11
Instrument ID: ICP-MS2 Run Time: 15:37 Method: 6020A
File ID: NI.122116.153720 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-14
Instrument ID: ICP-MS2 Run Time: 15:55 Method: 6020A
File ID: NI.122116.155556 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-35
Instrument ID: ICP-MS2 Run Time: 22:29 Method: 6020A
File ID: NI.122116.222919 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-39
Instrument ID: ICP-MS2 Run Time: 23:00 Method: 6020A
File ID: NI.122116.230018 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-11
Instrument ID: ICP-MS2 Run Time: 15:37 Method: 6020A
File ID: NI.122116.153720 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-17
Instrument ID: ICP-MS2 Run Time: 17:47 Method: 6020A
File ID: NI.122116.174738 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-19
 Instrument ID: ICP-MS2 Run Time: 18:24 Method: 6020A
 File ID: NI.122116.182446 Analyst: JYH Units: ug/L
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-21
Instrument ID: ICP-MS2 Run Time: 19:01 Method: 6020A
File ID: NI.122116.190154 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-35
Instrument ID: ICP-MS2 Run Time: 22:29 Method: 6020A
File ID: NI.122116.222919 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-39
Instrument ID: ICP-MS2 Run Time: 23:00 Method: 6020A
File ID: NI.122116.230018 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-11
Instrument ID: ICP-MS2 Run Time: 07:52 Method: 6020A
File ID: NI.122316.075227 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-17
Instrument ID: ICP-MS2 Run Time: 09:16 Method: 6020A
File ID: NI.122316.091641 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-21
Instrument ID: ICP-MS2 Run Time: 09:30 Method: 6020A
File ID: NI.122316.093030 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-23
Instrument ID: ICP-MS2 Run Time: 10:08 Method: 6020A
File ID: NI.122316.100852 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-25
Instrument ID: ICP-MS2 Run Time: 10:36 Method: 6020A
File ID: NI.122316.103644 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

CCB - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-29
Instrument ID: ICP-MS2 Run Time: 10:49 Method: 6020A
File ID: NI.122316.104917 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	0.400	U

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

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Microbac Laboratories Inc.
INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-05
Instrument ID: ICP-MS2 Run Time: 16:27 Method: 6020A
File ID: NI.121316.162724 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Arsenic	50	49.9	99.9	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-05
Instrument ID: ICP-MS2 Run Time: 15:18 Method: 6020A
File ID: NI.122116.151844 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Arsenic	50	49.6	99.3	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-05
Instrument ID: ICP-MS2 Run Time: 07:33 Method: 6020A
File ID: NI.122316.073349 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Arsenic	50	50.8	102	90 - 110	
Chromium	50	50.0	100	90 - 110	

* Exceeds LIMITS Limit

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PDF File ID: 5063317
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Microbac Laboratories Inc.
INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-05
Instrument ID: ICP-MS2 Run Time: 15:18 Method: 6020A
File ID: NI.122116.151844 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Arsenic	50	49.6	99.3	90 - 110	
Chromium	50	50.3	101	90 - 110	

* Exceeds LIMITS Limit

ICV - Modified 03/06/2008
PDF File ID: 5063317
Report generated 12/27/2016 10:44



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-10
Instrument ID: ICP-MS2 Run Time: 16:42 Method: 6020A
File ID: NI.121316.164256 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0493	mg/L	98.6	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-12
 Instrument ID: ICP-MS2 Run Time: 17:20 Method: 6020A
 File ID: NI.121316.172004 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0500	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5063320
 Report generated 12/27/2016 10:45



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-14
Instrument ID: ICP-MS2 Run Time: 17:57 Method: 6020A
File ID: NI.121316.175711 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0495	mg/L	99.0	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-18
Instrument ID: ICP-MS2 Run Time: 18:34 Method: 6020A
File ID: NI.121316.183420 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0494	mg/L	98.9	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-10
Instrument ID: ICP-MS2 Run Time: 15:34 Method: 6020A
File ID: NI.122116.153416 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0499	mg/L	99.9	90 - 110	

* Exceeds LIMITS Criteria

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Report generated 12/27/2016 10:45



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-13
 Instrument ID: ICP-MS2 Run Time: 15:52 Method: 6020A
 File ID: NI.122116.155251 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0505	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-34
Instrument ID: ICP-MS2 Run Time: 22:26 Method: 6020A
File ID: NI.122116.222613 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0549	mg/L	110	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-38
Instrument ID: ICP-MS2 Run Time: 22:57 Method: 6020A
File ID: NI.122116.225712 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0542	mg/L	108	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-10
 Instrument ID: ICP-MS2 Run Time: 15:34 Method: 6020A
 File ID: NI.122116.153416 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0499	mg/L	99.9	90 - 110	
Chromium	0.0500	0.0503	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-16
 Instrument ID: ICP-MS2 Run Time: 17:44 Method: 6020A
 File ID: NI.122116.174433 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0497	mg/L	99.4	90 - 110	
Chromium	0.0500	0.0501	mg/L	100	90 - 110	

* Exceeds LIMITS Criteria

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 PDF File ID: 5063320
 Report generated 12/27/2016 10:45



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-18
 Instrument ID: ICP-MS2 Run Time: 18:21 Method: 6020A
 File ID: NI.122116.182141 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0497	mg/L	99.5	90 - 110	
Chromium	0.0500	0.0511	mg/L	102	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5063320
 Report generated 12/27/2016 10:45



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-20
 Instrument ID: ICP-MS2 Run Time: 18:58 Method: 6020A
 File ID: NI.122116.185849 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0492	mg/L	98.4	90 - 110	
Chromium	0.0500	0.0505	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5063320
 Report generated 12/27/2016 10:45



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-34
 Instrument ID: ICP-MS2 Run Time: 22:26 Method: 6020A
 File ID: NI.122116.222613 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0549	mg/L	110	90 - 110	
Chromium	0.0500	0.0560	mg/L	112	90 - 110	*

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5063320
 Report generated 12/27/2016 10:45



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-38
 Instrument ID: ICP-MS2 Run Time: 22:57 Method: 6020A
 File ID: NI.122116.225712 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0542	mg/L	108	90 - 110	
Chromium	0.0500	0.0551	mg/L	110	90 - 110	

* Exceeds LIMITS Criteria

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 PDF File ID: 5063320
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-10
 Instrument ID: ICP-MS2 Run Time: 07:49 Method: 6020A
 File ID: NI.122316.074921 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0504	mg/L	101	90 - 110	
Chromium	0.0500	0.0507	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-16
 Instrument ID: ICP-MS2 Run Time: 09:13 Method: 6020A
 File ID: NI.122316.091336 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0502	mg/L	100	90 - 110	
Chromium	0.0500	0.0496	mg/L	99.2	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-20
 Instrument ID: ICP-MS2 Run Time: 09:27 Method: 6020A
 File ID: NI.122316.092725 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0517	mg/L	103	90 - 110	
Chromium	0.0500	0.0504	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-22
 Instrument ID: ICP-MS2 Run Time: 10:05 Method: 6020A
 File ID: NI.122316.100546 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0513	mg/L	103	90 - 110	
Chromium	0.0500	0.0513	mg/L	103	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5063320
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-24
Instrument ID: ICP-MS2 Run Time: 10:33 Method: 6020A
File ID: NI.122316.103338 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0507	mg/L	101	90 - 110	
Chromium	0.0500	0.0504	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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Report generated 12/27/2016 10:45



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-28
 Instrument ID: ICP-MS2 Run Time: 10:46 Method: 6020A
 File ID: NI.122316.104612 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0509	mg/L	102	90 - 110	
Chromium	0.0500	0.0506	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5063320
 Report generated 12/27/2016 10:45



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-07
Instrument ID: ICP-MS2 Run Time: 16:33 Method: 6020A
File ID: NI.121316.163338 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.425	ug/L	106	50 - 150	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/13/2016 Sample ID: WG594874-20
Instrument ID: ICP-MS2 Run Time: 18:40 Method: 6020A
File ID: NI.121316.184033 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 13-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.428	ug/L	107	50 - 150	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-07
Instrument ID: ICP-MS2 Run Time: 15:24 Method: 6020A
File ID: NI.122116.152457 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.331	ug/L	82.8	50 - 150	

* Exceeds LIMITS Criteria

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PDF File ID: 5081279
Report generated 12/23/2016 12:20



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-12
Instrument ID: ICP-MS2 Run Time: 15:40 Method: 6020A
File ID: NI.122116.154027 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.345	ug/L	86.4	50 - 150	

* Exceeds LIMITS Criteria

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Report generated 12/23/2016 12:20



Microbac Laboratories Inc.
 LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-15
 Instrument ID: ICP-MS2 Run Time: 15:59 Method: 6020A
 File ID: NI.122116.155903 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.332	ug/L	83.1	50 - 150	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-31
 Instrument ID: ICP-MS2 Run Time: 21:15 Method: 6020A
 File ID: NI.122116.211503 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594630 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.355	ug/L	88.8	50 - 150	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-07
 Instrument ID: ICP-MS2 Run Time: 15:24 Method: 6020A
 File ID: NI.122116.152457 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.331	ug/L	82.8	50 - 150	
Chromium	0.800	0.833	ug/L	104	50 - 150	

* Exceeds LIMITS Criteria

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 PDF File ID: 5081279
 Report generated 12/23/2016 12:20



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-12
Instrument ID: ICP-MS2 Run Time: 15:40 Method: 6020A
File ID: NI.122116.154027 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.345	ug/L	86.4	50 - 150	
Chromium	0.800	0.831	ug/L	104	50 - 150	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-15
Instrument ID: ICP-MS2 Run Time: 15:59 Method: 6020A
File ID: NI.122116.155903 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.332	ug/L	83.1	50 - 150	
Chromium	0.800	0.651	ug/L	81.3	50 - 150	

* Exceeds LIMITS Criteria

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Report generated 12/23/2016 12:20



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-24
Instrument ID: ICP-MS2 Run Time: 19:32 Method: 6020A
File ID: NI.122116.193253 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.327	ug/L	81.9	50 - 150	
Chromium	0.800	0.657	ug/L	82.2	50 - 150	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 5081279
Report generated 12/23/2016 12:20



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/21/2016 Sample ID: WG596009-31
Instrument ID: ICP-MS2 Run Time: 21:15 Method: 6020A
File ID: NI.122116.211503 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.355	ug/L	88.8	50 - 150	
Chromium	0.800	0.773	ug/L	96.7	50 - 150	

* Exceeds LIMITS Criteria



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-07
Instrument ID: ICP-MS2 Run Time: 07:40 Method: 6020A
File ID: NI.122316.074003 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.391	ug/L	97.7	50 - 150	
Chromium	0.800	0.728	ug/L	91.0	50 - 150	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 5081279
Report generated 12/23/2016 12:20



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120352 Run Date: 12/23/2016 Sample ID: WG596294-30
Instrument ID: ICP-MS2 Run Time: 10:52 Method: 6020A
File ID: NI.122316.105224 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG595999 Cal ID: ICP-MS - 23-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.443	ug/L	111	50 - 150	
Chromium	0.800	0.784	ug/L	98.0	50 - 150	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 5081279
Report generated 12/23/2016 12:20



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-MS2
Sol. A: WG594874-08
Sol. AB: WG594874-09

File ID: NI.121316.163643
File ID: NI.121316.163949

Workgroup (AAB#): WG594630
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	0.0350	NS	100	98.0	98.0	

NS = Not spiked

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

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

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



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-MS2
Sol. A: WG594874-16
Sol. AB: WG594874-17

File ID: NI.121316.182809
File ID: NI.121316.183113

Workgroup (AAB#): WG594630
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	0.0320	NS	100	97.7	97.7	

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.



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-MS2
Sol. A: WG596009-08
Sol. AB: WG596009-09

File ID: NI.122116.152803
File ID: NI.122116.153108

Workgroup (AAB#): WG595999
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	-0.0312	NS	100	99.1	99.1	
Chromium	NS	-0.170	NS	100	100	100	

NS = Not spiked

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

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

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



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-MS2
Sol. A: WG596009-36
Sol. AB: WG596009-37

File ID: NI.122116.225059
File ID: NI.122116.225405

Workgroup (AAB#): WG595999
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	-0.0309	NS	100	103	103	
Chromium	NS	-0.173	NS	100	104	104	

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.



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
 Instrument ID: ICP-MS2
 Sol. A: WG596294-08
 Sol. AB: WG596294-09

File ID: NI.122316.074308
 File ID: NI.122316.074614

Workgroup (AAB#): WG595999
 Method: 6020A
 Units: ug/L
 Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	0.0419	NS	100	113	113	
Chromium	NS	-0.231	NS	100	113	113	

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.



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
 Instrument ID: ICP-MS2
 Sol. A: WG596294-18
 Sol. AB: WG596294-19

File ID: NI.122316.092104
 File ID: NI.122316.092409

Workgroup (AAB#): WG595999
 Method: 6020A
 Units: ug/L
 Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	0.0571	NS	100	98.2	98.2	
Chromium	NS	-0.272	NS	100	95.7	95.7	

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.



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120352
Instrument ID: ICP-MS2
Sol. A: WG596294-26
Sol. AB: WG596294-27

File ID: NI.122316.103955
File ID: NI.122316.104300

Workgroup (AAB#): WG595999
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	0.0534	NS	100	100	100	
Chromium	NS	-0.208	NS	100	97.8	97.8	

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: L16120352 Analytical Method: 6020
 Analytical Workgroup: WG594630 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 13-DEC-2016 16:15

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L16120299-01	SAMP	13-DEC-2016 18:06	105.344	106.252	101.656
L16120352-01	SAMP	13-DEC-2016 16:55	98.659	100.326	96.905
L16120352-02	SAMP	13-DEC-2016 17:26	93.544	94.369	92.852
L16120352-03	SAMP	13-DEC-2016 16:58	99.316	101.701	96.781
L16120352-04	SAMP	13-DEC-2016 17:29	95.686	96.185	93.309
L16120352-05	SAMP	13-DEC-2016 17:01	96.21	94.779	92.229
L16120352-06	SAMP	13-DEC-2016 17:32	94.663	95.484	92.593
L16120352-22	SAMP	13-DEC-2016 17:04	106.342	105.092	102.31
L16120352-23	SAMP	13-DEC-2016 17:07	102.427	100.836	97.852
L16120352-24	SAMP	13-DEC-2016 17:35	100.407	100.257	96.204
L16120352-26	SAMP	13-DEC-2016 17:38	102.375	102.491	99.057
L16120352-27	SAMP	13-DEC-2016 17:41	100.63	99.298	97.123
WG594059-03	BLANK	13-DEC-2016 16:49	100.774	100.945	98.711
WG594059-04	LCS	13-DEC-2016 16:52	99.224	99.159	96.113
WG594630-01	PSPK	13-DEC-2016 17:10	102.032	101.513	98.26
WG594630-02	SERIAL	13-DEC-2016 17:13	98.156	90.549	90.434
WG594874-05	ICV	13-DEC-2016 16:27	104.131	101.924	101.671
WG594874-06	ICB	13-DEC-2016 16:30	92.671	89.081	89.199
WG594874-07	LLICV	13-DEC-2016 16:33	94.237	90.212	88.637
WG594874-08	ICS	13-DEC-2016 16:36	98.634	98.26	95.928
WG594874-09	ICS	13-DEC-2016 16:39	104.311	103.852	100.153
WG594874-10	CCV	13-DEC-2016 16:42	105.865	106.148	103.983
WG594874-11	CCB	13-DEC-2016 16:46	100.801	100.318	98.125
WG594874-12	CCV	13-DEC-2016 17:20	101.174	99.329	98.42
WG594874-13	CCB	13-DEC-2016 17:23	101.974	100.486	99.017
WG594874-14	CCV	13-DEC-2016 17:57	104.924	103.223	102.463
WG594874-15	CCB	13-DEC-2016 18:00	97.681	95.662	93.833
WG594874-16	ICS	13-DEC-2016 18:28	93.23	90.222	91.493
WG594874-17	ICS	13-DEC-2016 18:31	96.999	94.546	94.207
WG594874-18	CCV	13-DEC-2016 18:34	96.583	94.478	95.146
WG594874-19	CCB	13-DEC-2016 18:37	90.383	88.089	88.467
WG594874-20	LLCCV	13-DEC-2016 18:40	86.818	81.663	82.478

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

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Microbac Laboratories Inc.

INTERNAL STANDARD REPORT

Login: L16120352 Analytical Method: 6020
 Analytical Workgroup: WG594630 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 21-DEC-2016 15:06

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L16120299-01	SAMP	21-DEC-2016 15:43	105.023	106.067	105.886
WG594630-03	PSPK	21-DEC-2016 15:46	107.485	108.23	108.052
WG594630-04	SERIAL	21-DEC-2016 15:49	105.755	105.372	105.252
WG596009-05	ICV	21-DEC-2016 15:18	103.456	103.436	104.736
WG596009-06	ICB	21-DEC-2016 15:21	95.991	95.109	96.015
WG596009-07	LLICV	21-DEC-2016 15:24	92.464	89.844	90.81
WG596009-08	ICS	21-DEC-2016 15:28	101.692	102.462	102.853
WG596009-09	ICS	21-DEC-2016 15:31	99.445	99.911	99.74
WG596009-10	CCV	21-DEC-2016 15:34	106.439	103.543	106.136
WG596009-11	CCB	21-DEC-2016 15:37	98.704	98.653	99.031
WG596009-12	LLCCV	21-DEC-2016 15:40	92.845	89.834	92.606
WG596009-13	CCV	21-DEC-2016 15:52	105.966	105.104	106.75
WG596009-14	CCB	21-DEC-2016 15:55	99.804	99.294	99.733
WG596009-15	LLCCV	21-DEC-2016 15:59	98.636	97.105	98.023
WG596009-31	LLCCV	21-DEC-2016 21:15	96.645	97.046	99.679
WG596009-34	CCV	21-DEC-2016 22:26	115.53	116.187	118.829
WG596009-35	CCB	21-DEC-2016 22:29	108.349	107.213	110.911
WG596009-36	ICS	21-DEC-2016 22:50	109.131	109.475	112.052
WG596009-37	ICS	21-DEC-2016 22:54	113.566	117.031	117.568
WG596009-38	CCV	21-DEC-2016 22:57	112.672	114.609	115.944
WG596009-39	CCB	21-DEC-2016 23:00	105.494	105.967	107.662

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

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Microbac Laboratories Inc.

INTERNAL STANDARD REPORT

Login: L16120352 **Analytical Method:** 6020
Analytical Workgroup: WG595999 **Matrix:** 1
Instrument: ICP-MS2 **Analyst:** JYH
ICAL Date: 21-DEC-2016 15:06

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L16120352-07	SAMP	21-DEC-2016 17:56	104.126	106.314	105.497
L16120352-08	SAMP	21-DEC-2016 18:00	109.561	113.314	112.227
L16120352-09	SAMP	21-DEC-2016 18:03	107.156	108.667	108.9
L16120352-10	SAMP	21-DEC-2016 18:09	111.044	110.689	110.812
L16120352-11	SAMP	21-DEC-2016 18:06	107.898	109.053	109.16
L16120352-12	SAMP	21-DEC-2016 18:12	108.164	110.488	110.147
L16120352-13	SAMP	21-DEC-2016 18:15	103.232	104.657	105.427
L16120352-14	SAMP	21-DEC-2016 18:30	102.924	105.413	105.528
L16120352-15	SAMP	21-DEC-2016 18:34	109.376	109.577	110.997
L16120352-16	SAMP	21-DEC-2016 18:37	109.689	111.182	112.256
L16120352-17	SAMP	21-DEC-2016 18:40	107.931	109.354	109.166
L16120352-18	SAMP	21-DEC-2016 18:43	108.308	109.444	109.931
L16120352-21	SAMP	21-DEC-2016 18:46	106.003	106.616	108.34
WG594231-03	BLANK	21-DEC-2016 17:50	102.119	102.23	102.621
WG594231-04	LCS	21-DEC-2016 17:53	101.485	99.819	102.467
WG595999-01	PSPK	21-DEC-2016 18:18	104.763	106.277	106.027
WG595999-02	SERIAL	21-DEC-2016 18:27	108.245	108.516	109.75
WG596009-05	ICV	21-DEC-2016 15:18	103.456	103.436	104.736
WG596009-06	ICB	21-DEC-2016 15:21	95.991	95.109	96.015
WG596009-07	LLICV	21-DEC-2016 15:24	92.464	89.844	90.81
WG596009-08	ICS	21-DEC-2016 15:28	101.692	102.462	102.853
WG596009-09	ICS	21-DEC-2016 15:31	99.445	99.911	99.74
WG596009-10	CCV	21-DEC-2016 15:34	106.439	103.543	106.136
WG596009-11	CCB	21-DEC-2016 15:37	98.704	98.653	99.031
WG596009-12	LLCCV	21-DEC-2016 15:40	92.845	89.834	92.606
WG596009-15	LLCCV	21-DEC-2016 15:59	98.636	97.105	98.023
WG596009-16	CCV	21-DEC-2016 17:44	109.522	110.975	112.378
WG596009-17	CCB	21-DEC-2016 17:47	100.841	101.202	102.041
WG596009-18	CCV	21-DEC-2016 18:21	111.755	112.558	114.753
WG596009-19	CCB	21-DEC-2016 18:24	104.686	103.29	104.881
WG596009-20	CCV	21-DEC-2016 18:58	107.399	106.495	108.466
WG596009-21	CCB	21-DEC-2016 19:01	100.262	97.709	101.083
WG596009-24	LLCCV	21-DEC-2016 19:32	100.276	96.88	101.24
WG596009-31	LLCCV	21-DEC-2016 21:15	96.645	97.046	99.679
WG596009-34	CCV	21-DEC-2016 22:26	115.53	116.187	118.829
WG596009-35	CCB	21-DEC-2016 22:29	108.349	107.213	110.911
WG596009-36	ICS	21-DEC-2016 22:50	109.131	109.475	112.052
WG596009-37	ICS	21-DEC-2016 22:54	113.566	117.031	117.568
WG596009-38	CCV	21-DEC-2016 22:57	112.672	114.609	115.944
WG596009-39	CCB	21-DEC-2016 23:00	105.494	105.967	107.662

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

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INTERNAL STANDARD REPORT

Login: L16120352 Analytical Method: 6020
 Analytical Workgroup: WG595999 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 23-DEC-2016 07:21

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L16120352-07	SAMP	23-DEC-2016 09:41	99.674	102.709	98.202
L16120352-08	SAMP	23-DEC-2016 10:11	100.642	104.698	100.817
L16120352-09	SAMP	23-DEC-2016 09:44	100.876	103.7	99.412
L16120352-10	SAMP	23-DEC-2016 10:15	99.049	101.804	97.643
L16120352-11	SAMP	23-DEC-2016 09:47	100.593	103.447	99.527
L16120352-12	SAMP	23-DEC-2016 10:18	104.167	107.355	104.157
L16120352-15	SAMP	23-DEC-2016 09:50	101.238	105.048	100.792
L16120352-16	SAMP	23-DEC-2016 09:53	97.737	99.095	96.512
WG594231-03	BLANK	23-DEC-2016 09:34	97.844	95.509	95.627
WG594231-04	LCS	23-DEC-2016 09:37	98.971	98.061	97.026
WG595999-03	PSPK	23-DEC-2016 09:56	96.309	97.418	95.275
WG595999-04	SERIAL	23-DEC-2016 09:59	94.205	92.328	91.211
WG596294-05	ICV	23-DEC-2016 07:33	99.011	100.015	98.938
WG596294-06	ICB	23-DEC-2016 07:36	97.385	97.695	96.972
WG596294-07	LLICV	23-DEC-2016 07:40	91.501	88.056	88.597
WG596294-08	ICS	23-DEC-2016 07:43	94.5	96.373	94.642
WG596294-09	ICS	23-DEC-2016 07:46	98.009	99.353	97.769
WG596294-10	CCV	23-DEC-2016 07:49	98.251	99.805	99.547
WG596294-11	CCB	23-DEC-2016 07:52	98.302	100.491	97.459
WG596294-16	CCV	23-DEC-2016 09:13	104.519	106.451	103.536
WG596294-17	CCB	23-DEC-2016 09:16	100.535	100.162	99.15
WG596294-18	ICS	23-DEC-2016 09:21	98.288	100.041	96.986
WG596294-19	ICS	23-DEC-2016 09:24	103.499	104.989	101.813
WG596294-20	CCV	23-DEC-2016 09:27	97.569	95.661	94.754
WG596294-21	CCB	23-DEC-2016 09:30	100.51	100.909	98.658
WG596294-22	CCV	23-DEC-2016 10:05	99.577	100.943	99.787
WG596294-23	CCB	23-DEC-2016 10:08	98.321	97.952	98.029
WG596294-24	CCV	23-DEC-2016 10:33	101.372	102.942	101.35
WG596294-25	CCB	23-DEC-2016 10:36	93.391	93.457	92.231
WG596294-26	ICS	23-DEC-2016 10:39	97.677	97.358	95.599
WG596294-27	ICS	23-DEC-2016 10:43	103.296	104.813	102.086
WG596294-28	CCV	23-DEC-2016 10:46	99.317	100.182	98.625
WG596294-29	CCB	23-DEC-2016 10:49	96.688	98.736	95.324
WG596294-30	LLCCV	23-DEC-2016 10:52	96.052	94.758	92.98

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

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Microbac Laboratories Inc.
LINEAR RANGE (QUARTERLY)

Login Number: L16120352 Date: 10/24/2016
Instrument ID: ICP-MS2 Method: 6020A

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

Comments:

All analytes passed acceptance criteria at the specified concentration.



2.4 General Chemistry Data

2.4.1 Method 9056

2.4.1.1 Summary Data



Login Number: L16120352
Department: General Chromatography
Analyst: Craig Smith

METHOD

Analysis EPA300.0/SW846 9056

HOLDING TIMES

Sample Analysis: Hold times for NO₂ and NO₃ are 48 hours and the hold times for F, Cl, Br, and SO₄ are 28 days. The hold time forms calculate the hold time based on 48 hours. All samples were analyzed in hold.

CALIBRATION

Initial Calibration: All acceptance criteria were met.

Alternate Source Standards: All acceptance criteria were met.

Continuing Calibration Verification: All acceptance criteria were met.

Continuing Calibration Blank: All acceptance criteria were met.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: The MS/MSD results were not associated with this sample delivery group.

SAMPLES

Samples: Samples 01, 07, and 15 were analyzed at dilutions only due to their pre-run screen results SO₄ which were greater than 200 ppm. Any sample that has a single anion load greater than 200 ppm will be diluted in order to prevent damage to the ion chromatograph, which is caused by repeated overloading of the analytical column and oversaturation of the conductivity suppressor and/or detector.

MANUAL INTEGRATION: No manual integrations were required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120249

Approved By: Eric Lawson

A handwritten signature in black ink, appearing to read "Eric Lawson", is written over a light gray rectangular background.

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: IC3
Client ID: MW23-120616	Prep Method: 300.0	Prep Date: 12/08/2016 18:18
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG594194	Analyst: CAS	Run Date: 12/08/2016 20:00
Collect Date: 12/06/2016 10:57	Dilution: 25	File ID: I3_120816-08
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	289		5.00	2.50
Sulfate	14808-79-8	1240		25.0	12.5

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: IC3
Client ID: MW02-120616	Prep Method: 300.0	Prep Date: 12/08/2016 18:18
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG594194	Analyst: CAS	Run Date: 12/08/2016 20:20
Collect Date: 12/06/2016 11:10	Dilution: 5	File ID: I3_120816-09
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	110		1.00	0.500
Sulfate	14808-79-8	313		5.00	2.50

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: IC3
Client ID: MW01-120616	Prep Method: 300.0	Prep Date: 12/08/2016 18:18
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG594194	Analyst: CAS	Run Date: 12/08/2016 20:41
Collect Date: 12/06/2016 14:38	Dilution: 5	File ID: I3_120816-10
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	379	E	1.00	0.500
Sulfate	14808-79-8	82.3		5.00	2.50
E	Semiquantitative result (out of calibration range)				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: IC3
Client ID: MW01-120616	Prep Method: 300.0	Prep Date: 12/08/2016 18:18
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG594194	Analyst: CAS	Run Date: 12/08/2016 21:01
Collect Date: 12/06/2016 14:38	Dilution: 25	File ID: I3_120816-11
Sample Tag: DL02	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	427		5.00	2.50
Sulfate	14808-79-8	81.2		25.0	12.5

2.4.1.2 QC Summary Data

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

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

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

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

Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC3 Dataset: 120116 IC3 ICAL.SEQ_OL
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: RGT385836

Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM
 Analytical WGs: 593355 (LOD/LOQ Waters) 593356 (LOD/LOQ Soils)
 Internal STD: NA Surrogate STD: NA Calibration STD STD77046 01-DEC-2016
 CCV STD: STD77046 LCS STD: STD79166 MS/MSD STD: NA

Comments: System Backpressure: 2166 psi

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I3_120116-01	ELUENT	1	1		12/01/16 15:00
2	I3_120116-02	DI WATER	1	1		12/01/16 15:20
3	I3_120116-03	WG593545-01 STD	1	1	STD77046	12/01/16 15:40
4	I3_120116-04	WG593545-02 STD	1	1	STD77046	12/01/16 16:01
5	I3_120116-05	WG593545-03 STD	1	1	STD77046	12/01/16 16:21
6	I3_120116-06	WG593545-04 STD	1	1	STD77046	12/01/16 16:41
7	I3_120116-07	WG593545-05 STD	1	1	STD77046	12/01/16 17:02
8	I3_120116-08	WG593545-06 STD	1	1	STD77046	12/01/16 17:22
9	I3_120116-09	WG593545-07 SSCV	1	1	STD79166	12/01/16 17:43
10	I3_120116-10	LCRV @ Lvl 6	1	1	STD79166	12/01/16 18:03
11	I3_120116-11	LCRV @ Lvl 4	1	1	STD79166	12/01/16 18:23
12	I3_120116-12	LCRV @ Lvl 2	1	1	STD79166	12/01/16 18:44
13	I3_120116-13	LCRV @ Lvl 0	1	1		12/01/16 19:04
14	I3_120116-14	WG593357-01 ANION CCV	1	1	STD77046	12/01/16 19:24
15	I3_120116-15	WG593357-02 ANION CCB	1	1		12/01/16 19:45
16	I3_120116-16	WG593355-01 ANION BLANK	1	1		12/01/16 20:05
17	I3_120116-17	WG593355-02 ANION LCS	1	1	STD79166	12/01/16 20:25
18	I3_120116-18	WG593355-03 ANION LCS2	1	1	STD79166	12/01/16 20:46
19	I3_120116-19	L16100002-01 LOD (F,CL,BR,SO4)	1	1		12/01/16 21:06
20	I3_120116-20	L16100002-01 LOD (NO2,NO3)	1	1		12/01/16 21:27
21	I3_120116-21	L16100004-01 LOQ (F,CL,BR,SO4)	1	1		12/01/16 21:47
22	I3_120116-22	L16100004-01 LOQ (NO2,NO3)	1	1		12/01/16 22:07
23	I3_120116-23	L16100004-09 LOQ (F,CL,BR,SO4)	1	1		12/01/16 22:28
24	I3_120116-24	L16100004-09 LOQ (NO2,NO3)	1	1		12/01/16 22:48
25	I3_120116-25	WG593357-03 ANION CCV	1	1	STD77046	12/01/16 23:08
26	I3_120116-26	WG593357-04 ANION CCB	1	1		12/01/16 23:29
27	I3_120116-27	WG593356-01 ANION BLANK-SOIL	7	1		12/01/16 23:49
28	I3_120116-28	WG593356-02 ANION LCS-SOIL	7	1	STD79166	12/02/16 00:09
29	I3_120116-29	WG593356-03 ANION LCS2-SOIL	7	1	STD79166	12/02/16 00:30
30	I3_120116-30	L16100003-01 LOD (F,CL,BR,SO4)	7	1		12/02/16 00:50
31	I3_120116-31	L16100003-01 LOD (NO2,NO3)	7	1		12/02/16 01:11
32	I3_120116-32	L16100005-01 LOQ (F,CL,BR,SO4)	7	1		12/02/16 01:31
33	I3_120116-33	L16100005-01 LOQ (NO2,NO3)	7	1		12/02/16 01:51

Page: 1

Approved: 05-DEC-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC3 Dataset: 120116 IC3 ICAL.SEQ_OL
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: RGT385836

Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM
 Analytical WGs: 593355 (LOD/LOQ Waters) 593356 (LOD/LOQ Soils)
 Internal STD: NA Surrogate STD: NA STD77046 01-DEC-2016
 CCV STD: STD77046 LCS STD: STD79166 NA

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
34	I3_120116-34	L16100005-10 LOQ (F,CL,BR,SO4)	7	1		12/02/16 02:12
35	I3_120116-35	L16100005-10 LOQ (NO2,NO3)	7	1		12/02/16 02:32
36	I3_120116-36	WG593357-05 ANION CCV	1	1	STD77046	12/02/16 02:52
37	I3_120116-37	WG593357-06 ANION CCB	1	1		12/02/16 03:13
38	I3_120116-38	END	1	1		12/02/16 03:33

Comments

Seq.	Rerun	Dil.	Reason	Analytes
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Page: 2

Approved: 05-DEC-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC3 Dataset: 120816 IC3.SEQ
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: RGT38626

Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM
 Analytical WG594194
 Internal STD: NA Surrogate STD: NA Calibration STD STD77046 01-DEC-2016
 CCV STD: STD77046 LCS STD: STD79166 MS/MSD STD: STD79166

Comments: System Backpressure: 2063 psi

Samples L16120164-01, L16120426-01 were analyzed at dilutions only due to their pre-run screen results for chloride, which were greater than the ICAL max.

Samples L16120352 (-01,07,15) 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	I3_120816-01	ELUENT	1	1		12/08/16 17:38
2	I3_120816-02	DI WATER	1	1		12/08/16 17:58
3	I3_120816-03	WG594197-01 ANION CCV	1	1	STD77046	12/08/16 18:18
4	I3_120816-04	WG594197-02 ANION CCB	1	1		12/08/16 18:39
5	I3_120816-05	WG594194-01 ANION BLANK	1	1		12/08/16 18:59
6	I3_120816-06	WG594194-02 ANION LCS	1	1	STD79166	12/08/16 19:19
7	I3_120816-07	L16120164-01 (CL) 400x	2	400		12/08/16 19:40
8	I3_120816-08	L16120352-01 (CL,SO4) 25x	1	25		12/08/16 20:00
9	I3_120816-09	L16120352-07 (CL,SO4) 5x	1	5		12/08/16 20:20
10	I3_120816-10	L16120352-15 (CL,SO4) 5x	1	5		12/08/16 20:41
11	I3_120816-11	L16120352-15 RR CL 25x	1	25		12/08/16 21:01
12	I3_120816-12	L16120377-01 (SO4)	2	1		12/08/16 21:21
13	I3_120816-13	L16120377-02 (SO4)	2	1		12/08/16 21:42
14	I3_120816-14	L16120379-03 (SO4)	2	1		12/08/16 22:02
15	I3_120816-15	WG594197-03 ANION CCV	1	1	STD77046	12/08/16 22:22
16	I3_120816-16	WG594197-04 ANION CCB	1	1		12/08/16 22:43
17	I3_120816-17	L16120379-05 (SO4) REF	1	1		12/08/16 23:03
18	I3_120816-18	WG594194-04 DUP 0379-05	2	1		12/08/16 23:24
19	I3_120816-19	WG594194-05 MS 0379-05	2	1	STD79166	12/08/16 23:44
20	I3_120816-20	WG594194-06 MSD 0379-05	2	1	STD79166	12/09/16 00:04
21	I3_120816-21	L16120381-03 (F,NO2,NO3)	2	1		12/09/16 00:25
22	I3_120816-22	L16120424-02 (CL,NO3,SO4)	1	1		12/09/16 00:45
23	I3_120816-23	L16120424-02 RR CL 2x	1	2		12/09/16 01:05
24	I3_120816-24	WG594197-05 ANION CCV	1	1	STD77046	12/09/16 01:26
25	I3_120816-25	WG594197-06 ANION CCB	1	1		12/09/16 01:46
26	I3_120816-26	WG594197-07 ANION CCV	1	1	STD77046	12/09/16 09:14
27	I3_120816-27	WG594197-08 ANION CCB	1	1		12/09/16 09:34
28	I3_120816-28	L16120424-03 (CL,NO3,SO4) REF	1	1		12/09/16 09:54
29	I3_120816-29	WG594194-08 DUP 0424-03	1	1		12/09/16 10:15
30	I3_120816-30	L16120424-04 (CL,NO3,SO4) MS	1	1	STD79166	12/09/16 10:35

Page: 1

Approved: 09-DEC-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC3 _____ Dataset: 120816 IC3.SEQ _____
 Analyst1: CAS _____ Analyst2: NA _____
 Method: 300/9056 _____ SOP: IC01 _____ Rev: 19 _____

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254 _____
 Eluent ID#: RGT38626 _____

Workgroups: Column 1 ID: AG14A-4MM _____ Column 2 ID: AS14A-4MM _____
 Analytical WG594194 _____
 Internal STD: NA _____ Surrogate STD: NA _____ STD77046 01-DEC-2016
 CCV STD: STD77046 _____ LCS STD: STD79166 _____ STD79166 _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
31	I3_120816-31	L16120424-05 (CL,NO3,SO4) MSD	1	1	STD79166	12/09/16 10:55
32	I3_120816-32	L16120424-06 (CL,NO3,SO4)	1	1		12/09/16 11:16
33	I3_120816-33	L16120424-07 (CL,NO3,SO4)	1	1		12/09/16 11:36
34	I3_120816-34	L16120424-07 RR CL 5x	1	5		12/09/16 11:56
35	I3_120816-35	L16120426-01 (CL) 50x	2	50		12/09/16 12:17
36	I3_120816-36	WG594197-09 ANION CCV	1	1	STD77046	12/09/16 12:37
37	I3_120816-37	WG594197-10 ANION CCB	1	1		12/09/16 12:58
38	I3_120816-38	END	1	1		12/09/16 13:18

Comments

Seq.	Rerun	Dil.	Reason	Analytes




Microbac Laboratories Inc.

Data Checklist

Date: 01-DEC-2016
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC3
 Curve Workgroup: WG593545
 Runlog ID: 79020
 Analytical Workgroups: L16100002, L16100003, L16100004, L16100005

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)	2166PSI
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	NA
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	NA
Recoveries	NA
%RPD	NA
Samples	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	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	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:
05-DEC-2016



Secondary Reviewer:
05-DEC-2016



CHECKLIST1 - Modified 03/05/2008

Generated: DEC-05-2016 16:27:53



Microbac Laboratories Inc.

Data Checklist

Date: 08-DEC-2016
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC3
 Curve Workgroup: NA
 Runlog ID: 79145
 Analytical Workgroups: 120164, 120352, 120377, 120379, 120381, 120424, 120426

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)	2063 PSI
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	NA
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	X
Check for completeness	X
Primary Reviewer	CAS
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	ECL

Primary Reviewer:
09-DEC-2016



Secondary Reviewer:
09-DEC-2016



CHECKLIST1 - Modified 03/05/2008

Generated: DEC-09-2016 15:28:58



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:300.0
 Login Number:L16120352

AAB#:WG594194

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
MW23-120616	01	12/06/16					12/08/2016	2.3	2	*	12/08/16	2.4	2	*
MW02-120616	07	12/06/16					12/08/2016	2.3	2	*	12/08/16	2.4	2	*
MW01-120616	15	12/06/16					12/08/2016	2.2	2	*	12/08/16	2.3	2	*
MW01-120616	15	12/06/16					12/08/2016	2.2	2	*	12/08/16	2.3	2	*

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5056544
 Report generated 12/12/2016 09:20



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594194
 Blank File ID: I3_120816-05 Blank Sample ID: WG594194-01
 Prep Date: 12/08/16 18:18 Instrument ID: IC3
 Analyzed Date: 12/08/16 18:59 Method: 300.0
 Analyst: CAS

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594194-02	I3_120816-06	12/08/16 19:19	01
MW23-120616	L16120352-01	I3_120816-08	12/08/16 20:00	DL01
MW02-120616	L16120352-07	I3_120816-09	12/08/16 20:20	DL01
MW01-120616	L16120352-15	I3_120816-10	12/08/16 20:41	DL01
MW01-120616	L16120352-15	I3_120816-11	12/08/16 21:01	DL02
DUP	WG594194-04	I3_120816-18	12/08/16 23:24	01
DUP	WG594194-08	I3_120816-29	12/09/16 10:15	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5056546
 Report generated 12/12/2016 09:20



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/08/16 18:18 Sample ID: WG594194-01
Instrument ID: IC3 Run Date: 12/08/16 18:59 Prep Method: 300.0
File ID: I3 120816-05 Analyst: CAS Method: 300.0
Workgroup (AAB#): WG594194 Matrix: Water Units: mg/L
Contract #: Cal ID: IC3-01-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Chloride	0.100	0.200	0.100	1	U
Sulfate	0.500	1.00	0.500	1	U

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

Report Name: BLANK
PDF ID: 5056547
12-DEC-2016 09:20



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/08/2016 Sample ID: WG594194-02
Instrument ID: IC3 Run Time: 19:19 Prep Method: 300.0
File ID: I3 120816-06 Analyst: CAS Method: 300.0
Workgroup (AAB#): WG594194 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD79166 Cal ID: IC3-01-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Chloride	8.00	8.04	101	90 - 110	
Sulfate	40.0	40.7	102	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5056549
Report generated: 12/12/2016 09:20



Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

Login Number: L16120352
Analytical Method: 300.0
ICAL Workgroup: WG593545

Instrument ID: IC3
Initial Calibration Date: 01-DEC-16 17:22
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Chloride	5.791	5.91		1.00000
Sulfate	7.754	8.18		1.00000

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

INT_CAL - Modified 03/06/2008
PDF File ID: 5057228
Report generated 12/12/2016 09:20



Microbac Laboratories Inc.
 INITIAL CALIBRATION DATA

Login Number: L16120352
 Analytical Method: 300.0

Instrument ID: IC3
 Initial Calibration Date: 01-DEC-16 17:22
 Column ID: F

Analyte	WG593545-01			WG593545-02			WG593545-03		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloride	0.200	0.034300000 0	5.831	1.00	0.162700000	6.146	4.00	0.663600000	6.028
Sulfate	1.00	0.121500000	8.230	5.00	0.598000000	8.361	20.0	2.48560000	8.046

INT_CAL - Modified 03/06/2008
 PDF File ID: 5057228
 Report generated 12/12/2016 09:20



Microbac Laboratories Inc.
 INITIAL CALIBRATION DATA

Login Number: L16120352
 Analytical Method: 300.0

Instrument ID: IC3
 Initial Calibration Date: 01-DEC-16 17:22
 Column ID: F

Analyte	WG593545-04			WG593545-05			WG593545-06		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Chloride	8.00	1.36840000	5.846	12.0	2.11410000	5.676	24.0	4.60140000	5.216
Sulfate	40.0	5.18840000	7.710	60.0	8.07990000	7.426	120	17.7738000	6.752

INT_CAL - Modified 03/06/2008
 PDF File ID: 5057228
 Report generated 12/12/2016 09:20



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120352 Run Date: 12/01/2016 Sample ID: WG593545-07
 Instrument ID: IC3 Run Time: 17:43 Method: 300.0
 File ID: I3 120116-09 Analyst: CAS QC Key: WATERLOO
 ICal Workgroup: WG593545 Cal ID: IC3 - 01-DEC-16

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Chloride	8.00	8.01	mg/L	5.85	0.100	10	
Sulfate	40.0	40.2	mg/L	7.71	0.500	10	

* Exceeds %D Limit



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/08/2016 Sample ID: WG594197-02
Instrument ID: IC3 Run Time: 18:39 Method: 300.0
File ID: I3 120816-04 Analyst: CAS Units: mg/L
Workgroup (AAB#): WG594194 Cal ID: IC3 - 01-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.200	0.100	U
Sulfate	0.500	1.00	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: 5056553
Report generated 12/12/2016 09:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120352 Run Date: 12/08/2016 Sample ID: WG594197-04
Instrument ID: IC3 Run Time: 22:43 Method: 300.0
File ID: I3 120816-16 Analyst: CAS Units: mg/L
Workgroup (AAB#): WG594194 Cal ID: IC3 - 01-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Chloride	0.100	0.200	0.100	U
Sulfate	0.500	1.00	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: 5056553
Report generated 12/12/2016 09:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/08/2016 Sample ID: WG594197-01
 Instrument ID: IC3 Run Time: 18:18 Method: 300.0
 File ID: I3 120816-03 Analyst: CAS QC Key: WATERLOO
 Workgroup (AAB#): WG594194 Cal ID: IC3 - 01-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.07	mg/L	5.81	0.850	15	
Sulfate	40.0	40.5	mg/L	7.64	1.29	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5056551
 Report generated 12/12/2016 09:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120352 Run Date: 12/08/2016 Sample ID: WG594197-03
 Instrument ID: IC3 Run Time: 22:22 Method: 300.0
 File ID: I3 120816-15 Analyst: CAS QC Key: WATERLOO
 Workgroup (AAB#): WG594194 Cal ID: IC3 - 01-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.18	mg/L	5.72	2.23	15	
Sulfate	40.0	41.0	mg/L	7.55	2.45	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5056551
 Report generated 12/12/2016 09:20



2.4 General Chemistry Data

2.4.2 Alkalinity Data

2.4.2.1 Summary Data



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis EPA 310.2 (Alkalinity)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120650
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW23-120616	Prep Method: 310.2	Prep Date: N/A
Matrix: Water	Analytical Method: 310.2	Cal Date: 12/15/2016 15:09
Workgroup #: WG595115	Analyst: DCM	Run Date: 12/15/2016 15:14
Collect Date: 12/06/2016 10:57	Dilution: 5	File ID: S2161215002.015
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	738		100	50.0

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW23-120616	Prep Method: 310.2	Prep Date: N/A
Matrix: Water	Analytical Method: 310.2	Cal Date: 12/12/2016 12:37
Workgroup #: WG594496	Analyst: DCM	Run Date: 12/12/2016 12:43
Collect Date: 12/06/2016 10:57	Dilution: 10	File ID: S2161212004.016
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	775		200	100

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW02-120616	Prep Method: 310.2	Prep Date: N/A
Matrix: Water	Analytical Method: 310.2	Cal Date: 12/12/2016 12:37
Workgroup #: WG594496	Analyst: DCM	Run Date: 12/12/2016 12:54
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: S2161212004.032
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	214		20.0	10.0

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW01-120616	Prep Method: 310.2	Prep Date: N/A
Matrix: Water	Analytical Method: 310.2	Cal Date: 12/12/2016 12:37
Workgroup #: WG594496	Analyst: DCM	Run Date: 12/12/2016 12:44
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: S2161212004.018
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	186		20.0	10.0

2.4.2.2 QC Summary Data

Example Alkalinity (Colormetric) 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-DEC-2016
 Analyst: DCM
 Analyst: NA
 Method: ALK
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG594451 WG594496 WG594416

Calibration/Linearity	12-12-2016
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:
13-DEC-2016



Secondary Reviewer:
15-DEC-2016




Microbac Laboratories Inc.

Data Checklist

Date: 15-DEC-2016
 Analyst: DCM
 Analyst: NA
 Method: ALK
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG595115

Calibration/Linearity	12-15-2016
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:
16-DEC-2016



Secondary Reviewer:
16-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 310.2
 Login Number: L16120352

AAB#: WG594496

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
MW23-120616	01	12/06/16					12/12/2016	6.1	14		12/12/16	6.1	14	
MW02-120616	07	12/06/16					12/12/2016	6.1	14		12/12/16	6.1	14	
MW01-120616	15	12/06/16					12/12/2016	5.9	14		12/12/16	5.9	14	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5062970
 Report generated 12/16/2016 15:22



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 310.2
 Login Number: L16120352

AAB#: WG595115

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
MW23-120616	01	12/06/16					12/15/2016	9.2	14		12/15/16	9.2	14	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5062970
 Report generated 12/16/2016 15:22



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594496
 Blank File ID: S2161212004.012 Blank Sample ID: WG594496-01
 Prep Date: 12/12/16 12:40 Instrument ID: SMARTCHEM2
 Analyzed Date: 12/12/16 12:40 Method: 310.2
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594496-02	S2161212004.013	12/12/16 12:40	01
LCS2	WG594496-03	S2161212004.014	12/12/16 12:41	01
MW23-120616	L16120352-01	S2161212004.016	12/12/16 12:43	DL01
MW01-120616	L16120352-15	S2161212004.018	12/12/16 12:44	01
DUP	WG594496-05	S2161212004.031	12/12/16 12:53	01
MW02-120616	L16120352-07	S2161212004.032	12/12/16 12:54	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5062971
 Report generated 12/16/2016 15:22



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG595115
 Blank File ID: S2161215002.012 Blank Sample ID: WG595115-01
 Prep Date: 12/15/16 15:12 Instrument ID: SMARTCHEM2
 Analyzed Date: 12/15/16 15:12 Method: 310.2
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG595115-02	S2161215002.013	12/15/16 15:13	01
LCS2	WG595115-03	S2161215002.014	12/15/16 15:13	01
MW23-120616	L16120352-01	S2161215002.015	12/15/16 15:14	DL02
DUP	WG595115-05	S2161215002.024	12/15/16 15:20	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5062971
 Report generated 12/16/2016 15:22



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/12/16 12:40 Sample ID: WG594496-01
Instrument ID: SMARTCHEM2 Run Date: 12/12/16 12:40 Prep Method: 310.2
File ID: S2161212004.012 Analyst: DCM Method: 310.2
Workgroup (AAB#): WG594496 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-12-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Alkalinity, Total (as CaCO3)	10.0	20.0	10.0	1	U

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

Report Name: BLANK
PDF ID: 5062972
16-DEC-2016 15:22



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/15/16 15:12 Sample ID: WG595115-01
Instrument ID: SMARTCHEM2 Run Date: 12/15/16 15:12 Prep Method: 310.2
File ID: S2161215002.012 Analyst: DCM Method: 310.2
Workgroup (AAB#): WG595115 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-15-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Alkalinity, Total (as CaCO3)	10.0	20.0	10.0	1	U

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

Report Name: BLANK
PDF ID: 5062972
16-DEC-2016 15:22



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Analyst: DCM Prep Method: 310.2
 Instrument ID: SMARTCHEM2 Matrix: Water Method: 310.2
 Workgroup (AAB#): WG594496 Units: mg/L
 QC Key: WATERLOO Lot #: STD79201
 Sample ID: WG594496-02 LCS File ID: S2161212004.013 Run Date: 12/12/2016 12:40
 Sample ID: WG594496-03 LCS2 File ID: S2161212004.014 Run Date: 12/12/2016 12:41

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Alkalinity, Total (as CaCO3)	200	194	96.9	200	194	97.1	0.173	85 - 115	25	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5062973
 Report generated: 12/16/2016 15:22



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Analyst: DCM Prep Method: 310.2
 Instrument ID: SMARTCHEM2 Matrix: Water Method: 310.2
 Workgroup (AAB#): WG595115 Units: mg/L
 QC Key: WATERLOO Lot #: STD79201
 Sample ID: WG595115-02 LCS File ID: S2161215002.013 Run Date: 12/15/2016 15:13
 Sample ID: WG595115-03 LCS2 File ID: S2161215002.014 Run Date: 12/15/2016 15:13

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Alkalinity, Total (as CaCO3)	200	201	100	200	199	99.5	0.779	85 - 115	25	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5062973
 Report generated: 12/16/2016 15:22



2.4.2.3 Raw Data

SMARTCHEM RUN LOG

(smartchem2, smartchem3)

WORKGROUP: WG594416

594451

594496

Daily Check

- | | |
|--|---|
| <input checked="" type="checkbox"/> Lamp On | <input checked="" type="checkbox"/> WBL Run |
| <input checked="" type="checkbox"/> Probe Rinse Full | <input checked="" type="checkbox"/> Reagents Full |
| <input checked="" type="checkbox"/> DI Water > 1/2 Full | <input type="checkbox"/> Dilution H ₂ O Full |
| <input checked="" type="checkbox"/> Wash Solution > 1/2 Full | <input type="checkbox"/> Waste Container Check |
| <input type="checkbox"/> NO ₃ Reagent bottle connected / purged | |
| <input type="checkbox"/> NO ₃ pH adj to pH 5-9 | |
| Syringe filter lot # _____ | |
| pH paper Lot #: <u>HCL681919</u> | |

- 1) Workgroup _____
Plan # 20161212001
- 2) Workgroup _____
Plan # 20161212002
- 3) Workgroup _____
Plan # 20161212004
- Instrument: SC1 SC2

Analyte	1 2 3		
	Alk		
SC Prepared Curve	Dilution		
Position			
1-1	ICV		
1-2	Blk		
1-3	LCS		
1-4	LCS DUP		
1-5	12-484-c1	12-424-c7	
* 1-6	12-484-c2		BC
1-7	c3	12-520-c2	
1-8	c4	c3	
* 1-9	12-484-c5	c	BC
1-10	c9	12-520-c4	
1-11	10	11	
1-12	11	12-425-c1	
1-13	12-342-c2		
1-14	c3		
1-15	c4		
1-16	12-540-c2	1/4	color
1-17	c3	1/4	color
1-18	c5	1/4	color
1-19	c6	1/4	color
1-20	c8	1/4	color
1-21	c9	1/4	color
1-22	12-424-c2		
2-1	c3		
2-2	MS c4		
2-3	MSD c5		

Position	Analyte	1 2 3		
2-4	12-424-c6	1/2		
2-5	DUP 12-424-c6	1/2		
2-6				
2-7				
2-8	ICV			
2-9	Blk			
2-10	LCS			
2-11	LCS DUP			
2-12	12-425-c1	1/4		
2-13	12-520-11			
2-14	12-342-c2			
2-15	c3			
2-16	c4			
2-17	12-540-c2	1/4		color
2-18	c3	1/4		color
2-19	c5	1/4		color
2-20	c6	1/4		color
2-21	c8	1/4		color
2-22	c9	1/4		color
2-23	12-424-c2			
2-24	c3			
2-25	MS c4			
2-26	MSD c5			
3-20	c6	1/2		
3-21	c7			
122	12-352-c1	1/20		

NOTES: * Run NO₂ std on NO₃ runs
* LCS/D must be run if no MS or Duplicate
*MS(10% sample): NO₃, TKN, NH₃, PHOS

* pH < 8.3
oil Layer

DCN#122658



SMARTCHEM RUN LOG
(smartchem2, smartchem3)

Analyte		1	2	3
Position				
3-11	12-352-07	1/5		
3-12	15			
3-13	DUP 12-424-02			
3-14				
3-15				
3-16	ICV			
3-17	Blk			
3-18	LCS			
3-19	LSTDUP			
3-20	12-424-07			
3-21	12-552-01	1/10		
3-22	07	1/5		
3-23	15			

Analyte		1	2	3
Position				
3-159	12-425-05	1/2		
3-176	09	1/5		
3-181	19	1/2		
3-1912	12-521-01	1/2		
3-2013	03			
3-2114	05	1/2		
3-2215	07	1/100		color
3-2316	09	1/100		color
3-2417	11	1/4		
3-2518	12-568-01			
3-2619	DUP 12-568-01			
3-2720	12-352-07			
3-28				

Chloride	EPA 325.2/SM 4500-Cl E-2000
Nitrate-Nitrite	EPA 353.2/SM 4500-NO3 F-2000
✓ Alkalinity	EPA 310.2
Sulfate	EPA 375.4/SM 426C (15 th)/SM4500-504 E-1997

Ammonia	EPA 350.1/SM 4500-NH3 B-1997
TKN	EPA 351.2
Phos	EPA 365.4

Analyte	Alk	Reagents
SOP & Revision	K3102 R 17	REG 38674
Curve Stock (SC made)	Std 79040	
NO2 STD		
ICV	Std 79200	
CCV	Std 79059	
LCS	Std 79201	
MS	Std 78273 Dilution 0.4(25000) 10 = 100	

Comments: _____

Analyst: David Morchle

Date: 12/12/16

DCN#122658



MICROBAC (OVD)
 SMARTCHEM200 INST2 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WALK -Unit [mg/L] -ALKALINITY EPA 310.2

Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
DIL-1	RBL	0.0	0.5291	0.00		7:52:06 AM
DIL-1	RBL	0.0	0.5345	0.00		7:52:24 AM
DIL-1	RBL	0.0	0.5320	0.00		7:53:18 AM
DIL-1	Std-1	0.0	0.0041	0.00	INV	7:53:36 AM
SR5-1	Std-2	10.0	-0.0128	0.00		7:54:30 AM
SR5-2	Std-3	20.0	-0.0265	0.00		7:54:48 AM
SR5-3	Std-4	50.0	-0.0510	0.00		7:55:42 AM
SR5-4	Std-5	100.0	-0.1029	0.00		7:56:36 AM
SR5-5	Std-6	200.0	-0.2234	0.00		7:56:54 AM
SR5-6	Std-7	250.0	-0.2785	0.00		7:57:48 AM
SR5-7	Std-8	300.0	-0.3346	0.00		7:58:42 AM
ST-3	1CCV (150 mg/L)	152.1	-0.1659	101.37		7:59:00 AM
ST-2	2CCB (0 mg/L)	-5.2	0.0061	0.00	INV,><,LL	7:59:54 AM
1	ICV	253.8	-0.2820	0.00		8:00:12 AM
2	WG594416-01 BLK	2.3	-0.0019	0.00		8:01:06 AM
3	WG594416-02 LCS	201.4	-0.2217	0.00		8:02:00 AM
4	WG594416-03 LCSDUP	201.6	-0.2220	0.00		8:02:18 AM
5	L16120424-07	41.3	-0.0439	0.00		8:03:12 AM
6	L16120484-02	X-80.0	0.0851	0.00	INV,><,LL	8:04:06 AM
7	L16120520-02	16.7	-0.0173	0.00		8:04:24 AM
8	L16120520-03	25.1	-0.0263	0.00		8:05:36 AM
9	L16120484-05	X-41.6	0.0448	0.00	INV,><,LL	8:05:54 AM
10	L16120520-04	25.5	-0.0268	0.00		8:06:48 AM
ST-3	1CCV (150 mg/L)	158.8	-0.1735	105.88		8:07:42 AM
ST-2	2CCB (0 mg/L)	9.1	-0.0092	0.00		8:08:00 AM
11	L16120520-11	X 27.7	-0.0291	0.00		8:09:12 AM
12	L16120425-01	X 389.9	-0.4442	0.00	><,LH	8:09:30 AM
13	L16120342-02	X 30.6	-0.0323	0.00		8:10:24 AM
14	L16120342-03	X 106.9	-0.1156	0.00		8:10:42 AM
15	L16120342-04	X 34.7	-0.0367	0.00		8:11:54 AM
16	L16120540-02 (4)	X 154.6	-0.1687	0.00		8:12:12 AM
17	L16120540-03 (4)	X 76.4	-0.0821	0.00		8:13:06 AM

Report Date :12/12/2016 Run Date :12/12/2016 Operator : SMARTCHEM2 Plan # :20161212001
 Plan Description : ALK-A2-DCM/12/12/2016

MICROBAC (OVD)
 SMARTCHEM200 INST2 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WALK -Unit [mg/L] -ALKALINITY EPA 310.2

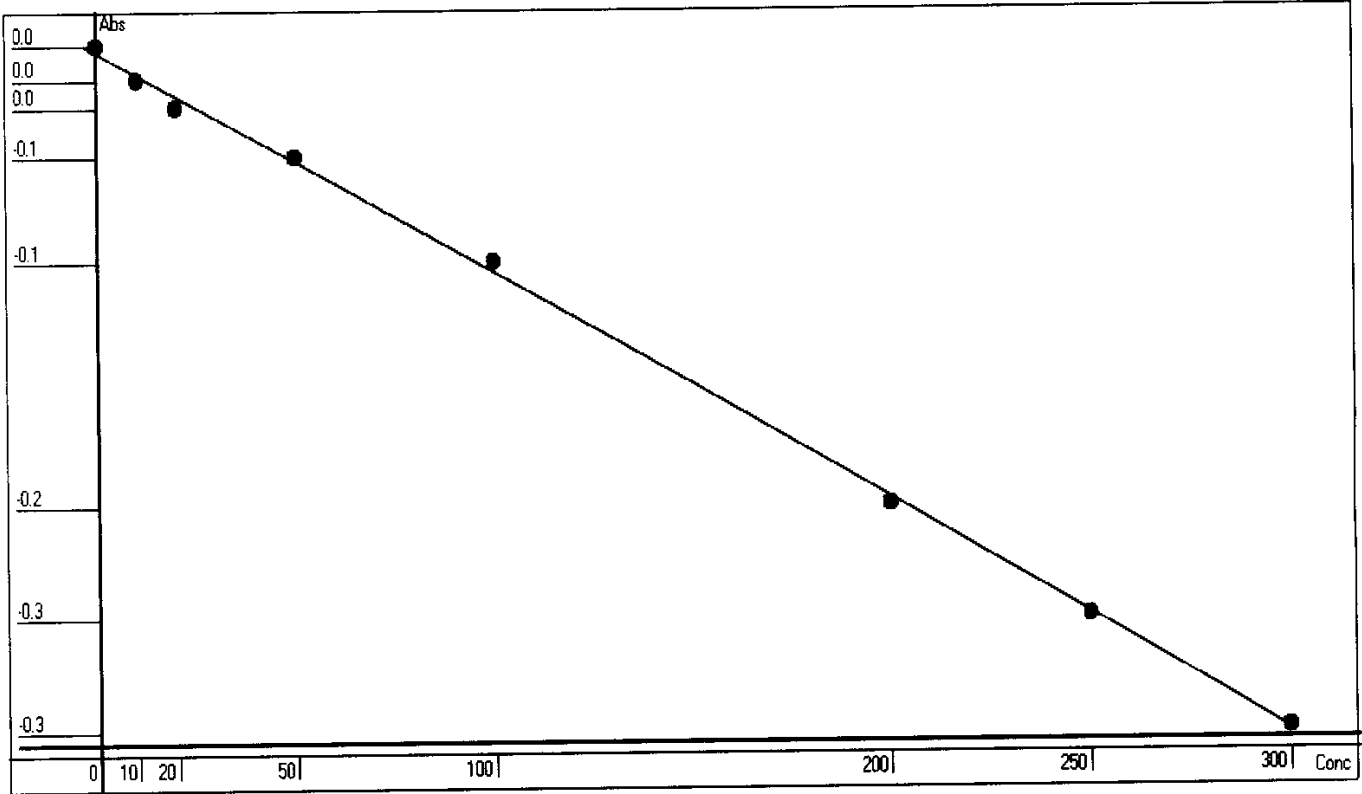
Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
18	L16120540-05 (4)	γ 132.9	-0.1445	0.00		8:14:00 AM
19	L16120540-06 (4)	× 50.3	-0.0536	0.00		8:14:18 AM
20	L16120540-08 (4)	× 135.6	-0.1475	0.00		8:15:12 AM
ST-3	1CCV (150 mg/L)	166.6	-0.1823	111.09		8:15:30 AM
ST-2	2CCB (0 mg/L)	20.5	-0.0214	0.00		8:16:42 AM
21	L16120540-09 (4)	× 75.1	-0.0806	0.00		8:17:00 AM
22	L16120424-02	× 66.6	-0.0713	0.00		8:18:12 AM
23	L16120424-03	γ 42.6	-0.0452	0.00		8:19:06 AM
24	L16120424-04 MS	γ 138.6	-0.1508	0.00		8:20:00 AM
25	L16120424-05 MSD	× 135.2	-0.1470	0.00		8:21:48 AM
26	L16120424-06 (2) <small>✓ 67-07 RIF</small>	85.4	-0.0919	0.00		8:22:07 AM
27	WG594416-08 (2) DUP	93.2	-0.1005	0.00		8:23:01 AM
28	ID 28	53.4	-0.0570	0.00		8:23:19 AM
ST-3	1CCV (150 mg/L)	175.8	-0.1926	117.17		8:24:13 AM
ST-2	2CCB (0 mg/L)	32.1	-0.0339	0.00		8:24:30 AM
29	ID 29	54.3	-0.0579	0.00		8:25:24 AM
30	ID 30	61.6	-0.0659	0.00		8:25:42 AM
31	ID 31	57.7	-0.0616	0.00		8:26:36 AM
32	ID 32	52.3	-0.0558	0.00		8:27:31 AM
33	ID 33	61.1	-0.0654	0.00		8:27:48 AM
34	ID 34	55.0	-0.0587	0.00		8:28:42 AM
35	ID 35	60.1	-0.0643	0.00		8:29:37 AM
ST-3	1CCV (150 mg/L)	184.0	-0.2019	122.65		8:29:55 AM
ST-2	2CCB (0 mg/L)	42.1	-0.0447	0.00		8:30:49 AM
12-[1/2]	L16120425-01	× 599.2	-0.3357	0.00	><,LH	8:38:29 AM
ST-3	1CCV (150 mg/L)	187.4	-0.2058	124.94		8:38:29 AM
ST-2	2CCB (0 mg/L)	48.1	-0.0512	0.00		8:39:22 AM

Report Date :12/12/2016 Run Date :12/12/2016 Operator : SMARTCHEM2 Plan # :20161212001
 Plan Description : ALK-A2-DCM/12/12/2016

Calibrant Report - WALK -

Calib Lot #:010104 Exp Date:6/21/2020 User:MICROBAC

Plan # : 20161212001 Description : [ALK-A2-DCM/12/12/2016] Unit



Point	OD	Conc	Recalc Conc	% Error
1	0.0041	0	-3.2398	-323.98
2	-0.0128	10	12.5451	25.45
3	-0.0265	20	25.2858	26.43
4	-0.0510	50	47.9464	-4.11
5	-0.1029	100	95.4255	-4.57
6	-0.2234	200	202.9138	1.46
7	-0.2785	250	250.7845	0.31
8	-0.3346	300	298.6989	-0.43

Conc = -132.2483*Abso^2 -935.1718*Abso +0.5966 R²=0.9992

RBL
0.5333
0

Report Date 12/12/2016 Run Date 12/12/2016

MICROBAC (OVD)
 SMARTCHEM200 INST2 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WALK -Unit [mg/L] - ALKALINITY EPA 310.2

Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
DIL-1	RBL	0.0	0.4249	0.00		9:26:40 AM
DIL-1	RBL	0.0	0.4263	0.00		9:26:58 AM
DIL-1	RBL	0.0	0.4268	0.00		9:27:52 AM
DIL-1	Std-1	0.0	-0.0037	0.00		9:28:10 AM
SR5-1	Std-2	10.0	-0.0037	0.00		9:29:04 AM
SR5-2	Std-3	20.0	-0.0199	0.00		9:29:22 AM
SR5-3	Std-4	50.0	-0.0385	0.00		9:30:16 AM
SR5-4	Std-5	100.0	-0.0861	0.00		9:31:10 AM
SR5-5	Std-6	200.0	-0.1874	0.00		9:31:28 AM
SR5-6	Std-7	250.0	-0.2355	0.00		9:32:22 AM
SR5-7	Std-8	300.0	-0.2778	0.00		9:33:16 AM
ST-3	1CCV (150 mg/L)	151.0	-0.1375	100.67		9:33:35 AM
ST-2	2CCB (0 mg/L)	-6.8	0.0080	0.00	INV,><,LL	9:34:28 AM
1	ICV	249.1	-0.2314	0.00		9:34:46 AM
2	WG594451-01 BLK	-5.8	0.0071	0.00	INV,><,LL	9:35:40 AM
3	WG594451-02 LCS	194.2	-0.1785	0.00		9:36:34 AM
4	WG594451-03 LCSDUP	197.3	-0.1815	0.00		9:36:52 AM
5	L16120425-01 (4)	140.8	-0.1279	0.00		9:37:46 AM
6	L16120520-11	20.3	-0.0166	0.00		9:38:40 AM
7	L16120342-02	20.4	-0.0166	0.00		9:38:58 AM
8	L16120342-03	96.3	-0.0863	0.00		9:40:10 AM
9	L16120342-04	23.7	-0.0197	0.00		9:40:28 AM
10	L16120540-02 (4)	137.9	-0.1252	0.00		9:41:22 AM
ST-3	1CCV (150 mg/L)	158.4	-0.1445	105.61		9:42:16 AM
ST-2	2CCB (0 mg/L)	7.3	-0.0048	0.00		9:42:34 AM
11	L16120540-03 (4)	60.1	-0.0529	0.00		9:43:46 AM
12	L16120540-05 (4)	122.6	-0.1108	0.00		9:44:04 AM
13	L16120540-06 (4)	38.6	-0.0333	0.00		9:44:58 AM
14	L16120540-08 (4)	116.9	-0.1055	0.00		9:45:16 AM
15	L16120540-09 (4)	57.0	-0.0500	0.00		9:46:28 AM
16	L16120424-02	-7.7	0.0087	0.00	INV,><,LL	9:46:46 AM
17	L16120424-03	34.1	-0.0292	0.00		9:47:40 AM

Report Date :12/12/2016 Run Date :12/12/2016 Operator : SMARTCHEM2 Plan # :20161212002
 Plan Description : ALK-B2-DCM/12/12/2016

MICROBAC (OVD)
 SMARTCHEM200 INST2 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

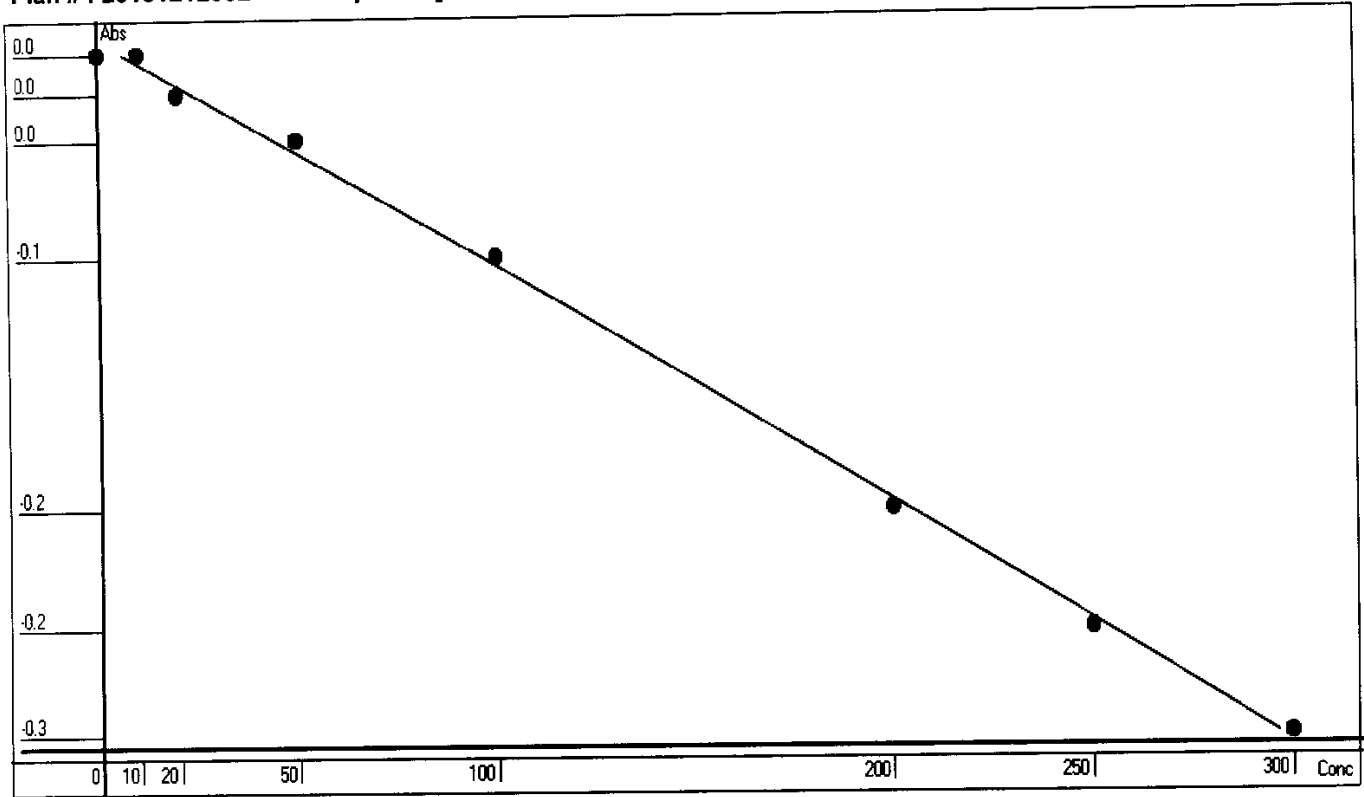
Method : WALK -Unit [mg/L] -ALKALINITY EPA 310.2

Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
18	L16120424-04 MS	126.5	-0.1145	0.00		9:48:34 AM
19	L16120424-05 MSD	124.6	-0.1127	0.00		9:48:52 AM
20	L16120424-06 (2)	70.5	-0.0624	0.00		9:49:47 AM
ST-3	1CCV (150 mg/L)	163.0	-0.1488	108.65		9:50:04 AM
ST-2	2CCB (0 mg/L)	14.3	-0.0112	0.00		9:51:16 AM
21	L16120424-07	✕ 63.4	-0.0560	0.00		9:51:34 AM
22	L16120352-01 (20)	✕ 69.1	-0.0612	0.00		9:52:46 AM
23	L16120352-07 (5)	✕ 212.2	-0.1957	0.00		9:53:40 AM
24	L16120352-15	✕ 209.3	-0.1930	0.00		9:54:34 AM
25	WG594451-08 DUP	11.2	-0.0084	0.00		9:56:23 AM
26	ID 26	***	0.4784	0.00	SS	9:56:40 AM
26	ID 26	35.9	-0.0308	0.00		10:00:52 AM
ST-3	1CCV (150 mg/L)	169.0	-0.1545	112.66		9:57:34 AM
ST-2	2CCB (0 mg/L)	21.1	-0.0173	0.00		9:57:52 AM

Report Date :12/12/2016 Run Date :12/12/2016 Operator : SMARTCHEM2 Plan # :20161212002
 Plan Description : ALK-B2-DCM/12/12/2016

Calibrant Report - WALK -

Calib Lot #:010104 Exp Date:6/21/2020 User:MICROBAC
 Plan # : 20161212002 Description : [ALK-B2-DCM/12/12/2016] Unit



Point	OD	Conc	Recalc Conc	% Error
1	-0.0037	0	6.0973	609.73
2	-0.0037	10	6.0973	-39.03
3	-0.0199	20	23.9722	19.86
4	-0.0385	50	44.3852	-11.23
5	-0.0861	100	96.0897	-3.91
6	-0.1874	200	203.5619	1.78
7	-0.2354	250	253.2689	1.31
8	-0.2777	300	296.4242	-1.19

Conc= -169.9066*Abso^2 -1107.399*Abso +2.0022 R²=0.9985

RBL
0.4266
0

Report Date 12/12/2016 Run Date 12/12/2016

MICROBAC (OVD)
 SMARTCHEM200 INST2 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WALK -Unit [mg/L] - ALKALINITY EPA 310.2

Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
DIL-1	RBL	0.0	0.3921	0.00		12:31:00 PM
DIL-1	RBL	0.0	0.3951	0.00		12:31:18 PM
DIL-1	RBL	0.0	0.3933	0.00		12:32:12 PM
DIL-1	Std-1	0.0	0.0018	0.00	INV	12:32:30 PM
SR5-1	Std-2	10.0	-0.0047	0.00		12:33:24 PM
SR5-2	Std-3	20.0	-0.0129	0.00		12:33:42 PM
SR5-3	Std-4	50.0	-0.0406	0.00		12:34:36 PM
SR5-4	Std-5	100.0	-0.0825	0.00		12:35:30 PM
SR5-5	Std-6	200.0	-0.1761	0.00		12:35:48 PM
SR5-6	Std-7	250.0	-0.2225	0.00		12:36:42 PM
SR5-7	Std-8	300.0	-0.2617	0.00		12:37:36 PM
ST-3	1CCV (150 mg/L)	150.4	-0.1304	100.28		12:37:54 PM
ST-2	2CCB (0 mg/L)	-10.9	0.0137	0.00	INV,><,LL	12:38:48 PM
1	ICV	242.5	-0.2128	0.00		12:39:06 PM
2	WG594496-01 BLK	-7.9	0.0111	0.00	INV,><,LL	12:40:00 PM
3	WG594496-02 LCS	193.8	-0.1692	0.00		12:40:54 PM
4	WG594496-03 LCSDUP	194.1	-0.1695	0.00		12:41:12 PM
5	L16120424-07	12.1	-0.0068	0.00		12:42:06 PM
6	L16120352-01 (10)	77.5	-0.0652	0.00		12:43:00 PM
7	L16120352-07 (5)	X 49.8	-0.0405	0.00		12:43:18 PM
8	L16120352-15	185.9	-0.1621	0.00		12:44:30 PM
9	L16120425-05 (2)	215.7	-0.1888	0.00		12:44:48 PM
10	L16120425-09 (5)	112.6	-0.0966	0.00		12:45:42 PM
ST-3	1CCV (150 mg/L)	152.3	-0.1321	101.54		12:46:36 PM
ST-2	2CCB (0 mg/L)	-7.2	0.0104	0.00	INV,><,LL	12:46:54 PM
11	L16120425-19 (2)	202.3	-0.1768	0.00		12:48:06 PM
12	L16120521-01 (2)	199.2	-0.1740	0.00		12:48:24 PM
13	L16120521-03	265.7	-0.2335	0.00		12:49:18 PM
14	L16120521-05 (2)	160.8	-0.1397	0.00		12:49:36 PM
15	L16120521-07 (100)	132.5	-0.1144	0.00		12:50:48 PM
16	L16120521-09 (100)	45.1	-0.0363	0.00		12:51:06 PM
17	L16120521-11 (4)	202.3	-0.1768	0.00		12:52:00 PM

Report Date :12/12/2016 Run Date :12/12/2016 Operator : SMARTCHEM2 Plan # :20161212004
 Plan Description : ALK-C2-DCM12/12/2016

MICROBAC (OVD)
 SMARTCHEM200 INST2 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

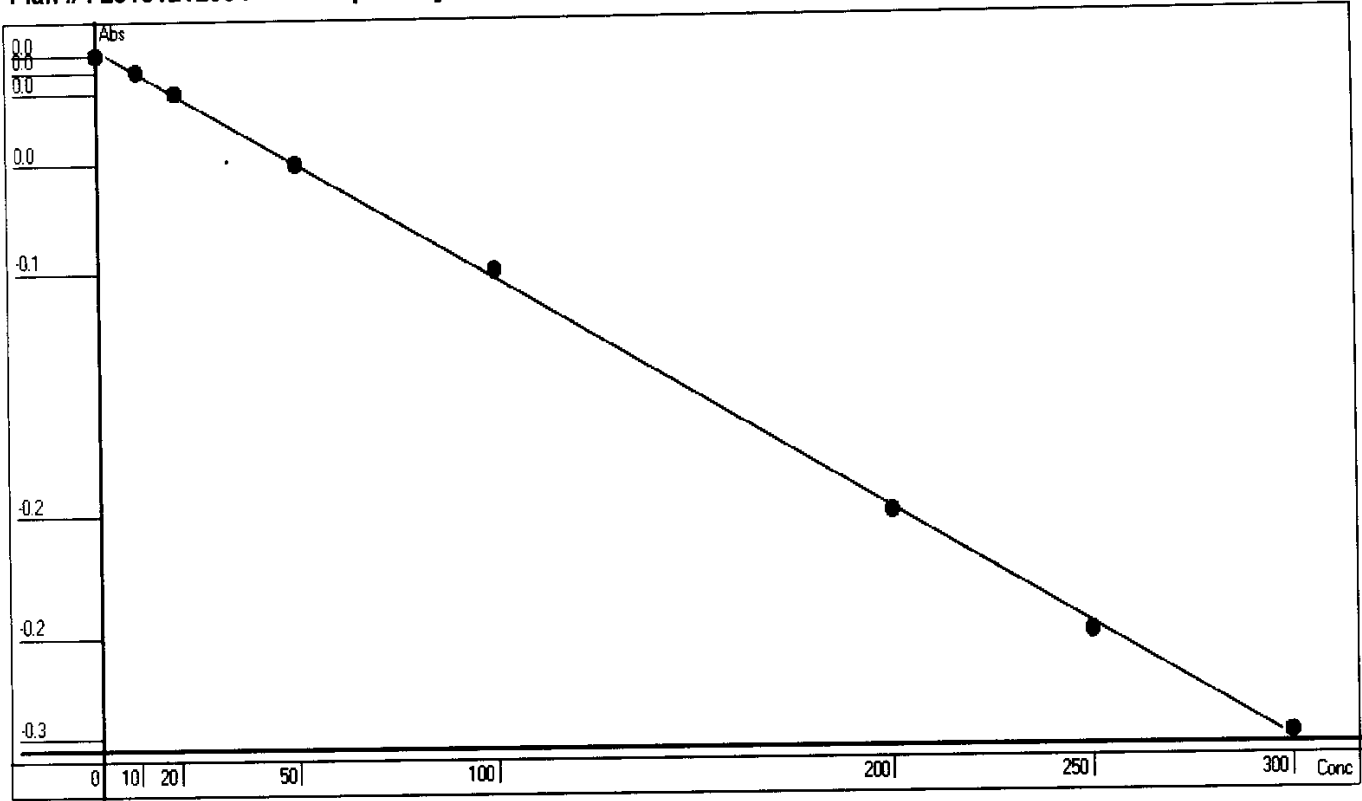
Method : WALK -Unit [mg/L] -ALKALINITY EPA 310.2

Smp#[Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
18	L16120568-01	16.7	-0.0109	0.00		12:52:54 PM
19	WG594496-05 DUP	16.7	-0.0109	0.00		12:53:12 PM
20	ID 20 12-352-07	214.5	-0.1877	0.00		12:54:06 PM
ST-3	1CCV (150 mg/L)	156.2	-0.1356	104.15		12:54:24 PM
ST-2	2CCB (0 mg/L)	6.2	-0.0015	0.00		12:55:36 PM

Report Date :12/12/2016 Run Date :12/12/2016 Operator : SMARTCHEM2 Plan # :20161212004
 Plan Description : ALK-C2-DCM12/12/2016

Calibrant Report - WALK -

Calib Lot #:010104 Exp Date:6/21/2020 User:MICROBAC
 Plan # : 20161212004 Description : [ALK-C2-DCM12/12/2016] Unit



Point	OD	Conc	Recalc Conc	% Error
1	0.0018	0	2.4706	247.06
2	-0.0047	10	9.7484	-2.52
3	-0.0129	20	18.9291	-5.35
4	-0.0406	50	49.9372	-0.13
5	-0.0825	100	96.8277	-3.17
6	-0.1761	200	201.5167	0.76
7	-0.2225	250	253.3837	1.35
8	-0.2617	300	297.1866	-0.94

Conc= -4.6557*Abso^2 -1119.677*Abso +4.486 R²=0.9996

RBL
0.3927
0

Report Date 12/12/2016 Run Date 12/12/2016

SMARTCHEM RUN LOG
(smartchem2, smartchem3)

Daily Check

- | | |
|--|--|
| <input checked="" type="checkbox"/> Lamp On | <input checked="" type="checkbox"/> WBL Run |
| <input checked="" type="checkbox"/> Probe Rinse Full | <input checked="" type="checkbox"/> Reagents Full |
| <input checked="" type="checkbox"/> DI Water > 1/2 Full | <input checked="" type="checkbox"/> Dilution H ₂ O Full |
| <input checked="" type="checkbox"/> Wash Solution > 1/2 Full | <input type="checkbox"/> Waste Container Check |
| <input type="checkbox"/> NO ₃ Reagent bottle connected / purged | |
| <input type="checkbox"/> NO ₃ pH adj to pH 5-9 | |
| Syringe filter lot # _____ | |
| pH paper Lot #: _____ | |

- 1) Workgroup _____
Plan # 2016/215002
- 2) Workgroup _____
Plan # _____
- 3) Workgroup _____
Plan # _____
- Instrument: SC1 SC2

Analyte	1	2	3
Aik			
Dilution			
SC Prepared Curve			
Position			
1-1	ICV		
1-2	Blk		
1-3	LCS		
1-4	LCSDUP		
1-5	12-352-e1	1/5	
1-6	12-703-02	1/4	color
1-7	03	1/4	color
1-8	05	1/4	color
1-9	06	1/4	color
1-10	12-782-05	1/10	
1-11	07	1/2	
1-12	DUP 12-782-04	1/2	
1-13			
1-14			
1-15			
1-16			
1-17			
1-18			
1-19			
1-20			
1-21			
1-22			
2-1			
2-2			
2-3			

Position	Analyte	1	2	3
2-4				
2-5				
2-6				
2-7				
2-8				
2-9				
2-10				
2-11				
2-12				
2-13				
2-14				
2-15				
2-16				
2-17				
2-18				
2-19				
2-20				
2-21				
2-22				
2-23				
2-24				
2-25				
2-26				
3-1				
3-2				

NOTES: * Run NO₂ std on NO₃ runs
* LCSD must be run if no MS or Duplicate
*MS(10% sample): NO₃, TKN, NH₃, PHOS



DCN#122761

SMARTCHEM RUN LOG
(smartchem2, smartchem3)

WORKGROUP: WG595115

	1	2	3
Analyte			
Position			
3-3			
3-4			
3-5			
3-6			
3-7			
3-8			
3-9			
3-10			
3-11			
3-12			
3-13			
3-14			
3-15			

	1	2	3
Analyte			
Position			
3-16			
3-17			
3-18			
3-19			
3-20			
3-21			
3-22			
3-23			
3-24			
3-25			
3-26			
3-27			
3-28			

Chloride	EPA 325.2/SM 4500-Cl E-2000
Nitrate-Nitrite	EPA 353.2/SM 4500-NO3 F-2000
✓ Alkalinity	EPA 310.2
Sulfate	EPA 375.4/SM 426C (15 th)/ SM4500-504 E-1997

Ammonia	EPA 350.1/SM 4500-NH3 B-1997
TKN	EPA 351.2
Phos	EPA 365.4

Analyte	1	2	3	Reagents
SOP & Revision	Aik K302 R17			REA 38716
Curve Stock (SC made)	Std 79046			
NO2 STD				
ICV	Std 79200			
CCV	Std 79059			
LCS	Std 79201			
MS	NA Dilution			

Comments: _____

Analyst: David Merckle

Date: 12/15/16

DCN#122761



MICROBAC (OVD)
 SMARTCHEM200 INST2 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WALK -Unit [mg/L] - ALKALINITY EPA 310.2

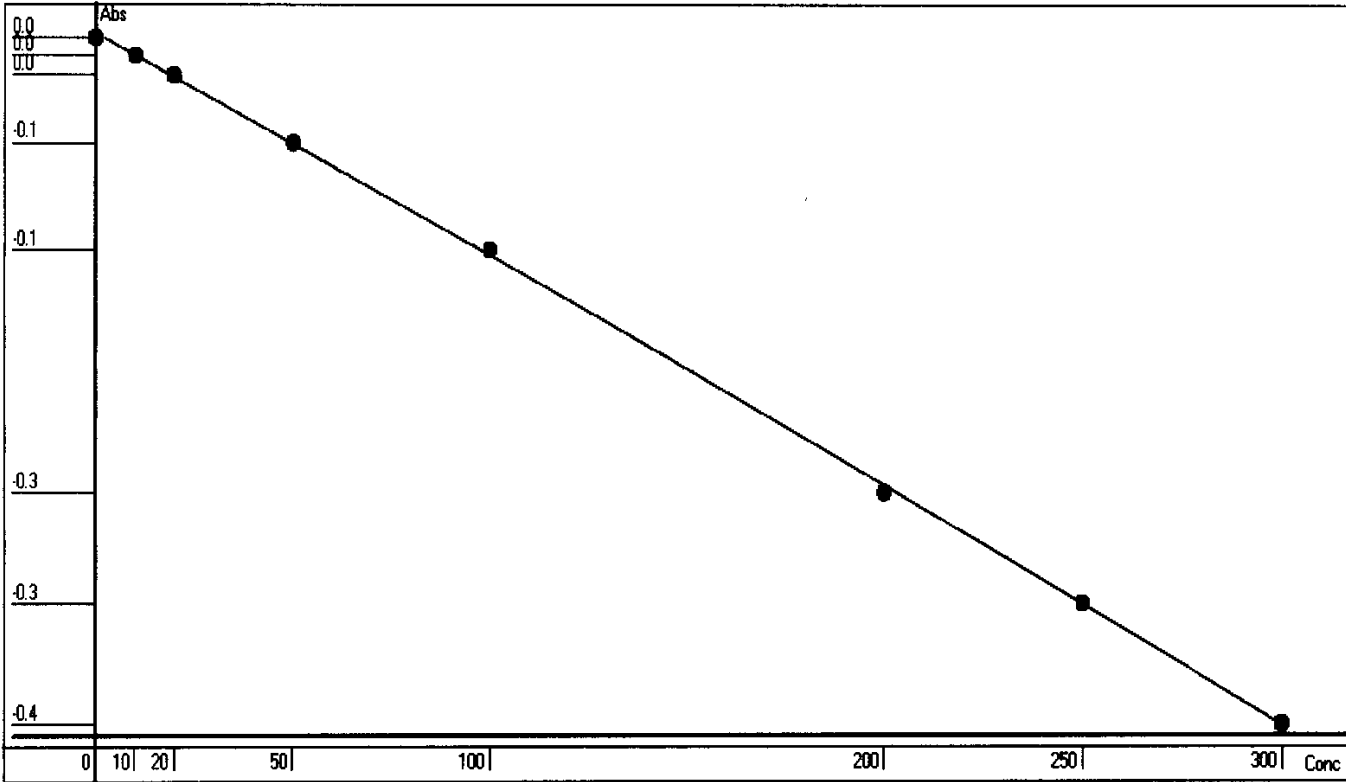
Smp#[[Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
DIL-1	RBL	0.0	0.6440	0.00		3:03:13 PM
DIL-1	RBL	0.0	0.6504	0.00		3:03:31 PM
DIL-1	RBL	0.0	0.6510	0.00		3:04:25 PM
DIL-1	Std-1	0.0	-0.0104	0.00		3:04:43 PM
SR5-1	Std-2	10.0	-0.0208	0.00		3:05:37 PM
SR5-2	Std-3	20.0	-0.0324	0.00		3:05:55 PM
SR5-3	Std-4	50.0	-0.0730	0.00		3:06:49 PM
SR5-4	Std-5	100.0	-0.1373	0.00		3:07:43 PM
SR5-5	Std-6	200.0	-0.2833	0.00		3:08:01 PM
SR5-6	Std-7	250.0	-0.3498	0.00		3:08:55 PM
SR5-7	Std-8	300.0	-0.4222	0.00		3:09:49 PM
ST-3	1CCV (150 mg/L)	147.2	-0.2052	98.13		3:10:07 PM
ST-2	2CCB (0 mg/L)	0.8	-0.0087	0.00		3:11:01 PM
1	ICV	242.4	-0.3394	0.00		3:11:19 PM
2	WG595115-01 BLK	0.8	-0.0087	0.00		3:12:13 PM
3	WG595115-02 LCS	200.6	-0.2798	0.00		3:13:07 PM
4	WG595115-03 LCSDUP	199.0	-0.2776	0.00		3:13:25 PM
5	L16120352-01 (5)	147.6	-0.2058	0.00		3:14:19 PM
6	L16120703-02 (4)	121.9	-0.1704	0.00		3:15:13 PM
7	L16120703-03 (4)	103.5	-0.1453	0.00		3:15:31 PM
8	L16120703-05 (4)	143.1	-0.1995	0.00		3:16:43 PM
9	L16120703-06 (4)	68.9	-0.0987	0.00		3:17:01 PM
10	L16120782-05 (10)	174.5	-0.2431	0.00		3:17:55 PM
ST-3	1CCV (150 mg/L)	164.2	-0.2288	109.48		3:18:49 PM
ST-2	2CCB (0 mg/L)	16.7	-0.0296	0.00		3:19:07 PM
11	L16120782-07 (2)	213.4	-0.2979	0.00		3:20:19 PM
12	WG595115-05 (2) DUP	203.9	-0.2845	0.00		3:20:37 PM
13	ID 13	23.8	-0.0389	0.00		3:21:31 PM
ST-3	1CCV (150 mg/L)	169.0	-0.2354	112.64		3:21:49 PM
ST-2	2CCB (0 mg/L)	16.9	-0.0298	0.00		3:23:01 PM

Report Date :12/15/2016 Run Date :12/15/2016 Operator : SMARTCHEM2 Plan # :20161215002
 Plan Description : ALK-A2-DCM/12/15/2016

Calibrant Report - WALK -

Calib Lot #:010104 Exp Date:6/21/2020 User:MICROBAC

Plan # : 20161215002 Description : [ALK-A2-DCM/12/15/2016] Unit



Point	OD	Conc	Recalc Conc	% Error
1	-0.0104	0	2.0815	208.15
2	-0.0208	10	10.0368	0.37
3	-0.0324	20	18.8824	-5.59
4	-0.0730	50	49.6122	-0.78
5	-0.1373	100	97.5496	-2.45
6	-0.2833	200	203.0691	1.53
7	-0.3498	250	249.5997	-0.16
8	-0.4222	300	299.1689	-0.28

Conc= -108.3664*Abso^2 -768.3154*Abso -5.8973 R²=0.9998

RBL
0.6507
0

Report Date 12/15/2016 Run Date 12/15/2016

2.4 General Chemistry Data

2.4.3 Ammonia Data

2.4.3.1 Summary Data



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis EPA 350.1/SM4500-NH3 B(NH3)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120651
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW23-120616	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 12/16/2016 08:28
Workgroup #: WG595181	Analyst: DCM	Run Date: 12/16/2016 09:16
Collect Date: 12/06/2016 10:57	Dilution: 2	File ID: S2161216001.054
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	3.32		0.200	0.100

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW02-120616	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 12/16/2016 08:28
Workgroup #: WG595181	Analyst: DCM	Run Date: 12/16/2016 09:18
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: S2161216001.055
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	1.03		0.100	0.0500

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW01-120616	Prep Method: 350.1	Prep Date: N/A
Matrix: Water	Analytical Method: 350.1	Cal Date: 12/16/2016 08:28
Workgroup #: WG595181	Analyst: DCM	Run Date: 12/16/2016 08:38
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: S2161216001.017
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	0.595		0.100	0.0500

2.4.3.2 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: 16-DEC-2016
 Analyst: DCM
 Analyst: NA
 Method: NH3
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG595181 WG595183 WG595184

Calibration/Linearity	12-16-2016
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:
16-DEC-2016



Secondary Reviewer:
19-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 350.1
 Login Number: L16120352

AAB#: WG595181

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
MW23-120616	01	12/06/16					12/16/2016	9.9	28		12/16/16	9.9	28	
MW02-120616	07	12/06/16					12/16/2016	9.9	28		12/16/16	9.9	28	
MW01-120616	15	12/06/16					12/16/2016	9.8	28		12/16/16	9.8	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5071670
 Report generated 12/19/2016 11:46



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG595181
 Blank File ID: S2161216001.011 Blank Sample ID: WG595181-01
 Prep Date: 12/16/16 08:32 Instrument ID: SMARTCHEM2
 Analyzed Date: 12/16/16 08:32 Method: 350.1
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
MW01-120616	L16120352-15	S2161216001.017	12/16/16 08:38	01
DUP	WG595181-04	S2161216001.037	12/16/16 09:00	01
MW23-120616	L16120352-01	S2161216001.054	12/16/16 09:16	DL01
MW02-120616	L16120352-07	S2161216001.055	12/16/16 09:18	01
LCS	WG595181-02	S2161216001.059	12/16/16 09:21	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5071671
 Report generated 12/19/2016 11:46



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/16/16 08:32 Sample ID: WG595181-01
Instrument ID: SMARTCHEM2 Run Date: 12/16/16 08:32 Prep Method: 350.1
File ID: S2161216001.011 Analyst: DCM Method: 350.1
Workgroup (AAB#): WG595181 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-16-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Nitrogen, Ammonia	0.0500	0.100	-0.0769	1	U

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

Report Name: BLANK
PDF ID: 5071672
19-DEC-2016 11:46



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/16/2016 Sample ID: WG595181-02
Instrument ID: SMARTCHEM2 Run Time: 09:21 Prep Method: 350.1
File ID: S2161216001.059 Analyst: DCM Method: 350.1
Workgroup (AAB#): WG595181 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD77841 Cal ID: SMARTC-16-DEC-16

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: 5071673
Report generated: 12/19/2016 11:46



2.4 General Chemistry Data

2.4.4 Nitrate Data

2.4.4.1 Summary Data



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis EPA 353.2/SM4500-NO3 F (Nitrate)

HOLDING TIMES

Sample Analysis: The instrument used for the analysis of nitrate only analyzes for nitrate-nitrite (NO₃NO₂) which is the amount of total nitrate (NO₃) and nitrite (NO₂) combined. The NO₃ concentration is determined by analyzing for NO₃NO₂ and NO₂ and calculating NO₃ by the difference. An unpreserved bottle only has a 48 hour hold time for NO₃ and NO₂ separately. However if the bottle is preserved with sulfuric acid, the hold time for NO₃NO₂ is 28 days. The NO₂ was analyzed within 48 hours. The NO₃NO₂ was analyzed from a preserved container within 28 days..

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

SAMPLES

Samples: The sample(s) were diluted to reduce color/matrix interference. The reporting limits are elevated accordingly.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120375
Approved By: Deanna Hesson

Danna Hesson

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW23-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 10:57	Dilution: 25	File ID: S216121314554801
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		3.08		1.25	0.625

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW23-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 10:57	Dilution: 25	File ID: S216121314552201
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	3.08		1.25	0.625

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW02-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 11:10	Dilution: 50	File ID: S216121314562301
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	6.10		2.50	1.25

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW02-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 11:10	Dilution: 50	File ID: S216121315025601
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		6.10		2.50	1.25

Certificate of Analysis

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW01-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 14:38	Dilution: 4	File ID: S216121315033201
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		0.908		0.200	0.100

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW01-120616	Prep Method: 353.2	Prep Date: N/A
Matrix: Water	Analytical Method: 353.2	Cal Date: 12/08/2016 11:55
Workgroup #: WG594211	Analyst: DCM	Run Date: 12/09/2016 09:48
Collect Date: 12/06/2016 14:38	Dilution: 4	File ID: S216121315030801
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	0.908		0.200	0.100

2.4.4.2 QC Summary Data

Example Nitrate 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: 09-DEC-2016
 Analyst: DCM
 Analyst: NA
 Method: NO3
 Instrument: SC2
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG594212 WG594211

Calibration/Linearity	12-09-2016
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:
12-DEC-2016



Secondary Reviewer:
15-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 353.2
 Login Number: L16120352

AAB#: WG594211

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
MW23-120616	01	12/06/16					12/09/2016	3	2	*	12/09/16	3	2	*
MW02-120616	07	12/06/16					12/09/2016	2.9	2	*	12/09/16	2.9	2	*
MW01-120616	15	12/06/16					12/09/2016	2.8	2	*	12/09/16	2.8	2	*

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061615
 Report generated 12/13/2016 16:35



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 353.2
 Login Number: L16120352

AAB#: WG594211

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
MW23-120616	01	12/06/16					12/09/2016	3	28		12/09/16	3	28	
MW02-120616	07	12/06/16					12/09/2016	2.9	28		12/09/16	2.9	28	
MW01-120616	15	12/06/16					12/09/2016	2.8	28		12/09/16	2.8	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061619
 Report generated 12/13/2016 16:35



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594211
 Blank File ID: S216121314504001 Blank Sample ID: WG594211-01
 Prep Date: 12/09/16 09:48 Instrument ID: SMARTCHEM2
 Analyzed Date: 12/09/16 09:48 Method: 353.2
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
MW01-120616	L16120352-15	S216121315033201	12/09/16 09:48	
MW23-120616	L16120352-01	S216121314552201	12/09/16 09:48	
MW01-120616	L16120352-15	S216121315030801	12/09/16 09:48	
LCS	WG594211-02	S216121314505801	12/09/16 09:48	
MW02-120616	L16120352-07	S216121315025601	12/09/16 09:48	
DUP	WG594211-05	S216121314521701	12/09/16 09:48	
MW23-120616	L16120352-01	S216121314554801	12/09/16 09:48	
MW02-120616	L16120352-07	S216121314562301	12/09/16 09:48	
LCS2	WG594211-03	S216121314512201	12/09/16 09:48	

Report Name: BLANK_SUMMARY
 PDF File ID: 5061616
 Report generated 12/13/2016 16:35



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594211
 Blank File ID: S216121314504001 Blank Sample ID: WG594211-01
 Prep Date: 12/09/16 09:48 Instrument ID: SMARTCHEM2
 Analyzed Date: 12/09/16 09:48 Method: 353.2
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
MW01-120616	L16120352-15	S216121315033201	12/09/16 09:48	
MW23-120616	L16120352-01	S216121314552201	12/09/16 09:48	
MW01-120616	L16120352-15	S216121315030801	12/09/16 09:48	
LCS	WG594211-02	S216121314505801	12/09/16 09:48	
MW02-120616	L16120352-07	S216121315025601	12/09/16 09:48	
DUP	WG594211-05	S216121314521701	12/09/16 09:48	
MW23-120616	L16120352-01	S216121314554801	12/09/16 09:48	
MW02-120616	L16120352-07	S216121314562301	12/09/16 09:48	
LCS2	WG594211-03	S216121314512201	12/09/16 09:48	

Report Name: BLANK_SUMMARY
 PDF File ID: 5061620
 Report generated 12/13/2016 16:35



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/09/16 09:48 Sample ID: WG594211-01
Instrument ID: SMARTCHEM2 Run Date: 12/09/16 09:48 Prep Method: 353.2
File ID: S216121314504001 Analyst: DCM Method: 353.2
Workgroup (AAB#): WG594211 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-08-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Nitrate (as N)	0.0250	0.0500	0.0250	1	U

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

Report Name: BLANK
PDF ID: 5061617
13-DEC-2016 16:35



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/09/16 09:48 Sample ID: WG594211-01
Instrument ID: SMARTCHEM2 Run Date: 12/09/16 09:48 Prep Method: 353.2
File ID: S216121314504001 Analyst: DCM Method: 353.2
Workgroup (AAB#): WG594211 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-08-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Nitrate-Nitrite (as N)	0.0250	0.0500	0.0250	1	U

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

Report Name: BLANK
PDF ID: 5061621
13-DEC-2016 16:35



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Analyst: DCM Prep Method: 353.2
 Instrument ID: SMARTCHEM2 Matrix: Water Method: 353.2
 Workgroup (AAB#): WG594211 Units: mg/L
 QC Key: WATERLOO Lot #: STD79077
 Sample ID: WG594211-02 LCS File ID: S216121314505801 Run Date: 12/09/2016 09:48
 Sample ID: WG594211-03 LCS2 File ID: S216121314512201 Run Date: 12/09/2016 09:48

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Nitrate (as N)	1.00	1.01	101	1.00	1.02	102	1.78	90 - 110	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5061618
 Report generated: 12/13/2016 16:35



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Analyst: DCM Prep Method: 353.2
 Instrument ID: SMARTCHEM2 Matrix: Water Method: 353.2
 Workgroup (AAB#): WG594211 Units: mg/L
 QC Key: WATERLOO Lot #: STD79077
 Sample ID: WG594211-02 LCS File ID: S216121314505801 Run Date: 12/09/2016 09:48
 Sample ID: WG594211-03 LCS2 File ID: S216121314512201 Run Date: 12/09/2016 09:48

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Nitrate-Nitrite (as N)	1.00	1.01	101	1.00	1.02	102	1.78	90 - 110	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5061622
 Report generated: 12/13/2016 16:35



2.4.4.3 Raw Data

SMARTCHEM RUN LOG
(smartchem2, smartchem3)

WORKGROUP: WG594211
594212

Daily Check

- Lamp On
- Probe Rinse Full
- DI Water > 1/2 Full
- Wash Solution > 1/2 Full
- NO3 Reagent bottle connected / purged
- NO3 pH adj to pH 5-9
- Syringe filter lot # 00220660
- pH paper Lot #: HCG81919
- WBL Run
- Reagents Full
- Dilution H2O Full
- Waste Container Check

- 1) Workgroup _____
Plan # 20161209001
- 2) Workgroup _____
Plan # _____
- 3) Workgroup _____
Plan # _____
- Instrument: SC1 SC2

Analyte	1	2	3
	NO3		
	Dilution		
SC Prepared Curve			
Position			
1-1	ICV		
1-2	Bilk		
1-3	LLS		
1-4	LCSDUP		
1-5	12-260-08 NO2		
1-6	12-260-08 1/2		color
* 1-7	09 1/50		
* 1-8	12-352-01 1/25		
* 1-9	07 1/50		
* 1-10	15 1/4		
1-11	12-377-01		
1-12	02 1/4		
1-13	12-378-01		
1-14	02		
1-15	12-349-01		
1-16	12-379-03		
1-17	05		
* 1-18	12-425-01 1/5		
* 1-19	05 1/4		
* 1-20	09 1/100		
* 1-21	19 1/20		
1-22	12-268-01		
2-1	02		
2-2	03		
2-3	12-441-01		

Position	Analyte	1	2	3
2-4	DUP 12-441-01			
2-5	MS 12-441-01			
2-6	MS 12-368-01 12-378-01			
2-7	Bilk			
2-8	LLS			
2-9	LCSDUP			
2-10	12-441-02			
2-11	12-270-01			
2-12	02			
2-13	12-438-02			
2-14	05			
2-15	12-442-01			
2-16	02			
2-17	10			
2-18	17			
2-19	12-456-01			
2-20	DUP 12-456-01			
2-21	MS 12-456-01			
2-22	12-456-02			
2-23	03 1/5			color
2-24	04 1/5			color
2-25	MS 12-456-02			
2-26				
3-1				
3-2	NO2			

NOTES: * Run NO2 std on NO3 runs
* LCSD must be run if no MS or Duplicate
* MS(10% sample): NO3, TKN, NH3, PHOS

* Diluted for matrix interference
Kills our column

DCN#122628



SMARTCHEM RUN LOG
(smartchem2, smartchem3)

WORKGROUP: WG594211

Analyte	1	2	3
Position			
3-3			
3-4			
3-5			
3-6			
3-7			
3-8			
3-9			
3-10			
3-11			
3-12			
3-13			
3-14			
3-15			

Analyte	1	2	3
Position			
3-16			
3-17			
3-18			
3-19			
3-20			
3-21			
3-22			
3-23			
3-24			
3-25			
3-26			
3-27			
3-28			

Chloride	EPA 325.2/SM 4500-Cl E-2000
<input checked="" type="checkbox"/> Nitrate-Nitrite	EPA 353.2/SM 4500-NO3 F-2000
Alkalinity	EPA 310.2
Sulfate	EPA 375.4/SM 426C (15 th)/SM4500-504 E-1997

Ammonia	EPA 350.1/SM 4500-NH3 B-1997
TKN	EPA 351.2
Phos	EPA 365.4

Analyte	NO3	Reagents
SOP & Revision	K 3532 R22	RETT 38174
Curve Stock (SC made)	Std 79074	RETT 38162
NO2 STD	Std 79305	
ICV	Std 79076	
CCV	Std 79075	
LCS	Std 79077	
MS	Std 79087 Dilution $\frac{0.1(25)}{5} = 0.5$	

Comments: _____

Analyst: David Merrill

Date: 12/9/16

DCN#122628



MICROBAC (OVD)
 SMARTCHEM200 INST2 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WNO3 -Unit [mg/L] - EPA 353.2 Nitrate-Nitrite

Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
DIL-1	RBL	0.000	0.0281	0.00		9:29:24 AM
DIL-1	RBL	0.000	0.0182	0.00		9:30:37 AM
DIL-1	RBL	0.000	0.0158	0.00		9:31:48 AM
DIL-1	RBL	0.000	0.0168	0.00		9:33:37 AM
DIL-1	Std-1	0.000	-0.0014	0.00	INV	9:35:24 AM
SR5-1	Std-2	0.040	0.0101	0.00		9:36:36 AM
SR5-2	Std-3	0.100	0.0319	0.00		9:38:24 AM
SR5-3	Std-4	0.500	0.1622	0.00		9:40:13 AM
SR5-4	Std-5	1.000	0.3120	0.00		9:41:25 AM
ST-1	Std-6	2.000	0.6263	0.00		9:42:37 AM
ST-3	1CCV (1 mg/L)	1.011	0.3170	101.12		9:43:49 AM
ST-2	2CCB (0 mg/L)	-0.012	-0.0037	0.00	INV,><,LL	9:45:36 AM
1	ICV	1.544	0.4841	0.00		9:46:48 AM
2	WG594211-01 BLK	-0.016	-0.0049	0.00	INV,><,LL	9:48:00 AM
3	WG594211-02 LCS	1.005	0.3151	0.00		9:49:12 AM
4	WG594211-03 LCSDUP	1.023	0.3206	0.00		9:50:24 AM
5	NO2	X 0.240	0.0752	0.00		9:51:36 AM
6	L16120266-08 (2)	0.437	0.1370	0.00	0.008>679	9:52:49 AM
7	L16120266-09 (50)	1.158	0.3630	0.00	0	9:54:01 AM
8	L16120352-01 (25)	0.123	0.0387	0.00	0	9:55:13 AM
9	L16120352-07 (50)	0.122	0.0383	0.00	0	9:56:25 AM
10	L16120352-15 (4)	0.227	0.0711	0.00	0	9:57:36 AM
ST-3	1CCV (1 mg/L)	0.989	0.3100	98.89		9:58:48 AM
ST-2	2CCB (0 mg/L)	-0.013	-0.0039	0.00	INV,><,LL	10:00:36 AM
11	L16120377-01	1.699	0.5326	0.00	0.00665	10:01:48 AM
12	L16120377-02 (4)	0.824	0.2584	0.00	0	10:03:01 AM
13	L16120378-01	1.017	0.3189	0.00	0	10:04:12 AM
14	L16120378-02	0.858	0.2691	0.00	0	10:06:01 AM
15	L16120349-01	0.544	0.1706	0.00	0.0047955	10:07:48 AM
16	L16120379-03	0.122	0.0382	0.00	0	10:09:00 AM
17	L16130379-05	1.694	0.5311	0.00	0.47+346.73707	10:10:48 AM
18	L16120425-01 (5)	0.147	0.0461	0.00	0.1489 dcm 12/12/16	10:12:37 AM

Report Date :12/09/2016 Run Date :12/9/2016 Operator : SMARTCHEM2 Plan # :20161209001
 Plan Description : NO3-A2-DCM/12/09/2016

MICROBAC (OVD)
 SMARTCHEM200 INST2 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WNO3 -Unit [mg/L] - EPA 353.2 Nitrate-Nitrite

Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
19	L16120425-05 (4)	0.183	0.0574	0.00	0	10:13:49 AM
20	L16120425-09 (100)	0.168	0.0527	0.00	0.0129	10:15:01 AM
ST-3	1CCV (1 mg/L)	0.998	0.3129	99.81		10:16:13 AM
ST-2	2CCB (0 mg/L)	-0.013	-0.0042	0.00	INV,><,LL	10:18:00 AM
21	L16120425-19 (20)	0.111	0.0348	0.00	0	10:19:12 AM
22	L16120268-01	1.420	0.4450	0.00		10:20:24 AM
23	L16120268-02	0.468	0.1466	0.00		10:21:36 AM
24	L16120268-03	0.248	0.0778	0.00		10:22:48 AM
25	L16120441-01	0.051	0.0161	0.00		10:24:00 AM
26	WG594211-05 DUP	0.052	0.0163	0.00		10:25:13 AM
27	WG594211-06 MS	0.745	0.2336	0.00		10:26:25 AM
28	WG594211-08 MS	1.347	0.4222	0.00		10:27:37 AM
29	WG594212-01 BLK	-0.011	-0.0035	0.00	INV,><,LL	10:28:49 AM
30	WG594212-02 LCS	1.021	0.3200	0.00		10:30:00 AM
ST-3	1CCV (1 mg/L)	0.988	0.3096	98.76		10:31:12 AM
ST-2	2CCB (0 mg/L)	-0.011	-0.0035	0.00	INV,><,LL	10:33:00 AM
31	WG594212-03 LCSDUP	1.016	0.3186	0.00		10:34:12 AM
32	L16120441-02	0.163	0.0511	0.00		10:35:25 AM
33	L16120270-01	0.354	0.1110	0.00		10:36:36 AM
34	L16120270-02	0.211	0.0662	0.00		10:38:25 AM
35	L16120438-02	0.142	0.0445	0.00		10:40:12 AM
36	L16120438-05	0.154	0.0482	0.00		10:41:24 AM
37	L16120442-01	1.342	0.4208	0.00		10:43:12 AM
38	L16120442-02	0.858	0.2689	0.00		10:45:01 AM
39	L16120442-10	0.298	0.0935	0.00		10:46:13 AM
40	L16120442-17	0.565	0.1772	0.00		10:47:25 AM
ST-3	1CCV (1 mg/L)	0.995	0.3119	99.49		10:48:37 AM
ST-2	2CCB (0 mg/L)	-0.005	-0.0016	0.00	INV,><,LL	10:50:24 AM
41	L16120456-01	0.318	0.0998	0.00		10:51:36 AM
42	WG594212-05 DUP	0.338	0.1059	0.00		10:52:48 AM
43	WG594212-06 MS	1.132	0.3550	0.00		10:54:00 AM
44	L16120456-02	0.469	0.1471	0.00		10:55:12 AM

Report Date :12/09/2016 Run Date :12/9/2016 Operator : SMARTCHEM2 Plan # :20161209001
 Plan Description : NO3-A2-DCM/12/09/2016

MICROBAC (OVD)
 SMARTCHEM200 INST2 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WNO3 -Unit [mg/L] - EPA 353.2 Nitrate-Nitrite

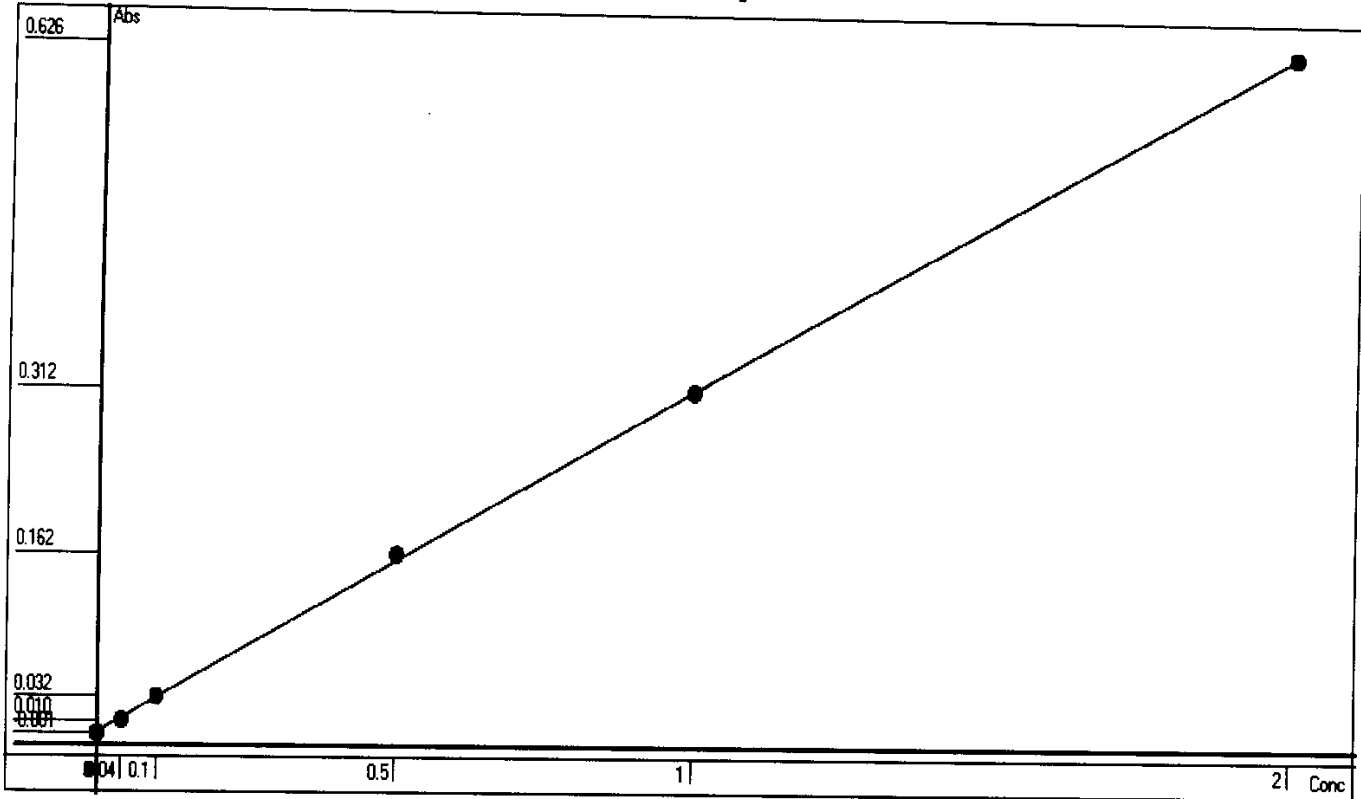
Smp#[Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
45	L16120456-03 (5)	0.138	0.0434	0.00		10:56:24 AM
46	L16120456-04 (5)	0.179	0.0560	0.00		10:57:37 AM
47	WG594212-08 MS	0.917	0.2875	0.00		10:58:48 AM
48	ID 48	0.285	0.0893	0.00		11:00:00 AM
49	ID 49	0.977	0.3064	0.00		11:01:12 AM
50	ID 50 NO ₂	1.011	0.3170	0.00		11:02:24 AM
ST-3	1CCV (1 mg/L)	0.989	0.3100	98.89		11:03:36 AM
ST-2	2CCB (0 mg/L)	-0.011	-0.0034	0.00	INV,><,LL	11:05:24 AM

Report Date :12/09/2016 Run Date :12/9/2016 Operator : SMARTCHEM2 Plan # :20161209001
 Plan Description : NO3-A2-DCM/12/09/2016

Calibrant Report - WNO3 -

Calib Lot #:010104 Exp Date:6/17/2020 User:MICROBAC

Plan #: 20161209001 Description: [NO3-A2-DCM/12/09/2016] Unit



Point	OD	Conc	Recalc Conc	% Error
1	-0.0014	0	-0.0045	-0.45
2	0.0101	0.04	0.0322	-19.50
3	0.0319	0.1	0.1018	1.80
4	0.1622	0.5	0.5174	3.48
5	0.3120	1	0.9953	-0.47
6	0.6263	2	1.9979	-0.11

Conc = +3.19 * Abs + 0 R² = 0.9999

RBL
0.0175
0

Report Date 12/9/2016 Run Date 12/9/2016

2.4 General Chemistry Data

2.4.5 Phosphorus Data

2.4.5.1 Summary Data



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis EPA 365.4 (Phosphorus)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120652
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW23-120616	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/09/2016 10:30
Workgroup #: WG594246	Analyst: DCM	Run Date: 12/09/2016 10:38
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: SC161209002.018
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0	0.701		0.200	0.100

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW02-120616	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/09/2016 10:30
Workgroup #: WG594246	Analyst: DCM	Run Date: 12/09/2016 10:39
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: SC161209002.021
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0		U	0.200	0.100
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW01-120616	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/09/2016 10:30
Workgroup #: WG594246	Analyst: DCM	Run Date: 12/09/2016 10:40
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: SC161209002.022
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0	0.127	J	0.200	0.100
J	The analyte was positively identified, but the quantitation was below the RL.				

2.4.5.2 QC Summary Data

Example Phosphorus 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: 09-DEC-2016
 Analyst: DCM
 Analyst: NA
 Method: PHOS
 Instrument: SC
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG594246

Calibration/Linearity	12-09-2016
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:
12-DEC-2016



Secondary Reviewer:
12-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 365.4
 Login Number: L16120352

AAB#: WG594246

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
MW23-120616	01	12/06/16					12/09/2016	3	28		12/09/16	3	28	
MW02-120616	07	12/06/16					12/09/2016	3	28		12/09/16	3	28	
MW01-120616	15	12/06/16					12/09/2016	2.8	28		12/09/16	2.8	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5058937
 Report generated 12/12/2016 13:25



METHOD BLANK SUMMARY

Login Number: L16120352
 Blank File ID: SC161209002.010
 Prep Date: 12/09/16 10:33
 Analyzed Date: 12/09/16 10:33
 Analyst: DCM

Work Group: WG594246
 Blank Sample ID: WG594246-01
 Instrument ID: SMARTCHEM
 Method: 365.4

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594246-02	SC161209002.011	12/09/16 10:33	01
MW23-120616	L16120352-01	SC161209002.018	12/09/16 10:38	01
MW02-120616	L16120352-07	SC161209002.021	12/09/16 10:39	01
MW01-120616	L16120352-15	SC161209002.022	12/09/16 10:40	01
DUP	WG594246-04	SC161209002.024	12/09/16 10:41	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5058938
 Report generated 12/12/2016 13:25



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/09/16 10:33 Sample ID: WG594246-01
Instrument ID: SMARTCHEM Run Date: 12/09/16 10:33 Prep Method: 365.4
File ID: SC161209002.010 Analyst: DCM Method: 365.4
Workgroup (AAB#): WG594246 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-09-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Phosphorus, Total	0.100	0.200	0.100	1	U

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

Report Name: BLANK
PDF ID: 5058939
12-DEC-2016 13:25



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594246-02
Instrument ID: SMARTCHEM Run Time: 10:33 Prep Method: 365.4
File ID: SC161209002.011 Analyst: DCM Method: 365.4
Workgroup (AAB#): WG594246 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD79329 Cal ID: SMARTC-09-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Phosphorus, Total	1.00	0.888	88.8	70 - 130	

LCS - Modified 03/06/2008
PDF File ID: 5058940
Report generated: 12/12/2016 13:25



2.4.5.3 Raw Data

SMARTCHEM RUN LOG

(smartchem2, smartchem3)

WORKGROUP: WG594246

Daily Check

- | | |
|--|---|
| <input checked="" type="checkbox"/> Lamp On
<input checked="" type="checkbox"/> Probe Rinse Full
<input checked="" type="checkbox"/> DI Water > 1/2 Full
<input checked="" type="checkbox"/> Wash Solution > 1/2 Full
<input type="checkbox"/> NO3 Reagent bottle connected / purged
<input type="checkbox"/> NO3 pH adj to pH 5-9
Syringe filter lot # _____
pH paper Lot #: _____ | <input checked="" type="checkbox"/> WBL Run
<input checked="" type="checkbox"/> Reagents Full
<input checked="" type="checkbox"/> Dilution H ₂ O Full
<input checked="" type="checkbox"/> Waste Container Check |
|--|---|

- 1) Workgroup _____
 Plan # 20161209002
- 2) Workgroup _____
 Plan # _____
- 3) Workgroup _____
 Plan # _____
- Instrument: SC1 SC2

	1	2	3
Analyte	PHOS		
Dilution			
SC Prepared Curve			
Position			
1-1	ICV		
1-2	Bik		
1-3	LC5		
1-4	12-33-05		
1-5	06		
1-6	07		
1-7	08		
1-8	12-270-01		
1-9	02		
1-10	12-352-01		
1-11	07		
1-12	15		
1-13	12-339-03	1ml/250	
1-14	DUP 12-3305		
1-15	MS 12-33-05		
1-16			
1-17			
1-18			
1-19			
1-20			
1-21			
1-22			
2-1			
2-2			
2-3			

	1	2	3
Position			
2-4			
2-5			
2-6			
2-7			
2-8			
2-9			
2-10			
2-11			
2-12			
2-13			
2-14			
2-15			
2-16			
2-17			
2-18			
2-19			
2-20			
2-21			
2-22			
2-23			
2-24			
2-25			
2-26			
3-1			
3-2			

NOTES: * Run NO2 std on NO3 runs
 * LCSD must be run if no MS or Duplicate
 *MS(10% sample): NO3, TKN, NH3, PHOS

DCN#122638



SMARTCHEM RUN LOG
(smartchem2, smartchem3)

WORKGROUP: WG594246

	1	2	3
Analyte			
Position			
3-3			
3-4			
3-5			
3-6			
3-7			
3-8			
3-9			
3-10			
3-11			
3-12			
3-13			
3-14			
3-15			

	1	2	3
Analyte			
Position			
3-16			
3-17			
3-18			
3-19			
3-20			
3-21			
3-22			
3-23			
3-24			
3-25			
3-26			
3-27			
3-28			

Chloride	EPA 325.2/SM 4500-Cl E-2000
Nitrate-Nitrite	EPA 353.2/SM 4500-NO3 F-2000
Alkalinity	EPA 310.2
Sulfate	EPA 375.4/SM 426C (15 th)/ SM4500-504 E-1997

Ammonia	EPA 350.1/SM 4500-NH3 B-1997
TKN	EPA 351.2
✓ Phos	EPA 365.4

Analyte		Reagents
SOP & Revision	<i>PHCS</i> K3654 R19	REAG 38662
Curve Stock (SC made)		REAG 37402
NO2 STD		REAG 38664
ICV	<i>see Digest</i>	
CCV	<i>low</i>	
LCS		
MS	Dilution	

Comments: _____

Analyst: David Mersble

Date: 12/9/16

DCN#122638



TKN/Phosphorus Digestion Log

TKN WG: _____	Phos WG: _____
TKN Std: <u>Std 79182</u>	Phos Std: <u>Std 79182</u>
TKN CCV: <u>1/2 (Std 79182)</u>	Phos CCV: <u>1/2 (Std 79182)</u>
TKN ICV: <u>Std 79115</u>	Phos ICV: <u>Std 79202</u>
TKN LCS: <u>Std 79020</u>	Phos LCS: <u>Std 79329</u>
MS/MSD: <u>Std 76885</u>	
Daily Dilution: <u>1/25</u>	
Block Digester Temperature: <u>380 °C</u>	Digest Reagent: <u>RGT 3832</u>

	Sample	Volume	TKN Dilution	Phos Dilution		Sample	Volume	TKN Dilution	Phos Dilution
1	Std				26	DNA 12-33-05		✓	✓
2	Std				27	MS 12-33-05		✓	✓
3	ICV				28	MS 12-33-06		✓	
4	ICV				29				
5	LCS				30				
6	LCS				31				
7	12-33-05		✓	✓	32				
8	06		✓	✓	33				
9	07		✓	✓	34				
10	08		✓	✓	35				
11	12-266-02	1/50	✓		36				
12	05	1/50	✓		37				
13	12-68-01		✓		38				
14	03		✓		39				
15	03		✓		40				
16	12-303-01		✓		41				
17	12-305-01		✓		42				
18	12-270-01		✓	✓	43				
19	02		✓	✓	44				
20	12-295-03		✓		45				
21	12-367-01		✓		46				
22	12-352-01		✓	✓	47				
23	07		✓	✓	48				
24	15		✓	✓	49				
25	12-339-05	1/250		✓	50				

Analyst: David Marshall Date: 12/8/16

MICROBAC (OVD)
 SMARTCHEM200 INST1 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WTPH -Unit [mg/L] - EPA 365.4 TOTAL PHOSPHORUS

Smp#[Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
DIL-1	RBL	0.000	0.0535	0.00	R	10:26:04 AM
DIL-1	RBL	0.000	0.0559	0.00	R	10:26:21 AM
DIL-1	RBL	0.000	0.0543	0.00	R	10:27:16 AM
SR5-1	Std-1	0.010	0.0048	0.00		10:27:33 AM
SR5-2	Std-2	0.200	0.0355	0.00		10:28:28 AM
SR5-3	Std-3	0.500	0.0796	0.00		10:28:45 AM
SR5-4	Std-4	1.000	0.1559	0.00		10:29:41 AM
SR5-5	Std-5	1.500	0.2178	0.00		10:29:57 AM
ST-1	Std-6	2.000	0.2917	0.00		10:30:53 AM
ST-3	1CCV (1 mg/L)	0.942	0.1414	94.18		10:31:10 AM
ST-2	2CCB (0 mg/L)	-0.098	-0.0074	0.00	INV,><,LL	10:32:04 AM
1	ICV	1.388	0.2052	0.00		10:32:21 AM
2	WG594246-01 BLK	-0.007	0.0056	0.00	LL	10:33:16 AM
3	WG594246-02 LCS	0.888	0.1337	0.00		10:33:33 AM
4	L16120033-05	-0.063	-0.0023	0.00	INV,><,LL	10:34:28 AM
5	L16120033-06	-0.109	-0.0089	0.00	INV,><,LL	10:34:45 AM
6	L16120033-07	0.258	0.0435	0.00		10:35:40 AM
7	L16120033-08	0.204	0.0358	0.00		10:35:58 AM
8	L16120270-01	0.009	0.0079	0.00		10:36:52 AM
9	L16120270-02	-0.067	-0.0029	0.00	INV,><,LL	10:37:10 AM
10	L16120352-01	0.701	0.1069	0.00		10:38:04 AM
ST-3	1CCV (1 mg/L)	0.933	0.1401	93.28		10:38:22 AM
ST-2	2CCB (0 mg/L)	-0.102	-0.0080	0.00	INV,><,LL	10:39:16 AM
11	L16120352-07	0.098	0.0206	0.00		10:39:34 AM
12	L16120352-15	0.128	0.0249	0.00		10:40:27 AM
13	L16120339-03 (250)	1.113	0.1659	0.00		10:40:45 AM
14	WG594246-04 DUP	-0.091	-0.0064	0.00	INV,EPL,><	10:41:39 AM
15	WG594246-05 MS	0.886	0.1334	0.00		10:41:57 AM
16	ID 16	0.689	0.1052	0.00		10:42:52 AM
17	ID 17	0.956	0.1434	0.00		10:43:09 AM
18	ID 18	0.973	0.1459	0.00		10:44:04 AM
ST-3	1CCV (1 mg/L)	0.962	0.1443	96.21		10:44:22 AM

Report Date :12/09/2016 Run Date :12/9/2016 Operator : SMARTCHEM1 Plan # :20161209002
 Plan Description : PHOS-A1-DCM/12/09/2016

MICROBAC (OVD)
SMARTCHEM200 INST1 (VER3.1.14)
NH3, TKN, NO3NO2 (MG/L N)
ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WTPH -Unit [mg/L] - EPA 365.4 TOTAL PHOSPHORUS

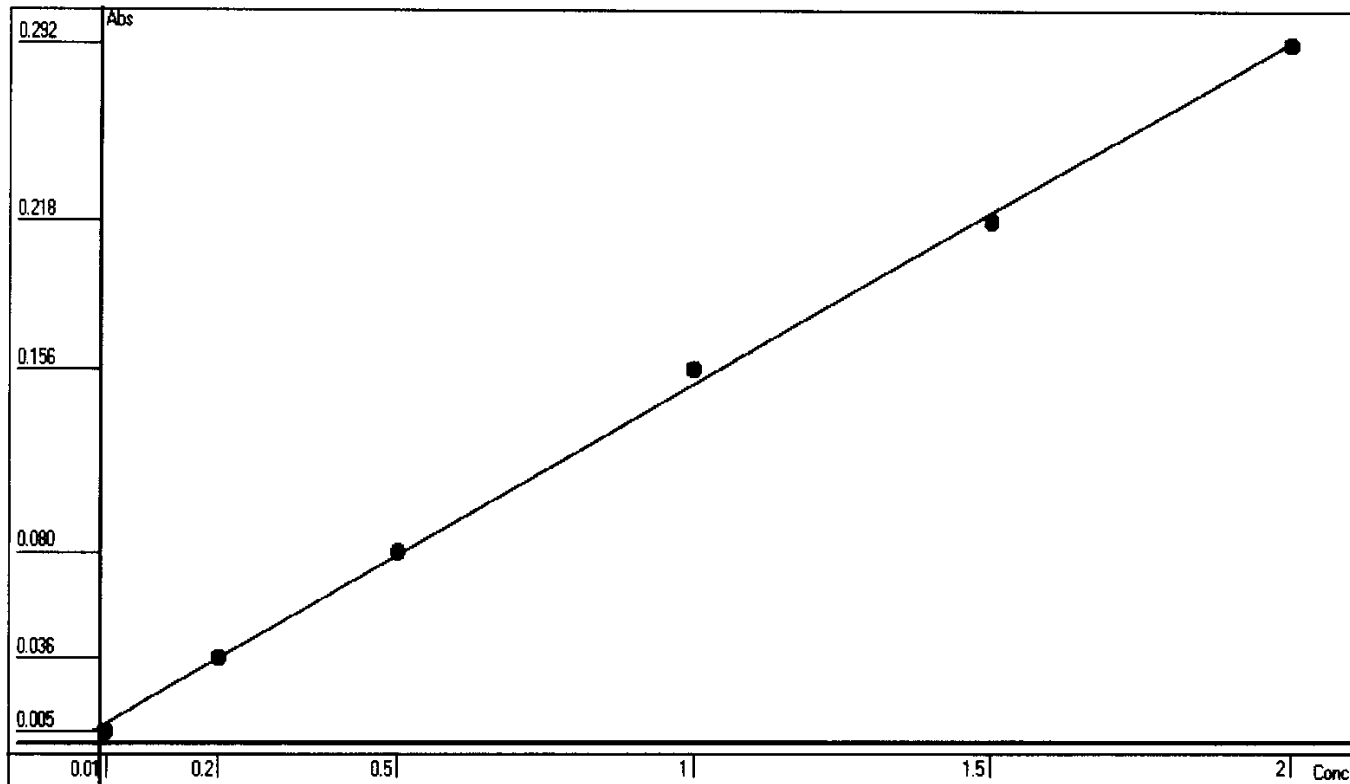
Smp#[Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
ST-2	2CCB (0 mg/L)	-0.107	-0.0087	0.00	INV,><,LL	10:45:15 AM

Report Date :12/09/2016 Run Date :12/9/2016 Operator : SMARTCHEM1 Plan # :20161209002
Plan Description : PHOS-A1-DCM/12/09/2016

Calibrant Report - WTPH -

Calib Lot #:010104 Exp Date:6/18/2020 User:MICROBAC

Plan #: 20161209002 Description: [PHOS-A1-DCM/12/09/2016] Unit



Point	OD	Conc	Recalc Conc	% Error
1	0.0048	0.01	-0.0129	-229.00
2	0.0355	0.2	0.2016	0.80
3	0.0796	0.5	0.5099	1.98
4	0.1559	1	1.0432	4.32
5	0.2178	1.5	1.4759	-1.61
6	0.2917	2	1.9925	-0.38

Conc= +6.9899*Abso -0.0465 R²=0.9990

RBL
0.0539
0

Report Date 12/9/2016 Run Date 12/9/2016

2.4 General Chemistry Data

2.4.6 Orthophosphate Data

2.4.6.1 Summary Data



Login Number: L16120352
Department: Conventionals
Analyst: Tammy Morris

METHOD

Analysis EPA 365.2/SM4500-P E (Orthophosphate)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120654
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: MW23-120616	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 09/13/2016 11:30
Workgroup #: WG593844	Analyst: TMM	Run Date: 12/07/2016 09:00
Collect Date: 12/06/2016 10:57	Dilution: 5	File ID: 00.1612070900-07
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2	0.638		0.250	0.125

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: UV-2600
Client ID: MW02-120616	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 09/13/2016 11:30
Workgroup #: WG593844	Analyst: TMM	Run Date: 12/07/2016 09:00
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: 00.1612070900-08
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2	0.0989		0.0500	0.0250

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: UV-2600
Client ID: MW01-120616	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 09/13/2016 11:30
Workgroup #: WG593844	Analyst: TMM	Run Date: 12/07/2016 09:00
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: 00.1612070900-09
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2		U	0.0500	0.0250
U	Not detected at or above adjusted sample detection limit.				

2.4.6.2 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: 07-DEC-2016
 Analyst: ADG
 Analyst: TMM
 Method: PO4
 Instrument: UV-2600
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG593844

Calibration/Linearity	9/13/16
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:
13-DEC-2016

Jammy Morris

Secondary Reviewer:
15-DEC-2016

Denna Johnson



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: SM4500-P-E-1999
 Login Number: L16120352

AAB#: WG593844

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
MW23-120616	01	12/06/16					12/07/2016	.9	2		12/07/16	.9	2	
MW02-120616	07	12/06/16					12/07/2016	.9	2		12/07/16	.9	2	
MW01-120616	15	12/06/16					12/07/2016	.8	2		12/07/16	.8	2	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5064129
 Report generated 12/14/2016 15:15



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG593844
 Blank File ID: 00.1612070900-03 Blank Sample ID: WG593844-01
 Prep Date: 12/07/16 09:00 Instrument ID: UV-2600
 Analyzed Date: 12/07/16 09:00 Method: SM4500-P-E-1999
 Analyst: TMM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG593844-02	00.1612070900-04	12/07/16 09:00	
LCS2	WG593844-03	00.1612070900-05	12/07/16 09:00	
MW23-120616	L16120352-01	00.1612070900-07	12/07/16 09:00	
MW02-120616	L16120352-07	00.1612070900-08	12/07/16 09:00	
MW01-120616	L16120352-15	00.1612070900-09	12/07/16 09:00	
DUP	WG593844-05	00.1612070900-11	12/07/16 09:00	

Report Name: BLANK_SUMMARY
 PDF File ID: 5064130
 Report generated 12/14/2016 15:15



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/07/16 09:00 Sample ID: WG593844-01
Instrument ID: UV-2600 Run Date: 12/07/16 09:00 Prep Method: SM4500-P-E-1999
File ID: 00.1612070900-03 Analyst: TMM Method: SM4500-P-E-1999
Workgroup (AAB#): WG593844 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: UV-260-07-NOV-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Orthophosphate	0.0250	0.0500	0.0250	1	U

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

Report Name: BLANK
PDF ID: 5064131
14-DEC-2016 15:15



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Analyst: TMM Prep Method: SM4500-P-E-1999
 Instrument ID: UV-2600 Matrix: Water Method: SM4500-P-E-1999
 Workgroup (AAB#): WG593844 Units: mg/L
 QC Key: WATERLOO Lot #: STD79302
 Sample ID: WG593844-02 LCS File ID: 00.1612070900-04 Run Date: 12/07/2016 09:00
 Sample ID: WG593844-03 LCS2 File ID: 00.1612070900-05 Run Date: 12/07/2016 09:00

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	0.976	97.6	1.00	0.974	97.4	0.164	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5064132
 Report generated: 12/14/2016 15:15



2.4.6.3 Raw Data

Curves

WG 583526

Parameter: P04

Spectrophotometer: UV 2600

Calibration (Curve) standard stock: STD 75790

Concentration: 1000 mg/L

Recipe for preparation of curve standards found in:

SOP: K2653 Revision: 17 Page: 9

Second Source Stock: STD 78016 (concentration: 10)

Daily Preparation: 10(1.0)/1000

concentration = $\frac{0.1 \times 1.0}{0.19 - 13 - 16}$

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
STD 1 1.0	50	1 cm	880	0.628
STD 2 0.7				0.471
STD 3 0.5			1009-13-16	0.315 0.317
STD 4 0.2				0.130
STD 5 0.1				0.064
STD 6 0.05				0.032
STD 7 0.00				0.001
2nd Source 1.0				0.624

Analyst: Christy Payne

Date/Time: 09-13-16 / 1130

DCN#120847



Microbac Laboratories Inc.
INITIAL CALIBRATION

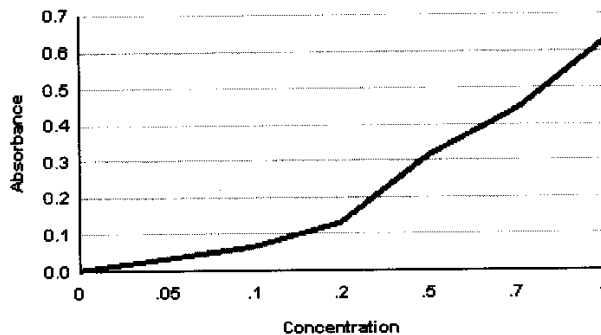
Workgroup: WG583526
Analytical Method: 300
Instrument ID: UV-2600

Analyst: DLP
Initial Calibration Date: 09/13/2016

Analyte: **ORTHOPHOSPHATE**
Number of Points: 7
Slope: 0.627171
Y-Intercept: 0.00195906
Coef. Of Correlation (R^2): 0.999961
Coef. Of Correlation (R): 0.999980

Concentration X	Absorbance Y	X ²	X * Y	Y-Fitted (mX ² +B)
0.00	0.00100	0.00	0.00	0.00195906
0.0500	0.0320	0.00250	0.00160	0.0333176
0.100	0.0640	0.0100	0.00640	0.0646762
0.200	0.130	0.0400	0.0260	0.127393
0.500	0.317	0.250	0.159	0.315545
0.700	0.441	0.490	0.309	0.440979
1.00	0.628	1.00	0.628	0.629130

Curve Fit



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 09/13/2016 12:16



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

Workgroup #: WG583526
File ID: 00.1609131130-08
CCV ID: WG583526-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 09/13/2016
Run Time: 11:30
Analyst: DLP
Cal ID: UV-260 - 13-SEP-16 11:30:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	0.992	0.624	0.8	

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

WET_WG_SSCV - Modified 03/06/2008
Report generated 09/13/2016 12:17



Orthophosphate
(orthophosphate1)

EPA 365.2 / SM4500-P E
SOP K3653 Rev _____

CCV: 79303
Daily Dilution: 5(5)/100
Daily Dilution: =0.5
Spectrophotometer: UV-2100
pH paper Lot #: _____

LCS: 79302
Daily Dilution: 10(10)/100
Daily Dilution: 12/11/100 = 0.10
Curve ID: 9-13-10

Spike: 79302
Daily Dilution: 2(N)/100
Daily Dilution: =0.4

Color Reagent Chemicals
Ref 38276
Ref 37208
Ref 38084
COX 17313

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: mg/L	50	✓		0.322
BLK: /OCB	50	✓		0.000
LCS: ppm	50	✓		0.614
LCS: ppm	50	✓		0.613
12-0273-01	50	✓	1/5	0.379
	50			
CCV	50	✓		0.330
A 12-352-C1	50	✓	1/5	0.082 *
B 07	50	✓		0.064
C 15	50	✓		0.007
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
OCB	50	✓		0.000
DUP: 0273-01	50	✓	1/5	0.375
MS: () 0273-01	50	✓	1/5	0.407
MSD: ()	50			
CCV: ()	0	✓		0.322

Analyst: Paul Green Date / Time: 12/7/16 0900

Jimmy Morris

* Sample diluted for color.

DCN#122561



**Microbac Laboratories Inc.
SAMPLE REPORT**

Workgroup: WG593844

Analyst: TMM

Analyte: ORTHOPHOSPHATE

Date: 12/07/2016

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG593844-01	50	50	0	0.6272	0.001959	-0.0031236	-0.0031236	1	mg/L
WG593844-02	50	50	0.614	0.6272	0.001959	0.97588	0.97588	1	mg/L
WG593844-03	50	50	0.613	0.6272	0.001959	0.97428	0.97428	1	mg/L
L16120273-01	50	50	0.379	0.6272	0.001959	0.60118	3.0059	5	mg/L
WG593844-04	50	50	0.379	0.6272	0.001959	0.60118	3.0059	5	mg/L
L16120352-01	50	50	0.0820	0.6272	0.001959	0.12762	0.63811	5	mg/L
L16120352-07	50	50	0.0640	0.6272	0.001959	0.098922	0.098922	1	mg/L
L16120352-15	50	50	0.00700	0.6272	0.001959	0.0080376	ND	1	mg/L
WG593844-05	50	50	0.375	0.6272	0.001959	0.59480	2.9740	5	mg/L
WG593844-06	50	50	0.407	0.6272	0.001959	0.64582	3.2291	5	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 12/13/2016 08:14



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

Workgroup #: WG594618
File ID: 00.1612070900-13
CCV ID: WG594618-04
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 12/07/2016
Run Time: 09:00
Analyst: TMM
Cal ID: UV-260 - 07-NOV-16

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.510	0.644	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 12/13/2016 08:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

Workgroup #: WG594618
 File ID: 00.1612070900-01
 CCV ID: WG594618-01
 Units: mg/L
 Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
 Run Date: 12/07/2016
 Run Time: 09:00
 Analyst: TMM
 Cal ID: UV-260 - 07-NOV-16

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.510	0.644	2.0	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 12/13/2016 08:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

Workgroup #: WG594618
File ID: 00.1612070900-14
CCV ID: WG594618-05
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 12/07/2016
Run Time: 09:00
Analyst: TMM
Cal ID: UV-260 - 07-NOV-16

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.523	0.660	4.6	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 12/14/2016 15:12



2.4 General Chemistry Data

2.4.7 Sulfide Data

2.4.7.1 Summary Data



Login Number: L16120352
Department: Conventionals
Analyst: Todd Boyle

METHOD

Analysis SW-846 9030/EPA 376.1/SM4500-S(-2) F (Sulfide)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120656
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: BURET
Client ID: MW23-120616	Prep Method: SM4500-S-(-2)-F-2000	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-S-(-2)-F-2000	Cal Date:
Workgroup #: WG594108	Analyst: TB	Run Date: 12/09/2016 10:30
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: ET.1612091030-04
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	8.86		1.00	0.500

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: BURET
Client ID: MW02-120616	Prep Method: SM4500-S-(-2)-F-2000	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-S-(-2)-F-2000	Cal Date:
Workgroup #: WG594108	Analyst: TB	Run Date: 12/09/2016 10:30
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: ET.1612091030-05
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	3.44		1.00	0.500

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: BURET
Client ID: MW01-120616	Prep Method: SM4500-S-(-2)-F-2000	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-S-(-2)-F-2000	Cal Date:
Workgroup #: WG594108	Analyst: TB	Run Date: 12/09/2016 10:30
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: ET.1612091030-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	0.571	J	1.00	0.500
J	The analyte was positively identified, but the quantitation was below the RL.				

2.4.7.2 QC Summary Data

Example Total Sulfide(Liquid) Calculations

$[\text{mL Iodine} * \text{N Iodide}] - (\text{mL titrant} * \text{N titrant}) * 16000 / (\text{volume} * \text{dilution}) = \text{mg/L Sulfide}$
where:

mL Iodine = mL of Iodine used

N Iodine = normality of Iodine

mL titrant = mL of titrant used

N titrant = normality of titrant

16000 = factor: 1mL of 0.025 N iodine reacts with 0.4mg sulfide

volume = mL filtered of mL titrated(if not filtered)

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

Example Total Sulfide(Soil) Calculations

$[(\text{mL Iodine} * \text{N Iodine}) - (\text{mL titrant} * \text{N titrant})] * 16.03 / \text{weight} = \text{mg/kg sulfide}$
where:

mL Iodine = mL of Iodine used

N Iodine = normality of Iodine

mL titrant = normality of titrant

16.03 = 32.06 grams per 2 equivalents

weight = kg of sample used

Microbac Laboratories Inc.

Data Checklist

Date: 09-DEC-2016
 Analyst: TB
 Analyst: NA
 Method: S
 Instrument: BURET
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG594108

Calibration/Linearity	12/09/16
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:
09-DEC-2016

Todd Boyle

Secondary Reviewer:
15-DEC-2016

Denna Johnson



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: SM4500-S-(-2)-F-
 Login Number: L16120352

AAB#: WG594108

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
MW23-120616	01	12/06/16					12/09/2016	3	7		12/09/16	3	7	
MW02-120616	07	12/06/16					12/09/2016	3	7		12/09/16	3	7	
MW01-120616	15	12/06/16					12/09/2016	2.8	7		12/09/16	2.8	7	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5064025
 Report generated 12/14/2016 14:55



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594108
 Blank File ID: ET.1612091030-01 Blank Sample ID: WG594108-01
 Prep Date: 12/09/16 10:30 Instrument ID: BURET
 Analyzed Date: 12/09/16 10:30 Method: SM4500-S-(-2)-F-
 Analyst: TB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594108-02	ET.1612091030-02	12/09/16 10:30	
LCS2	WG594108-03	ET.1612091030-03	12/09/16 10:30	
MW23-120616	L16120352-01	ET.1612091030-04	12/09/16 10:30	
MW02-120616	L16120352-07	ET.1612091030-05	12/09/16 10:30	
MW01-120616	L16120352-15	ET.1612091030-06	12/09/16 10:30	

Report Name: BLANK_SUMMARY
 PDF File ID: 5064026
 Report generated 12/14/2016 14:55



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/09/16 10:30 Sample ID: WG594108-01
Instrument ID: BURET Run Date: 12/09/16 10:30 Prep Method: SM4500-S-(-2)-F
File ID: ET.1612091030-01 Analyst: TB Method: SM4500-S-(-2)-F
Workgroup (AAB#): WG594108 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: BURET -

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Sulfide	0.500	1.00	0.500	1	U

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

Report Name: BLANK
PDF ID: 5064027
14-DEC-2016 14:55



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Analyst: TB Prep Method: SM4500-S-(-2)-F
 Instrument ID: BURET Matrix: Water Method: SM4500-S-(-2)-F
 Workgroup (AAB#): WG594108 Units: mg/L
 QC Key: WATERLOO Lot #: STD79358
 Sample ID: WG594108-02 LCS File ID: ET.1612091030-02 Run Date: 12/09/2016 10:30
 Sample ID: WG594108-03 LCS2 File ID: ET.1612091030-03 Run Date: 12/09/2016 10:30

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Sulfide	17.4	17.2	98.9	17.4	17.2	98.9	0.00	85 - 115	10	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5064028
 Report generated: 12/14/2016 14:55



2.4.7.3 Raw Data

SULFIDE
(sulfide I)

WORKGROUP: WG594108

Water:
EPA 376.1 / SM4500-S(-2)-F
SOP K3761 Revision #: 17

Soil:
SM846 9030B/9034
SOP K9030 Revision #: _____

Instrument: Buret

LCS: SA 79358

Iodine standardization (0.025N) COA: 19159
mL 0.025N titrant: 10.0
Volume I: 10.0 mL
Normality I: 0.025

(0.1 N I) COA: 18931
mL 0.025 N titrant: 12.0
Volume I: 9.0 mL
Normality I: 0.100

Stock standardization (in duplicate) 5.0 mL stock
mL I 1) 10.0 2) 10.0
N I 1) 0.10 2) 0.10
mL 0.025 titrant 1) 25.5 2) 25.5
LCS daily dilution: 3(116)/100 = 17.4 mg/L

pH paper lot #: 15A103

1160 = stock conc (mg/L)

Titrant: T- 15A103 1977-2-01
13 12/9/16

SAMPLE	Volume Filtered mL	mL Iodine	N Iodine	0.025 N Sodium Thiosulfate (mL)
BLANK	200	15.0	0.025	15.0
LCS (mL)	200	15.0	0.025	6.4
LCS DUP (mL)	200	15.0	0.025	6.4
12-352-01	510	15.0	0.025	3.7
07	500	15.0	0.025	10.7
15	490	15.0	0.025	14.3
425-01	360	15.0	0.025	14.6
03	470	15.0	0.025	14.2
09	460	15.0	0.025	13.0
19	510	15.0	0.025	13.8
438-02	520	15.0	0.025	14.8
05	520	15.0	0.025	14.7

Analyst: Tommy Bush Date/Time: 1030 12/9/16

DCN#122604



Microbac Laboratories Inc.
TITRAMETRIC REPORT

Workgroup (AAB#):WG594108

Analyst:TB

Product:EPA 376.1\9034

Run Date:12/09/2016 10:30

Analyte:Sulfide

SAMPLE NUMBER	Volume	Voi I	Nor I	Voi T	Nor T	Dil	Analytical	Reported	Units
WG594108-01	200.0	15	.025	15	.025	1	0	0	mg/L
WG594108-02	200.0	15	.025	6.4	.025	1	17.2	17.20	mg/L
WG594108-03	200.0	15	.025	6.4	.025	1	17.2	17.20	mg/L
L16120352-01	510.0	15	.025	3.7	.025	1	8.86	8.863	mg/L
L16120352-07	500.0	15	.025	10.7	.025	1	3.44	3.440	mg/L
L16120352-15	490.0	15	.025	14.3	.025	1	0.571	0.5714 F	mg/L
L16120425-01	360.0	15	.025	14.6	.025	1	0.444	ND	mg/L
L16120425-05	470.0	15	.025	14.2	.025	1	0.681	0.6809 F	mg/L
L16120425-09	460.0	15	.025	13	.025	1	1.74	1.739	mg/L
L16120425-19	510.0	15	.025	13.8	.025	1	0.941	0.9412 F	mg/L
L16120438-02	520.0	15	.025	14.8	.025	1	0.154	ND	mg/L
L16120438-05	520.0	15	.025	14.7	.025	1	0.231	ND	mg/L

SULFIDE_REPORT - Modified 03/06/2008

Report generated 12/09/2016 18:06



2.4 General Chemistry Data

2.4.8 Total Dissolved Solids Data

2.4.8.1 Summary Data



Login Number: L16120352
Department: Conventionals
Analyst: Andrew Essig

METHOD

Analysis EPA 160.1/SM2540 C(Total Dissolved Solids)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120657
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: OVEN
Client ID: MW23-120616	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594068	Analyst: AWE	Run Date: 12/08/2016 11:52
Collect Date: 12/06/2016 10:57	Dilution: 1	File ID: EN.1612081152-04
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		3110		20.0	10.0

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: OVEN
Client ID: MW02-120616	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594068	Analyst: AWE	Run Date: 12/08/2016 11:52
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: EN.1612081152-05
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		872		20.0	10.0

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: OVEN
Client ID: MW01-120616	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594068	Analyst: AWE	Run Date: 12/08/2016 11:52
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: EN.1612081152-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		1010		20.0	10.0

2.4.8.2 QC Summary Data

Example Total Dissolved Solids Calculations

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

where:

WT1 = weight (grams) of empty container.

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

1000000 = factor to get to mg/L.

volume = mL of sample used.

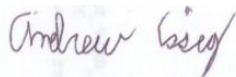
Microbac Laboratories Inc.

Data Checklist

Date: 08-DEC-2016
 Analyst: AWE
 Analyst: NA
 Method: TDS
 Instrument: OVEN
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG594068

Calibration/Linearity	12/08/16
Second Source Check	
ICV/CCV (std)	
ICB/CCB	
Blank	X
LCS/LCS Dup	X
MS/MSD	
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	AWE
Secondary Reviewer	SAV
Comments	

Primary Reviewer:
09-DEC-2016



Secondary Reviewer:
13-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: SM2540-C-1997
 Login Number: L16120352

AAB#: WG594068

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
MW23-120616	01	12/06/16					12/08/2016	2	7		12/08/16	2	7	
MW02-120616	07	12/06/16					12/08/2016	2	7		12/08/16	2	7	
MW01-120616	15	12/06/16					12/08/2016	1.9	7		12/08/16	1.9	7	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061373
 Report generated 12/13/2016 15:48



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594068
 Blank File ID: EN.1612081152-01 Blank Sample ID: WG594068-01
 Prep Date: 12/08/16 11:52 Instrument ID: OVEN
 Analyzed Date: 12/08/16 11:52 Method: SM2540-C-1997
 Analyst: AWE

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594068-02	EN.1612081152-02	12/08/16 11:52	
LCS2	WG594068-03	EN.1612081152-03	12/08/16 11:52	
MW23-120616	L16120352-01	EN.1612081152-04	12/08/16 11:52	
MW02-120616	L16120352-07	EN.1612081152-05	12/08/16 11:52	
MW01-120616	L16120352-15	EN.1612081152-06	12/08/16 11:52	
DUP	WG594068-05	EN.1612081152-24	12/08/16 11:52	
DUP	WG594068-07	EN.1612081152-25	12/08/16 11:52	

Report Name: BLANK_SUMMARY
 PDF File ID: 5061375
 Report generated 12/13/2016 15:48



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/08/16 11:52 Sample ID: WG594068-01
Instrument ID: OVEN Run Date: 12/08/16 11:52 Prep Method: 160.1/SM2540C
File ID: EN.1612081152-01 Analyst: AWE Method: SM2540-C-1997
Workgroup (AAB#): WG594068 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: OVEN-

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Total Dissolved Solids	5.00	10.0	5.00	1	U

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

Report Name: BLANK
PDF ID: 5061376
13-DEC-2016 15:48



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Analyst: AWE Prep Method: 160.1/SM2540C
 Instrument ID: OVEN Matrix: Water Method: SM2540-C-1997
 Workgroup (AAB#): WG594068 Units: mg/L
 QC Key: WATERLOO Lot #: STD79315
 Sample ID: WG594068-02 LCS File ID: EN.1612081152-02 Run Date: 12/08/2016 11:52
 Sample ID: WG594068-03 LCS2 File ID: EN.1612081152-03 Run Date: 12/08/2016 11:52

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Dissolved Solids	500	454	90.8	500	462	92.4	1.75	80 - 120	25	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5061377
 Report generated: 12/13/2016 15:48



2.4.8.3 Raw Data

TOTAL DISSOLVED SOLIDS

(tds1)

Oven: TDS MICS1
 EPA 160.1 / SM2540C
LCS: 79315
Daily Dilution: 5(5000)/50=500

Balance: AND GR-202 / Other
Matrix Spike:
Daily Dilution:
Filter Lot #: 9227603

On Temp/Time:			103 1152	180 1629	180 0703	1
SAMPLE	#	VOLUME (mL)	INITIAL WEIGHT WT1 (g)	DRY WEIGHT WT2A (g)	DRY WEIGHT WT2B (g)	DRY WEIGHT WT2C (g)
BLANK	BLK 1	100				
LCS:	mg/L LCS1	50				
LCSDUP:	mg/L LCS2	50				
120352-01	1	50				
-07	2	50				
-15	3	50				
120355-03	4	25				
120356-01	5	50				
-02	6	20				
-03	7	50				
120358-01	8	50				
120384-05	9	50				
-07	10	50				
-14	11	50				
120386-01	12	50				
-02	13	50				
-03	14	50				
120387-01	15	50				
120388-01	16	50				
120395-01	17	50				
120402-01	18	50				
120403-01	19	50				
120408-03	20	50				
DUP: 120356-01	Dup1	50				
DUP: 120408-03	Dup2	50				
Off Temp/Time:			104 11629	180 10557	180 10803	1

ANALYST: Andrew Ewing
* Duplicate required on 10% of samples

DATE/TIME: (on) 12-8-16 1152
DATE/TIME: (off) 12-9-16
DATE/TIME: (off) 12-9-16
DATE/TIME: (off)

DCN#122599



Microbac Laboratories Inc.
GRAVIMETRIC REPORT

Workgroup (AAB#): WG594068

Method: 160.1/SM2540C

Analyst: AWE

SOP: Revision

Analyte: TOTAL DISSOLVED SOLIDS

Spike Solution: STD79315

Balance: BAL018

Daily Dilution: _____

SAMPLE ID	Instrument	OVEN	INITIAL VOL	INITIAL WT	DRY WT A	DRY WT B	DRY WT C	Anal. Conc	Rep. Conc.	Units
WG594068-01	B		100	76.2803	76.28	76.2802		-1.000	-1.000	mg/L
WG594068-02	L		50	52.105	52.1276	52.1277		454.0	454.0	mg/L
WG594068-03	L2		50	58.2189	58.2416	58.242		462.0	462.0	mg/L
L16120352-01	1		50	64.834	64.9896	64.9897		3114	3114	mg/L
L16120352-07	2		50	67.7713	67.8146	67.8149		872.0	872.0	mg/L
L16120352-15	3		50	61.6212	61.6717	61.6716		1008	1008	mg/L
L16120355-03	4		25	60.6714	60.833	60.8331		6468	6468	mg/L
L16120356-01	5		50	70.1105	70.1742	70.1743		1276	1276	mg/L
WG594068-04	5		50	70.1105	70.1742	70.1743		1276	1276	mg/L
L16120356-02	6		20	64.9751	65.0951	65.095		5995	5995	mg/L
L16120356-03	7		50	62.0483	62.1346	62.1343		1720	1720	mg/L
L16120358-01	8		50	62.0818	62.1434	62.1433		1230	1230	mg/L
L16120384-05	9		50	60.8901	60.9081	60.9081		360.0	360.0	mg/L
L16120384-07	10		50	63.0752	63.1087	63.1087		670.0	670.0	mg/L
L16120384-14	11		50	58.5571	58.5628	58.5627		112.0	112.0	mg/L
L16120386-01	12		50	68.4506	68.4661	68.4662		312.0	312.0	mg/L
L16120386-02	13		50	64.5723	64.5827	64.5826		206.0	206.0	mg/L
L16120386-03	14		50	58.031	58.0482	58.0481		342.0	342.0	mg/L
L16120387-01	15		50	65.3657	65.3724	65.372		126.0	126.0	mg/L
L16120388-01	16		50	59.7908	59.7948	59.7948		80.00	80.00	mg/L
L16120395-01	17		50	63.9917	64.0108	64.0111		388.0	388.0	mg/L
L16120402-01	18		50	61.8168	61.8646	61.8651		966.0	966.0	mg/L
L16120403-01	19		50	66.8751	66.8912	66.8914		326.0	326.0	mg/L
L16120408-03	20		50	59.4047	59.4307	59.4312		530.0	530.0	mg/L
WG594068-06	20		50	59.4047	59.4307	59.4312		530.0	530.0	mg/L
WG594068-05	D		50	67.288	67.3523	67.3527		1294	1294	mg/L
WG594068-07	D2		50	57.0365	57.063	57.0635		540.0	540.0	mg/L

Analyst: Andrew Gies

Date/Time (on) : 12/08/2016 11:52
 Date/Time (off) : 12/09/2016 05:57
 Date/Time (off) : 12/09/2016 08:03
 Date/Time (off) : _____

*Duplicate required on 10% of samples

CONT_GRAV_REPORT - Modified 02/18/2011
 PDF ID: 5053440
 Report generated: 12/09/2016 09:10



Microbac Laboratories Inc.
GRAVIMETRIC REPORT

Workgroup (AAB#): WG594068

Method: 160.1/SM2540C

Analyst: AWE

SOP: Revison

Analyte: TOTAL DISSOLVED SOLIDS

Spike Solution: STD79315

Balance: BAL018

Daily Dilution: _____

SAMPLE ID	Instrument#	OVEN	INITIAL VOL	INITIAL WT	DRY WT A	DRY WT B	DRY WT C	Anal. Conc	Rep. Conc.	Units
WG594068-01	B		100	76.2803	76.28	76.2802		-1.000	-1.000	mg/L
WG594068-02	L		50	52.105	52.1276	52.1277		454.0	454.0	mg/L
WG594068-03	L2		50	58.2189	58.2416	58.242		462.0	462.0	mg/L
L16120352-01	1		50	64.834	64.9896	64.9897		3114	3114	mg/L
L16120352-07	2		50	67.7713	67.8146	67.8149		872.0	872.0	mg/L
L16120352-15	3		50	61.6212	61.6717	61.6716		1008	1008	mg/L
L16120355-03	4		25	60.6714	60.833	60.8331		6468	6468	mg/L
L16120356-01	5		50	70.1105	70.1742	70.1743		1276	1276	mg/L
WG594068-04	5		50	70.1105	70.1742	70.1743		1276	1276	mg/L
L16120356-02	6		20	64.9751	65.0951	65.095		5995	5995	mg/L
L16120356-03	7		50	62.0483	62.1346	62.1343		1720	1720	mg/L
L16120358-01	8		50	62.0818	62.1434	62.1433		1230	1230	mg/L
L16120384-05	9		50	60.8901	60.9081	60.9081		360.0	360.0	mg/L
L16120384-07	10		50	63.0752	63.1087	63.1087		670.0	670.0	mg/L
L16120384-14	11		50	58.5571	58.5628	58.5627		112.0	112.0	mg/L
L16120386-01	12		50	68.4506	68.4661	68.4662		312.0	312.0	mg/L
L16120386-02	13		50	64.5723	64.5827	64.5826		206.0	206.0	mg/L
L16120386-03	14		50	58.031	58.0482	58.0481		342.0	342.0	mg/L
L16120387-01	15		50	65.3657	65.3724	65.372		126.0	126.0	mg/L
L16120388-01	16		50	59.7908	59.7948	59.7948		80.00	80.00	mg/L
L16120395-01	17		50	63.9917	64.0108	64.0111		388.0	388.0	mg/L
L16120402-01	18		50	61.8168	61.8646	61.8651		966.0	966.0	mg/L
L16120403-01	19		50	66.8751	66.8912	66.8914		326.0	326.0	mg/L
L16120408-03	20		50	59.4047	59.4307	59.4312		530.0	530.0	mg/L
WG594068-06	20		50	59.4047	59.4307	59.4312		530.0	530.0	mg/L
WG594068-05	D		50	67.288	67.3523	67.3527		1294	1294	mg/L
WG594068-07	D2		50	57.0365	57.063	57.0635		540.0	540.0	mg/L

Analyst: Andrew Gieg

Date/Time (on) : 12/08/2016 11:52
 Date/Time (off) : 12/09/2016 05:57
 Date/Time (off) : 12/09/2016 08:03
 Date/Time (off) : _____

*Duplicate required on 10% of samples



2.4 General Chemistry Data

2.4.9 TKN Data

2.4.9.1 Summary Data



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis EPA 351.2(TKN)

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120653
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW23-120616	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/09/2016 07:55
Workgroup #: WG594210	Analyst: DCM	Run Date: 12/09/2016 08:16
Collect Date: 12/06/2016 10:57	Dilution: 2	File ID: SC161209001.030
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	3.68		0.400	0.200

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW02-120616	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/09/2016 07:55
Workgroup #: WG594210	Analyst: DCM	Run Date: 12/09/2016 08:17
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: SC161209001.031
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	1.14		0.200	0.100

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW01-120616	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/09/2016 07:55
Workgroup #: WG594210	Analyst: DCM	Run Date: 12/09/2016 08:20
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: SC161209001.034
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	0.585		0.200	0.100

2.4.9.2 QC Summary Data

Example TKN 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: 09-DEC-2016
 Analyst: DCM
 Analyst: NA
 Method: TKN
 Instrument: SC
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG594210

Calibration/Linearity	12-09-2016
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:
12-DEC-2016



Secondary Reviewer:
12-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 351.2
 Login Number: L16120352

AAB#: WG594210

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
MW23-120616	01	12/06/16					12/09/2016	2.9	28		12/09/16	2.9	28	
MW02-120616	07	12/06/16					12/09/2016	2.9	28		12/09/16	2.9	28	
MW01-120616	15	12/06/16					12/09/2016	2.7	28		12/09/16	2.7	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5058965
 Report generated 12/12/2016 13:26



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG594210
 Blank File ID: SC161209001.011 Blank Sample ID: WG594210-01
 Prep Date: 12/09/16 07:59 Instrument ID: SMARTCHEM
 Analyzed Date: 12/09/16 07:59 Method: 351.2
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594210-02	SC161209001.012	12/09/16 08:00	01
MW23-120616	L16120352-01	SC161209001.030	12/09/16 08:16	DL01
MW02-120616	L16120352-07	SC161209001.031	12/09/16 08:17	01
MW01-120616	L16120352-15	SC161209001.034	12/09/16 08:20	01
DUP	WG594210-04	SC161209001.035	12/09/16 08:20	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5058966
 Report generated 12/12/2016 13:26



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/09/16 07:59 Sample ID: WG594210-01
Instrument ID: SMARTCHEM Run Date: 12/09/16 07:59 Prep Method: 351.2
File ID: SC161209001.011 Analyst: DCM Method: 351.2
Workgroup (AAB#): WG594210 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-09-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Nitrogen, Total Kjeldahl	0.100	0.200	0.100	1	U

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

Report Name: BLANK
PDF ID: 5058967
12-DEC-2016 13:26



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Run Date: 12/09/2016 Sample ID: WG594210-02
Instrument ID: SMARTCHEM Run Time: 08:00 Prep Method: 351.2
File ID: SC161209001.012 Analyst: DCM Method: 351.2
Workgroup (AAB#): WG594210 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD79020 Cal ID: SMARTC-09-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Total Kjeldahl	1.00	0.988	98.8	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5058968
Report generated: 12/12/2016 13:27



2.4.9.3 Raw Data

SMARTCHEM RUN LOG
(smartchem2, smartchem3)

Daily Check

- | | |
|--|--|
| <input checked="" type="checkbox"/> Lamp On | <input checked="" type="checkbox"/> WBL Run |
| <input checked="" type="checkbox"/> Probe Rinse Full | <input checked="" type="checkbox"/> Reagents Full |
| <input checked="" type="checkbox"/> DI Water > 1/2 Full | <input checked="" type="checkbox"/> Dilution H ₂ O Full |
| <input checked="" type="checkbox"/> Wash Solution > 1/2 Full | <input type="checkbox"/> Waste Container Check |
| <input type="checkbox"/> NO ₃ Reagent bottle connected / purged | |
| <input type="checkbox"/> NO ₃ pH adj to pH 5-9 | |
| Syringe filter lot # _____ | |
| pH paper Lot #: _____ | |

- 1) Workgroup _____
Plan # 2016120901
- 2) Workgroup _____
Plan # _____
- 3) Workgroup _____
Plan # _____
- Instrument: SC1 SC2

Analyte	1	2	3
	TKN		
	Dilution		
SC Prepared Curve			
Position			
1-1	ICV		
1-2	BK		
1-3	LCS		
1-4	12-33-05		
1-5	06		
1-6	07		
1-7	08		
1-8	12-2106-02	1m/50	
1-9	05	1m/50	
1-10	12-2108-01		
1-11	02		
1-12	03		
1-13	12-303-01	Auto 1/5	
1-14	12-305-01	Auto 1/5	
1-15	12-270-01		
1-16	02		
1-17	12-295-03		
1-18	12-307-01		
1-19	12-352-01	1/2	
1-20	07		
1-21	15		
1-22	DUP 12-33-05		
2-1	MS 12-33-05		
2-2	MS 12-33-06		
2-3			

Position	1	2	3
2-4			
2-5			
2-6			
2-7			
2-8			
2-9			
2-10			
2-11			
2-12			
2-13			
2-14			
2-15			
2-16			
2-17			
2-18			
2-19			
2-20			
2-21			
2-22			
2-23			
2-24			
2-25			
2-26			
3-1			
3-2			

NOTES: * Run NO₂ std on NO₃ runs
* LCS must be run if no MS or Duplicate
*MS(10% sample): NO₃, TKN, NH₃, PHOS

DCN#122627



SMARTCHEM RUN LOG
(smartchem2, smartchem3)

Analyte	1	2	3
Position			
3-3			
3-4			
3-5			
3-6			
3-7			
3-8			
3-9			
3-10			
3-11			
3-12			
3-13			
3-14			
3-15			

Analyte	1	2	3
Position			
3-16			
3-17			
3-18			
3-19			
3-20			
3-21			
3-22			
3-23			
3-24			
3-25			
3-26			
3-27			
3-28			

Chloride	EPA 325.2/SM 4500-CI E-2000
Nitrate-Nitrite	EPA 353.2/SM 4500-NO3 F-2000
Alkalinity	EPA 310.2
Sulfate	EPA 375.4/SM 426C (15 th)/ SM4500-504 E-1997

Ammonia	EPA 350.1/SM 4500-NH3 B-1997
<input checked="" type="checkbox"/> TKN	EPA 351.2
Phos	EPA 365.4

Analyte	TKN	Reagents
SOP & Revision	K 3512 R20	RG 38562
Curve Stock (SC made)		RG 38624
NO2 STD		RG 38554
ICV	50% 12/9/16	
CCV	LOG	
LCS		
MS	Dilution	

Comments: _____

Analyst: David Muehle

Date: 12/9/16

DCN#122627



TKN/Phosphorus Digestion Log

TKN WG: _____ Phos WG: _____
 TKN Std: Std 79182 Phos Std: Std 79182
 TKN CCV: 1/2 (Std 79182) Phos CCV: 1/2 (Std 79182)
 TKN ICV: Std 79115 Phos ICV: Std 79202
 TKN LCS: Std 79020 Phos LCS: Std 79329

MS/MSD: Std 76885

Daily Dilution: 1/25

Block Digester Temperature: 380 °C

Digest Reagent: Reagent 58832

	Sample	Volume	TKN Dilution	Phos Dilution		Sample	Volume	TKN Dilution	Phos Dilution
1	Std				26	DUP 12-33-05		✓	✓
2	Std				27	MS 12-33-05		✓	✓
3	ICV				28	MS 12-33-06		✓	
4	ICVP				29				
5	LCS				30				
6	LCS P				31				
7	12-33-05		✓	✓	32				
8	06		✓	✓	33				
9	07		✓	✓	34				
10	08		✓	✓	35				
11	12-266-02	1/50	✓		36				
12	05	1/50	✓		37				
13	12-68-01		✓		38				
14	02		✓		39				
15	03		✓		40				
16	12-305-01		✓		41				
17	12-305-01		✓		42				
18	12-270-01		✓	✓	43				
19	02		✓	✓	44				
20	12-295-03		✓		45				
21	12-367-01		✓		46				
22	12-352-01		✓	✓	47				
23	07		✓	✓	48				
24	15		✓	✓	49				
25	12-339-05	1/250	✓	✓	50				

Analyst: David Muehle Date: 12/8/16

MICROBAC (OVD)
 SMARTCHEM200 INST1 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WTKN -Unit [mg/L] - EPA 351.2 TKN

Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
DIL-1	RBL	0.000	0.2915	0.00		7:47:54 AM
DIL-1	RBL	0.000	0.2964	0.00		7:48:12 AM
DIL-1	RBL	0.000	0.2893	0.00		7:49:42 AM
DIL-1	Std-1	0.000	0.0012	0.00		7:50:00 AM
SR5-1	Std-2	0.100	0.0245	0.00		7:51:31 AM
SR5-2	Std-3	0.250	0.0329	0.00		7:51:48 AM
SR5-3	Std-4	0.500	0.0635	0.00	EPL	7:53:20 AM
SR5-4	Std-5	1.000	0.1266	0.00		7:53:36 AM
SR5-5	Std-6	2.500	0.3052	0.00	EPL	7:55:06 AM
ST-1	Std-7	5.000	0.6000	0.00		7:55:27 AM
ST-3	1CCV (2.5 mg/L)	2.535	0.3077	101.42		7:56:54 AM
ST-2	2CCB (0 mg/L)	0.060	0.0129	0.00		7:57:12 AM
1	ICV	2.174	0.2646	0.00		7:58:42 AM
2	WG594210-01 BLK	0.031	0.0095	0.00	EPL	7:59:00 AM
3	WG594210-02 LCS	0.988	0.1234	0.00		8:00:30 AM
4	L16120033-05	0.093	0.0169	0.00		8:00:48 AM
5	L16120033-06	0.192	0.0286	0.00		8:02:18 AM
6	L16120033-07	1.136	0.1410	0.00		8:02:36 AM
7	L16120033-08	1.136	0.1411	0.00		8:04:07 AM
8	L16120266-02 (50)	1.429	0.1759	0.00		8:04:25 AM
9	L16120266-05 (50)	1.851	0.2262	0.00		8:05:55 AM
10	L16120068-01	1.428	0.1758	0.00		8:06:13 AM
ST-3	1CCV (2.5 mg/L)	2.530	0.3070	101.18		8:07:43 AM
ST-2	2CCB (0 mg/L)	0.065	0.0135	0.00		8:08:01 AM
11	L16120068-02	X 8.041	0.9633	0.00	><,LH	8:09:31 AM
12	L16120068-03	X 7.605	0.9113	0.00	><,LH	8:09:49 AM
13	L16120303-01	X 17.518	2.0917	0.00	><,LH	8:11:19 AM
14	L16120305-01	X 14.651	1.7503	0.00	><,LH	8:11:37 AM
15	L16120270-01	0.335	0.0457	0.00		8:13:07 AM
16	L16120270-02	0.078	0.0151	0.00		8:13:25 AM
17	L16120295-03	2.368	0.2877	0.00	EPL	8:14:55 AM
18	L16120367-01	0.805	0.1017	0.00		8:15:13 AM

Report Date :12/09/2016 Run Date :12/9/2016 Operator : SMARTCHEM1 Plan # :20161209001
 Plan Description : TKN-A1-DCM/12/09/2016

MICROBAC (OVD)
 SMARTCHEM200 INST1 (VER3.1.14)
 NH3, TKN, NO3NO2 (MG/L N)
 ALK (MG/L CaCO3) CL, SO4 (MG/L)

Method : WTKN -Unit [mg/L] - EPA 351.2 TKN

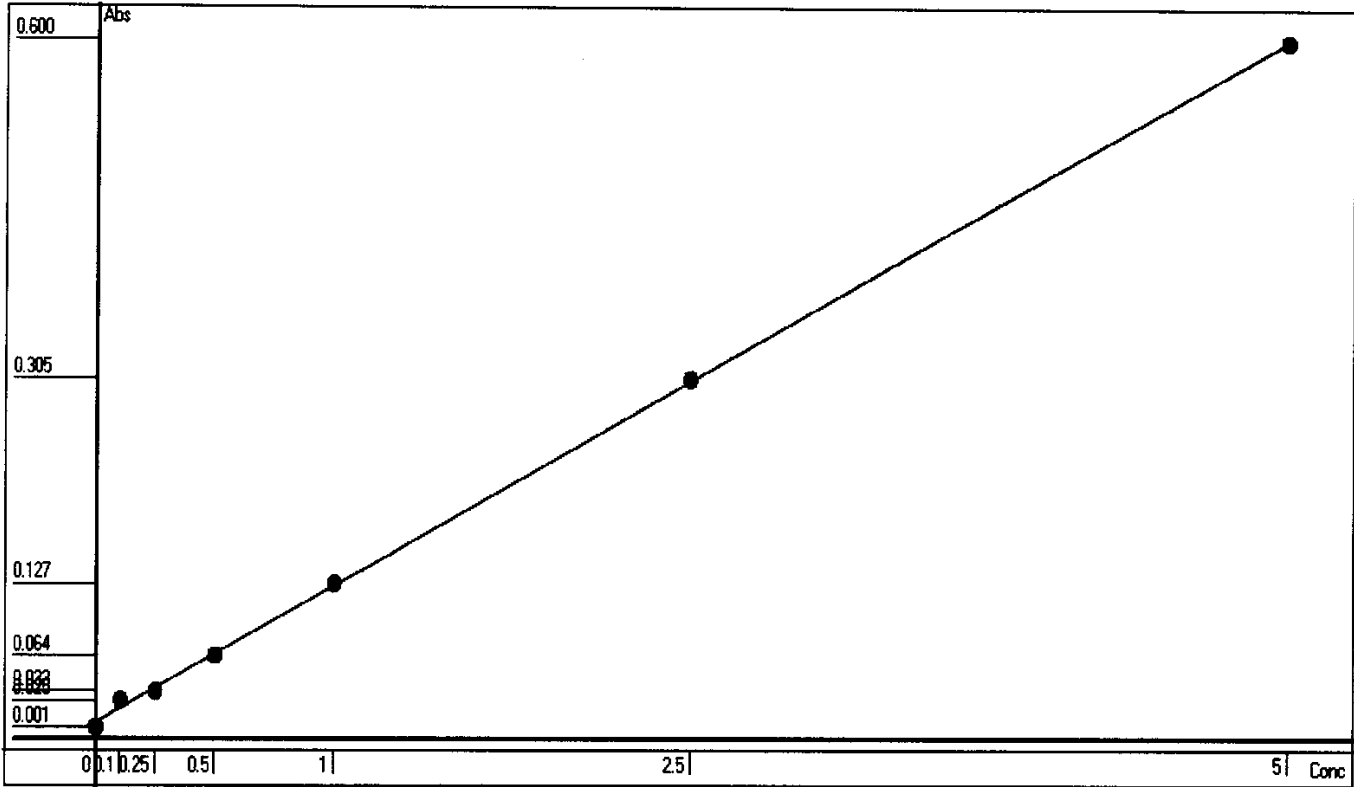
Smp#[Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
19	L16120352-01 (2)	1.841	0.2250	0.00		8:16:43 AM
20	L16120352-07	1.145	0.1421	0.00		8:17:01 AM
ST-3	1CCV (2.5 mg/L)	2.553	0.3098	102.12		8:18:31 AM
ST-2	2CCB (0 mg/L)	0.036	0.0101	0.00		8:18:49 AM
21	L16120352-15	0.585	0.0754	0.00		8:20:19 AM
22	WG594210-04 DUP	0.235	0.0338	0.00		8:20:37 AM
23	WG594210-05 MS	1.065	0.1326	0.00		8:22:07 AM
24	WG594210-07 MS	1.164	0.1444	0.00		8:22:25 AM
25	ID 25	0.867	0.1090	0.00		8:23:55 AM
26	ID 26	0.994	0.1242	0.00		8:24:13 AM
27	ID 27	0.965	0.1207	0.00		8:25:43 AM
ST-3	1CCV (2.5 mg/L)	2.661	0.3226	106.42		8:26:01 AM
ST-2	2CCB (0 mg/L)	0.003	0.0061	0.00		8:27:31 AM
11-[1/2]	L16120068-02	7.904	0.4764	0.00	LH	8:40:53 AM
12-[1/2] <i>dm</i>	L16120068-03	7.162	0.4322	0.00	LH	8:42:41 AM
13-[1/2] <i>12/12/16</i>	L16120303-01 (↔)	3.148	0.1932	0.00		8:44:29 AM
ST-3	1CCV (2.5 mg/L)	2.613	0.3169	104.51		8:44:29 AM
ST-2	2CCB (0 mg/L)	0.085	0.0159	0.00		8:45:59 AM
14-[1/2]	L16120305-01 (↔)	3.228	0.1980	0.00		8:48:05 AM
ST-3	1CCV (2.5 mg/L)	2.625	0.3184	105.01		8:48:05 AM
ST-2	2CCB (0 mg/L)	0.066	0.0137	0.00		8:49:35 AM

Report Date :12/09/2016 Run Date :12/9/2016 Operator : SMARTCHEM1 Plan # :20161209001
 Plan Description : TKN-A1-DCM/12/09/2016

Calibrant Report - WTKN -

Calib Lot #:010104 Exp Date:6/18/2020 User:MICROBAC

Plan #: 20161209001 Description: [TKN-A1-DCM/12/09/2016] Unit



Point	OD	Conc	Recalc Conc	% Error
1	0.0012	0	-0.0385	-3.85
2	0.0245	0.1	0.1572	57.20
3	0.0329	0.25	0.2277	-8.92
4	0.0635	0.5	0.4847	-3.06
5	0.1266	1	1.0146	1.46
6	0.3052	2.5	2.5145	0.58
7	0.6000	5	4.9902	-0.20

Conc= +8.398*Abso -0.0486 R²=0.9997

RBL
0.2904
0

Report Date 12/9/2016 Run Date 12/9/2016

2.4 General Chemistry Data

2.4.10 Total Organic Carbon Data

2.4.10.1 Summary Data



Login Number: L16120352
Department: Conventionals
Analyst: David Merckle

METHOD

Analysis Water: EPA 415.1/SM5310C/SW846 9060 (Total Organic Carbon)
Soil: Lloyd-Khan Methodology

HOLDING TIMES

Sample Analysis: All holding times were met.

PREPARATION

Sample preparation proceeded normally.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Duplicates: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Narrative ID: 120655
Approved By: Deanna Hesson

A handwritten signature in cursive script that reads "Deanna Hesson".

Certificate of Analysis

Sample #: L16120352-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: MW23-120616	Prep Method: SM5310-C-2011	Prep Date: N/A
Matrix: Water	Analytical Method: SM5310-C-2011	Cal Date:
Workgroup #: WG595004	Analyst: DCM	Run Date: 12/16/2016 08:55
Collect Date: 12/06/2016 10:57	Dilution: 5	File ID: TC12152016.066
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	132		5.00	2.50

Sample #: L16120352-07	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: MW02-120616	Prep Method: SM5310-C-2011	Prep Date: N/A
Matrix: Water	Analytical Method: SM5310-C-2011	Cal Date:
Workgroup #: WG595004	Analyst: DCM	Run Date: 12/15/2016 20:19
Collect Date: 12/06/2016 11:10	Dilution: 1	File ID: TC12152016.043
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	6.02		1.00	0.500

Sample #: L16120352-15	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: MW01-120616	Prep Method: SM5310-C-2011	Prep Date: N/A
Matrix: Water	Analytical Method: SM5310-C-2011	Cal Date:
Workgroup #: WG595004	Analyst: DCM	Run Date: 12/15/2016 20:32
Collect Date: 12/06/2016 14:38	Dilution: 1	File ID: TC12152016.044
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	8.21		1.00	0.500

2.4.10.2 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-DEC-2016
 Analyst: DCM
 Analyst: NA
 Method: TOC
 Instrument: TOC-VWP
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG595003 WG595004

Calibration/Linearity	10-31-2015
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:
16-DEC-2016



Secondary Reviewer:
19-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: SM5310-C-2011
 Login Number: L16120352

AAB#: WG595004

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
MW23-120616	01	12/06/16					12/16/2016	9.9	28		12/16/16	9.9	28	
MW02-120616	07	12/06/16					12/15/2016	9.4	28		12/15/16	9.4	28	
MW01-120616	15	12/06/16					12/15/2016	9.2	28		12/15/16	9.2	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5072231
 Report generated 12/19/2016 13:20



METHOD BLANK SUMMARY

Login Number: L16120352 Work Group: WG595004
 Blank File ID: TC12152016.033 Blank Sample ID: WG595004-01
 Prep Date: 12/15/16 18:19 Instrument ID: TOC-VWP
 Analyzed Date: 12/15/16 18:19 Method: SM5310-C-2011
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG595004-02	TC12152016.034	12/15/16 18:30	01
LCS2	WG595004-03	TC12152016.035	12/15/16 18:42	01
MW02-120616	L16120352-07	TC12152016.043	12/15/16 20:19	01
MW01-120616	L16120352-15	TC12152016.044	12/15/16 20:32	01
DUP	WG595004-05	TC12152016.060	12/15/16 23:55	01
MW23-120616	L16120352-01	TC12152016.066	12/16/16 08:55	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5072232
 Report generated 12/19/2016 13:20



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120352 Prep Date: 12/15/16 18:19 Sample ID: WG595004-01
Instrument ID: TOC-VWP Run Date: 12/15/16 18:19 Prep Method: SM5310-C-2011
File ID: TC12152016.033 Analyst: DCM Method: SM5310-C-2011
Workgroup (AAB#): WG595004 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: TOC-VW-19-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Total Organic Carbon	0.500	1.00	0.500	1	U

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

Report Name: BLANK
PDF ID: 5072233
19-DEC-2016 13:20



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120352 Analyst: DCM Prep Method: SM5310-C-2011
 Instrument ID: TOC-VWP Matrix: Water Method: SM5310-C-2011
 Workgroup (AAB#): WG595004 Units: mg/L
 QC Key: WATERLOO Lot #: STD77870
 Sample ID: WG595004-02 LCS File ID: TC12152016.034 Run Date: 12/15/2016 18:30
 Sample ID: WG595004-03 LCS2 File ID: TC12152016.035 Run Date: 12/15/2016 18:42

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Organic Carbon	25.0	27.3	109	25.0	26.9	107	1.59	85 - 115	15	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5072281
 Report generated: 12/19/2016 13:30



2.4.10.3 Raw Data

595004

Total Organic Carbon

MAKE DAILY

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

LCS (TOC): Std 77870
 $(5/200)(1000) = 25\text{mg/L}$

CCV (TIC): Std 78236
 $(5/200)(1000) = 25\text{mg/L}$

MS (TOC): Std 77870
 $0.4(1000) / 10 = 40$

Calibration Curve Date: 10/31/15

Reagent: Rbt 38591
Rbt 37673

SM5310-C : Matrix 2 WG 595003

EPA 415.1/9060A(mod): Matrix 1 WG 595004 SOP: K 4151 Rev. 19

Instrument: Shimadza TOC-VWP/ASI

- drain reservoir filled
- ASI water bottle full
- dilution water bottle full
- 3rd bottle full
- sufficient gas
- sufficient persulfate
- sufficient acid waste container

Position	Sample ID	Dilution	Position	Sample ID	Dilution	Position	Sample ID	Dilution
1	TIC		26	CCV		51	CCB	
2	TOC/TIC		27	CCB		52	12-425-05	
3	CCV		28	12-590-38		53	09	
4	Blk		29	39		54	19	
5	LCS		30	40		55	12-521-01	
6	LCS/DUP		31	DUP 12-590-41 40 dup		56	03	
7	12-732-02		32	MS 12-590-09 40 replicate		57	05	
8	04		33	Blk		58	07	1/100
9	12-734-01		34	LCS		59	09	1/25
10	02		35	LCS/DUP		60	DUP 12-590-42	
11	12-735-01		36	12-590-41		61	MS 12-590-42	
12	02		37	42		62	CCV	
13	03		38	CCV		63	CCB	
14	CCV		39	CCB		64	CCV	
15	CCB		40	12-715-01		65	CCB	
16	12-735-04		41	02	1/2	66	12-352-01	1/5
17	05		42	12-352-01	1/5	67	CCV	
18	06		43	07		68	CCB	
19	07		44	15		69		
20	12-750-01		45	12-692-01	1/25	70		
21	02		46	12-762-01		71		
22	12-800-01		47	02		72		
23	12-590-35		48	12-790-01		73		
24	36		49	12-425-01		74		
25	37		50	CCV		75		

Analyst: Daniel Horvath Date/Time: 12/15/16 0832

* Preserved with phosphoric acid

DCN#122744



	Analysis	Sample Name	Result	Status	Date / Time	Vial
1	TOC	TIC	TOC:3.899mg/L TC:29.01mg/L IC:25.12mg/L	Complete	12/15/2016 8:32:59 AM	1
2	TOC	TOC/TIC	TOC:28.65mg/L TC:37.31mg/L IC:8.658mg/L	Complete	12/15/2016 8:45:41 AM	2
3	TOC	CCV	TOC:26.41mg/L TC:26.45mg/L IC:0.03974mg/L	Complete	12/15/2016 8:57:50 AM	3
4	TOC	WG595003-01 BLK	!!Error!! TOC:-0.00103mg/L TC:0.1164mg/L IC:0.117	Complete	12/15/2016 9:14:23 AM	0
5	TOC	WG595003-02 LCS	TOC:24.74mg/L TC:24.78mg/L IC:0.03631mg/L	Complete	12/15/2016 9:35:07 AM	5
6	TOC	WG595003-03 LCSDUP	TOC:26.67mg/L TC:26.69mg/L IC:0.01660mg/L	Complete	12/15/2016 10:04:16 AM	6
7	TOC	L16120732-02	TOC:1.810mg/L TC:2.044mg/L IC:0.2350mg/L	Complete	12/15/2016 10:24:00 AM	7
8	TOC	L16120732-04	TOC:0.9352mg/L TC:1.124mg/L IC:0.1884mg/L	Complete	12/15/2016 10:43:35 AM	8
9	TOC	L16120734-01	TOC:5.081mg/L TC:0.4834mg/L IC:14.41mg/L	Complete	12/15/2016 11:04:55 AM	9
10	TOC	L16120734-02	TOC:7.607mg/L TC:22.59mg/L IC:14.98mg/L	Complete	12/15/2016 11:26:31 AM	10
11	TOC	L16120735-01	TOC:0.8827mg/L TC:1.421mg/L IC:0.5385mg/L	Complete	12/15/2016 11:46:12 AM	11
12	TOC	L16120735-02	TOC:0.5955mg/L TC:0.6367mg/L IC:0.04119mg/L	Complete	12/15/2016 12:05:29 PM	12
13	TOC	L16120735-03	TOC:0.4522mg/L TC:0.4834mg/L IC:0.03121mg/L	Complete	12/15/2016 12:24:46 PM	13
14	TOC	CCV	TOC:26.46mg/L TC:26.50mg/L IC:0.03570mg/L	Complete	12/15/2016 12:36:58 PM	14
15	TOC	CCB	TOC:0.03220mg/L TC:0.08391mg/L IC:0.05171mg/L	Complete	12/15/2016 12:45:47 PM	0
16	TOC	L16120735-04	TOC:0.4271mg/L TC:0.4656mg/L IC:0.03845mg/L	Complete	12/15/2016 1:05:03 PM	16
17	TOC	L16120735-05	TOC:0.4515mg/L TC:0.4817mg/L IC:0.03020mg/L	Complete	12/15/2016 1:24:13 PM	17
18	TOC	L16120735-06	TOC:0.4970mg/L TC:0.5364mg/L IC:0.03944mg/L	Complete	12/15/2016 1:43:32 PM	18
19	TOC	L16120735-07	TOC:0.4800mg/L TC:0.5254mg/L IC:0.04535mg/L	Complete	12/15/2016 2:02:52 PM	19
20	TOC	L16120750-01	TOC:8.718mg/L TC:40.93mg/L IC:32.21mg/L	Complete	12/15/2016 2:26:31 PM	20
21	TOC	L16120750-02	TOC:4.063mg/L TC:8.298mg/L IC:4.233mg/L	Complete	12/15/2016 2:47:30 PM	21
22	TOC	L16120800-01	TOC:0.4465mg/L TC:0.4979mg/L IC:0.05147mg/L	Complete	12/15/2016 3:06:49 PM	22
23	TOC	L16120590-35	TOC:2.700mg/L TC:9.049mg/L IC:6.349mg/L	Complete	12/15/2016 3:27:49 PM	23
24	TOC	L16120590-36	TOC:2.715mg/L TC:8.369mg/L IC:5.654mg/L	Complete	12/15/2016 3:48:44 PM	24
25	TOC	L16120590-37	TOC:2.862mg/L TC:7.226mg/L IC:4.364mg/L	Complete	12/15/2016 4:09:37 PM	25
26	TOC	CCV	TOC:26.92mg/L TC:27.01mg/L IC:0.08863mg/L	Complete	12/15/2016 4:22:13 PM	26
27	TOC	CCB	TOC:0.02460mg/L TC:0.08098mg/L IC:0.05637mg/L	Complete	12/15/2016 4:31:05 PM	0
28	TOC	L16120590-38	TOC:2.617mg/L TC:5.782mg/L IC:3.165mg/L	Complete	12/15/2016 4:51:31 PM	28
29	TOC	L16120590-39	TOC:2.788mg/L TC:6.977mg/L IC:4.189mg/L	Complete	12/15/2016 5:12:12 PM	29
30	TOC	L16120590-40	TOC:2.903mg/L TC:6.727mg/L IC:3.824mg/L	Complete	12/15/2016 5:32:49 PM	30
31	TOC	WG595003-05 DUP	TOC:2.864mg/L TC:6.963mg/L IC:4.100mg/L	Complete	12/15/2016 5:53:32 PM	31
32	TOC	WG595003-06 MS	TOC:14.73mg/L TC:16.18mg/L IC:1.453mg/L	Complete	12/15/2016 6:14:05 PM	32
33	TOC	WG595004-01 BLK	TOC:0.02137mg/L TC:0.08229mg/L IC:0.06092mg/L	Complete	12/15/2016 6:22:59 PM	0
34	TOC	WG595004-02 LCS	TOC:27.29mg/L TC:27.37mg/L IC:0.08163mg/L	Complete	12/15/2016 6:35:09 PM	34
35	TOC	WG595004-03 LCSDUP	TOC:26.86mg/L TC:26.93mg/L IC:0.07759mg/L	Complete	12/15/2016 6:47:18 PM	35
36	TOC	L16120590-41	TOC:2.746mg/L TC:5.697mg/L IC:3.951mg/L	Complete	12/15/2016 6:59:23 PM	36
37	TOC	L16120590-42	TOC:2.565mg/L TC:5.876mg/L IC:3.311mg/L	Complete	12/15/2016 7:11:21 PM	37
38	TOC	CCV	TOC:27.13mg/L TC:27.22mg/L IC:0.08964mg/L	Complete	12/15/2016 7:23:31 PM	38
39	TOC	CCB	TOC:0.02425mg/L TC:0.09071mg/L IC:0.06646mg/L	Complete	12/15/2016 7:32:23 PM	0
40	TOC	L16120715-01	TOC:4.822mg/L TC:7.670mg/L IC:12.81mg/L	Complete	12/15/2016 7:48:16 PM	40
41	TOC	L16120715-02 (2)	TOC:5.132mg/L TC:15.88mg/L IC:10.75mg/L	Complete	12/15/2016 7:59:33 PM	41
42	TOC		TOC:3.544mg/L TC:6.415mg/L IC:2.871mg/L	Complete	12/15/2016 8:11:31 PM	42
43	TOC	L16120352-07	TOC:6.016mg/L TC:8.464mg/L IC:2.448mg/L	Complete	12/15/2016 8:23:46 PM	43
44	TOC	L16120352-15	TOC:8.205mg/L TC:10.54mg/L IC:2.331mg/L	Complete	12/15/2016 8:37:16 PM	44
45	TOC	L16120692-01 (25)	TOC:10.72mg/L TC:10.92mg/L IC:0.1997mg/L	Complete	12/15/2016 8:52:03 PM	45
46	TOC	L16120762-01	TOC:2.287mg/L TC:6.939mg/L IC:4.652mg/L	Complete	12/15/2016 9:04:05 PM	46
47	TOC	L16120762-02	TOC:2.118mg/L TC:4.836mg/L IC:2.718mg/L	Complete	12/15/2016 9:16:03 PM	47
48	TOC	L16120790-01	TOC:3.583mg/L TC:16.41mg/L IC:12.82mg/L	Complete	12/15/2016 9:28:29 PM	48
49	TOC	L16120425-01	TOC:2.927mg/L TC:5.108mg/L IC:2.181mg/L	Complete	12/15/2016 9:40:21 PM	49
50	TOC	CCV	TOC:27.13mg/L TC:27.22mg/L IC:0.08602mg/L	Complete	12/15/2016 9:52:36 PM	50
51	TOC	CCB	TOC:0.02210mg/L TC:0.09846mg/L IC:0.07636mg/L	Complete	12/15/2016 10:01:31 PM	0
52	TOC	L16120425-05	TOC:3.420mg/L TC:7.670mg/L IC:4.251mg/L	Complete	12/15/2016 10:15:13 PM	52
53	TOC	L16120425-09	TOC:7.406mg/L TC:18.53mg/L IC:11.12mg/L	Complete	12/15/2016 10:28:07 PM	53
54	TOC	L16120425-19	TOC:7.591mg/L TC:13.52mg/L IC:5.926mg/L	Complete	12/15/2016 10:43:07 PM	54
55	TOC	L16120521-01	TOC:2.967mg/L TC:8.256mg/L IC:5.289mg/L	Complete	12/15/2016 10:55:49 PM	55
56	TOC	L16120521-03	TOC:2.023mg/L TC:3.945mg/L IC:1.922mg/L	Complete	12/15/2016 11:09:48 PM	56
57	TOC	L16120521-05	TOC:1.529mg/L TC:1.651mg/L IC:0.1222mg/L	Complete	12/15/2016 11:22:42 PM	57
58	TOC	L16120521-07 (100)	TOC:7.291mg/L TC:28.30mg/L IC:21.00mg/L	Complete	12/15/2016 11:35:26 PM	58
59	TOC	L16120521-09 (25)	TOC:10.21mg/L TC:11.56mg/L IC:1.348mg/L	Complete	12/15/2016 11:47:51 PM	59
60	TOC	WG595004-05 DUP	TOC:2.161mg/L TC:3.439mg/L IC:1.278mg/L	Complete	12/15/2016 11:59:44 PM	60
61	TOC	WG595004-06 MS	TOC:12.25mg/L TC:12.85mg/L IC:0.6062mg/L	Complete	12/16/2016 12:11:42 AM	61
62	TOC	CCV	TOC:27.70mg/L TC:27.78mg/L IC:0.08249mg/L	Complete	12/16/2016 12:23:58 AM	62
63	TOC	CCB	TOC:0.02470mg/L TC:0.1076mg/L IC:0.08285mg/L	Complete	12/16/2016 12:32:51 AM	0
64	TOC	CCV	TOC:26.47mg/L TC:26.58mg/L IC:0.1015mg/L	Complete	12/16/2016 8:39:07 AM	64
65	TOC	CCB	TOC:0.02130mg/L TC:0.1051mg/L IC:0.08384mg/L	Complete	12/16/2016 8:48:03 AM	0
66	TOC	L16120352-01 (5)	TOC:26.31mg/L TC:26.42mg/L IC:0.1125mg/L	Complete	12/16/2016 9:00:22 AM	66
67	TOC	CCV	TOC:26.65mg/L TC:26.70mg/L IC:0.05530mg/L	Complete	12/16/2016 9:15:52 AM	67

F35
dem
12/15/16

	Analysis	Sample Name	Result	Status	Date / Time	Vial
68	TOC	CCB	TOC:0.01528mg/L TC:0.09959mg/L IC:0.08432mg/L	Complete	12/16/2016 9:24:48 AM	0

Instr. Information

System: TOCVW ASI
 Detector: Wet Chemical

Sample

Sample Name: TIC
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

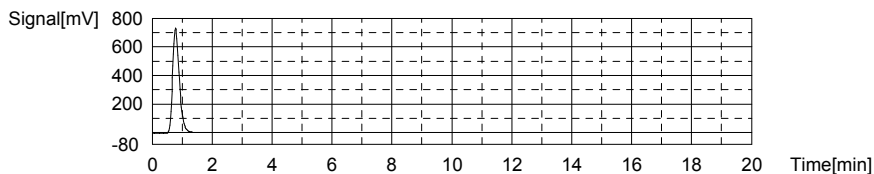
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.899mg/L TC:29.01mg/L IC:25.12mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1135	29.01mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 8:27:29 AM

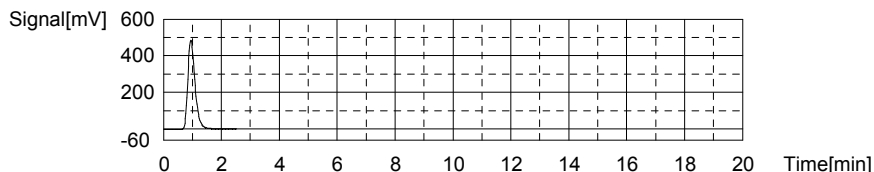
Mean Area: 1135
 Mean Conc.: 29.01mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	845.4	25.12mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 8:32:59 AM

Mean Area: 845.4
 Mean Conc.: 25.12mg/L



Sample

Sample Name: TOC/TIC
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

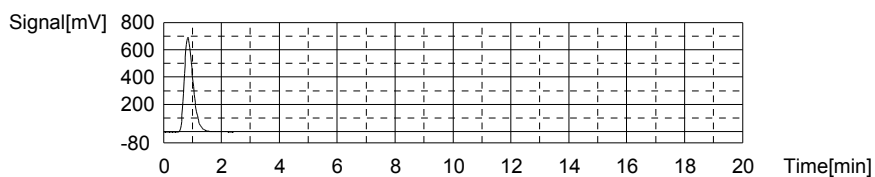
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:28.65mg/L TC:37.31mg/L IC:8.658mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1458	37.31mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 8:40:51 AM

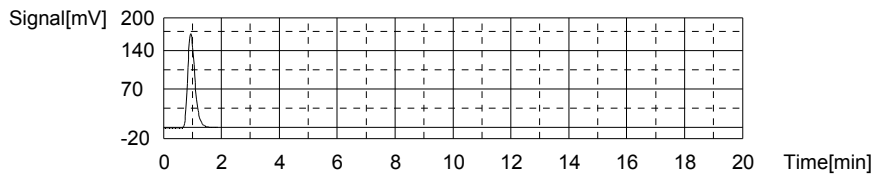
Mean Area 1458
Mean Conc. 37.31mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	295.3	8.658mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 8:45:41 AM

Mean Area 295.3
Mean Conc. 8.658mg/L



Sample

Sample Name: CCV
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

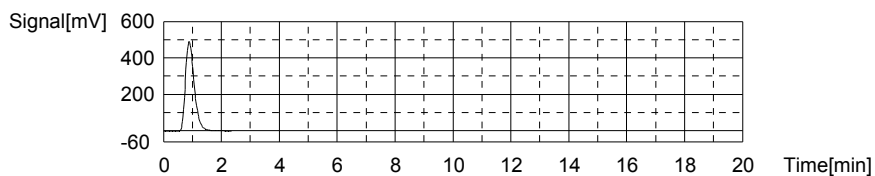
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.41mg/L TC:26.45mg/L IC:0.03974mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1035	26.45mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 8:53:27 AM

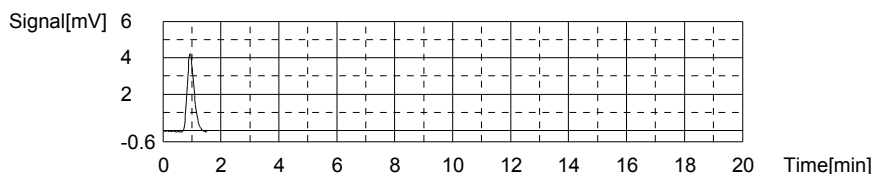
Mean Area 1035
Mean Conc. 26.45mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.255	0.03974mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 8:57:50 AM

Mean Area 7.255
 Mean Conc. 0.03974mg/L



Sample

Sample Name: WG595003-01 BLK
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result

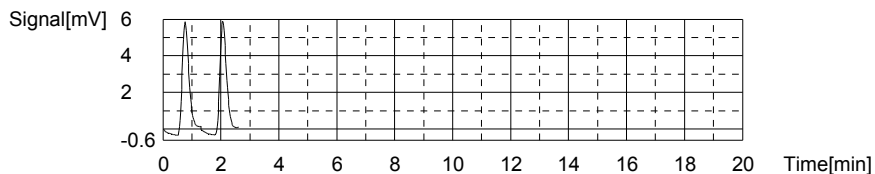
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-0.00103mg/L TC:0.1164mg/L IC:0.1175mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.518	0.1172mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 9:02:46 AM
2	9.457	0.1157mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 9:06:17 AM

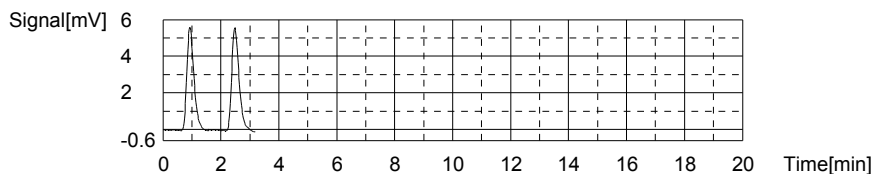
Mean Area 9.488
 Mean Conc. 0.1164mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.697	0.1128mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55_01	12/15/2016 9:10:18 AM
2	10.01	0.1222mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55_01	12/15/2016 9:14:23 AM

Mean Area 9.854
 Mean Conc. 0.1175mg/L



Sample

Sample Name: WG595003-02 LCS
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result

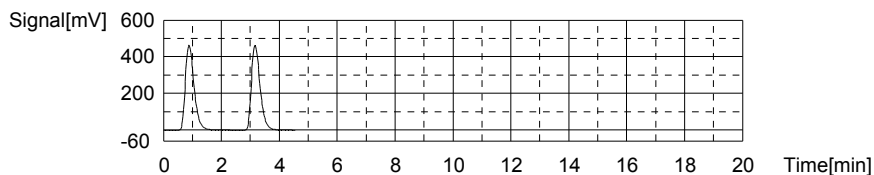
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:24.74mg/L TC:24.78mg/L IC:0.03631mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	971.8	24.82mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 9:22:06 AM
2	968.0	24.73mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 9:26:37 AM

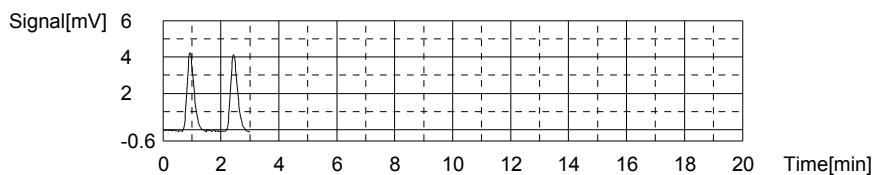
Mean Area 969.9
Mean Conc. 24.78mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.218	0.03863mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_01	12/15/2016 9:30:59 AM
2	7.063	0.03399mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_01	12/15/2016 9:35:07 AM

Mean Area 7.141
Mean Conc. 0.03631mg/L



Sample

Sample Name: WG595003-03 LCS DUP
Sample ID: <Untitled>
Origin: TOC-10-31-2015A.met
Status: Completed
Chk. Result:

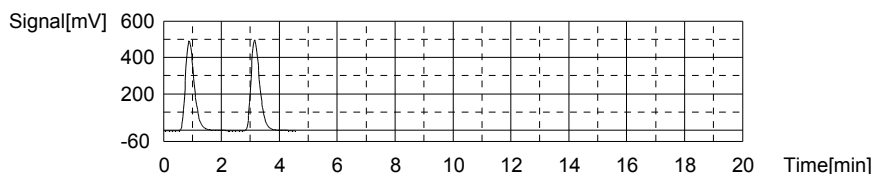
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.67mg/L TC:26.69mg/L IC:0.01660mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1042	26.63mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 9:51:16 AM
2	1047	26.75mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 9:55:50 AM

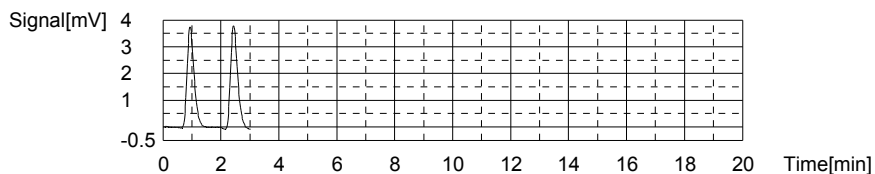
Mean Area 1045
Mean Conc. 26.69mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.364	0.01308mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 10:00:08 AM
2	6.599	0.02011mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 10:04:16 AM

Mean Area 6.482
 Mean Conc. 0.01660mg/L



Sample

Sample Name: L16120732-02
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result

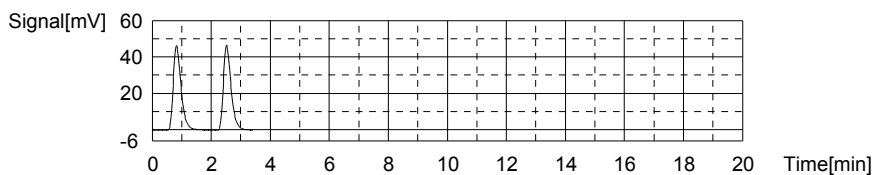
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.810mg/L TC:2.044mg/L IC:0.2350mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	84.37	2.039mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 10:11:25 AM
2	84.79	2.050mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 10:15:23 AM

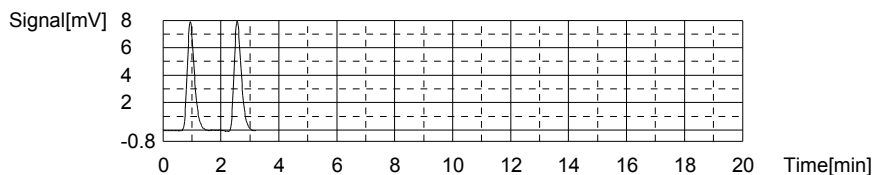
Mean Area 84.58
 Mean Conc. 2.044mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	13.74	0.2338mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 10:19:50 AM
2	13.82	0.2362mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 10:24:00 AM

Mean Area 13.78
 Mean Conc. 0.2350mg/L



Sample

Sample Name: L16120732-04
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result:

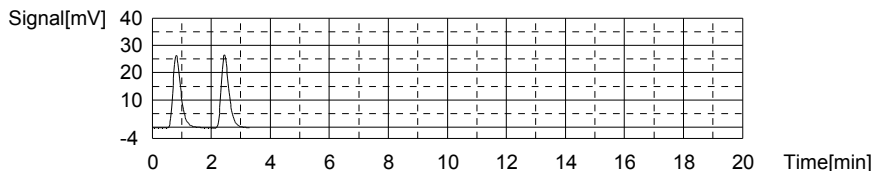
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.9352mg/L TC:1.124mg/L IC:0.1884mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	48.48	1.118mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 10:31:05 AM
2	48.95	1.130mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 10:35:00 AM

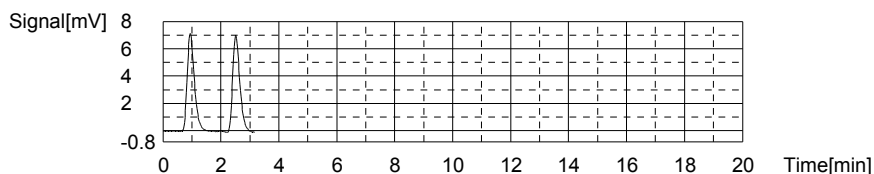
Mean Area 48.72
 Mean Conc. 1.124mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.32	0.1913mg/L	500uL	1		TICURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 10:39:23 AM
2	12.13	0.1856mg/L	500uL	1		TICURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 10:43:35 AM

Mean Area 12.23
 Mean Conc. 0.1884mg/L



Sample

Sample Name: L16120734-01
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result:

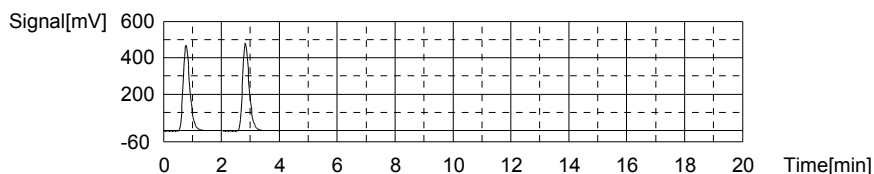
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.081mg/L TC:19.49mg/L IC:14.41mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	756.3	19.29mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 10:51:03 AM
2	771.8	19.69mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 10:55:14 AM

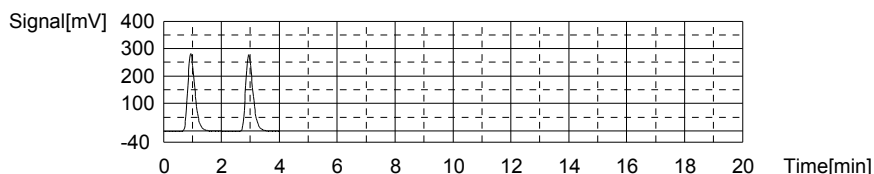
Mean Area 764.1
 Mean Conc. 19.49mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	488.9	14.45mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 11:00:09 AM
2	486.2	14.37mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 11:04:55 AM

Mean Area 487.6
 Mean Conc. 14.41mg/L



Sample

Sample Name: L16120734-02
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result

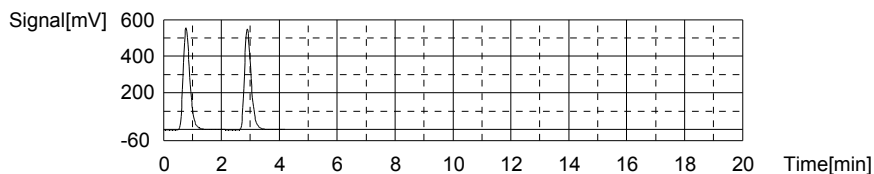
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.607mg/L TC:22.59mg/L IC:14.98mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	888.8	22.69mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 11:12:28 AM
2	880.6	22.48mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 11:16:48 AM

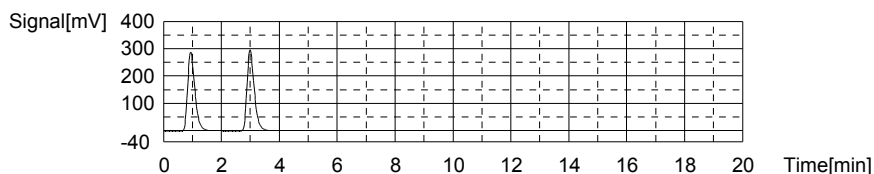
Mean Area 884.7
 Mean Conc. 22.59mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	501.3	14.82mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 11:21:50 AM
2	512.0	15.14mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 11:26:31 AM

Mean Area 506.6
 Mean Conc. 14.98mg/L



Sample

Sample Name: L16120735-01
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result

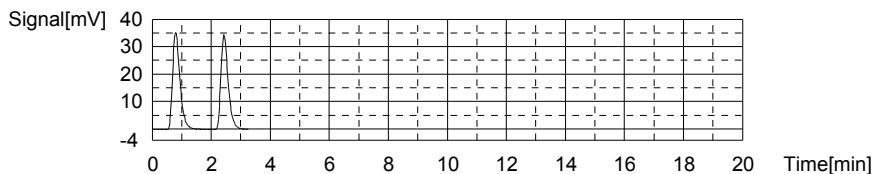
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.8827mg/L TC:1.421mg/L IC:0.5385mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	61.05	1.440mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 11:33:35 AM
2	59.56	1.402mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 11:37:28 AM

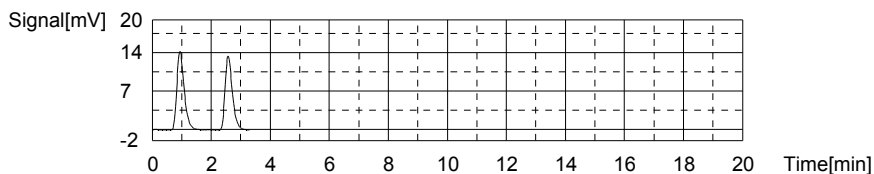
Mean Area 60.31
 Mean Conc. 1.421mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	24.62	0.5593mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 11:41:56 AM
2	23.23	0.5177mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 11:46:12 AM

Mean Area 23.93
 Mean Conc. 0.5385mg/L



Sample

Sample Name: L16120735-02
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result

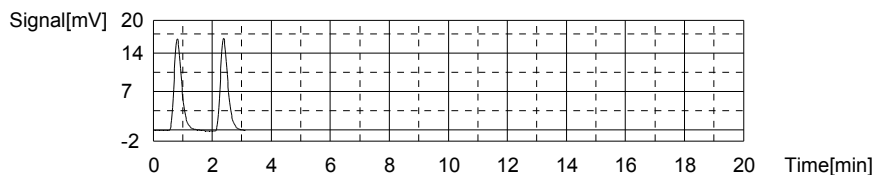
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.5955mg/L TC:0.6367mg/L IC:0.04119mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	29.59	0.6326mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 11:53:11 AM
2	29.91	0.6408mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 11:57:00 AM

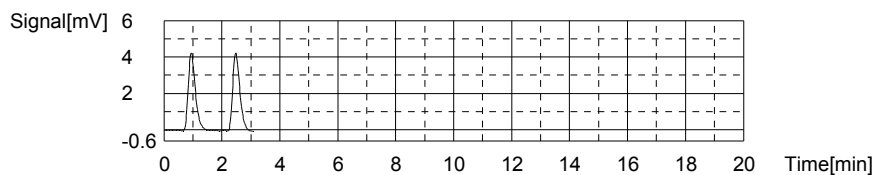
Mean Area 29.75
Mean Conc. 0.6367mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.282	0.04055mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 12:01:20 PM
2	7.325	0.04183mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 12:05:29 PM

Mean Area 7.303
Mean Conc. 0.04119mg/L



Sample

Sample Name: L16120735-03
Sample ID: <Untitled>
Origin: TOC-10-31-2015A.met
Status: Completed
Chk. Result

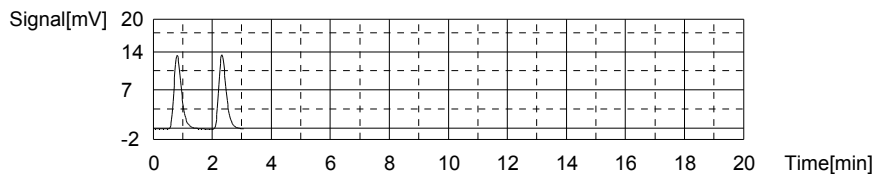
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4522mg/L TC:0.4834mg/L IC:0.03121mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	23.65	0.4801mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 12:12:26 PM
2	23.91	0.4868mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 12:16:15 PM

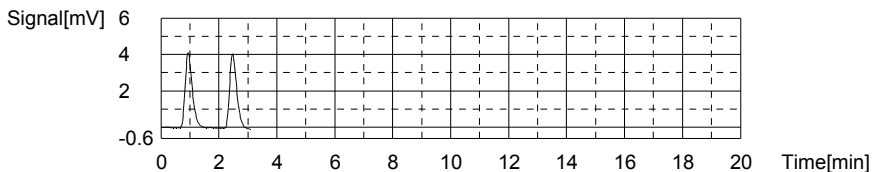
Mean Area 23.78
Mean Conc. 0.4834mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.018	0.03265mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 12:20:36 PM
2	6.922	0.02978mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 12:24:46 PM

Mean Area 6.970
 Mean Conc. 0.03121mg/L



Sample

Sample Name: CCV
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

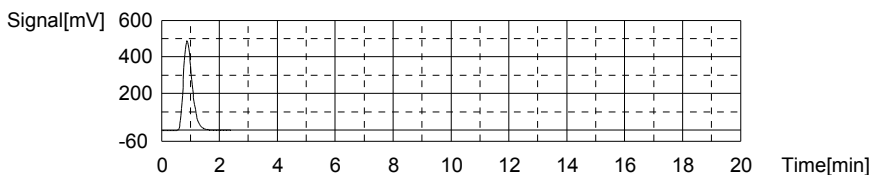
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.46mg/L TC:26.50mg/L IC:0.03570mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1037	26.50mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 12:32:36 PM

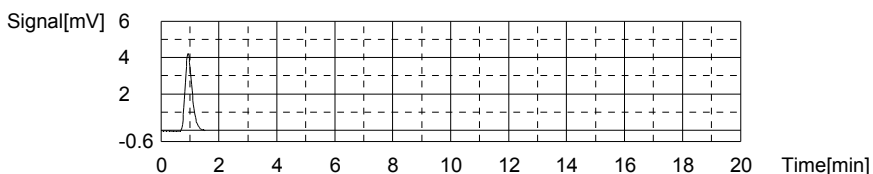
Mean Area 1037
 Mean Conc. 26.50mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.120	0.03570mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 12:36:58 PM

Mean Area 7.120
 Mean Conc. 0.03570mg/L



Sample

Sample Name: CCB
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

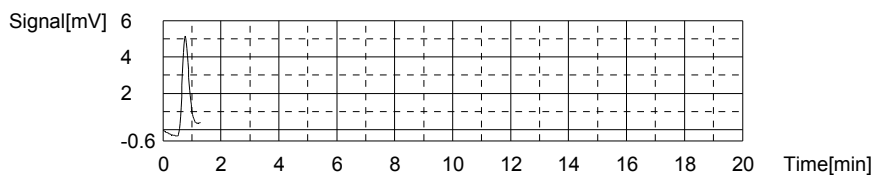
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.03220mg/L TC:0.08391mg/L IC:0.05171mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.220	0.08391mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 12:41:54 PM

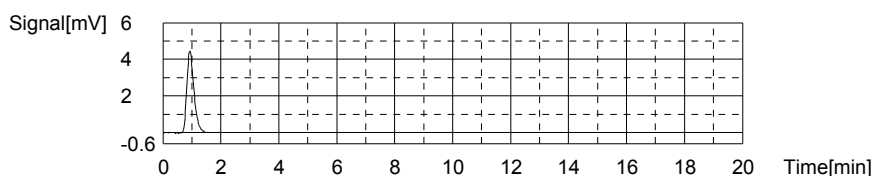
Mean Area 8.220
Mean Conc. 0.08391mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.655	0.05171mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 12:45:47 PM

Mean Area 7.655
Mean Conc. 0.05171mg/L



Sample

Sample Name: L16120735-04
Sample ID: <Untitled>
Origin: TOC-10-31-2015A.met
Status: Completed
Chk. Result

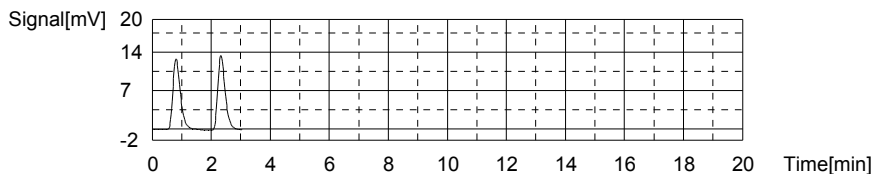
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4271mg/L TC:0.4656mg/L IC:0.03845mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	22.48	0.4500mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 12:52:47 PM
2	23.69	0.4811mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 12:56:35 PM

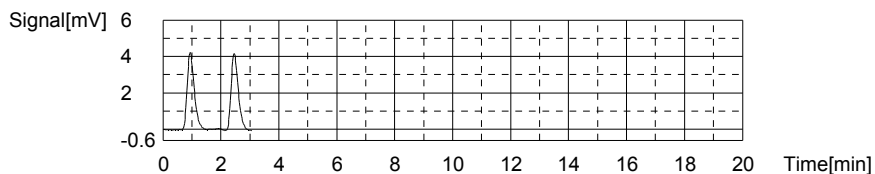
Mean Area 23.09
Mean Conc. 0.4656mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.194	0.03791mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 1:00:56 PM
2	7.230	0.03899mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 1:05:03 PM

Mean Area 7.212
 Mean Conc. 0.03845mg/L



Sample

Sample Name: L16120735-05
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result:

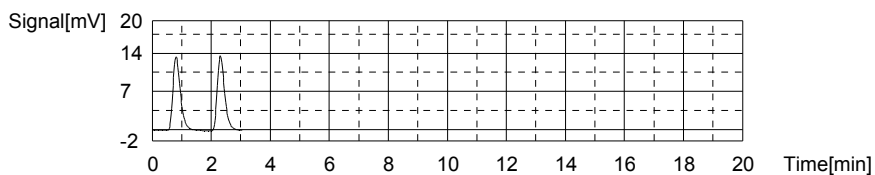
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4515mg/L TC:0.4817mg/L IC:0.03020mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	23.56	0.4778mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 1:11:59 PM
2	23.87	0.4857mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 1:15:48 PM

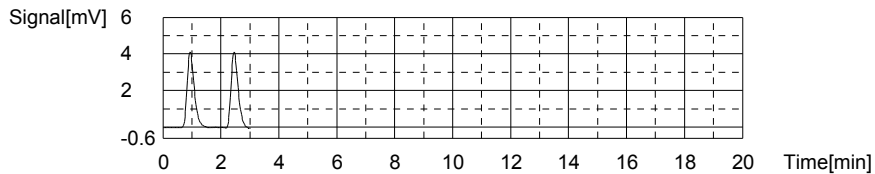
Mean Area 23.72
 Mean Conc. 0.4817mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	6.973	0.03130mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 1:20:09 PM
2	6.899	0.02909mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 1:24:13 PM

Mean Area 6.936
 Mean Conc. 0.03020mg/L



Sample

Sample Name: L16120735-06
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result:

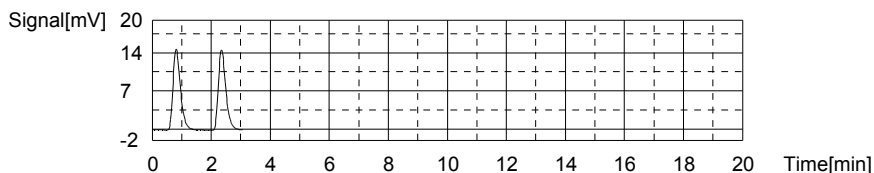
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4970mg/L TC:0.5364mg/L IC:0.03944mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	25.86	0.5368mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 1:31:11 PM
2	25.83	0.5360mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 1:34:58 PM

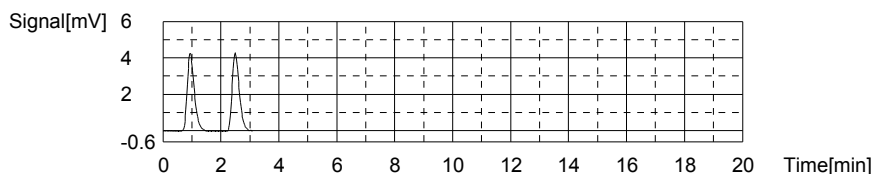
Mean Area 25.85
 Mean Conc. 0.5364mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.247	0.03950mg/L	500uL	1		TICURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 1:39:22 PM
2	7.243	0.03938mg/L	500uL	1		TICURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 1:43:32 PM

Mean Area 7.245
 Mean Conc. 0.03944mg/L



Sample

Sample Name: L16120753-07
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result:

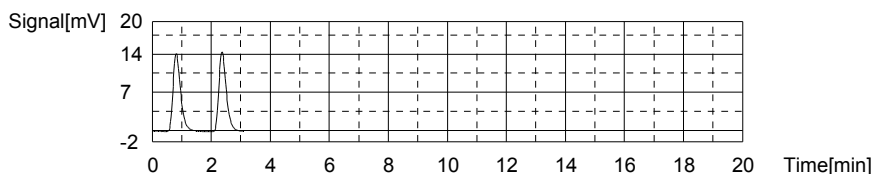
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4800mg/L TC:0.5254mg/L IC:0.04535mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	25.21	0.5201mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 1:50:32 PM
2	25.62	0.5307mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 1:54:20 PM

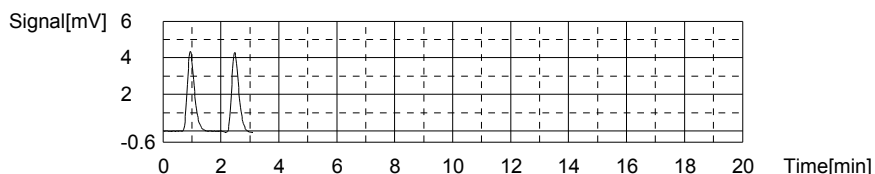
Mean Area 25.41
 Mean Conc. 0.5254mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.432	0.04503mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 1:58:42 PM
2	7.453	0.04566mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 2:02:52 PM

Mean Area 7.443
 Mean Conc. 0.04535mg/L



Sample

Sample Name: L16120750-01
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result

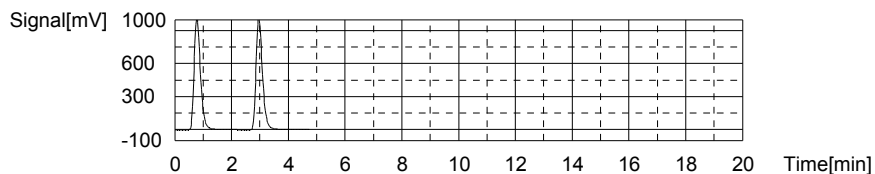
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:8.718mg/L TC:40.93mg/L IC:32.21mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1593	40.77mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 2:10:29 PM
2	1605	41.08mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 2:16:13 PM

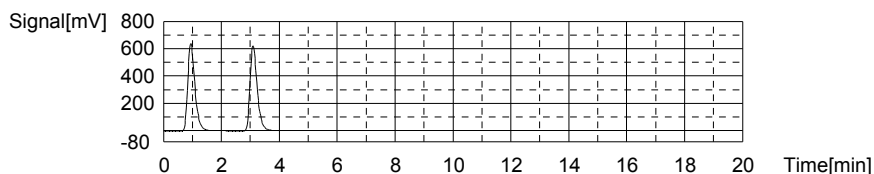
Mean Area 1599
 Mean Conc. 40.93mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1093	32.52mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 2:21:25 PM
2	1072	31.90mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 2:26:31 PM

Mean Area 1083
Mean Conc. 32.21mg/L



Sample

Sample Name: L16120750-02
Sample ID: <Untitled>
Origin: TOC-10-31-2015A.met
Status: Completed
Chk. Result

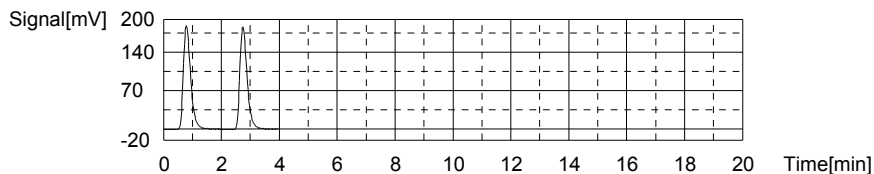
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.063mg/L TC:8.296mg/L IC:4.233mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	328.9	8.317mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 2:33:55 PM
2	327.2	8.274mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 2:38:11 PM

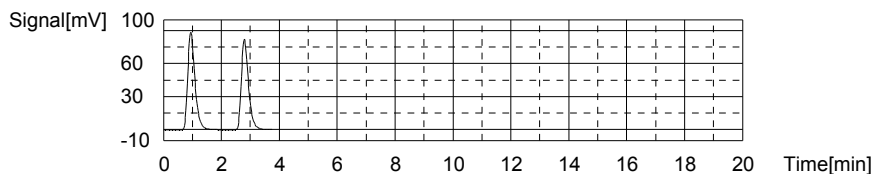
Mean Area 328.1
Mean Conc. 8.296mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	152.8	4.394mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 2:42:59 PM
2	142.0	4.071mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 2:47:30 PM

Mean Area 147.4
Mean Conc. 4.233mg/L



Sample

Sample Name: L16120800-01
Sample ID: <Untitled>
Origin: TOC-10-31-2015A.met
Status: Completed
Chk. Result

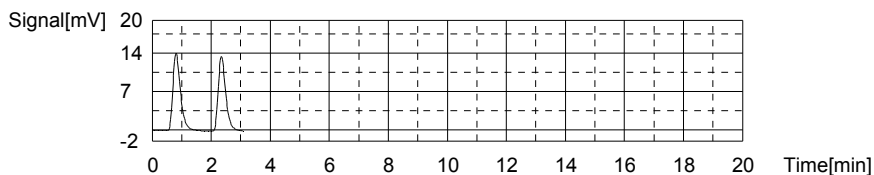
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4465mg/L TC:0.4979mg/L IC:0.05147mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	24.82	0.5101mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 2:54:30 PM
2	23.87	0.4857mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 2:58:18 PM

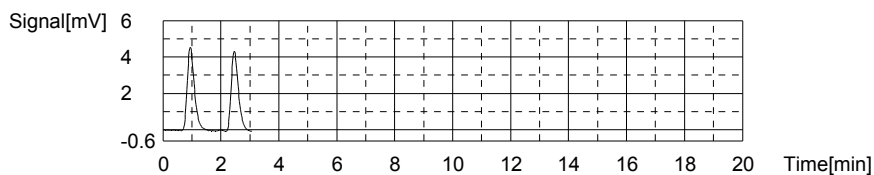
Mean Area 24.34
Mean Conc. 0.4979mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.776	0.05533mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_01	12/15/2016 3:02:39 PM
2	7.518	0.04761mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_01	12/15/2016 3:06:49 PM

Mean Area 7.647
Mean Conc. 0.05147mg/L



Sample

Sample Name: L16120590-35
Sample ID: <Untitled>
Origin: TOC-10-31-2015A.met
Status: Completed
Chk. Result

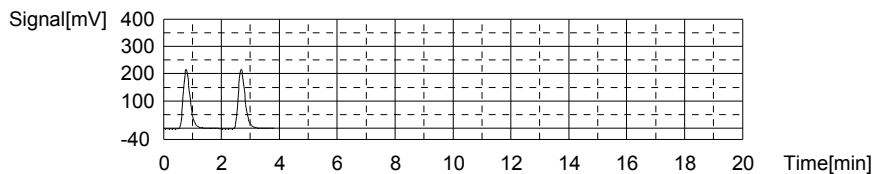
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.700mg/L TC:9.049mg/L IC:6.349mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	356.3	9.021mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 3:14:09 PM
2	358.5	9.077mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 3:18:21 PM

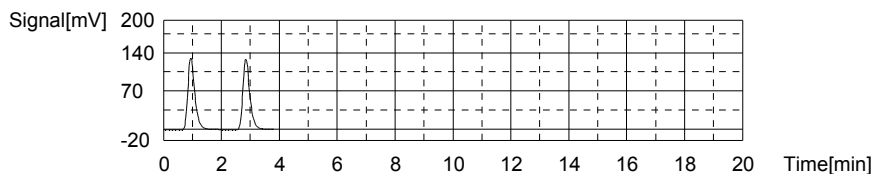
Mean Area 357.4
Mean Conc. 9.049mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	219.5	6.390mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 3:23:10 PM
2	216.8	6.309mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 3:27:49 PM

Mean Area 218.2
Mean Conc. 6.349mg/L



Sample

Sample Name: L16120590-36
Sample ID: <Untitled>
Origin: TOC-10-31-2015A.met
Status: Completed
Chk. Result

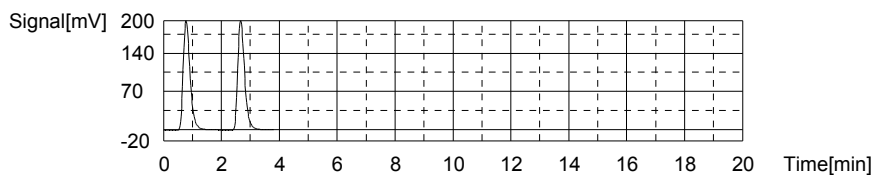
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.715mg/L TC:8.369mg/L IC:5.654mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	329.7	8.338mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 3:35:10 PM
2	332.1	8.400mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 3:39:23 PM

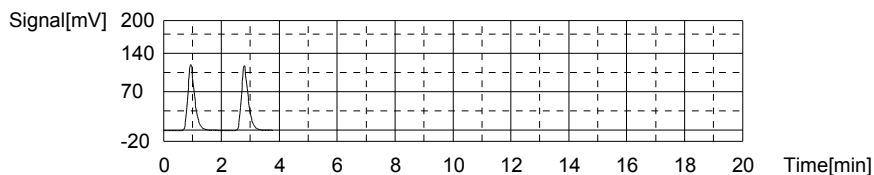
Mean Area 330.9
Mean Conc. 8.369mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	196.4	5.699mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 3:44:09 PM
2	193.4	5.609mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 3:48:44 PM

Mean Area 194.9
Mean Conc. 5.654mg/L



Sample

Sample Name: L16120590-37
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result:

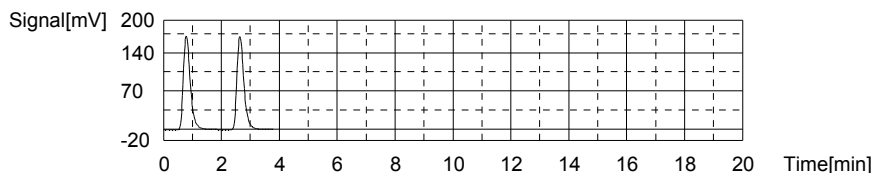
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.862mg/L TC:7.226mg/L IC:4.364mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	285.7	7.208mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 3:56:02 PM
2	287.1	7.244mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 4:00:19 PM

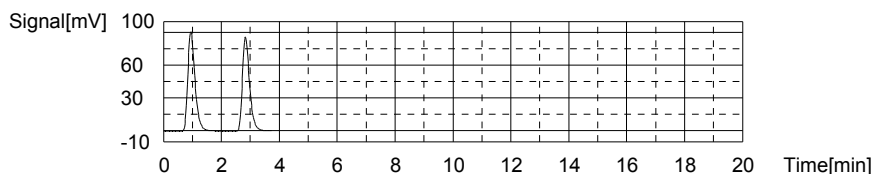
Mean Area 286.4
 Mean Conc. 7.226mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	156.0	4.490mg/L	500uL	1		TICURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 4:05:03 PM
2	147.6	4.239mg/L	500uL	1		TICURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 4:09:37 PM

Mean Area 151.8
 Mean Conc. 4.364mg/L



Sample

Sample Name: CCV
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result:

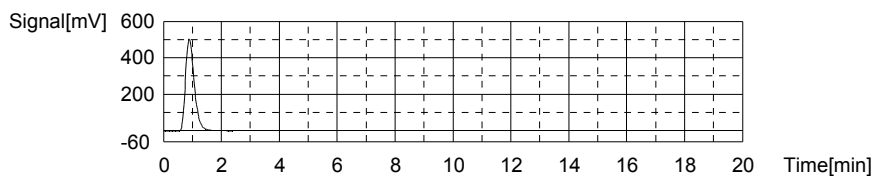
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.92mg/L TC:27.01mg/L IC:0.08863mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1057	27.01mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 4:17:25 PM

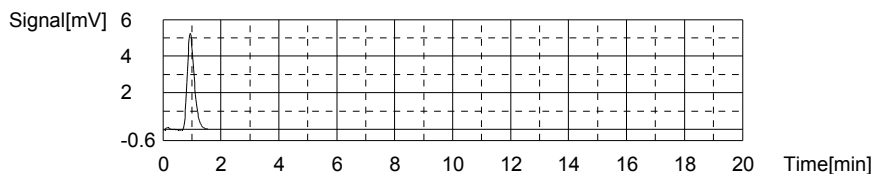
Mean Area 1057
Mean Conc. 27.01mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.889	0.08863mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 4:22:13 PM

Mean Area 8.889
Mean Conc. 0.08863mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

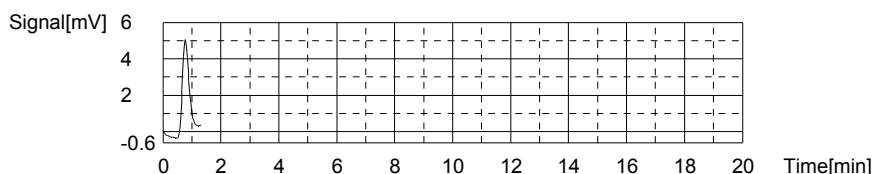
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02460mg/L TC:0.08098mg/L IC:0.05637mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.106	0.08098mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 4:27:10 PM

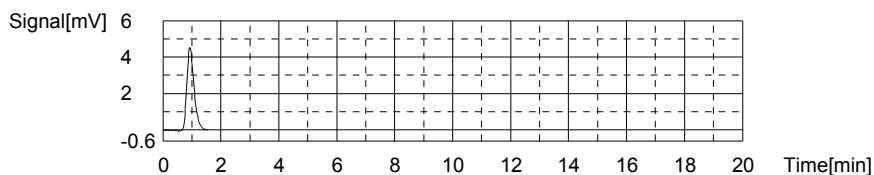
Mean Area 8.106
Mean Conc. 0.08098mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.811	0.05637mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55	012/15/2016 4:31:05 PM

Mean Area 7.811
Mean Conc. 0.05637mg/L



Sample

Sample Name: L16120590-38
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result:

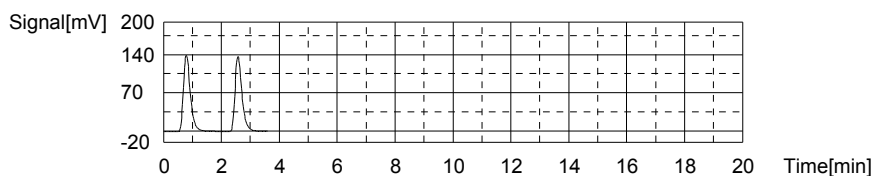
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.617mg/L TC:5.782mg/L IC:3.165mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	231.4	5.814mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 4:38:19 PM
2	228.9	5.750mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 4:42:24 PM

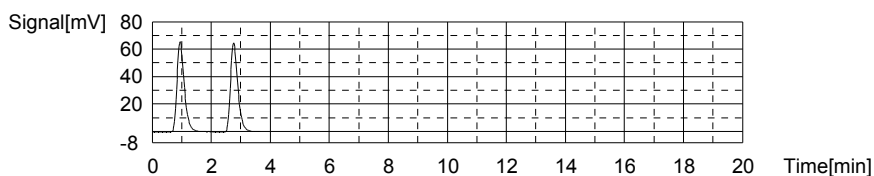
Mean Area 230.2
 Mean Conc. 5.782mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	112.3	3.183mg/L	500uL	1		TICURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 4:47:03 PM
2	111.1	3.147mg/L	500uL	1		TICURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 4:51:31 PM

Mean Area 111.7
 Mean Conc. 3.165mg/L



Sample

Sample Name: L16120590-39
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result:

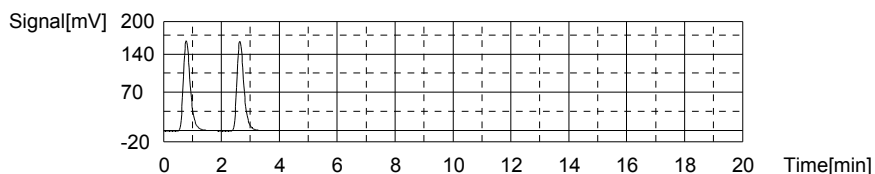
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.788mg/L TC:6.977mg/L IC:4.189mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	277.6	7.000mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 4:58:50 PM
2	275.8	6.954mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 5:02:54 PM

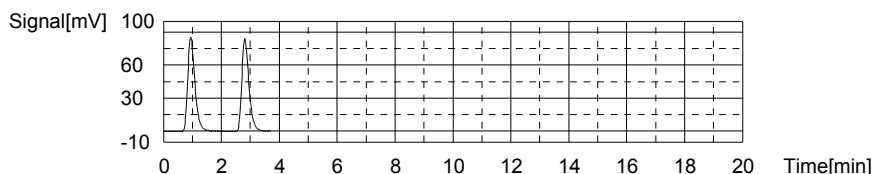
Mean Area 276.7
Mean Conc. 6.977mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	146.7	4.212mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 5:07:40 PM
2	145.2	4.167mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 5:12:12 PM

Mean Area 146.0
Mean Conc. 4.189mg/L



Sample

Sample Name: L16120590-40
Sample ID: <Untitled>
Origin: TOC-10-31-2015A.met
Status: Completed
Chk. Result

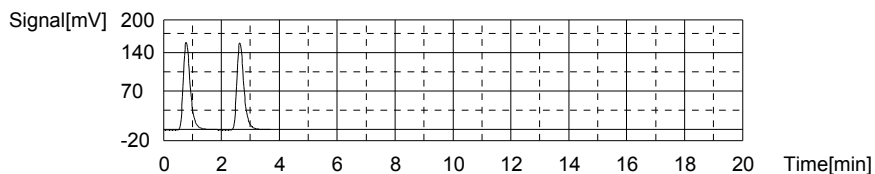
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.903mg/L TC:6.727mg/L IC:3.824mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	267.0	6.728mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 5:19:31 PM
2	266.9	6.726mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 5:23:38 PM

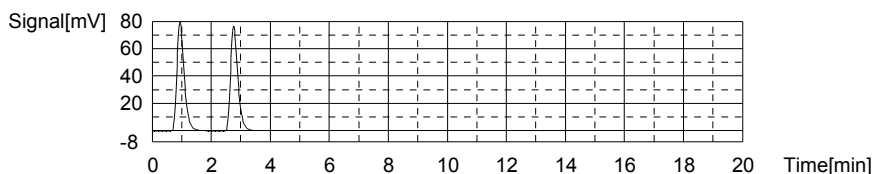
Mean Area 267.0
Mean Conc. 6.727mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	136.5	3.907mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 5:28:21 PM
2	131.0	3.742mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 5:32:49 PM

Mean Area 133.8
 Mean Conc. 3.824mg/L



Sample

Sample Name: WG595003-05 DUP
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result

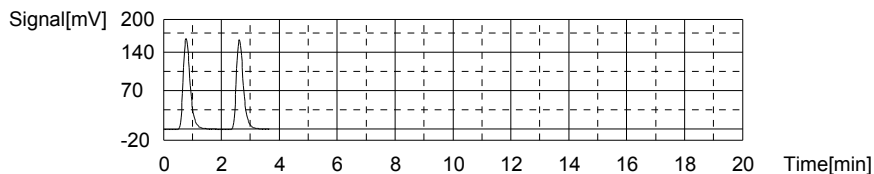
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.864mg/L TC:6.963mg/L IC:4.100mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	277.7	7.003mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 5:40:07 PM
2	274.6	6.923mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 31	12/15/2016 5:44:13 PM

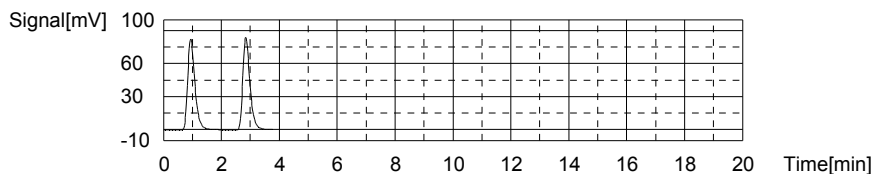
Mean Area 276.1
 Mean Conc. 6.963mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	141.9	4.068mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 5:48:58 PM
2	144.0	4.131mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 5:53:32 PM

Mean Area 142.9
 Mean Conc. 4.100mg/L



Sample

Sample Name: WG595003-06 MS
 Sample ID: <Untitled>
 Origin: TOC-10-31-2015A.met
 Status: Completed
 Chk. Result

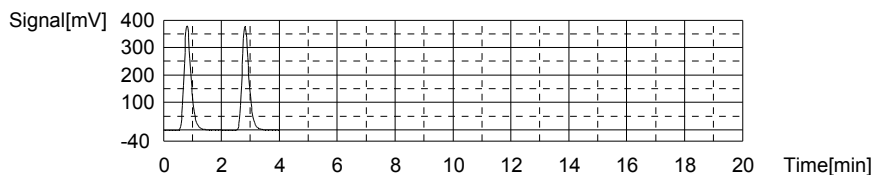
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.73mg/L TC:16.18mg/L IC:1.453mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	635.5	16.19mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 6:00:59 PM
2	635.0	16.18mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 6:05:14 PM

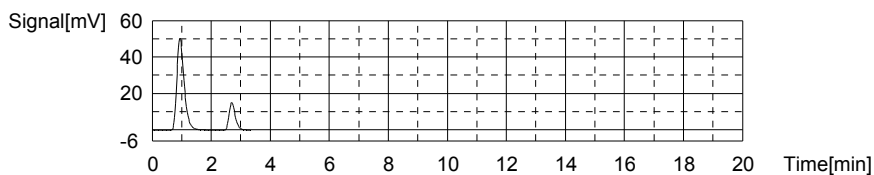
Mean Area 635.3
Mean Conc. 16.18mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	86.72	2.417mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_01	12/15/2016 6:09:56 PM
2	22.25	0.4884mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_01	12/15/2016 6:14:05 PM

Mean Area 54.48
Mean Conc. 1.453mg/L



Sample

Sample Name: WG595004-01 BLK
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

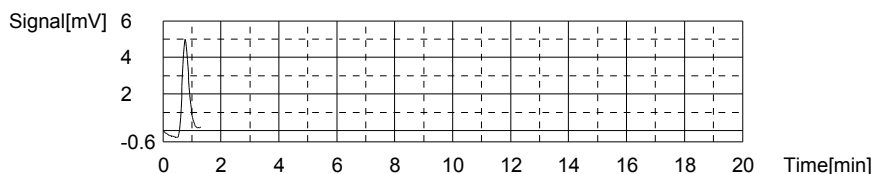
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02137mg/L TC:0.08229mg/L IC:0.06092mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.157	0.08229mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 6:19:02 PM

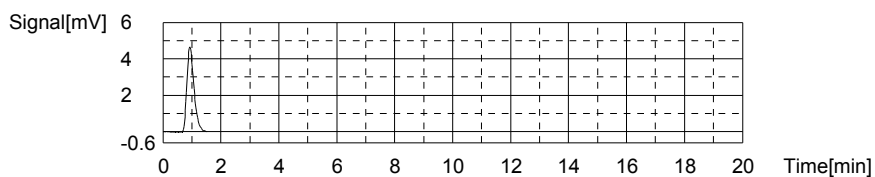
Mean Area 8.157
Mean Conc. 0.08229mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.963	0.06092mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 6:22:59 PM

Mean Area 7.963
 Mean Conc. 0.06092mg/L



Sample

Sample Name: WG595004-02 LCS
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

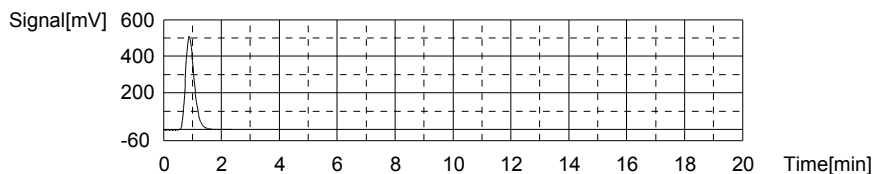
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.29mg/L TC:27.37mg/L IC:0.08163mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1071	27.37mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 6:30:47 PM

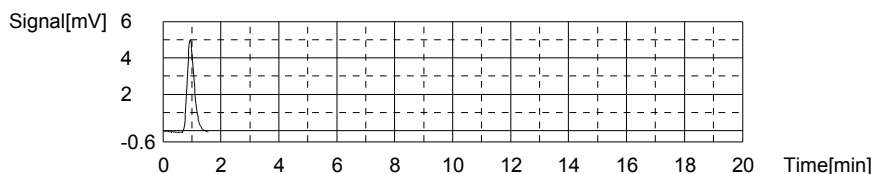
Mean Area 1071
 Mean Conc. 27.37mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.655	0.08163mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 6:35:09 PM

Mean Area 8.655
 Mean Conc. 0.08163mg/L



Sample

Sample Name: WG595004-03 LCS DUP
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

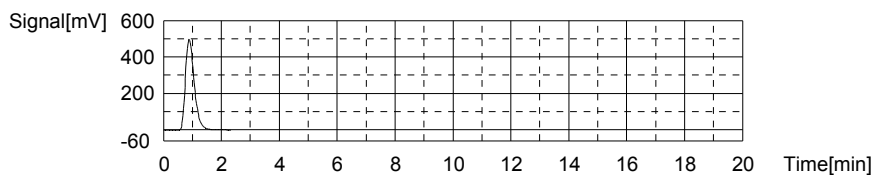
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.86mg/L TC:26.93mg/L IC:0.07759mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1054	26.93mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 6:42:56 PM

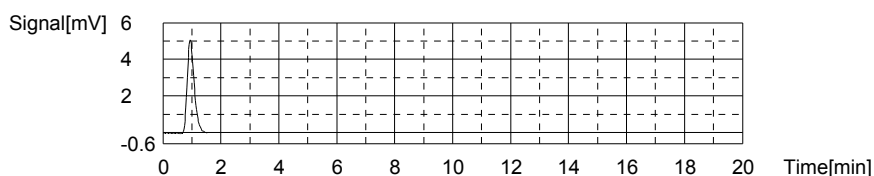
Mean Area 1054
Mean Conc. 26.93mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.520	0.07759mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 6:47:18 PM

Mean Area 8.520
Mean Conc. 0.07759mg/L



Sample

Sample Name: L16120590-41
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

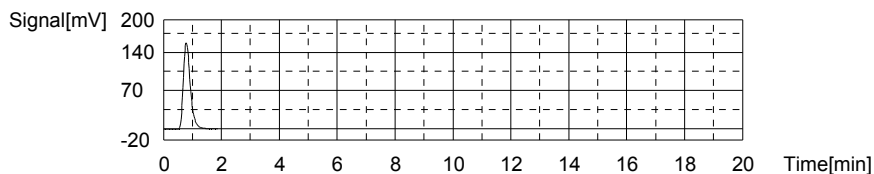
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.746mg/L TC:6.697mg/L IC:3.951mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	265.8	6.697mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 6:54:39 PM

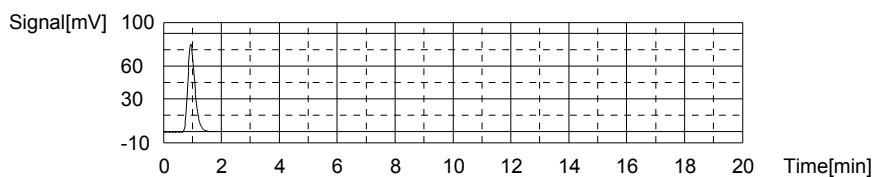
Mean Area 265.8
Mean Conc. 6.697mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	138.0	3.951mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 6:59:23 PM

Mean Area 138.0
 Mean Conc. 3.951mg/L



Sample

Sample Name: L16120590-42
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

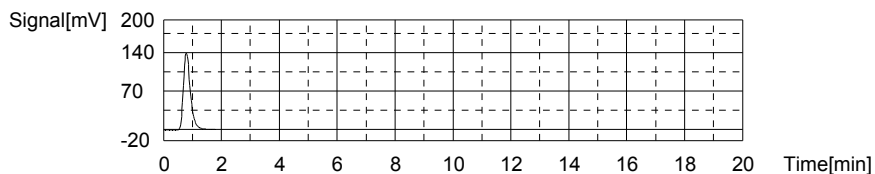
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.565mg/L TC:5.876mg/L IC:3.311mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	233.8	5.876mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 7:06:38 PM

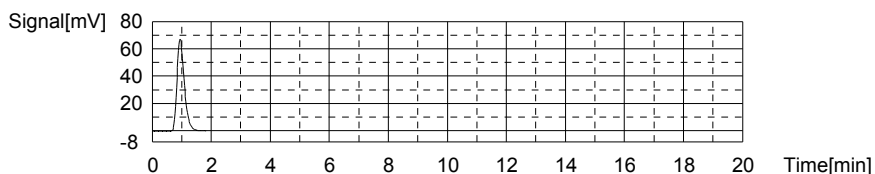
Mean Area 233.8
 Mean Conc. 5.876mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	116.6	3.311mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 7:11:21 PM

Mean Area 116.6
 Mean Conc. 3.311mg/L



Sample

Sample Name: CCV
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

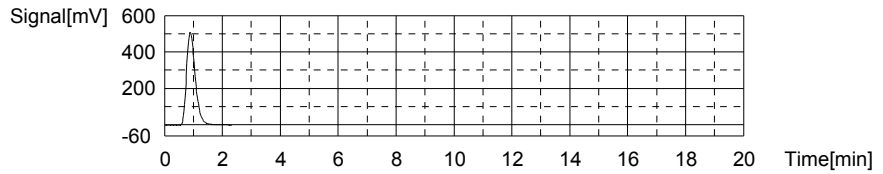
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.13mg/L TC:27.22mg/L IC:0.08964mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1065	27.22mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 7:19:07 PM

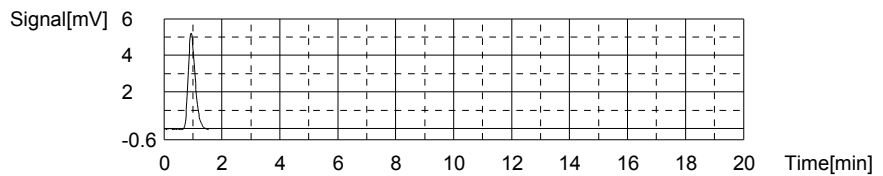
Mean Area 1065
Mean Conc. 27.22mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.923	0.08964mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 7:23:31 PM

Mean Area 8.923
Mean Conc. 0.08964mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

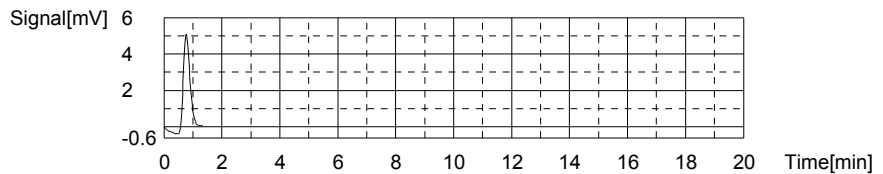
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02425mg/L TC:0.09071mg/L IC:0.06646mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.485	0.09071mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 7:28:29 PM

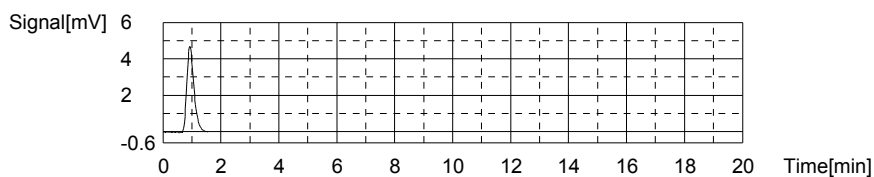
Mean Area 8.485
Mean Conc. 0.09071mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.148	0.06646mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 7:32:23 PM

Mean Area 8.148
 Mean Conc. 0.06646mg/L



Sample

Sample Name: L16120715-01
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

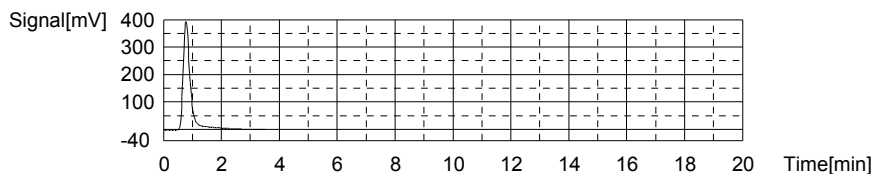
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.822mg/L TC:17.63mg/L IC:12.81mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	691.7	17.63mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 7:41:21 PM

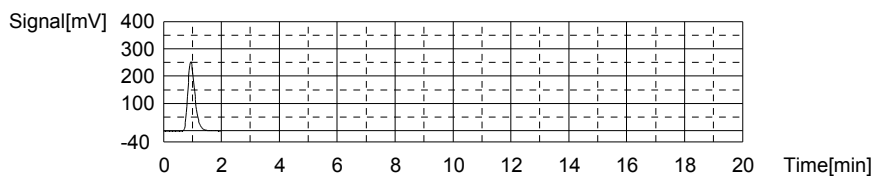
Mean Area 691.7
 Mean Conc. 17.63mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	434.1	12.81mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 7:46:16 PM

Mean Area 434.1
 Mean Conc. 12.81mg/L



Sample

Sample Name: L16120715-02 (2)
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

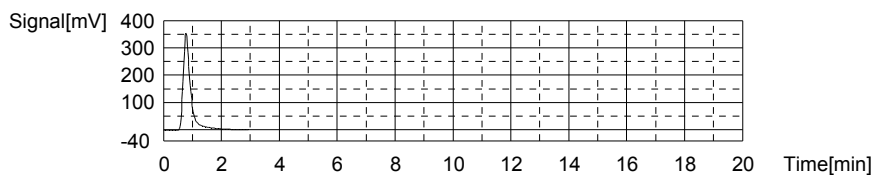
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.132mg/L TC:15.88mg/L IC:10.75mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	623.6	15.88mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 7:54:40 PM

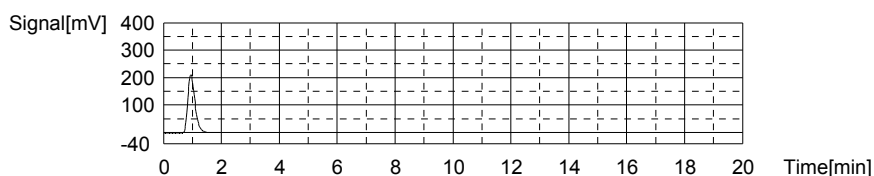
Mean Area 623.6
Mean Conc. 15.88mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	365.3	10.75mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 7:59:33 PM

Mean Area 365.3
Mean Conc. 10.75mg/L



Sample

Sample Name:
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

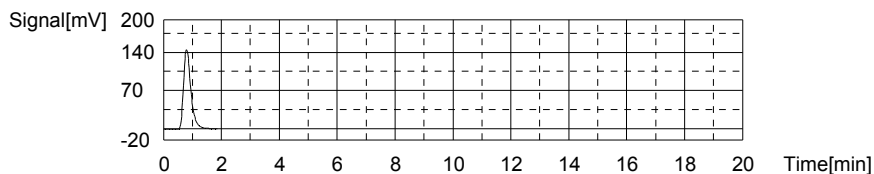
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.544mg/L TC:6.415mg/L IC:2.871mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	254.8	6.415mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 8:06:52 PM

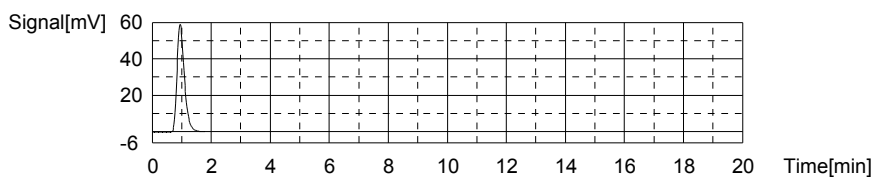
Mean Area 254.8
Mean Conc. 6.415mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	101.9	2.871mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 8:11:31 PM

Mean Area 101.9
Mean Conc. 2.871mg/L



Sample

Sample Name: L16120352-07
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

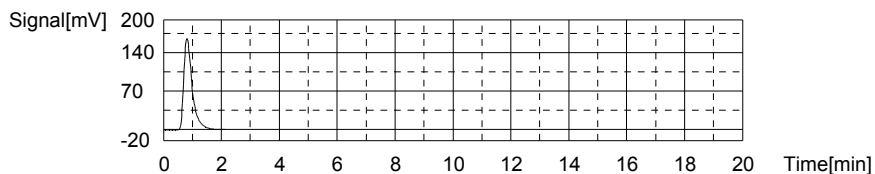
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:6.016mg/L TC:8.464mg/L IC:2.448mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	334.6	8.464mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 8:19:06 PM

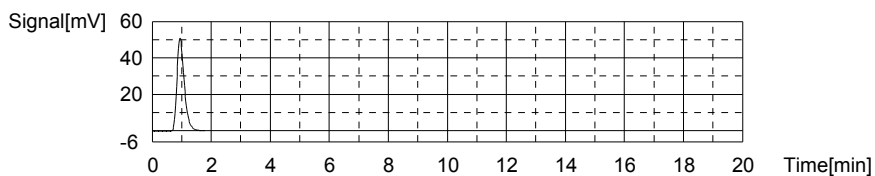
Mean Area 334.6
Mean Conc. 8.464mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	87.74	2.448mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 8:23:46 PM

Mean Area 87.74
Mean Conc. 2.448mg/L



Sample

Sample Name: L16120352-15
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

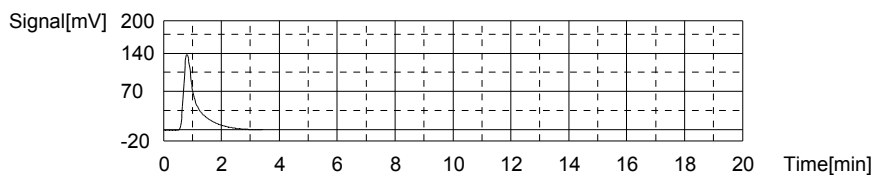
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:8.205mg/L TC:10.54mg/L IC:2.331mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	415.3	10.54mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 8:32:37 PM

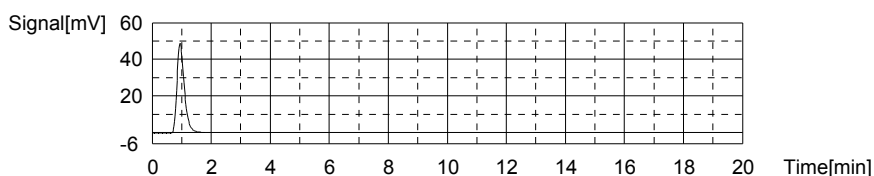
Mean Area 415.3
Mean Conc. 10.54mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	83.84	2.331mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 8:37:16 PM

Mean Area 83.84
Mean Conc. 2.331mg/L



Sample

Sample Name: L16120692-01 (25)
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

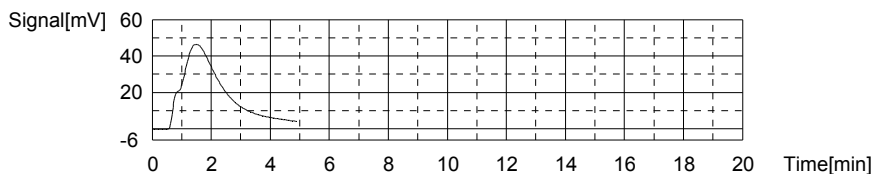
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:10.72mg/L TC:10.92mg/L IC:0.1997mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	430.3	10.92mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 8:47:37 PM

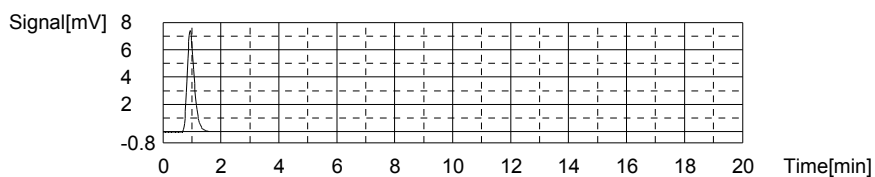
Mean Area 430.3
Mean Conc. 10.92mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.60	0.1997mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 8:52:03 PM

Mean Area 12.60
 Mean Conc. 0.1997mg/L



Sample

Sample Name: L16120762-01
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

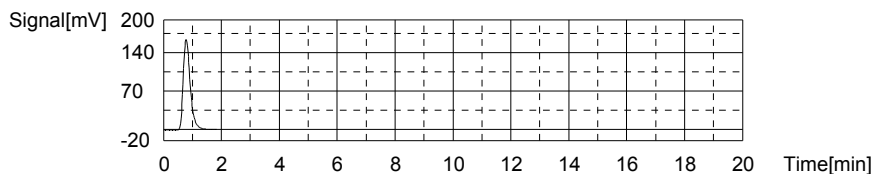
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.287mg/L TC:6.939mg/L IC:4.652mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	275.2	6.939mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 8:59:21 PM

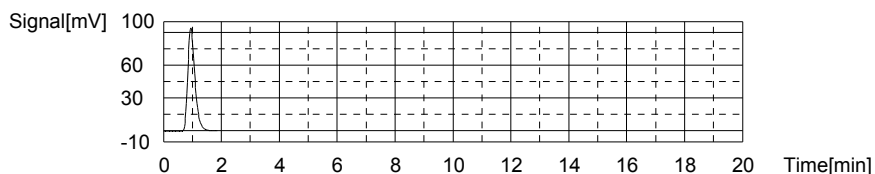
Mean Area 275.2
 Mean Conc. 6.939mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	161.4	4.652mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 9:04:05 PM

Mean Area 161.4
 Mean Conc. 4.652mg/L



Sample

Sample Name: L16120762-02
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

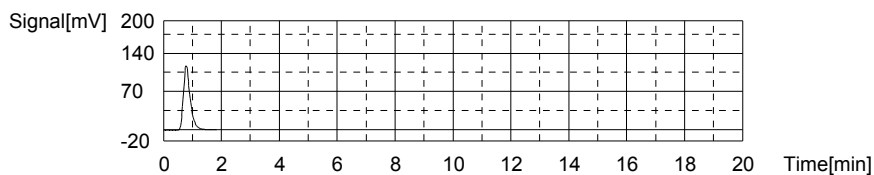
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.118mg/L TC:4.836mg/L IC:2.718mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	193.3	4.836mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 9:11:23 PM

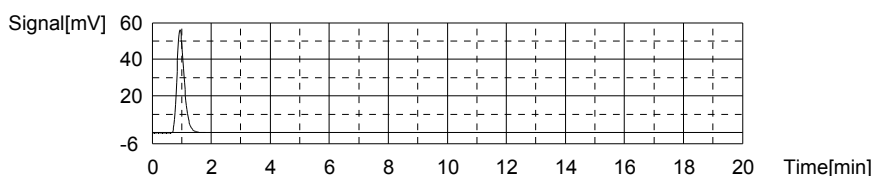
Mean Area 193.3
Mean Conc. 4.836mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	96.76	2.718mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 9:16:03 PM

Mean Area 96.76
Mean Conc. 2.718mg/L



Sample

Sample Name: L16120790-01
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

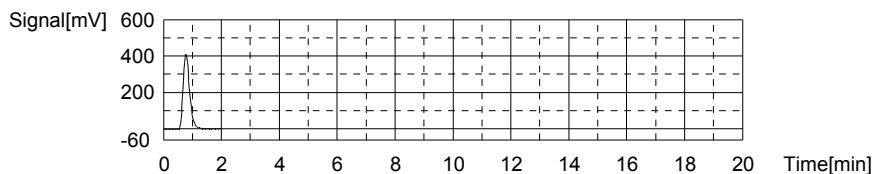
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.583mg/L TC:16.41mg/L IC:12.82mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	643.9	16.41mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 9:23:30 PM

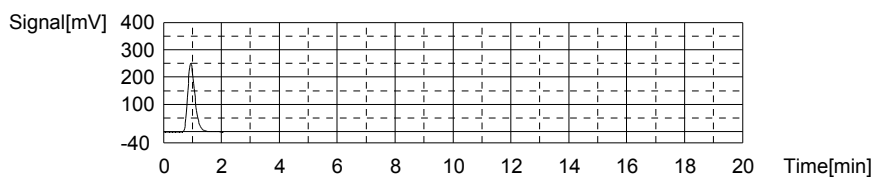
Mean Area 643.9
Mean Conc. 16.41mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	434.5	12.82mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 9:28:29 PM

Mean Area 434.5
Mean Conc. 12.82mg/L



Sample

Sample Name: L16120425-01
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

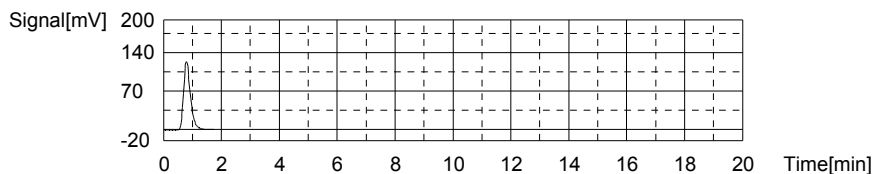
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.927mg/L TC:5.108mg/L IC:2.181mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	203.9	5.108mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 9:35:42 PM

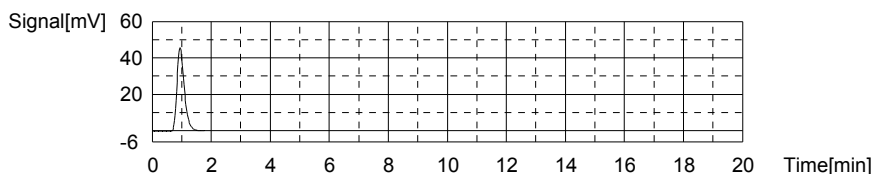
Mean Area 203.9
Mean Conc. 5.108mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	78.82	2.181mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 9:40:21 PM

Mean Area 78.82
Mean Conc. 2.181mg/L



Sample

Sample Name: CCV
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

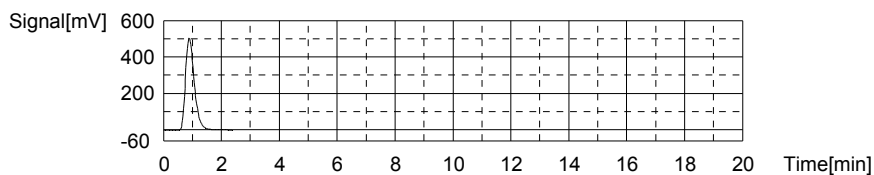
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.13mg/L TC:27.22mg/L IC:0.08602mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1065	27.22mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 9:48:12 PM

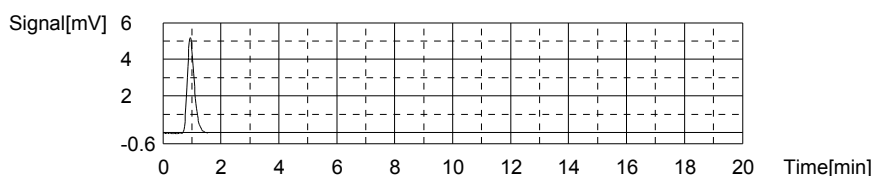
Mean Area 1065
Mean Conc. 27.22mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.802	0.08602mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 9:52:36 PM

Mean Area 8.802
Mean Conc. 0.08602mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

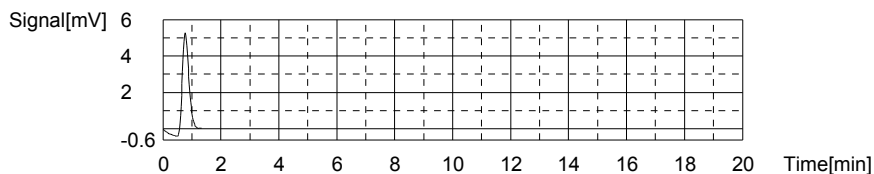
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02210mg/L TC:0.09846mg/L IC:0.07636mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.787	0.09846mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 9:57:34 PM

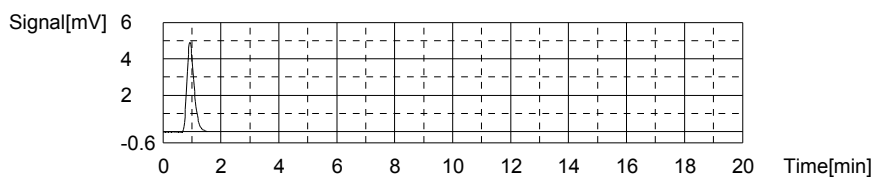
Mean Area 8.787
Mean Conc. 0.09846mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.479	0.07636mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 10:01:31 PM

Mean Area 8.479
 Mean Conc. 0.07636mg/L



Sample

Sample Name: L16120425-05
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

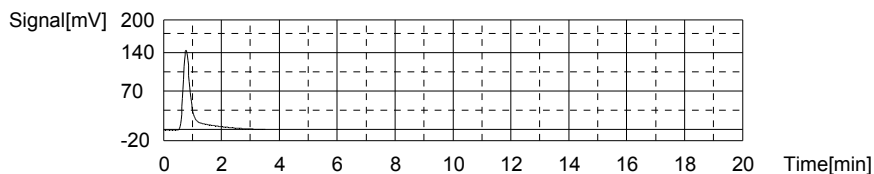
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.420mg/L TC:7.670mg/L IC:4.251mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	303.7	7.670mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 10:10:31 PM

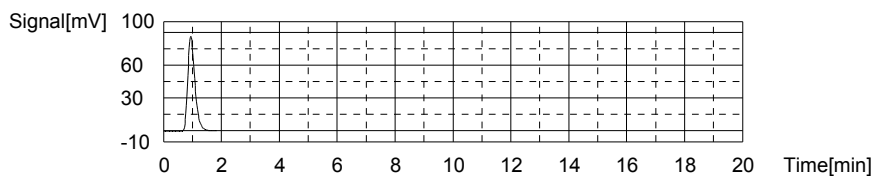
Mean Area 303.7
 Mean Conc. 7.670mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	148.0	4.251mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 10:15:13 PM

Mean Area 148.0
 Mean Conc. 4.251mg/L



Sample

Sample Name: L16120425-09
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

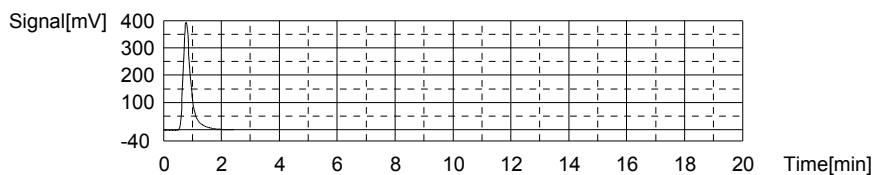
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.406mg/L TC:18.53mg/L IC:11.12mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	726.5	18.53mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 10:23:07 PM

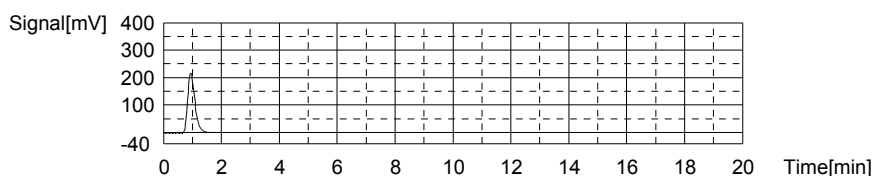
Mean Area 726.5
Mean Conc. 18.53mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	377.6	11.12mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 10:28:07 PM

Mean Area 377.6
Mean Conc. 11.12mg/L



Sample

Sample Name: L16120425-19
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

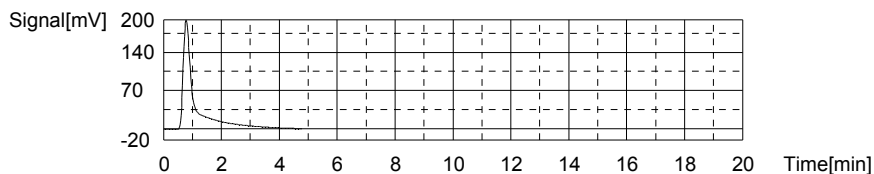
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.591mg/L TC:13.52mg/L IC:5.926mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	531.4	13.52mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 10:38:22 PM

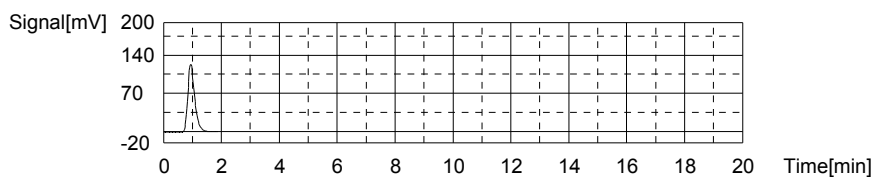
Mean Area 531.4
Mean Conc. 13.52mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	204.0	5.926mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 10:43:07 PM

Mean Area 204.0
 Mean Conc. 5.926mg/L



Sample

Sample Name: L16120521-01
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

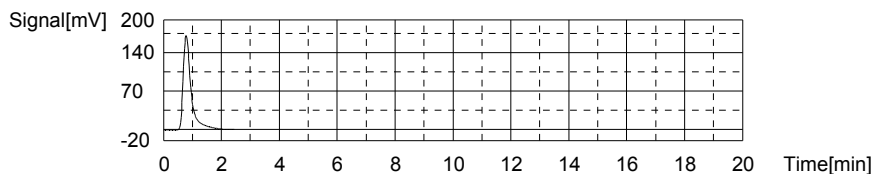
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.967mg/L TC:8.256mg/L IC:5.289mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	326.5	8.256mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 10:51:02 PM

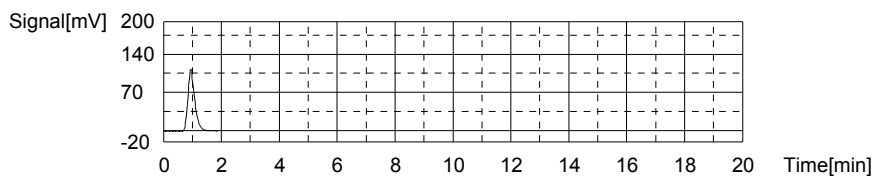
Mean Area 326.5
 Mean Conc. 8.256mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	182.7	5.289mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 10:55:49 PM

Mean Area 182.7
 Mean Conc. 5.289mg/L



Sample

Sample Name: L16120521-03
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

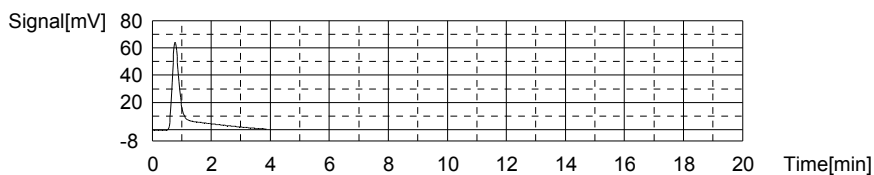
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.023mg/L TC:3.945mg/L IC:1.922mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	158.6	3.945mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 11:05:10 PM

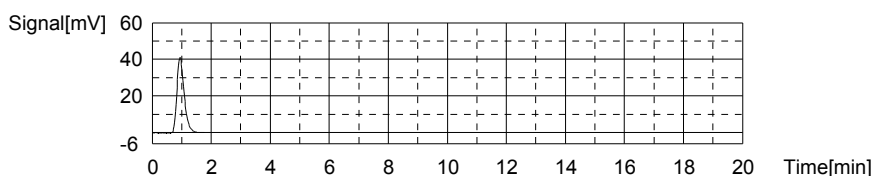
Mean Area 158.6
Mean Conc. 3.945mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	70.16	1.922mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 11:09:48 PM

Mean Area 70.16
Mean Conc. 1.922mg/L



Sample

Sample Name: L16120521-05
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

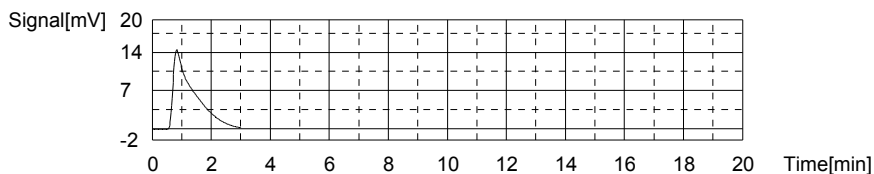
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.529mg/L TC:1.651mg/L IC:0.1222mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	69.25	1.651mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 11:18:16 PM

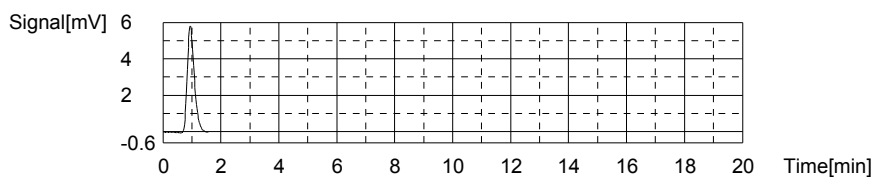
Mean Area 69.25
Mean Conc. 1.651mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	10.01	0.1222mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 11:22:42 PM

Mean Area 10.01
 Mean Conc. 0.1222mg/L



Sample

Sample Name: L16120521-07 (100)
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

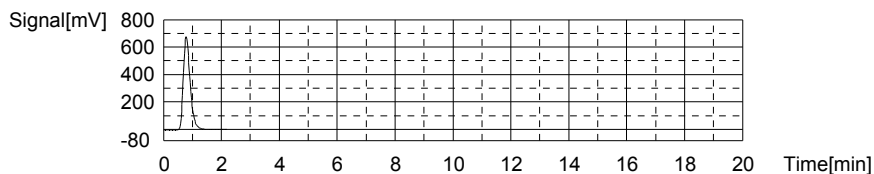
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.291mg/L TC:28.30mg/L IC:21.00mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1107	28.30mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 11:30:22 PM

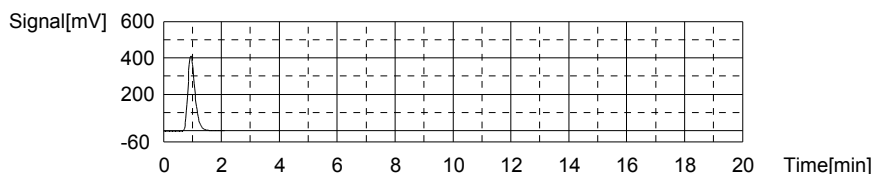
Mean Area 1107
 Mean Conc. 28.30mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	708.0	21.00mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/15/2016 11:35:26 PM

Mean Area 708.0
 Mean Conc. 21.00mg/L



Sample

Sample Name: L16120521-09 (25)
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

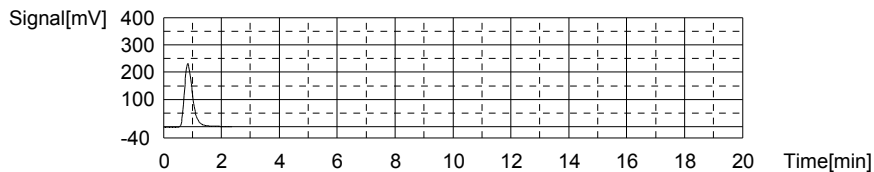
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:10.21mg/L TC:11.56mg/L IC:1.348mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	455.0	11.56mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 11:43:16 PM

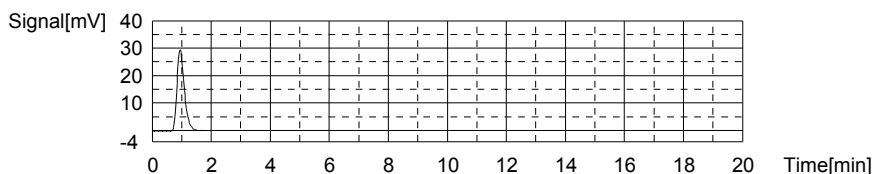
Mean Area 455.0
Mean Conc. 11.56mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	50.99	1.348mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 11:47:51 PM

Mean Area 50.99
Mean Conc. 1.348mg/L



Sample

Sample Name: WG595004-05 DUP
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

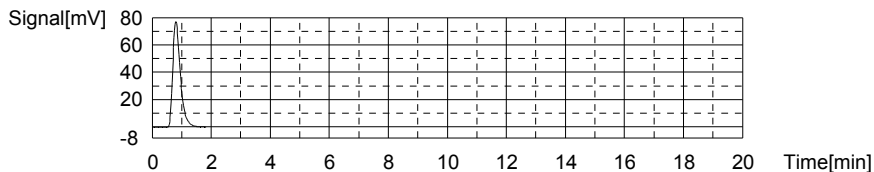
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.161mg/L TC:3.439mg/L IC:1.278mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	138.9	3.439mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 11:55:09 PM

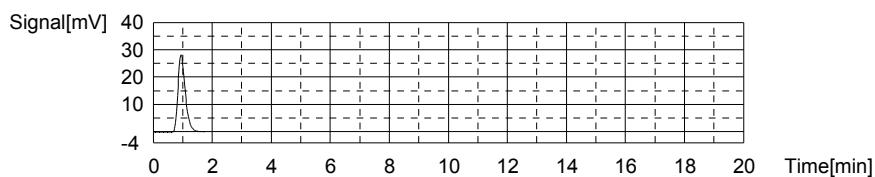
Mean Area 138.9
Mean Conc. 3.439mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	48.64	1.278mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55_0	12/15/2016 11:59:44 PM

Mean Area 48.64
Mean Conc. 1.278mg/L



Sample

Sample Name: WG595004-06 MS
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

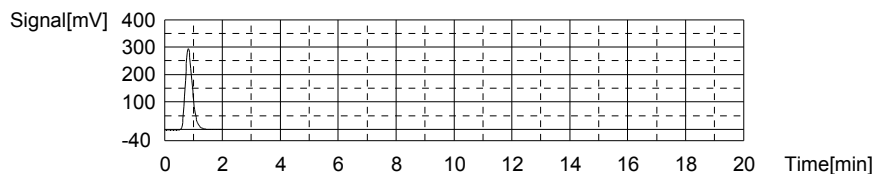
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.25mg/L TC:12.85mg/L IC:0.6062mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	505.6	12.85mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/16/2016 12:07:12 AM

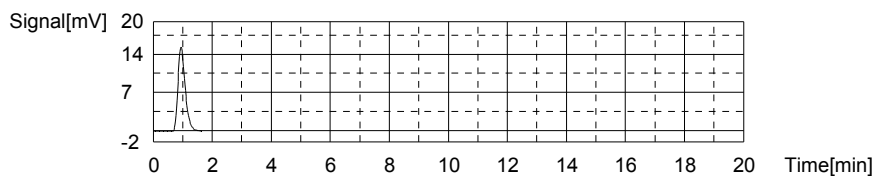
Mean Area 505.6
Mean Conc. 12.85mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	26.19	0.6062mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55_0	12/16/2016 12:11:42 AM

Mean Area 26.19
Mean Conc. 0.6062mg/L



Sample

Sample Name: CCV
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

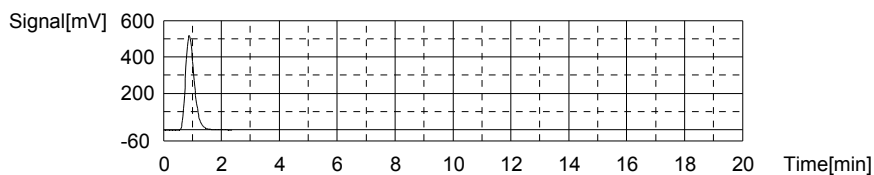
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.70mg/L TC:27.78mg/L IC:0.08249mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1087	27.78mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/16/2016 12:19:33 AM

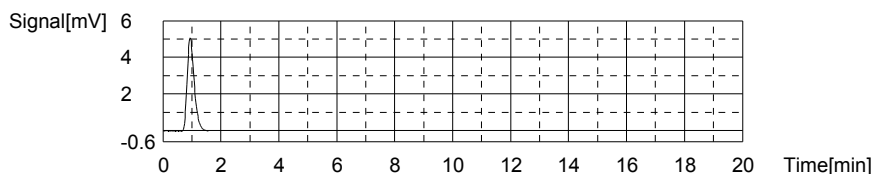
Mean Area 1087
Mean Conc. 27.78mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.684	0.08249mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/16/2016 12:23:58 AM

Mean Area 8.684
Mean Conc. 0.08249mg/L



Sample

Sample Name: CCB
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

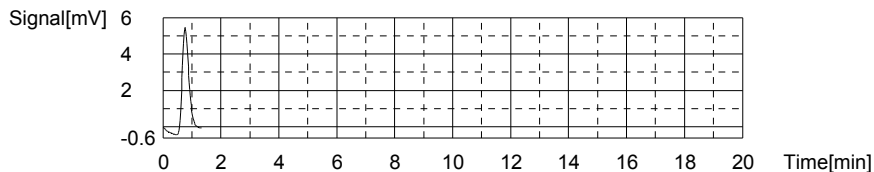
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02470mg/L TC:0.1076mg/L IC:0.08285mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.141	0.1076mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/16/2016 12:28:55 AM

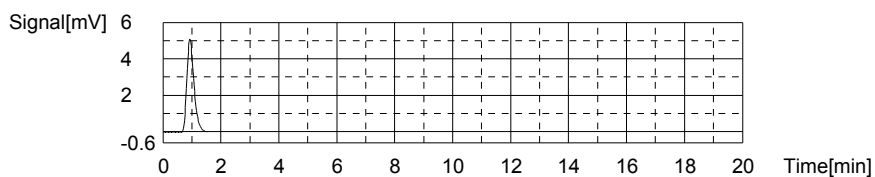
Mean Area 9.141
Mean Conc. 0.1076mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.696	0.08285mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/16/2016 12:32:51 AM

Mean Area 8.696
 Mean Conc. 0.08285mg/L



Sample

Sample Name: CCV
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

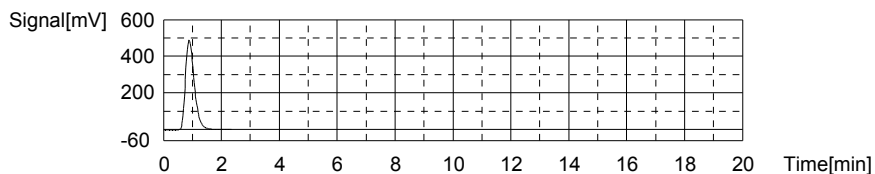
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.47mg/L TC:26.58mg/L IC:0.1015mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1040	26.58mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_30_16_06_3	12/16/2016 8:34:40 AM

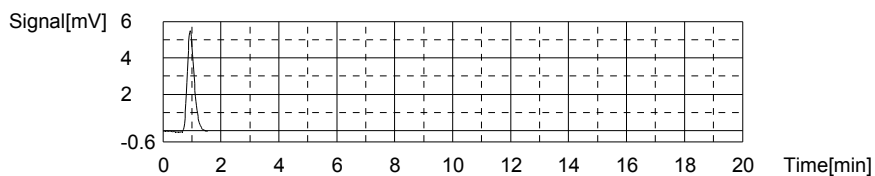
Mean Area 1040
 Mean Conc. 26.58mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.319	0.1015mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/16/2016 8:39:07 AM

Mean Area 9.319
 Mean Conc. 0.1015mg/L



Sample

Sample Name: CCB
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

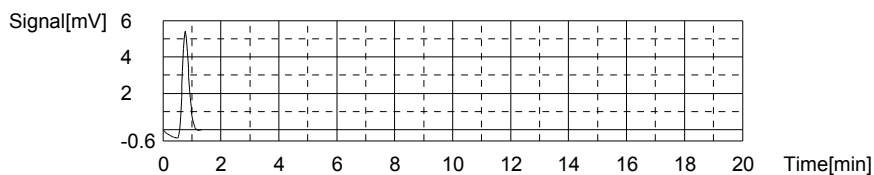
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02130mg/L TC:0.1051mg/L IC:0.08384mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.047	0.1051mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/16/2016 8:44:05 AM

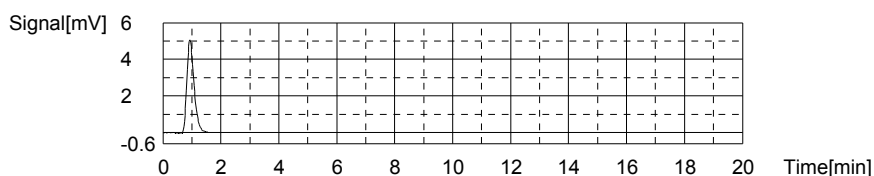
Mean Area 9.047
Mean Conc. 0.1051mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.729	0.08384mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	12/16/2016 8:48:03 AM

Mean Area 8.729
Mean Conc. 0.08384mg/L



Sample

Sample Name: L16120352-01 (5)
Sample ID:
Origin: TOC-10-31-2015.met
Status: Completed
Chk. Result

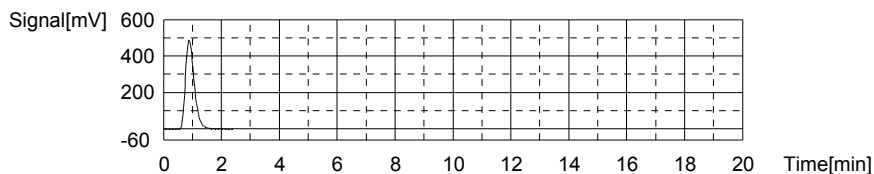
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.31mg/L TC:26.42mg/L IC:0.1125mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1034	26.42mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/16/2016 8:55:58 AM

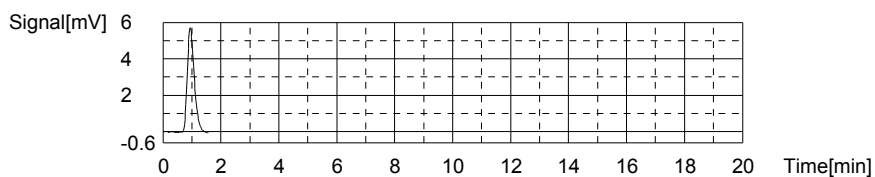
Mean Area 1034
Mean Conc. 26.42mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	9.686	0.1125mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/16/2016 9:00:22 AM

Mean Area 9.686
 Mean Conc. 0.1125mg/L



Sample

Sample Name: CCV
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

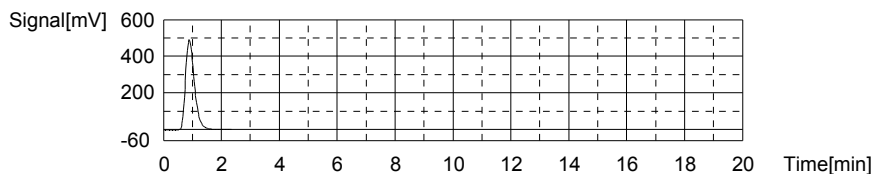
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.65mg/L TC:26.70mg/L IC:0.05530mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1045	26.70mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_30_16_06_3	12/16/2016 9:11:29 AM

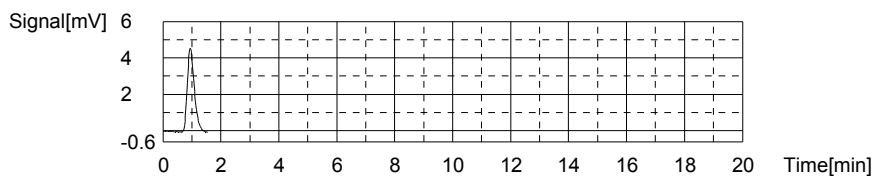
Mean Area 1045
 Mean Conc. 26.70mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.775	0.05530mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55	012/16/2016 9:15:52 AM

Mean Area 7.775
 Mean Conc. 0.05530mg/L



Sample

Sample Name: CCB
 Sample ID:
 Origin: TOC-10-31-2015.met
 Status: Completed
 Chk. Result

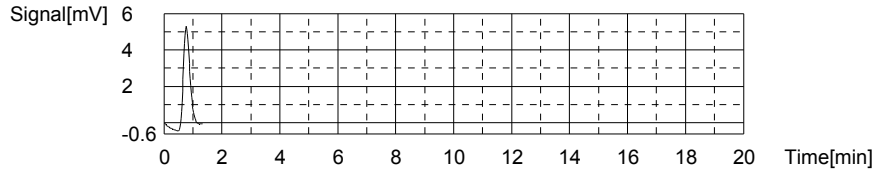
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.01528mg/L TC:0.09959mg/L IC:0.08432mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.831	0.09959mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/16/2016 9:20:51 AM

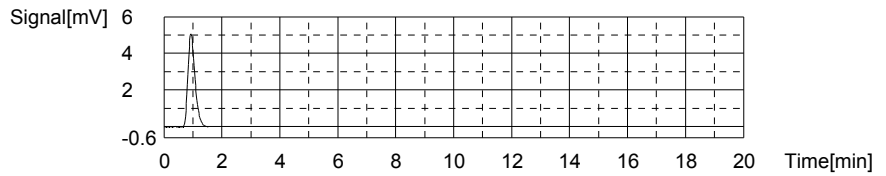
Mean Area 8.831
Mean Conc. 0.09959mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.745	0.08432mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_31_11_55_0	12/16/2016 9:24:48 AM

Mean Area 8.745
Mean Conc. 0.08432mg/L



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
December 28, 2016

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
AED - ALLEN E. DAVIS	ALS - ADRIANE L. STEED
AMA - ALEXANDRA M. ALFRED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BKT - BRENDAN TORRENCE	BLG - BRENDA L. GREENWALT
BNB - Brandi N. Bentley	BRG - BRENDA R. GREGORY
CAA - CASSIE A. AUGENSTEIN	CAF - CHERYL A. FLOWERS
CAS - Craig A. Smith	CEB - CHAD E. BARNES
CJQ - Cameron J. Quick	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CLW - CHARISSA L. WINTERS
CPD - CHAD P. DAVIS	CRW - CHRISTINA R. WILSON
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	EMW - ERIC M. WILKEN
ENY - EMILY N. YOAK	ERP - ERIN R. PORTER
FJB - FRANCES J. BOLDEN	HDD - HANAH D. DAWKINS
JDH - JUSTIN D. HESSON	JDS - JARED D. SMITH
JKP - JACQUELINE K. PARSONS	JLD - JESSICA L. DELONG
JLL - JOHN L. LENT	JMW - JEANA M. WHITE
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KAT - KATHY A. TUCKER
KDD - Katelyn D. Daley	KDW - KATHRYN D. WELCH
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRB - KAELY R. BECKER	KRP - KATHY R. PARSONS
LJH - Lacey J. Hendershot	LKN - LINDA K. NEDEFF
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
LSJ - LAURA S. JONES	MAP - MARLA A. PORTER
MBK - MORGAN B. KNOWLTON	MDA - MIKE D. ALBERTSON
MDC - MIKE D. COCHRAN	MES - MARY E. SCHILLING
MMB - MAREN M. BEERY	MRT - MICHELLE R. TAYLOR
MSW - MATT S. WILSON	NPH - Natalie P. Hart
PDM - PIERCE D. MORRIS	PIT - MICROBAC WARRENDALE
QX - QIN XU	RAH - ROY A. HALSTEAD
REK - BOB E. KYER	RLB - BOB BUCHANAN
RNP - RICK N. PETTY	SAV - SARAH A. VANDENBERG
SCB - SARAH C. BOGOLIN	SDC - SHALYN D. CONLEY
SLM - STEPHANIE L. MOSSBURG	SLP - SHERI L. PFALZGRAF
TB - TODD BOYLE	TGF - TIM G. FELTON
TMB - TIFFANY M. BAILEY	TMM - TAMMY M. MORRIS
VC - VICKI COLLIER	WJB - WILL J. BEASLEY
WTD - WADE T. DELONG	XXX - UNAVAILABLE OR SUBCONTRACT

December 28, 2016

Qualkey: WATERLOO

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.
>	Result is greater than the associated numerical value.
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	Analyte detected in the 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	The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to interference.
E	Semiquantitative result (out of calibration range)
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.
J	The analyte was positively identified, but the quantitation was below the RL.
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 RL/LOQ.
J,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	Analyte detected in both the method blank and sample above the MDL.
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	Tentatively identified compound(TIC)
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.
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
TIC	Library Search Compound
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	Not detected at or above adjusted sample detection limit.



Microbac Laboratories Inc.

List of Valid Qualifiers

December 28, 2016

Qualkey: WATERLOO

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum Container ID Products**L16120352-01 837728**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:42	BRG		
2	PREP	W1	SEM	08-DEC-2016 12:46	CAS	BRG	

Comments:Products cancelled.

3	STORE	SEM	A2	12-DEC-2016 15:50	BRG	CAS	
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Comments:Products cancelled.

Samplenum Container ID Products**L16120352-01 837729**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:42	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 10:30	DCM	BRG	

Comments:Products cancelled.

3	STORE	WET	A2	14-DEC-2016 10:45	BRG	DCM	
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Comments:Products cancelled.

4	STORE	WET	A2	26-DEC-2016 13:24	AZH	DCM	
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Comments:Products cancelled.

Samplenum Container ID Products**L16120352-01 837730 NO3 PO4**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:42	BRG		
2	ANALYZ	W1	WET	07-DEC-2016 15:30	TMM	BRG	

Samplenum Container ID Products**L16120352-01 837731 TDS**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:42	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 10:30	DCM	BRG	
3	STORE	WET	A2	23-DEC-2016 15:39	CLS	ADG	

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-01 837732 NH3 NO3NO2 PHOS TKN TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:42	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 10:30	DCM	BRG	
3	STORE	WET	A2	26-DEC-2016 13:23	AZH	DCM	

Samplenum **Container ID** **Products**
L16120352-01 837732 AL AS-MS CA FE K MG MN NA SI SILICA-ICP

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	08-DEC-2016 13:40	BRG	ERP	
4	ANALYZ*	DIG	METALS	13-DEC-2016 09:11	JYH	ERP	

**Sample extract/digestate/leachate*

Samplenum **Container ID** **Products**
L16120352-01 837736 300 ALK S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 10:31	DCM	BRG	
3	STORE	WET	A2	12-DEC-2016 09:26	BRG	TB	

Samplenum **Container ID** **Products**
L16120352-02 837737 FE-D MN-D AL-D AS-MSD

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	08-DEC-2016 13:40	BRG	ERP	
4	ANALYZ*	DIG	METALS	13-DEC-2016 09:11	JYH	ERP	

**Sample extract/digestate/leachate*

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



Microbac Laboratories Inc.
Internal Chain of Custody Report

Login: L16120352
Account: 2736
Project: 2736.061
Samples: 27
Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-03 837738 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:38	ERP	BRG	
3	STORE	DIG	A2	08-DEC-2016 13:40	BRG	ERP	
4	ANALYZ*	DIG	METALS	13-DEC-2016 09:11	JYH	ERP	

**Sample extract/digestate/leachate*

Samplenum **Container ID** **Products**
L16120352-04 837739 MN-D AL-D AS-MSD FE-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	08-DEC-2016 13:40	BRG	ERP	
4	ANALYZ*	DIG	METALS	13-DEC-2016 09:11	JYH	ERP	

**Sample extract/digestate/leachate*

Samplenum **Container ID** **Products**
L16120352-05 837740 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	08-DEC-2016 13:40	BRG	ERP	
4	ANALYZ*	DIG	METALS	13-DEC-2016 09:11	JYH	ERP	

**Sample extract/digestate/leachate*

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-06 837741 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	08-DEC-2016 13:40	BRG	ERP	
4	ANALYZ*	DIG	METALS	13-DEC-2016 09:11	JYH	ERP	

*Sample extract/digestate/leachate

Samplenum **Container ID** **Products**
L16120352-07 837742

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Samplenum **Container ID** **Products**
L16120352-07 837743

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	SEM	08-DEC-2016 12:46	CAS	BRG	

Comments:Products cancelled.

3	STORE	SEM	A2	12-DEC-2016 15:50	BRG	CAS	
---	-------	-----	----	-------------------	-----	-----	--

Comments:Products cancelled.

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



Microbac Laboratories Inc.
Internal Chain of Custody Report

Login: L16120352
Account: 2736
Project: 2736.061
Samples: 27
Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-07 837744 ALK NO3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	ANALYZ	W1	WET	07-DEC-2016 15:30	TMM	BRG	
3	STORE	WET	A2	09-DEC-2016 15:25	BRG	SDC	

Samplenum **Container ID** **Products**
L16120352-07 837745 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	ANALYZ	W1	WET	12-DEC-2016 07:13	DCM	BRG	
3	STORE	WET	A2	14-DEC-2016 10:45	BRG	DCM	

Samplenum **Container ID** **Products**
L16120352-07 837746 TDS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 09:32	AWE	BRG	

Samplenum **Container ID** **Products**
L16120352-07 837747 NH3 NO3NO2 PHOS TKN TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	ANALYZ	W1	DIG	08-DEC-2016 08:29	DCM	BRG	
3	STORE	WET	A2	26-DEC-2016 13:23	AZH	DCM	

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-07 837748 AL AS-MS CA CR-MS FE K MG MN NA SI SILICA-ICP

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	ANALYZ*	DIG	METALS	09-DEC-2016 11:51	KKB	ERP	
4	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

**Sample extract/digestate/leachate*

Samplenum **Container ID** **Products**
L16120352-07 837792 300 8260C S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:51	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 09:52	TB	BRG	
3	STORE	WET	A2	12-DEC-2016 09:25	BRG	TB	

Samplenum **Container ID** **Products**
L16120352-08 837749 MN-D AL-D AS-MSD CR-MS-D FE-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	12-DEC-2016 13:24	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:51	KKB	ERP	

**Sample extract/digestate/leachate*

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



Microbac Laboratories Inc.
Internal Chain of Custody Report

Login: L16120352
Account: 2736
Project: 2736.061
Samples: 27
Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-09 837750 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Samplenum **Container ID** **Products**
L16120352-09 837751 AL AS-MS CA CR-MS FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	ANALYZ*	DIG	METALS	09-DEC-2016 11:51	KKB	ERP	
4	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120352-10 837752 AL-D AS-MSD CR-MS-D FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	12-DEC-2016 13:24	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:51	KKB	ERP	

****Sample extract/digestate/leachate***

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



Microbac Laboratories Inc.
Internal Chain of Custody Report

Login: L16120352
Account: 2736
Project: 2736.061
Samples: 27
Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-11 837753 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Samplenum **Container ID** **Products**
L16120352-11 837754 AL AS-MS CA CR-MS FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	ANALYZ*	DIG	METALS	09-DEC-2016 11:51	KKB	ERP	
4	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120352-12 837755 AL-D AS-MSD CR-MS-D FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	12-DEC-2016 13:24	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:51	KKB	ERP	

****Sample extract/digestate/leachate***

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



Login: L16120352
Account: 2736
Project: 2736.061
Samples: 27
Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-13 837756

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Samplenum **Container ID** **Products**
L16120352-13 837757 8260C 827-PAHL 827-SPE-DIOX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	EXT	08-DEC-2016 15:39	JDH	BRG	
3	ANALYZ*	EXT	SEMI	12-DEC-2016 09:39	SCB	JDH	
4	DISP	EXT	DISP	21-DEC-2016 15:46	BJO	BJO	

****Sample extract/digestate/leachate***

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	STORE	W1	A1	20-DEC-2016 09:20	BRG	BRG	

****Sample extract/digestate/leachate***

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



Microbac Laboratories Inc.
Internal Chain of Custody Report

Login: L16120352
Account: 2736
Project: 2736.061
Samples: 27
Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-13 837758

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	07-DEC-2016 14:43	BRG		
2	DISP	EXT	DISP	13-DEC-2016 12:12	BJO	BJO	

Comments:Products cancelled.

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	STORE	W1	A1	20-DEC-2016 09:20	BRG	BRG	

Comments:Products cancelled.

Samplenum **Container ID** **Products**
L16120352-13 837759 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	ANALYZ*	DIG	METALS	09-DEC-2016 11:51	KKB	ERP	
4	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120352-14 837760 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	08-DEC-2016 10:30	ERP	BRG	
3	ANALYZ*	DIG	METALS	09-DEC-2016 11:51	KKB	ERP	
4	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

****Sample extract/digestate/leachate***

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum Container ID Products**L16120352-15 837761**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:41	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Samplenum Container ID Products**L16120352-15 837762**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	SEM	08-DEC-2016 12:46	CAS	BRG	

Comments:Products cancelled.

3	STORE	SEM	A2	12-DEC-2016 15:50	BRG	CAS	
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Comments:Products cancelled.

Samplenum Container ID Products**L16120352-15 837763**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 10:30	DCM	BRG	

Comments:Products cancelled.

3	STORE	WET	A2	14-DEC-2016 10:45	BRG	DCM	
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Comments:Products cancelled.

A1 - Sample Archive (COLD)

A2 - Sample Archive (AMBIENT)

F1 - Volatiles Freezer in Login

V1 - Volatiles Refrigerator in Login

W1 - Walkin Cooler in Login



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-15 837764 NO3 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	ANALYZ	W1	WET	07-DEC-2016 15:30	TMM	BRG	

Samplenum **Container ID** **Products**
L16120352-15 837765 TDS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 10:30	DCM	BRG	
3	STORE	WET	A2	23-DEC-2016 15:39	CLS	ADG	

Samplenum **Container ID** **Products**
L16120352-15 837766 NH3 NO3NO2 PHOS TKN TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 10:31	DCM	BRG	
3	STORE	WET	A2	26-DEC-2016 13:23	AZH	DCM	

Samplenum **Container ID** **Products**
L16120352-15 837767 CA CR-MS FE K MG MN NA SI SILICA-ICP AL AS-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	ANALYZ*	DIG	METALS	09-DEC-2016 11:51	KKB	ERP	
4	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

*Sample extract/digestate/leachate

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-15 837768 S 300 8260C ALK

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 10:31	DCM	BRG	
3	STORE	WET	A2	12-DEC-2016 09:25	BRG	TB	

Samplenum **Container ID** **Products**
L16120352-16 837769 AL-D AS-MSD CR-MS-D FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	08-DEC-2016 10:30	ERP	BRG	
3	STORE	DIG	A2	12-DEC-2016 13:24	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:51	KKB	ERP	

*Sample extract/digestate/leachate

Samplenum **Container ID** **Products**
L16120352-17 837770

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-17 837771 8260C 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	07-DEC-2016 14:43	BRG		
2	DISP	EXT	DISP	13-DEC-2016 12:12	BJO	BJO	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	STORE	W1	A1	20-DEC-2016 09:20	BRG	BRG	

Samplenum **Container ID** **Products**
L16120352-17 837772 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	12-DEC-2016 13:24	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:51	KKB	ERP	

***Sample extract/digestate/leachate**

Samplenum **Container ID** **Products**
L16120352-18 837773 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	12-DEC-2016 13:24	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:51	KKB	ERP	

***Sample extract/digestate/leachate**

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



Microbac Laboratories Inc.
Internal Chain of Custody Report

Login: L16120352
Account: 2736
Project: 2736.061
Samples: 27
Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-19 837774

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER		07-DEC-2016 14:43	BRG		

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Samplenum **Container ID** **Products**
L16120352-19 837775 8260C 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	07-DEC-2016 14:43	BRG		
2	DISP	EXT	DISP	13-DEC-2016 12:12	BJO	BJO	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER		07-DEC-2016 14:43	BRG		

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



Internal Chain of Custody Report

Login: L16120352
Account: 2736
Project: 2736.061
Samples: 27
Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-20 837776

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:19	CLS	AWE	

Comments:Products cancelled.

Samplenum **Container ID** **Products**
L16120352-20 837777 8260C 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	07-DEC-2016 14:43	BRG		
2	DISP	EXT	DISP	13-DEC-2016 12:20	BJO	BJO	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-21 837778

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Comments:Products cancelled.

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Comments:Products cancelled.

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Comments:Products cancelled.

Samplenum **Container ID** **Products**
L16120352-21 837779 8260C 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	07-DEC-2016 14:43	BRG		
2	DISP	EXT	DISP	13-DEC-2016 12:20	BJO	BJO	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER		07-DEC-2016 14:43	BRG		

Samplenum **Container ID** **Products**
L16120352-21 837780 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	STORE	DIG	A2	12-DEC-2016 13:24	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:51	KKB	ERP	

***Sample extract/digestate/leachate**

A1 - Sample Archive (COLD)

A2 - Sample Archive (AMBIENT)

F1 - Volatiles Freezer in Login

V1 - Volatiles Refrigerator in Login

W1 - Walkin Cooler in Login



Microbac Laboratories Inc.
Internal Chain of Custody Report

Login: L16120352
Account: 2736
Project: 2736.061
Samples: 27
Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-22 837781 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	ANALYZ*	DIG	METALS	09-DEC-2016 12:01	KKB	ERP	
4	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

**Sample extract/digestate/leachate*

Samplenum **Container ID** **Products**
L16120352-23 837782

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Comments:Products cancelled.

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:42	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Comments:Products cancelled.

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:43	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Comments:Products cancelled.

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-23 837783 8260C 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	07-DEC-2016 14:43	BRG		
2	DISP	EXT	DISP	13-DEC-2016 12:12	BJO	BJO	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	STORE	W1	A1	20-DEC-2016 09:20	BRG	BRG	

Samplenum **Container ID** **Products**
L16120352-23 837784 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	08-DEC-2016 10:30	ERP	BRG	
3	ANALYZ*	DIG	METALS	09-DEC-2016 12:01	KKB	ERP	
4	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120352-24 837785 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	DIG	07-DEC-2016 14:43	BRG		
2	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-25 837786 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:43	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:43	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Samplenum **Container ID** **Products**
L16120352-26 837787

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:43	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Comments:Products cancelled.

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:43	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Comments:Products cancelled.

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	07-DEC-2016 14:43	BRG		
2	ANALYZ	V1	ORG4	07-DEC-2016 15:43	TMB	BRG	
3	STORE	ORG4	A2	20-DEC-2016 07:18	CLS	AWE	

Comments:Products cancelled.

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



Internal Chain of Custody Report

Login: L16120352

Account: 2736

Project: 2736.061

Samples: 27

Due Date: 21-DEC-2016

Samplenum **Container ID** **Products**
L16120352-26 837788 8260C 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	07-DEC-2016 14:43	BRG		
2	DISP	EXT	DISP	13-DEC-2016 12:12	BJO	BJO	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	STORE	W1	A1	20-DEC-2016 09:20	BRG	BRG	

Samplenum **Container ID** **Products**
L16120352-26 837789 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	ANALYZ*	DIG	METALS	09-DEC-2016 12:01	KKB	ERP	
4	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

***Sample extract/digestate/leachate**

Samplenum **Container ID** **Products**
L16120352-27 837790 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-DEC-2016 14:43	BRG		
2	PREP	W1	DIG	07-DEC-2016 15:39	ERP	BRG	
3	ANALYZ*	DIG	METALS	09-DEC-2016 12:01	KKB	ERP	
4	STORE	DIG	A2	09-DEC-2016 13:29	BRG	ERP	

***Sample extract/digestate/leachate**

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



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 CHEMICALS

OVD 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)