



Laboratory Report Number: L16120425

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 January 03 2017

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: MW07-120716 (12/7/16 @ 09:45). Received a set of SVOC's that are labeled MS and MSD but not listed on COC. BRG	Please log ALS

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0018592	H	0.0		1015923871060004575000784908226632	X
00113323	H	0.0		1015923871060004575000784908226654	X
00113752	H	1.0		1002239571060004575000809948944311	X
0017398	H	2.0		1015923871060004575000784908226643	X
00113603	H	3.0		1015923871060004575000784908226621	X

Inspection Checklist

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

Samples Received

Client ID	Laboratory ID	Date Collected	Date Received
PZ06-120616	L16120425-01	12/07/2016 15:00	12/08/2016 10:23
PZ06-120616	L16120425-02	12/07/2016 15:00	12/08/2016 10:23
MW18-120616	L16120425-03	12/07/2016 15:40	12/08/2016 10:23
MW18-120616	L16120425-04	12/07/2016 15:40	12/08/2016 10:23
MW11S-120716	L16120425-05	12/07/2016 10:18	12/08/2016 10:23
MW11S-120716	L16120425-06	12/07/2016 10:18	12/08/2016 10:23
MW05I-120716	L16120425-07	12/07/2016 09:30	12/08/2016 10:23
MW05I-120716	L16120425-08	12/07/2016 09:30	12/08/2016 10:23
MW30-120716	L16120425-09	12/07/2016 14:06	12/08/2016 10:23
MW30-120716	L16120425-10	12/07/2016 14:06	12/08/2016 10:23
MW07-120716	L16120425-11	12/07/2016 09:45	12/08/2016 10:23
MW07-120716	L16120425-12	12/07/2016 09:45	12/08/2016 10:23
MW20-120716	L16120425-13	12/07/2016 11:25	12/08/2016 10:23
MW20-120716	L16120425-14	12/07/2016 11:25	12/08/2016 10:23
MW06-120716	L16120425-15	12/07/2016 13:55	12/08/2016 10:23
MW06-120716	L16120425-16	12/07/2016 13:55	12/08/2016 10:23
MW10-120716	L16120425-17	12/07/2016 11:20	12/08/2016 10:23
MW10-120716	L16120425-18	12/07/2016 11:20	12/08/2016 10:23
PZ03-120716	L16120425-19	12/07/2016 15:10	12/08/2016 10:23
PZ03-120716	L16120425-20	12/07/2016 15:10	12/08/2016 10:23
DUP-GW-120716-1	L16120425-21	12/07/2016 12:30	12/08/2016 10:23
DUP-GW-120716-1	L16120425-22	12/07/2016 12:30	12/08/2016 10:23
DUP-GW-120716-2	L16120425-23	12/07/2016 12:31	12/08/2016 10:23
DUP-GW-120716-2	L16120425-24	12/07/2016 12:31	12/08/2016 10:23
FB-120716	L16120425-25	12/07/2016 15:01	12/08/2016 10:23
TB-120716	L16120425-26	12/07/2016 08:00	12/08/2016 10:23
MW07-120716	L16120425-27	12/07/2016 09:45	12/08/2016 10:23
MW07-120716	L16120425-28	12/07/2016 09:45	12/08/2016 10:23



Login Number: L16120425
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: All acceptance criteria were met.

Continuing Calibration and Tune: All acceptance criteria were met.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: Recoveries out of range were observed for the following analytes: 1,4-Dioxane failed low, Benzo[ghi]perylene failed high but was non-detect in the associated samples. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
WG594288-02	1,4-Dioxane	2016-12-15 14:12:00	42.0	50	150	Recovery
WG594288-02	Benzo[ghi]perylene	2016-12-15 14:12:00	143	45	140	Recovery

Matrix Spikes: Recoveries out of range were observed for the following analyte: 1,4-Dioxane failed marginally low in the MS but was acceptable in the MSD. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
L16120425-27	1,4-Dioxane	2016-12-15 20:02:00	49.6	50	150	Recovery

SAMPLES

Samples: All acceptance criteria were met.

Internal Standards: All acceptance criteria were met.

Surrogates: Recoveries out of range were observed for the following surrogate: 2-Fluorobiphenyl failed low. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
L16120425-07	2-Fluorobiphenyl	2016-12-15 16:51:00	35.0	43	116	Recovery

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: 120643
Approved By: Eric Lawson

Eri C. Zimm



Login Number: L16120425
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: The MS/MSD results were not associated with this sample delivery group.

SAMPLES

Samples: All acceptance criteria were met.

Internal Standards: All acceptance criteria were met.

Surrogates: Recoveries out of range were observed for the following surrogate: p-Terphenyl-d14 failed low. Sample 03 was not re-extracted per client instructions. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
L16120425-03	p-Terphenyl-d14	2016-12-12 22:48:00	23.9	33	141	Recovery

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: 120479
Approved By: Mary Schilling

may Schilling



Login Number: L16120425
Department: Metals
Analyst: Kerri Buck
Analyst #2: Ji Hu

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: 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 21 and 24 along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for sodium. The continuing calibration verification analyzed on 16-DEC-2016 at 03:09 yielded a noncompliant recovery for potassium. However, client samples were bracketed by compliant CCVs, therefore, no further action was taken. 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.

WG594875 - Due to continuing calibration verification failure for iron on 21-Dec-2016 at 19:56, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for iron.

Continuing Calibration Blank: WG594872 - The continuing calibration blank analyzed on 16-DEC-2016 at 02:50 yielded a result for calcium that was over the reporting limit. However, client samples were bracketed by compliant CCBs for

calcium, 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: WG594872 - All acceptance criteria were met.

WG594875 - All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: WG594872 - Client sample 23 required dilution analysis in order to obtain a result for sodium within the linear range.

WG594875 - Client samples 01, 05, 09, and 19 required dilution analysis in order to obtain results for sodium within the linear range.

Narrative ID: 120590

Approved By: Kerri Buck

K: K Buck



Login Number: L16120425
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 01, 02 and the batch QA/QC samples were reanalyzed on a later calibration which was compliant for chromium.

WG596004 - Due to continuing calibration verification failure for chromium on 21-DEC-2016 at 20:40, client samples 19, 20 and the batch QA/QC 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: WG595999 - The post digestion spike was reanalyzed on a later calibration for all analytes and was compliant for analytes of concern.

WG596004 - All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: WG595999 - Client samples 05 and 06 required dilution analyses in order to obtain results for arsenic within the linear range.

WG596004 - Client samples 23 and 24 required dilution analyses in order to obtain results for arsenic within the linear range.

Narrative ID: 120880

Approved By: Kerri Buck

K: K Buck



Login Number: L16120425
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, 05, and 09 were analyzed at dilutions only due to their pre-run screen results for CL and/or 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: 120807

Approved By: Mary Schilling

A handwritten signature in cursive script, appearing to read "Mary Schilling".



Login Number: L16120425
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: 120658
Approved By: Deanna Hesson

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



Login Number: L16120425
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: 120659
Approved By: Deanna Hesson

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



Login Number: L16120425
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: 120376
Approved By: Deanna Hesson

Danna Hesson



Login Number: L16120425
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: 120660
Approved By: Deanna Hesson

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



Login Number: L16120425
Department: Conventionals
Analyst: April Greene

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: 120662
Approved By: Deanna Hesson

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



Login Number: L16120425
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: 120664
Approved By: Deanna Hesson

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



Login Number: L16120425
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: 120665
Approved By: Deanna Hesson

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



Login Number: L16120425
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: 120661

Approved By: Deanna Hesson

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



Login Number: L16120425
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: 120663
Approved By: Deanna Hesson

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

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: HPMS9
Client ID: PZ06-120616	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 16:56
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: 9M977671
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfur dioxide		29.2		0.000	0.000

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: HPMS9
Client ID: PZ06-120616	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 16:56
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: 9M977671
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	6.31	J	10.0	2.50
Benzene	71-43-2		U	1.00	0.500
Bromochloromethane	74-97-5		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	90.0	80	120	
Dibromofluoromethane	94.3	86	118	
p-Bromofluorobenzene	103	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.

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ06-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:04
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: T3.122216.200436
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.520		0.100	0.0500

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: PZ06-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:18
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: T4.122116.201839
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	0.326		0.200	0.100
Calcium, Total	7440-70-2	18.0		0.500	0.250
Magnesium, Total	7439-95-4	5.03		0.500	0.250
Manganese, Total	7439-96-5	0.0142		0.0100	0.00500
Potassium, Total	7440-09-7	5.54		1.00	0.500
Silica, Calculated as SiO2		13.1		2.14	1.07
Silicon, Total	7440-21-3	6.14		1.00	0.500

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ06-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:08
Collect Date: 12/07/2016 15:00	Dilution: 5	File ID: T3.122216.200831
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	428		2.50	1.25
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 #: L16120425-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ06-120616	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 18:49
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: NI.122116.184931
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00706		0.00100	0.000500

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ06-120616	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 10:21
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: NI.122316.102115
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.00470		0.00200	0.00100

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: IC3
Client ID: PZ06-120616	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 16:31
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: I3_122016-07
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	61.7	E	0.200	0.100
Sulfate	14808-79-8	47.8		1.00	0.500
E	Semiquantitative result (out of calibration range)				

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: IC3
Client ID: PZ06-120616	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 16:51
Collect Date: 12/07/2016 15:00	Dilution: 5	File ID: I3_122016-08
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	66.2		1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Sulfate	14808-79-8	46.3		5.00	2.50

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ06-120616	Prep Method: 310.2	Prep Date: N/A
Matrix: Water	Analytical Method: 310.2	Cal Date: 12/12/2016 09:33
Workgroup #: WG594451	Analyst: DCM	Run Date: 12/12/2016 09:37
Collect Date: 12/07/2016 15:00	Dilution: 4	File ID: S2161212002.015
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	563		80.0	40.0

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ06-120616	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 08:39
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: S2161216001.018
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	0.208		0.100	0.0500

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ06-120616	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: 12/07/2016 15:00	Dilution: 5	File ID: S216121315051701
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	0.720		0.250	0.125

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ06-120616	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: 12/07/2016 15:00	Dilution: 52	File ID: S216121315053401
Sample Tag:	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		7.64		2.60	1.30

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: PZ06-120616	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/13/2016 09:26
Workgroup #: WG594624	Analyst: DCM	Run Date: 12/13/2016 09:33
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: SC161213002.018
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 #: L16120425-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: PZ06-120616	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 12/08/2016 13:50
Workgroup #: WG594146	Analyst: ADG	Run Date: 12/08/2016 15:06
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: 00.1612081506-09
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2	0.135		0.0500	0.0250

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: BURET
Client ID: PZ06-120616	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: 12/07/2016 15:00	Dilution: 1	File ID: ET.1612091030-07
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8		U	1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: OVEN
Client ID: PZ06-120616	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594207	Analyst: AWE	Run Date: 12/09/2016 08:12
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: EN.1612090812-04
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		1110		20.0	10.0

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: PZ06-120616	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/13/2016 08:05
Workgroup #: WG594601	Analyst: DCM	Run Date: 12/13/2016 08:27
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: SC161213001.031
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	0.405		0.200	0.100

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: PZ06-120616	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 21:35
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: TC12152016.049
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	2.93		1.00	0.500

Sample #: L16120425-02	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ06-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:12
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: T3.122216.201226
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6		U	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.				

Certificate of Analysis

Sample #: L16120425-02	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: PZ06-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:22
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: T4.122116.202225
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		U	0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-02	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ06-120616	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 10:24
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: NI.122316.102420
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.00232		0.00200	0.00100

Sample #: L16120425-02	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ06-120616	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 18:52
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: NI.122116.185237
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00351		0.00100	0.000500

Sample #: L16120425-03	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW18-120616	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 17:30
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: 9M977672
Sample Tag: 01	Units: ug/L	

Certificate of Analysis

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

Sample #: L16120425-03	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW18-120616	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 17:30
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: 9M977672
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

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	89.1	80	120		
Dibromofluoromethane	95.6	86	118		
p-Bromofluorobenzene	106	86	115		
Toluene-d8	101	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-03	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW18-120616	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 22:48
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: 7M68279
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0602	0.0301
Acenaphthene	83-32-9		U	0.0602	0.0301
Acenaphthylene	208-96-8		U	0.0602	0.0301

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Anthracene	120-12-7		U	0.0602	0.0301
Benzo(a)anthracene	56-55-3	0.0358	J	0.0602	0.0301
Benzo(a)pyrene	50-32-8		U	0.0602	0.0301
Benzo(b)fluoranthene	205-99-2	0.0575	J	0.0602	0.0301
Benzo(g,h,i)perylene	191-24-2		U	0.0602	0.0301
Benzo(k)fluoranthene	207-08-9		U	0.0602	0.0301
Chrysene	218-01-9	0.0369	J	0.0602	0.0301
Dibenzo(a,h)anthracene	53-70-3		U	0.0602	0.0301
Fluoranthene	206-44-0	0.0740		0.0602	0.0301
Fluorene	86-73-7		U	0.0602	0.0301
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0602	0.0301
Naphthalene	91-20-3		U	0.0602	0.0301
Phenanthrene	85-01-8	0.0750		0.0602	0.0301
Pyrene	129-00-0	0.0801		0.0602	0.0301

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2-Fluorobiphenyl	74.4	43	116	
Nitrobenzene-d5	84.8	35	114	
p-Terphenyl-d14	23.9	33	141	*

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

Sample #: L16120425-03	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW18-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:16
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: T3.122216.201618
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	21.9		0.100	0.0500

Sample #: L16120425-03	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW18-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:26
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: T4.122116.202612
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	5.04		0.200	0.100

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Calcium, Total	7440-70-2	151		0.500	0.250
Magnesium, Total	7439-95-4	25.1		0.500	0.250
Manganese, Total	7439-96-5	1.14		0.0100	0.00500
Potassium, Total	7440-09-7	11.0		1.00	0.500
Sodium, Total	7440-23-5	172		0.500	0.250

Sample #: L16120425-03	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW18-120616	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 18:55
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: NI.122116.185542
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00587		0.00100	0.000500

Sample #: L16120425-04	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW18-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:29
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: T4.122116.202956
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	1.24		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-04	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW18-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:20
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: T3.122216.202007
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	5.03		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-04	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW18-120616	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 19:05
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: NI.122116.190501
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000724	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW11S-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:31
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: T3.122216.203129
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.0687	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 #: L16120425-05	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW11S-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:33
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: T4.122116.203342
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	3.40		0.500	0.250
Magnesium, Total	7439-95-4	3.73		0.500	0.250
Manganese, Total	7439-96-5	0.0101		0.0100	0.00500
Potassium, Total	7440-09-7	2.03		1.00	0.500
Silica, Calculated as SiO2		10.2		2.14	1.07
Silicon, Total	7440-21-3	4.75		1.00	0.500
E	Semiquantitative result (out of calibration range)				
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 #: L16120425-05	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW11S-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:43
Collect Date: 12/07/2016 10:18	Dilution: 5	File ID: T3.122216.204305
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	683		2.50	1.25
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW11S-120716	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 10:27
Collect Date: 12/07/2016 10:18	Dilution: 100	File ID: NI.122316.102726
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	1.13		0.100	0.0500

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: IC3
Client ID: MW11S-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 17:11
Collect Date: 12/07/2016 10:18	Dilution: 5	File ID: I3_122016-09
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	539	E	1.00	0.500
Sulfate	14808-79-8	261		5.00	2.50
E	Semiquantitative result (out of calibration range)				

Certificate of Analysis

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: IC3
Client ID: MW11S-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/21/2016 10:02
Collect Date: 12/07/2016 10:18	Dilution: 50	File ID: I3_122016-31
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	676		10.0	5.00
Sulfate	14808-79-8	256		50.0	25.0

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW11S-120716	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: 12/07/2016 10:18	Dilution: 2	File ID: S2161212004.019
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	431		40.0	20.0

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW11S-120716	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 08:40
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: S2161216001.019
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	0.323		0.100	0.0500

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW11S-120716	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: 12/07/2016 10:18	Dilution: 4	File ID: S216121315061601
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		0.732		0.200	0.100

Certificate of Analysis

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW11S-120716	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: 12/07/2016 10:18	Dilution: 4	File ID: S216121315055901
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	0.732		0.200	0.100

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW11S-120716	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/13/2016 09:26
Workgroup #: WG594624	Analyst: DCM	Run Date: 12/13/2016 09:35
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: SC161213002.021
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0	0.215		0.200	0.100

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: UV-2600
Client ID: MW11S-120716	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 12/08/2016 13:50
Workgroup #: WG594146	Analyst: ADG	Run Date: 12/08/2016 15:06
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: 00.1612081506-10
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2	0.400		0.0500	0.0250

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: BURET
Client ID: MW11S-120716	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: 12/07/2016 10:18	Dilution: 1	File ID: ET.1612091030-08
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	0.681	J	1.00	0.500
J	The analyte was positively identified, but the quantitation was below the RL.				

Certificate of Analysis

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: OVEN
Client ID: MW11S-120716	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594207	Analyst: AWE	Run Date: 12/09/2016 08:12
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: EN.1612090812-05
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		1870		20.0	10.0

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW11S-120716	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/13/2016 08:05
Workgroup #: WG594601	Analyst: DCM	Run Date: 12/13/2016 08:30
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: SC161213001.034
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	0.230		0.200	0.100

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: MW11S-120716	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 22:10
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: TC12152016.052
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	3.42		1.00	0.500

Sample #: L16120425-06	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW11S-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:37
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: T4.122116.203737
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	0.0105		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-06	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW11S-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:47
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: T3.122216.204701
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6		U	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 #: L16120425-06	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW11S-120716	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 10:30
Collect Date: 12/07/2016 10:18	Dilution: 100	File ID: NI.122316.103031
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	1.11		0.100	0.0500

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW05I-120716	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 18:00
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: 9M977673
Sample Tag: 01	Units: ug/L	

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

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW05I-120716	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 18:00
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: 9M977673
Sample Tag: 01	Units: ug/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,1,2,2-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
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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	90.3	80	120		
Dibromofluoromethane	94.2	86	118		
p-Bromofluorobenzene	105	86	115		
Toluene-d8	101	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW051-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 16:51
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: 12M60655
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN		7.58		0.000	0.000

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW051-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 16:51
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: 12M60655
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	27.4	3.42
1,3,5-Trinitrobenzene	99-35-4		U	6.85	3.42

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Analyte	CAS #	Result	Qual	RL	MDL
1,3-Dinitrobenzene	99-65-0		U	6.85	3.42
1,4-Dioxane	123-91-1		U	13.7	6.85
2,4,5-Trichlorophenol	95-95-4		U	6.85	3.42
2,4,6-Trichlorophenol	88-06-2		U	6.85	3.42
2,4-Dichlorophenol	120-83-2		U	6.85	3.42
2,4-Dimethylphenol	105-67-9		U	6.85	3.42
2,4-Dinitrophenol	51-28-5		U	34.2	17.1
2,4-Dinitrotoluene	121-14-2		U	6.85	3.42
2,6-Dinitrotoluene	606-20-2		U	6.85	3.42
2-Chloronaphthalene	91-58-7		U	6.85	3.42
2-Chlorophenol	95-57-8		U	6.85	3.42
2-Methylnaphthalene	91-57-6		U	6.85	3.42
2-Methylphenol	95-48-7		U	6.85	3.42
2-Nitroaniline	88-74-4		U	34.2	17.1
2-Nitrophenol	88-75-5		U	6.85	3.42
3-Nitroaniline	99-09-2		U	34.2	17.1
3,3'-Dichlorobenzidine	91-94-1		U	6.85	3.42
3-,4-Methylphenol	65794-96-9		U	6.85	3.42
4-Bromophenyl-phenylether	101-55-3		U	6.85	3.42
4-Chloroaniline	106-47-8		U	6.85	3.42
4-Nitrophenol	100-02-7		U	34.2	17.1
Acenaphthene	83-32-9		U	6.85	3.42
Acenaphthylene	208-96-8		U	6.85	3.42
Anthracene	120-12-7		U	6.85	3.42
Benzo(a)anthracene	56-55-3		U	6.85	3.42
Benzo(a)pyrene	50-32-8		U	6.85	3.42
Benzo(b)fluoranthene	205-99-2		U	6.85	3.42
Benzo(g,h,i)Perylene	191-24-2		U	6.85	3.42
Benzo(k)fluoranthene	207-08-9		U	6.85	3.42
Benzoic acid	65-85-0		U	27.4	13.7
Benzyl alcohol	100-51-6		U	6.85	3.42
Bis(2-Chloroethyl)ether	111-44-4		U	6.85	3.42
Bis(2-Chloroethoxy)Methane	111-91-1		U	6.85	3.42
bis(2-Ethylhexyl)phthalate	117-81-7		U	6.85	3.42
Butylbenzylphthalate	85-68-7		U	6.85	3.42
Carbazole	86-74-8		U	27.4	3.42
Chrysene	218-01-9		U	6.85	3.42
Di-N-Butylphthalate	84-74-2		U	6.85	3.42
Di-n-octylphthalate	117-84-0		U	6.85	3.42

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Dibenzo(a,h)Anthracene	53-70-3		U	6.85	3.42
Dibenzofuran	132-64-9		U	6.85	3.42
Diethylphthalate	84-66-2		U	6.85	3.42
Dimethylphthalate	131-11-3		U	6.85	3.42
Fluoranthene	206-44-0		U	6.85	3.42
Fluorene	86-73-7		U	6.85	3.42
Hexachlorobenzene	118-74-1		U	6.85	3.42
Hexachlorobutadiene	87-68-3		U	6.85	3.42
Hexachlorocyclopentadiene	77-47-4		U	6.85	3.42
Hexachloroethane	67-72-1		U	6.85	3.42
Indeno(1,2,3-cd)pyrene	193-39-5		U	6.85	3.42
Isophorone	78-59-1		U	6.85	3.42
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	6.85	3.42
Naphthalene	91-20-3		U	6.85	3.42
Nitrobenzene	98-95-3		U	6.85	3.42
Pentachlorophenol	87-86-5		U	34.2	17.1
Phenanthrene	85-01-8		U	6.85	3.42
Phenol	108-95-2		U	6.85	3.42
Pyrene	129-00-0		U	6.85	3.42

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2,4,6-Tribromophenol	21.0	10	123	
2-Fluorobiphenyl	35.0	43	116	*
2-Fluorophenol	31.3	21	100	
Nitrobenzene-d5	39.2	35	114	
p-Terphenyl-d14	66.7	33	141	
Phenol-d5	36.4	10	94	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW05I-120716	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 23:15
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: 7M68280
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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	74.6	43	116		
Nitrobenzene-d5	82.7	35	114		
p-Terphenyl-d14	64.3	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW05I-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:51
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: T3.122216.205104
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.208		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW05I-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:56
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: T4.122116.205633
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	77.5		0.500	0.250

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Magnesium, Total	7439-95-4	19.2		0.500	0.250
Manganese, Total	7439-96-5	0.0851		0.0100	0.00500
Potassium, Total	7440-09-7	4.11		1.00	0.500
Sodium, Total	7440-23-5	71.7		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW05I-120716	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 19:14
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: NI.122116.191417
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00108		0.00100	0.000500

Sample #: L16120425-08	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW05I-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:54
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: T3.122216.205457
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	0.177		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-08	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW05I-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:00
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: T4.122116.210018
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	0.0841		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-08	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW051-120716	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 19:17
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: NI.122116.191722
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000991	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:58
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: T3.122216.205850
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.475		0.100	0.0500

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:04
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: T4.122116.210405
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	0.252		0.200	0.100
Calcium, Total	7440-70-2	49.5		0.500	0.250
Magnesium, Total	7439-95-4	20.5		0.500	0.250
Manganese, Total	7439-96-5	0.0260		0.0100	0.00500
Potassium, Total	7440-09-7	7.36		1.00	0.500
Silica, Calculated as SiO2		21.9		2.14	1.07
Silicon, Total	7440-21-3	10.2		1.00	0.500

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Sample #: L16120425-09	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:02
Collect Date: 12/07/2016 14:06	Dilution: 5	File ID: T3.122216.210251
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	860		2.50	1.25
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW30-120716	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 19:20
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: NI.122116.192028
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.0314		0.00100	0.000500

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: IC3
Client ID: MW30-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 17:52
Collect Date: 12/07/2016 14:06	Dilution: 4	File ID: I3_122016-11
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	174	E	0.800	0.400
Sulfate	14808-79-8	232		4.00	2.00
E	Semiquantitative result (out of calibration range)				

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: IC3
Client ID: MW30-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 18:12
Collect Date: 12/07/2016 14:06	Dilution: 20	File ID: I3_122016-12
Sample Tag: DL02	Units: mg/L	

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Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	176		4.00	2.00
Sulfate	14808-79-8	223		20.0	10.0

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW30-120716	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 12:45
Collect Date: 12/07/2016 14:06	Dilution: 5	File ID: S2161212004.020
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	563		100	50.0

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW30-120716	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 08:44
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: S2161216001.022
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	0.473		0.100	0.0500

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW30-120716	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: 12/07/2016 14:06	Dilution: 100	File ID: S216121316134701
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		16.8		5.00	2.50

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW30-120716	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: 12/07/2016 14:06	Dilution: 100	File ID: S216121315062801
Sample Tag:	Units: mg/L	

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Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	16.8		5.00	2.50

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW30-120716	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/13/2016 09:26
Workgroup #: WG594624	Analyst: DCM	Run Date: 12/13/2016 09:36
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: SC161213002.022
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0	0.185	J	0.200	0.100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: UV-2600
Client ID: MW30-120716	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 12/08/2016 13:50
Workgroup #: WG594146	Analyst: ADG	Run Date: 12/08/2016 15:06
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: 00.1612081506-11
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2	0.279		0.0500	0.0250

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: BURET
Client ID: MW30-120716	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: 12/07/2016 14:06	Dilution: 1	File ID: ET.1612091030-09
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	1.74		1.00	0.500

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: OVEN
Client ID: MW30-120716	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594207	Analyst: AWE	Run Date: 12/09/2016 08:12
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: EN.1612090812-06
Sample Tag:	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		1670		20.0	10.0

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW30-120716	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/13/2016 08:05
Workgroup #: WG594601	Analyst: DCM	Run Date: 12/13/2016 08:31
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: SC161213001.035
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	0.448		0.200	0.100

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: MW30-120716	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 22:23
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: TC12152016.053
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	7.41		1.00	0.500

Sample #: L16120425-10	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:06
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: T3.122216.210645
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	0.343		0.100	0.0500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-10	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:07
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: T4.122116.210759
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
Manganese, Dissolved	7439-96-5	0.0448		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-10	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:23
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: NI.122116.192334
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000546	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-10	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:42
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: NI.122116.194211
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00284		0.00100	0.000500

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW07-120716	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 18:31
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 9M977674
Sample Tag: 01	Units: ug/L	

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

Certificate of Analysis

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW07-120716	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 18:31
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 9M977674
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
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	90.5	80	120	
Dibromofluoromethane	95.9	86	118	
p-Bromofluorobenzene	107	86	115	
Toluene-d8	102	88	110	

U Not detected at or above adjusted sample detection limit.

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 17:23
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60656
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	20.0	2.50
1,3,5-Trinitrobenzene	99-35-4		U	5.00	2.50
1,3-Dinitrobenzene	99-65-0		U	5.00	2.50
1,4-Dioxane	123-91-1		U	10.0	5.00
2,4,5-Trichlorophenol	95-95-4		U	5.00	2.50
2,4,6-Trichlorophenol	88-06-2		U	5.00	2.50

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2,4-Dichlorophenol	120-83-2		U	5.00	2.50
2,4-Dimethylphenol	105-67-9		U	5.00	2.50
2,4-Dinitrophenol	51-28-5		U	25.0	12.5
2,4-Dinitrotoluene	121-14-2		U	5.00	2.50
2,6-Dinitrotoluene	606-20-2		U	5.00	2.50
2-Chloronaphthalene	91-58-7		U	5.00	2.50
2-Chlorophenol	95-57-8		U	5.00	2.50
2-Methylnaphthalene	91-57-6		U	5.00	2.50
2-Methylphenol	95-48-7		U	5.00	2.50
2-Nitroaniline	88-74-4		U	25.0	12.5
2-Nitrophenol	88-75-5		U	5.00	2.50
3-Nitroaniline	99-09-2		U	25.0	12.5
3,3'-Dichlorobenzidine	91-94-1		U	5.00	2.50
3-,4-Methylphenol	65794-96-9		U	5.00	2.50
4-Bromophenyl-phenylether	101-55-3		U	5.00	2.50
4-Chloroaniline	106-47-8		U	5.00	2.50
4-Nitrophenol	100-02-7		U	25.0	12.5
Acenaphthene	83-32-9		U	5.00	2.50
Acenaphthylene	208-96-8		U	5.00	2.50
Anthracene	120-12-7		U	5.00	2.50
Benzo(a)anthracene	56-55-3		U	5.00	2.50
Benzo(a)pyrene	50-32-8		U	5.00	2.50
Benzo(b)fluoranthene	205-99-2		U	5.00	2.50
Benzo(g,h,i)Perylene	191-24-2		U	5.00	2.50
Benzo(k)fluoranthene	207-08-9		U	5.00	2.50
Benzoic acid	65-85-0		U	20.0	10.0
Benzyl alcohol	100-51-6		U	5.00	2.50
Bis(2-Chloroethyl)ether	111-44-4		U	5.00	2.50
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.00	2.50
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.00	2.50
Butylbenzylphthalate	85-68-7		U	5.00	2.50
Carbazole	86-74-8		U	20.0	2.50
Chrysene	218-01-9		U	5.00	2.50
Di-N-Butylphthalate	84-74-2		U	5.00	2.50
Di-n-octylphthalate	117-84-0		U	5.00	2.50
Dibenzo(a,h)Anthracene	53-70-3		U	5.00	2.50
Dibenzofuran	132-64-9		U	5.00	2.50
Diethylphthalate	84-66-2		U	5.00	2.50
Dimethylphthalate	131-11-3		U	5.00	2.50

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Fluoranthene	206-44-0		U	5.00	2.50
Fluorene	86-73-7		U	5.00	2.50
Hexachlorobenzene	118-74-1		U	5.00	2.50
Hexachlorobutadiene	87-68-3		U	5.00	2.50
Hexachlorocyclopentadiene	77-47-4		U	5.00	2.50
Hexachloroethane	67-72-1		U	5.00	2.50
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.00	2.50
Isophorone	78-59-1		U	5.00	2.50
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.00	2.50
Naphthalene	91-20-3		U	5.00	2.50
Nitrobenzene	98-95-3		U	5.00	2.50
Pentachlorophenol	87-86-5		U	25.0	12.5
Phenanthrene	85-01-8		U	5.00	2.50
Phenol	108-95-2		U	5.00	2.50
Pyrene	129-00-0		U	5.00	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2,4,6-Tribromophenol	43.8	10	123	
2-Fluorobiphenyl	50.6	43	116	
2-Fluorophenol	45.1	21	100	
Nitrobenzene-d5	55.1	35	114	
p-Terphenyl-d14	55.5	33	141	
Phenol-d5	51.5	10	94	

U Not detected at or above adjusted sample detection limit.

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 17:23
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60656
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN		10.1		0.000	0.000

Certificate of Analysis

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW07-120716	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 23:41
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 7M68281
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0538	0.0269
Acenaphthene	83-32-9		U	0.0538	0.0269
Acenaphthylene	208-96-8		U	0.0538	0.0269
Anthracene	120-12-7		U	0.0538	0.0269
Benzo(a)anthracene	56-55-3		U	0.0538	0.0269
Benzo(a)pyrene	50-32-8		U	0.0538	0.0269
Benzo(b)fluoranthene	205-99-2		U	0.0538	0.0269
Benzo(g,h,i)perylene	191-24-2		U	0.0538	0.0269
Benzo(k)fluoranthene	207-08-9		U	0.0538	0.0269
Chrysene	218-01-9		U	0.0538	0.0269
Dibenzo(a,h)anthracene	53-70-3		U	0.0538	0.0269
Fluoranthene	206-44-0		U	0.0538	0.0269
Fluorene	86-73-7		U	0.0538	0.0269
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0538	0.0269
Naphthalene	91-20-3		U	0.0538	0.0269
Phenanthrene	85-01-8		U	0.0538	0.0269
Pyrene	129-00-0		U	0.0538	0.0269
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	78.2	43	116		
Nitrobenzene-d5	86.3	35	114		
p-Terphenyl-d14	56.9	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:10
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: T3.122216.211038
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.236		0.100	0.0500
J	The analyte was positively identified, but the quantitation was below the RL.				

Certificate of Analysis

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:11
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: T4.122116.211144
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	0.308		0.200	0.100
Calcium, Total	7440-70-2	61.6		0.500	0.250
Magnesium, Total	7439-95-4	8.46		0.500	0.250
Manganese, Total	7439-96-5	0.00545	J	0.0100	0.00500
Potassium, Total	7440-09-7	3.08		1.00	0.500
Sodium, Total	7440-23-5	260		0.500	0.250
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:45
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: NI.122116.194517
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00454		0.00100	0.000500

Sample #: L16120425-12	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:15
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: T4.122116.211530
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		U	0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-12	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:14
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: T3.122216.211433
Sample Tag: 01	Units: mg/L	

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

Sample #: L16120425-12	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:48
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: NI.122116.194822
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00584		0.00100	0.000500

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW20-120716	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 19:01
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: 9M977675
Sample Tag: 01	Units: ug/L	

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

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW20-120716	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 19:01
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: 9M977675
Sample Tag: 01	Units: ug/L	

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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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
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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	90.0	80	120		
Dibromofluoromethane	94.6	86	118		
p-Bromofluorobenzene	106	86	115		
Toluene-d8	102	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW20-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 17:55
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: 12M60657
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	22.5	2.81
1,3,5-Trinitrobenzene	99-35-4		U	5.62	2.81
1,3-Dinitrobenzene	99-65-0		U	5.62	2.81
1,4-Dioxane	123-91-1		U	11.2	5.62
2,4,5-Trichlorophenol	95-95-4		U	5.62	2.81
2,4,6-Trichlorophenol	88-06-2		U	5.62	2.81
2,4-Dichlorophenol	120-83-2		U	5.62	2.81
2,4-Dimethylphenol	105-67-9		U	5.62	2.81
2,4-Dinitrophenol	51-28-5		U	28.1	14.0
2,4-Dinitrotoluene	121-14-2		U	5.62	2.81
2,6-Dinitrotoluene	606-20-2		U	5.62	2.81
2-Chloronaphthalene	91-58-7		U	5.62	2.81
2-Chlorophenol	95-57-8		U	5.62	2.81
2-Methylnaphthalene	91-57-6		U	5.62	2.81

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylphenol	95-48-7		U	5.62	2.81
2-Nitroaniline	88-74-4		U	28.1	14.0
2-Nitrophenol	88-75-5		U	5.62	2.81
3-Nitroaniline	99-09-2		U	28.1	14.0
3,3'-Dichlorobenzidine	91-94-1		U	5.62	2.81
3-,4-Methylphenol	65794-96-9		U	5.62	2.81
4-Bromophenyl-phenylether	101-55-3		U	5.62	2.81
4-Chloroaniline	106-47-8		U	5.62	2.81
4-Nitrophenol	100-02-7		U	28.1	14.0
Acenaphthene	83-32-9		U	5.62	2.81
Acenaphthylene	208-96-8		U	5.62	2.81
Anthracene	120-12-7		U	5.62	2.81
Benzo(a)anthracene	56-55-3		U	5.62	2.81
Benzo(a)pyrene	50-32-8		U	5.62	2.81
Benzo(b)fluoranthene	205-99-2		U	5.62	2.81
Benzo(g,h,i)Perylene	191-24-2		U	5.62	2.81
Benzo(k)fluoranthene	207-08-9		U	5.62	2.81
Benzoic acid	65-85-0		U	22.5	11.2
Benzyl alcohol	100-51-6		U	5.62	2.81
Bis(2-Chloroethyl)ether	111-44-4		U	5.62	2.81
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.62	2.81
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.62	2.81
Butylbenzylphthalate	85-68-7		U	5.62	2.81
Carbazole	86-74-8		U	22.5	2.81
Chrysene	218-01-9		U	5.62	2.81
Di-N-Butylphthalate	84-74-2		U	5.62	2.81
Di-n-octylphthalate	117-84-0		U	5.62	2.81
Dibenzo(a,h)Anthracene	53-70-3		U	5.62	2.81
Dibenzofuran	132-64-9		U	5.62	2.81
Diethylphthalate	84-66-2		U	5.62	2.81
Dimethylphthalate	131-11-3		U	5.62	2.81
Fluoranthene	206-44-0		U	5.62	2.81
Fluorene	86-73-7		U	5.62	2.81
Hexachlorobenzene	118-74-1		U	5.62	2.81
Hexachlorobutadiene	87-68-3		U	5.62	2.81
Hexachlorocyclopentadiene	77-47-4		U	5.62	2.81
Hexachloroethane	67-72-1		U	5.62	2.81
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.62	2.81
Isophorone	78-59-1		U	5.62	2.81

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.62	2.81
Naphthalene	91-20-3		U	5.62	2.81
Nitrobenzene	98-95-3		U	5.62	2.81
Pentachlorophenol	87-86-5		U	28.1	14.0
Phenanthrene	85-01-8		U	5.62	2.81
Phenol	108-95-2		U	5.62	2.81
Pyrene	129-00-0		U	5.62	2.81
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	40.3	10	123		
2-Fluorobiphenyl	49.1	43	116		
2-Fluorophenol	47.2	21	100		
Nitrobenzene-d5	54.4	35	114		
p-Terphenyl-d14	89.2	33	141		
Phenol-d5	53.4	10	94		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW20-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 17:55
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: 12M60657
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN		4.51		0.000	0.000

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW20-120716	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 00:08
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: 7M68282
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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	61.5	43	116		
Nitrobenzene-d5	70.6	35	114		
p-Terphenyl-d14	78.3	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:19
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: T4.122116.211914
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	109		0.500	0.250
Magnesium, Total	7439-95-4	17.2		0.500	0.250
Manganese, Total	7439-96-5		U	0.0100	0.00500
Potassium, Total	7440-09-7	5.69		1.00	0.500
Sodium, Total	7440-23-5	16.8		0.500	0.250
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 #: L16120425-13	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:18
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: T3.122216.211826
Sample Tag: 01	Units: mg/L	

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

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:51
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: NI.122116.195128
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2		U	0.00100	0.000500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-14	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:29
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: T3.122216.212950
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6		U	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 #: L16120425-14	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:23
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: T4.122116.212300
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
Manganese, Dissolved	7439-96-5	0.00625	J	0.0100	0.00500
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-14	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:54
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: NI.122116.195433
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000513	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW06-120716	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 19:31
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: 9M977676
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfur dioxide		0.370		0.000	0.000

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW06-120716	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 19:31
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: 9M977676
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		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

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	90.4	80	120		
Dibromofluoromethane	94.7	86	118		
p-Bromofluorobenzene	105	86	115		
Toluene-d8	103	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW06-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 18:27
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: 12M60658
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN		5.71		0.000	0.000

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW06-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 18:27
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: 12M60658
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	21.3	2.66
1,3,5-Trinitrobenzene	99-35-4		U	5.32	2.66
1,3-Dinitrobenzene	99-65-0		U	5.32	2.66
1,4-Dioxane	123-91-1		U	10.6	5.32
2,4,5-Trichlorophenol	95-95-4		U	5.32	2.66
2,4,6-Trichlorophenol	88-06-2		U	5.32	2.66
2,4-Dichlorophenol	120-83-2		U	5.32	2.66
2,4-Dimethylphenol	105-67-9		U	5.32	2.66

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2,4-Dinitrophenol	51-28-5		U	26.6	13.3
2,4-Dinitrotoluene	121-14-2		U	5.32	2.66
2,6-Dinitrotoluene	606-20-2		U	5.32	2.66
2-Chloronaphthalene	91-58-7		U	5.32	2.66
2-Chlorophenol	95-57-8		U	5.32	2.66
2-Methylnaphthalene	91-57-6		U	5.32	2.66
2-Methylphenol	95-48-7		U	5.32	2.66
2-Nitroaniline	88-74-4		U	26.6	13.3
2-Nitrophenol	88-75-5		U	5.32	2.66
3-Nitroaniline	99-09-2		U	26.6	13.3
3,3'-Dichlorobenzidine	91-94-1		U	5.32	2.66
3-,4-Methylphenol	65794-96-9		U	5.32	2.66
4-Bromophenyl-phenylether	101-55-3		U	5.32	2.66
4-Chloroaniline	106-47-8		U	5.32	2.66
4-Nitrophenol	100-02-7		U	26.6	13.3
Acenaphthene	83-32-9		U	5.32	2.66
Acenaphthylene	208-96-8		U	5.32	2.66
Anthracene	120-12-7		U	5.32	2.66
Benzo(a)anthracene	56-55-3		U	5.32	2.66
Benzo(a)pyrene	50-32-8		U	5.32	2.66
Benzo(b)fluoranthene	205-99-2		U	5.32	2.66
Benzo(g,h,i)Perylene	191-24-2		U	5.32	2.66
Benzo(k)fluoranthene	207-08-9		U	5.32	2.66
Benzoic acid	65-85-0		U	21.3	10.6
Benzyl alcohol	100-51-6		U	5.32	2.66
Bis(2-Chloroethyl)ether	111-44-4		U	5.32	2.66
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.32	2.66
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.32	2.66
Butylbenzylphthalate	85-68-7		U	5.32	2.66
Carbazole	86-74-8		U	21.3	2.66
Chrysene	218-01-9		U	5.32	2.66
Di-N-Butylphthalate	84-74-2		U	5.32	2.66
Di-n-octylphthalate	117-84-0		U	5.32	2.66
Dibenzo(a,h)Anthracene	53-70-3		U	5.32	2.66
Dibenzofuran	132-64-9		U	5.32	2.66
Diethylphthalate	84-66-2		U	5.32	2.66
Dimethylphthalate	131-11-3		U	5.32	2.66
Fluoranthene	206-44-0		U	5.32	2.66
Fluorene	86-73-7		U	5.32	2.66

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Hexachlorobenzene	118-74-1		U	5.32	2.66
Hexachlorobutadiene	87-68-3		U	5.32	2.66
Hexachlorocyclopentadiene	77-47-4		U	5.32	2.66
Hexachloroethane	67-72-1		U	5.32	2.66
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.32	2.66
Isophorone	78-59-1		U	5.32	2.66
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.32	2.66
Naphthalene	91-20-3		U	5.32	2.66
Nitrobenzene	98-95-3		U	5.32	2.66
Pentachlorophenol	87-86-5		U	26.6	13.3
Phenanthrene	85-01-8		U	5.32	2.66
Phenol	108-95-2		U	5.32	2.66
Pyrene	129-00-0		U	5.32	2.66
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	37.5	10	123		
2-Fluorobiphenyl	44.8	43	116		
2-Fluorophenol	40.3	21	100		
Nitrobenzene-d5	49.6	35	114		
p-Terphenyl-d14	64.3	33	141		
Phenol-d5	46.9	10	94		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW06-120716	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 00:34
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: 7M68283
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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	73.9	43	116		
Nitrobenzene-d5	82.7	35	114		
p-Terphenyl-d14	79.9	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:26
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: T4.122116.212646
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	124		0.500	0.250
Magnesium, Total	7439-95-4	19.1		0.500	0.250
Manganese, Total	7439-96-5	0.00750	J	0.0100	0.00500
Potassium, Total	7440-09-7	1.72		1.00	0.500
Sodium, Total	7440-23-5	31.2		0.500	0.250
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:33
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: T3.122216.213342
Sample Tag: 01	Units: mg/L	

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

Certificate of Analysis

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:57
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: NI.122116.195739
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.000694	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-16	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:30
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: T4.122116.213032
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		U	0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-16	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:37
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: T3.122216.213735
Sample Tag: 01	Units: mg/L	

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

Certificate of Analysis

Sample #: L16120425-16	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:13
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: NI.122116.201309
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000752	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW10-120716	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 20:01
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: 9M977677
Sample Tag: 01	Units: ug/L	

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

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW10-120716	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 20:01
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: 9M977677
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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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
Vinyl chloride	75-01-4		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	88.5	80	120		
Dibromofluoromethane	93.9	86	118		
p-Bromofluorobenzene	106	86	115		
Toluene-d8	102	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW10-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 18:58
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: 12M60659
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	22.0	2.75
1,3,5-Trinitrobenzene	99-35-4		U	5.49	2.75
1,3-Dinitrobenzene	99-65-0		U	5.49	2.75
1,4-Dioxane	123-91-1		U	11.0	5.49
2,4,5-Trichlorophenol	95-95-4		U	5.49	2.75
2,4,6-Trichlorophenol	88-06-2		U	5.49	2.75
2,4-Dichlorophenol	120-83-2		U	5.49	2.75
2,4-Dimethylphenol	105-67-9		U	5.49	2.75
2,4-Dinitrophenol	51-28-5		U	27.5	13.7
2,4-Dinitrotoluene	121-14-2		U	5.49	2.75
2,6-Dinitrotoluene	606-20-2		U	5.49	2.75
2-Chloronaphthalene	91-58-7		U	5.49	2.75
2-Chlorophenol	95-57-8		U	5.49	2.75
2-Methylnaphthalene	91-57-6		U	5.49	2.75
2-Methylphenol	95-48-7		U	5.49	2.75
2-Nitroaniline	88-74-4		U	27.5	13.7
2-Nitrophenol	88-75-5		U	5.49	2.75
3-Nitroaniline	99-09-2		U	27.5	13.7
3,3'-Dichlorobenzidine	91-94-1		U	5.49	2.75
3-,4-Methylphenol	65794-96-9		U	5.49	2.75
4-Bromophenyl-phenylether	101-55-3		U	5.49	2.75
4-Chloroaniline	106-47-8		U	5.49	2.75
4-Nitrophenol	100-02-7		U	27.5	13.7
Acenaphthene	83-32-9		U	5.49	2.75

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Acenaphthylene	208-96-8		U	5.49	2.75
Anthracene	120-12-7		U	5.49	2.75
Benzo(a)anthracene	56-55-3		U	5.49	2.75
Benzo(a)pyrene	50-32-8		U	5.49	2.75
Benzo(b)fluoranthene	205-99-2		U	5.49	2.75
Benzo(g,h,i)Perylene	191-24-2		U	5.49	2.75
Benzo(k)fluoranthene	207-08-9		U	5.49	2.75
Benzoic acid	65-85-0		U	22.0	11.0
Benzyl alcohol	100-51-6		U	5.49	2.75
Bis(2-Chloroethyl)ether	111-44-4		U	5.49	2.75
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.49	2.75
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.49	2.75
Butylbenzylphthalate	85-68-7		U	5.49	2.75
Carbazole	86-74-8		U	22.0	2.75
Chrysene	218-01-9		U	5.49	2.75
Di-N-Butylphthalate	84-74-2		U	5.49	2.75
Di-n-octylphthalate	117-84-0		U	5.49	2.75
Dibenzo(a,h)Anthracene	53-70-3		U	5.49	2.75
Dibenzofuran	132-64-9		U	5.49	2.75
Diethylphthalate	84-66-2		U	5.49	2.75
Dimethylphthalate	131-11-3		U	5.49	2.75
Fluoranthene	206-44-0		U	5.49	2.75
Fluorene	86-73-7		U	5.49	2.75
Hexachlorobenzene	118-74-1		U	5.49	2.75
Hexachlorobutadiene	87-68-3		U	5.49	2.75
Hexachlorocyclopentadiene	77-47-4		U	5.49	2.75
Hexachloroethane	67-72-1		U	5.49	2.75
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.49	2.75
Isophorone	78-59-1		U	5.49	2.75
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.49	2.75
Naphthalene	91-20-3		U	5.49	2.75
Nitrobenzene	98-95-3		U	5.49	2.75
Pentachlorophenol	87-86-5		U	27.5	13.7
Phenanthrene	85-01-8		U	5.49	2.75
Phenol	108-95-2		U	5.49	2.75
Pyrene	129-00-0		U	5.49	2.75
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	39.3	10	123		
2-Fluorobiphenyl	61.7	43	116		

Certificate of Analysis

2-Fluorophenol	53.0	21	100	
Nitrobenzene-d5	69.7	35	114	
p-Terphenyl-d14	39.5	33	141	
Phenol-d5	59.0	10	94	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW10-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 18:58
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: 12M60659
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN		8.76		0.000	0.000

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW10-120716	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 01:00
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: 7M68284
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

Certificate of Analysis

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2-Fluorobiphenyl	59.8	43	116	
Nitrobenzene-d5	68.4	35	114	
p-Terphenyl-d14	74.6	33	141	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:41
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: T3.122216.214127
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.245		0.100	0.0500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:41
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: T4.122116.214144
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	0.252		0.200	0.100
Calcium, Total	7440-70-2	45.1		0.500	0.250
Magnesium, Total	7439-95-4	4.55		0.500	0.250
Manganese, Total	7439-96-5		U	0.0100	0.00500
Potassium, Total	7440-09-7	1.02		1.00	0.500
Sodium, Total	7440-23-5	110		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:16
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: NI.122116.201614
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.0141		0.00100	0.000500

Sample #: L16120425-18	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:45
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: T4.122116.214530
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		U	0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-18	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:45
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: T3.122216.214520
Sample Tag: 01	Units: mg/L	

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

Sample #: L16120425-18	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:19
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: NI.122116.201920
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.0114		0.00100	0.000500

Certificate of Analysis

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: HPMS9
Client ID: PZ03-120716	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 20:31
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: 9M977678
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfur dioxide		41.0		0.000	0.000

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: HPMS9
Client ID: PZ03-120716	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 20:31
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: 9M977678
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	0.940	J	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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	87.9	80	120	
Dibromofluoromethane	93.3	86	118	
p-Bromofluorobenzene	103	86	115	
Toluene-d8	99.1	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.

Certificate of Analysis

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:49
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: T3.122216.214913
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	1.35		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:49
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: T4.122116.214916
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	185		0.500	0.250
Magnesium, Total	7439-95-4	87.2		0.500	0.250
Manganese, Total	7439-96-5	0.304		0.0100	0.00500
Potassium, Total	7440-09-7	8.82		1.00	0.500
Silica, Calculated as SiO2		23.4		2.14	1.07
Silicon, Total	7440-21-3	10.9		1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:53
Collect Date: 12/07/2016 15:10	Dilution: 5	File ID: T3.122216.215314
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	3100		2.50	1.25
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:22
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: NI.122116.202225
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.0289		0.00100	0.000500

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/29/2016 07:46
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/29/2016 13:18
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: NI.122916.131829
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.00182	J	0.00200	0.00100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: IC3
Client ID: PZ03-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 18:33
Collect Date: 12/07/2016 15:10	Dilution: 10	File ID: I3_122016-13
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	1060	E	2.00	1.00
Sulfate	14808-79-8	352		10.0	5.00
E	Semiquantitative result (out of calibration range)				

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: IC3
Client ID: PZ03-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 18:53
Collect Date: 12/07/2016 15:10	Dilution: 100	File ID: I3_122016-14
Sample Tag: DL02	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	1310		20.0	10.0
Sulfate	14808-79-8	346		100	50.0

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ03-120716	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 12:48
Collect Date: 12/07/2016 15:10	Dilution: 2	File ID: S2161212004.023
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	405		40.0	20.0

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ03-120716	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 08:44
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: S2161216001.023
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	0.821		0.100	0.0500

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ03-120716	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: 12/07/2016 15:10	Dilution: 20	File ID: S216121315065101
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	2.22		1.00	0.500

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ03-120716	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: 12/07/2016 15:10	Dilution: 20	File ID: S216121315070401
Sample Tag:	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		2.22		1.00	0.500

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: PZ03-120716	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/13/2016 09:26
Workgroup #: WG594624	Analyst: DCM	Run Date: 12/13/2016 09:36
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: SC161213002.023
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0	0.157	J	0.200	0.100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: UV-2600
Client ID: PZ03-120716	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 12/08/2016 13:50
Workgroup #: WG594146	Analyst: ADG	Run Date: 12/08/2016 15:06
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: 00.1612081506-12
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 #: L16120425-19	PrePrep Method: N/A	Instrument: BURET
Client ID: PZ03-120716	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: 12/07/2016 15:10	Dilution: 1	File ID: ET.1612091030-10
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	0.941	J	1.00	0.500
J	The analyte was positively identified, but the quantitation was below the RL.				

Certificate of Analysis

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: OVEN
Client ID: PZ03-120716	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594207	Analyst: AWE	Run Date: 12/09/2016 08:12
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: EN.1612090812-07
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		3060		20.0	10.0

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: PZ03-120716	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/13/2016 08:05
Workgroup #: WG594601	Analyst: DCM	Run Date: 12/13/2016 08:32
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: SC161213001.036
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	0.696		0.200	0.100

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: PZ03-120716	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 22:38
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: TC12152016.054
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	7.59		1.00	0.500

Sample #: L16120425-20	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:57
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: T3.122216.215715
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	3.43		0.100	0.0500

Certificate of Analysis

Sample #: L16120425-20	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:53
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: T4.122116.215310
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	0.260		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-20	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/29/2016 07:46
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/29/2016 13:21
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: NI.122916.132134
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.00182	J	0.00200	0.00100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-20	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:25
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: NI.122116.202531
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.0244		0.00100	0.000500

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: HPMS9
Client ID: DUP-GW-120716-1	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 21:02
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: 9M977679
Sample Tag: 01	Units: ug/L	

Certificate of Analysis

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

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: HPMS9
Client ID: DUP-GW-120716-1	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 21:02
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: 9M977679
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

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	89.6	80	120		
Dibromofluoromethane	94.7	86	118		
p-Bromofluorobenzene	108	86	115		
Toluene-d8	102	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: HPMS12
Client ID: DUP-GW-120716-1	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 19:30
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: 12M60660
Sample Tag: 01	Units: ug/L	

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

Certificate of Analysis

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: HPMS12
Client ID: DUP-GW-120716-1	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 19:30
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: 12M60660
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	21.5	2.69
1,3,5-Trinitrobenzene	99-35-4		U	5.38	2.69
1,3-Dinitrobenzene	99-65-0		U	5.38	2.69
1,4-Dioxane	123-91-1		U	10.8	5.38
2,4,5-Trichlorophenol	95-95-4		U	5.38	2.69
2,4,6-Trichlorophenol	88-06-2		U	5.38	2.69
2,4-Dichlorophenol	120-83-2		U	5.38	2.69
2,4-Dimethylphenol	105-67-9		U	5.38	2.69
2,4-Dinitrophenol	51-28-5		U	26.9	13.4
2,4-Dinitrotoluene	121-14-2		U	5.38	2.69
2,6-Dinitrotoluene	606-20-2		U	5.38	2.69
2-Chloronaphthalene	91-58-7		U	5.38	2.69
2-Chlorophenol	95-57-8		U	5.38	2.69
2-Methylnaphthalene	91-57-6		U	5.38	2.69
2-Methylphenol	95-48-7		U	5.38	2.69
2-Nitroaniline	88-74-4		U	26.9	13.4
2-Nitrophenol	88-75-5		U	5.38	2.69
3-Nitroaniline	99-09-2		U	26.9	13.4
3,3'-Dichlorobenzidine	91-94-1		U	5.38	2.69
3-,4-Methylphenol	65794-96-9		U	5.38	2.69
4-Bromophenyl-phenylether	101-55-3		U	5.38	2.69
4-Chloroaniline	106-47-8		U	5.38	2.69
4-Nitrophenol	100-02-7		U	26.9	13.4
Acenaphthene	83-32-9		U	5.38	2.69
Acenaphthylene	208-96-8		U	5.38	2.69
Anthracene	120-12-7		U	5.38	2.69
Benzo(a)anthracene	56-55-3		U	5.38	2.69
Benzo(a)pyrene	50-32-8		U	5.38	2.69
Benzo(b)fluoranthene	205-99-2		U	5.38	2.69
Benzo(g,h,i)Perylene	191-24-2		U	5.38	2.69
Benzo(k)fluoranthene	207-08-9		U	5.38	2.69
Benzoic acid	65-85-0		U	21.5	10.8
Benzyl alcohol	100-51-6		U	5.38	2.69

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Bis(2-Chloroethyl)ether	111-44-4		U	5.38	2.69
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.38	2.69
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.38	2.69
Butylbenzylphthalate	85-68-7		U	5.38	2.69
Carbazole	86-74-8		U	21.5	2.69
Chrysene	218-01-9		U	5.38	2.69
Di-N-Butylphthalate	84-74-2		U	5.38	2.69
Di-n-octylphthalate	117-84-0		U	5.38	2.69
Dibenzo(a,h)Anthracene	53-70-3		U	5.38	2.69
Dibenzofuran	132-64-9		U	5.38	2.69
Diethylphthalate	84-66-2		U	5.38	2.69
Dimethylphthalate	131-11-3		U	5.38	2.69
Fluoranthene	206-44-0		U	5.38	2.69
Fluorene	86-73-7		U	5.38	2.69
Hexachlorobenzene	118-74-1		U	5.38	2.69
Hexachlorobutadiene	87-68-3		U	5.38	2.69
Hexachlorocyclopentadiene	77-47-4		U	5.38	2.69
Hexachloroethane	67-72-1		U	5.38	2.69
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.38	2.69
Isophorone	78-59-1		U	5.38	2.69
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.38	2.69
Naphthalene	91-20-3		U	5.38	2.69
Nitrobenzene	98-95-3		U	5.38	2.69
Pentachlorophenol	87-86-5		U	26.9	13.4
Phenanthrene	85-01-8		U	5.38	2.69
Phenol	108-95-2		U	5.38	2.69
Pyrene	129-00-0		U	5.38	2.69
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	42.3	10	123		
2-Fluorobiphenyl	56.8	43	116		
2-Fluorophenol	54.5	21	100		
Nitrobenzene-d5	62.8	35	114		
p-Terphenyl-d14	54.2	33	141		
Phenol-d5	59.0	10	94		
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: HPMS7
Client ID: DUP-GW-120716-1	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 01:27
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: 7M68285
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0515	0.0258
Acenaphthene	83-32-9		U	0.0515	0.0258
Acenaphthylene	208-96-8		U	0.0515	0.0258
Anthracene	120-12-7		U	0.0515	0.0258
Benzo(a)anthracene	56-55-3		U	0.0515	0.0258
Benzo(a)pyrene	50-32-8		U	0.0515	0.0258
Benzo(b)fluoranthene	205-99-2		U	0.0515	0.0258
Benzo(g,h,i)perylene	191-24-2		U	0.0515	0.0258
Benzo(k)fluoranthene	207-08-9		U	0.0515	0.0258
Chrysene	218-01-9		U	0.0515	0.0258
Dibenzo(a,h)anthracene	53-70-3		U	0.0515	0.0258
Fluoranthene	206-44-0		U	0.0515	0.0258
Fluorene	86-73-7		U	0.0515	0.0258
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0515	0.0258
Naphthalene	91-20-3		U	0.0515	0.0258
Phenanthrene	85-01-8		U	0.0515	0.0258
Pyrene	129-00-0		U	0.0515	0.0258
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	65.6	43	116		
Nitrobenzene-d5	74.8	35	114		
p-Terphenyl-d14	81.3	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-1	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 19:03
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: T4.121816.190313
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	72.1		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-1	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 01:40
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: T4.121616.014036
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	77.5		0.500	0.250
Magnesium, Total	7439-95-4	20.1		0.500	0.250
Manganese, Total	7439-96-5	0.0824		0.0100	0.00500
Potassium, Total	7440-09-7	4.08		1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: DUP-GW-120716-1	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 18:16
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: T3.122216.181649
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.176		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120716-1	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:28
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: NI.122116.202836
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.000936	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Certificate of Analysis

Sample #: L16120425-22	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: DUP-GW-120716-1	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 18:20
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: T3.122216.182041
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	0.170		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-22	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-1	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 01:44
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: T4.121616.014423
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	0.0826		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-22	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120716-1	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:31
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: NI.122116.203141
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00120		0.00100	0.000500

Sample #: L16120425-23	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-2	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 01:48
Collect Date: 12/07/2016 12:31	Dilution: 1	File ID: T4.121616.014808
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	3.24		0.500	0.250
Magnesium, Total	7439-95-4	3.81		0.500	0.250
Manganese, Total	7439-96-5	0.00800	J	0.0100	0.00500
Potassium, Total	7440-09-7	1.95		1.00	0.500
E	Semiquantitative result (out of calibration range)				
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-23	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: DUP-GW-120716-2	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 18:24
Collect Date: 12/07/2016 12:31	Dilution: 1	File ID: T3.122216.182434
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.0736	J	0.100	0.0500
E	Semiquantitative result (out of calibration range)				
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-23	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-2	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 19:22
Collect Date: 12/07/2016 12:31	Dilution: 10	File ID: T4.121816.192205
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	748		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 #: L16120425-23	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120716-2	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/30/2016 12:05
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/30/2016 16:20
Collect Date: 12/07/2016 12:31	Dilution: 100	File ID: NI.123016.162058
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	1.12		0.100	0.0500

Sample #: L16120425-24	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: DUP-GW-120716-2	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 18:28
Collect Date: 12/07/2016 12:31	Dilution: 1	File ID: T3.122216.182835
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6		U	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 #: L16120425-24	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-2	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 01:52
Collect Date: 12/07/2016 12:31	Dilution: 1	File ID: T4.121616.015203
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		U	0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-24	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120716-2	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/30/2016 12:05
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/30/2016 16:24
Collect Date: 12/07/2016 12:31	Dilution: 100	File ID: NI.123016.162403
Sample Tag: DL01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	1.11		0.100	0.0500

Sample #: L16120425-25	PrePrep Method: N/A	Instrument: HPMS9
Client ID: FB-120716	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 15:26
Collect Date: 12/07/2016 15:01	Dilution: 1	File ID: 9M977668
Sample Tag: 01	Units: ug/L	

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

Sample #: L16120425-25	PrePrep Method: N/A	Instrument: HPMS9
Client ID: FB-120716	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 15:26
Collect Date: 12/07/2016 15:01	Dilution: 1	File ID: 9M977668
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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Acetone	67-64-1	3.58	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	1.21		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	88.2	80	120	
Dibromofluoromethane	94.1	86	118	
p-Bromofluorobenzene	105	86	115	
Toluene-d8	100	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.

Certificate of Analysis

Sample #: L16120425-26	PrePrep Method: N/A	Instrument: HPMS9
Client ID: TB-120716	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 14:56
Collect Date: 12/07/2016 08:00	Dilution: 1	File ID: 9M977667
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
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	88.9	80	120	
Dibromofluoromethane	95.2	86	118	
p-Bromofluorobenzene	105	86	115	
Toluene-d8	101	88	110	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120425-27	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 20:02
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60661
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4	46.6		24.1	3.01
1,3,5-Trinitrobenzene	99-35-4	11.8		6.02	3.01
1,3-Dinitrobenzene	99-65-0	56.8		6.02	3.01
1,4-Dioxane	123-91-1	29.9		12.0	6.02
2,4,5-Trichlorophenol	95-95-4	45.4		6.02	3.01
2,4,6-Trichlorophenol	88-06-2	45.3		6.02	3.01

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2,4-Dichlorophenol	120-83-2	44.8		6.02	3.01
2,4-Dimethylphenol	105-67-9	47.9		6.02	3.01
2,4-Dinitrophenol	51-28-5	55.7		30.1	15.1
2,4-Dinitrotoluene	121-14-2	62.3		6.02	3.01
2,6-Dinitrotoluene	606-20-2	57.4		6.02	3.01
2-Chloronaphthalene	91-58-7	39.1		6.02	3.01
2-Chlorophenol	95-57-8	44.3		6.02	3.01
2-Methylnaphthalene	91-57-6	37.0		6.02	3.01
2-Methylphenol	95-48-7	48.4		6.02	3.01
2-Nitroaniline	88-74-4	63.0		30.1	15.1
2-Nitrophenol	88-75-5	44.8		6.02	3.01
3-Nitroaniline	99-09-2	61.1		30.1	15.1
3,3'-Dichlorobenzidine	91-94-1	62.1		6.02	3.01
3-,4-Methylphenol	65794-96-9	49.0		6.02	3.01
4-Bromophenyl-phenylether	101-55-3	51.4		6.02	3.01
4-Chloroaniline	106-47-8	49.5		6.02	3.01
4-Nitrophenol	100-02-7	65.8		30.1	15.1
Acenaphthene	83-32-9	47.6		6.02	3.01
Acenaphthylene	208-96-8	45.8		6.02	3.01
Anthracene	120-12-7	57.4		6.02	3.01
Benzo(a)anthracene	56-55-3	53.6		6.02	3.01
Benzo(a)pyrene	50-32-8	61.3		6.02	3.01
Benzo(b)fluoranthene	205-99-2	54.5		6.02	3.01
Benzo(g,h,i)Perylene	191-24-2	73.8		6.02	3.01
Benzo(k)fluoranthene	207-08-9	66.2		6.02	3.01
Benzoic acid	65-85-0	44.9		24.1	12.0
Benzyl alcohol	100-51-6	50.9		6.02	3.01
Bis(2-Chloroethyl)ether	111-44-4	52.1		6.02	3.01
Bis(2-Chloroethoxy)Methane	111-91-1	40.2		6.02	3.01
bis(2-Ethylhexyl)phthalate	117-81-7	58.6		6.02	3.01
Butylbenzylphthalate	85-68-7	58.2		6.02	3.01
Carbazole	86-74-8	66.0		24.1	3.01
Chrysene	218-01-9	57.4		6.02	3.01
Di-N-Butylphthalate	84-74-2	60.4		6.02	3.01
Di-n-octylphthalate	117-84-0	63.0		6.02	3.01
Dibenzo(a,h)Anthracene	53-70-3	50.4		6.02	3.01
Dibenzofuran	132-64-9	45.3		6.02	3.01
Diethylphthalate	84-66-2	63.3		6.02	3.01
Dimethylphthalate	131-11-3	58.5		6.02	3.01

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Fluoranthene	206-44-0	57.4		6.02	3.01
Fluorene	86-73-7	50.8		6.02	3.01
Hexachlorobenzene	118-74-1	51.5		6.02	3.01
Hexachlorobutadiene	87-68-3	29.4		6.02	3.01
Hexachlorocyclopentadiene	77-47-4	13.7		6.02	3.01
Hexachloroethane	67-72-1	29.5		6.02	3.01
Indeno(1,2,3-cd)pyrene	193-39-5	64.3		6.02	3.01
Isophorone	78-59-1	52.5		6.02	3.01
Diphenylamine/n-Nitrosodiphenylamine	86-30-6	42.4		6.02	3.01
Naphthalene	91-20-3	41.8		6.02	3.01
Nitrobenzene	98-95-3	53.8		6.02	3.01
Pentachlorophenol	87-86-5	55.8		30.1	15.1
Phenanthrene	85-01-8	59.9		6.02	3.01
Phenol	108-95-2	46.6		6.02	3.01
Pyrene	129-00-0	59.4		6.02	3.01

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2,4,6-Tribromophenol	83.0	10	123	
2-Fluorobiphenyl	76.1	43	116	
2-Fluorophenol	74.8	21	100	
Nitrobenzene-d5	84.7	35	114	
p-Terphenyl-d14	46.4	33	141	
Phenol-d5	81.7	10	94	

Sample #: L16120425-27	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 20:02
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60661
Sample Tag: 01	Units: ug/L	

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

Sample #: L16120425-28	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 20:34
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60662
Sample Tag: 01	Units: ug/L	

Certificate of Analysis

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

Sample #: L16120425-28	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 20:34
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60662
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4	45.1		22.5	2.81
1,3,5-Trinitrobenzene	99-35-4	10.6		5.62	2.81
1,3-Dinitrobenzene	99-65-0	52.5		5.62	2.81
1,4-Dioxane	123-91-1	31.3		11.2	5.62
2,4,5-Trichlorophenol	95-95-4	44.5		5.62	2.81
2,4,6-Trichlorophenol	88-06-2	45.2		5.62	2.81
2,4-Dichlorophenol	120-83-2	42.9		5.62	2.81
2,4-Dimethylphenol	105-67-9	44.5		5.62	2.81
2,4-Dinitrophenol	51-28-5	55.7		28.1	14.0
2,4-Dinitrotoluene	121-14-2	55.7		5.62	2.81
2,6-Dinitrotoluene	606-20-2	52.7		5.62	2.81
2-Chloronaphthalene	91-58-7	37.5		5.62	2.81
2-Chlorophenol	95-57-8	41.5		5.62	2.81
2-Methylnaphthalene	91-57-6	36.4		5.62	2.81
2-Methylphenol	95-48-7	44.9		5.62	2.81
2-Nitroaniline	88-74-4	57.2		28.1	14.0
2-Nitrophenol	88-75-5	42.6		5.62	2.81
3-Nitroaniline	99-09-2	54.3		28.1	14.0
3,3'-Dichlorobenzidine	91-94-1	55.4		5.62	2.81
3-,4-Methylphenol	65794-96-9	45.9		5.62	2.81
4-Bromophenyl-phenylether	101-55-3	45.9		5.62	2.81
4-Chloroaniline	106-47-8	45.9		5.62	2.81
4-Nitrophenol	100-02-7	61.0		28.1	14.0
Acenaphthene	83-32-9	45.7		5.62	2.81
Acenaphthylene	208-96-8	44.1		5.62	2.81
Anthracene	120-12-7	50.7		5.62	2.81
Benzo(a)anthracene	56-55-3	48.7		5.62	2.81
Benzo(a)pyrene	50-32-8	55.3		5.62	2.81
Benzo(b)fluoranthene	205-99-2	49.6		5.62	2.81
Benzo(g,h,i)Perylene	191-24-2	66.2		5.62	2.81

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Benzo(k)fluoranthene	207-08-9	61.3		5.62	2.81
Benzoic acid	65-85-0	45.9		22.5	11.2
Benzyl alcohol	100-51-6	47.0		5.62	2.81
Bis(2-Chloroethyl)ether	111-44-4	46.7		5.62	2.81
Bis(2-Chloroethoxy)Methane	111-91-1	37.7		5.62	2.81
bis(2-Ethylhexyl)phthalate	117-81-7	53.4		5.62	2.81
Butylbenzylphthalate	85-68-7	52.3		5.62	2.81
Carbazole	86-74-8	57.8		22.5	2.81
Chrysene	218-01-9	51.3		5.62	2.81
Di-N-Butylphthalate	84-74-2	53.7		5.62	2.81
Di-n-octylphthalate	117-84-0	57.5		5.62	2.81
Dibenzo(a,h)Anthracene	53-70-3	41.9		5.62	2.81
Dibenzofuran	132-64-9	42.7		5.62	2.81
Diethylphthalate	84-66-2	57.2		5.62	2.81
Dimethylphthalate	131-11-3	54.6		5.62	2.81
Fluoranthene	206-44-0	51.2		5.62	2.81
Fluorene	86-73-7	47.0		5.62	2.81
Hexachlorobenzene	118-74-1	47.2		5.62	2.81
Hexachlorobutadiene	87-68-3	32.2		5.62	2.81
Hexachlorocyclopentadiene	77-47-4	15.8		5.62	2.81
Hexachloroethane	67-72-1	29.3		5.62	2.81
Indeno(1,2,3-cd)pyrene	193-39-5	58.3		5.62	2.81
Isophorone	78-59-1	48.9		5.62	2.81
Diphenylamine/n-Nitrosodiphenylamine	86-30-6	38.4		5.62	2.81
Naphthalene	91-20-3	39.8		5.62	2.81
Nitrobenzene	98-95-3	49.2		5.62	2.81
Pentachlorophenol	87-86-5	53.5		28.1	14.0
Phenanthrene	85-01-8	52.6		5.62	2.81
Phenol	108-95-2	43.2		5.62	2.81
Pyrene	129-00-0	52.9		5.62	2.81
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	82.6	10	123		
2-Fluorobiphenyl	78.5	43	116		
2-Fluorophenol	73.1	21	100		
Nitrobenzene-d5	83.2	35	114		
p-Terphenyl-d14	48.8	33	141		
Phenol-d5	82.1	10	94		

2.1 Volatiles Data

2.1.1 Volatiles GCMS Data (8260)

2.1.1.1 Summary Data



Login Number: L16120425
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 analyzed 09/28/2016 on HPMS9. 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 CCV WG594656-02 analyzed 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 LCS 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
WG594657-02	Cyclohexane	2016-12-13 12:56:00	74.0	80	130	Recovery

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

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.

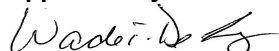
Reason #3: Improperly Integrated Isomers and/or coeluting compounds. This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene 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: 120617
Approved By: Wade DeLong



Certificate of Analysis

Sample #: L16120425-01

PrePrep Method: N/A

Instrument: HPMS9

Client ID: PZ06-120616

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 16:56

Collect Date: 12/07/2016 15:00

Dilution: 1

File ID: 9M977671

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	6.31	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		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	90.0	80	120		
Dibromofluoromethane	94.3	86	118		
p-Bromofluorobenzene	103	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 #: L16120425-03

PrePrep Method: N/A

Instrument: HPMS9

Client ID: MW18-120616

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 17:30

Collect Date: 12/07/2016 15:40

Dilution: 1

File ID: 9M977672

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	RL	MDL
1,1,1-Trichloroethane	71-55-6		U	1.00	0.500
1,1,1,2,2-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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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
m,p-Xylene	179601-23-1		U	1.00	0.500
o-Xylene	95-47-6		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	89.1	80	120		
Dibromofluoromethane	95.6	86	118		
p-Bromofluorobenzene	106	86	115		
Toluene-d8	101	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW05I-120716	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 18:00
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: 9M977673
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	90.3	80	120		
Dibromofluoromethane	94.2	86	118		
p-Bromofluorobenzene	105	86	115		

Certificate of Analysis

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

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW07-120716	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 18:31
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 9M977674
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	90.5	80	120	
Dibromofluoromethane	95.9	86	118	
p-Bromofluorobenzene	107	86	115	
Toluene-d8	102	88	110	

U Not detected at or above adjusted sample detection limit.

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW20-120716	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 19:01
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: 9M977675
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

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	90.0	80	120		
Dibromofluoromethane	94.6	86	118		
p-Bromofluorobenzene	106	86	115		
Toluene-d8	102	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-15

PrePrep Method: N/A

Instrument: HPMS9

Client ID: MW06-120716

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 19:31

Collect Date: 12/07/2016 13:55

Dilution: 1

File ID: 9M977676

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	90.4	80	120		

Certificate of Analysis

Dibromofluoromethane	94.7	86	118	
p-Bromofluorobenzene	105	86	115	
Toluene-d8	103	88	110	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: HPMS9
Client ID: MW10-120716	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 20:01
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: 9M977677
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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	88.5	80	120		
Dibromofluoromethane	93.9	86	118		
p-Bromofluorobenzene	106	86	115		
Toluene-d8	102	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-19

PrePrep Method: N/A

Instrument: HPMS9

Client ID: PZ03-120716

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 20:31

Collect Date: 12/07/2016 15:10

Dilution: 1

File ID: 9M977678

Sample Tag: 01

Units: ug/L

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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	0.940	J	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

Certificate of Analysis

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	87.9	80	120		
Dibromofluoromethane	93.3	86	118		
p-Bromofluorobenzene	103	86	115		
Toluene-d8	99.1	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 #: L16120425-21

PrePrep Method: N/A

Instrument: HPMS9

Client ID: DUP-GW-120716-1

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 21:02

Collect Date: 12/07/2016 12:30

Dilution: 1

File ID: 9M977679

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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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
Vinyl chloride	75-01-4		U	1.00	0.500

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Epichlorohydrin	106-89-8			0.000	0.000
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
1,2-Dichloroethane-d4	89.6	80	120		
Dibromofluoromethane	94.7	86	118		
p-Bromofluorobenzene	108	86	115		
Toluene-d8	102	88	110		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-25	PrePrep Method: N/A	Instrument: HPMS9
Client ID: FB-120716	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 15:26
Collect Date: 12/07/2016 15:01	Dilution: 1	File ID: 9M977668
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
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	3.58	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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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	1.21		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	88.2	80	120		
Dibromofluoromethane	94.1	86	118		
p-Bromofluorobenzene	105	86	115		
Toluene-d8	100	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.				

Certificate of Analysis

Sample #: L16120425-26	PrePrep Method: N/A	Instrument: HPMS9
Client ID: TB-120716	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 14:56
Collect Date: 12/07/2016 08:00	Dilution: 1	File ID: 9M977667
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	88.9	80	120		
Dibromofluoromethane	95.2	86	118		
p-Bromofluorobenzene	105	86	115		
Toluene-d8	101	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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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: **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: 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

Page: 1




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: 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: L16120425

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
PZ06-120616	01	12/07/16					12/13/2016	6.1	14		12/13/16	6.1	14	
MW18-120616	03	12/07/16					12/13/2016	6.1	14		12/13/16	6.1	14	
MW05I-120716	07	12/07/16					12/13/2016	6.4	14		12/13/16	6.4	14	
MW07-120716	11	12/07/16					12/13/2016	6.4	14		12/13/16	6.4	14	
MW20-120716	13	12/07/16					12/13/2016	6.3	14		12/13/16	6.3	14	
MW06-120716	15	12/07/16					12/13/2016	6.2	14		12/13/16	6.2	14	
MW10-120716	17	12/07/16					12/13/2016	6.4	14		12/13/16	6.4	14	
PZ03-120716	19	12/07/16					12/13/2016	6.2	14		12/13/16	6.2	14	
DUP-GW-120716-1	21	12/07/16					12/13/2016	6.4	14		12/13/16	6.4	14	
FB-120716	25	12/07/16					12/13/2016	6	14		12/13/16	6	14	
TB-120716	26	12/07/16					12/13/2016	6.3	14		12/13/16	6.3	14	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5064874
 Report generated 12/16/2016 15:12



Microbac Laboratories Inc.
SURROGATE STANDARDS

Login Number: L16120425
Instrument Id: HPMS9
Workgroup (AAB#): WG594657

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

Sample Number	Dilution	Tag	1	2	3	4
L16120425-01	1.00	01	90.0	94.3	103	102
L16120425-03	1.00	01	89.1	95.6	106	101
L16120425-07	1.00	01	90.3	94.2	105	101
L16120425-11	1.00	01	90.5	95.9	107	102
L16120425-13	1.00	01	90.0	94.6	106	102
L16120425-15	1.00	01	90.4	94.7	105	103
L16120425-17	1.00	01	88.5	93.9	106	102
L16120425-19	1.00	01	87.9	93.3	103	99.1
L16120425-21	1.00	01	89.6	94.7	108	102
L16120425-25	1.00	01	88.2	94.1	105	100
L16120425-26	1.00	01	88.9	95.2	105	101
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: L16120425 Work Group: WG594657
 Blank File ID: 9M977662 Blank Sample ID: WG594657-01
 Prep Date: 12/13/16 12:25 Instrument ID: HPMS9
 Analyzed Date: 12/13/16 12:25 Method: 8260C
 Analyst: ADC

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
TB-120716	L16120425-26	9M977667	12/13/16 14:56	01
FB-120716	L16120425-25	9M977668	12/13/16 15:26	01
PZ06-120616	L16120425-01	9M977671	12/13/16 16:56	01
MW18-120616	L16120425-03	9M977672	12/13/16 17:30	01
MW05I-120716	L16120425-07	9M977673	12/13/16 18:00	01
MW07-120716	L16120425-11	9M977674	12/13/16 18:31	01
MW20-120716	L16120425-13	9M977675	12/13/16 19:01	01
MW06-120716	L16120425-15	9M977676	12/13/16 19:31	01
MW10-120716	L16120425-17	9M977677	12/13/16 20:01	01
PZ03-120716	L16120425-19	9M977678	12/13/16 20:31	01
DUP-GW-120716-1	L16120425-21	9M977679	12/13/16 21:02	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5064875
 Report generated 12/16/2016 15:12



METHOD BLANK REPORT

Login Number: L16120425 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: 5064876

16-DEC-2016 15:12



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5064876
16-DEC-2016 15:12



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5064877
Report generated: 12/16/2016 15:12



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5064877
 Report generated: 12/16/2016 15:12



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L16120425
Instrument: HPMS9
Analyst: ADC
Workgroup: WG585420

Tune ID: WG585420-01
Run Date: 09/28/2016
Run Time: 12:34
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: L16120425

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	
L16120425-26	TB-120716	01	12/13/2016 14:56	
L16120425-25	FB-120716	01	12/13/2016 15:26	
L16120425-01	PZ06-120616	01	12/13/2016 16:56	
L16120425-03	MW18-120616	01	12/13/2016 17:30	
L16120425-07	MW05I-120716	01	12/13/2016 18:00	
L16120425-11	MW07-120716	01	12/13/2016 18:31	
L16120425-13	MW20-120716	01	12/13/2016 19:01	
L16120425-15	MW06-120716	01	12/13/2016 19:31	
L16120425-17	MW10-120716	01	12/13/2016 20:01	
L16120425-19	PZ03-120716	01	12/13/2016 20:31	
L16120425-21	DUP-GW-120716-1	01	12/13/2016 21:02	

* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008
PDF File ID: 5064879
Report generated 12/16/2016 15:12



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: WG585420
 Calibration Files

Compound	0.5 1 2 5 20 50 100 200 300									Avg	%RSD	Linear	Qsdratic	
	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: L16120425 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: 5064878
 Report generated 12/16/2016 15:12



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120425 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



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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
PDF File ID: 5064882
Report generated 12/16/2016 15:12



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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: 5064882
 Report generated 12/16/2016 15:12



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

Login Number: L16120425
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>L16120425-01</u>	1.00	01	178537	355652	489527
L16120425-03	1.00	01	168946	341765	469510
L16120425-07	1.00	01	174678	353921	481161
L16120425-11	1.00	01	169350	348779	472303
L16120425-13	1.00	01	171762	347765	479933
L16120425-15	1.00	01	173077	348073	479363
L16120425-17	1.00	01	169634	343485	469548
L16120425-19	1.00	01	174128	352064	484345
L16120425-21	1.00	01	168227	343278	471150
L16120425-25	1.00	01	182495	367714	502207
L16120425-26	1.00	01	183048	365291	498035
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: L16120425
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
L16120425-01	1.00	01	<u>17.69</u>	14.67	10.8
L16120425-03	1.00	01	17.7	14.67	10.8
L16120425-07	1.00	01	17.7	14.67	10.79
L16120425-11	1.00	01	17.7	14.67	10.8
L16120425-13	1.00	01	17.7	14.67	10.8
L16120425-15	1.00	01	17.69	14.67	10.8
L16120425-17	1.00	01	17.69	14.67	10.8
L16120425-19	1.00	01	17.69	14.67	10.8
L16120425-21	1.00	01	17.69	14.67	10.8
L16120425-25	1.00	01	17.7	14.67	10.8
L16120425-26	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: L16120425
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: All acceptance criteria were met.

Continuing Calibration and Tune: All acceptance criteria were met.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: Recoveries out of range were observed for the following analytes: 1,4-Dioxane failed low, Benzo[ghi]perylene failed high but was non-detect in the associated samples. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
WG594288-02	1,4-Dioxane	2016-12-15 14:12:00	42.0	50	150	Recovery
WG594288-02	Benzo[ghi]perylene	2016-12-15 14:12:00	143	45	140	Recovery

Matrix Spikes: Recoveries out of range were observed for the following analyte: 1,4-Dioxane failed marginally low in the MS but was acceptable in the MSD. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
L16120425-27	1,4-Dioxane	2016-12-15 20:02:00	49.6	50	150	Recovery

SAMPLES

Samples: All acceptance criteria were met.

Internal Standards: All acceptance criteria were met.

Surrogates: Recoveries out of range were observed for the following surrogate: 2-Fluorobiphenyl failed low. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
L16120425-07	2-Fluorobiphenyl	2016-12-15 16:51:00	35.0	43	116	Recovery

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: 120643
Approved By: Eric Lawson

Eri C. Zimm

Certificate of Analysis

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW05I-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 16:51
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: 12M60655
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN		7.58		0.000	0.000

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW05I-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 16:51
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: 12M60655
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	27.4	3.42
1,3,5-Trinitrobenzene	99-35-4		U	6.85	3.42
1,3-Dinitrobenzene	99-65-0		U	6.85	3.42
1,4-Dioxane	123-91-1		U	13.7	6.85
2,4,5-Trichlorophenol	95-95-4		U	6.85	3.42
2,4,6-Trichlorophenol	88-06-2		U	6.85	3.42
2,4-Dichlorophenol	120-83-2		U	6.85	3.42
2,4-Dimethylphenol	105-67-9		U	6.85	3.42
2,4-Dinitrophenol	51-28-5		U	34.2	17.1
2,4-Dinitrotoluene	121-14-2		U	6.85	3.42
2,6-Dinitrotoluene	606-20-2		U	6.85	3.42
2-Chloronaphthalene	91-58-7		U	6.85	3.42
2-Chlorophenol	95-57-8		U	6.85	3.42
2-Methylnaphthalene	91-57-6		U	6.85	3.42
2-Methylphenol	95-48-7		U	6.85	3.42
2-Nitroaniline	88-74-4		U	34.2	17.1
2-Nitrophenol	88-75-5		U	6.85	3.42
3-Nitroaniline	99-09-2		U	34.2	17.1
3,3'-Dichlorobenzidine	91-94-1		U	6.85	3.42
3-,4-Methylphenol	65794-96-9		U	6.85	3.42
4-Bromophenyl-phenylether	101-55-3		U	6.85	3.42
4-Chloroaniline	106-47-8		U	6.85	3.42
4-Nitrophenol	100-02-7		U	34.2	17.1

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Acenaphthene	83-32-9		U	6.85	3.42
Acenaphthylene	208-96-8		U	6.85	3.42
Anthracene	120-12-7		U	6.85	3.42
Benzo(a)anthracene	56-55-3		U	6.85	3.42
Benzo(a)pyrene	50-32-8		U	6.85	3.42
Benzo(b)fluoranthene	205-99-2		U	6.85	3.42
Benzo(g,h,i)Perylene	191-24-2		U	6.85	3.42
Benzo(k)fluoranthene	207-08-9		U	6.85	3.42
Benzoic acid	65-85-0		U	27.4	13.7
Benzyl alcohol	100-51-6		U	6.85	3.42
Bis(2-Chloroethyl)ether	111-44-4		U	6.85	3.42
Bis(2-Chloroethoxy)Methane	111-91-1		U	6.85	3.42
bis(2-Ethylhexyl)phthalate	117-81-7		U	6.85	3.42
Butylbenzylphthalate	85-68-7		U	6.85	3.42
Carbazole	86-74-8		U	27.4	3.42
Chrysene	218-01-9		U	6.85	3.42
Di-N-Butylphthalate	84-74-2		U	6.85	3.42
Di-n-octylphthalate	117-84-0		U	6.85	3.42
Dibenzo(a,h)Anthracene	53-70-3		U	6.85	3.42
Dibenzofuran	132-64-9		U	6.85	3.42
Diethylphthalate	84-66-2		U	6.85	3.42
Dimethylphthalate	131-11-3		U	6.85	3.42
Fluoranthene	206-44-0		U	6.85	3.42
Fluorene	86-73-7		U	6.85	3.42
Hexachlorobenzene	118-74-1		U	6.85	3.42
Hexachlorobutadiene	87-68-3		U	6.85	3.42
Hexachlorocyclopentadiene	77-47-4		U	6.85	3.42
Hexachloroethane	67-72-1		U	6.85	3.42
Indeno(1,2,3-cd)pyrene	193-39-5		U	6.85	3.42
Isophorone	78-59-1		U	6.85	3.42
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	6.85	3.42
Naphthalene	91-20-3		U	6.85	3.42
Nitrobenzene	98-95-3		U	6.85	3.42
Pentachlorophenol	87-86-5		U	34.2	17.1
Phenanthrene	85-01-8		U	6.85	3.42
Phenol	108-95-2		U	6.85	3.42
Pyrene	129-00-0		U	6.85	3.42
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	21.0	10	123		

Certificate of Analysis

2-Fluorobiphenyl	35.0	43	116	*
2-Fluorophenol	31.3	21	100	
Nitrobenzene-d5	39.2	35	114	
p-Terphenyl-d14	66.7	33	141	
Phenol-d5	36.4	10	94	

U	Not detected at or above adjusted sample detection limit.
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Sample #: L16120425-11	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 17:23
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60656
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	20.0	2.50
1,3,5-Trinitrobenzene	99-35-4		U	5.00	2.50
1,3-Dinitrobenzene	99-65-0		U	5.00	2.50
1,4-Dioxane	123-91-1		U	10.0	5.00
2,4,5-Trichlorophenol	95-95-4		U	5.00	2.50
2,4,6-Trichlorophenol	88-06-2		U	5.00	2.50
2,4-Dichlorophenol	120-83-2		U	5.00	2.50
2,4-Dimethylphenol	105-67-9		U	5.00	2.50
2,4-Dinitrophenol	51-28-5		U	25.0	12.5
2,4-Dinitrotoluene	121-14-2		U	5.00	2.50
2,6-Dinitrotoluene	606-20-2		U	5.00	2.50
2-Chloronaphthalene	91-58-7		U	5.00	2.50
2-Chlorophenol	95-57-8		U	5.00	2.50
2-Methylnaphthalene	91-57-6		U	5.00	2.50
2-Methylphenol	95-48-7		U	5.00	2.50
2-Nitroaniline	88-74-4		U	25.0	12.5
2-Nitrophenol	88-75-5		U	5.00	2.50
3-Nitroaniline	99-09-2		U	25.0	12.5
3,3'-Dichlorobenzidine	91-94-1		U	5.00	2.50
3-,4-Methylphenol	65794-96-9		U	5.00	2.50
4-Bromophenyl-phenylether	101-55-3		U	5.00	2.50
4-Chloroaniline	106-47-8		U	5.00	2.50
4-Nitrophenol	100-02-7		U	25.0	12.5
Acenaphthene	83-32-9		U	5.00	2.50
Acenaphthylene	208-96-8		U	5.00	2.50
Anthracene	120-12-7		U	5.00	2.50

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Benzo(a)anthracene	56-55-3		U	5.00	2.50
Benzo(a)pyrene	50-32-8		U	5.00	2.50
Benzo(b)fluoranthene	205-99-2		U	5.00	2.50
Benzo(g,h,i)Perylene	191-24-2		U	5.00	2.50
Benzo(k)fluoranthene	207-08-9		U	5.00	2.50
Benzoic acid	65-85-0		U	20.0	10.0
Benzyl alcohol	100-51-6		U	5.00	2.50
Bis(2-Chloroethyl)ether	111-44-4		U	5.00	2.50
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.00	2.50
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.00	2.50
Butylbenzylphthalate	85-68-7		U	5.00	2.50
Carbazole	86-74-8		U	20.0	2.50
Chrysene	218-01-9		U	5.00	2.50
Di-N-Butylphthalate	84-74-2		U	5.00	2.50
Di-n-octylphthalate	117-84-0		U	5.00	2.50
Dibenzo(a,h)Anthracene	53-70-3		U	5.00	2.50
Dibenzofuran	132-64-9		U	5.00	2.50
Diethylphthalate	84-66-2		U	5.00	2.50
Dimethylphthalate	131-11-3		U	5.00	2.50
Fluoranthene	206-44-0		U	5.00	2.50
Fluorene	86-73-7		U	5.00	2.50
Hexachlorobenzene	118-74-1		U	5.00	2.50
Hexachlorobutadiene	87-68-3		U	5.00	2.50
Hexachlorocyclopentadiene	77-47-4		U	5.00	2.50
Hexachloroethane	67-72-1		U	5.00	2.50
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.00	2.50
Isophorone	78-59-1		U	5.00	2.50
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.00	2.50
Naphthalene	91-20-3		U	5.00	2.50
Nitrobenzene	98-95-3		U	5.00	2.50
Pentachlorophenol	87-86-5		U	25.0	12.5
Phenanthrene	85-01-8		U	5.00	2.50
Phenol	108-95-2		U	5.00	2.50
Pyrene	129-00-0		U	5.00	2.50
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	43.8	10	123		
2-Fluorobiphenyl	50.6	43	116		
2-Fluorophenol	45.1	21	100		
Nitrobenzene-d5	55.1	35	114		

Certificate of Analysis

p-Terphenyl-d14	55.5	33	141	
Phenol-d5	51.5	10	94	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 17:23
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60656
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN		10.1		0.000	0.000

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW20-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 17:55
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: 12M60657
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN		4.51		0.000	0.000

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW20-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 17:55
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: 12M60657
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	22.5	2.81
1,3,5-Trinitrobenzene	99-35-4		U	5.62	2.81
1,3-Dinitrobenzene	99-65-0		U	5.62	2.81
1,4-Dioxane	123-91-1		U	11.2	5.62
2,4,5-Trichlorophenol	95-95-4		U	5.62	2.81
2,4,6-Trichlorophenol	88-06-2		U	5.62	2.81
2,4-Dichlorophenol	120-83-2		U	5.62	2.81
2,4-Dimethylphenol	105-67-9		U	5.62	2.81
2,4-Dinitrophenol	51-28-5		U	28.1	14.0

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2,4-Dinitrotoluene	121-14-2		U	5.62	2.81
2,6-Dinitrotoluene	606-20-2		U	5.62	2.81
2-Chloronaphthalene	91-58-7		U	5.62	2.81
2-Chlorophenol	95-57-8		U	5.62	2.81
2-Methylnaphthalene	91-57-6		U	5.62	2.81
2-Methylphenol	95-48-7		U	5.62	2.81
2-Nitroaniline	88-74-4		U	28.1	14.0
2-Nitrophenol	88-75-5		U	5.62	2.81
3-Nitroaniline	99-09-2		U	28.1	14.0
3,3'-Dichlorobenzidine	91-94-1		U	5.62	2.81
3-,4-Methylphenol	65794-96-9		U	5.62	2.81
4-Bromophenyl-phenylether	101-55-3		U	5.62	2.81
4-Chloroaniline	106-47-8		U	5.62	2.81
4-Nitrophenol	100-02-7		U	28.1	14.0
Acenaphthene	83-32-9		U	5.62	2.81
Acenaphthylene	208-96-8		U	5.62	2.81
Anthracene	120-12-7		U	5.62	2.81
Benzo(a)anthracene	56-55-3		U	5.62	2.81
Benzo(a)pyrene	50-32-8		U	5.62	2.81
Benzo(b)fluoranthene	205-99-2		U	5.62	2.81
Benzo(g,h,i)Perylene	191-24-2		U	5.62	2.81
Benzo(k)fluoranthene	207-08-9		U	5.62	2.81
Benzoic acid	65-85-0		U	22.5	11.2
Benzyl alcohol	100-51-6		U	5.62	2.81
Bis(2-Chloroethyl)ether	111-44-4		U	5.62	2.81
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.62	2.81
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.62	2.81
Butylbenzylphthalate	85-68-7		U	5.62	2.81
Carbazole	86-74-8		U	22.5	2.81
Chrysene	218-01-9		U	5.62	2.81
Di-N-Butylphthalate	84-74-2		U	5.62	2.81
Di-n-octylphthalate	117-84-0		U	5.62	2.81
Dibenzo(a,h)Anthracene	53-70-3		U	5.62	2.81
Dibenzofuran	132-64-9		U	5.62	2.81
Diethylphthalate	84-66-2		U	5.62	2.81
Dimethylphthalate	131-11-3		U	5.62	2.81
Fluoranthene	206-44-0		U	5.62	2.81
Fluorene	86-73-7		U	5.62	2.81
Hexachlorobenzene	118-74-1		U	5.62	2.81

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Hexachlorobutadiene	87-68-3		U	5.62	2.81
Hexachlorocyclopentadiene	77-47-4		U	5.62	2.81
Hexachloroethane	67-72-1		U	5.62	2.81
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.62	2.81
Isophorone	78-59-1		U	5.62	2.81
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.62	2.81
Naphthalene	91-20-3		U	5.62	2.81
Nitrobenzene	98-95-3		U	5.62	2.81
Pentachlorophenol	87-86-5		U	28.1	14.0
Phenanthrene	85-01-8		U	5.62	2.81
Phenol	108-95-2		U	5.62	2.81
Pyrene	129-00-0		U	5.62	2.81
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	40.3	10	123		
2-Fluorobiphenyl	49.1	43	116		
2-Fluorophenol	47.2	21	100		
Nitrobenzene-d5	54.4	35	114		
p-Terphenyl-d14	89.2	33	141		
Phenol-d5	53.4	10	94		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-15

PrePrep Method: N/A

Instrument: HPMS12

Client ID: MW06-120716

Prep Method: 3520C

Prep Date: 12/12/2016 17:00

Matrix: Water

Analytical Method: 8270D

Cal Date: 11/18/2016 16:08

Workgroup #: WG594943

Analyst: SCB

Run Date: 12/15/2016 18:27

Collect Date: 12/07/2016 13:55

Dilution: 1

File ID: 12M60658

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	21.3	2.66
1,3,5-Trinitrobenzene	99-35-4		U	5.32	2.66
1,3-Dinitrobenzene	99-65-0		U	5.32	2.66
1,4-Dioxane	123-91-1		U	10.6	5.32
2,4,5-Trichlorophenol	95-95-4		U	5.32	2.66
2,4,6-Trichlorophenol	88-06-2		U	5.32	2.66
2,4-Dichlorophenol	120-83-2		U	5.32	2.66
2,4-Dimethylphenol	105-67-9		U	5.32	2.66
2,4-Dinitrophenol	51-28-5		U	26.6	13.3
2,4-Dinitrotoluene	121-14-2		U	5.32	2.66
2,6-Dinitrotoluene	606-20-2		U	5.32	2.66

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2-Chloronaphthalene	91-58-7		U	5.32	2.66
2-Chlorophenol	95-57-8		U	5.32	2.66
2-Methylnaphthalene	91-57-6		U	5.32	2.66
2-Methylphenol	95-48-7		U	5.32	2.66
2-Nitroaniline	88-74-4		U	26.6	13.3
2-Nitrophenol	88-75-5		U	5.32	2.66
3-Nitroaniline	99-09-2		U	26.6	13.3
3,3'-Dichlorobenzidine	91-94-1		U	5.32	2.66
3-,4-Methylphenol	65794-96-9		U	5.32	2.66
4-Bromophenyl-phenylether	101-55-3		U	5.32	2.66
4-Chloroaniline	106-47-8		U	5.32	2.66
4-Nitrophenol	100-02-7		U	26.6	13.3
Acenaphthene	83-32-9		U	5.32	2.66
Acenaphthylene	208-96-8		U	5.32	2.66
Anthracene	120-12-7		U	5.32	2.66
Benzo(a)anthracene	56-55-3		U	5.32	2.66
Benzo(a)pyrene	50-32-8		U	5.32	2.66
Benzo(b)fluoranthene	205-99-2		U	5.32	2.66
Benzo(g,h,i)Perylene	191-24-2		U	5.32	2.66
Benzo(k)fluoranthene	207-08-9		U	5.32	2.66
Benzoic acid	65-85-0		U	21.3	10.6
Benzyl alcohol	100-51-6		U	5.32	2.66
Bis(2-Chloroethyl)ether	111-44-4		U	5.32	2.66
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.32	2.66
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.32	2.66
Butylbenzylphthalate	85-68-7		U	5.32	2.66
Carbazole	86-74-8		U	21.3	2.66
Chrysene	218-01-9		U	5.32	2.66
Di-N-Butylphthalate	84-74-2		U	5.32	2.66
Di-n-octylphthalate	117-84-0		U	5.32	2.66
Dibenzo(a,h)Anthracene	53-70-3		U	5.32	2.66
Dibenzofuran	132-64-9		U	5.32	2.66
Diethylphthalate	84-66-2		U	5.32	2.66
Dimethylphthalate	131-11-3		U	5.32	2.66
Fluoranthene	206-44-0		U	5.32	2.66
Fluorene	86-73-7		U	5.32	2.66
Hexachlorobenzene	118-74-1		U	5.32	2.66
Hexachlorobutadiene	87-68-3		U	5.32	2.66
Hexachlorocyclopentadiene	77-47-4		U	5.32	2.66

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Hexachloroethane	67-72-1		U	5.32	2.66
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.32	2.66
Isophorone	78-59-1		U	5.32	2.66
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.32	2.66
Naphthalene	91-20-3		U	5.32	2.66
Nitrobenzene	98-95-3		U	5.32	2.66
Pentachlorophenol	87-86-5		U	26.6	13.3
Phenanthrene	85-01-8		U	5.32	2.66
Phenol	108-95-2		U	5.32	2.66
Pyrene	129-00-0		U	5.32	2.66

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2,4,6-Tribromophenol	37.5	10	123	
2-Fluorobiphenyl	44.8	43	116	
2-Fluorophenol	40.3	21	100	
Nitrobenzene-d5	49.6	35	114	
p-Terphenyl-d14	64.3	33	141	
Phenol-d5	46.9	10	94	

U Not detected at or above adjusted sample detection limit.

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW06-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 18:27
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: 12M60658
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN		5.71		0.000	0.000

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW10-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 18:58
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: 12M60659
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
UNKNOWN		8.76		0.000	0.000

Certificate of Analysis

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW10-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 18:58
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: 12M60659
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	22.0	2.75
1,3,5-Trinitrobenzene	99-35-4		U	5.49	2.75
1,3-Dinitrobenzene	99-65-0		U	5.49	2.75
1,4-Dioxane	123-91-1		U	11.0	5.49
2,4,5-Trichlorophenol	95-95-4		U	5.49	2.75
2,4,6-Trichlorophenol	88-06-2		U	5.49	2.75
2,4-Dichlorophenol	120-83-2		U	5.49	2.75
2,4-Dimethylphenol	105-67-9		U	5.49	2.75
2,4-Dinitrophenol	51-28-5		U	27.5	13.7
2,4-Dinitrotoluene	121-14-2		U	5.49	2.75
2,6-Dinitrotoluene	606-20-2		U	5.49	2.75
2-Chloronaphthalene	91-58-7		U	5.49	2.75
2-Chlorophenol	95-57-8		U	5.49	2.75
2-Methylnaphthalene	91-57-6		U	5.49	2.75
2-Methylphenol	95-48-7		U	5.49	2.75
2-Nitroaniline	88-74-4		U	27.5	13.7
2-Nitrophenol	88-75-5		U	5.49	2.75
3-Nitroaniline	99-09-2		U	27.5	13.7
3,3'-Dichlorobenzidine	91-94-1		U	5.49	2.75
3-,4-Methylphenol	65794-96-9		U	5.49	2.75
4-Bromophenyl-phenylether	101-55-3		U	5.49	2.75
4-Chloroaniline	106-47-8		U	5.49	2.75
4-Nitrophenol	100-02-7		U	27.5	13.7
Acenaphthene	83-32-9		U	5.49	2.75
Acenaphthylene	208-96-8		U	5.49	2.75
Anthracene	120-12-7		U	5.49	2.75
Benzo(a)anthracene	56-55-3		U	5.49	2.75
Benzo(a)pyrene	50-32-8		U	5.49	2.75
Benzo(b)fluoranthene	205-99-2		U	5.49	2.75
Benzo(g,h,i)Perylene	191-24-2		U	5.49	2.75
Benzo(k)fluoranthene	207-08-9		U	5.49	2.75
Benzoic acid	65-85-0		U	22.0	11.0
Benzyl alcohol	100-51-6		U	5.49	2.75

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Bis(2-Chloroethyl)ether	111-44-4		U	5.49	2.75
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.49	2.75
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.49	2.75
Butylbenzylphthalate	85-68-7		U	5.49	2.75
Carbazole	86-74-8		U	22.0	2.75
Chrysene	218-01-9		U	5.49	2.75
Di-N-Butylphthalate	84-74-2		U	5.49	2.75
Di-n-octylphthalate	117-84-0		U	5.49	2.75
Dibenzo(a,h)Anthracene	53-70-3		U	5.49	2.75
Dibenzofuran	132-64-9		U	5.49	2.75
Diethylphthalate	84-66-2		U	5.49	2.75
Dimethylphthalate	131-11-3		U	5.49	2.75
Fluoranthene	206-44-0		U	5.49	2.75
Fluorene	86-73-7		U	5.49	2.75
Hexachlorobenzene	118-74-1		U	5.49	2.75
Hexachlorobutadiene	87-68-3		U	5.49	2.75
Hexachlorocyclopentadiene	77-47-4		U	5.49	2.75
Hexachloroethane	67-72-1		U	5.49	2.75
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.49	2.75
Isophorone	78-59-1		U	5.49	2.75
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.49	2.75
Naphthalene	91-20-3		U	5.49	2.75
Nitrobenzene	98-95-3		U	5.49	2.75
Pentachlorophenol	87-86-5		U	27.5	13.7
Phenanthrene	85-01-8		U	5.49	2.75
Phenol	108-95-2		U	5.49	2.75
Pyrene	129-00-0		U	5.49	2.75
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	39.3	10	123		
2-Fluorobiphenyl	61.7	43	116		
2-Fluorophenol	53.0	21	100		
Nitrobenzene-d5	69.7	35	114		
p-Terphenyl-d14	39.5	33	141		
Phenol-d5	59.0	10	94		
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: HPMS12
Client ID: DUP-GW-120716-1	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 19:30
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: 12M60660
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4		U	21.5	2.69
1,3,5-Trinitrobenzene	99-35-4		U	5.38	2.69
1,3-Dinitrobenzene	99-65-0		U	5.38	2.69
1,4-Dioxane	123-91-1		U	10.8	5.38
2,4,5-Trichlorophenol	95-95-4		U	5.38	2.69
2,4,6-Trichlorophenol	88-06-2		U	5.38	2.69
2,4-Dichlorophenol	120-83-2		U	5.38	2.69
2,4-Dimethylphenol	105-67-9		U	5.38	2.69
2,4-Dinitrophenol	51-28-5		U	26.9	13.4
2,4-Dinitrotoluene	121-14-2		U	5.38	2.69
2,6-Dinitrotoluene	606-20-2		U	5.38	2.69
2-Chloronaphthalene	91-58-7		U	5.38	2.69
2-Chlorophenol	95-57-8		U	5.38	2.69
2-Methylnaphthalene	91-57-6		U	5.38	2.69
2-Methylphenol	95-48-7		U	5.38	2.69
2-Nitroaniline	88-74-4		U	26.9	13.4
2-Nitrophenol	88-75-5		U	5.38	2.69
3-Nitroaniline	99-09-2		U	26.9	13.4
3,3'-Dichlorobenzidine	91-94-1		U	5.38	2.69
3-,4-Methylphenol	65794-96-9		U	5.38	2.69
4-Bromophenyl-phenylether	101-55-3		U	5.38	2.69
4-Chloroaniline	106-47-8		U	5.38	2.69
4-Nitrophenol	100-02-7		U	26.9	13.4
Acenaphthene	83-32-9		U	5.38	2.69
Acenaphthylene	208-96-8		U	5.38	2.69
Anthracene	120-12-7		U	5.38	2.69
Benzo(a)anthracene	56-55-3		U	5.38	2.69
Benzo(a)pyrene	50-32-8		U	5.38	2.69
Benzo(b)fluoranthene	205-99-2		U	5.38	2.69
Benzo(g,h,i)Perylene	191-24-2		U	5.38	2.69
Benzo(k)fluoranthene	207-08-9		U	5.38	2.69
Benzoic acid	65-85-0		U	21.5	10.8
Benzyl alcohol	100-51-6		U	5.38	2.69

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Bis(2-Chloroethyl)ether	111-44-4		U	5.38	2.69
Bis(2-Chloroethoxy)Methane	111-91-1		U	5.38	2.69
bis(2-Ethylhexyl)phthalate	117-81-7		U	5.38	2.69
Butylbenzylphthalate	85-68-7		U	5.38	2.69
Carbazole	86-74-8		U	21.5	2.69
Chrysene	218-01-9		U	5.38	2.69
Di-N-Butylphthalate	84-74-2		U	5.38	2.69
Di-n-octylphthalate	117-84-0		U	5.38	2.69
Dibenzo(a,h)Anthracene	53-70-3		U	5.38	2.69
Dibenzofuran	132-64-9		U	5.38	2.69
Diethylphthalate	84-66-2		U	5.38	2.69
Dimethylphthalate	131-11-3		U	5.38	2.69
Fluoranthene	206-44-0		U	5.38	2.69
Fluorene	86-73-7		U	5.38	2.69
Hexachlorobenzene	118-74-1		U	5.38	2.69
Hexachlorobutadiene	87-68-3		U	5.38	2.69
Hexachlorocyclopentadiene	77-47-4		U	5.38	2.69
Hexachloroethane	67-72-1		U	5.38	2.69
Indeno(1,2,3-cd)pyrene	193-39-5		U	5.38	2.69
Isophorone	78-59-1		U	5.38	2.69
Diphenylamine/n-Nitrosodiphenylamine	86-30-6		U	5.38	2.69
Naphthalene	91-20-3		U	5.38	2.69
Nitrobenzene	98-95-3		U	5.38	2.69
Pentachlorophenol	87-86-5		U	26.9	13.4
Phenanthrene	85-01-8		U	5.38	2.69
Phenol	108-95-2		U	5.38	2.69
Pyrene	129-00-0		U	5.38	2.69
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	42.3	10	123		
2-Fluorobiphenyl	56.8	43	116		
2-Fluorophenol	54.5	21	100		
Nitrobenzene-d5	62.8	35	114		
p-Terphenyl-d14	54.2	33	141		
Phenol-d5	59.0	10	94		
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: HPMS12
Client ID: DUP-GW-120716-1	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 19:30
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: 12M60660
Sample Tag: 01	Units: ug/L	

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

Sample #: L16120425-27	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 20:02
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60661
Sample Tag: 01	Units: ug/L	

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

Sample #: L16120425-27	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 20:02
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60661
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4	46.6		24.1	3.01
1,3,5-Trinitrobenzene	99-35-4	11.8		6.02	3.01
1,3-Dinitrobenzene	99-65-0	56.8		6.02	3.01
1,4-Dioxane	123-91-1	29.9		12.0	6.02
2,4,5-Trichlorophenol	95-95-4	45.4		6.02	3.01
2,4,6-Trichlorophenol	88-06-2	45.3		6.02	3.01
2,4-Dichlorophenol	120-83-2	44.8		6.02	3.01
2,4-Dimethylphenol	105-67-9	47.9		6.02	3.01
2,4-Dinitrophenol	51-28-5	55.7		30.1	15.1
2,4-Dinitrotoluene	121-14-2	62.3		6.02	3.01
2,6-Dinitrotoluene	606-20-2	57.4		6.02	3.01
2-Chloronaphthalene	91-58-7	39.1		6.02	3.01
2-Chlorophenol	95-57-8	44.3		6.02	3.01

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6	37.0		6.02	3.01
2-Methylphenol	95-48-7	48.4		6.02	3.01
2-Nitroaniline	88-74-4	63.0		30.1	15.1
2-Nitrophenol	88-75-5	44.8		6.02	3.01
3-Nitroaniline	99-09-2	61.1		30.1	15.1
3,3'-Dichlorobenzidine	91-94-1	62.1		6.02	3.01
3-,4-Methylphenol	65794-96-9	49.0		6.02	3.01
4-Bromophenyl-phenylether	101-55-3	51.4		6.02	3.01
4-Chloroaniline	106-47-8	49.5		6.02	3.01
4-Nitrophenol	100-02-7	65.8		30.1	15.1
Acenaphthene	83-32-9	47.6		6.02	3.01
Acenaphthylene	208-96-8	45.8		6.02	3.01
Anthracene	120-12-7	57.4		6.02	3.01
Benzo(a)anthracene	56-55-3	53.6		6.02	3.01
Benzo(a)pyrene	50-32-8	61.3		6.02	3.01
Benzo(b)fluoranthene	205-99-2	54.5		6.02	3.01
Benzo(g,h,i)Perylene	191-24-2	73.8		6.02	3.01
Benzo(k)fluoranthene	207-08-9	66.2		6.02	3.01
Benzoic acid	65-85-0	44.9		24.1	12.0
Benzyl alcohol	100-51-6	50.9		6.02	3.01
Bis(2-Chloroethyl)ether	111-44-4	52.1		6.02	3.01
Bis(2-Chloroethoxy)Methane	111-91-1	40.2		6.02	3.01
bis(2-Ethylhexyl)phthalate	117-81-7	58.6		6.02	3.01
Butylbenzylphthalate	85-68-7	58.2		6.02	3.01
Carbazole	86-74-8	66.0		24.1	3.01
Chrysene	218-01-9	57.4		6.02	3.01
Di-N-Butylphthalate	84-74-2	60.4		6.02	3.01
Di-n-octylphthalate	117-84-0	63.0		6.02	3.01
Dibenzo(a,h)Anthracene	53-70-3	50.4		6.02	3.01
Dibenzofuran	132-64-9	45.3		6.02	3.01
Diethylphthalate	84-66-2	63.3		6.02	3.01
Dimethylphthalate	131-11-3	58.5		6.02	3.01
Fluoranthene	206-44-0	57.4		6.02	3.01
Fluorene	86-73-7	50.8		6.02	3.01
Hexachlorobenzene	118-74-1	51.5		6.02	3.01
Hexachlorobutadiene	87-68-3	29.4		6.02	3.01
Hexachlorocyclopentadiene	77-47-4	13.7		6.02	3.01
Hexachloroethane	67-72-1	29.5		6.02	3.01
Indeno(1,2,3-cd)pyrene	193-39-5	64.3		6.02	3.01

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Isophorone	78-59-1	52.5		6.02	3.01
Diphenylamine/n-Nitrosodiphenylamine	86-30-6	42.4		6.02	3.01
Naphthalene	91-20-3	41.8		6.02	3.01
Nitrobenzene	98-95-3	53.8		6.02	3.01
Pentachlorophenol	87-86-5	55.8		30.1	15.1
Phenanthrene	85-01-8	59.9		6.02	3.01
Phenol	108-95-2	46.6		6.02	3.01
Pyrene	129-00-0	59.4		6.02	3.01
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	83.0	10	123		
2-Fluorobiphenyl	76.1	43	116		
2-Fluorophenol	74.8	21	100		
Nitrobenzene-d5	84.7	35	114		
p-Terphenyl-d14	46.4	33	141		
Phenol-d5	81.7	10	94		

Sample #: L16120425-28	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 20:34
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60662
Sample Tag: 01	Units: ug/L	

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

Sample #: L16120425-28	PrePrep Method: N/A	Instrument: HPMS12
Client ID: MW07-120716	Prep Method: 3520C	Prep Date: 12/12/2016 17:00
Matrix: Water	Analytical Method: 8270D	Cal Date: 11/18/2016 16:08
Workgroup #: WG594943	Analyst: SCB	Run Date: 12/15/2016 20:34
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: 12M60662
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
1,1'-Biphenyl	92-52-4	45.1		22.5	2.81
1,3,5-Trinitrobenzene	99-35-4	10.6		5.62	2.81
1,3-Dinitrobenzene	99-65-0	52.5		5.62	2.81
1,4-Dioxane	123-91-1	31.3		11.2	5.62
2,4,5-Trichlorophenol	95-95-4	44.5		5.62	2.81
2,4,6-Trichlorophenol	88-06-2	45.2		5.62	2.81

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
2,4-Dichlorophenol	120-83-2	42.9		5.62	2.81
2,4-Dimethylphenol	105-67-9	44.5		5.62	2.81
2,4-Dinitrophenol	51-28-5	55.7		28.1	14.0
2,4-Dinitrotoluene	121-14-2	55.7		5.62	2.81
2,6-Dinitrotoluene	606-20-2	52.7		5.62	2.81
2-Chloronaphthalene	91-58-7	37.5		5.62	2.81
2-Chlorophenol	95-57-8	41.5		5.62	2.81
2-Methylnaphthalene	91-57-6	36.4		5.62	2.81
2-Methylphenol	95-48-7	44.9		5.62	2.81
2-Nitroaniline	88-74-4	57.2		28.1	14.0
2-Nitrophenol	88-75-5	42.6		5.62	2.81
3-Nitroaniline	99-09-2	54.3		28.1	14.0
3,3'-Dichlorobenzidine	91-94-1	55.4		5.62	2.81
3-,4-Methylphenol	65794-96-9	45.9		5.62	2.81
4-Bromophenyl-phenylether	101-55-3	45.9		5.62	2.81
4-Chloroaniline	106-47-8	45.9		5.62	2.81
4-Nitrophenol	100-02-7	61.0		28.1	14.0
Acenaphthene	83-32-9	45.7		5.62	2.81
Acenaphthylene	208-96-8	44.1		5.62	2.81
Anthracene	120-12-7	50.7		5.62	2.81
Benzo(a)anthracene	56-55-3	48.7		5.62	2.81
Benzo(a)pyrene	50-32-8	55.3		5.62	2.81
Benzo(b)fluoranthene	205-99-2	49.6		5.62	2.81
Benzo(g,h,i)Perylene	191-24-2	66.2		5.62	2.81
Benzo(k)fluoranthene	207-08-9	61.3		5.62	2.81
Benzoic acid	65-85-0	45.9		22.5	11.2
Benzyl alcohol	100-51-6	47.0		5.62	2.81
Bis(2-Chloroethyl)ether	111-44-4	46.7		5.62	2.81
Bis(2-Chloroethoxy)Methane	111-91-1	37.7		5.62	2.81
bis(2-Ethylhexyl)phthalate	117-81-7	53.4		5.62	2.81
Butylbenzylphthalate	85-68-7	52.3		5.62	2.81
Carbazole	86-74-8	57.8		22.5	2.81
Chrysene	218-01-9	51.3		5.62	2.81
Di-N-Butylphthalate	84-74-2	53.7		5.62	2.81
Di-n-octylphthalate	117-84-0	57.5		5.62	2.81
Dibenzo(a,h)Anthracene	53-70-3	41.9		5.62	2.81
Dibenzofuran	132-64-9	42.7		5.62	2.81
Diethylphthalate	84-66-2	57.2		5.62	2.81
Dimethylphthalate	131-11-3	54.6		5.62	2.81

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Fluoranthene	206-44-0	51.2		5.62	2.81
Fluorene	86-73-7	47.0		5.62	2.81
Hexachlorobenzene	118-74-1	47.2		5.62	2.81
Hexachlorobutadiene	87-68-3	32.2		5.62	2.81
Hexachlorocyclopentadiene	77-47-4	15.8		5.62	2.81
Hexachloroethane	67-72-1	29.3		5.62	2.81
Indeno(1,2,3-cd)pyrene	193-39-5	58.3		5.62	2.81
Isophorone	78-59-1	48.9		5.62	2.81
Diphenylamine/n-Nitrosodiphenylamine	86-30-6	38.4		5.62	2.81
Naphthalene	91-20-3	39.8		5.62	2.81
Nitrobenzene	98-95-3	49.2		5.62	2.81
Pentachlorophenol	87-86-5	53.5		28.1	14.0
Phenanthrene	85-01-8	52.6		5.62	2.81
Phenol	108-95-2	43.2		5.62	2.81
Pyrene	129-00-0	52.9		5.62	2.81
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2,4,6-Tribromophenol	82.6	10	123		
2-Fluorobiphenyl	78.5	43	116		
2-Fluorophenol	73.1	21	100		
Nitrobenzene-d5	83.2	35	114		
p-Terphenyl-d14	48.8	33	141		
Phenol-d5	82.1	10	94		

2.2.1.2 QC Summary Data

Example 8270 Calculations

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

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

Example

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

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

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

Example

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

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

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

Example

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

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: WG594288 TIME ON: 18:00 OFF: 12:05 ON: 16:55 OFF: 10:55
 Analyst: CPD CH2CL2 Lot #: COA19311
 Spike Analyst: CPD Sodium Sulfate, Anhydrous, Granular Lot #: COA19291
 Method: 3520C 1:1 H2SO4 Lot #: RGT38550
 Run Date: 12/12/2016 17:00 10N NaOH Lot #: RGT38548
 SOP: EXB01 Revision 20
 Spike Witness: AC
 Surr Solution: STD78228

	SAMPLE #	Type	Reference	Prod	pH	Init Amnt	Surr Amnt	Spike Amnt	Spike Sol	Final Vol	Color
1	L16120425-07	SAMP		27-SPE-DIO<2>12		730 mL	.5 mL			1 mL	Transparent
2	L16120425-11	RS01		27-SPE-DIO<2>12		1000 mL	.5 mL			1 mL	Colored
3	L16120425-13	SAMP		27-SPE-DIO<2>12		890 mL	.5 mL			1 mL	Transparent
4	L16120425-15	SAMP		27-SPE-DIO<2>12		940 mL	.5 mL			1 mL	Transparent
5	L16120425-17	SAMP		27-SPE-DIO<2>12		910 mL	.5 mL			1 mL	Transparent
6	L16120425-21	SAMP		27-SPE-DIO<2>12		930 mL	.5 mL			1 mL	Transparent
7	L16120425-27	MS01	L16120425-11	27-SPE-DIO<2>12		830 mL	.5 mL	.5 mL	STD78353	1 mL	Colored
8	L16120425-28	SD01	L16120425-11	27-SPE-DIO<2>12		890 mL	.5 mL	.5 mL	STD78353	1 mL	Colored
9	L16120618-01	SAMP		27-SPE-DIO<2>12		930 mL	.5 mL			1 mL	Colored
10	L16120619-01	SAMP		27-SPE-DIO<2>12		960 mL	.5 mL			1 mL	Colored
11	L16120620-01	SAMP		27-SPE-DIO<2>12		920 mL	.5 mL			1 mL	Colored
12	L16120621-01	SAMP		27-SPE-DIO<2>12		880 mL	.5 mL			1 mL	Colored
13	L16120646-01	SAMP		27-SPE-DIO<2>12		930 mL	.5 mL			1 mL	Opaque
14	WG594288-01	BLANK		27-SPE-DIO<2>12		1000 mL	.5 mL			1 mL	Transparent
15	WG594288-02	LCS		27-SPE-DIO<2>12		1000 mL	.5 mL	.5 mL	STD78353	1 mL	Colored
16	WG594288-03	REF	L16120425-11	27-SPE-DIO<2>12		1000 mL	.5 mL			1 mL	Colored
17	WG594288-04	MS	L16120425-11	27-SPE-DIO<2>12		830 mL	.5 mL	.5 mL	STD78353	1 mL	Colored
18	WG594288-05	MSD	L16120425-11	27-SPE-DIO<2>12		890 mL	.5 mL	.5 mL	STD78353	1 mL	Colored

TV1 P5
 pH 0-3 Lot#230515
 pH 10-12 Lot#213515

Analyst: *Lebeck Davis*

Reviewer: *Austin Allison*



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS12 Dataset: 110416
 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
WG590339, WG590490
 Internal STD: COA19217 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD78613, 78137 LCS STD: _____ MS/MSD STD: _____

Comments: _____

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	12M60166	RINSE W/ IS	1	1		11/04/16 08:51
2	12M60167	WG590339-01 50PPM DFTPP STD	1	1	STD77832	11/04/16 09:22
3	12M60168	WG590339-02 50PPM 8270 STD	1	1	STD78613	11/04/16 09:41
4	12M60169	WG590339-03 1PPM 8270 STD	1	1	STD78613	11/04/16 10:14
5	12M60170	WG590339-04 3PPM 8270 STD	1	1	STD78613	11/04/16 10:46
6	12M60171	WG590339-05 10PPM 8270 STD	1	1	STD78613	11/04/16 11:18
7	12M60172	WG590339-06 15PPM 8270 STD	1	1	STD78613	11/04/16 11:50
8	12M60173	WG590339-07 25PPM 8270 STD	1	1	STD78613	11/04/16 12:22
9	12M60174	WG590339-08 80PPM 8270 STD	1	1	STD78613	11/04/16 12:54
10	12M60175	WG590339-09 100PPM 8270 STD	1	1	STD78613	11/04/16 13:26
11	12M60176	WG590339-10 120PPM 8270 STD	1	1	STD78613	11/04/16 13:57
12	12M60177	WG590339-11 50PPM 8270 ALT SRC	1	1	STD78148	11/04/16 14:29
13	12M60178	WG590339-12 50PPM 1,4-DIOX ALT SRC	1	1	STD76455	11/04/16 15:01
14	12M60179	WG590339-13 50PPM MP,A9,BENZ ALT SRC	1	1	STD77155	11/04/16 15:33
15	12M60180	WG590490-01 50PPM TCL STD	1	1	STD78137	11/04/16 16:06
16	12M60181	WG590490-02 3PPM TCL STD	1	1	STD78137	11/04/16 16:38
17	12M60182	WG590490-03 10PPM TCL STD	1	1	STD78137	11/04/16 17:09
18	12M60183	WG590490-04 25PPM TCL STD	1	1	STD78137	11/04/16 17:42
19	12M60184	WG590490-05 80PPM TCL STD	1	1	STD78137	11/04/16 18:14
20	12M60185	WG590490-06 100PPM TCL STD	1	1	STD78137	11/04/16 18:45
21	12M60186	WG590490-07 50PPM TCL ALT SRC	1	1	STD78432	11/04/16 19:17
22	12M60187	BAKE OUT	1	1		11/04/16 19:49

Comments

Seq.	Rerun	Dil.	Reason	Analytes
21				
			WG590490-07 50PPM TCL ALT SRC ran again on 11/7/16, DNR	

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Approved: 08-NOV-16

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS12 Dataset: 110716
 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
WG590490, WG590873, WG590510
 Internal STD: COA19217 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD78613, 78432, 7816 LCS STD: _____ MS/MSD STD: _____

Comments:

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	12M60188	WG590601-01 50PPM DFTPP STD	1	1	STD77832	11/07/16 11:23
2	12M60189	WG590601-02 50PPM 8270 STD	1	1	STD78613	11/07/16 11:41
3	12M60190	WG590490-07 50PPM TCL ALT ARC	1	1	STD78432	11/07/16 12:13
4	12M60191	WG590281-01 BLANK 11/4	17	1		11/07/16 12:45
5	12M60192	WG590281-02 LCS 11/4	17	1		11/07/16 13:18
6	12M60193	WG590281-03 LCS2 11/4	17	1		11/07/16 13:50
7	12M60194	WG590630-01 50PPM TCL STD	1	1	STD78137	11/07/16 14:19
8	12M60195	WG589933-01 BLANK 11/2	1	1		11/07/16 14:51
9	12M60196	L16100002-01 3510C LOD RE	1	1		11/07/16 15:22
10	12M60197	L16100004-01 3510C LOQ RE	1	1		11/07/16 15:54
11	12M60198	L16100004-09 3510C LOQ RE	1	1		11/07/16 16:26
12	12M60199	L16110102-01 REF	17	1		11/07/16 16:58
13	12M60200	WG590281-05 MS	17	1		11/07/16 17:30
14	12M60201	L16110105-01	17	1		11/07/16 18:02
15	12M60202	L16110105-02	17	1		11/07/16 18:34
16	12M60203	L16110105-03	17	1		11/07/16 19:06
17	12M60204	L16110112-01	17	1		11/07/16 19:38
18	12M60205	L16110112-02	17	1		11/07/16 20:09
19	12M60206	WG590200-01 FBLK1	17	1		11/07/16 20:41
20	12M60207	WG590200-02 FBLK2	17	1		11/07/16 21:13
21	12M60208	BAKE OUT	1	1		11/07/16 21:44

Comments

Seq.	Rerun	Dil.	Reason	Analytes
6				
			WG590281-03 LCS2 11/4 pentachlorophenol has a high %REC, all samples are non-detect for this high outlier	
8				
			WG589933-01 BLANK 11/2 has one low base surrogate recovery for samples L16100004-01 and -09	
9				
			L16100002-01 3510C LOD RE re-extracted for 7,12-dimethylbenz(a)anthracene	
10				
			L16100004-01 3510C LOQ RE re-extracted for 7,12-dimethylbenz(a)anthracene, has one low base surrogate recovery	
11				

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Approved: 09-NOV-16

Mary Schilling



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS12 Dataset: 110716
 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#: _____

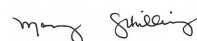
Workgroups: Column 1 ID: RXI-5MS Column 2 ID: NA
WG590490, WG590873, WG590510
 Internal STD: COA19217 Surrogate STD: NA
 CCV STD: STD78613, 78432, 7816 LCS STD: _____

Comments

Seq.	Rerun	Dil.	Reason	Analytes
			L16100004-09 3510C LOQ RE re-extracted for 7,12-dimethylbenz(a)anthracene, has one low base surrogate recovery	

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Approved: 09-NOV-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS12 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: WG592228, WG592220
 Column 1 ID: RXI-5MS Column 2 ID: NA
 Internal STD: COA19217 Surrogate STD: NA Calibration STD: _____
 CCV STD: STD78613, STD78967 LCS STD: STD78148, STD76455, ST MS/MSD STD: _____

Comments: L16110002-45,-46,-47,-48 all need re-extracted due to sporadic low recoveries.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	12M60412	WG592228-01 50PPM DFTPP STD	1	1	STD77832	11/18/16 09:20
2	12M60413	WG592228-02 50PPM 8270 STD	1	1	STD78613	11/18/16 09:39
3	12M60414	WG592228-02 50PPM 8270 STD	1	1	STD78613	11/18/16 10:11
4	12M60416	WG592228-01 50PPM DFTPP STD	1	1	STD77832	11/18/16 11:03
5	12M60417	WG592228-02 50PPM 8270 STD	1	1	STD78613	11/18/16 11:22
6	12M60418	WG592228-02 50PPM 8270 STD	1	1	STD78613	11/18/16 11:54
7	12M60419	WG592228-03 1 PPM 8270 STD	1	1	STD78613	11/18/16 12:26
8	12M60420	WG592228-04 3 PPM 8270 STD	1	1	STD78613	11/18/16 12:57
9	12M60421	WG592228-05 10 PPM 8270 STD	1	1	STD78613	11/18/16 13:29
10	12M60422	WG592228-06 15 PPM 8270 STD	1	1	STD78613	11/18/16 14:01
11	12M60423	WG592228-07 25 PPM 8270 STD	1	1	STD78613	11/18/16 14:32
12	12M60424	WG592228-08 80 PPM 8270 STD	1	1	STD78613	11/18/16 15:04
13	12M60425	WG592228-09 100 PPM 8270 STD	1	1	STD78613	11/18/16 15:36
14	12M60426	WG592228-10 120 PPM 8270 STD	1	1	STD78613	11/18/16 16:08
15	12M60427	WG592228-11 50PPM 8270 ALT SRC	1	1	STD78148	11/18/16 16:40
16	12M60428	WG592228-12 50PPM 1,4-DIOXANE ALT SRC	1	1	STD76455	11/18/16 17:12
17	12M60429	WG592228-13 50PPM AP9,MP,BENZIDINE ALT S	1	1	STD77155	11/18/16 17:41
18	12M60430	WG592383-01 50PPM TCL STD	1	1	STD78967	11/18/16 18:13
19	12M60431	WG591949-01 BLANK 11/17	7	1	SOIL	11/18/16 18:42
41	12M60432	L16110002-45 WG591949-02 LCS 11/17	7	1	SOIL	11/18/16 19:13
38	12M60433	L16110002-46 3546 DOC	7	1	SOIL	11/18/16 19:45
39	12M60434	L16110002-47 3546 DOC	7	1	SOIL	11/18/16 20:17
40	12M60435	L16110002-48 3546 DOC	7	1	SOIL	11/18/16 20:49
32	12M60436	L16110787-01 REF	7	1	SOIL	11/18/16 21:20
25	12M60437	WG591949-04 MS L16110787-01	7	1	SOIL	11/18/16 21:52
26	12M60438	WG591949-05 MSD L16110787-01	7	1	SOIL	11/18/16 22:23
27	12M60439	L16110570-01 10X	10	10	SOIL	11/18/16 22:55
28	12M60440	L16110570-02 10X	10	10	SOIL	11/18/16 23:26
29	12M60441	BAKEOUT	1	1		11/18/16 23:58
30	12M60442	BAKEOUT	1	1		11/19/16 00:29
31	12M60443	BAKEOUT	1	1		11/19/16 01:00

Comments

Page: 1

Approved: 22-NOV-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS12 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
WG592228, WG592220
 Internal STD: COA19217 Surrogate STD: NA
 CCV STD: STD78613, STD78967 LCS STD: STD78148, STD76455, ST

Comments

Seq.	Rerun	Dil.	Reason	Analytes
2				
			Rerun CCV, benzoic acid is low.	
3				
			WG592228-02 50PPM 8270 STD Benzoic acid is still low and di-n-octylphthalate is high. Clipping column and restarting.	
5				
			WG592228-02 50PPM 8270 STD di-n-octylphthalate is high, rerun.	
6				
			Di-n-octylphthalate is still high and benzoic acid is low. Running a curve.	
19				
			WG591949-01 BLANK 11/17 four high surrogates for DOWWV.	
28	X	10	Missed Tune	
			L16110570-02 10X	




Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS12 Dataset: 121516
 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
WG594943, WG595415
 Internal STD: STD19217 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	12M60643	WG595046-01 50PPM DFTPP STD	1	1	STD77832	12/15/16 10:29
2	12M60644	WG595046-02 50PPM 8270 STD	1	1	STD78613	12/15/16 10:48
3	12M60645	WG595046-02 50PPM 8270 STD	1	1	STD78613	12/15/16 11:20
4	12M60646	WG595046-01 50PPM DFTPP STD	1	1	STD77832	12/15/16 12:19
5	12M60647	WG595046-02 50PPM 8270 STD	1	1	STD78613	12/15/16 12:37
6	12M60648	WG595069-01 50PPM TCL STD	1	1	STD78967	12/15/16 13:08
7	12M60649	WG594288-01 BLANK 12/12	1	1		12/15/16 13:40
8	12M60650	WG594288-02 LCS 12/12	1	1		12/15/16 14:12
9	12M60651	WG594635-01 BLANK 12/13	7	1	SOIL	12/15/16 14:44
10	12M60652	WG594635-02 LCS 12/13	7	1	SOIL	12/15/16 15:15
11	12M60653	L16120589-01	10	1		12/15/16 15:47
12	12M60654	L16120608-01 5X	10	5		12/15/16 16:19
13	12M60655	L16120425-07	1	1		12/15/16 16:51
32	12M60656	L16120425-11 REF	1	1		12/15/16 17:23
15	12M60657	L16120425-13	1	1		12/15/16 17:55
16	12M60658	L16120425-15	1	1		12/15/16 18:27
17	12M60659	L16120425-17	1	1		12/15/16 18:58
18	12M60660	L16120425-21	1	1		12/15/16 19:30
35	12M60661	WG594288-04 L16120425-27 MS	1	1		12/15/16 20:02
34	12M60662	WG594288-05 L16120425-28 MSD	1	1		12/15/16 20:34
21	12M60663	L16120619-01	1	1		12/15/16 21:05
22	12M60664	L16120621-01	1	1		12/15/16 21:36
23	12M60665	L16120620-01	1	1		12/15/16 22:07
24	12M60666	L16120618-01	1	1		12/15/16 22:39
25	12M60667	L16120563-01 10X	7	10	SOIL	12/15/16 23:10
26	12M60668	L16120646-01 10X	1	10		12/15/16 23:42
27	12M60669	BAKE OUT	1	1		12/16/16 00:14
28	12M60670	BAKE OUT	1	1		12/16/16 00:45
29	12M60671	BAKE OUT	1	1		12/16/16 01:16

Comments

Seq.	Rerun	Dil.	Reason	Analytes
1				

Page: 1

Approved: 19-DEC-16

Eri C. Zimm



Microbac Laboratories Inc.
Instrument Run Log

Instrument: HPMS12 Dataset: 121516
 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
WG594943, WG595415
 Internal STD: STD19217 Surrogate STD: NA
 CCV STD: STD78613 LCS STD: _____

Comments

Seq.	Rerun	Dil.	Reason	Analytes
			<u>WG595046-01 50PPM DFTPP STD CCV not passing, DNR</u>	
2			<u>WG595046-02 50PPM 8270 STD PCP not passing, DNR</u>	
3			<u>WG595046-02 50PPM 8270 STD PCP not passing, changed the liner, DNR</u>	
8			<u>WG594288-02 LCS 12/12 has one low and one high %REC for samples L16120425's</u>	
11			<u>L16120589-01 all surrogate recoveries are <10%, needs re-extracted</u>	
12			<u>L16120608-01 5X ran at a dilution due to a dark, viscous sample matrix, has one low surrogate recovery <10%, needs re-extracted</u>	
35			<u>WG594288-04 L16120425-27 MS has one low %REC</u>	
21	X		<u>Internal standard failure</u>	
			<u>L16120619-01 DNR</u>	
22	X		<u>Internal standard failure</u>	
			<u>L16120621-01 DNR</u>	
23	X		<u>Internal standard failure</u>	
			<u>L16120620-01 DNR</u>	
24	X		<u>Internal standard failure</u>	
			<u>L16120618-01 DNR</u>	
25			<u>L16120563-01 10X checking a large peak for target analyte, none are present, DNR</u>	
26	X		<u>Internal standard failure</u>	
			<u>L16120646-01 10X ran at a dilution due to a cloudy, brown sample matrix</u>	



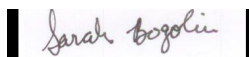

Microbac Laboratories Inc.

Data Checklist


Date: 04-NOV-2016
 Analyst: SCB
 Analyst: NA
 Method: 8270
 Instrument: HPMS12
 Curve Workgroup: NA
 Runlog ID: 78539
 Analytical Workgroups: WG590339, WG590490

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)	NA
% D/% Drift	NA
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	NA
Special standards	X
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:
07-NOV-2016



Secondary Reviewer:
08-NOV-2016





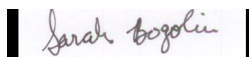
Microbac Laboratories Inc.

Data Checklist

Date: 07-NOV-2016
 Analyst: SCB
 Analyst: NA
 Method: 8270
 Instrument: HPMS12
 Curve Workgroup: NA
 Runlog ID: 78542
 Analytical Workgroups: WG590490, L16100002, L16100004, L16110102, L16110105, L1611011

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	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:
08-NOV-2016



Secondary Reviewer:
09-NOV-2016





Microbac Laboratories Inc.

Data Checklist

Date: 18-NOV-2016
 Analyst: MES
 Analyst: NA
 Method: 8270
 Instrument: HPMS12
 Curve Workgroup: NA
 Runlog ID: 78860
 Analytical Workgroups: L16110002, L16110570, L16110787

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)	NA
% D/% Drift	NA
Minimum response factors (MS)	NA
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	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	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



Secondary Reviewer:
22-NOV-2016



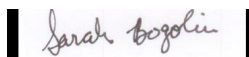

Microbac Laboratories Inc.

Data Checklist


Date: 15-DEC-2016
 Analyst: SCB
 Analyst: MES
 Method: 8270
 Instrument: HPMS12
 Curve Workgroup: NA
 Runlog ID: 79292
 Analytical Workgroups: L16120589, L16120608, 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	X
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 MES
Surrogate recoveries	X
Internal standard areas (MS)	X
Library searches (MS)	X
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	ECL

Primary Reviewer:
18-DEC-2016



Secondary Reviewer:
19-DEC-2016





Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:8270D
 Login Number:L16120425

AAB#:WG594943

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
MW05I-120716	07	12/07/16					12/12/2016	5.3	7		12/15/16	3	40	
MW07-120716	11	12/07/16					12/12/2016	5.3	7		12/15/16	3	40	
MW20-120716	13	12/07/16					12/12/2016	5.2	7		12/15/16	3	40	
MW06-120716	15	12/07/16					12/12/2016	5.1	7		12/15/16	3.1	40	
MW10-120716	17	12/07/16					12/12/2016	5.2	7		12/15/16	3.1	40	
DUP-GW-120716-1	21	12/07/16					12/12/2016	5.2	7		12/15/16	3.1	40	
MW07-120716	27	12/07/16					12/12/2016	5.3	7		12/15/16	3.1	40	
MW07-120716	28	12/07/16					12/12/2016	5.3	7		12/15/16	3.1	40	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5070259
 Report generated 12/19/2016 11:05



Microbac Laboratories Inc.
SURROGATE STANDARDS

Login Number:L16120425
Instrument Id:HPMS12
Workgroup (AAB#):WG594943

Method:8270
CAL ID: HPMS12-18-NOV-16
Matrix:Water

Sample Number	Dilution	Tag	1	2	3	4	5	6
L16120425-07	1.00	01	21.0	<u>35.0</u>	31.3	39.2	66.7	36.4
L16120425-11	1.00	01	43.8	50.6	45.1	55.1	55.5	51.5
L16120425-13	1.00	01	40.3	49.1	47.2	54.4	89.2	53.4
L16120425-15	1.00	01	37.5	44.8	40.3	49.6	64.3	46.9
L16120425-17	1.00	01	39.3	61.7	53.0	69.7	39.5	59.0
L16120425-21	1.00	01	42.3	56.8	54.5	62.8	54.2	59.0
L16120425-27	1.00	01	83.0	76.1	74.8	84.7	46.4	81.7
L16120425-28	1.00	01	82.6	78.5	73.1	83.2	48.8	82.1
WG594288-01	1.00	01	66.9	68.7	58.3	71.6	80.8	63.2
WG594288-02	1.00	01	82.4	58.9	54.2	62.9	82.0	59.3

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 SUMMARY

Login Number: L16120425 Work Group: WG594943
 Blank File ID: 12M60649 Blank Sample ID: WG594288-01
 Prep Date: 12/12/16 17:00 Instrument ID: HPMS12
 Analyzed Date: 12/15/16 13:40 Method: 8270D
 Analyst: SCB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594288-02	12M60650	12/15/16 14:12	01
MW05I-120716	L16120425-07	12M60655	12/15/16 16:51	01
MW07-120716	L16120425-11	12M60656	12/15/16 17:23	01
MW20-120716	L16120425-13	12M60657	12/15/16 17:55	01
MW06-120716	L16120425-15	12M60658	12/15/16 18:27	01
MW10-120716	L16120425-17	12M60659	12/15/16 18:58	01
DUP-GW-120716-1	L16120425-21	12M60660	12/15/16 19:30	01
MW07-120716	L16120425-27	12M60661	12/15/16 20:02	01
MW07-120716	L16120425-28	12M60662	12/15/16 20:34	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5070260
 Report generated 12/19/2016 11:05



METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/12/16 17:00 Sample ID: WG594288-01
Instrument ID: HPMS12 Run Date: 12/15/16 13:40 Prep Method: 3520C
File ID: 12M60649 Analyst: SCB Method: 8270D
Workgroup (AAB#): WG594943 Matrix: Water Units: ug/L
Contract #: Cal ID: HPMS12-18-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: 5070261

19-DEC-2016 11:05



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/12/16 17:00 Sample ID: WG594288-01
 Instrument ID: HPMS12 Run Date: 12/15/16 13:40 Prep Method: 3520C
 File ID: 12M60649 Analyst: SCB Method: 8270D
 Workgroup (AAB#): WG594943 Matrix: Water Units: ug/L
 Contract #: _____ Cal ID: HPMS12-18-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	66.9	10 - 123	PASS
2-Fluorobiphenyl	68.7	43 - 116	PASS
2-Fluorophenol	58.3	21 - 100	PASS
Nitrobenzene-d5	71.6	35 - 114	PASS
p-Terphenyl-d14	80.8	33 - 141	PASS
Phenol-d5	63.2	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: 5070261
 19-DEC-2016 11:05



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Run Date: 12/15/2016 Sample ID: WG594288-02
 Instrument ID: HPMS12 Run Time: 14:12 Prep Method: 3520C
 File ID: 12M60650 Analyst: SCB Method: 8270D
 Workgroup (AAB#): WG594943 Matrix: Water Units: ug/L
 QC Key: WATERLOO Lot#: STD78353 Cal ID: HPMS12-18-NOV-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
1,1'-Biphenyl	50.0	30.5	61.1	40 - 140	
1,4-Dioxane	50.0	20.8	41.5	50 - 150	*
2,4,5-Trichlorophenol	50.0	32.6	65.1	35 - 120	
2,4,6-Trichlorophenol	50.0	32.7	65.4	30 - 120	
2,4-Dichlorophenol	50.0	27.7	55.4	20 - 110	
2,4-Dimethylphenol	50.0	27.2	54.5	20 - 120	
2,4-Dinitrophenol	50.0	52.0	104	20 - 140	
2,4-Dinitrotoluene	50.0	47.6	95.1	50 - 139	
2,6-Dinitrotoluene	50.0	42.4	84.9	50 - 120	
2-Chloronaphthalene	50.0	28.2	56.3	25 - 120	
2-Chlorophenol	50.0	26.7	53.4	25 - 110	
2-Methylnaphthalene	50.0	26.6	53.2	25 - 120	
2-Methylphenol	50.0	28.9	57.9	20 - 110	
2-Nitroaniline	50.0	45.1	90.1	45 - 115	
2-Nitrophenol	50.0	28.6	57.1	20 - 115	
3-Nitroaniline	50.0	45.8	91.6	40 - 120	
3,3'-Dichlorobenzidine	50.0	55.4	111	30 - 140	
3-,4-Methylphenol	50.0	29.7	59.4	20 - 110	
4-Bromophenyl-phenylether	50.0	42.2	84.4	40 - 115	
4-Chloroaniline	50.0	33.3	66.7	25 - 120	
4-Nitrophenol	50.0	52.1	104	10 - 132	
Acenaphthene	50.0	35.7	71.4	30 - 120	
Acenaphthylene	50.0	33.1	66.3	30 - 120	
Anthracene	50.0	46.7	93.3	55 - 130	
Benzo(a)anthracene	50.0	50.2	100	60 - 130	
Benzo(a)pyrene	50.0	58.6	117	55 - 135	
Benzo(b)fluoranthene	50.0	50.8	102	45 - 125	
Benzo(g,h,i)Perylene	50.0	71.5	143	45 - 140	*
Benzo(k)fluoranthene	50.0	62.6	125	55 - 140	
Benzoic acid	50.0	24.7	49.3	10 - 100	
Benzyl alcohol	50.0	30.1	60.2	20 - 110	
Bis(2-Chloroethyl)ether	50.0	30.7	61.4	25 - 110	
Bis(2-Chloroethoxy)Methane	50.0	24.2	48.3	20 - 105	
bis(2-Ethylhexyl)phthalate	50.0	55.9	112	50 - 150	
Butylbenzylphthalate	50.0	51.5	103	55 - 150	
Carbazole	50.0	51.2	102	50 - 130	
Chrysene	50.0	52.9	106	55 - 130	
Di-N-Butylphthalate	50.0	51.2	102	55 - 118	
Di-n-octylphthalate	50.0	58.6	117	40 - 146	
Dibenzo(a,h)Anthracene	50.0	47.6	95.2	45 - 125	
Dibenzofuran	50.0	33.5	67.0	35 - 115	

LCS - Modified 03/06/2008
 PDF File ID: 5070262
 Report generated: 12/19/2016 11:06



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Run Date: 12/15/2016 Sample ID: WG594288-02
Instrument ID: HPMS12 Run Time: 14:12 Prep Method: 3520C
File ID: 12M60650 Analyst: SCB Method: 8270D
Workgroup (AAB#): WG594943 Matrix: Water Units: ug/L
QC Key: WATERLOO Lot#: STD78353 Cal ID: HPMS12-18-NOV-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Diethylphthalate	50.0	48.5	97.0	45 - 120	
Dimethylphthalate	50.0	44.3	88.5	25 - 112	
Fluoranthene	50.0	49.3	98.7	50 - 137	
Fluorene	50.0	39.0	77.9	40 - 120	
Hexachlorobenzene	50.0	46.1	92.2	50 - 130	
Hexachlorobutadiene	50.0	21.7	43.4	24 - 105	
Hexachlorocyclopentadiene	50.0	12.9	25.8	20 - 143	
Hexachloroethane	50.0	18.0	36.0	25 - 95	
Indeno(1,2,3-cd)pyrene	50.0	63.1	126	50 - 135	
Isophorone	50.0	32.4	64.8	30 - 110	
Diphenylamine/n-Nitrosodiphenylamine	50.0	43.7	87.4	40 - 110	
Naphthalene	50.0	27.1	54.1	25 - 110	
Nitrobenzene	50.0	31.9	63.8	30 - 110	
Pentachlorophenol	50.0	51.4	103	40 - 140	
Phenanthrene	50.0	47.3	94.5	55 - 120	
Phenol	50.0	27.6	55.1	10 - 120	
Pyrene	50.0	51.1	102	55 - 130	

Surrogates	% Recovery	Surrogate Limits	Qualifier
2,4,6-Tribromophenol	82.4	10 - 123	PASS
2-Fluorobiphenyl	58.9	43 - 116	PASS
2-Fluorophenol	54.2	21 - 100	PASS
Nitrobenzene-d5	62.9	35 - 114	PASS
p-Terphenyl-d14	82.0	33 - 141	PASS
Phenol-d5	59.3	10 - 94	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
PDF File ID: 5070262
Report generated: 12/19/2016 11:06



MS/MSD REPORT

Loginnum: L16120425Cal ID: HPMS12- 18-NOV-16Worknum: WG594943Instrument ID: HPMS12

Contract #: _____

Prep Method: 3520CParent ID: L16120425-11File ID: 12M60656Dil: 1Method: 8270CSample ID: L16120425-27 MSFile ID: 12M60661Dil: 1Matrix: WaterSample ID: L16120425-28 MSDFile ID: 12M60662Dil: 1Units: ug/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
1,1'-Biphenyl	U	60.2	46.6	77.3	56.2	45.1	80.2	3.21	40 - 140	30	
1,4-Dioxane	U	60.2	29.9	49.6	56.2	31.3	55.8	4.85	50 - 150	30	*
2,4,5-Trichlorophenol	U	60.2	45.4	75.3	56.2	44.5	79.2	1.97	35 - 120	30	
2,4,6-Trichlorophenol	U	60.2	45.3	75.1	56.2	45.2	80.5	0.0561	30 - 120	30	
2,4-Dichlorophenol	U	60.2	44.8	74.3	56.2	42.9	76.4	4.23	20 - 110	30	
2,4-Dimethylphenol	U	60.2	47.9	79.6	56.2	44.5	79.2	7.50	20 - 120	30	
2,4-Dinitrophenol	U	60.2	55.7	92.5	56.2	55.7	99.1	0.0415	20 - 140	30	
2,4-Dinitrotoluene	U	60.2	62.3	103	56.2	55.7	99.1	11.3	50 - 139	30	
2,6-Dinitrotoluene	U	60.2	57.4	95.3	56.2	52.7	93.7	8.62	50 - 120	30	
2-Chloronaphthalene	U	60.2	39.1	65	56.2	37.5	66.7	4.36	25 - 120	30	
2-Chlorophenol	U	60.2	44.3	73.6	56.2	41.5	73.8	6.65	25 - 110	30	
2-Methylnaphthalene	U	60.2	37.0	61.4	56.2	36.4	64.7	1.73	25 - 120	30	
2-Methylphenol	U	60.2	48.4	80.3	56.2	44.9	79.9	7.45	20 - 110	30	
2-Nitroaniline	U	60.2	63.0	105	56.2	57.2	102	9.68	45 - 115	30	
2-Nitrophenol	U	60.2	44.8	74.4	56.2	42.6	75.8	5.13	20 - 115	30	
3,3'-Dichlorobenzidine	U	60.2	62.1	103	56.2	55.4	98.6	11.3	30 - 140	30	
3-,4-Methylphenol	U	60.2	49.0	81.3	56.2	45.9	81.8	6.40	20 - 110	30	
3-Nitroaniline	U	60.2	61.1	101	56.2	54.3	96.7	11.7	40 - 120	30	
4-Bromophenyl-phenylether	U	60.2	51.4	85.4	56.2	45.9	81.7	11.4	40 - 115	30	
4-Chloroaniline	U	60.2	49.5	82.1	56.2	45.9	81.8	7.39	25 - 120	30	
4-Nitrophenol	U	60.2	65.8	109	56.2	61.0	109	7.59	10 - 132	30	
Acenaphthene	U	60.2	47.6	79.1	56.2	45.7	81.4	4.11	30 - 120	30	
Acenaphthylene	U	60.2	45.8	76	56.2	44.1	78.6	3.61	30 - 120	30	
Anthracene	U	60.2	57.4	95.2	56.2	50.7	90.2	12.4	55 - 130	30	
Benzo(a)anthracene	U	60.2	53.6	88.9	56.2	48.7	86.8	9.40	60 - 130	30	
Benzo(a)pyrene	U	60.2	61.3	102	56.2	55.3	98.4	10.3	55 - 135	30	
Benzo(b)fluoranthene	U	60.2	54.5	90.4	56.2	49.6	88.3	9.33	45 - 125	30	
Benzo(g,h,i)Perylene	U	60.2	73.8	122	56.2	66.2	118	10.8	45 - 140	30	
Benzo(k)fluoranthene	U	60.2	66.2	110	56.2	61.3	109	7.68	55 - 140	30	
Benzoic acid	U	60.2	44.9	74.5	56.2	45.9	81.7	2.23	10 - 100	30	
Benzyl alcohol	U	60.2	50.9	84.6	56.2	47.0	83.7	7.99	20 - 110	30	
Bis(2-Chloroethoxy)Methane	U	60.2	40.2	66.7	56.2	37.7	67.1	6.37	20 - 105	30	
Bis(2-Chloroethyl)ether	U	60.2	52.1	86.5	56.2	46.7	83.2	10.8	25 - 110	30	
bis(2-Ethylhexyl)phthalate	U	60.2	58.6	97.3	56.2	53.4	95.1	9.23	50 - 150	30	
Butylbenzylphthalate	U	60.2	58.2	96.7	56.2	52.3	93.1	10.8	55 - 150	30	
Carbazole	U	60.2	66.0	109	56.2	57.8	103	13.2	50 - 130	30	
Chrysene	U	60.2	57.4	95.2	56.2	51.3	91.3	11.2	55 - 130	30	
Di-N-Butylphthalate	U	60.2	60.4	100	56.2	53.7	95.7	11.7	55 - 118	30	
Di-n-octylphthalate	U	60.2	63.0	105	56.2	57.5	102	9.21	40 - 146	30	
Dibenzo(a,h)Anthracene	U	60.2	50.4	83.7	56.2	41.9	74.5	18.5	45 - 125	30	
Dibenzofuran	U	60.2	45.3	75.3	56.2	42.7	76	6.01	35 - 115	30	

MS_MSD - Modified 03/06/2008

PDF File ID: 5070263

Report generated 12/19/2016 11:06



MS/MSD REPORT

Loginnum: L16120425 Cal ID: HPMS12 18-NOV-16 Worknum: WG594943
 Instrument ID: HPMS12 Contract #: _____ Prep Method: 3520C
 Parent ID: L16120425-11 File ID: 12M60656 Dil: 1 Method: 8270C
 Sample ID: L16120425-27 MS File ID: 12M60661 Dil: 1 Matrix: Water
 Sample ID: L16120425-28 MSD File ID: 12M60662 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
Diethylphthalate	U	60.2	63.3	105	56.2	57.2	102	10.1	45 - 120	30	
Dimethylphthalate	U	60.2	58.5	97	56.2	54.6	97.1	6.88	25 - 112	30	
Fluoranthene	U	60.2	57.4	95.2	56.2	51.2	91.2	11.3	50 - 137	30	
Fluorene	U	60.2	50.8	84.4	56.2	47.0	83.6	7.92	40 - 120	30	
Hexachlorobenzene	U	60.2	51.5	85.5	56.2	47.2	83.9	8.76	50 - 130	30	
Hexachlorobutadiene	U	60.2	29.4	48.8	56.2	32.2	57.3	9.03	24 - 105	30	
Hexachlorocyclopentadiene	U	60.2	13.7	22.7	56.2	15.8	28.1	14.5	20 - 143	30	
Hexachloroethane	U	60.2	29.5	48.9	56.2	29.3	52.2	0.441	25 - 95	30	
Indeno(1,2,3-cd)pyrene	U	60.2	64.3	107	56.2	58.3	104	9.73	50 - 135	30	
Isophorone	U	60.2	52.5	87.1	56.2	48.9	87	7.15	30 - 110	30	
Diphenylamine/n-Nitrosodiphenylamine	U	60.2	42.4	70.3	56.2	38.4	68.3	9.92	40 - 110	30	
Naphthalene	U	60.2	41.8	69.4	56.2	39.8	70.8	4.99	25 - 110	30	
Nitrobenzene	U	60.2	53.8	89.2	56.2	49.2	87.6	8.77	30 - 110	30	
Pentachlorophenol	U	60.2	55.8	92.7	56.2	53.5	95.2	4.37	40 - 140	30	
Phenanthrene	U	60.2	59.9	99.4	56.2	52.6	93.7	12.9	55 - 120	30	
Phenol	U	60.2	46.6	77.4	56.2	43.2	76.9	7.69	10 - 120	30	
Pyrene	U	60.2	59.4	98.5	56.2	52.9	94.1	11.6	55 - 130	30	

* FAILS %REC LIMIT

FAILS RPD LIMIT



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120425 Tune ID: WG590339-01
 Instrument: HPMS12 Run Date: 11/04/2016
 Analyst: SCB Run Time: 09:22
 Workgroup: WG590339 File ID: 12M60167
 Cal ID: HPMS12-04-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	37.9	38530	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	42.1	42810	PASS
70.0	69.0	0	2.00	0.740	317	PASS
127	198	40.0	60.0	47.1	47816	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	101586	PASS
199	198	5.00	9.00	6.67	6772	PASS
275	198	10.0	30.0	27.5	27893	PASS
365	198	1.00	100	3.66	3719	PASS
441	443	0.0100	100	73.1	8633	PASS
442	198	40.0	100	58.4	59344	PASS
443	442	17.0	23.0	19.9	11805	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG590490-01	STD-CCV	01	11/04/2016 16:06	
WG590490-02	STD	01	11/04/2016 16:38	
WG590490-03	STD	01	11/04/2016 17:09	
WG590490-04	STD	01	11/04/2016 17:42	
WG590490-05	STD	01	11/04/2016 18:14	
WG590490-06	STD	01	11/04/2016 18:45	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120425 Tune ID: WG590601-01
 Instrument: HPMS12 Run Date: 11/07/2016
 Analyst: SCB Run Time: 11:23
 Workgroup: WG590601 File ID: 12M60188
 Cal ID: HPMS12-04-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	41.0	47810	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	46.5	54247	PASS
70.0	69.0	0	2.00	0.706	383	PASS
127	198	40.0	60.0	49.2	57437	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	116709	PASS
199	198	5.00	9.00	6.58	7681	PASS
275	198	10.0	30.0	25.5	29762	PASS
365	198	1.00	100	3.19	3726	PASS
441	443	0.0100	100	70.2	8759	PASS
442	198	40.0	100	54.5	63594	PASS
443	442	17.0	23.0	19.6	12481	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG590490-07	SSCV	01	11/07/2016 12:13	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120425 Tune ID: WG592228-01
Instrument: HPMS12 Run Date: 11/18/2016
Analyst: MES Run Time: 11:03
Workgroup: WG592228 File ID: 12M60416
Cal ID: HPMS12-18-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	39.7	54237	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	44.0	60040	PASS
70.0	69.0	0	2.00	0.598	359	PASS
127	198	40.0	60.0	49.3	67312	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	136541	PASS
199	198	5.00	9.00	7.01	9576	PASS
275	198	10.0	30.0	25.9	35421	PASS
365	198	1.00	100	2.95	4024	PASS
441	443	0.0100	100	78.7	12115	PASS
442	198	40.0	100	58.2	79480	PASS
443	442	17.0	23.0	19.4	15392	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG592228-02	STD-CCV	01	11/18/2016 11:54	
WG592228-03	STD	01	11/18/2016 12:26	
WG592228-04	STD	01	11/18/2016 12:57	
WG592228-05	STD	01	11/18/2016 13:29	
WG592228-06	STD	01	11/18/2016 14:01	
WG592228-07	STD	01	11/18/2016 14:32	
WG592228-08	STD	01	11/18/2016 15:04	
WG592228-09	STD	01	11/18/2016 15:36	
WG592228-10	STD	01	11/18/2016 16:08	
WG592228-11	SSCV	01	11/18/2016 16:40	
WG592228-12	SSCV	01	11/18/2016 17:12	
WG592228-13	SSCV	01	11/18/2016 17:41	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120425 Tune ID: WG595046-01
 Instrument: HPMS12 Run Date: 12/15/2016
 Analyst: SCB Run Time: 12:19
 Workgroup: WG595046 File ID: 12M60646
 Cal ID: HPMS12-18-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	38.8	41346	PASS
68.0	69.0	0	2.00	0	0	PASS
69.0	198	0	100	44.8	47757	PASS
70.0	69.0	0	2.00	0.714	341	PASS
127	198	40.0	60.0	50.6	53949	PASS
197	198	0	1.00	0	0	PASS
198	198	100	100	100	106597	PASS
199	198	5.00	9.00	6.95	7405	PASS
275	198	10.0	30.0	26.5	28253	PASS
365	198	1.00	100	3.39	3616	PASS
441	443	0.0100	100	78.7	9678	PASS
442	198	40.0	100	59.6	63496	PASS
443	442	17.0	23.0	19.4	12302	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG595046-02	CCV	01	12/15/2016 12:37	
WG595069-01	CCV	01	12/15/2016 13:08	
WG594288-01	BLANK	01	12/15/2016 13:40	
WG594288-01	BLANK	01	12/15/2016 13:40	
WG594288-02	LCS	01	12/15/2016 14:12	
L16120425-07	MW05I-120716	01	12/15/2016 16:51	
L16120425-11	MW07-120716	01	12/15/2016 17:23	
L16120425-13	MW20-120716	01	12/15/2016 17:55	
L16120425-15	MW06-120716	01	12/15/2016 18:27	
L16120425-17	MW10-120716	01	12/15/2016 18:58	
L16120425-21	DUP-GW-120716-1	01	12/15/2016 19:30	
L16120425-27	MW07-120716	01	12/15/2016 20:02	
L16120425-28	MW07-120716	01	12/15/2016 20:34	

* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008
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Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

Login Number: L16120425
Analytical Method: 8270D
ICAL Workgroup: WG590490

Instrument ID: HPMS12
Initial Calibration Date: 04-NOV-16 18:45
Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
1,1'-Biphenyl	1.534	8.82		

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

INT_CAL - Modified 03/06/2008
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Report generated 12/19/2016 11:06



Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

Login Number: L16120425
Analytical Method: 8270D
ICAL Workgroup: WG592228

Instrument ID: HPMS12
Initial Calibration Date: 18-NOV-16 16:08
Column ID: F

Analyte		AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
2,4,6-Trichlorophenol	CCC	0.4357	11.9		
2,4-Dichlorophenol	CCC	0.2936	9.07		
2-Nitrophenol	CCC	0.1826	5.69		
Acenaphthene	CCC	1.316	11.1		
Benzo[a]pyrene	CCC	1.197	10.2		
Di-n-Octyl Phthalate	CCC	1.540	6.70		
Fluoranthene	CCC	1.221	10.1		
Hexachlorobutadiene	CCC	0.2296	5.94		
Pentachlorophenol	CCC	0.1312	22.9		1.00000
Phenol	CCC	1.689	2.24		
2,4-Dinitrophenol	SPCC	0.1841	44.3		0.99900
4-Nitrophenol	SPCC	0.3255	5.41		
Hexachlorocyclopentadiene	SPCC	0.3544	18.7		0.99900
n-Nitrosodipropylamine	SPCC	1.092	14.3		
1,3-Dinitrobenzene		0.2329	8.69		
1,4-Dioxane		0.6197	5.55		
2,4,5-Trichlorophenol		0.4368	12.2		
2,4-Dimethylphenol		0.3102	5.77		
2,4-Dinitrotoluene		0.4639	11.8		
2,6-Dinitrotoluene		0.3275	5.94		
2-Chloronaphthalene		1.246	8.11		
2-Chlorophenol		1.289	3.68		
2-Methylnaphthalene		0.7249	8.78		
2-Methylphenol		1.152	3.90		
2-Nitroaniline		0.4454	2.64		
3,3'-Dichlorobenzidine		0.3851	10.7		
3-Nitroaniline		0.3186	8.86		
4-Bromophenyl Phenyl Ether		0.2273	11.5		
4-Chloroaniline		0.1655	3.76		
Acenaphthylene		1.992	8.23		
Anthracene		1.132	8.50		
Benzo[a]anthracene		1.179	8.54		
Benzo[b]fluoranthene		1.492	15.2		1.00000
Benzo[ghi]perylene		0.9059	7.33		
Benzo[k]fluoranthene		1.178	6.62		
Benzoic Acid		0.1472	53.9		0.99800
Benzyl Alcohol		0.9275	3.44		
Butyl Benzyl Phthalate		0.5705	3.63		
Carbazole		0.9389	10.2		
Chrysene		1.072	9.13		
Di-n-Butyl Phthalate		1.269	4.28		
Dibenz[ah]anthracene		0.9610	14.2		
Dibenzofuran		1.795	8.67		
Diethylphthalate		1.535	2.61		
Dimethylphthalate		1.474	5.70		

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Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

Login Number: L16120425
 Analytical Method: 8270D
 ICAL Workgroup: WG592228

Instrument ID: HPMS12
 Initial Calibration Date: 18-NOV-16 16:08
 Column ID: F

Analyte	AVG RF	% RSD	LINEAR (R)	QUAD (R ²)
Fluorene	1.542	10.6		
Hexachlorobenzene	0.2261	13.9		
Hexachloroethane	0.6513	2.56		
Indeno[1,2,3-cd]pyrene	1.207	11.5		
Isophorone	0.7881	3.42		
Naphthalene	1.006	6.36		
Nitrobenzene	0.4414	4.35		
Phenanthrene	1.084	8.48		
Pyrene	1.164	7.30		
Sym-Trinitrobenzene	0.2380	15.4	0.99900	
bis(2-Chloroethoxy)methane	0.5599	3.94		
bis(2-Chloroethyl)ether	1.078	7.82		
bis(2-Ethylhexyl)phthalate	0.7639	11.2		

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: L16120425
Analytical Method: 8270D

Instrument ID: HPMS12
Initial Calibration Date: 04-NOV-16 18:45
Column ID: F

Analyte	WG590490-01			WG590490-02			WG590490-03		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1'-Biphenyl	50.0	558001.000	1.580	3.00	26432.0000	1.382	10.0	86599.0000	1.363

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INITIAL CALIBRATION DATA

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Analytical Method: 8270D

Instrument ID: HPMS12
Initial Calibration Date: 04-NOV-16 18:45
Column ID: F

Analyte	WG590490-04			WG590490-05			WG590490-06		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
1,1'-Biphenyl	25.0	255444.000	1.540	80.0	855629.000	1.666	100	1090545.00	1.674

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Microbac Laboratories Inc.
INITIAL CALIBRATION DATA

Login Number: L16120425
Analytical Method: 8270D

Instrument ID: HPMS12
Initial Calibration Date: 18-NOV-16 16:08
Column ID: F

Analyte	WG592228-02			WG592228-03			WG592228-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
2,4,6-Trichlorophenol	50.0	284914.000	0.4556	NA	NA	NA	3.00	13681.0000	0.3761
2,4-Dichlorophenol	50.0	346724.000	0.3079	NA	NA	NA	3.00	17913.0000	0.2653
2-Nitrophenol	50.0	216824.000	0.1925	NA	NA	NA	3.00	11229.0000	0.1663
Acenaphthene	50.0	868673.000	1.389	NA	NA	NA	3.00	42345.0000	1.164
Benzo[a]pyrene	50.0	1456849.00	1.290	NA	NA	NA	3.00	69147.0000	1.073
Di-n-Octyl Phthalate	50.0	1909202.00	1.691	NA	NA	NA	3.00	90520.0000	1.404
Fluoranthene	50.0	1647127.00	1.281	NA	NA	NA	3.00	79954.0000	1.079
Hexachlorobutadiene	50.0	268207.000	0.2382	NA	NA	NA	3.00	14706.0000	0.2178
Pentachlorophenol	50.0	178992.000	0.1392	NA	NA	NA	NA	NA	NA
Phenol	50.0	506882.000	1.758	NA	NA	NA	3.00	29196.0000	1.672
2,4-Dinitrophenol	50.0	129333.000	0.2068	NA	NA	NA	NA	NA	NA
4-Nitrophenol	50.0	216234.000	0.3457	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	50.0	251805.000	0.4026	NA	NA	NA	3.00	8102.00000	0.2227
n-Nitrosodipropylamine	50.0	320362.000	1.111	NA	NA	NA	3.00	22476.0000	1.287
1,3-Dinitrobenzene	50.0	154734.000	0.2474	NA	NA	NA	3.00	7145.00000	0.1964
1,4-Dioxane	50.0	191372.000	0.6639	NA	NA	NA	3.00	10727.0000	0.6145
2,4,5-Trichlorophenol	50.0	284746.000	0.4553	NA	NA	NA	3.00	13451.0000	0.3698
2,4-Dimethylphenol	50.0	367225.000	0.3261	NA	NA	NA	3.00	19449.0000	0.2880
2,4-Dinitrotoluene	50.0	297705.000	0.4760	NA	NA	NA	3.00	14507.0000	0.3988
2,6-Dinitrotoluene	50.0	211326.000	0.3379	NA	NA	NA	3.00	11138.0000	0.3062
2-Chloronaphthalene	50.0	798335.000	1.277	NA	NA	NA	3.00	42158.0000	1.159
2-Chlorophenol	50.0	387554.000	1.344	NA	NA	NA	3.00	22555.0000	1.292
2-Methylnaphthalene	50.0	858682.000	0.7625	NA	NA	NA	3.00	44506.0000	0.6591
2-Methylphenol	50.0	351531.000	1.220	NA	NA	NA	3.00	19724.0000	1.130
2-Nitroaniline	50.0	289464.000	0.4628	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	50.0	570060.000	0.4128	NA	NA	NA	3.00	26454.0000	0.3477
3-Nitroaniline	50.0	204825.000	0.3275	NA	NA	NA	NA	NA	NA
4-Bromophenyl Phenyl Ether	50.0	294385.000	0.2290	NA	NA	NA	3.00	15356.0000	0.2073
4-Chloroaniline	50.0	192937.000	0.1713	NA	NA	NA	3.00	11505.0000	0.1704
Acenaphthylene	50.0	1312625.00	2.099	NA	NA	NA	3.00	65504.0000	1.801
Anthracene	50.0	1510853.00	1.175	NA	NA	NA	3.00	76557.0000	1.033
Benzo[a]anthracene	50.0	1712821.00	1.241	NA	NA	NA	3.00	83277.0000	1.095
Benzo[b]fluoranthene	50.0	1761223.00	1.560	NA	NA	NA	3.00	79344.0000	1.231
Benzo[ghi]perylene	50.0	1155864.00	1.024	NA	NA	NA	3.00	52071.0000	0.8077
Benzo[k]fluoranthene	50.0	1424284.00	1.261	NA	NA	NA	3.00	74134.0000	1.150
Benzoic Acid	50.0	182365.000	0.1619	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	50.0	277307.000	0.9620	NA	NA	NA	3.00	15832.0000	0.9069
Butyl Benzyl Phthalate	50.0	849642.000	0.6153	NA	NA	NA	3.00	42539.0000	0.5591
Carbazole	50.0	1261197.00	0.9809	NA	NA	NA	3.00	62282.0000	0.8407
Chrysene	50.0	1533432.00	1.111	NA	NA	NA	3.00	76222.0000	1.002
Di-n-Butyl Phthalate	50.0	1711290.00	1.331	NA	NA	NA	3.00	88610.0000	1.196
Dibenz[ah]anthracene	50.0	1243498.00	1.101	NA	NA	NA	3.00	48660.0000	0.7548

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Microbac Laboratories Inc.
INITIAL CALIBRATION DATA

Login Number: L16120425
Analytical Method: 8270D

Instrument ID: HPMS12
Initial Calibration Date: 18-NOV-16 16:08
Column ID: F

Analyte	WG592228-02			WG592228-03			WG592228-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Dibenzofuran	50.0	1145373.00	1.831	NA	NA	NA	3.00	60757.0000	1.670
Diethylphthalate	50.0	987680.000	1.579	NA	NA	NA	3.00	54873.0000	1.509
Dimethylphthalate	50.0	952665.000	1.523	NA	NA	NA	3.00	50623.0000	1.392
Fluorene	50.0	1033245.00	1.652	NA	NA	NA	3.00	50421.0000	1.386
Hexachlorobenzene	50.0	291320.000	0.2266	NA	NA	NA	3.00	14412.0000	0.1945
Hexachloroethane	50.0	196649.000	0.6822	NA	NA	NA	3.00	11171.0000	0.6399
Indeno[1,2,3-cd]pyrene	50.0	1544728.00	1.368	NA	NA	NA	3.00	64401.0000	0.9989
Isophorone	50.0	927683.000	0.8237	NA	NA	NA	3.00	55057.0000	0.8154
Naphthalene	50.0	1171487.00	1.040	NA	NA	NA	3.00	65392.0000	0.9684
Nitrobenzene	50.0	514174.000	0.4566	NA	NA	NA	3.00	31112.0000	0.4608
Phenanthrene	50.0	1438680.00	1.119	NA	NA	NA	3.00	73901.0000	0.9975
Pyrene	50.0	1673785.00	1.212	NA	NA	NA	3.00	82623.0000	1.086
Sym-Trinitrobenzene	50.0	339328.000	0.2639	NA	NA	NA	3.00	11743.0000	0.1585
bis(2-Chloroethoxy)methane	50.0	661402.000	0.5873	NA	NA	NA	3.00	39185.0000	0.5803
bis(2-Chloroethyl)ether	50.0	323907.000	1.124	NA	NA	NA	3.00	20077.0000	1.150
bis(2-Ethylhexyl)phthalate	50.0	1166964.00	0.8451	1.00	15674.0000	0.5608	3.00	56069.0000	0.7370

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Instrument ID: HPMS12
Initial Calibration Date: 18-NOV-16 16:08
Column ID: F

Analyte	WG592228-05			WG592228-06			WG592228-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
2,4,6-Trichlorophenol	10.0	46240.0000	0.3879	15.0	71244.0000	0.3932	25.0	124948.000	0.4052
2,4-Dichlorophenol	10.0	58863.0000	0.2690	15.0	90573.0000	0.2717	25.0	153209.000	0.2714
2-Nitrophenol	10.0	38740.0000	0.1771	15.0	58791.0000	0.1764	25.0	98565.0000	0.1746
Acenaphthene	10.0	141205.000	1.185	15.0	212142.000	1.171	25.0	374194.000	1.213
Benzo[a]pyrene	10.0	234131.000	1.076	15.0	364922.000	1.090	25.0	634507.000	1.109
Di-n-Octyl Phthalate	10.0	319458.000	1.467	15.0	483780.000	1.445	25.0	848420.000	1.483
Fluoranthene	10.0	269401.000	1.108	15.0	410662.000	1.121	25.0	713806.000	1.130
Hexachlorobutadiene	10.0	48309.0000	0.2208	15.0	72133.0000	0.2164	25.0	121619.000	0.2155
Pentachlorophenol	10.0	21828.0000	0.08980	15.0	37570.0000	0.1026	25.0	70591.0000	0.1117
Phenol	10.0	97307.0000	1.701	15.0	146634.000	1.708	25.0	242707.000	1.653
2,4-Dinitrophenol	10.0	8701.00000	0.07300	15.0	17993.0000	0.09930	25.0	41140.0000	0.1334
4-Nitrophenol	10.0	40182.0000	0.3371	15.0	60222.0000	0.3324	25.0	103585.000	0.3359
Hexachlorocyclopentadiene	10.0	36413.0000	0.3055	15.0	59531.0000	0.3286	25.0	110228.000	0.3574
n-Nitrosodipropylamine	10.0	70157.0000	1.226	15.0	103636.000	1.207	25.0	167886.000	1.143
1,3-Dinitrobenzene	10.0	26283.0000	0.2205	15.0	40583.0000	0.2240	25.0	69039.0000	0.2239
1,4-Dioxane	10.0	33644.0000	0.5881	15.0	48123.0000	0.5607	25.0	89105.0000	0.6067
2,4,5-Trichlorophenol	10.0	46334.0000	0.3887	15.0	73152.0000	0.4038	25.0	125342.000	0.4065
2,4-Dimethylphenol	10.0	64233.0000	0.2936	15.0	99646.0000	0.2990	25.0	166534.000	0.2950
2,4-Dinitrotoluene	10.0	49529.0000	0.4155	15.0	76109.0000	0.4201	25.0	133591.000	0.4332
2,6-Dinitrotoluene	10.0	37628.0000	0.3157	15.0	55987.0000	0.3090	25.0	95942.0000	0.3111
2-Chloronaphthalene	10.0	136763.000	1.147	15.0	211530.000	1.168	25.0	357052.000	1.158
2-Chlorophenol	10.0	70135.0000	1.226	15.0	106403.000	1.240	25.0	181705.000	1.237
2-Methylnaphthalene	10.0	147158.000	0.6726	15.0	222115.000	0.6664	25.0	378455.000	0.6705
2-Methylphenol	10.0	63465.0000	1.109	15.0	95404.0000	1.112	25.0	161288.000	1.098
2-Nitroaniline	10.0	53884.0000	0.4520	15.0	82239.0000	0.4539	25.0	137547.000	0.4460
3,3'-Dichlorobenzidine	10.0	85579.0000	0.3382	15.0	133938.000	0.3450	25.0	241352.000	0.3600
3-Nitroaniline	10.0	33694.0000	0.2827	15.0	52037.0000	0.2872	25.0	92936.0000	0.3014
4-Bromophenyl Phenyl Ether	10.0	50396.0000	0.2073	15.0	75791.0000	0.2070	25.0	126623.000	0.2004
4-Chloroaniline	10.0	37855.0000	0.1730	15.0	56240.0000	0.1687	25.0	92977.0000	0.1647
Acenaphthylene	10.0	219175.000	1.839	15.0	334284.000	1.845	25.0	580421.000	1.882
Anthracene	10.0	253574.000	1.043	15.0	384882.000	1.051	25.0	665252.000	1.053
Benzo[a]anthracene	10.0	273910.000	1.083	15.0	421444.000	1.086	25.0	729313.000	1.088
Benzo[b]fluoranthene	10.0	285920.000	1.313	15.0	426741.000	1.274	25.0	782918.000	1.369
Benzo[ghi]perylene	10.0	184760.000	0.8487	15.0	293842.000	0.8775	25.0	518511.000	0.9066
Benzo[k]fluoranthene	10.0	234891.000	1.079	15.0	380694.000	1.137	25.0	631679.000	1.105
Benzoic Acid	10.0	11780.0000	0.05380	15.0	19056.0000	0.05720	25.0	51828.0000	0.09180
Benzyl Alcohol	10.0	51257.0000	0.8960	15.0	77157.0000	0.8989	25.0	130906.000	0.8914
Butyl Benzyl Phthalate	10.0	143384.000	0.5667	15.0	217694.000	0.5608	25.0	374628.000	0.5587
Carbazole	10.0	203509.000	0.8373	15.0	315838.000	0.8625	25.0	552444.000	0.8745
Chrysene	10.0	247350.000	0.9776	15.0	378808.000	0.9758	25.0	658063.000	0.9815
Di-n-Butyl Phthalate	10.0	297817.000	1.225	15.0	451921.000	1.234	25.0	773535.000	1.224
Dibenz[ah]anthracene	10.0	180732.000	0.8302	15.0	291911.000	0.8717	25.0	516072.000	0.9023

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INITIAL CALIBRATION DATA

Login Number: L16120425
Analytical Method: 8270D

Instrument ID: HPMS12
Initial Calibration Date: 18-NOV-16 16:08
Column ID: F

Analyte	WG592228-05			WG592228-06			WG592228-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Dibenzofuran	10.0	196651.000	1.650	15.0	300799.000	1.660	25.0	510308.000	1.655
Diethylphthalate	10.0	182468.000	1.531	15.0	269420.000	1.487	25.0	456430.000	1.480
Dimethylphthalate	10.0	168434.000	1.413	15.0	254577.000	1.405	25.0	427604.000	1.387
Fluorene	10.0	163859.000	1.375	15.0	250591.000	1.383	25.0	437797.000	1.420
Hexachlorobenzene	10.0	49395.0000	0.2032	15.0	73619.0000	0.2010	25.0	126764.000	0.2007
Hexachloroethane	10.0	36555.0000	0.6390	15.0	55629.0000	0.6481	25.0	93177.0000	0.6345
Indeno[1,2,3-cd]pyrene	10.0	234195.000	1.076	15.0	371534.000	1.110	25.0	659767.000	1.154
Isophorone	10.0	175477.000	0.8020	15.0	267340.000	0.8021	25.0	441499.000	0.7822
Naphthalene	10.0	207465.000	0.9482	15.0	314319.000	0.9430	25.0	527275.000	0.9341
Nitrobenzene	10.0	101439.000	0.4636	15.0	149792.000	0.4494	25.0	247014.000	0.4376
Phenanthrene	10.0	244014.000	1.004	15.0	368152.000	1.005	25.0	629672.000	0.9967
Pyrene	10.0	275622.000	1.089	15.0	419908.000	1.082	25.0	728540.000	1.087
Sym-Trinitrobenzene	10.0	53039.0000	0.2182	15.0	84898.0000	0.2318	25.0	152314.000	0.2411
bis(2-Chloroethoxy)methane	10.0	125008.000	0.5714	15.0	190644.000	0.5720	25.0	313048.000	0.5546
bis(2-Chloroethyl)ether	10.0	65357.0000	1.143	15.0	98998.0000	1.153	25.0	162616.000	1.107
bis(2-Ethylhexyl)phthalate	10.0	190774.000	0.7540	15.0	294533.000	0.7587	25.0	509449.000	0.7598

INT_CAL - Modified 03/06/2008
PDF File ID: 5070264
Report generated 12/19/2016 11:06



Microbac Laboratories Inc.
INITIAL CALIBRATION DATA

Login Number: L16120425
Analytical Method: 8270D

Instrument ID: HPMS12
Initial Calibration Date: 18-NOV-16 16:08
Column ID: F

Analyte	WG592228-08			WG592228-09			WG592228-10		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
2,4,6-Trichlorophenol	80.0	461442.000	0.4664	100	606773.000	0.4859	120	741532.000	0.5152
2,4-Dichlorophenol	80.0	563228.000	0.3143	100	733117.000	0.3207	120	870369.000	0.3286
2-Nitrophenol	80.0	335945.000	0.1874	100	438455.000	0.1918	120	516004.000	0.1948
Acenaphthene	80.0	1432243.000	1.448	100	1852657.000	1.484	120	2128225.000	1.479
Benzo[a]pyrene	80.0	2373050.000	1.266	100	3087926.000	1.305	120	3731090.000	1.368
Di-n-Octyl Phthalate	80.0	2979261.000	1.589	100	3793016.000	1.603	120	4463920.000	1.636
Fluoranthene	80.0	2650647.000	1.318	100	3452727.000	1.348	120	4091094.000	1.382
Hexachlorobutadiene	80.0	421156.000	0.2350	100	553111.000	0.2420	120	664595.000	0.2509
Pentachlorophenol	80.0	298870.000	0.1486	100	402618.000	0.1572	120	501569.000	0.1694
Phenol	80.0	775357.000	1.711	100	968716.000	1.652	120	1151076.000	1.655
2,4-Dinitrophenol	80.0	236491.000	0.2390	100	329107.000	0.2635	120	393788.000	0.2736
4-Nitrophenol	80.0	320061.000	0.3235	100	382001.000	0.3059	120	428614.000	0.2978
Hexachlorocyclopentadiene	80.0	402360.000	0.4066	100	497940.000	0.3987	120	594601.000	0.4131
n-Nitrosodipropylamine	80.0	449147.000	0.9913	100	531950.000	0.9069	120	597719.000	0.8591
1,3-Dinitrobenzene	80.0	241931.000	0.2445	100	310097.000	0.2483	120	371693.000	0.2583
1,4-Dioxane	80.0	296317.000	0.6540	100	372840.000	0.6357	120	441032.000	0.6339
2,4,5-Trichlorophenol	80.0	453696.000	0.4585	100	611310.000	0.4895	120	751855.000	0.5224
2,4-Dimethylphenol	80.0	575439.000	0.3211	100	743979.000	0.3255	120	881736.000	0.3329
2,4-Dinitrotoluene	80.0	494206.000	0.4995	100	650736.000	0.5211	120	787103.000	0.5469
2,6-Dinitrotoluene	80.0	334223.000	0.3378	100	428959.000	0.3435	120	516406.000	0.3588
2-Chloronaphthalene	80.0	1287287.000	1.301	100	1697791.000	1.360	120	2013750.000	1.399
2-Chlorophenol	80.0	600594.000	1.326	100	771605.000	1.316	120	923833.000	1.328
2-Methylnaphthalene	80.0	1378413.000	0.7691	100	1792668.000	0.7843	120	2157662.000	0.8145
2-Methylphenol	80.0	540127.000	1.192	100	689839.000	1.176	120	817840.000	1.176
2-Nitroaniline	80.0	433950.000	0.4386	100	536420.000	0.4295	120	625971.000	0.4349
3,3'-Dichlorobenzidine	80.0	920892.000	0.4158	100	1196251.000	0.4225	120	1447427.000	0.4391
3-Nitroaniline	80.0	329575.000	0.3331	100	429149.000	0.3436	120	510229.000	0.3545
4-Bromophenyl Phenyl Ether	80.0	486720.000	0.2421	100	655175.000	0.2559	120	797453.000	0.2694
4-Chloroaniline	80.0	288542.000	0.1610	100	360713.000	0.1578	120	416862.000	0.1574
Acenaphthylene	80.0	2103874.000	2.126	100	2694707.000	2.158	120	3145810.000	2.186
Anthracene	80.0	2435646.000	1.211	100	3148782.000	1.230	120	3734297.000	1.261
Benzo[a]anthracene	80.0	2762542.000	1.247	100	3639792.000	1.285	120	4325059.000	1.312
Benzo[b]fluoranthene	80.0	3021597.000	1.612	100	4155742.000	1.757	120	4974635.000	1.824
Benzo[ghi]perylene	80.0	1792175.000	0.9560	100	2204191.000	0.9317	120	2442230.000	0.8953
Benzo[k]fluoranthene	80.0	2187406.000	1.167	100	2890568.000	1.222	120	3557598.000	1.304
Benzoic Acid	80.0	358589.000	0.2001	100	512203.000	0.2241	120	640168.000	0.2417
Benzyl Alcohol	80.0	434529.000	0.9591	100	554557.000	0.9455	120	668280.000	0.9605
Butyl Benzyl Phthalate	80.0	1296943.000	0.5856	100	1603507.000	0.5663	120	1817629.000	0.5514
Carbazole	80.0	2034908.000	1.012	100	2629649.000	1.027	120	3185013.000	1.076
Chrysene	80.0	2532852.000	1.144	100	3351045.000	1.183	120	3960463.000	1.202
Di-n-Butyl Phthalate	80.0	2645090.000	1.316	100	3349121.000	1.308	120	3910103.000	1.321
Dibenz[ah]anthracene	80.0	2010795.000	1.073	100	2560459.000	1.082	120	2926976.000	1.073

INT_CAL - Modified 03/06/2008
PDF File ID: 5070264
Report generated 12/19/2016 11:06



Microbac Laboratories Inc.
INITIAL CALIBRATION DATA

Login Number: L16120425
Analytical Method: 8270D

Instrument ID: HPMS12
Initial Calibration Date: 18-NOV-16 16:08
Column ID: F

Analyte	WG592228-08			WG592228-09			WG592228-10		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Dibenzofuran	80.0	1886182.00	1.906	100	2453073.00	1.964	120	2914148.00	2.025
Diethylphthalate	80.0	1546301.00	1.563	100	1928667.00	1.544	120	2280085.00	1.584
Dimethylphthalate	80.0	1507427.00	1.524	100	1932486.00	1.547	120	2305339.00	1.602
Fluorene	80.0	1679622.00	1.698	100	2106734.00	1.687	120	2503119.00	1.739
Hexachlorobenzene	80.0	493055.000	0.2452	100	668293.000	0.2610	120	819303.000	0.2768
Hexachloroethane	80.0	303308.000	0.6695	100	384145.000	0.6549	120	447094.000	0.6426
Indeno[1,2,3-cd]pyrene	80.0	2469953.00	1.318	100	3125692.00	1.321	120	3579232.00	1.312
Isophorone	80.0	1384109.00	0.7723	100	1723639.00	0.7541	120	1993994.00	0.7527
Naphthalene	80.0	1880720.00	1.049	100	2438327.00	1.067	120	2902074.00	1.096
Nitrobenzene	80.0	772496.000	0.4310	100	951362.000	0.4162	120	1101403.00	0.4158
Phenanthrene	80.0	2324629.00	1.156	100	3025327.00	1.181	120	3577095.00	1.208
Pyrene	80.0	2717359.00	1.227	100	3546741.00	1.253	120	4198095.00	1.274
Sym-Trinitrobenzene	80.0	536663.000	0.2669	100	662859.000	0.2589	120	782426.000	0.2643
bis(2-Chloroethoxy)methane	80.0	993457.000	0.5543	100	1221983.00	0.5346	120	1388966.00	0.5243
bis(2-Chloroethyl)ether	80.0	465498.000	1.027	100	569665.000	0.9712	120	657253.000	0.9447
bis(2-Ethylhexyl)phthalate	80.0	1819898.00	0.8217	100	2319252.00	0.8190	120	2698955.00	0.8188

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Fluorene	1.386	1.375	1.383	1.42	1.652	1.698	1.687	1.739	1.54242	10.644	
4-Chlorophenyl Phenyl Ether	0.707	0.715	0.711	0.715	0.804	0.839	0.868	0.918	0.78457	10.715	
4-Nitroaniline		0.325	0.332	0.351	0.379	0.379	0.374	0.384	0.36057	6.76256	
5-Nitro-o-Toluidine	0.355	0.367	0.381	0.395	0.46	0.477	0.475	0.489	0.42468	13.0864	
1,2-Diphenylhydrazine	1.845	1.803	1.781	1.751	1.789	1.658	1.605	1.596	1.72866	5.52419	
2,4,6-Tribromophenol	0.154	0.168	0.171	0.179	0.215	0.235	0.25	0.267	0.20493	20.8254	1.000
Phenanthrene-d10	ISTD										
4,6-Dinitro-2-Methylphenol		0.087	0.098	0.11	0.138	0.147	0.155	0.166	0.12859	23.6303	1.000
Diphenylamine/n-Nitrosodiphenylar	0.575	0.576	0.578	0.576	0.64	0.673	0.684	0.708	0.62621	9.00345	
Sulfotepp	0.105	0.107	0.11	0.116	0.14	0.153	0.159	0.17	0.13247	19.6446	1.000
Sym-Trinitrobenzene	0.159	0.218	0.232	0.241	0.264	0.267	0.259	0.264	0.23795	15.3933	0.999
Diallate	0.303	0.299	0.299	0.296	0.297	0.278	0.269	0.263	0.28809	5.4128	
Phenacetin	0.402	0.414	0.42	0.412	0.444	0.435	0.422	0.414	0.42058	3.21962	
Phorate	0.492	0.49	0.487	0.472	0.472	0.436	0.424	0.409	0.4603	7.07525	
4-Bromophenyl Phenyl Ether	0.207	0.207	0.207	0.2	0.229	0.242	0.256	0.269	0.22728	11.4503	
Hexachlorobenzene	0.195	0.203	0.201	0.201	0.227	0.245	0.261	0.277	0.22612	13.9282	
Dimethoate	0.288	0.298	0.294	0.276	0.265	0.226	0.2		0.26376	14.0902	
4-Aminobiphenyl	0.607	0.577	0.58	0.622	0.708	0.755	0.764	0.805	0.67722	13.4891	
Pentachlorophenol		0.09	0.103	0.112	0.139	0.149	0.157	0.169	0.13123	22.8971	1.000
Pronamide	0.316	0.332	0.335	0.335	0.368	0.372	0.373	0.39	0.35257	7.44546	
Pentachloronitrobenzene	0.109	0.119	0.121	0.119	0.13	0.132	0.131	0.135	0.12456	7.15303	
Disulfoton	0.364	0.379	0.382	0.376	0.384	0.375	0.361	0.363	0.37295	2.41845	
Phenanthrene	0.998	1.004	1.005	0.997	1.119	1.156	1.181	1.208	1.08353	8.47786	
Anthracene	1.033	1.043	1.051	1.053	1.175	1.211	1.23	1.261	1.13226	8.49953	
Carbazole	0.841	0.837	0.862	0.874	0.981	1.012	1.027	1.076	0.93883	10.152	
Parathion Methyl	0.22	0.235	0.238	0.238	0.239	0.215	0.194	0.184	0.22036	9.79734	
Di-n-Butyl Phthalate	1.196	1.225	1.234	1.224	1.331	1.316	1.308	1.321	1.26937	4.27716	
Parathion Ethyl	0.142	0.166	0.165	0.166	0.178	0.174	0.171	0.172	0.16683	6.56473	
4-Nitroquinoline 1-Oxide	0.025	0.037	0.046	0.057	0.071	0.077	0.073	0.07	0.05692	33.8731	0.993
Methapyrilene	0.495	0.514	0.492	0.441	0.386	0.274	0.235	0.213	0.38124	32.4738	0.994
Isodrin	0.121	0.127	0.123	0.122	0.134	0.138	0.139	0.146	0.13111	7.02618	
Fluoranthene	1.079	1.108	1.121	1.13	1.281	1.318	1.348	1.382	1.22106	10.0869	
Chrysene-d12	ISTD										
Benzidine		0.232	0.258	0.309	0.311	0.348	0.326	0.323	0.30094	13.6244	0.998
Pyrene	1.086	1.089	1.082	1.087	1.212	1.227	1.253	1.274	1.1636	7.30391	
Aramite	0.066	0.072	0.074	0.073	0.078	0.072	0.07	0.07	0.07183	4.98255	
p-Terphenyl-d14	0.757	0.758	0.754	0.767	0.88	0.911	0.948	0.969	0.8429	11.0997	
p-(Dimethylamino)azobenzene	0.21	0.228	0.227	0.228	0.254	0.259	0.268	0.282	0.24444	10.1913	
Chlorobenzilate	0.323	0.342	0.337	0.334	0.369	0.372	0.386	0.405	0.3586	7.97682	
Famphur				0.041					0.04102	0	
Butyl Benzyl Phthalate	0.559	0.567	0.561	0.559	0.615	0.586	0.566	0.551	0.57049	3.62574	
3,3'-Dimethylbenzidine	0.974	0.824	0.908	0.946	0.914	0.993	0.936	0.893	0.92359	5.68814	
2-Acetylaminofluorene	0.372	0.426	0.454	0.469	0.533	0.534	0.538	0.553	0.48482	13.4173	
bis(2-Ethylhexyl)phthalate	0.737	0.754	0.759	0.76	0.845	0.822	0.819	0.819	0.561	0.76389	11.1565
3,3'-Dichlorobenzidine	0.348	0.338	0.345	0.36	0.413	0.416	0.422	0.439	0.38514	10.6863	
Benzo[a]anthracene	1.095	1.083	1.086	1.088	1.24	1.247	1.285	1.312	1.17947	8.53595	
Chrysene	1.002	0.978	0.976	0.981	1.111	1.144	1.183	1.202	1.07197	9.13215	
Perylene-d12	ISTD										
Di-n-Octyl Phthalate	1.404	1.467	1.445	1.483	1.691	1.589	1.603	1.636	1.53994	6.70032	
7,12-Dimethylbenz[a]anthracene	0.577	0.584	0.593	0.624	0.77	0.776	0.805	0.842	0.69634	16.0486	0.994
Benzo[b]fluoranthene	1.231	1.313	1.274	1.369	1.56	1.612	1.757	1.824	1.49241	15.2309	1.000
Benzo[k]fluoranthene	1.15	1.079	1.137	1.104	1.261	1.167	1.222	1.304	1.17806	6.62321	
Benzo[a]pyrene	1.073	1.075	1.09	1.109	1.29	1.266	1.305	1.368	1.19705	10.1707	
3-Methylcholanthrene	0.496	0.51	0.514	0.529	0.619	0.602	0.613	0.631	0.56403	10.0624	
Indeno[1,2,3-cd]pyrene	0.999	1.076	1.109	1.154	1.368	1.318	1.321	1.312	1.2071	11.511	
Dibenz[ah]anthracene	0.755	0.83	0.872	0.902	1.101	1.073	1.082	1.073	0.96103	14.2055	
Benzo[ghi]perylene	0.808	0.849	0.877	0.907	1.024	0.956	0.932	0.895	0.9059	7.33333	

Mon Nov 21 15:55:29 2016

Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120425 Run Date: 11/07/2016 Sample ID: WG590490-07
Instrument ID: HPMS12 Run Time: 12:13 Method: 8270D
File ID: 12M60190 Analyst: SCB QC Key: WATERLOO
ICal Workgroup: WG590490 Cal ID: HPMS12 - 04-NOV-16

Analyte	Expected	Found	Units	RF	%D	UCL	Q
1,1'-Biphenyl	50000	56800	ug/L	1.74	13.7	25	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

ALT - Modified 09/06/2007
Version 1.5 PDF File ID: 5070265
Report generated 12/19/2016 11:07



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120425 Run Date: 11/18/2016 Sample ID: WG592228-11
 Instrument ID: HPMS12 Run Time: 16:40 Method: 8270D
 File ID: 12M60427 Analyst: MES QC Key: WATERLOO
 ICal Workgroup: WG592228 Cal ID: HPMS12 - 18-NOV-16

Analyte		Expected	Found	Units	RF	%D	UCL	Q
2,4,6-Trichlorophenol	CCC	50000	43100	ug/L	0.375	13.8	25	
2,4-Dichlorophenol	CCC	50000	42700	ug/L	0.251	14.7	25	
2-Nitrophenol	CCC	50000	44700	ug/L	0.163	10.6	25	
Acenaphthene	CCC	50000	44500	ug/L	1.17	10.9	25	
Benzo[a]pyrene	CCC	50000	42100	ug/L	1.01	15.8	25	
Di-n-Octyl Phthalate	CCC	50000	43700	ug/L	1.35	12.6	25	
Fluoranthene	CCC	50000	43900	ug/L	1.07	12.1	25	
Hexachlorobutadiene	CCC	50000	49300	ug/L	0.226	1.50	25	
Diphenylamine/n-Nitrosodiphenylamine	CCC	50000	45300	ug/L	0.567	9.40	25	
Pentachlorophenol	CCC	50000	55000	ug/L	0.151	10.0	25	
Phenol	CCC	50000	45300	ug/L	1.53	9.40	25	
n-Nitrosodipropylamine	SPCC	50000	46300	ug/L	1.01	7.30	25	
2,4-Dinitrophenol	SPCC	50000	51100	ug/L	0.207	2.20	25	
4-Nitrophenol	SPCC	50000	44000	ug/L	0.287	12.0	25	
Hexachlorocyclopentadiene	SPCC	50000	43800	ug/L	0.335	12.5	25	
1,3-Dinitrobenzene		50000	42400	ug/L	0.197	15.3	25	
2,4,5-Trichlorophenol		50000	41400	ug/L	0.362	17.1	25	
2,4-Dimethylphenol		50000	45400	ug/L	0.282	9.10	25	
2,4-Dinitrotoluene		50000	43300	ug/L	0.402	13.4	25	
2,6-Dinitrotoluene		50000	43700	ug/L	0.287	12.5	25	
2-Chloronaphthalene		50000	49900	ug/L	1.24	0.100	25	
2-Chlorophenol		50000	45400	ug/L	1.17	9.30	25	
2-Methylnaphthalene		50000	43000	ug/L	0.624	14.0	25	
2-Methylphenol		50000	44800	ug/L	1.03	10.3	25	
2-Nitroaniline		50000	45600	ug/L	0.406	8.90	25	
3-Nitroaniline		50000	43100	ug/L	0.274	13.9	25	
3-,4-Methylphenol		50000	45100	ug/L	1.34	9.90	25	
4-Bromophenyl Phenyl Ether		50000	45600	ug/L	0.207	8.90	25	
4-Chloroaniline		50000	43200	ug/L	0.143	13.6	25	
Acenaphthylene		50000	43700	ug/L	1.74	12.6	25	
Anthracene		50000	43800	ug/L	0.993	12.3	25	
Benzo[a]anthracene		50000	42700	ug/L	1.01	14.6	25	
Benzo[b]fluoranthene		50000	44000	ug/L	1.30	12.0	25	
Benzo[ghi]perylene		50000	44300	ug/L	0.802	11.5	25	
Benzo[k]fluoranthene		50000	44900	ug/L	1.06	10.1	25	
Benzoic Acid		50000	55700	ug/L	0.183	11.3	25	
Benzyl Alcohol		50000	45100	ug/L	0.836	9.80	25	
bis(2-Chloroethyl)ether		50000	45700	ug/L	0.985	8.60	25	
bis(2-Chloroethoxy)methane		50000	47100	ug/L	0.528	5.80	25	
bis(2-Ethylhexyl)phthalate		50000	44200	ug/L	0.675	11.7	25	
Butyl Benzyl Phthalate		50000	44000	ug/L	0.502	12.0	25	
Carbazole		50000	44400	ug/L	0.833	11.2	25	

ALT - Modified 09/06/2007
 Version 1.5 PDF File ID: 5070265
 Report generated 12/19/2016 11:07



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120425 Run Date: 11/18/2016 Sample ID: WG592228-11
 Instrument ID: HPMS12 Run Time: 16:40 Method: 8270D
 File ID: 12M60427 Analyst: MES QC Key: WATERLOO
 ICal Workgroup: WG592228 Cal ID: HPMS12 - 18-NOV-16

Analyte	Expected	Found	Units	RF	%D	UCL	Q
Chrysene	50000	44800	ug/L	0.960	10.4	25	
Di-n-Butyl Phthalate	50000	46800	ug/L	1.19	6.40	25	
Dibenz[ah]anthracene	50000	44100	ug/L	0.848	11.8	25	
Dibenzofuran	50000	43100	ug/L	1.55	13.7	25	
Diethylphthalate	50000	44700	ug/L	1.37	10.6	25	
Dimethylphthalate	50000	45000	ug/L	1.33	10.0	25	
Fluorene	50000	43100	ug/L	1.33	13.9	25	
Hexachlorobenzene	50000	44500	ug/L	0.201	10.9	25	
Hexachloroethane	50000	43600	ug/L	0.567	12.9	25	
Indeno[1,2,3-cd]pyrene	50000	43600	ug/L	1.05	12.8	25	
Isophorone	50000	44100	ug/L	0.696	11.7	25	
Naphthalene	50000	43700	ug/L	0.879	12.6	25	
Nitrobenzene	50000	45500	ug/L	0.401	9.10	25	
Phenanthrene	50000	43800	ug/L	0.950	12.3	25	
Pyrene	50000	43500	ug/L	1.01	13.0	25	

* Exceeds %D Limit

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120425 Run Date: 11/18/2016 Sample ID: WG592228-12
Instrument ID: HPMS12 Run Time: 17:12 Method: 8270D
File ID: 12M60428 Analyst: MES QC Key: WATERLOO
ICal Workgroup: WG592228 Cal ID: HPMS12 - 18-NOV-16

Analyte	Expected	Found	Units	RF	%D	UCL	Q
1,4-Dioxane	50000	51000	ug/L	0.633	2.10	25	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120425 Run Date: 11/18/2016 Sample ID: WG592228-13
Instrument ID: HPMS12 Run Time: 17:41 Method: 8270D
File ID: 12M60429 Analyst: MES QC Key: WATERLOO
ICal Workgroup: WG592228 Cal ID: HPMS12 - 18-NOV-16

Analyte	Expected	Found	Units	RF	%D	UCL	Q
3,3'-Dichlorobenzidine	50000	51000	ug/L	0.393	2.00	25	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

ALT - Modified 09/06/2007
Version 1.5 PDF File ID: 5070265
Report generated 12/19/2016 11:07



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/15/2016 Sample ID: WG595046-02
Instrument ID: HPMS12 Run Time: 12:37 Method: 8270D
File ID: 12M60647 Analyst: SCB QC Key: WATERLOO
Workgroup (AAB#): WG594943 Cal ID: HPMS12 - 18-NOV-16
Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,4-Dichlorobenzene	CCC	50000	46500	ug/L	1.39	7.05	20	
4-Chloro-3-Methylphenol	CCC	50000	46800	ug/L	0.344	6.39	20	
2,4,6-Trichlorophenol	CCC	50000	47800	ug/L	0.417	4.30	20	
2,4-Dichlorophenol	CCC	50000	46500	ug/L	0.273	7.09	20	
2-Nitrophenol	CCC	50000	47100	ug/L	0.172	5.71	20	
Acenaphthene	CCC	50000	52100	ug/L	1.37	4.21	20	
Benzo[a]pyrene	CCC	50000	49100	ug/L	1.18	1.81	20	
Di-n-Octyl Phthalate	CCC	50000	48100	ug/L	1.48	3.76	20	
Fluoranthene	CCC	50000	49600	ug/L	1.21	0.765	20	
Hexachlorobutadiene	CCC	50000	46700	ug/L	0.215	6.58	20	
Diphenylamine/n-Nitrosodiphenylamine	CCC	50000	47000	ug/L	0.588	6.07	20	
Pentachlorophenol	CCC	50000	41000	ug/L	0.106	18.1	20	
Phenol	CCC	50000	49100	ug/L	1.66	1.85	20	
n-Nitrosodipropylamine	SPCC	50000	48700	ug/L	1.06	2.66	20	
2,4-Dinitrophenol	SPCC	50000	51600	ug/L	0.210	3.22	20	
4-Nitrophenol	SPCC	50000	52700	ug/L	0.343	5.36	20	
Hexachlorocyclopentadiene	SPCC	50000	48200	ug/L	0.371	3.65	20	
Sym-Trinitrobenzene		50000	50100	ug/L	0.260	0.298	20	
1,3-Dinitrobenzene		50000	48500	ug/L	0.226	2.99	20	
1,4-Dioxane		50000	47100	ug/L	0.584	5.74	20	
2,4,5-Trichlorophenol		50000	47500	ug/L	0.415	5.05	20	
2,4-Dimethylphenol		50000	47200	ug/L	0.293	5.52	20	
2,4-Dinitrotoluene		50000	49100	ug/L	0.456	1.81	20	
2,6-Dinitrotoluene		50000	47700	ug/L	0.313	4.59	20	
2-Chloronaphthalene		50000	48300	ug/L	1.20	3.46	20	
2-Chlorophenol		50000	46600	ug/L	1.20	6.87	20	
2-Methylnaphthalene		50000	47900	ug/L	0.695	4.14	20	
2-Methylphenol		50000	48100	ug/L	1.11	3.72	20	
2-Nitroaniline		50000	51100	ug/L	0.455	2.11	20	
3-Nitroaniline		50000	48000	ug/L	0.306	4.10	20	
3,3'-Dichlorobenzidine		50000	51500	ug/L	0.396	2.92	20	
3-,4-Methylphenol		50000	45900	ug/L	1.36	8.28	20	
4-Bromophenyl Phenyl Ether		50000	45200	ug/L	0.205	9.69	20	
4-Chloroaniline		50000	49300	ug/L	0.163	1.41	20	
Acenaphthylene		50000	50100	ug/L	2.00	0.206	20	
Anthracene		50000	48200	ug/L	1.09	3.70	20	
Benzo[a]anthracene		50000	48900	ug/L	1.15	2.11	20	
Benzo[b]fluoranthene		50000	48600	ug/L	1.46	2.85	20	
Benzo[ghi]perylene		50000	57400	ug/L	1.04	14.7	20	
Benzo[k]fluoranthene		50000	45500	ug/L	1.07	8.97	20	
Benzoic Acid		50000	40100	ug/L	0.112	19.8	20	
Benzyl Alcohol		50000	46500	ug/L	0.862	7.03	20	

CCV - Modified 03/05/2008
PDF File ID: 5070267
Report generated 12/19/2016 11:07



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/15/2016 Sample ID: WG595046-02
Instrument ID: HPMS12 Run Time: 12:37 Method: 8270D
File ID: 12M60647 Analyst: SCB QC Key: WATERLOO
Workgroup (AAB#): WG594943 Cal ID: HPMS12 - 18-NOV-16
Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
bis(2-Chloroethyl)ether	50000	48900	ug/L	1.05	2.19	20	
bis(2-Chloroethoxy)methane	50000	49900	ug/L	0.558	0.265	20	
bis(2-Ethylhexyl)phthalate	50000	52300	ug/L	0.799	4.57	20	
Butyl Benzyl Phthalate	50000	51900	ug/L	0.593	3.89	20	
Carbazole	50000	48400	ug/L	0.910	3.13	20	
Chrysene	50000	48300	ug/L	1.04	3.42	20	
Di-n-Butyl Phthalate	50000	49000	ug/L	1.24	2.09	20	
Dibenz[ah]anthracene	50000	56500	ug/L	1.09	13.0	20	
Dibenzofuran	50000	48200	ug/L	1.73	3.57	20	
Diethylphthalate	50000	48600	ug/L	1.49	2.89	20	
Dimethylphthalate	50000	47900	ug/L	1.41	4.12	20	
Fluorene	50000	50900	ug/L	1.57	1.78	20	
Hexachlorobenzene	50000	45400	ug/L	0.205	9.20	20	
Hexachloroethane	50000	47500	ug/L	0.619	4.96	20	
Indeno[1,2,3-cd]pyrene	50000	56600	ug/L	1.37	13.2	20	
Isophorone	50000	48600	ug/L	0.767	2.71	20	
Naphthalene	50000	47900	ug/L	0.964	4.13	20	
Nitrobenzene	50000	49200	ug/L	0.435	1.52	20	
Phenanthrene	50000	48100	ug/L	1.04	3.76	20	
Pyrene	50000	48600	ug/L	1.13	2.82	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
PDF File ID: 5070267
Report generated 12/19/2016 11:07



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/15/2016 Sample ID: WG595069-01
 Instrument ID: HPMS12 Run Time: 13:08 Method: 8270D
 File ID: 12M60648 Analyst: SCB QC Key: WATERLOO
 Workgroup (AAB#): WG594943 Cal ID: HPMS12 - 04-NOV-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
1,1'-Biphenyl	50000	51900	ug/L	1.59	3.89	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
 SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
 PDF File ID: 5070267
 Report generated 12/19/2016 11:07



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

Login Number: L16120425
Instrument ID: HPMS12
Workgroup (AAB#): WG594943

CCV Number: WG595046-02
CAL ID: HPMS12-18-NOV-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3	IS-4	IS-5	IS-6
WG595046-02	NA	NA	184110	368579	844063	694984	739965	772301
Upper Limit	NA	NA	368220	737158	1688126	1389968	1479930	1544602
Lower Limit	NA	NA	92055	184290	422032	347492	369983	386151
<u>L16120425-07</u>	1.00	01	150509	301394	635768	567031	471593	612671
<u>L16120425-11</u>	1.00	01	153541	316123	674718	591615	492050	634971
<u>L16120425-13</u>	1.00	01	141060	287789	612111	547478	450715	586901
<u>L16120425-15</u>	1.00	01	146800	302405	642752	568978	471856	618125
<u>L16120425-17</u>	1.00	01	144316	291867	624869	550261	456317	592356
<u>L16120425-21</u>	1.00	01	144154	293633	628760	551533	464743	594463
<u>L16120425-27</u>	1.00	01	138702	285542	620825	537114	465559	592055
<u>L16120425-28</u>	1.00	01	154076	307667	673889	583582	505487	641664
WG594288-01	1.00	01	156492	312654	671657	598800	502652	636476
WG594288-02	1.00	01	162735	331150	723426	618612	546995	683624

- 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: L16120425
Instrument ID: HPMS12
Workgroup (AAB#): WG594943

CCV Number: WG595046-02
CAL ID: HPMS12-18-NOV-16
Matrix: WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3	IS-4	IS-5	IS-6
WG595046-02	NA	NA	7.74	10.85	16.14	9.04	18.89	12.45
Upper Limit	NA	NA	8.24	11.35	16.64	9.54	19.39	12.95
Lower Limit	NA	NA	7.24	10.35	15.64	8.54	18.39	11.95
L16120425-07	1.00	01	7.738	10.847	16.13	9.031	18.876	12.45
L16120425-11	1.00	01	7.738	10.847	16.13	9.036	18.876	12.45
L16120425-13	1.00	01	7.743	10.847	16.13	9.036	18.871	12.449
L16120425-15	1.00	01	7.738	10.847	16.13	9.031	18.876	12.45
L16120425-17	1.00	01	7.743	10.847	16.13	9.03	18.876	12.449
L16120425-21	1.00	01	7.738	10.847	16.13	9.036	18.876	12.45
L16120425-27	1.00	01	7.738	10.847	16.136	9.036	18.876	12.449
L16120425-28	1.00	01	7.743	10.847	16.136	9.036	18.882	12.45
WG594288-01	1.00	01	7.738	10.847	16.13	9.036	18.876	12.45
WG594288-02	1.00	01	7.743	10.847	16.136	9.036	18.876	12.449

- 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: L16120425
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: The MS/MSD results were not associated with this sample delivery group.

SAMPLES

Samples: All acceptance criteria were met.

Internal Standards: All acceptance criteria were met.

Surrogates: Recoveries out of range were observed for the following surrogate: p-Terphenyl-d14 failed low. Sample 03 was not re-extracted per client instructions. Please see the applicable QC report for a detailed presentation of the failures.

Sample #	Analyte	Date	Result	Lower	Upper	Type
L16120425-03	p-Terphenyl-d14	2016-12-12 22:48:00	23.9	33	141	Recovery

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: 120479
Approved By: Mary Schilling

may Schilling

Certificate of Analysis

Sample #: L16120425-03	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW18-120616	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 22:48
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: 7M68279
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0602	0.0301
Acenaphthene	83-32-9		U	0.0602	0.0301
Acenaphthylene	208-96-8		U	0.0602	0.0301
Anthracene	120-12-7		U	0.0602	0.0301
Benzo(a)anthracene	56-55-3	0.0358	J	0.0602	0.0301
Benzo(a)pyrene	50-32-8		U	0.0602	0.0301
Benzo(b)fluoranthene	205-99-2	0.0575	J	0.0602	0.0301
Benzo(g,h,i)perylene	191-24-2		U	0.0602	0.0301
Benzo(k)fluoranthene	207-08-9		U	0.0602	0.0301
Chrysene	218-01-9	0.0369	J	0.0602	0.0301
Dibenzo(a,h)anthracene	53-70-3		U	0.0602	0.0301
Fluoranthene	206-44-0	0.0740		0.0602	0.0301
Fluorene	86-73-7		U	0.0602	0.0301
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0602	0.0301
Naphthalene	91-20-3		U	0.0602	0.0301
Phenanthrene	85-01-8	0.0750		0.0602	0.0301
Pyrene	129-00-0	0.0801		0.0602	0.0301

Surrogate	Recovery	Lower Limit	Upper Limit	Q
2-Fluorobiphenyl	74.4	43	116	
Nitrobenzene-d5	84.8	35	114	
p-Terphenyl-d14	23.9	33	141	*

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

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW05I-120716	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 23:15
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: 7M68280
Sample Tag: 01	Units: ug/L	

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

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
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
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	74.6	43	116		
Nitrobenzene-d5	82.7	35	114		
p-Terphenyl-d14	64.3	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-11

PrePrep Method: N/A

Instrument: HPMS7

Client ID: MW07-120716

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 23:41

Collect Date: 12/07/2016 09:45

Dilution: 1

File ID: 7M68281

Sample Tag: 01

Units: ug/L

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0538	0.0269
Acenaphthene	83-32-9		U	0.0538	0.0269
Acenaphthylene	208-96-8		U	0.0538	0.0269
Anthracene	120-12-7		U	0.0538	0.0269
Benzo(a)anthracene	56-55-3		U	0.0538	0.0269
Benzo(a)pyrene	50-32-8		U	0.0538	0.0269
Benzo(b)fluoranthene	205-99-2		U	0.0538	0.0269
Benzo(g,h,i)perylene	191-24-2		U	0.0538	0.0269
Benzo(k)fluoranthene	207-08-9		U	0.0538	0.0269
Chrysene	218-01-9		U	0.0538	0.0269

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Dibenzo(a,h)anthracene	53-70-3		U	0.0538	0.0269
Fluoranthene	206-44-0		U	0.0538	0.0269
Fluorene	86-73-7		U	0.0538	0.0269
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0538	0.0269
Naphthalene	91-20-3		U	0.0538	0.0269
Phenanthrene	85-01-8		U	0.0538	0.0269
Pyrene	129-00-0		U	0.0538	0.0269
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	78.2	43	116		
Nitrobenzene-d5	86.3	35	114		
p-Terphenyl-d14	56.9	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW20-120716	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 00:08
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: 7M68282
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
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	61.5	43	116		

Certificate of Analysis

Nitrobenzene-d5	70.6	35	114	
p-Terphenyl-d14	78.3	33	141	
U	Not detected at or above adjusted sample detection limit.			

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW06-120716	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 00:34
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: 7M68283
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
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	73.9	43	116	
Nitrobenzene-d5	82.7	35	114	
p-Terphenyl-d14	79.9	33	141	

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

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: HPMS7
Client ID: MW10-120716	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 01:00
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: 7M68284
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	59.8	43	116		
Nitrobenzene-d5	68.4	35	114		
p-Terphenyl-d14	74.6	33	141		
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: HPMS7
Client ID: DUP-GW-120716-1	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 01:27
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: 7M68285
Sample Tag: 01	Units: ug/L	

Analyte	CAS #	Result	Qual	RL	MDL
2-Methylnaphthalene	91-57-6		U	0.0515	0.0258
Acenaphthene	83-32-9		U	0.0515	0.0258

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Acenaphthylene	208-96-8		U	0.0515	0.0258
Anthracene	120-12-7		U	0.0515	0.0258
Benzo(a)anthracene	56-55-3		U	0.0515	0.0258
Benzo(a)pyrene	50-32-8		U	0.0515	0.0258
Benzo(b)fluoranthene	205-99-2		U	0.0515	0.0258
Benzo(g,h,i)perylene	191-24-2		U	0.0515	0.0258
Benzo(k)fluoranthene	207-08-9		U	0.0515	0.0258
Chrysene	218-01-9		U	0.0515	0.0258
Dibenzo(a,h)anthracene	53-70-3		U	0.0515	0.0258
Fluoranthene	206-44-0		U	0.0515	0.0258
Fluorene	86-73-7		U	0.0515	0.0258
Indeno(1,2,3-cd)pyrene	193-39-5		U	0.0515	0.0258
Naphthalene	91-20-3		U	0.0515	0.0258
Phenanthrene	85-01-8		U	0.0515	0.0258
Pyrene	129-00-0		U	0.0515	0.0258
Surrogate	Recovery	Lower Limit	Upper Limit	Q	
2-Fluorobiphenyl	65.6	43	116		
Nitrobenzene-d5	74.8	35	114		
p-Terphenyl-d14	81.3	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:

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

Example

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

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

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

Example

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

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

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

Example

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

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 Henson

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	

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 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

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Approved: 14-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
 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	

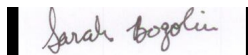
Microbac Laboratories Inc.

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





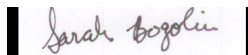
Microbac Laboratories Inc.

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.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8270D_SIM
 Login Number: L16120425

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
MW18-120616	03	12/07/16					12/09/2016	1.8	7		12/12/16	3.5	40	
MW05I-120716	07	12/07/16					12/09/2016	2.1	7		12/12/16	3.5	40	
MW07-120716	11	12/07/16					12/09/2016	2.1	7		12/12/16	3.5	40	
MW20-120716	13	12/07/16					12/09/2016	2	7		12/13/16	3.5	40	
MW06-120716	15	12/07/16					12/09/2016	1.9	7		12/13/16	3.6	40	
MW10-120716	17	12/07/16					12/09/2016	2	7		12/13/16	3.6	40	
DUP-GW-120716-1	21	12/07/16					12/09/2016	1.9	7		12/13/16	3.6	40	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061669
 Report generated 12/15/2016 11:46



Microbac Laboratories Inc.
SURROGATE STANDARDS

Login Number: L16120425
Instrument Id: HPMS7
Workgroup (AAB#): WG594466

Method: 8270L
CAL ID: HPMS7-09-DEC-16
Matrix: Water

Sample Number	Dilution	Tag	1	2	3
L16120425-03	1.00	01	74.4	84.8	<u>23.9</u>
L16120425-07	1.00	01	74.6	82.7	64.3
L16120425-11	1.00	01	78.2	86.3	56.9
L16120425-13	1.00	01	61.5	70.6	78.3
L16120425-15	1.00	01	73.9	82.7	79.9
L16120425-17	1.00	01	59.8	68.4	74.6
L16120425-21	1.00	01	65.6	74.8	81.3
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: L16120425 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
MW18-120616	L16120425-03	7M68279	12/12/16 22:48	01
MW05I-120716	L16120425-07	7M68280	12/12/16 23:15	01
MW07-120716	L16120425-11	7M68281	12/12/16 23:41	01
MW20-120716	L16120425-13	7M68282	12/13/16 00:08	01
MW06-120716	L16120425-15	7M68283	12/13/16 00:34	01
MW10-120716	L16120425-17	7M68284	12/13/16 01:00	01
DUP-GW-120716-1	L16120425-21	7M68285	12/13/16 01:27	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5061670
 Report generated 12/15/2016 11:47



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5061671
 15-DEC-2016 11:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5061672
 Report generated: 12/15/2016 11:47



Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

DFTPP

Login Number: L16120425 Tune ID: WG594224-01
 Instrument: HPMS7 Run Date: 12/09/2016
 Analyst: SCB Run Time: 10:13
 Workgroup: WG594224 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: L16120425 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	
L16120425-03	MW18-120616	01	12/12/2016 22:48	
L16120425-07	MW05I-120716	01	12/12/2016 23:15	
L16120425-11	MW07-120716	01	12/12/2016 23:41	
L16120425-13	MW20-120716	01	12/13/2016 00:08	
L16120425-15	MW06-120716	01	12/13/2016 00:34	
L16120425-17	MW10-120716	01	12/13/2016 01:00	
L16120425-21	DUP-GW-120716-1	01	12/13/2016 01:27	

* Sample past 12 hour tune limit



Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

Login Number: L16120425
 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: 5061673
 Report generated 12/15/2016 11:47



Login Number: L16120425
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: 5061673
Report generated 12/15/2016 11:47



Login Number: L16120425
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
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Report generated 12/15/2016 11:47



Login Number: L16120425
 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

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Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120425 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: L16120425 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: 5061676
 Report generated 12/15/2016 11:47



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

Login Number: L16120425
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>L16120425-03</u>	1.00	01	<u>33646</u>	<u>74618</u>	<u>64330</u>	<u>74103</u>	<u>64110</u>
L16120425-07	1.00	01	31152	66205	57915	65698	60072
L16120425-11	1.00	01	29654	62146	55834	61372	56778
L16120425-13	1.00	01	27435	56265	50975	55833	53504
L16120425-15	1.00	01	29079	60645	54840	60106	56472
L16120425-17	1.00	01	31434	65125	58817	64071	61087
L16120425-21	1.00	01	28352	58287	52982	58356	54914
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 RETENTION TIME SUMMARY
(COMPARED TO CCV)

Login Number: L16120425
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>L16120425-03</u>	1.00	01	8.42	13.68	6.21	16.06	10.29
L16120425-07	1.00	01	8.42	13.68	6.22	16.06	10.29
L16120425-11	1.00	01	8.42	13.68	6.22	16.06	10.29
L16120425-13	1.00	01	8.42	13.68	6.21	16.06	10.29
L16120425-15	1.00	01	8.42	13.68	6.21	16.06	10.29
L16120425-17	1.00	01	8.42	13.68	6.21	16.06	10.29
L16120425-21	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



2.3 Metals Data

2.3.1 Metals I C P Data

2.3.1.1 Summary Data



Login Number: L16120425
Department: Metals
Analyst: Kerri Buck
Analyst #2: Ji Hu

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: 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 21 and 24 along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for sodium. The continuing calibration verification analyzed on 16-DEC-2016 at 03:09 yielded a noncompliant recovery for potassium. However, client samples were bracketed by compliant CCVs, therefore, no further action was taken. 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.

WG594875 - Due to continuing calibration verification failure for iron on 21-Dec-2016 at 19:56, all client samples along with the batch QA/QC samples were reanalyzed on a later calibration which was compliant for iron.

Continuing Calibration Blank: WG594872 - The continuing calibration blank analyzed on 16-DEC-2016 at 02:50 yielded a result for calcium that was over the reporting limit. However, client samples were bracketed by compliant CCBs for

calcium, 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: WG594872 - All acceptance criteria were met.

WG594875 - All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: WG594872 - Client sample 23 required dilution analysis in order to obtain a result for sodium within the linear range.

WG594875 - Client samples 01, 05, 09, and 19 required dilution analysis in order to obtain results for sodium within the linear range.

Narrative ID: 120590

Approved By: Kerri Buck

K: K Buck

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ06-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:04
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: T3.122216.200436
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.520		0.100	0.0500

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: PZ06-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:18
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: T4.122116.201839
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	0.326		0.200	0.100
Calcium, Total	7440-70-2	18.0		0.500	0.250
Magnesium, Total	7439-95-4	5.03		0.500	0.250
Manganese, Total	7439-96-5	0.0142		0.0100	0.00500
Potassium, Total	7440-09-7	5.54		1.00	0.500
Silica, Calculated as SiO2		13.1		2.14	1.07
Silicon, Total	7440-21-3	6.14		1.00	0.500

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ06-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:08
Collect Date: 12/07/2016 15:00	Dilution: 5	File ID: T3.122216.200831
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	428		2.50	1.25
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 #: L16120425-02	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: PZ06-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:22
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: T4.122116.202225
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		U	0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-02	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ06-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:12
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: T3.122216.201226
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6		U	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 #: L16120425-03	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW18-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:16
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: T3.122216.201618
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	21.9		0.100	0.0500

Sample #: L16120425-03	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW18-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:26
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: T4.122116.202612
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	5.04		0.200	0.100
Calcium, Total	7440-70-2	151		0.500	0.250
Magnesium, Total	7439-95-4	25.1		0.500	0.250
Manganese, Total	7439-96-5	1.14		0.0100	0.00500
Potassium, Total	7440-09-7	11.0		1.00	0.500
Sodium, Total	7440-23-5	172		0.500	0.250

Sample #: L16120425-04	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW18-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:29
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: T4.122116.202956
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	1.24		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-04	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW18-120616	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:20
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: T3.122216.202007
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	5.03		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW11S-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:33
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: T4.122116.203342
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	3.40		0.500	0.250

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Magnesium, Total	7439-95-4	3.73		0.500	0.250
Manganese, Total	7439-96-5	0.0101		0.0100	0.00500
Potassium, Total	7440-09-7	2.03		1.00	0.500
Silica, Calculated as SiO ₂		10.2		2.14	1.07
Silicon, Total	7440-21-3	4.75		1.00	0.500
E	Semiquantitative result (out of calibration range)				
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW11S-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:31
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: T3.122216.203129
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.0687	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 #: L16120425-05	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW11S-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:43
Collect Date: 12/07/2016 10:18	Dilution: 5	File ID: T3.122216.204305
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	683		2.50	1.25
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-06	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW11S-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:37
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: T4.122116.203737
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
Manganese, Dissolved	7439-96-5	0.0105		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-06	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW11S-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:47
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: T3.122216.204701
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6		U	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 #: L16120425-07	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW05I-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:51
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: T3.122216.205104
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.208		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW05I-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 20:56
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: T4.122116.205633
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	77.5		0.500	0.250
Magnesium, Total	7439-95-4	19.2		0.500	0.250
Manganese, Total	7439-96-5	0.0851		0.0100	0.00500
Potassium, Total	7440-09-7	4.11		1.00	0.500

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Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	71.7		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-08	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW05I-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:54
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: T3.122216.205457
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	0.177		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-08	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW05I-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:00
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: T4.122116.210018
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	0.0841		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:04
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: T4.122116.210405
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	0.252		0.200	0.100
Calcium, Total	7440-70-2	49.5		0.500	0.250
Magnesium, Total	7439-95-4	20.5		0.500	0.250
Manganese, Total	7439-96-5	0.0260		0.0100	0.00500
Potassium, Total	7440-09-7	7.36		1.00	0.500
Silica, Calculated as SiO2		21.9		2.14	1.07

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Analyte	CAS #	Result	Qual	RL	MDL
Silicon, Total	7440-21-3	10.2		1.00	0.500

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 20:58
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: T3.122216.205850
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.475		0.100	0.0500

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:02
Collect Date: 12/07/2016 14:06	Dilution: 5	File ID: T3.122216.210251
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	860		2.50	1.25
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-10	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:06
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: T3.122216.210645
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	0.343		0.100	0.0500
J	The analyte was positively identified, but the quantitation was below the RL.				

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Sample #: L16120425-10	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:07
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: T4.122116.210759
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	0.0448		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:11
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: T4.122116.211144
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	0.308		0.200	0.100
Calcium, Total	7440-70-2	61.6		0.500	0.250
Magnesium, Total	7439-95-4	8.46		0.500	0.250
Manganese, Total	7439-96-5	0.00545	J	0.0100	0.00500
Potassium, Total	7440-09-7	3.08		1.00	0.500
Sodium, Total	7440-23-5	260		0.500	0.250
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:10
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: T3.122216.211038
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.236		0.100	0.0500
J	The analyte was positively identified, but the quantitation was below the RL.				

Certificate of Analysis

Sample #: L16120425-12	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:14
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: T3.122216.211433
Sample Tag: 01	Units: mg/L	

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

Sample #: L16120425-12	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:15
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: T4.122116.211530
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		U	0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:19
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: T4.122116.211914
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	109		0.500	0.250
Magnesium, Total	7439-95-4	17.2		0.500	0.250
Manganese, Total	7439-96-5		U	0.0100	0.00500
Potassium, Total	7440-09-7	5.69		1.00	0.500
Sodium, Total	7440-23-5	16.8		0.500	0.250
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 #: L16120425-13	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:18
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: T3.122216.211826
Sample Tag: 01	Units: mg/L	

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

Sample #: L16120425-14	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:29
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: T3.122216.212950
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6		U	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 #: L16120425-14	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:23
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: T4.122116.212300
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	0.00625	J	0.0100	0.00500
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 #: L16120425-15	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:33
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: T3.122216.213342
Sample Tag: 01	Units: mg/L	

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

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:26
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: T4.122116.212646
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	124		0.500	0.250
Magnesium, Total	7439-95-4	19.1		0.500	0.250
Manganese, Total	7439-96-5	0.00750	J	0.0100	0.00500
Potassium, Total	7440-09-7	1.72		1.00	0.500
Sodium, Total	7440-23-5	31.2		0.500	0.250
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-16	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:37
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: T3.122216.213735
Sample Tag: 01	Units: mg/L	

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

Certificate of Analysis

Sample #: L16120425-16	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:30
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: T4.122116.213032
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		U	0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:41
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: T4.122116.214144
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Aluminum, Total	7429-90-5	0.252		0.200	0.100
Calcium, Total	7440-70-2	45.1		0.500	0.250
Magnesium, Total	7439-95-4	4.55		0.500	0.250
Manganese, Total	7439-96-5		U	0.0100	0.00500
Potassium, Total	7440-09-7	1.02		1.00	0.500
Sodium, Total	7440-23-5	110		0.500	0.250
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:41
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: T3.122216.214127
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.245		0.100	0.0500
J	The analyte was positively identified, but the quantitation was below the RL.				

Certificate of Analysis

Sample #: L16120425-18	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:45
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: T4.122116.214530
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		U	0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-18	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:45
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: T3.122216.214520
Sample Tag: 01	Units: mg/L	

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

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:49
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: T3.122216.214913
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	1.35		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:49
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: T4.122116.214916
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	185		0.500	0.250
Magnesium, Total	7439-95-4	87.2		0.500	0.250
Manganese, Total	7439-96-5	0.304		0.0100	0.00500
Potassium, Total	7440-09-7	8.82		1.00	0.500
Silica, Calculated as SiO2		23.4		2.14	1.07
Silicon, Total	7440-21-3	10.9		1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:53
Collect Date: 12/07/2016 15:10	Dilution: 5	File ID: T3.122216.215314
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	3100		2.50	1.25
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-20	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/22/2016 16:14
Workgroup #: WG594875	Analyst: JYH	Run Date: 12/22/2016 21:57
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: T3.122216.215715
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	3.43		0.100	0.0500

Sample #: L16120425-20	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/13/2016 09:32
Matrix: Water	Analytical Method: 6010C	Cal Date: 12/21/2016 12:02
Workgroup #: WG594875	Analyst: KKB	Run Date: 12/21/2016 21:53
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: T4.122116.215310
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	0.260		0.0100	0.00500

Certificate of Analysis

U	Not detected at or above adjusted sample detection limit.
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Sample #: L16120425-21	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-1	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 01:40
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: T4.121616.014036
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	77.5		0.500	0.250
Magnesium, Total	7439-95-4	20.1		0.500	0.250
Manganese, Total	7439-96-5	0.0824		0.0100	0.00500
Potassium, Total	7440-09-7	4.08		1.00	0.500

U	Not detected at or above adjusted sample detection limit.
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Sample #: L16120425-21	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-1	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 19:03
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: T4.121816.190313
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	72.1		0.500	0.250

U	Not detected at or above adjusted sample detection limit.
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Sample #: L16120425-21	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: DUP-GW-120716-1	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 18:16
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: T3.122216.181649
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.176		0.100	0.0500

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

Sample #: L16120425-22	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-1	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 01:44
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: T4.121616.014423
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	0.0826		0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-22	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: DUP-GW-120716-1	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 18:20
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: T3.122216.182041
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6	0.170		0.100	0.0500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-23	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: DUP-GW-120716-2	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 18:24
Collect Date: 12/07/2016 12:31	Dilution: 1	File ID: T3.122216.182434
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Total	7439-89-6	0.0736	J	0.100	0.0500
E	Semiquantitative result (out of calibration range)				
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 #: L16120425-23	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-2	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 01:48
Collect Date: 12/07/2016 12:31	Dilution: 1	File ID: T4.121616.014808
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	3.24		0.500	0.250
Magnesium, Total	7439-95-4	3.81		0.500	0.250
Manganese, Total	7439-96-5	0.00800	J	0.0100	0.00500
Potassium, Total	7440-09-7	1.95		1.00	0.500
E	Semiquantitative result (out of calibration range)				
J	The analyte was positively identified, but the quantitation was below the RL.				
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-23	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-2	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 19:22
Collect Date: 12/07/2016 12:31	Dilution: 10	File ID: T4.121816.192205
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sodium, Total	7440-23-5	748		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.				

Sample #: L16120425-24	PrePrep Method: N/A	Instrument: ICP-THERMO4
Client ID: DUP-GW-120716-2	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 01:52
Collect Date: 12/07/2016 12:31	Dilution: 1	File ID: T4.121616.015203
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		U	0.0100	0.00500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-24	PrePrep Method: N/A	Instrument: ICP-THERMO3
Client ID: DUP-GW-120716-2	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 18:28
Collect Date: 12/07/2016 12:31	Dilution: 1	File ID: T3.122216.182835
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Iron, Dissolved	7439-89-6		U	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.				

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 Revison 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: 5059062
 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:



Microbac Laboratories Inc.
Microwave Digestion Log

Workgroup: WG594634
 Analyst: ERP
 Spike Analyst: ERP
 Run Date: 12/13/2016 09:32
 Method: 3015
 Balance: BAL019
 Instrument: MW-1
 Instrument Start: 12/13/2016 09:47

SOP: ME407 Revision 19
 Spike Solution: STD79117
 Spike Witness: REK
 HNO3 Lot #: COA19324
 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	WG594634-02	BLANK	1	40 mL	50 mL	205.008 g	204.985 g	
2	WG594634-03	LCS	1	40 mL	50 mL	212.653 g	212.651 g	5 mL
3	L16120425-01	SAMP	1	40 mL	50 mL	205.897 g	205.889 g	12/22/16
4	L16120425-02	SAMP	1	40 mL	50 mL	205.499 g	205.48 g	12/22/16
5	L16120425-03	SAMP	1	40 mL	50 mL	205.584 g	205.578 g	12/22/16
6	L16120425-04	SAMP	1	40 mL	50 mL	206.606 g	206.596 g	12/22/16
7	L16120425-05	SAMP	1	40 mL	50 mL	205.59 g	205.576 g	12/22/16
8	L16120425-06	SAMP	1	40 mL	50 mL	206.761 g	206.752 g	12/22/16
9	L16120425-07	SAMP	1	40 mL	50 mL	207.434 g	207.427 g	12/22/16
10	L16120425-08	SAMP	1	40 mL	50 mL	205.872 g	205.862 g	12/22/16
11	L16120425-09	SAMP	1	40 mL	50 mL	203.545 g	203.526 g	12/22/16
12	L16120425-10	SAMP	1	40 mL	50 mL	205.23 g	205.218 g	12/22/16
13	L16120425-11	RS01	1	40 mL	50 mL	205.87 g	205.858 g	12/22/16
14	L16120425-12	SAMP	1	40 mL	50 mL	204.916 g	204.912 g	12/22/16
15	L16120425-13	SAMP	1	40 mL	50 mL	204.612 g	204.601 g	12/22/16
16	L16120425-14	SAMP	1	40 mL	50 mL	205.426 g	205.414 g	12/22/16
17	L16120425-15	SAMP	1	40 mL	50 mL	206.006 g	206.001 g	12/22/16
18	L16120425-16	SAMP	1	40 mL	50 mL	207.087 g	207.071 g	12/22/16
19	L16120425-17	SAMP	1	40 mL	50 mL	206.233 g	206.234 g	12/22/16
20	L16120425-18	SAMP	1	40 mL	50 mL	206.073 g	206.074 g	12/22/16
21	L16120425-19	SAMP	1	40 mL	50 mL	208.901 g	208.899 g	12/22/16
22	WG594634-01	REF	1	40 mL	50 mL	205.324 g	205.321 g	
23	L16120425-20	SAMP	1	40 mL	50 mL	205.324 g	205.321 g	12/22/16
24	WG594634-04	MS	1	40 mL	50 mL	211.317 g	211.317 g	5 mL
25	WG594634-05	MSD	1	40 mL	50 mL	210.901 g	210.902 g	5 mL

L16120425-03	filtered digestate
L16120425-09	filtered digestate

Analyst: Evan Posten

Reviewer: [Signature]



Microbac Laboratories Inc.

Instrument Run Log

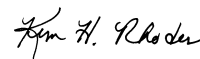
Instrument: ICP-THERMO4 Dataset: 121516T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594871,594869,594866,594872

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
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

Page: 1 Approved: December 16, 2016




Microbac Laboratories Inc.

Instrument Run Log

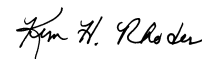
Instrument: ICP-THERMO4 Dataset: 121516T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol: _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594871,594869,594866,594872

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
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

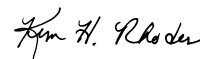
Instrument: ICP-THERMO4 Dataset: 121516T4.1R.TXT
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning 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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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: _____

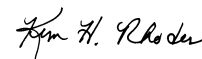
Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

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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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: 594866,594869,594871,594872

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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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: 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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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: 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: _____

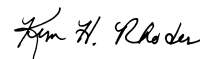
Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594866,594869,594871,594872

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
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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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
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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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: _____

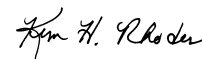
Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning Sol : _____
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594869,595141,594644,594975

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
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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Sam H. Rhodes

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Instrument Run Log

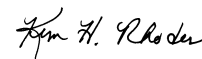
Instrument: ICP-THERMO4 Dataset: 122116T4.1
 Analyst1: KKB Analyst2: N/A
 Method: 200.7/6010B/6010C SOP: ME600G Rev: 8
 Maintenance Log ID: _____
 Calibration Std: STD78879 ICV Std: STD79359 Post Spike: STD77492
 ICSA: STD79273 ICSAB: STD79274 Int. Std: RGT37691
 CCV: STD79360 LLCCV: COA19158 Tuning 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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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: 594872,594644,594875,595139,595141,595175,595976Comments:

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: 594872,594644,594875,595139,595141,595175,595976

Comments:

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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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
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: 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
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: 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
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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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:L16120425

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
DUP-GW-120716-1	21	12/07/16					12/12/2016	5	180		12/22/16	15.2	180	
DUP-GW-120716-1	22	12/07/16					12/12/2016	5	180		12/22/16	15.2	180	
DUP-GW-120716-2	23	12/07/16					12/12/2016	5	180		12/22/16	15.2	180	
DUP-GW-120716-2	24	12/07/16					12/12/2016	5	180		12/22/16	15.2	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5080428
 Report generated 12/23/2016 08:53



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6010C

AAB#:WG594875

Login Number:L16120425

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
PZ06-120616	01	12/07/16					12/13/2016	5.8	180		12/22/16	15.2	180	
PZ06-120616	01	12/07/16					12/13/2016	5.8	180		12/22/16	15.2	180	
PZ06-120616	02	12/07/16					12/13/2016	5.8	180		12/22/16	15.2	180	
MW18-120616	03	12/07/16					12/13/2016	5.7	180		12/22/16	15.2	180	
MW18-120616	04	12/07/16					12/13/2016	5.7	180		12/22/16	15.2	180	
MW11S-120716	05	12/07/16					12/13/2016	6	180		12/22/16	15.4	180	
MW11S-120716	05	12/07/16					12/13/2016	6	180		12/22/16	15.4	180	
MW11S-120716	06	12/07/16					12/13/2016	6	180		12/22/16	15.4	180	
MW05I-120716	07	12/07/16					12/13/2016	6	180		12/22/16	15.5	180	
MW05I-120716	08	12/07/16					12/13/2016	6	180		12/22/16	15.5	180	
MW30-120716	09	12/07/16					12/13/2016	5.8	180		12/22/16	15.3	180	
MW30-120716	09	12/07/16					12/13/2016	5.8	180		12/22/16	15.3	180	
MW30-120716	10	12/07/16					12/13/2016	5.8	180		12/22/16	15.3	180	
MW07-120716	11	12/07/16					12/13/2016	6	180		12/22/16	15.5	180	
MW07-120716	12	12/07/16					12/13/2016	6	180		12/22/16	15.5	180	
MW20-120716	13	12/07/16					12/13/2016	5.9	180		12/22/16	15.4	180	
MW20-120716	14	12/07/16					12/13/2016	5.9	180		12/22/16	15.4	180	
MW06-120716	15	12/07/16					12/13/2016	5.8	180		12/22/16	15.3	180	
MW06-120716	16	12/07/16					12/13/2016	5.8	180		12/22/16	15.3	180	
MW10-120716	17	12/07/16					12/13/2016	5.9	180		12/22/16	15.4	180	
MW10-120716	18	12/07/16					12/13/2016	5.9	180		12/22/16	15.4	180	
PZ03-120716	19	12/07/16					12/13/2016	5.8	180		12/22/16	15.3	180	
PZ03-120716	19	12/07/16					12/13/2016	5.8	180		12/22/16	15.3	180	
PZ03-120716	20	12/07/16					12/13/2016	5.8	180		12/22/16	15.3	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5080428
 Report generated 12/23/2016 08:53



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6010C
 Login Number:L16120425

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
DUP-GW-120716-1	21	12/07/16					12/12/2016	5	180		12/18/16	11.3	180	
DUP-GW-120716-1	21	12/07/16					12/12/2016	5	180		12/16/16	8.5	180	
DUP-GW-120716-1	22	12/07/16					12/12/2016	5	180		12/16/16	8.6	180	
DUP-GW-120716-2	23	12/07/16					12/12/2016	5	180		12/18/16	11.3	180	
DUP-GW-120716-2	23	12/07/16					12/12/2016	5	180		12/16/16	8.6	180	
DUP-GW-120716-2	24	12/07/16					12/12/2016	5	180		12/16/16	8.6	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5068509
 Report generated 12/22/2016 10:59



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6010C

AAB#:WG594875

Login Number:L16120425

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
PZ06-120616	01	12/07/16					12/13/2016	5.8	180		12/21/16	14.2	180	
PZ06-120616	02	12/07/16					12/13/2016	5.8	180		12/21/16	14.2	180	
MW18-120616	03	12/07/16					12/13/2016	5.7	180		12/21/16	14.2	180	
MW18-120616	04	12/07/16					12/13/2016	5.7	180		12/21/16	14.2	180	
MW11S-120716	05	12/07/16					12/13/2016	6	180		12/21/16	14.4	180	
MW11S-120716	06	12/07/16					12/13/2016	6	180		12/21/16	14.4	180	
MW05I-120716	07	12/07/16					12/13/2016	6	180		12/21/16	14.5	180	
MW05I-120716	08	12/07/16					12/13/2016	6	180		12/21/16	14.5	180	
MW30-120716	09	12/07/16					12/13/2016	5.8	180		12/21/16	14.3	180	
MW30-120716	10	12/07/16					12/13/2016	5.8	180		12/21/16	14.3	180	
MW07-120716	11	12/07/16					12/13/2016	6	180		12/21/16	14.5	180	
MW07-120716	12	12/07/16					12/13/2016	6	180		12/21/16	14.5	180	
MW20-120716	13	12/07/16					12/13/2016	5.9	180		12/21/16	14.4	180	
MW20-120716	14	12/07/16					12/13/2016	5.9	180		12/21/16	14.4	180	
MW06-120716	15	12/07/16					12/13/2016	5.8	180		12/21/16	14.3	180	
MW06-120716	16	12/07/16					12/13/2016	5.8	180		12/21/16	14.3	180	
MW10-120716	17	12/07/16					12/13/2016	5.9	180		12/21/16	14.4	180	
MW10-120716	18	12/07/16					12/13/2016	5.9	180		12/21/16	14.4	180	
PZ03-120716	19	12/07/16					12/13/2016	5.8	180		12/21/16	14.3	180	
PZ03-120716	20	12/07/16					12/13/2016	5.8	180		12/21/16	14.3	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5068509
 Report generated 12/22/2016 10:59



METHOD BLANK SUMMARY

Login Number: L16120425 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
DUP-GW-120716-1	L16120425-21	T3.122216.181649	12/22/16 18:16	01
DUP-GW-120716-1	L16120425-22	T3.122216.182041	12/22/16 18:20	01
DUP-GW-120716-2	L16120425-23	T3.122216.182434	12/22/16 18:24	01
DUP-GW-120716-2	L16120425-24	T3.122216.182835	12/22/16 18:28	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5080429
 Report generated 12/23/2016 08:53



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG594875
 Blank File ID: T3.122216.195701 Blank Sample ID: WG594634-02
 Prep Date: 12/13/16 09:32 Instrument ID: ICP-THERMO3
 Analyzed Date: 12/22/16 19:57 Method: 6010C
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594634-03	T3.122216.200057	12/22/16 20:00	01
PZ06-120616	L16120425-01	T3.122216.200436	12/22/16 20:04	01
PZ06-120616	L16120425-01	T3.122216.200831	12/22/16 20:08	DL01
PZ06-120616	L16120425-02	T3.122216.201226	12/22/16 20:12	01
MW18-120616	L16120425-03	T3.122216.201618	12/22/16 20:16	01
MW18-120616	L16120425-04	T3.122216.202007	12/22/16 20:20	01
MW11S-120716	L16120425-05	T3.122216.203129	12/22/16 20:31	01
MW11S-120716	L16120425-05	T3.122216.204305	12/22/16 20:43	DL01
MW11S-120716	L16120425-06	T3.122216.204701	12/22/16 20:47	01
MW05I-120716	L16120425-07	T3.122216.205104	12/22/16 20:51	01
MW05I-120716	L16120425-08	T3.122216.205457	12/22/16 20:54	01
MW30-120716	L16120425-09	T3.122216.205850	12/22/16 20:58	01
MW30-120716	L16120425-09	T3.122216.210251	12/22/16 21:02	DL01
MW30-120716	L16120425-10	T3.122216.210645	12/22/16 21:06	01
MW07-120716	L16120425-11	T3.122216.211038	12/22/16 21:10	01
MW07-120716	L16120425-12	T3.122216.211433	12/22/16 21:14	01
MW20-120716	L16120425-13	T3.122216.211826	12/22/16 21:18	01
MW20-120716	L16120425-14	T3.122216.212950	12/22/16 21:29	01
MW06-120716	L16120425-15	T3.122216.213342	12/22/16 21:33	01
MW06-120716	L16120425-16	T3.122216.213735	12/22/16 21:37	01
MW10-120716	L16120425-17	T3.122216.214127	12/22/16 21:41	01
MW10-120716	L16120425-18	T3.122216.214520	12/22/16 21:45	01
PZ03-120716	L16120425-19	T3.122216.214913	12/22/16 21:49	01
PZ03-120716	L16120425-19	T3.122216.215314	12/22/16 21:53	DL01
PZ03-120716	L16120425-20	T3.122216.215715	12/22/16 21:57	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5080429
 Report generated 12/23/2016 08:53



METHOD BLANK SUMMARY

Login Number: L16120425 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
DUP-GW-120716-1	L16120425-21	T4.121616.014036	12/16/16 01:40	01
DUP-GW-120716-1	L16120425-22	T4.121616.014423	12/16/16 01:44	01
DUP-GW-120716-2	L16120425-23	T4.121616.014808	12/16/16 01:48	01
DUP-GW-120716-2	L16120425-24	T4.121616.015203	12/16/16 01:52	01
LCS	WG594498-03	T4.121816.183334	12/18/16 18:33	02
DUP-GW-120716-1	L16120425-21	T4.121816.190313	12/18/16 19:03	02
DUP-GW-120716-2	L16120425-23	T4.121816.192205	12/18/16 19:22	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5068555
 Report generated 12/22/2016 11:10



METHOD BLANK SUMMARY

Login Number: L16120425 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
DUP-GW-120716-1	L16120425-21	T4.121616.014036	12/16/16 01:40	01
DUP-GW-120716-1	L16120425-22	T4.121616.014423	12/16/16 01:44	01
DUP-GW-120716-2	L16120425-23	T4.121616.014808	12/16/16 01:48	01
DUP-GW-120716-2	L16120425-24	T4.121616.015203	12/16/16 01:52	01
LCS	WG594498-03	T4.121816.183334	12/18/16 18:33	02
DUP-GW-120716-1	L16120425-21	T4.121816.190313	12/18/16 19:03	02
DUP-GW-120716-2	L16120425-23	T4.121816.192205	12/18/16 19:22	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5068555
 Report generated 12/22/2016 11:10



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG594875
 Blank File ID: T4.122116.201113 Blank Sample ID: WG594634-02
 Prep Date: 12/13/16 09:32 Instrument ID: ICP-THERMO4
 Analyzed Date: 12/21/16 20:11 Method: 6010C
 Analyst: KKB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594634-03	T4.122116.201501	12/21/16 20:15	01
PZ06-120616	L16120425-01	T4.122116.201839	12/21/16 20:18	01
PZ06-120616	L16120425-02	T4.122116.202225	12/21/16 20:22	01
MW18-120616	L16120425-03	T4.122116.202612	12/21/16 20:26	01
MW18-120616	L16120425-04	T4.122116.202956	12/21/16 20:29	01
MW11S-120716	L16120425-05	T4.122116.203342	12/21/16 20:33	01
MW11S-120716	L16120425-06	T4.122116.203737	12/21/16 20:37	01
MW05I-120716	L16120425-07	T4.122116.205633	12/21/16 20:56	01
MW05I-120716	L16120425-08	T4.122116.210018	12/21/16 21:00	01
MW30-120716	L16120425-09	T4.122116.210405	12/21/16 21:04	01
MW30-120716	L16120425-10	T4.122116.210759	12/21/16 21:07	01
MW07-120716	L16120425-11	T4.122116.211144	12/21/16 21:11	01
MW07-120716	L16120425-12	T4.122116.211530	12/21/16 21:15	01
MW20-120716	L16120425-13	T4.122116.211914	12/21/16 21:19	01
MW20-120716	L16120425-14	T4.122116.212300	12/21/16 21:23	01
MW06-120716	L16120425-15	T4.122116.212646	12/21/16 21:26	01
MW06-120716	L16120425-16	T4.122116.213032	12/21/16 21:30	01
MW10-120716	L16120425-17	T4.122116.214144	12/21/16 21:41	01
MW10-120716	L16120425-18	T4.122116.214530	12/21/16 21:45	01
PZ03-120716	L16120425-19	T4.122116.214916	12/21/16 21:49	01
PZ03-120716	L16120425-20	T4.122116.215310	12/21/16 21:53	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5068555
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5080430
23-DEC-2016 13:47



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/13/16 09:32 Sample ID: WG594634-02
Instrument ID: ICP-THERMO3 Run Date: 12/22/16 19:57 Prep Method: 3015
File ID: T3.122216.195701 Analyst: JYH Method: 6010C
Workgroup (AAB#): WG594875 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
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: 5080430
23-DEC-2016 13:47



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5068556
 22-DEC-2016 11:10



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5068556
22-DEC-2016 11:10



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/13/16 09:32 Sample ID: WG594634-02
Instrument ID: ICP-THERMO4 Run Date: 12/21/16 20:11 Prep Method: 3015
File ID: T4.122116.201113 Analyst: KKB Method: 6010C
Workgroup (AAB#): WG594875 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: ICP-TH-21-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: 5068556
22-DEC-2016 11:10



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5080431
Report generated: 12/23/2016 13:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Run Date: 12/22/2016 Sample ID: WG594634-03
Instrument ID: ICP-THERMO3 Run Time: 20:00 Prep Method: 3015
File ID: T3.122216.200057 Analyst: JYH Method: 6010C
Workgroup (AAB#): WG594875 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	2.41	96.2	85 - 115	
Sodium, Total	31.3	29.1	93.3	85 - 115	

LCS - Modified 03/06/2008
PDF File ID: 5080431
Report generated: 12/23/2016 13:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5068557
 Report generated: 12/22/2016 11:10



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5068557
Report generated: 12/22/2016 11:10



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG594634-03
 Instrument ID: ICP-THERMO4 Run Time: 20:15 Prep Method: 3015
 File ID: T4.122116.201501 Analyst: KKB Method: 6010C
 Workgroup (AAB#): WG594875 Matrix: Water Units: mg/L
 QC Key: WATERLOO Lot#: STD79117 Cal ID: ICP-TH-21-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Total	6.25	6.14	98.3	85 - 115	
Calcium, Total	6.25	6.06	96.9	85 - 115	
Magnesium, Total	6.25	5.40	86.5	85 - 115	
Manganese, Total	0.313	0.279	89.2	85 - 115	
Potassium, Total	31.3	30.8	98.7	85 - 115	
Silicon, Total	3.13	2.95	94.5	85 - 115	
Sodium, Total	31.3	30.7	98.1	85 - 115	

LCS - Modified 03/06/2008
 PDF File ID: 5068557
 Report generated: 12/22/2016 11:10



MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L16120425 Cal ID: ICP-THERMO3- Worknum: WG594875
 Instrument ID: ICP-THERMO3 Contract #: _____ Method: 6010C
 Parent ID: WG594634-01 File ID: T3.122216.215715 Dil: 1 Matrix: WATER
 Sample ID: WG594634-04 MS File ID: T3.122216.220100 Dil: 1 Units: mg/L
 Sample ID: WG594634-05 MSD File ID: T3.122216.220446 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Iron, Dissolved	3.43	2.50	3.49	2.54	2.50	0.269	-126	171	85 - 115	20	*#
Sodium, Dissolved	622	31.3	641	62.1	31.3	164	-1470	119	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: L16120425 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: L16120425 Cal ID: ICP-THERMO4 Worknum: WG594872
 Instrument ID: ICP-THERMO4 Contract #: _____ Method: 6010C
 Parent ID: WG594498-01 File ID: T4.121616.005947 Dil: 1 Matrix: WATER
 Sample ID: WG594498-04 MS File ID: T4.121616.010332 Dil: 1 Units: mg/L
 Sample ID: WG594498-05 MSD File ID: T4.121616.010707 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum, Dissolved	ND	6.25	5.88	94.0	6.25	5.90	94.4	0.386	85 - 115	20	
Calcium	120	6.25	123	51.6	6.25	124	73.2	1.09	85 - 115	20	*
Magnesium	12.7	6.25	18.2	88.5	6.25	18.3	89.8	0.453	85 - 115	20	
Manganese, Dissolved	0.0919	0.313	0.392	96.1	0.313	0.388	94.8	1.00	85 - 115	20	
Potassium	3.94	31.3	35.5	101	31.3	35.8	102	0.922	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: L16120425 Cal ID: ICP-THERMO4- Worknum: WG594872
 Instrument ID: ICP-THERMO4 Contract #: _____ Method: 6010C
 Parent ID: WG594498-01 File ID: T4.121816.183711 Dil: 1 Matrix: WATER
 Sample ID: WG594498-04 MS File ID: T4.121816.184056 Dil: 1 Units: mg/L
 Sample ID: WG594498-05 MSD File ID: T4.121816.184433 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Sodium	162	31.3	188	82.8	31.3	192	94.3	1.89	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: L16120425 Cal ID: ICP-THERMO4 - Worknum: WG594875
 Instrument ID: ICP-THERMO4 Contract #: Method: 6010C
 Parent ID: WG594634-01 File ID: T4.122116.215310 Dil: 1 Matrix: WATER
 Sample ID: WG594634-04 MS File ID: T4.122116.215705 Dil: 1 Units: mg/L
 Sample ID: WG594634-05 MSD File ID: T4.122116.220052 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum, Dissolved	ND	6.25	5.72	91.4	6.25	5.64	90.2	1.38	85 - 115	20	
Calcium, Dissolved	168	6.25	171	50.6	6.25	173	91.8	1.50	85 - 115	20	*
Magnesium, Dissolved	85.5	6.25	89.7	66.9	6.25	90.8	84.2	1.20	85 - 115	20	*
Manganese, Dissolved	0.260	0.313	0.542	90.2	0.313	0.541	89.7	0.279	85 - 115	20	
Potassium, Dissolved	7.68	31.3	42.0	110	31.3	42.1	110	0.158	85 - 115	20	
Silicon, Dissolved	10.5	3.13	13.5	94.7	3.13	13.7	100	1.29	85 - 115	20	
Sodium, Dissolved	636	31.3	654	57.6	31.3	661	78.6	0.996	85 - 115	20	*

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120425 Worknum: WG594875
Instrument: ICP-THERMO3 Method: 6010C
Serial Dil: WG594875-04 File ID: T3.122216.202736 Dil: 5 Units: ug/L
Sample: L16120425-04 File ID: T3.122216.202007 Dil: 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	23.7		62.1		162.00	E
Calcium	114000		129000		13.60	E
Iron	4020		4450		10.70	E
Magnesium	19300		22000		14.20	E
Manganese	1030		1150		12.30	E
Potassium	6950		8300		19.40	E
Silicon	5160		5510		6.74	
Sodium	132000		148000		11.60	E

U = Result is below MDL.

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

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

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

SERIAL_DIL - Modified 09/22/2008

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12/23/2016 08:53



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120425 **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.

SERIAL_DIL - Modified 09/22/2008
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Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120425 **Worknum:** WG594875
Instrument: ICP-THERMO4 **Method:** 6010C
Serial Dil: WG594875-02 **File ID:** T4.122116.204518 **Dil:** 5 **Units:** ug/L
Sample: L16120425-06 **File ID:** T4.122116.203737 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	ND	U	ND	U		
Calcium	3060		2990		2.20	
Iron	ND	U	ND	U		
Magnesium	3050		3060		0.49	
Manganese	8.38		12.9		53.30	E
Potassium	1720		3020		75.70	E
Silicon	3840		3890		1.29	
Sodium	529000		585000		10.60	E

U = Result is below MDL.
F = Result is greater than or equal to MDL and less than the RL.
X = Result is greater than or equal to RL and less than 25 times the MDL.
E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 25 times the MDL.

SERIAL_DIL - Modified 09/22/2008
PDF File ID: 5068548
12/22/2016 11:10



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120425 **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.

SERIAL_DIL - Modified 09/22/2008
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Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120425 **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.
POST SPIKE REPORT

Sample Login ID: L16120425

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

POST_SPIKE - Modified 03/06/2008
PDF File ID: 5080427
Report generated: 12/23/2016 08:50



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120425

Worknum: WG594875

Instrument ID: ICP-THERMO3

Method: 6010C

Post Spike ID: WG594875-03

File ID: T3.122216.202359

Dil: 1

Units: ug/L

Sample ID: L16120425-04

File ID: T3.122216.202007

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	93.7	75 - 125	
CALCIUM	104000		114000		5000	37.0	75 - 125	N
IRON	5400		4020		2000	89.1	75 - 125	
MAGNESIUM	21600		19300		5000	86.0	75 - 125	
MANGANESE	1130		1030		250	80.1	75 - 125	
POTASSIUM	28600		6950		25000	89.5	75 - 125	
SILICON	6980		5160		2500	93.5	75 - 125	
SODIUM	138000		132000		25000	75.6	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

POST_SPIKE - Modified 03/06/2008
PDF File ID: 5080427
Report generated: 12/23/2016 08:50



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120425
 Instrument ID: ICP-THERMO4
 Post Spike ID: WG594872-01
 Sample ID: L16120352-18

Worknum: WG594872
 Method: 6010C
 Units: ug/L
 Matrix: Water

File ID: T4.121616.012202 Dil: 1
 File ID: T4.121616.011817 Dil: 1

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

POST_SPIKE - Modified 03/06/2008
 PDF File ID: 5068553
 Report generated: 12/22/2016 11:10



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120425

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		37.7		5000	98.8	75 - 125	
IRON	1730		0	U	2000	86.4	75 - 125	
MAGNESIUM	4420		53.4		5000	87.5	75 - 125	
MANGANESE	209		0	U	250	83.7	75 - 125	
POTASSIUM	25500		9.36		25000	102.1	75 - 125	
SILICON	2410		19.6		2500	95.9	75 - 125	
SODIUM	25400		269		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

POST_SPIKE - Modified 03/06/2008
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Report generated: 12/22/2016 11:10



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120425

Worknum: WG594875

Instrument ID: ICP-THERMO4

Method: 6010C

Post Spike ID: WG594875-01

File ID: T4.122116.204132

Dil: 1

Units: ug/L

Sample ID: L16120425-06

File ID: T4.122116.203737

Dil: 1

Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4660		0	U	5000	93.3	75 - 125	
CALCIUM	7870		3060		5000	102.4	75 - 125	
IRON	1780		0	U	2000	88.8	75 - 125	
MAGNESIUM	7120		3050		5000	87.5	75 - 125	
MANGANESE	234		8.38		250	90.7	75 - 125	
POTASSIUM	28900		1720		25000	109.4	75 - 125	
SILICON	5910		3840		2500	98.1	75 - 125	
SODIUM	495000		529000		25000	78.3	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: 5068553
Report generated: 12/22/2016 11:10



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120425 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	
SODIUM	0	-0.0248	.5	0.0577	1	0.134	50	9.53	100	19.0	.999981	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120425 Workgroup (AAB#): WG594875
 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	
SODIUM	0	-0.0248	.5	0.0577	1	0.134	50	9.53	100	19.0	.999981	

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



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120425 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	
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: L16120425 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	
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

INT_CAL_ICP - Modified 03/06/2008
PDF File ID: 5068564
Report generated: 22-DEC-2016 11:10



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120425 Workgroup (AAB#): WG594875
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	
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

INT_CAL_ICP - Modified 03/06/2008
PDF File ID: 5068564
Report generated: 22-DEC-2016 11:10



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120425 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
SODIUM	.2	.4	.2	U

ICB - Modified 07/14/2009
PDF File ID: 5080437
Report generated 12/23/2016 08:50



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120425 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#): WG594875 Cal ID: ICP-THERM - 22-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
IRON	.04	.08	.04	U
SODIUM	.2	.4	.2	U

ICB - Modified 07/14/2009
PDF File ID: 5080437
Report generated 12/23/2016 08:50



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120425 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
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: 5068567
Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120425 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
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: 5068567
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120425 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#): WG594875 Cal ID: ICP-THERM - 21-DEC-16
 Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	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: 5068567
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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.

CCB - Modified 03/05/2008
PDF File ID: 5080440
Report generated 12/23/2016 08:50



Microbac Laboratories Inc.
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Login Number: L16120425 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: L16120425 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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Login Number: L16120425 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: L16120425 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: L16120425 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#): WG594875 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	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: L16120425 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#): WG594875 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	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: L16120425 Run Date: 12/22/2016 Sample ID: WG596231-27
Instrument ID: ICP-THERMO3 Run Time: 20:39 Method: 6010C
File ID: T3.122216.203908 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594875 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	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: L16120425 Run Date: 12/22/2016 Sample ID: WG596231-29
 Instrument ID: ICP-THERMO3 Run Time: 21:25 Method: 6010C
 File ID: T3.122216.212553 Analyst: JYH Units: mg/L
 Workgroup (AAB#): WG594875 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	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: L16120425 Run Date: 12/22/2016 Sample ID: WG596231-31
Instrument ID: ICP-THERMO3 Run Time: 22:12 Method: 6010C
File ID: T3.122216.221215 Analyst: JYH Units: mg/L
Workgroup (AAB#): WG594875 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	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: L16120425 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#): WG594875 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	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: L16120425 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#): WG594875 Cal ID: ICP-TH - 22-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Iron	0.0400	0.0800	0.0400	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: L16120425 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: L16120425 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: L16120425 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: L16120425 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: L16120425 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: L16120425 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: L16120425 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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Login Number: L16120425 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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Login Number: L16120425 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: L16120425 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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Login Number: L16120425 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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Login Number: L16120425 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#): WG594875 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: L16120425 Run Date: 12/21/2016 Sample ID: WG596008-44
 Instrument ID: ICP-THERMO4 Run Time: 19:59 Method: 6010C
 File ID: T4.122116.195945 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594875 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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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG596008-48
 Instrument ID: ICP-THERMO4 Run Time: 20:52 Method: 6010C
 File ID: T4.122116.205242 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594875 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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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG596008-50
 Instrument ID: ICP-THERMO4 Run Time: 21:37 Method: 6010C
 File ID: T4.122116.213754 Analyst: KKB Units: mg/L
 Workgroup (AAB#): WG594875 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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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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#): WG594875 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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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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#): WG594875 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.

CCB - Modified 03/05/2008
 PDF File ID: 5068575
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120425 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: L16120425 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#): WG594875 Cal ID: ICP-TH - 22-DEC-16
QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Iron	4	3.86	96.5	90 - 110	
Sodium	50	48.2	96.4	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120425 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



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120425 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



Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120425 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#): WG594875 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.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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: L16120425 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: 5080439
Report generated 12/23/2016 08:50



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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: 5080439
 Report generated 12/23/2016 08:50



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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#): WG594875 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	
Sodium	50.0	49.2	mg/L	98.5	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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#): WG594875 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	
Sodium	50.0	49.5	mg/L	99.0	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/22/2016 Sample ID: WG596231-26
 Instrument ID: ICP-THERMO3 Run Time: 20:35 Method: 6010C
 File ID: T3.122216.203533 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594875 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	3.83	mg/L	95.6	90 - 110	
Sodium	50.0	47.4	mg/L	94.8	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/22/2016 Sample ID: WG596231-28
 Instrument ID: ICP-THERMO3 Run Time: 21:22 Method: 6010C
 File ID: T3.122216.212219 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594875 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	3.96	mg/L	99.0	90 - 110	
Sodium	50.0	49.0	mg/L	98.0	90 - 110	

* Exceeds LIMITS Criteria

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 PDF File ID: 5080439
 Report generated 12/23/2016 08:50



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/22/2016 Sample ID: WG596231-30
 Instrument ID: ICP-THERMO3 Run Time: 22:08 Method: 6010C
 File ID: T3.122216.220840 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594875 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	4.00	3.96	mg/L	98.9	90 - 110	
Sodium	50.0	48.8	mg/L	97.7	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5080439
 Report generated 12/23/2016 08:50



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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#): WG594875 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	
Sodium	50.0	48.9	mg/L	97.8	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
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 Report generated 12/23/2016 08:50



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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#): WG594875 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	
Sodium	50.0	49.1	mg/L	98.2	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5080439
 Report generated 12/23/2016 08:50



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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
 PDF File ID: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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
 PDF File ID: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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
 PDF File ID: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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
 PDF File ID: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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
 PDF File ID: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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: 5068574
 Report generated 12/22/2016 11:10



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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#): WG594875 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



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG596008-43
 Instrument ID: ICP-THERMO4 Run Time: 19:56 Method: 6010C
 File ID: T4.122116.195612 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594875 Cal ID: ICP-TH - 21-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	10.0	mg/L	100	90 - 110	
Magnesium	10.0	9.03	mg/L	90.3	90 - 110	
Manganese	0.500	0.460	mg/L	91.9	90 - 110	
Potassium	50.0	52.4	mg/L	105	90 - 110	
Silicon	5.00	4.87	mg/L	97.3	90 - 110	
Sodium	50.0	51.7	mg/L	103	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG596008-47
 Instrument ID: ICP-THERMO4 Run Time: 20:49 Method: 6010C
 File ID: T4.122116.204909 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594875 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	9.28	mg/L	92.8	90 - 110	
Manganese	0.500	0.466	mg/L	93.1	90 - 110	
Potassium	50.0	53.1	mg/L	106	90 - 110	
Silicon	5.00	4.92	mg/L	98.3	90 - 110	
Sodium	50.0	52.0	mg/L	104	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG596008-49
 Instrument ID: ICP-THERMO4 Run Time: 21:34 Method: 6010C
 File ID: T4.122116.213421 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594875 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	9.14	mg/L	91.4	90 - 110		
Manganese	0.500	0.468	mg/L	93.5	90 - 110		
Potassium	50.0	53.4	mg/L	107	90 - 110		
Silicon	5.00	4.91	mg/L	98.1	90 - 110		
Sodium	50.0	52.4	mg/L	105	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5068574
 Report generated 12/22/2016 11:10



CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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#): WG594875 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
 PDF File ID: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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#): WG594875 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
 PDF File ID: 5068574
 Report generated 12/22/2016 11:10



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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: 5080441
 Report generated 12/23/2016 13:24



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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

LLCCV - Modified 1/7/2010
 PDF File ID: 5080441
 Report generated 12/23/2016 13:24



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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#): WG594875 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	
Sodium	0.400	0.432	mg/L	108	70 - 130	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 5080441
Report generated 12/23/2016 13:24



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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#): WG594875 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	
Sodium	0.400	0.413	mg/L	103	70 - 130	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
 PDF File ID: 5080441
 Report generated 12/23/2016 13:24



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 Run Date: 12/22/2016 Sample ID: WG596231-32
 Instrument ID: ICP-THERMO3 Run Time: 22:16 Method: 6010C
 File ID: T3.122216.221611 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG594875 Cal ID: ICP-TH - 22-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Iron	0.0800	0.0814	mg/L	102	70 - 130	
Sodium	0.400	0.416	mg/L	104	70 - 130	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
 PDF File ID: 5080441
 Report generated 12/23/2016 13:24



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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: 5068577
 Report generated 12/22/2016 11:25



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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

LLCCV - Modified 1/7/2010
 PDF File ID: 5068577
 Report generated 12/22/2016 11:25



Microbac Laboratories Inc.
 LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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

LLCCV - Modified 1/7/2010
 PDF File ID: 5068577
 Report generated 12/22/2016 11:25



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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: L16120425 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

LLCCV - Modified 1/7/2010
 PDF File ID: 5068577
 Report generated 12/22/2016 11:25



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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: L16120425 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



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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: L16120425 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

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 PDF File ID: 5068577
 Report generated 12/22/2016 11:25



Microbac Laboratories Inc.
 LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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#): WG594875 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



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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#): WG594875 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

LLCCV - Modified 1/7/2010
 PDF File ID: 5068577
 Report generated 12/22/2016 11:25



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG596008-46
 Instrument ID: ICP-THERMO4 Run Time: 20:07 Method: 6010C
 File ID: T4.122116.200724 Analyst: KKB QC Key: WATERLOO
 Workgroup (AAB#): WG594875 Cal ID: ICP-TH - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Aluminum	0.160	0.157	mg/L	98.0	70 - 130	
Calcium	0.400	0.403	mg/L	101	70 - 130	
Magnesium	0.400	0.333	mg/L	83.4	70 - 130	
Manganese	0.00800	0.0100	mg/L	126	70 - 130	
Potassium	0.800	0.836	mg/L	105	70 - 130	
Silicon	0.800	0.723	mg/L	90.4	70 - 130	
Sodium	0.400	0.448	mg/L	112	70 - 130	

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
 PDF File ID: 5068577
 Report generated 12/22/2016 11:25



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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#): WG594875 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

LLCCV - Modified 1/7/2010
 PDF File ID: 5068577
 Report generated 12/22/2016 11:25



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120425
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

* = 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: L16120425
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.

= 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: L16120425
Instrument ID: ICP-THERMO3
Sol. A: WG596231-10
Sol. AB: WG596231-11

File ID: T3.122216.163303
File ID: T3.122216.163656

Workgroup (AAB#): WG594875
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: L16120425
Instrument ID: ICP-THERMO3
Sol. A: WG596231-58
Sol. AB: WG596231-59

File ID: T3.122316.040949
File ID: T3.122316.041342

Workgroup (AAB#): WG594875
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

* = 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: L16120425
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	
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: L16120425
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	
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: L16120425
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	
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: L16120425
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	
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.
INTERFERENCE CHECK SAMPLES

Login number: L16120425
Instrument ID: ICP-THERMO4
Sol. A: WG596008-11
Sol. AB: WG596008-12

File ID: T4.122116.123919
File ID: T4.122116.124308

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	240	96.0	
Calcium	250	223	89.2	250	226	90.4	
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	
Sodium	NS	0.0206	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: L16120425
Instrument ID: ICP-THERMO4
Sol. A: WG596008-55
Sol. AB: WG596008-56

File ID: T4.122116.221940
File ID: T4.122116.222335

Workgroup (AAB#): WG594872
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	
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	
Sodium	NS	0.0737	NS	5.00	5.35	107	

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: L16120425
Instrument ID: ICP-THERMO4
Sol. A: WG595250-10
Sol. AB: WG595250-11

File ID: T4.121516.185114
File ID: T4.121516.185504

Workgroup (AAB#): WG594875
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	
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	
Silicon	NS	0.797	NS	NS	0.0143	NS	
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: L16120425
Instrument ID: ICP-THERMO4
Sol. A: WG595250-44
Sol. AB: WG595250-45

File ID: T4.121616.030217
File ID: T4.121616.030611

Workgroup (AAB#): WG594875
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	
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	
Silicon	NS	0.794	NS	NS	0.0177	NS	
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: L16120425
Instrument ID: ICP-THERMO4
Sol. A: WG595477-10
Sol. AB: WG595477-11

File ID: T4.121816.114425
File ID: T4.121816.114812

Workgroup (AAB#): WG594875
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	
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	
Silicon	NS	0.00953	NS	NS	0.0159	NS	
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).

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120425
Instrument ID: ICP-THERMO4
Sol. A: WG595477-44
Sol. AB: WG595477-45

File ID: T4.121816.203630
File ID: T4.121816.204026

Workgroup (AAB#): WG594875
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	
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	
Silicon	NS	0.0131	NS	NS	0.0171	NS	
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.
INTERFERENCE CHECK SAMPLES

Login number: L16120425
Instrument ID: ICP-THERMO4
Sol. A: WG596008-11
Sol. AB: WG596008-12

File ID: T4.122116.123919
File ID: T4.122116.124308

Workgroup (AAB#): WG594875
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	
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

* = 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: L16120425
Instrument ID: ICP-THERMO4
Sol. A: WG596008-55
Sol. AB: WG596008-56

File ID: T4.122116.221940
File ID: T4.122116.222335

Workgroup (AAB#): WG594875
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	
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

* = 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.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120425
 Instrument ID: ICP-THERMO3

Date: 01/04/2016
 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

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5080434
 Report generated: 12/23/2016 08:50



Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120425

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

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5080434
 Report generated: 12/23/2016 08:50



Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120425

Date: 01/04/2016

Instrument ID: ICP-THERMO3

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

CORR_FACTORS - Modified 03/05/2008
 PDF File ID: 5080434
 Report generated: 12/23/2016 08:50



Microbac Laboratories Inc.
INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120425

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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Login Number: L16120425

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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Login Number: L16120425

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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INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120425
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

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Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120425

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

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Login Number: L16120425
 Instrument ID: ICP-THERMO4

Date: 07/25/2016
 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

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Login Number: L16120425
 Instrument ID: ICP-THERMO4

Date: 07/25/2016
 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	0.0000120	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

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Login Number: L16120425

Date: 07/25/2016

Instrument ID: ICP-THERMO4

Method: 6010C

Analyte	Wave Length	MN	MO	NA	NI	P
ALUMINUM	308.20	0	0.0163	0	0	0
ANTIMONY	206.80	0	0.000670	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

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Login Number: L16120425

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

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Microbac Laboratories Inc.
 INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120425

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

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Microbac Laboratories Inc.
INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L16120425

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
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Report generated: 12/22/2016 10:59



Microbac Laboratories Inc.
LINEAR RANGE (QUARTERLY)

Login Number: L16120425
Instrument ID: ICP-THERMO3

Date: 07/29/2016
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: 5080433
Report generated: 12/23/2016 08:50



Microbac Laboratories Inc.
LINEAR RANGE (QUARTERLY)

Login Number: L16120425 **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: 5068519
 Report generated: 12/22/2016 10:59



2.3 Metals Data

2.3.2 Metals ICP-MS Data

2.3.2.1 Summary Data



Login Number: L16120425
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 01, 02 and the batch QA/QC samples were reanalyzed on a later calibration which was compliant for chromium.

WG596004 - Due to continuing calibration verification failure for chromium on 21-DEC-2016 at 20:40, client samples 19, 20 and the batch QA/QC 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: WG595999 - The post digestion spike was reanalyzed on a later calibration for all analytes and was compliant for analytes of concern.

WG596004 - All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: WG595999 - Client samples 05 and 06 required dilution analyses in order to obtain results for arsenic within the linear range.

WG596004 - Client samples 23 and 24 required dilution analyses in order to obtain results for arsenic within the linear range.

Narrative ID: 120880

Approved By: Kerri Buck

K: K Buck

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ06-120616	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 10:21
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: NI.122316.102115
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.00470		0.00200	0.00100

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ06-120616	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 18:49
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: NI.122116.184931
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00706		0.00100	0.000500

Sample #: L16120425-02	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ06-120616	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 10:24
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: NI.122316.102420
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.00232		0.00200	0.00100

Sample #: L16120425-02	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ06-120616	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 18:52
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: NI.122116.185237
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00351		0.00100	0.000500

Certificate of Analysis

Sample #: L16120425-03	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW18-120616	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 18:55
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: NI.122116.185542
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00587		0.00100	0.000500

Sample #: L16120425-04	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW18-120616	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 19:05
Collect Date: 12/07/2016 15:40	Dilution: 1	File ID: NI.122116.190501
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000724	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW11S-120716	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 10:27
Collect Date: 12/07/2016 10:18	Dilution: 100	File ID: NI.122316.102726
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	1.13		0.100	0.0500

Sample #: L16120425-06	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW11S-120716	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 10:30
Collect Date: 12/07/2016 10:18	Dilution: 100	File ID: NI.122316.103031
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	1.11		0.100	0.0500

Certificate of Analysis

Sample #: L16120425-07	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW05I-120716	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 19:14
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: NI.122116.191417
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00108		0.00100	0.000500

Sample #: L16120425-08	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW05I-120716	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 19:17
Collect Date: 12/07/2016 09:30	Dilution: 1	File ID: NI.122116.191722
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000991	J	0.00100	0.000500

J The analyte was positively identified, but the quantitation was below the RL.

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW30-120716	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 19:20
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: NI.122116.192028
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.0314		0.00100	0.000500

Sample #: L16120425-10	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:23
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: NI.122116.192334
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000546	J	0.00100	0.000500

J The analyte was positively identified, but the quantitation was below the RL.

Certificate of Analysis

Sample #: L16120425-10	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW30-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:42
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: NI.122116.194211
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00284		0.00100	0.000500

Sample #: L16120425-11	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:45
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: NI.122116.194517
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.00454		0.00100	0.000500

Sample #: L16120425-12	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW07-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:48
Collect Date: 12/07/2016 09:45	Dilution: 1	File ID: NI.122116.194822
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00584		0.00100	0.000500

Sample #: L16120425-13	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:51
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: NI.122116.195128
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2		U	0.00100	0.000500
U	Not detected at or above adjusted sample detection limit.				

Certificate of Analysis

Sample #: L16120425-14	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW20-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:54
Collect Date: 12/07/2016 11:25	Dilution: 1	File ID: NI.122116.195433
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000513	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-15	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 19:57
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: NI.122116.195739
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.000694	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-16	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW06-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:13
Collect Date: 12/07/2016 13:55	Dilution: 1	File ID: NI.122116.201309
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.000752	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-17	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:16
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: NI.122116.201614
Sample Tag: 01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.0141		0.00100	0.000500

Sample #: L16120425-18	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: MW10-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:19
Collect Date: 12/07/2016 11:20	Dilution: 1	File ID: NI.122116.201920
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.0114		0.00100	0.000500

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/29/2016 07:46
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/29/2016 13:18
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: NI.122916.131829
Sample Tag: 02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Total	7440-47-3	0.00182	J	0.00200	0.00100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:22
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: NI.122116.202225
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.0289		0.00100	0.000500

Sample #: L16120425-20	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/29/2016 07:46
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/29/2016 13:21
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: NI.122916.132134
Sample Tag: 02	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Chromium, Dissolved	7440-47-3	0.00182	J	0.00200	0.00100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-20	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: PZ03-120716	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:25
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: NI.122116.202531
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.0244		0.00100	0.000500

Sample #: L16120425-21	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120716-1	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:28
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: NI.122116.202836
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	0.000936	J	0.00100	0.000500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-22	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120716-1	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/21/2016 15:15
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/21/2016 20:31
Collect Date: 12/07/2016 12:30	Dilution: 1	File ID: NI.122116.203141
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	0.00120		0.00100	0.000500

Certificate of Analysis

Sample #: L16120425-23	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120716-2	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/30/2016 12:05
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/30/2016 16:20
Collect Date: 12/07/2016 12:31	Dilution: 100	File ID: NI.123016.162058
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Total	7440-38-2	1.12		0.100	0.0500

Sample #: L16120425-24	PrePrep Method: N/A	Instrument: ICP-MS2
Client ID: DUP-GW-120716-2	Prep Method: 3015	Prep Date: 12/14/2016 08:36
Matrix: Water	Analytical Method: 6020A	Cal Date: 12/30/2016 12:05
Workgroup #: WG596004	Analyst: JYH	Run Date: 12/30/2016 16:24
Collect Date: 12/07/2016 12:31	Dilution: 100	File ID: NI.123016.162403
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Arsenic, Dissolved	7440-38-2	1.11		0.100	0.0500

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 TUCOA19282
 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: WG594796
 Analyst: VC
 Spike Analyst: VC
 Run Date: 12/14/2016 08:36
 Method: 3015
 Balance: BAL016
 Instrument: MW-3
 Instrument Start: 12/14/2016 08:42

SOP: ME407 Revision 19
 Spike Solution: STD78216
 Spike Witness: ERP
 40 & 50 ML. DIGESTION TU COA19282
 HNO3 Lot #: COA19324
 MS Filters- fisher-Lot# RRGT38288

SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG594796-02	BLANK	1	20 mL	50 mL	182.483 g	182.489 g	
2	WG594796-03	LCS	1	20 mL	50 mL	182.598 g	182.604 g	.25 mL
3	L16120425-10	SAMP	1	20 mL	50 mL	181.869 g	181.866 g	
4	L16120425-11	RS01	1	20 mL	50 mL	183.057 g	183.042 g	
5	L16120425-12	SAMP	1	20 mL	50 mL	181.954 g	181.948 g	
6	L16120425-13	SAMP	1	20 mL	50 mL	182.847 g	182.842 g	
7	L16120425-14	SAMP	1	20 mL	50 mL	183.998 g	183.981 g	
8	L16120425-15	SAMP	1	20 mL	50 mL	183.189 g	183.181 g	
9	L16120425-16	SAMP	1	20 mL	50 mL	182.065 g	182.057 g	
10	L16120425-17	SAMP	1	20 mL	50 mL	182.119 g	182.133 g	
11	L16120425-18	SAMP	1	20 mL	50 mL	183.609 g	183.603 g	
12	L16120425-19	SAMP	1	20 mL	50 mL	182.927 g	182.936 g	
13	L16120425-20	SAMP	1	20 mL	50 mL	181.4 g	181.397 g	
14	L16120425-21	SAMP	1	20 mL	50 mL	182.748 g	182.738 g	
15	L16120425-22	SAMP	1	20 mL	50 mL	182.944 g	182.952 g	
16	L16120425-23	SAMP	1	20 mL	50 mL	182.575 g	182.583 g	
17	L16120425-24	SAMP	1	20 mL	50 mL	183.335 g	183.324 g	
18	L16120564-01	SAMP	1	20 mL	50 mL	182.101 g	182.109 g	
19	L16120564-02	SAMP	1	20 mL	50 mL	183.346 g	183.343 g	
20	L16120564-03	SAMP	1	20 mL	50 mL	181.285 g	181.276 g	
21	L16120564-04	SAMP	1	20 mL	50 mL	183.543 g	183.549 g	
22	WG594796-01	REF	1	20 mL	50 mL	182.338 g	182.338 g	
23	L16120568-01	SAMP	1	20 mL	50 mL	182.338 g	182.338 g	
24	WG594796-04	MS	1	20 mL	50 mL	182.99 g	182.972 g	.25 mL
25	WG594796-05	MSD	1	20 mL	50 mL	183.925 g	183.92 g	.25 mL

Analyst: Vicki Collier

Reviewer: Erin Boston



Microbac Laboratories Inc.

Instrument Run Log

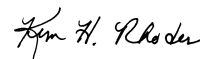
Instrument: ICP-MS2 Dataset: 122116C.REP
 Analyst1: PDM Analyst2: N/A
 Method: 6020A/6020 SOP: ME700A Rev: 3
 Maintenance Log ID: _____

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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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: 594630,595999,596004,596006

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

Page: 2 Approved: December 21, 2016

Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

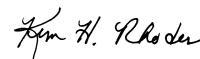
Instrument: ICP-MS2 Dataset: 122116C.REP
 Analyst1: PDM Analyst2: N/A
 Method: 6020A/6020 SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD79556 ICV Std: STD79554 Post Spike: STD76567
 ICSA: STD79552 ICSAB: STD79553 Int. Std: RGT38094
 CCV: STD79555 LLCCV: STD79064 Tuning Sol : STD78941
 Stannous : _____ Hydroxylamine : _____

Workgroups: 594630,595999,596004,596006

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

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: 594630,595999,596004,596006

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

Sam H. Rhodes

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: RGT38094
 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

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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: 596006,595999,594633Comments:

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

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K: K Buck

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122916E.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A 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: 596535,594709,596227,596004,596789,596289Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.122916.073416	Blank	Blank		1		12/29/16 07:34
2	NI.122916.073722	WG596744-01	Calibration Point		1		12/29/16 07:37
3	NI.122916.074027	WG596744-02	Calibration Point		1		12/29/16 07:40
4	NI.122916.074333	WG596744-03	Calibration Point		1		12/29/16 07:43
5	NI.122916.074638	WG596744-04	Calibration Point		1		12/29/16 07:46
6	NI.122916.074946	WG596744-05	Initial Calibration Verification		1		12/29/16 07:49
7	NI.122916.075253	WG596744-06	Initial Calib Blank		1		12/29/16 07:52
8	NI.122916.075559	WG596744-07	Low Level Initial Calibration V		1		12/29/16 07:55
9	NI.122916.075904	WG596744-08	Interference Check		1		12/29/16 07:59
10	NI.122916.080209	WG596744-09	Interference Check		1		12/29/16 08:02
11	NI.122916.080515	WG596744-10	CCV		1		12/29/16 08:05
12	NI.122916.080821	WG596744-11	CCB		1		12/29/16 08:08
13	NI.122916.081128	WG596404-02	Method/Prep Blank	.25/100	1		12/29/16 08:11
14	NI.122916.081433	WG596404-03	Laboratory Control S	.25/100	1		12/29/16 08:14
15	NI.122916.081740	WG596404-01	Reference Sample		1	L16121255-15	12/29/16 08:17
16	NI.122916.082045	WG596404-04	Matrix Spike	.253/100	1	L16121255-15	12/29/16 08:20
17	NI.122916.082351	WG596404-05	Matrix Spike Duplica	.253/100	1	L16121255-15	12/29/16 08:23
18	NI.122916.082656	L16121247-02	BFB-16-098	.253/100	1		12/29/16 08:26
19	NI.122916.083002	L16121247-04	BFB-16-099	.251/100	1		12/29/16 08:30
20	NI.122916.083308	WG596535-01	Post Digestion Spike		1	L16121247-04	12/29/16 08:33
21	NI.122916.083613	WG596535-02	Serial Dilution		5	L16121247-04	12/29/16 08:36
22	NI.122916.083918	WG596535-02	Serial Dilution		25	L16121247-04	12/29/16 08:39
23	NI.122916.084225	WG596744-12	CCV		1		12/29/16 08:42
24	NI.122916.084531	WG596744-13	CCB		1		12/29/16 08:45
25	NI.122916.084837	L16121247-06	BFB-16-100	.25/100	1		12/29/16 08:48
26	NI.122916.085142	L16121247-08	BFB-16-101	.252/100	1		12/29/16 08:51
27	NI.122916.085448	L16121247-10	BFB-16-102	.254/100	1		12/29/16 08:54
28	NI.122916.085753	L16121247-12	BFB-16-103	.253/100	1		12/29/16 08:57
29	NI.122916.090059	L16121255-01	MC10-01	.25/100	1		12/29/16 09:00
30	NI.122916.090404	L16121255-02	MC10-02	.255/100	1		12/29/16 09:04
31	NI.122916.090709	L16121255-03	MC10-03	.251/100	1		12/29/16 09:07
32	NI.122916.091014	L16121255-04	MC10-04	.253/100	1		12/29/16 09:10
33	NI.122916.091320	L16121255-05	MC10-05	.251/100	1		12/29/16 09:13
34	NI.122916.091626	L16121255-06	MC10-06	.251/100	1		12/29/16 09:16

Page: 1 Approved: December 30, 2016

Maren Beery

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122916E.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A 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: 596535,594709,596227,596004,596789,596289Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.122916.091933	WG596744-14	CCV		1		12/29/16 09:19
36	NI.122916.092237	WG596744-15	CCB		1		12/29/16 09:22
37	NI.122916.092544	L16121255-07	MC10-07	.251/100	1		12/29/16 09:25
38	NI.122916.092849	L16121255-08	MC10-08	.25/100	1		12/29/16 09:28
39	NI.122916.093154	L16121255-09	MC10-09	.255/100	1		12/29/16 09:31
40	NI.122916.093459	L16121255-10	MC10-10	.253/100	1		12/29/16 09:34
41	NI.122916.093804	L16121255-11	MC10-11	.255/100	1		12/29/16 09:38
42	NI.122916.094110	L16121255-12	MC10-12	.253/100	1		12/29/16 09:41
43	NI.122916.094504	L16121255-14	MC10B-01	.251/100	1		12/29/16 09:45
44	NI.122916.094809	WG596744-16	CCV		1		12/29/16 09:48
45	NI.122916.095115	WG596744-17	CCB		1		12/29/16 09:51
46	NI.122916.095518	WG594620-02	Method/Prep Blank	20/50	1		12/29/16 09:55
47	NI.122916.095824	WG594620-03	Laboratory Control S	20/50	1		12/29/16 09:58
48	NI.122916.100129	WG594620-01	Reference Sample		1	L16120521-12	12/29/16 10:01
49	NI.122916.100434	WG594620-04	Matrix Spike	20/50	1	L16120521-12	12/29/16 10:04
50	NI.122916.100739	WG594620-05	Matrix Spike Duplica	20/50	1	L16120521-12	12/29/16 10:07
51	NI.122916.101045	L16120520-02	A08-MW03-Y1S4	20/50	1		12/29/16 10:10
52	NI.122916.101350	L16120520-03	A08-MW09-Y1S4		1		12/29/16 10:13
53	NI.122916.101656	WG594709-03	Post Digestion Spike		1	L16120520-02	12/29/16 10:16
54	NI.122916.103344	WG594709-04	Serial Dilution		25	L16120520-02	12/29/16 10:33
55	NI.122916.103652	WG596744-18	CCV		1		12/29/16 10:36
56	NI.122916.103957	WG596744-19	CCB		1		12/29/16 10:39
57	NI.122916.104304	L16120520-03	A08-MW09-Y1S4	20/50	1		12/29/16 10:43
58	NI.122916.104609	L16120520-04	A08-MW10-Y1S4	20/50	1		12/29/16 10:46
59	NI.122916.104915	L16120520-11	A08-TM01-Y1S4	20/50	1		12/29/16 10:49
60	NI.122916.105222	WG596744-20	CCV		1		12/29/16 10:52
61	NI.122916.105528	WG596744-21	CCB		1		12/29/16 10:55
62	NI.122916.105903	WG595955-02	Method/Prep Blank	20/50	1		12/29/16 10:59
63	NI.122916.110208	WG595955-03	Laboratory Control S	20/50	1		12/29/16 11:02
64	NI.122916.110514	WG595955-01	Reference Sample		1	L16121183-09	12/29/16 11:05
65	NI.122916.110819	WG595955-04	Matrix Spike	20/50	1	L16121183-09	12/29/16 11:08
66	NI.122916.111125	WG595955-05	Matrix Spike Duplica	20/50	1	L16121183-09	12/29/16 11:11
67	NI.122916.111430	L16121183-01	FEW3-MW311-0503	20/50	1		12/29/16 11:14
68	NI.122916.111735	L16121183-02	FEW3-MW311-0503-FD	20/50	1		12/29/16 11:17

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Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122916E.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A 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: 596535,594709,596227,596004,596789,596289

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	NI.122916.112041	WG596227-01	Post Digestion Spike		1	L16121183-02	12/29/16 11:20
70	NI.122916.112346	WG596227-02	Serial Dilution		5	L16121183-02	12/29/16 11:23
71	NI.122916.112652	WG596227-02	Serial Dilution		25	L16121183-02	12/29/16 11:26
72	NI.122916.112959	WG596744-22	CCV		1		12/29/16 11:29
73	NI.122916.113304	WG596744-23	CCB		1		12/29/16 11:33
74	NI.122916.113612	L16121183-03	FEW3-MW15I-0500	20/50	1		12/29/16 11:36
75	NI.122916.113917	L16121183-04	FEW3-MW55I-0505	20/50	1		12/29/16 11:39
76	NI.122916.114223	L16121183-05	FEW03-MW23I-0502	20/50	1		12/29/16 11:42
77	NI.122916.114528	L16121183-06	FEW03-MW58I-0508	20/50	1		12/29/16 11:45
78	NI.122916.114833	L16121183-07	FEW03-MW22I-0501	20/50	1		12/29/16 11:48
79	NI.122916.115138	L16121183-08	FEW03-MW57I-0507	20/50	1		12/29/16 11:51
80	NI.122916.115444	L16121183-12	FEW03-MW42I-0504	20/50	1		12/29/16 11:54
81	NI.122916.115749	L16121183-08	FEW03-MW57I-0507	20/50	50		12/29/16 11:57
82	NI.122916.120056	WG596744-24	CCV		1		12/29/16 12:00
83	NI.122916.120402	WG596744-25	CCB		1		12/29/16 12:04
84	NI.122916.120709	L16121149-01	TANK 1	20/50	1		12/29/16 12:07
85	NI.122916.121015	L16121149-02	TANK 2	20/50	100		12/29/16 12:10
86	NI.122916.121320	L16121149-03	TANK 3	20/50	100		12/29/16 12:13
87	NI.122916.121626	L16121149-04	TANK 4	20/50	1		12/29/16 12:16
88	NI.122916.121933	WG596744-26	CCV		1		12/29/16 12:19
89	NI.122916.122238	WG596744-27	CCB		1		12/29/16 12:22
90	NI.122916.123512	WG596744-28	CCV		1		12/29/16 12:35
91	NI.122916.123830	WG596744-29	CCB		1		12/29/16 12:38
92	NI.122916.130301	WG594796-02	Method/Prep Blank	20/50	1		12/29/16 13:03
93	NI.122916.130607	WG594796-03	Laboratory Control S	20/50	1		12/29/16 13:06
94	NI.122916.130913	WG594796-01	Reference Sample		1	L16120568-01	12/29/16 13:09
95	NI.122916.131218	WG594796-04	Matrix Spike	20/50	1	L16120568-01	12/29/16 13:12
96	NI.122916.131523	WG594796-05	Matrix Spike Duplica	20/50	1	L16120568-01	12/29/16 13:15
97	NI.122916.131829	L16120425-19	PZ03-120716	20/50	1		12/29/16 13:18
98	NI.122916.132134	L16120425-20	PZ03-120716	20/50	1		12/29/16 13:21
99	NI.122916.132439	WG596004-03	Post Digestion Spike		1	L16120425-20	12/29/16 13:24
100	NI.122916.132745	WG596004-04	Serial Dilution		5	L16120425-20	12/29/16 13:27
101	NI.122916.133050	WG596004-04	Serial Dilution		25	L16120425-20	12/29/16 13:30
102	NI.122916.133358	WG596744-30	CCV		1		12/29/16 13:33

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Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122916E.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A 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: 596535,594709,596227,596004,596789,596289Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	NI.122916.133702	WG596744-31	CCB		1		12/29/16 13:37
104	NI.122916.134009	L16120564-01	MW34-GW-120816	20/50	1		12/29/16 13:40
105	NI.122916.134314	L16120564-02	SW01-120816	20/50	1		12/29/16 13:43
106	NI.122916.134619	L16120564-03	MW31-GW-120916	20/50	1		12/29/16 13:46
107	NI.122916.134924	L16120564-04	MW32-GW-120916	20/50	1		12/29/16 13:49
108	NI.122916.135230	L16120564-04	MW32-GW-120916		50		12/29/16 13:52
109	NI.122916.135537	WG596744-32	CCV		1		12/29/16 13:55
110	NI.122916.135842	WG596744-33	CCB		1		12/29/16 13:58
111	NI.122916.140148	WG596240-03	Method/Prep Blank	20/50	1		12/29/16 14:01
112	NI.122916.140454	WG596240-04	Laboratory Control S	20/50	1		12/29/16 14:04
113	NI.122916.140759	WG596240-01	Reference Sample		1	L16120857-02	12/29/16 14:07
114	NI.122916.141104	WG596240-05	Matrix Spike	20/50	1	L16120857-02	12/29/16 14:11
115	NI.122916.141410	WG596240-06	Matrix Spike Duplica	20/50	1	L16120857-02	12/29/16 14:14
116	NI.122916.141715	L16120857-05	AG4618	20/50	1		12/29/16 14:17
117	NI.122916.142021	L16120857-06	AG4619	20/50	1		12/29/16 14:20
118	NI.122916.142326	WG596789-01	Post Digestion Spike		1	L16120857-06	12/29/16 14:23
119	NI.122916.142632	WG596789-02	Serial Dilution		5	L16120857-06	12/29/16 14:26
120	NI.122916.142938	WG596789-02	Serial Dilution		25	L16120857-06	12/29/16 14:29
121	NI.122916.143244	WG596744-34	CCV		1		12/29/16 14:32
122	NI.122916.143549	WG596744-35	CCB		1		12/29/16 14:35
123	NI.122916.143856	L16120857-07	AG4623	20/50	1		12/29/16 14:38
124	NI.122916.144202	L16120857-08	AG4624	20/50	1		12/29/16 14:42
125	NI.122916.144508	L16120857-09	AG4625	20/50	1		12/29/16 14:45
126	NI.122916.144813	L16120857-10	AG4626	20/50	1		12/29/16 14:48
127	NI.122916.145118	L16120857-11	AG4627	20/50	1		12/29/16 14:51
128	NI.122916.145424	L16120857-12	AG4628	20/50	1		12/29/16 14:54
129	NI.122916.145729	L16121255-13	MC10W-01	20/50	1		12/29/16 14:57
130	NI.122916.150034	L16121276-02	MW2A-328-14	20/50	1		12/29/16 15:00
131	NI.122916.150339	WG596240-02	Reference Sample		1	L16121276-07	12/29/16 15:03
132	NI.122916.150646	WG596744-36	CCV		1		12/29/16 15:06
133	NI.122916.150952	WG596744-37	CCB		1		12/29/16 15:09
134	NI.122916.151259	WG596240-07	Matrix Spike	20/50	1	L16121276-07	12/29/16 15:12
135	NI.122916.151604	WG596240-08	Matrix Spike Duplica	20/50	1	L16121276-07	12/29/16 15:16
136	NI.122916.151909	L16121276-14	MW4A-328-14	20/50	1		12/29/16 15:19

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Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122916E.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A 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: 596535,594709,596227,596004,596789,596289Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
137	NI.122916.152215	L16121276-17	MW5A-328-14	20/50	1		12/29/16 15:22
138	NI.122916.152520	L16121276-20	OW1A-328-14	20/50	1		12/29/16 15:25
139	NI.122916.152826	L16121276-23	OW1A2-328-14	20/50	1		12/29/16 15:28
140	NI.122916.153131	L16121276-26	OW2A-328-14	20/50	1		12/29/16 15:31
141	NI.122916.153436	L16121276-29	OW3A-328-14	20/50	1		12/29/16 15:34
142	NI.122916.153743	WG596744-38	CCV		1		12/29/16 15:37
143	NI.122916.154048	WG596744-39	CCB		1		12/29/16 15:40
144	NI.122916.154354	WG595903-02	Method/Prep Blank	20/50	1		12/29/16 15:43
145	NI.122916.154659	WG595903-03	Laboratory Control S	20/50	1		12/29/16 15:46
146	NI.122916.155005	L16120975-13	18CPTMW14F-121516		1	WG595903-01	12/29/16 15:50
147	NI.122916.155310	WG595903-04	Matrix Spike	20/50	1	L16120975-13	12/29/16 15:53
148	NI.122916.155615	WG595903-05	Matrix Spike Duplica	20/50	1	L16120975-13	12/29/16 15:56
149	NI.122916.155921	L16120782-01	MW19-121316	20/50	1		12/29/16 15:59
150	NI.122916.160226	L16120782-02	MW19-121316	20/50	1		12/29/16 16:02
151	NI.122916.160531	WG596289-01	Post Digestion Spike		1	L16120782-02	12/29/16 16:05
152	NI.122916.160837	WG596289-02	Serial Dilution		5	L16120782-02	12/29/16 16:08
153	NI.122916.161142	WG596289-02	Serial Dilution		25	L16120782-02	12/29/16 16:11
154	NI.122916.161448	WG596744-40	CCV		1		12/29/16 16:14
155	NI.122916.161754	WG596744-41	CCB		1		12/29/16 16:17
156	NI.122916.162059	L16120782-03	TW01-121316	20/50	1		12/29/16 16:20
157	NI.122916.162405	L16120782-04	TW01-121316	20/50	1		12/29/16 16:24
158	NI.122916.162711	L16120782-05	PZ04-121316	20/50	1		12/29/16 16:27
159	NI.122916.163016	L16120782-06	PZ04-121316	20/50	1		12/29/16 16:30
160	NI.122916.163322	L16120782-07	PZ07R-121316	20/50	1		12/29/16 16:33
161	NI.122916.163627	L16120782-08	PZ07R-121316	20/50	1		12/29/16 16:36
162	NI.122916.163932	L16120782-09	DUP-GW-121316	20/50	1		12/29/16 16:39
163	NI.122916.164238	L16120782-10	DUP-GW-121316	20/50	1		12/29/16 16:42
164	NI.122916.164543	L16120975-02	AWD4F-121316	20/50	1		12/29/16 16:45
165	NI.122916.164849	L16120975-04	AWD4FDF-121316	20/50	1		12/29/16 16:48
166	NI.122916.165155	WG596744-42	CCV		1		12/29/16 16:51
167	NI.122916.165501	WG596744-43	CCB		1		12/29/16 16:55
168	NI.122916.165808	L16120975-06	18CPTMW24-121316	20/50	1		12/29/16 16:58
169	NI.122916.170114	L16120975-07	MW8-121516	20/50	1		12/29/16 17:01
170	NI.122916.170420	L16120975-08	MW8FD-121516	20/50	1		12/29/16 17:04

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Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 122916E.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A 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 : _____

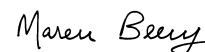
Workgroups: 596535,594709,596227,596004,596789,596289

Comments:

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Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
171	NI.122916.170724	L16120975-10	MW18F-121516	20/50	1		12/29/16 17:07
172	NI.122916.171030	L16120975-11	18WW20-121516	20/50	1		12/29/16 17:10
173	NI.122916.171336	L16120975-15	18CPTMW18F-121516	20/50	1		12/29/16 17:13
174	NI.122916.171642	WG596744-44	CCV		1		12/29/16 17:16
175	NI.122916.171948	WG596744-45	CCB		1		12/29/16 17:19
176	NI.122916.172254	L16120975-15	18CPTMW18F-121516	20/50	50		12/29/16 17:22
177	NI.122916.172601	WG596744-46	Interference Check		1		12/29/16 17:26
178	NI.122916.172905	WG596744-47	Interference Check		1		12/29/16 17:29
179	NI.122916.173212	WG596744-48	CCV		1		12/29/16 17:32
180	NI.122916.173518	WG596744-49	CCB		1		12/29/16 17:35
181	NI.122916.173824	WG596744-50	Low Level Continuing Calibra		1		12/29/16 17:38

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Microbac Laboratories Inc.

Instrument Run Log

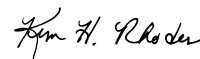
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 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A SOP: ME700A Rev: 3
 Maintenance Log ID: _____
 Calibration Std: STD79556 ICV Std: STD79554 Post Spike: STD76567
 ICSA: STD79552 ICSAB: STD79553 Int. Std: RGT38094
 CCV: STD79555 LLCCV: STD79550 Tuning Sol : STD78941
 Stannous : _____ Hydroxylamine : _____

Workgroups: 596004,596286,596789

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.123016.115308	Blank	Blank		1		12/30/16 11:53
2	NI.123016.115614	WG597007-01	Calibration Point		1		12/30/16 11:56
3	NI.123016.115920	WG597007-02	Calibration Point		1		12/30/16 11:59
4	NI.123016.120225	WG597007-03	Calibration Point		1		12/30/16 12:02
5	NI.123016.120530	WG597007-04	Calibration Point		1		12/30/16 12:05
6	NI.123016.120837	WG597007-05	Initial Calibration Verification		1		12/30/16 12:08
7	NI.123016.121144	WG597007-06	Initial Calib Blank		1		12/30/16 12:11
8	NI.123016.121450	WG597007-07	Low Level Initial Calibration V		1		12/30/16 12:14
9	NI.123016.121756	WG597007-08	Interference Check		1		12/30/16 12:17
10	NI.123016.122101	WG597007-09	Interference Check		1		12/30/16 12:21
11	NI.123016.122409	WG597007-10	CCV		1		12/30/16 12:24
12	NI.123016.122714	WG597007-11	CCB		1		12/30/16 12:27
13	NI.123016.123021	WG594796-02	Method/Prep Blank	20/50	1		12/30/16 12:30
14	NI.123016.123327	WG594796-03	Laboratory Control S	20/50	1		12/30/16 12:33
15	NI.123016.123632	WG594796-01	Reference Sample		1	L16120568-01	12/30/16 12:36
16	NI.123016.123937	WG594796-04	Matrix Spike	20/50	1	L16120568-01	12/30/16 12:39
17	NI.123016.124242	WG594796-05	Matrix Spike Duplica	20/50	1	L16120568-01	12/30/16 12:42
18	NI.123016.124547	WG596004-05	Post Digestion Spike		1	L16120568-01	12/30/16 12:45
19	NI.123016.124852	WG596004-06	Serial Dilution		5	L16120568-01	12/30/16 12:48
20	NI.123016.125158	WG596004-06	Serial Dilution		25	L16120568-01	12/30/16 12:51
21	NI.123016.125504	WG597007-12	CCV		1		12/30/16 12:55
22	NI.123016.125810	WG597007-13	CCB		1		12/30/16 12:58
23	NI.123016.130732	WG596240-03	Method/Prep Blank	20/50	1		12/30/16 13:07
24	NI.123016.131037	WG596240-04	Laboratory Control S	20/50	1		12/30/16 13:10
25	NI.123016.131342	WG596240-01	Reference Sample		1	L16120857-02	12/30/16 13:13
26	NI.123016.131648	WG596240-05	Matrix Spike	20/50	1	L16120857-02	12/30/16 13:16
27	NI.123016.131953	WG596240-06	Matrix Spike Duplica	20/50	1	L16120857-02	12/30/16 13:19
28	NI.123016.132259	L16120857-05	AG4618	20/50	1		12/30/16 13:22
29	NI.123016.132605	L16120857-06	AG4619	20/50	1		12/30/16 13:26
30	NI.123016.132910	WG596789-01	Post Digestion Spike		1	L16120857-06	12/30/16 13:29
31	NI.123016.133215	WG596789-02	Serial Dilution		5	L16120857-06	12/30/16 13:32
32	NI.123016.133521	WG596789-02	Serial Dilution		25	L16120857-06	12/30/16 13:35
33	NI.123016.133828	WG597007-14	CCV		1		12/30/16 13:38
34	NI.123016.134133	WG597007-15	CCB		1		12/30/16 13:41

Page: 1 Approved: January 03, 2017




Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 123016B.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A 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: 596004,596286,596789Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.123016.134535	L16120857-07	AG4623	20/50	1		12/30/16 13:45
36	NI.123016.134840	L16120857-08	AG4624	20/50	1		12/30/16 13:48
37	NI.123016.135146	L16120857-09	AG4625	20/50	1		12/30/16 13:51
38	NI.123016.135451	L16120857-10	AG4626	20/50	1		12/30/16 13:54
39	NI.123016.135757	L16120857-11	AG4627	20/50	1		12/30/16 13:57
40	NI.123016.140103	L16120857-12	AG4628	20/50	1		12/30/16 14:01
41	NI.123016.140409	WG597007-16	CCV		1		12/30/16 14:04
42	NI.123016.140715	WG597007-17	CCB		1		12/30/16 14:07
43	NI.123016.141117	WG595008-02	Method/Prep Blank	20/50	1		12/30/16 14:11
44	NI.123016.141423	WG595008-03	Laboratory Control S	20/50	1		12/30/16 14:14
45	NI.123016.141728	WG595008-01	Reference Sample		1	L16120719-08	12/30/16 14:17
46	NI.123016.142034	WG595008-04	Matrix Spike	20/50	1	L16120719-08	12/30/16 14:20
47	NI.123016.142339	WG595008-05	Matrix Spike Duplica	20/50	1	L16120719-08	12/30/16 14:23
48	NI.123016.142644	L16120719-03	120F-120916	20/50	1		12/30/16 14:26
49	NI.123016.142949	L16120719-04	109-120916	20/50	1		12/30/16 14:29
50	NI.123016.143254	WG596286-01	Post Digestion Spike		1	L16120719-04	12/30/16 14:32
51	NI.123016.143559	WG596286-02	Serial Dilution		5	L16120719-04	12/30/16 14:35
52	NI.123016.143905	WG596286-02	Serial Dilution		25	L16120719-04	12/30/16 14:39
53	NI.123016.144212	WG597007-18	CCV		1		12/30/16 14:42
54	NI.123016.144518	WG597007-19	CCB		1		12/30/16 14:45
55	NI.123016.144825	L16120719-16	18WW25F-120916	20/50	1		12/30/16 14:48
56	NI.123016.145130	L16120719-18	18WW02-121216	20/50	1		12/30/16 14:51
57	NI.123016.145435	L16120719-19	MW16-121216	20/50	1		12/30/16 14:54
58	NI.123016.145741	L16120719-21	18CPTMW19SW-121216	20/50	1		12/30/16 14:57
59	NI.123016.150046	L16120755-02	AG4603	20/50	1		12/30/16 15:00
60	NI.123016.150352	L16120755-03	AG4604	20/50	1		12/30/16 15:03
61	NI.123016.150657	L16120755-05	AG4606	20/50	1		12/30/16 15:06
62	NI.123016.151145	L16120755-06	AG4607	20/50	1		12/30/16 15:11
63	NI.123016.151450	L16120755-07	AG4608	20/50	1		12/30/16 15:14
64	NI.123016.151756	L16120755-13	AG4614	20/50	1		12/30/16 15:17
65	NI.123016.152103	WG597007-20	CCV		1		12/30/16 15:21
66	NI.123016.152446	WG597007-21	CCB		1		12/30/16 15:24
67	NI.123016.153148	WG596286-02	Serial Dilution		25	L16120719-04	12/30/16 15:31
68	NI.123016.153521	L16120755-17	AG4621	20/50	1		12/30/16 15:35

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Sam H. Rhodes

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 123016B.REP
 Analyst1: JYH Analyst2: N/A
 Method: 6020/6020A 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: 596004,596286,596789

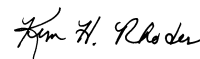
Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	NI.123016.153827	L16120755-18	AG4622	20/50	1		12/30/16 15:38
70	NI.123016.154132	WG595008-01	Reference Sample		10	L16120719-08	12/30/16 15:41
71	NI.123016.154438	WG595008-04	Matrix Spike	20/50	10	L16120719-08	12/30/16 15:44
72	NI.123016.154743	WG595008-05	Matrix Spike Duplica	20/50	10	L16120719-08	12/30/16 15:47
73	NI.123016.155048	L16120719-04	109-120916	20/50	10		12/30/16 15:50
74	NI.123016.155353	WG596286-01	Post Digestion Spike		10	L16120719-04	12/30/16 15:53
75	NI.123016.155658	WG596286-02	Serial Dilution		50	L16120719-04	12/30/16 15:56
76	NI.123016.160006	WG597007-22	CCV		1		12/30/16 16:00
77	NI.123016.160349	WG597007-23	CCB		1		12/30/16 16:03
78	NI.123016.161117	L16120719-16	18WW25F-120916	20/50	10		12/30/16 16:11
79	NI.123016.161447	L16120719-19	MW16-121216	20/50	10		12/30/16 16:14
80	NI.123016.161753	L16120719-21	18CPTMW19SW-121216	20/50	10		12/30/16 16:17
81	NI.123016.162058	L16120425-23	DUP-GW-120716-2	20/50	100		12/30/16 16:20
82	NI.123016.162403	L16120425-24	DUP-GW-120716-2	20/50	100		12/30/16 16:24
83	NI.123016.162710	WG597007-24	Interference Check		1		12/30/16 16:27
84	NI.123016.163015	WG597007-25	Interference Check		1		12/30/16 16:30
85	NI.123016.163322	WG597007-26	CCV		1		12/30/16 16:33
86	NI.123016.163628	WG597007-27	CCB		1		12/30/16 16:36
87	NI.123016.163935	WG597007-28	Low Level Continuing Calibra		1		12/30/16 16:39

Comments

Seq.	Rerun	Dil.	Reason	Analytes
82			Wrong sample number. JYH	

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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.

Data Checklist

Date: 29-DEC-2016
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A
 Instrument: ICP-MS2
 Curve Workgroup: 596744
 Runlog ID: 79522
 Analytical Workgroups: 596535,594709

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	1149,1183,564,857,782,975
Client Forms	X
Level X	
Level 3	1247,564,425
Level 4	520,1183,857,782,975
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	MMB
Comments	

Primary Reviewer:
29-DEC-2016

Secondary Reviewer:
30-DEC-2016



Microbac Laboratories Inc.

Data Checklist

Date: 30-DEC-2016
 Analyst: JYH
 Analyst: NA
 Method: 6020/6020A
 Instrument: ICP-MS2
 Curve Workgroup: 597007
 Runlog ID: 79573
 Analytical Workgroups: 596004,596286,596789

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	719,755
Client Forms	X
Level X	
Level 3	
Level 4	568,425,719,755,857
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:
03-JAN-2017



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6020A
 Login Number:L16120425

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
PZ06-120616	01	12/07/16					12/09/2016	1.7	180		12/23/16	15.8	180	
PZ06-120616	01	12/07/16					12/09/2016	1.7	180		12/21/16	14.2	180	
PZ06-120616	02	12/07/16					12/09/2016	1.7	180		12/23/16	15.8	180	
PZ06-120616	02	12/07/16					12/09/2016	1.7	180		12/21/16	14.2	180	
MW18-120616	03	12/07/16					12/09/2016	1.7	180		12/21/16	14.1	180	
MW18-120616	04	12/07/16					12/09/2016	1.7	180		12/21/16	14.1	180	
MW11S-120716	05	12/07/16					12/09/2016	1.9	180		12/23/16	16	180	
MW11S-120716	06	12/07/16					12/09/2016	1.9	180		12/23/16	16	180	
MW05I-120716	07	12/07/16					12/09/2016	2	180		12/21/16	14.4	180	
MW05I-120716	08	12/07/16					12/09/2016	2	180		12/21/16	14.4	180	
MW30-120716	09	12/07/16					12/09/2016	1.8	180		12/21/16	14.2	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5079086
 Report generated 01/03/2017 08:18



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:6020A
 Login Number:L16120425

AAB#:WG596004

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
MW30-120716	10	12/07/16					12/14/2016	6.8	180		12/21/16	14.2	180	
MW30-120716	10	12/07/16					12/14/2016	6.8	180		12/21/16	14.2	180	
MW07-120716	11	12/07/16					12/14/2016	7	180		12/21/16	14.4	180	
MW07-120716	12	12/07/16					12/14/2016	7	180		12/21/16	14.4	180	
MW20-120716	13	12/07/16					12/14/2016	6.9	180		12/21/16	14.4	180	
MW20-120716	14	12/07/16					12/14/2016	6.9	180		12/21/16	14.4	180	
MW06-120716	15	12/07/16					12/14/2016	6.8	180		12/21/16	14.3	180	
MW06-120716	16	12/07/16					12/14/2016	6.8	180		12/21/16	14.3	180	
MW10-120716	17	12/07/16					12/14/2016	6.9	180		12/21/16	14.4	180	
MW10-120716	18	12/07/16					12/14/2016	6.9	180		12/21/16	14.4	180	
PZ03-120716	19	12/07/16					12/14/2016	6.7	180		12/29/16	21.9	180	
PZ03-120716	19	12/07/16					12/14/2016	6.7	180		12/21/16	14.2	180	
PZ03-120716	20	12/07/16					12/14/2016	6.7	180		12/21/16	14.2	180	
PZ03-120716	20	12/07/16					12/14/2016	6.7	180		12/29/16	21.9	180	
DUP-GW-120716-1	21	12/07/16					12/14/2016	6.8	180		12/21/16	14.3	180	
DUP-GW-120716-1	22	12/07/16					12/14/2016	6.8	180		12/21/16	14.3	180	
DUP-GW-120716-2	23	12/07/16					12/14/2016	6.8	180		12/30/16	23.2	180	
DUP-GW-120716-2	24	12/07/16					12/14/2016	6.8	180		12/30/16	23.2	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5079086
 Report generated 01/03/2017 08:18



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG595999
 Blank File ID: NI.122116.175045 Blank Sample ID: WG594231-03
 Prep Date: 12/09/16 08:49 Instrument ID: ICP-MS2
 Analyzed Date: 12/21/16 17:50 Method: 6020A
 Analyst: JYH

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
PZ06-120616	L16120425-01	NI.122116.184931	12/21/16 18:49	01
PZ06-120616	L16120425-02	NI.122116.185237	12/21/16 18:52	01
MW18-120616	L16120425-03	NI.122116.185542	12/21/16 18:55	01
MW18-120616	L16120425-04	NI.122116.190501	12/21/16 19:05	01
MW05I-120716	L16120425-07	NI.122116.191417	12/21/16 19:14	01
MW05I-120716	L16120425-08	NI.122116.191722	12/21/16 19:17	01
MW30-120716	L16120425-09	NI.122116.192028	12/21/16 19:20	01
LCS	WG594231-04	NI.122316.093756	12/23/16 09:37	02
PZ06-120616	L16120425-01	NI.122316.102115	12/23/16 10:21	02
PZ06-120616	L16120425-02	NI.122316.102420	12/23/16 10:24	02
MW11S-120716	L16120425-05	NI.122316.102726	12/23/16 10:27	DL01
MW11S-120716	L16120425-06	NI.122316.103031	12/23/16 10:30	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5079087
 Report generated 01/03/2017 08:19



METHOD BLANK SUMMARY

Login Number: L16120425
 Blank File ID: NI.122116.193600
 Prep Date: 12/14/16 08:36
 Analyzed Date: 12/21/16 19:36
 Analyst: JYH

Work Group: WG596004
 Blank Sample ID: WG594796-02
 Instrument ID: ICP-MS2
 Method: 6020A

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
MW30-120716	L16120425-10	NI.122116.192334	12/21/16 19:23	01
LCS	WG594796-03	NI.122116.193905	12/21/16 19:39	01
MW30-120716	L16120425-10	NI.122116.194211	12/21/16 19:42	02
MW07-120716	L16120425-11	NI.122116.194517	12/21/16 19:45	01
MW07-120716	L16120425-12	NI.122116.194822	12/21/16 19:48	01
MW20-120716	L16120425-13	NI.122116.195128	12/21/16 19:51	01
MW20-120716	L16120425-14	NI.122116.195433	12/21/16 19:54	01
MW06-120716	L16120425-15	NI.122116.195739	12/21/16 19:57	01
MW06-120716	L16120425-16	NI.122116.201309	12/21/16 20:13	01
MW10-120716	L16120425-17	NI.122116.201614	12/21/16 20:16	01
MW10-120716	L16120425-18	NI.122116.201920	12/21/16 20:19	01
PZ03-120716	L16120425-19	NI.122116.202225	12/21/16 20:22	01
PZ03-120716	L16120425-20	NI.122116.202531	12/21/16 20:25	01
DUP-GW-120716-1	L16120425-21	NI.122116.202836	12/21/16 20:28	01
DUP-GW-120716-1	L16120425-22	NI.122116.203141	12/21/16 20:31	01
LCS	WG594796-03	NI.122916.130607	12/29/16 13:06	02
PZ03-120716	L16120425-19	NI.122916.131829	12/29/16 13:18	02
PZ03-120716	L16120425-20	NI.122916.132134	12/29/16 13:21	02
LCS	WG594796-03	NI.123016.123327	12/30/16 12:33	03
DUP-GW-120716-2	L16120425-23	NI.123016.162058	12/30/16 16:20	DL01
DUP-GW-120716-2	L16120425-24	NI.123016.162403	12/30/16 16:24	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5079087
 Report generated 01/03/2017 08:19



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG595999
 Blank File ID: NI.122316.093450 Blank Sample ID: WG594231-03
 Prep Date: 12/09/16 08:49 Instrument ID: ICP-MS2
 Analyzed Date: 12/23/16 09:34 Method: 6020A
 Analyst: JYH

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
PZ06-120616	L16120425-01	NI.122116.184931	12/21/16 18:49	01
PZ06-120616	L16120425-02	NI.122116.185237	12/21/16 18:52	01
MW18-120616	L16120425-03	NI.122116.185542	12/21/16 18:55	01
MW18-120616	L16120425-04	NI.122116.190501	12/21/16 19:05	01
MW05I-120716	L16120425-07	NI.122116.191417	12/21/16 19:14	01
MW05I-120716	L16120425-08	NI.122116.191722	12/21/16 19:17	01
MW30-120716	L16120425-09	NI.122116.192028	12/21/16 19:20	01
LCS	WG594231-04	NI.122316.093756	12/23/16 09:37	02
PZ06-120616	L16120425-01	NI.122316.102115	12/23/16 10:21	02
PZ06-120616	L16120425-02	NI.122316.102420	12/23/16 10:24	02
MW11S-120716	L16120425-05	NI.122316.102726	12/23/16 10:27	DL01
MW11S-120716	L16120425-06	NI.122316.103031	12/23/16 10:30	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5079087
 Report generated 01/03/2017 08:19



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG596004
 Blank File ID: NI.122916.130301 Blank Sample ID: WG594796-02
 Prep Date: 12/14/16 08:36 Instrument ID: ICP-MS2
 Analyzed Date: 12/29/16 13:03 Method: 6020A
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
MW30-120716	L16120425-10	NI.122116.192334	12/21/16 19:23	01
LCS	WG594796-03	NI.122116.193905	12/21/16 19:39	01
MW30-120716	L16120425-10	NI.122116.194211	12/21/16 19:42	02
MW07-120716	L16120425-11	NI.122116.194517	12/21/16 19:45	01
MW07-120716	L16120425-12	NI.122116.194822	12/21/16 19:48	01
MW20-120716	L16120425-13	NI.122116.195128	12/21/16 19:51	01
MW20-120716	L16120425-14	NI.122116.195433	12/21/16 19:54	01
MW06-120716	L16120425-15	NI.122116.195739	12/21/16 19:57	01
MW06-120716	L16120425-16	NI.122116.201309	12/21/16 20:13	01
MW10-120716	L16120425-17	NI.122116.201614	12/21/16 20:16	01
MW10-120716	L16120425-18	NI.122116.201920	12/21/16 20:19	01
PZ03-120716	L16120425-19	NI.122116.202225	12/21/16 20:22	01
PZ03-120716	L16120425-20	NI.122116.202531	12/21/16 20:25	01
DUP-GW-120716-1	L16120425-21	NI.122116.202836	12/21/16 20:28	01
DUP-GW-120716-1	L16120425-22	NI.122116.203141	12/21/16 20:31	01
LCS	WG594796-03	NI.122916.130607	12/29/16 13:06	02
PZ03-120716	L16120425-19	NI.122916.131829	12/29/16 13:18	02
PZ03-120716	L16120425-20	NI.122916.132134	12/29/16 13:21	02
LCS	WG594796-03	NI.123016.123327	12/30/16 12:33	03
DUP-GW-120716-2	L16120425-23	NI.123016.162058	12/30/16 16:20	DL01
DUP-GW-120716-2	L16120425-24	NI.123016.162403	12/30/16 16:24	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5079087
 Report generated 01/03/2017 08:19



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG596004
 Blank File ID: NI.123016.123021 Blank Sample ID: WG594796-02
 Prep Date: 12/14/16 08:36 Instrument ID: ICP-MS2
 Analyzed Date: 12/30/16 12:30 Method: 6020A
 Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
MW30-120716	L16120425-10	NI.122116.192334	12/21/16 19:23	01
LCS	WG594796-03	NI.122116.193905	12/21/16 19:39	01
MW30-120716	L16120425-10	NI.122116.194211	12/21/16 19:42	02
MW07-120716	L16120425-11	NI.122116.194517	12/21/16 19:45	01
MW07-120716	L16120425-12	NI.122116.194822	12/21/16 19:48	01
MW20-120716	L16120425-13	NI.122116.195128	12/21/16 19:51	01
MW20-120716	L16120425-14	NI.122116.195433	12/21/16 19:54	01
MW06-120716	L16120425-15	NI.122116.195739	12/21/16 19:57	01
MW06-120716	L16120425-16	NI.122116.201309	12/21/16 20:13	01
MW10-120716	L16120425-17	NI.122116.201614	12/21/16 20:16	01
MW10-120716	L16120425-18	NI.122116.201920	12/21/16 20:19	01
PZ03-120716	L16120425-19	NI.122116.202225	12/21/16 20:22	01
PZ03-120716	L16120425-20	NI.122116.202531	12/21/16 20:25	01
DUP-GW-120716-1	L16120425-21	NI.122116.202836	12/21/16 20:28	01
DUP-GW-120716-1	L16120425-22	NI.122116.203141	12/21/16 20:31	01
LCS	WG594796-03	NI.122916.130607	12/29/16 13:06	02
PZ03-120716	L16120425-19	NI.122916.131829	12/29/16 13:18	02
PZ03-120716	L16120425-20	NI.122916.132134	12/29/16 13:21	02
LCS	WG594796-03	NI.123016.123327	12/30/16 12:33	03
DUP-GW-120716-2	L16120425-23	NI.123016.162058	12/30/16 16:20	DL01
DUP-GW-120716-2	L16120425-24	NI.123016.162403	12/30/16 16:24	DL01

Report Name: BLANK_SUMMARY
 PDF File ID: 5079087
 Report generated 01/03/2017 08:19



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5079088
03-JAN-2017 16:41



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/14/16 08:36 Sample ID: WG594796-02
Instrument ID: ICP-MS2 Run Date: 12/21/16 19:36 Prep Method: 3015
File ID: NI.122116.193600 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG596004 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: 5079088
03-JAN-2017 16:41



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5079088
03-JAN-2017 16:41



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/14/16 08:36 Sample ID: WG594796-02
Instrument ID: ICP-MS2 Run Date: 12/29/16 13:03 Prep Method: 3015
File ID: NI.122916.130301 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG596004 Matrix: Water Units: mg/L
Contract #: Cal ID: ICP-MS - 29-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: 5079088
03-JAN-2017 16:41



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5079089
Report generated: 01/03/2017 16:41



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG594796-03
Instrument ID: ICP-MS2 Run Time: 19:39 Prep Method: 3015
File ID: NI.122116.193905 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG596004 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	0.121	97.2	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5079089
Report generated: 01/03/2017 16:41



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5079089
Report generated: 01/03/2017 16:41



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG594796-03
Instrument ID: ICP-MS2 Run Time: 13:06 Prep Method: 3015
File ID: NI.122916.130607 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG596004 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD78216 Cal ID: ICP-MS - 29-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Chromium, Total	0.125	0.121	96.7	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5079089
Report generated: 01/03/2017 16:41



MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L16120425 Cal ID: ICP-MS2- Worknum: WG596004
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG594796-01 File ID: NI.122116.205933 Dil: 1 Matrix: WATER
 Sample ID: WG594796-04 MS File ID: NI.122116.210238 Dil: 1 Units: mg/L
 Sample ID: WG594796-05 MSD File ID: NI.122116.210544 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic	ND	0.125	0.137	109	0.125	0.134	108	1.59	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: L16120425 Cal ID: ICP-MS2- Worknum: WG596004
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG594796-01 File ID: NI.122916.130913 Dil: 1 Matrix: WATER
 Sample ID: WG594796-04 MS File ID: NI.122916.131218 Dil: 1 Units: mg/L
 Sample ID: WG594796-05 MSD File ID: NI.122916.131523 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Chromium	ND	0.125	0.129	103	0.125	0.131	105	1.83	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: L16120425 Cal ID: ICP-MS2- Worknum: WG595999
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG594231-01 File ID: NI.122116.175656 Dil: 1 Matrix: WATER
 Sample ID: WG594231-05 MS File ID: NI.122116.180307 Dil: 1 Units: mg/L
 Sample ID: WG594231-06 MSD File ID: NI.122116.180612 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, Total	0.000736	0.125	0.129	103	0.125	0.129	102	0.248	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: L16120425 Cal ID: ICP-MS2- Worknum: WG595999
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG594231-02 File ID: NI.122116.180002 Dil: 1 Matrix: WATER
 Sample ID: WG594231-07 MS File ID: NI.122116.180918 Dil: 1 Units: mg/L
 Sample ID: WG594231-08 MSD File ID: NI.122116.181223 Dil: 1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, Dissolved	0.000597	0.125	0.132	105	0.125	0.128	102	2.93	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: L16120425 Cal ID: ICP-MS2- Worknum: WG595999
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG594231-01 File ID: NI.122316.094101 Dil: 1 Matrix: WATER
 Sample ID: WG594231-05 MS File ID: NI.122316.094406 Dil: 1 Units: mg/L
 Sample ID: WG594231-06 MSD File ID: NI.122316.094711 Dil: 1

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

NOTE: This is an internal quality control sample.



MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum: L16120425 Cal ID: ICP-MS2- Worknum: WG595999
 Instrument ID: ICP-MS2 Contract #: _____ Method: 6020A
 Parent ID: WG594231-02 File ID: NI.122316.101159 Dil: 1 Matrix: WATER
 Sample ID: WG594231-07 MS File ID: NI.122316.101504 Dil: 1 Units: mg/L
 Sample ID: WG594231-08 MSD File ID: NI.122316.101809 Dil: 1

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

NOTE: This is an internal quality control sample.

Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120425 Worknum: WG596004
Instrument: ICP-MS2 Method: 6020A
Serial Dil: WG596004-02 File ID: NI.122116.201004 Dil: 5 Units: ug/L
Sample: L16120425-15 File ID: NI.122116.195739 Dil: 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Arsenic	0.278	F	ND	U		
Chromium	0.462	F	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

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Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120425 Worknum: WG596004
Instrument: ICP-MS2 Method: 6020A
Serial Dil: WG596004-04 File ID: NI.122916.132745 Dil: 5 Units: ug/L
Sample: L16120425-20 File ID: NI.122916.132134 Dil: 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Arsenic	9.45	X	9.34	X	1.23	
Chromium	0.730	F	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: 5079084

01/03/2017 08:18



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120425 Worknum: WG596004
Instrument: ICP-MS2 Method: 6020A
Serial Dil: WG596004-06 File ID: NI.123016.124852 Dil: 5 Units: ug/L

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: 5079084

01/03/2017 08:18



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120425 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.



Microbac Laboratories Inc.
Serial Dilution Report

Login: L16120425 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

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Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120425

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: 5079085
Report generated: 01/03/2017 08:18



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120425 _____ Worknum: WG595999 _____
 Instrument ID: ICP-MS2 _____ Method: 6020A _____
 Post Spike ID: WG595999-03 _____ File ID:NI.122316.095628 Dil:1 _____ Units: ug/L _____
 Sample ID: L16120352-16 _____ File ID:NI.122316.095322 Dil:1 _____ Matrix: Water _____

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

POST_SPIKE - Modified 03/06/2008
 PDF File ID: 5079085
 Report generated: 01/03/2017 08:18



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120425 Worknum: WG596004
 Instrument ID: ICP-MS2 Method: 6020A
 Post Spike ID: WG596004-01 File ID: NI.122116.200044 Dil: 1 Units: ug/L
 Sample ID: L16120425-15 File ID: NI.122116.195739 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ARSENIC	52.1		0.278	F	50	103.7	75 - 125	
CHROMIUM	54.0		0.462		50	107.1	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

POST_SPIKE - Modified 03/06/2008
 PDF File ID: 5079085
 Report generated: 01/03/2017 08:18



Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16120425 Worknum: WG596004
 Instrument ID: ICP-MS2 Method: 6020A
 Post Spike ID: WG596004-03 File ID: NI.122916.132439 Dil: 1 Units: ug/L
 Sample ID: L16120425-20 File ID: NI.122916.132134 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ARSENIC	61.7		9.45		50	104.5	75 - 125	
CHROMIUM	52.7		0.730		50	103.9	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.
POST SPIKE REPORT

Sample Login ID: L16120425 Worknum: WG596004
 Instrument ID: ICP-MS2 Method: 6020A
 Post Spike ID: WG596004-05 File ID: NI.123016.124547 Dil: 1 Units: ug/L
 Sample ID: L16120568-01 File ID: NI.123016.123632 Dil: 1 Matrix: Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ARSENIC	52.5		0	U	50	105.1	75 - 125	
CHROMIUM	51.8		-0.0319		50	103.7	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

POST_SPIKE - Modified 03/06/2008
 PDF File ID: 5079085
 Report generated: 01/03/2017 08:18



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120425 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: L16120425 Workgroup (AAB#): WG596004
 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

INT_CAL_ICP - Modified 03/06/2008
 PDF File ID: 5079093
 Report generated: 03-JAN-2017 08:19



Microbac Laboratories Inc.
Initial Calibration Summary

Login:	<u>L16120425</u>	Workgroup (AAB#):	<u>WG595999</u>
Analytical Method:	<u>6020A</u>	Instrument ID:	<u>ICP-MS2</u>
ICAL Worknum:	<u>WG596294</u>	Initial Calibration Date:	<u>23-DEC-2016 07:30</u>

	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

INT_CAL_ICP - Modified 03/06/2008
PDF File ID: 5079093
Report generated: 03-JAN-2017 08:19



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120425 Workgroup (AAB#): WG596004
Analytical Method: 6020A Instrument ID: ICP-MS2
ICAL Worknum: WG596744 Initial Calibration Date: 29-DEC-2016 07:46

	WG596744-01		WG596744-02		WG596744-03		WG596744-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ARSENIC	0	-64.1	.4	-20.5	50	38400	100	77000	.999973	
CHROMIUM	0	9720	.4	9710	50	286000	100	557000	.999997	

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

INT_CAL_ICP - Modified 03/06/2008
PDF File ID: 5079093
Report generated: 03-JAN-2017 08:19



Microbac Laboratories Inc.
Initial Calibration Summary

Login: L16120425 Workgroup (AAB#): WG596004
Analytical Method: 6020A Instrument ID: ICP-MS2
ICAL Worknum: WG597007 Initial Calibration Date: 30-DEC-2016 12:05

	WG597007-01		WG597007-02		WG597007-03		WG597007-04		R	Q
	Conc	INT	Conc	INT	Conc	INT	Conc	INT		
ARSENIC	0	-27.2	.4	17.7	50	35600	100	68100	.999877	
CHROMIUM	0	8490	.4	8960	50	249000	100	473000	.999948	

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: L16120425 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

ICB - Modified 07/14/2009
PDF File ID: 5079095
Report generated 01/03/2017 08:19



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120425 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

ICB - Modified 07/14/2009
PDF File ID: 5079095
Report generated 01/03/2017 08:19



Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120425 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#): WG596004 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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Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-06
Instrument ID: ICP-MS2 Run Time: 07:52 Method: 6020A
File ID: NI.122916.075253 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS2 - 29-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.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-06
Instrument ID: ICP-MS2 Run Time: 12:11 Method: 6020A
File ID: NI.123016.121144 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS2 - 30-DEC-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ARSENIC	.2	.4	.2	U
CHROMIUM	.4	.8	-.528	F

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PDF File ID: 5079095
Report generated 01/03/2017 08:19



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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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PDF File ID: 5079098
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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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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Report generated 01/03/2017 08:19



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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: L16120425 Run Date: 12/21/2016 Sample ID: WG596009-23
 Instrument ID: ICP-MS2 Run Time: 19:29 Method: 6020A
 File ID: NI.122116.192946 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: L16120425 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: L16120425 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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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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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Login Number: L16120425 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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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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.

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 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#): WG596004 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: L16120425 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#): WG596004 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: L16120425 Run Date: 12/21/2016 Sample ID: WG596009-23
Instrument ID: ICP-MS2 Run Time: 19:29 Method: 6020A
File ID: NI.122116.192946 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 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: L16120425 Run Date: 12/21/2016 Sample ID: WG596009-26
Instrument ID: ICP-MS2 Run Time: 20:06 Method: 6020A
File ID: NI.122116.200657 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 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: L16120425 Run Date: 12/21/2016 Sample ID: WG596009-28
Instrument ID: ICP-MS2 Run Time: 20:44 Method: 6020A
File ID: NI.122116.204404 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 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: L16120425 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#): WG596004 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: L16120425 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#): WG596004 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: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-11
Instrument ID: ICP-MS2 Run Time: 08:08 Method: 6020A
File ID: NI.122916.080821 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-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: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-29
Instrument ID: ICP-MS2 Run Time: 12:38 Method: 6020A
File ID: NI.122916.123830 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-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: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-31
Instrument ID: ICP-MS2 Run Time: 13:37 Method: 6020A
File ID: NI.122916.133702 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-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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PDF File ID: 5079098
Report generated 01/03/2017 08:19



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-45
Instrument ID: ICP-MS2 Run Time: 17:19 Method: 6020A
File ID: NI.122916.171948 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-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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PDF File ID: 5079098
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Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-49
Instrument ID: ICP-MS2 Run Time: 17:35 Method: 6020A
File ID: NI.122916.173518 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-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: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-11
Instrument ID: ICP-MS2 Run Time: 12:27 Method: 6020A
File ID: NI.123016.122714 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	-0.518	F

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: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-13
Instrument ID: ICP-MS2 Run Time: 12:58 Method: 6020A
File ID: NI.123016.125810 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-DEC-16
Matrix: WATER QAPP: WATERLOO

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Chromium	0.400	0.800	-0.567	F

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: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-23
Instrument ID: ICP-MS2 Run Time: 16:03 Method: 6020A
File ID: NI.123016.160349 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-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: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-27
Instrument ID: ICP-MS2 Run Time: 16:36 Method: 6020A
File ID: NI.123016.163628 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-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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INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120425 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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Microbac Laboratories Inc.
INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120425 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
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Microbac Laboratories Inc.
INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-05
Instrument ID: ICP-MS2 Run Time: 12:08 Method: 6020A
File ID: NI.123016.120837 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-DEC-16
QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Arsenic	50	49.5	98.9	90 - 110	
Chromium	50	49.1	98.3	90 - 110	

* Exceeds LIMITS Limit



Microbac Laboratories Inc.
INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-05
Instrument ID: ICP-MS2 Run Time: 07:49 Method: 6020A
File ID: NI.122916.074946 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-DEC-16
QC Key: WATERLOO

Analyte	Expected	Found	%REC	LIMITS	Q
Arsenic	50	49.3	98.5	90 - 110	
Chromium	50	49.3	98.6	90 - 110	

* Exceeds LIMITS Limit

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Microbac Laboratories Inc.
 INITIAL CALIBRATION VERIFICATION (ICV)
 (Alternate Source)

Login Number: L16120425 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#): WG596004 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

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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: L16120425 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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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG596009-22
Instrument ID: ICP-MS2 Run Time: 19:26 Method: 6020A
File ID: NI.122116.192641 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	0.0506	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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: L16120425 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

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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

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CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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#): WG596004 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: L16120425 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#): WG596004 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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG596009-22
Instrument ID: ICP-MS2 Run Time: 19:26 Method: 6020A
File ID: NI.122116.192641 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG596004 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	0.0506	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG596009-25
Instrument ID: ICP-MS2 Run Time: 20:03 Method: 6020A
File ID: NI.122116.200351 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 21-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0529	mg/L	106	90 - 110	
Chromium	0.0500	0.0543	mg/L	109	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG596009-27
 Instrument ID: ICP-MS2 Run Time: 20:40 Method: 6020A
 File ID: NI.122116.204059 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 21-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0544	mg/L	109	90 - 110	
Chromium	0.0500	0.0560	mg/L	112	90 - 110	*

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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#): WG596004 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

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 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#): WG596004 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

CCV - Modified 03/05/2008
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-10
 Instrument ID: ICP-MS2 Run Time: 08:05 Method: 6020A
 File ID: NI.122916.080515 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0494	mg/L	98.7	90 - 110	
Chromium	0.0500	0.0492	mg/L	98.5	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-28
Instrument ID: ICP-MS2 Run Time: 12:35 Method: 6020A
File ID: NI.122916.123512 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0502	mg/L	100	90 - 110	
Chromium	0.0500	0.0495	mg/L	99.1	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-30
 Instrument ID: ICP-MS2 Run Time: 13:33 Method: 6020A
 File ID: NI.122916.133358 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0489	mg/L	97.9	90 - 110	
Chromium	0.0500	0.0492	mg/L	98.3	90 - 110	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-44
Instrument ID: ICP-MS2 Run Time: 17:16 Method: 6020A
File ID: NI.122916.171642 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0507	mg/L	101	90 - 110	
Chromium	0.0500	0.0516	mg/L	103	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5079097
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-48
 Instrument ID: ICP-MS2 Run Time: 17:32 Method: 6020A
 File ID: NI.122916.173212 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0505	mg/L	101	90 - 110	
Chromium	0.0500	0.0505	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5079097
 Report generated 01/03/2017 08:19



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-10
 Instrument ID: ICP-MS2 Run Time: 12:24 Method: 6020A
 File ID: NI.123016.122409 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0500	mg/L	100	90 - 110	
Chromium	0.0500	0.0498	mg/L	99.7	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5079097
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-12
Instrument ID: ICP-MS2 Run Time: 12:55 Method: 6020A
File ID: NI.123016.125504 Analyst: JYH QC Key: WATERLOO
Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-DEC-16
Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0517	mg/L	103	90 - 110	
Chromium	0.0500	0.0507	mg/L	101	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5079097
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Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-22
 Instrument ID: ICP-MS2 Run Time: 16:00 Method: 6020A
 File ID: NI.123016.160006 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0541	mg/L	108	90 - 110	
Chromium	0.0500	0.0520	mg/L	104	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5079097
 Report generated 01/03/2017 08:19



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-26
 Instrument ID: ICP-MS2 Run Time: 16:33 Method: 6020A
 File ID: NI.123016.163322 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.0500	0.0530	mg/L	106	90 - 110	
Chromium	0.0500	0.0509	mg/L	102	90 - 110	

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5079097
 Report generated 01/03/2017 08:19



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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: L16120425 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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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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
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 Report generated 01/03/2017 16:46



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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

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 PDF File ID: 5081280
 Report generated 01/03/2017 16:46



Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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#): WG596004 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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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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#): WG596004 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: L16120425 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#): WG596004 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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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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#): WG596004 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

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 PDF File ID: 5081280
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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 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#): WG596004 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

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-07
 Instrument ID: ICP-MS2 Run Time: 07:55 Method: 6020A
 File ID: NI.122916.075559 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.430	ug/L	108	50 - 150	
Chromium	0.800	0.749	ug/L	93.7	50 - 150	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 Run Date: 12/29/2016 Sample ID: WG596744-50
 Instrument ID: ICP-MS2 Run Time: 17:38 Method: 6020A
 File ID: NI.122916.173824 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 29-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.370	ug/L	92.6	50 - 150	
Chromium	0.800	0.700	ug/L	87.5	50 - 150	

* Exceeds LIMITS Criteria

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 PDF File ID: 5081280
 Report generated 01/03/2017 16:46



Microbac Laboratories Inc.
 LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-07
 Instrument ID: ICP-MS2 Run Time: 12:14 Method: 6020A
 File ID: NI.123016.121450 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.484	ug/L	121	50 - 150	
Chromium	0.800	0.560	ug/L	69.9	50 - 150	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16120425 Run Date: 12/30/2016 Sample ID: WG597007-28
 Instrument ID: ICP-MS2 Run Time: 16:39 Method: 6020A
 File ID: NI.123016.163935 Analyst: JYH QC Key: WATERLOO
 Workgroup (AAB#): WG596004 Cal ID: ICP-MS - 30-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	%REC	LIMITS	Q
Arsenic	0.400	0.387	ug/L	96.6	50 - 150	
Chromium	0.800	0.734	ug/L	91.8	50 - 150	

* Exceeds LIMITS Criteria

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Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120425
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: L16120425
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: L16120425
 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: L16120425
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: L16120425
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.



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120425
Instrument ID: ICP-MS2
Sol. A: WG596009-08
Sol. AB: WG596009-09

File ID: NI.122116.152803
File ID: NI.122116.153108

Workgroup (AAB#): WG596004
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: L16120425
Instrument ID: ICP-MS2
Sol. A: WG596009-36
Sol. AB: WG596009-37

File ID: NI.122116.225059
File ID: NI.122116.225405

Workgroup (AAB#): WG596004
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: L16120425
Instrument ID: ICP-MS2
Sol. A: WG596744-08
Sol. AB: WG596744-09

File ID: NI.122916.075904
File ID: NI.122916.080209

Workgroup (AAB#): WG596004
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	0.00310	NS	100	96.9	96.9	
Chromium	NS	-0.281	NS	100	95.2	95.2	

NS = Not spiked

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

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

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



Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16120425
Instrument ID: ICP-MS2
Sol. A : WG596744-46
Sol. AB : WG596744-47

File ID: NI.122916.172601
File ID: NI.122916.172905

Workgroup (AAB#): WG596004
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	0.0345	NS	100	98.7	98.7	
Chromium	NS	-0.245	NS	100	99.0	99.0	

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: L16120425
Instrument ID: ICP-MS2
Sol. A: WG597007-08
Sol. AB: WG597007-09

File ID: NI.123016.121756
File ID: NI.123016.122101

Workgroup (AAB#): WG596004
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	-0.0288	NS	100	103	103	
Chromium	NS	-0.426	NS	100	101	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: L16120425
Instrument ID: ICP-MS2
Sol. A: WG597007-24
Sol. AB: WG597007-25

File ID: NI.123016.162710
File ID: NI.123016.163015

Workgroup (AAB#): WG596004
Method: 6020A
Units: ug/L
Matrix: Water

ANALYTE	Sol. A			Sol. AB			Q
	True	Found	%Recovery	True	Found	%Recovery	
Arsenic	NS	-0.0138	NS	100	109	109	
Chromium	NS	-0.379	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.

INTERNAL STANDARD REPORT

Login: L16120425 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
L16120352-13	SAMP	21-DEC-2016 18:15	103.232	104.657	105.427
L16120352-16	SAMP	21-DEC-2016 18:37	109.689	111.182	112.256
L16120425-01	SAMP	21-DEC-2016 18:49	101.097	101.554	102.65
L16120425-02	SAMP	21-DEC-2016 18:52	102.085	102.132	103.532
L16120425-03	SAMP	21-DEC-2016 18:55	104.258	104.927	106.321
L16120425-04	SAMP	21-DEC-2016 19:05	103.637	104.768	105.957
L16120425-07	SAMP	21-DEC-2016 19:14	109.048	107.544	109.724
L16120425-08	SAMP	21-DEC-2016 19:17	109.427	110.084	111.448
L16120425-09	SAMP	21-DEC-2016 19:20	100.748	103.441	104.459
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
WG596009-22	CCV	21-DEC-2016 19:26	106.617	106.103	108.337
WG596009-23	CCB	21-DEC-2016 19:29	103.074	100.596	103.86
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: L16120425 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
L16120352-16	SAMP	23-DEC-2016 09:53	97.737	99.095	96.512
L16120425-01	SAMP	23-DEC-2016 10:21	99.379	104.453	100.047
L16120425-02	SAMP	23-DEC-2016 10:24	102.313	105.319	101.389
L16120425-05	SAMP	23-DEC-2016 10:27	91.17	86.959	86.202
L16120425-06	SAMP	23-DEC-2016 10:30	87.324	82.103	83.172
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.

INTERNAL STANDARD REPORT

Login: L16120425 Analytical Method: 6020
 Analytical Workgroup: WG596004 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 21-DEC-2016 15:06

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L16120425-10	SAMP	21-DEC-2016 19:23	106.539	105.347	107.646
L16120425-10	SAMP	21-DEC-2016 19:42	101.266	102.169	103.203
L16120425-11	SAMP	21-DEC-2016 19:45	102.197	101.163	103.574
L16120425-12	SAMP	21-DEC-2016 19:48	104.428	102.929	106.411
L16120425-13	SAMP	21-DEC-2016 19:51	105.012	103.895	106.809
L16120425-14	SAMP	21-DEC-2016 19:54	111.461	113.339	114.385
L16120425-15	SAMP	21-DEC-2016 19:57	111.852	116.138	117.121
L16120425-16	SAMP	21-DEC-2016 20:13	107.651	108.238	110.19
L16120425-17	SAMP	21-DEC-2016 20:16	104.487	105.123	107.841
L16120425-18	SAMP	21-DEC-2016 20:19	104.955	105.807	107.597
L16120425-19	SAMP	21-DEC-2016 20:22	104.071	104.251	106.671
L16120425-20	SAMP	21-DEC-2016 20:25	105.259	106.172	108.885
L16120425-21	SAMP	21-DEC-2016 20:28	110.54	110.843	114.403
L16120425-22	SAMP	21-DEC-2016 20:31	108.446	110.025	111.61
L16120568-01	SAMP	21-DEC-2016 20:59	96.186	94.957	98.527
WG594796-02	BLANK	21-DEC-2016 19:36	99.387	97.233	99.052
WG594796-03	LCS	21-DEC-2016 19:39	102.193	100.756	102.901
WG596004-01	PSPK	21-DEC-2016 20:00	110.117	112.517	113.557
WG596004-02	SERIAL	21-DEC-2016 20:10	109.884	108.605	111.162
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
WG596009-20	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
WG596009-22	CCV	21-DEC-2016 19:26	106.617	106.103	108.337
WG596009-23	CCB	21-DEC-2016 19:29	103.074	100.596	103.86
WG596009-24	LLCCV	21-DEC-2016 19:32	100.276	96.88	101.24
WG596009-25	CCV	21-DEC-2016 20:03	107.697	105.058	109.956
WG596009-26	CCB	21-DEC-2016 20:06	105.177	102.066	106.698
WG596009-27	CCV	21-DEC-2016 20:40	108.018	107.689	111.02
WG596009-28	CCB	21-DEC-2016 20:44	103.468	102.754	105.141
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

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: L16120425 Analytical Method: 6020
 Analytical Workgroup: WG596004 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 21-DEC-2016 15:06

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
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: L16120425 Analytical Method: 6020
 Analytical Workgroup: WG596004 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 29-DEC-2016 07:37

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L16120425-19	SAMP	29-DEC-2016 13:18	97.322	93.963	97.637
L16120425-20	SAMP	29-DEC-2016 13:21	97.997	93.902	97.873
L16120568-01	SAMP	29-DEC-2016 13:09	107.553	101.325	106.565
WG594796-02	BLANK	29-DEC-2016 13:03	102.24	94.782	99.111
WG594796-03	LCS	29-DEC-2016 13:06	107.955	100.618	106.829
WG596004-03	PSPK	29-DEC-2016 13:24	98.351	95.365	98.296
WG596004-04	SERIAL	29-DEC-2016 13:27	103.356	96.005	101.144
WG596744-05	ICV	29-DEC-2016 07:49	103.225	101.584	103.762
WG596744-06	ICB	29-DEC-2016 07:52	96.846	94.354	96.361
WG596744-07	LLICV	29-DEC-2016 07:55	94.144	88.692	90.653
WG596744-08	ICS	29-DEC-2016 07:59	102.518	101.641	103.109
WG596744-09	ICS	29-DEC-2016 08:02	103.779	102.204	103.846
WG596744-10	CCV	29-DEC-2016 08:05	106.08	102.93	106.469
WG596744-11	CCB	29-DEC-2016 08:08	98.11	94.668	97.214
WG596744-28	CCV	29-DEC-2016 12:35	104.469	101.21	106.425
WG596744-29	CCB	29-DEC-2016 12:38	108.701	101.945	108.211
WG596744-30	CCV	29-DEC-2016 13:33	108.003	101.437	107.109
WG596744-31	CCB	29-DEC-2016 13:37	107.993	99.481	105.349
WG596744-44	CCV	29-DEC-2016 17:16	108.4	99.496	106.889
WG596744-45	CCB	29-DEC-2016 17:19	108.763	97.736	105.311
WG596744-46	ICS	29-DEC-2016 17:26	106.583	98.178	104.345
WG596744-47	ICS	29-DEC-2016 17:29	106.876	99.087	104.686
WG596744-48	CCV	29-DEC-2016 17:32	108.55	99.104	106.794
WG596744-49	CCB	29-DEC-2016 17:35	108.849	98.805	106.854
WG596744-50	LLCCV	29-DEC-2016 17:38	106.376	94.09	101.672

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: L16120425 Analytical Method: 6020
 Analytical Workgroup: WG596004 Matrix: 1
 Instrument: ICP-MS2 Analyst: JYH
 ICAL Date: 30-DEC-2016 11:56

Sample	Type	Run Date	BISMUTH	GERMANIUM	INDIUM
			% Rec	% Rec	% Rec
L16120425-23	SAMP	30-DEC-2016 16:20	102.681	100.044	99.126
L16120425-24	SAMP	30-DEC-2016 16:24	101.236	98.959	98.195
L16120568-01	SAMP	30-DEC-2016 12:36	102.896	104.717	103.365
WG594796-02	BLANK	30-DEC-2016 12:30	106.292	108.325	106.598
WG594796-03	LCS	30-DEC-2016 12:33	106.282	106.809	105.821
WG596004-05	PSPK	30-DEC-2016 12:45	108.822	110.419	108.102
WG596004-06	SERIAL	30-DEC-2016 12:48	100.241	98.275	97.941
WG597007-05	ICV	30-DEC-2016 12:08	109.854	110.999	110.089
WG597007-06	ICB	30-DEC-2016 12:11	118.86	117.1	118.174
WG597007-07	LLICV	30-DEC-2016 12:14	102.137	100.114	101.008
WG597007-08	ICS	30-DEC-2016 12:17	106.021	106.652	105.97
WG597007-09	ICS	30-DEC-2016 12:21	107.786	108.788	107.84
WG597007-10	CCV	30-DEC-2016 12:24	107.082	107.539	107.203
WG597007-11	CCB	30-DEC-2016 12:27	112.764	114.358	112.154
WG597007-12	CCV	30-DEC-2016 12:55	108.321	110.18	109.061
WG597007-13	CCB	30-DEC-2016 12:58	101.399	106.42	100.97
WG597007-22	CCV	30-DEC-2016 16:00	106.97	106.993	106.467
WG597007-23	CCB	30-DEC-2016 16:03	101.597	102.515	100.26
WG597007-24	ICS	30-DEC-2016 16:27	104.442	105.169	103.771
WG597007-25	ICS	30-DEC-2016 16:30	106.51	107.859	104.977
WG597007-26	CCV	30-DEC-2016 16:33	107.102	107.864	106.105
WG597007-27	CCB	30-DEC-2016 16:36	101.383	101.611	99.579
WG597007-28	LLCCV	30-DEC-2016 16:39	91.194	87.974	88.101

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: L16120425 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: L16120425
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, 05, and 09 were analyzed at dilutions only due to their pre-run screen results for CL and/or 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: 120807

Approved By: Mary Schilling

A handwritten signature in cursive script, appearing to read "Mary Schilling".

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: IC3
Client ID: PZ06-120616	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 16:31
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: I3_122016-07
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	61.7	E	0.200	0.100
Sulfate	14808-79-8	47.8		1.00	0.500
E	Semiquantitative result (out of calibration range)				

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: IC3
Client ID: PZ06-120616	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 16:51
Collect Date: 12/07/2016 15:00	Dilution: 5	File ID: I3_122016-08
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	66.2		1.00	0.500
Sulfate	14808-79-8	46.3		5.00	2.50

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: IC3
Client ID: MW11S-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 17:11
Collect Date: 12/07/2016 10:18	Dilution: 5	File ID: I3_122016-09
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	539	E	1.00	0.500
Sulfate	14808-79-8	261		5.00	2.50
E	Semiquantitative result (out of calibration range)				

Certificate of Analysis

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: IC3
Client ID: MW11S-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/21/2016 10:02
Collect Date: 12/07/2016 10:18	Dilution: 50	File ID: I3_122016-31
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	676		10.0	5.00
Sulfate	14808-79-8	256		50.0	25.0

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: IC3
Client ID: MW30-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 17:52
Collect Date: 12/07/2016 14:06	Dilution: 4	File ID: I3_122016-11
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	174	E	0.800	0.400
Sulfate	14808-79-8	232		4.00	2.00
E	Semiquantitative result (out of calibration range)				

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: IC3
Client ID: MW30-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 18:12
Collect Date: 12/07/2016 14:06	Dilution: 20	File ID: I3_122016-12
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	176		4.00	2.00
Sulfate	14808-79-8	223		20.0	10.0

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: IC3
Client ID: PZ03-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 18:33
Collect Date: 12/07/2016 15:10	Dilution: 10	File ID: I3_122016-13
Sample Tag: DL01	Units: mg/L	

Certificate of Analysis

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	1060	E	2.00	1.00
Sulfate	14808-79-8	352		10.0	5.00
E	Semiquantitative result (out of calibration range)				

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: IC3
Client ID: PZ03-120716	Prep Method: 300.0	Prep Date: 12/20/2016 15:09
Matrix: Water	Analytical Method: 300.0	Cal Date: 12/01/2016 17:22
Workgroup #: WG595853	Analyst: CAS	Run Date: 12/20/2016 18:53
Collect Date: 12/07/2016 15:10	Dilution: 100	File ID: I3_122016-14
Sample Tag: DL02	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Chloride	16887-00-6	1310		20.0	10.0
Sulfate	14808-79-8	346		100	50.0

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

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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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Approved: 05-DEC-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC3 Dataset: 122016 IC3.SEQ
 Analyst1: CAS Analyst2: NA
 Method: 300/9056 SOP: IC01 Rev: 19

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254
 Eluent ID#: RGT38762

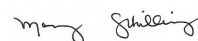
Workgroups: Column 1 ID: AG14A-4MM Column 2 ID: AS14A-4MM
 Analytical WG595853
 Internal STD: NA Surrogate STD: NA Calibration STD STD77046 01-DEC-2016
 CCV STD: STD77046 LCS STD: STD79166 MS/MSD STD: STD79166

Comments: System Backpressure: 2145 psi
 Samples L16120425 (-05,19) were analyzed at dilutions only due to thier pre-run screen results for chloride and sulfate, which were greater than 200 ppm.
 Samples L16120425-09 and L16121119 (-01,02,03,04) were analyzed at dilutions only due to thier pre-run screen results for sulfate, which were greater than 200 ppm.
 Sample L16120993-02 was analyzed at dilution only due to its pre-run screen result for chloride, which was greater than the ICAL max.

Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
1	I3_122016-01	ELUENT	1	1		12/20/16 14:29
2	I3_122016-02	DI WATER	1	1		12/20/16 14:49
3	I3_122016-03	WG595856-01 ANION CCV	1	1	STD77046	12/20/16 15:09
4	I3_122016-04	WG595856-02 ANION CCB	1	1		12/20/16 15:30
5	I3_122016-05	WG595853-01 ANION BLANK	1	1		12/20/16 15:50
6	I3_122016-06	WG595853-02 ANION LCS	1	1	STD79166	12/20/16 16:10
7	I3_122016-07	L16120425-01 (CL,SO4)	1	1		12/20/16 16:31
8	I3_122016-08	L16120425-01 RR CL 5x	1	5		12/20/16 16:51
9	I3_122016-09	L16120425-05 (CL,SO4) 5x	1	5		12/20/16 17:11
10	I3_122016-10	L16120425-05 RR CL 50x (NR)	1	50		12/20/16 17:32
11	I3_122016-11	L16120425-09 (CL,SO4) 4x	1	4		12/20/16 17:52
12	I3_122016-12	L16120425-09 RR CL 20x	1	20		12/20/16 18:12
13	I3_122016-13	L16120425-19 (CL,SO4) 10x	1	10		12/20/16 18:33
14	I3_122016-14	L16120425-19 RR CL 100x	1	100		12/20/16 18:53
15	I3_122016-15	L16120993-02 (CL) 400x	2	400		12/20/16 19:13
16	I3_122016-16	WG595856-03 ANION CCV	1	1	STD77046	12/20/16 19:34
17	I3_122016-17	WG595856-04 ANION CCB	1	1		12/20/16 19:54
18	I3_122016-18	L16121119-01 (All) 2x	1	2		12/20/16 20:15
19	I3_122016-19	L16121119-01 RR CL,SO4 10x	1	10		12/20/16 20:35
35	I3_122016-20	L16121119-02 (All) REF (2x)	1	2		12/20/16 20:55
21	I3_122016-21	WG595853-04 DUP 1119-02 (2x)	1	2		12/20/16 21:16
36	I3_122016-22	L16121119-02 RR CL 10x	1	10		12/20/16 21:36
37	I3_122016-23	L16121119-03 (All) MS (2x)	1	2	STD79166	12/20/16 21:56
38	I3_122016-24	L16121119-04 (All) MSD (2x)	1	2	STD79166	12/20/16 22:17
25	I3_122016-25	L16121119-05 (All)	1	1		12/20/16 22:37
26	I3_122016-26	L16121119-05 RR CL,SO4 5x	1	5		12/20/16 22:57
27	I3_122016-27	WG595856-05 ANION CCV	1	1	STD77046	12/20/16 23:18
28	I3_122016-28	WG595856-06 ANION CCB	1	1		12/20/16 23:38

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Approved: 21-DEC-16




Microbac Laboratories Inc.
Instrument Run Log

Instrument: IC3 _____ Dataset: 122016 IC3.SEQ _____
 Analyst1: CAS _____ Analyst2: NA _____
 Method: 300/9056 _____ SOP: IC01 _____ Rev: 19 _____

Maintenance Log ID: _____ Syringe Filter Lot#: 160109254 _____
 Eluent ID#: RGT38762 _____

Workgroups: Column 1 ID: AG14A-4MM _____ Column 2 ID: AS14A-4MM _____
 Analytical WG595853 _____
 Internal STD: NA _____ Surrogate STD: NA _____ STD77046 01-DEC-2016 _____
 CCV STD: STD77046 _____ LCS STD: STD79166 _____ STD79166 _____

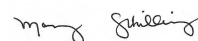
Seq.	File ID	Sample Information	Mat	Dil	Reference	Date/Time
29	I3_122016-29	WG595856-07 ANION CCV	1	1	STD77046	12/21/16 09:22
30	I3_122016-30	WG595856-08 ANION CCB	1	1		12/21/16 09:42
31	I3_122016-31	L16120425-05 RR CL 50x	1	50		12/21/16 10:02
32	I3_122016-32	WG595856-09 ANION CCV	1	1	STD77046	12/21/16 10:22
33	I3_122016-33	WG595856-10 ANION CCB	1	1		12/21/16 10:43
34	I3_122016-34	END	1	1		12/21/16 11:03

Comments

Seq.	Rerun	Dil.	Reason	Analytes
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Approved: 21-DEC-16




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




Microbac Laboratories Inc.

Data Checklist

Date: 20-DEC-2016
 Analyst: CAS
 Analyst: NA
 Method: 300/9056
 Instrument: IC3
 Curve Workgroup: NA
 Runlog ID: 79383
 Analytical Workgroups: L16120425,0993,1119

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)	2145 PSI
Window standard (FID)	NA
Initial Calibration	NA
Average RF	NA
Linear regression or higher order curve	NA
Alternate source standard (ICV) % Difference	NA
Continuing Calibration (CCV)	X
% D/% Drift	X
Minimum response factors (MS)	NA
Continuing calibration blank (CCB) (IC)	X
Special standards	NA
Blanks	X
TCL hits	ND
Surrogate recoveries	NA
LCS/LCSD (Laboratory Control Sample)	X
Recoveries	X
Surrogate recoveries	NA
MS/MSD/Sample duplicates	X
Recoveries	X
%RPD	X
Samples	X
TCL hits	X
Mass spectra (MS/HPLC)/2nd column confirmations (ECD/FID/HPLC)	NA
Surrogate recoveries	NA
Internal standard areas (MS)	NA
Library searches (MS)	NA
Calculations & correct factors	X
Compounds above calibration range	X
Reruns	X
Manual integrations	NA
Project/client specific requirements	X
REPORTING	
Upload batch form	X
KOBRA workgroup data/forms/bench sheets	X
Case narratives	X
Check for completeness	X
Primary Reviewer	CAS
SUPERVISORY/SECONDARY REVIEW	
Check for compliance with method and project specific requirements	X
Check the completeness/accuracy of reported information	X
Data qualifiers	X
Secondary Reviewer	MES

Primary Reviewer:
21-DEC-2016



Secondary Reviewer:
21-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method:300.0
 Login Number:L16120425

AAB#:WG595853

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
PZ06-120616	01	12/07/16					12/20/2016	13	2	*	12/20/16	13.1	2	*
PZ06-120616	01	12/07/16					12/20/2016	13	2	*	12/20/16	13.1	2	*
MW11S-120716	05	12/07/16					12/20/2016	13.2	2	*	12/20/16	13.3	2	*
MW11S-120716	05	12/07/16					12/20/2016	13.2	2	*	12/21/16	14	2	*
MW30-120716	09	12/07/16					12/20/2016	13	2	*	12/20/16	13.2	2	*
MW30-120716	09	12/07/16					12/20/2016	13	2	*	12/20/16	13.2	2	*
PZ03-120716	19	12/07/16					12/20/2016	13	2	*	12/20/16	13.1	2	*
PZ03-120716	19	12/07/16					12/20/2016	13	2	*	12/20/16	13.2	2	*

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5076828
 Report generated 12/21/2016 14:20



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG595853
 Blank File ID: I3_122016-05 Blank Sample ID: WG595853-01
 Prep Date: 12/20/16 15:09 Instrument ID: IC3
 Analyzed Date: 12/20/16 15:50 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	WG595853-02	I3_122016-06	12/20/16 16:10	01
PZ06-120616	L16120425-01	I3_122016-07	12/20/16 16:31	01
PZ06-120616	L16120425-01	I3_122016-08	12/20/16 16:51	DL01
MW11S-120716	L16120425-05	I3_122016-09	12/20/16 17:11	DL01
MW30-120716	L16120425-09	I3_122016-11	12/20/16 17:52	DL01
MW30-120716	L16120425-09	I3_122016-12	12/20/16 18:12	DL02
PZ03-120716	L16120425-19	I3_122016-13	12/20/16 18:33	DL01
PZ03-120716	L16120425-19	I3_122016-14	12/20/16 18:53	DL02
DUP	WG595853-04	I3_122016-21	12/20/16 21:16	DL01
MW11S-120716	L16120425-05	I3_122016-31	12/21/16 10:02	DL02

Report Name: BLANK_SUMMARY
 PDF File ID: 5076829
 Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/20/16 15:09 Sample ID: WG595853-01
Instrument ID: IC3 Run Date: 12/20/16 15:50 Prep Method: 300.0
File ID: I3 122016-05 Analyst: CAS Method: 300.0
Workgroup (AAB#): WG595853 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: 5076830
21-DEC-2016 14:20



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Run Date: 12/20/2016 Sample ID: WG595853-02
Instrument ID: IC3 Run Time: 16:10 Prep Method: 300.0
File ID: I3 122016-06 Analyst: CAS Method: 300.0
Workgroup (AAB#): WG595853 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	8.08	101	90 - 110	
Sulfate	40.0	40.9	102	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5076831
Report generated: 12/21/2016 14:20



Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

Login Number: L16120425
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: 5077034
Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
 INITIAL CALIBRATION DATA

Login Number: L16120425
 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: 5077034
 Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
INITIAL CALIBRATION DATA

Login Number: L16120425
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: 5077034
Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L16120425 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

ALT - Modified 09/06/2007
Version 1.5 PDF File ID: 5077035
Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 Run Date: 12/20/2016 Sample ID: WG595856-02
Instrument ID: IC3 Run Time: 15:30 Method: 300.0
File ID: I3 122016-04 Analyst: CAS Units: mg/L
Workgroup (AAB#): WG595853 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: 5076833
Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 Run Date: 12/20/2016 Sample ID: WG595856-04
Instrument ID: IC3 Run Time: 19:54 Method: 300.0
File ID: I3 122016-17 Analyst: CAS Units: mg/L
Workgroup (AAB#): WG595853 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: 5076833
Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG595856-08
Instrument ID: IC3 Run Time: 09:42 Method: 300.0
File ID: I3 122016-30 Analyst: CAS Units: mg/L
Workgroup (AAB#): WG595853 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: 5076833
Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG595856-10
 Instrument ID: IC3 Run Time: 10:43 Method: 300.0
 File ID: I3 122016-33 Analyst: CAS Units: mg/L
 Workgroup (AAB#): WG595853 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: 5076833
 Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/20/2016 Sample ID: WG595856-01
Instrument ID: IC3 Run Time: 15:09 Method: 300.0
File ID: I3 122016-03 Analyst: CAS QC Key: WATERLOO
Workgroup (AAB#): WG595853 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	2.29	15	
Sulfate	40.0	41.1	mg/L	7.54	2.63	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008
PDF File ID: 5076832
Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/20/2016 Sample ID: WG595856-03
 Instrument ID: IC3 Run Time: 19:34 Method: 300.0
 File ID: I3 122016-16 Analyst: CAS QC Key: WATERLOO
 Workgroup (AAB#): WG595853 Cal ID: IC3 - 01-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.20	mg/L	5.71	2.50	15	
Sulfate	40.0	41.1	mg/L	7.53	2.69	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5076832
 Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG595856-07
 Instrument ID: IC3 Run Time: 09:22 Method: 300.0
 File ID: I3 122016-29 Analyst: CAS QC Key: WATERLOO
 Workgroup (AAB#): WG595853 Cal ID: IC3 - 01-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.17	mg/L	5.73	2.11	15	
Sulfate	40.0	41.0	mg/L	7.55	2.49	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5076832
 Report generated 12/21/2016 14:20



Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16120425 Run Date: 12/21/2016 Sample ID: WG595856-09
 Instrument ID: IC3 Run Time: 10:22 Method: 300.0
 File ID: I3 122016-32 Analyst: CAS QC Key: WATERLOO
 Workgroup (AAB#): WG595853 Cal ID: IC3 - 01-DEC-16
 Matrix: WATER

Analyte	Expected	Found	UNITS	RF	%D	UCL	Q
Chloride	8.00	8.20	mg/L	5.71	2.49	15	
Sulfate	40.0	41.0	mg/L	7.55	2.45	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008
 PDF File ID: 5076832
 Report generated 12/21/2016 14:20



2.4 General Chemistry Data

2.4.2 Alkalinity Data

2.4.2.1 Summary Data



Login Number: L16120425
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: 120658
Approved By: Deanna Hesson

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

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ06-120616	Prep Method: 310.2	Prep Date: N/A
Matrix: Water	Analytical Method: 310.2	Cal Date: 12/12/2016 09:33
Workgroup #: WG594451	Analyst: DCM	Run Date: 12/12/2016 09:37
Collect Date: 12/07/2016 15:00	Dilution: 4	File ID: S2161212002.015
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	563		80.0	40.0

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW11S-120716	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: 12/07/2016 10:18	Dilution: 2	File ID: S2161212004.019
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	431		40.0	20.0

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW30-120716	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 12:45
Collect Date: 12/07/2016 14:06	Dilution: 5	File ID: S2161212004.020
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	563		100	50.0

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ03-120716	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 12:48
Collect Date: 12/07/2016 15:10	Dilution: 2	File ID: S2161212004.023
Sample Tag: DL01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Alkalinity, Total (as CaCO3)	11-43-8	405		40.0	20.0

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.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 310.2
 Login Number: L16120425

AAB#: WG594451

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
PZ06-120616	01	12/07/16					12/12/2016	4.8	14		12/12/16	4.8	14	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5062962
 Report generated 12/14/2016 11:07



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 310.2
 Login Number: L16120425

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
MW11S-120716	05	12/07/16					12/12/2016	5.1	14		12/12/16	5.1	14	
MW30-120716	09	12/07/16					12/12/2016	4.9	14		12/12/16	4.9	14	
PZ03-120716	19	12/07/16					12/12/2016	4.9	14		12/12/16	4.9	14	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5062962
 Report generated 12/14/2016 11:07



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG594451
 Blank File ID: S2161212002.012 Blank Sample ID: WG594451-01
 Prep Date: 12/12/16 09:35 Instrument ID: SMARTCHEM2
 Analyzed Date: 12/12/16 09:35 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	WG594451-02	S2161212002.013	12/12/16 09:36	01
LCS2	WG594451-03	S2161212002.014	12/12/16 09:36	01
PZ06-120616	L16120425-01	S2161212002.015	12/12/16 09:37	DL01
DUP	WG594451-08	S2161212002.039	12/12/16 09:56	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5062963
 Report generated 12/14/2016 11:07



METHOD BLANK SUMMARY

Login Number: L16120425 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
MW11S-120716	L16120425-05	S2161212004.019	12/12/16 12:44	DL01
MW30-120716	L16120425-09	S2161212004.020	12/12/16 12:45	DL01
PZ03-120716	L16120425-19	S2161212004.023	12/12/16 12:48	DL01
DUP	WG594496-05	S2161212004.031	12/12/16 12:53	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5062963
 Report generated 12/14/2016 11:07



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/12/16 09:35 Sample ID: WG594451-01
Instrument ID: SMARTCHEM2 Run Date: 12/12/16 09:35 Prep Method: 310.2
File ID: S2161212002.012 Analyst: DCM Method: 310.2
Workgroup (AAB#): WG594451 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: 5062964
14-DEC-2016 11:07



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5062964
14-DEC-2016 11:07



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5062965
 Report generated: 12/14/2016 11:07



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Analyst: DCM Prep Method: 310.2
 Instrument ID: SMARTCHEM2 Matrix: Water Method: 310.2
 Workgroup (AAB#): WG594451 Units: mg/L
 QC Key: WATERLOO Lot #: STD79201
 Sample ID: WG594451-02 LCS File ID: S2161212002.013 Run Date: 12/12/2016 09:36
 Sample ID: WG594451-03 LCS2 File ID: S2161212002.014 Run Date: 12/12/2016 09:36

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Alkalinity, Total (as CaCO3)	200	194	97.1	200	197	98.7	1.60	85 - 115	25	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5062965
 Report generated: 12/14/2016 11:07



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	03	12-520-c2	
1-8	04	03	
* 1-9	12-484-c5	c	BC
1-10	09	12-520-c4	
1-11	10	11	
1-12	11	12-425-c1	
1-13	12-342-c2		
1-14	03		
1-15	04		
1-16	12-540-c2	1/4	color
1-17	03	1/4	color
1-18	05	1/4	color
1-19	06	1/4	color
1-20	08	1/4	color
1-21	09	1/4	color
1-22	12-424-c2		
2-1	03		
2-2	MS 04		
2-3	MSD 05		

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	03			
2-16	04			
2-17	12-540-c2	1/4		color
2-18	03	1/4		color
2-19	05	1/4		color
2-20	06	1/4		color
2-21	08	1/4		color
2-22	09	1/4		color
2-23	12-424-c2			
2-24	03			
2-25	MS 04			
2-26	MSD 05			
3-20	06	1/2		
3-21	07			
22	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
3-8 1	12-352-07	1/5		
3-8 2	15			
3-8 3	DUP 12-424-02			
3-8 4				
3-8 1	ICV			
3-8 2	Bk			
3-8 3	LCS			
3-8 4	LSTDUP			
3-12 5	12-424-07			
3-13 4	12-552-01	1/10		
3-14 7	07	1/5		
3-15 8	15			

	Analyte	1	2	3
3-15 9	12-425-05	1/2		
3-17 6	09	1/5		
3-18 11	19	1/2		
3-19 12	12-521-01	1/2		
3-20 13	03			
3-21 14	05	1/2		
3-22 5	07	1/100		color
3-23 6	09	1/100		color
3-24 7	11	1/4		
3-25 8	12-568-01			
3-26 9	DUP 12-568-01			
3-27 00	12-352-07			
3-28				

Chloride	EPA 325.2/SM 4500-Cl E-2000
Nitrate-Nitrite	EPA 353.2/SM 4500-NO3 F-2000
<input checked="" type="checkbox"/> 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 Morcillo

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

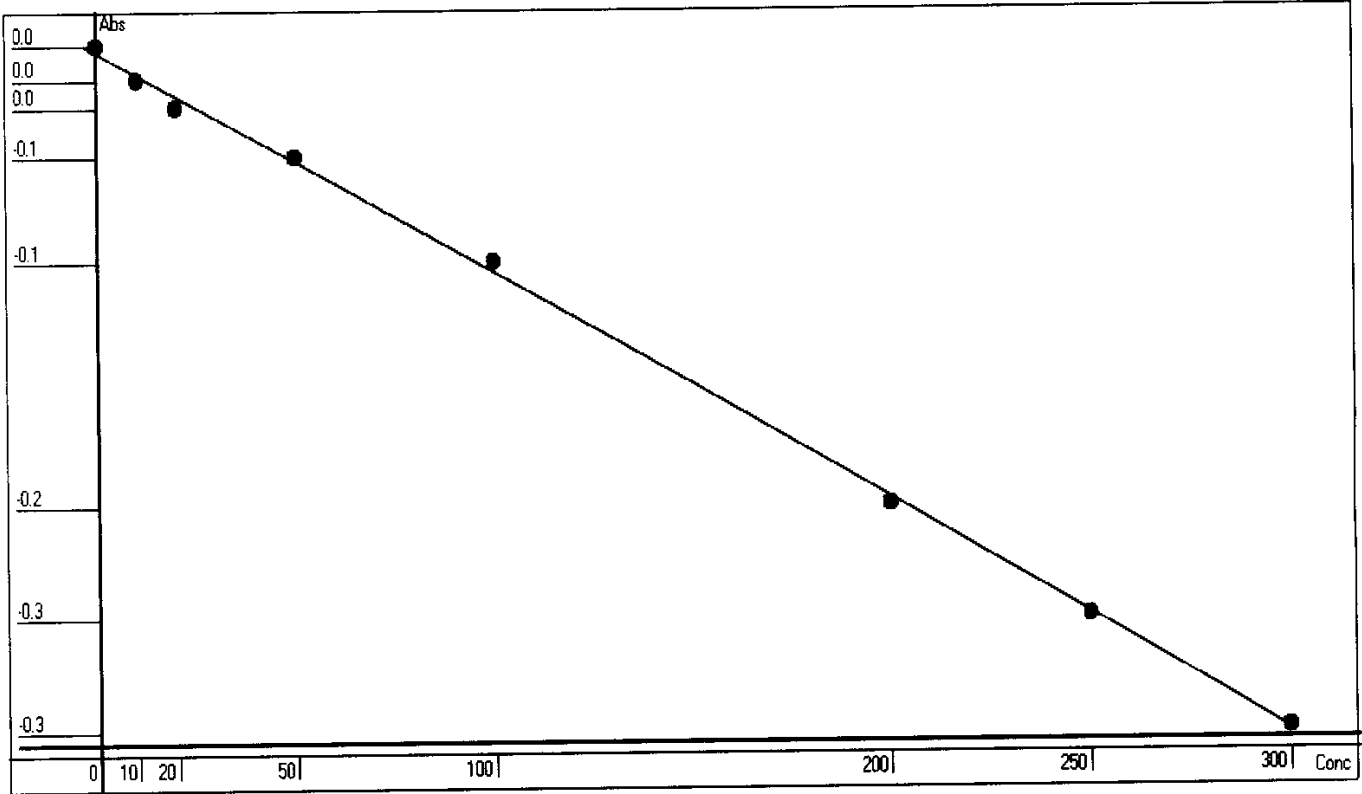
Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
18	L16120540-05 (4)	γ 132.9	-0.1445	0.00		8:14:00 AM
19	L16120540-06 (4)	× 50.3	-0.0536	0.00		8:14:18 AM
20	L16120540-08 (4)	× 135.6	-0.1475	0.00		8:15:12 AM
ST-3	1CCV (150 mg/L)	166.6	-0.1823	111.09		8:15:30 AM
ST-2	2CCB (0 mg/L)	20.5	-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)

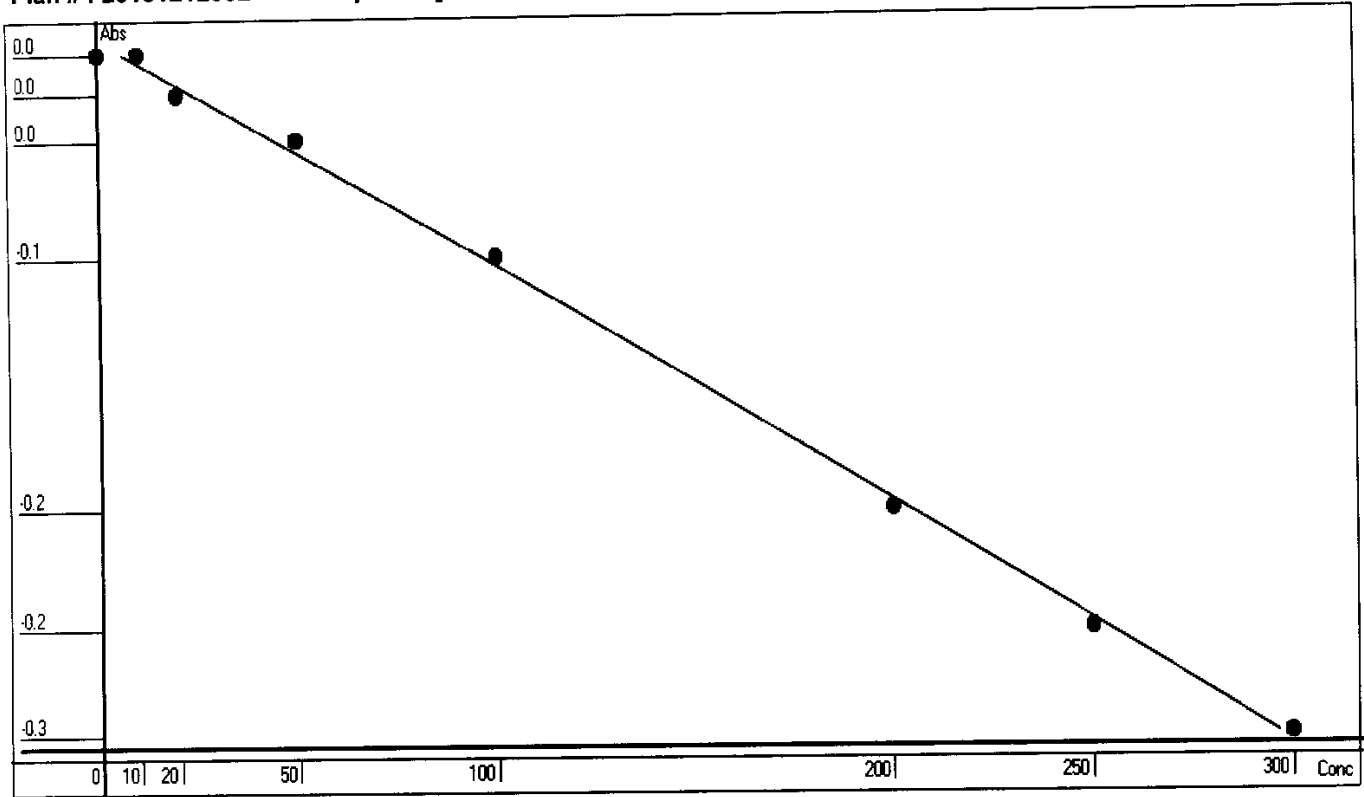
Method : WALK -Unit [mg/L] -ALKALINITY EPA 310.2

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

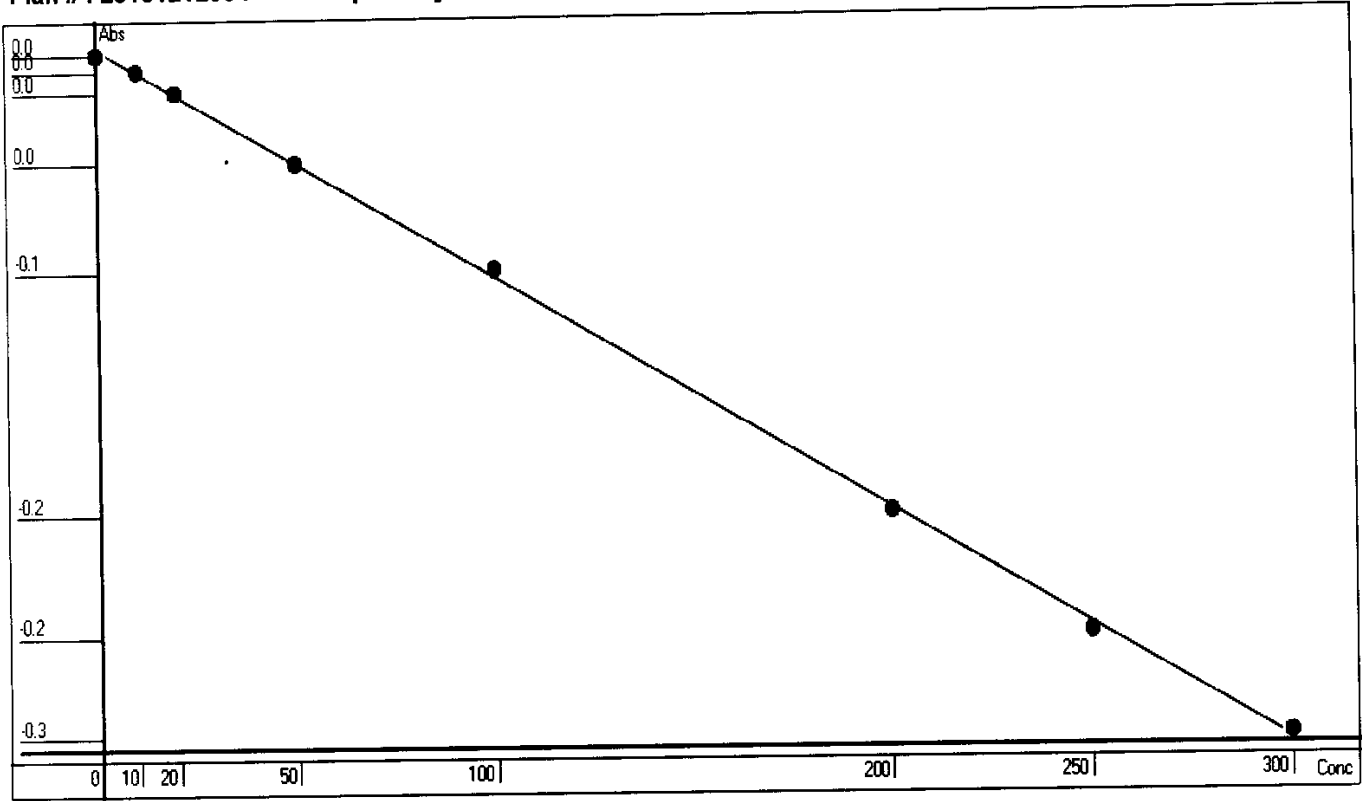
Smp#[Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
18	L16120568-01	16.7	-0.0109	0.00		12:52:54 PM
19	WG594496-05 DUP	16.7	-0.0109	0.00		12:53:12 PM
20	ID 20 12-352-07	214.5	-0.1877	0.00		12:54:06 PM
ST-3	1CCV (150 mg/L)	156.2	-0.1356	104.15		12:54:24 PM
ST-2	2CCB (0 mg/L)	6.2	-0.0015	0.00		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

2.4 General Chemistry Data

2.4.3 Ammonia Data

2.4.3.1 Summary Data



Login Number: L16120425
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: 120659
Approved By: Deanna Hesson

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

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ06-120616	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 08:39
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: S2161216001.018
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	0.208		0.100	0.0500

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW11S-120716	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 08:40
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: S2161216001.019
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	0.323		0.100	0.0500

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW30-120716	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 08:44
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: S2161216001.022
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	0.473		0.100	0.0500

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ03-120716	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 08:44
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: S2161216001.023
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Ammonia	7664-41-7	0.821		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: L16120425

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
PZ06-120616	01	12/07/16					12/16/2016	8.7	28		12/16/16	8.7	28	
MW11S-120716	05	12/07/16					12/16/2016	8.9	28		12/16/16	8.9	28	
MW30-120716	09	12/07/16					12/16/2016	8.8	28		12/16/16	8.8	28	
PZ03-120716	19	12/07/16					12/16/2016	8.7	28		12/16/16	8.7	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5071697
 Report generated 12/19/2016 11:47



METHOD BLANK SUMMARY

Login Number: L16120425 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
PZ06-120616	L16120425-01	S2161216001.018	12/16/16 08:39	01
MW11S-120716	L16120425-05	S2161216001.019	12/16/16 08:40	01
MW30-120716	L16120425-09	S2161216001.022	12/16/16 08:44	01
PZ03-120716	L16120425-19	S2161216001.023	12/16/16 08:44	01
DUP	WG595181-04	S2161216001.037	12/16/16 09:00	01
LCS	WG595181-02	S2161216001.059	12/16/16 09:21	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5071698
 Report generated 12/19/2016 11:47



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5071699
19-DEC-2016 11:47



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5071700
Report generated: 12/19/2016 11:47



2.4 General Chemistry Data

2.4.4 Nitrate Data

2.4.4.1 Summary Data



Login Number: L16120425
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: 120376
Approved By: Deanna Hesson

Danna Hesson

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ06-120616	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: 12/07/2016 15:00	Dilution: 5	File ID: S216121315051701
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	0.720		0.250	0.125

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ06-120616	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: 12/07/2016 15:00	Dilution: 52	File ID: S216121315053401
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		7.64		2.60	1.30

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW11S-120716	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: 12/07/2016 10:18	Dilution: 4	File ID: S216121315055901
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	0.732		0.200	0.100

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW11S-120716	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: 12/07/2016 10:18	Dilution: 4	File ID: S216121315061601
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		0.732		0.200	0.100

Certificate of Analysis

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW30-120716	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: 12/07/2016 14:06	Dilution: 100	File ID: S216121316134701
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		16.8		5.00	2.50

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: MW30-120716	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: 12/07/2016 14:06	Dilution: 100	File ID: S216121315062801
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	16.8		5.00	2.50

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ03-120716	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: 12/07/2016 15:10	Dilution: 20	File ID: S216121315070401
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate-Nitrite (as N)		2.22		1.00	0.500

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM2
Client ID: PZ03-120716	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: 12/07/2016 15:10	Dilution: 20	File ID: S216121315065101
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrate (as N)	14797-55-8	2.22		1.00	0.500

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: L16120425

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
PZ06-120616	01	12/07/16					12/09/2016	1.8	2		12/09/16	1.8	2	
MW11S-120716	05	12/07/16					12/09/2016	2	2		12/09/16	2	2	
MW30-120716	09	12/07/16					12/09/2016	1.8	2		12/09/16	1.8	2	
PZ03-120716	19	12/07/16					12/09/2016	1.8	2		12/09/16	1.8	2	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061639
 Report generated 12/13/2016 16:36



Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 353.2
 Login Number: L16120425

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
PZ06-120616	01	12/07/16					12/09/2016	1.8	28		12/09/16	1.8	28	
MW11S-120716	05	12/07/16					12/09/2016	2	28		12/09/16	2	28	
MW30-120716	09	12/07/16					12/09/2016	1.8	28		12/09/16	1.8	28	
PZ03-120716	19	12/07/16					12/09/2016	1.8	28		12/09/16	1.8	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061643
 Report generated 12/13/2016 16:36



METHOD BLANK SUMMARY

Login Number: L16120425 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
PZ03-120716	L16120425-19	S216121315070401	12/09/16 09:48	
MW30-120716	L16120425-09	S216121315062801	12/09/16 09:48	
PZ03-120716	L16120425-19	S216121315065101	12/09/16 09:48	
LCS	WG594211-02	S216121314505801	12/09/16 09:48	
PZ06-120616	L16120425-01	S216121315053401	12/09/16 09:48	
PZ06-120616	L16120425-01	S216121315051701	12/09/16 09:48	
MW30-120716	L16120425-09	S216121316134701	12/09/16 09:48	
MW11S-120716	L16120425-05	S216121315061601	12/09/16 09:48	
LCS2	WG594211-03	S216121314512201	12/09/16 09:48	
DUP	WG594211-05	S216121314521701	12/09/16 09:48	
MW11S-120716	L16120425-05	S216121315055901	12/09/16 09:48	

Report Name: BLANK_SUMMARY
 PDF File ID: 5061640
 Report generated 12/13/2016 16:36



METHOD BLANK SUMMARY

Login Number: L16120425 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
PZ03-120716	L16120425-19	S216121315070401	12/09/16 09:48	
MW30-120716	L16120425-09	S216121315062801	12/09/16 09:48	
PZ03-120716	L16120425-19	S216121315065101	12/09/16 09:48	
LCS	WG594211-02	S216121314505801	12/09/16 09:48	
PZ06-120616	L16120425-01	S216121315053401	12/09/16 09:48	
PZ06-120616	L16120425-01	S216121315051701	12/09/16 09:48	
MW30-120716	L16120425-09	S216121316134701	12/09/16 09:48	
MW11S-120716	L16120425-05	S216121315061601	12/09/16 09:48	
LCS2	WG594211-03	S216121314512201	12/09/16 09:48	
DUP	WG594211-05	S216121314521701	12/09/16 09:48	
MW11S-120716	L16120425-05	S216121315055901	12/09/16 09:48	

Report Name: BLANK_SUMMARY
 PDF File ID: 5061644
 Report generated 12/13/2016 16:36



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5061641
13-DEC-2016 16:36



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5061645
13-DEC-2016 16:36



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5061642
 Report generated: 12/13/2016 16:36



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5061646
 Report generated: 12/13/2016 16:36



2.4.4.3 Raw Data

SMARTCHEM RUN LOG

(smartchem2, smartchem3)

WORKGROUP: WG594211
594212

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 checked="" type="checkbox"/> NO3 Reagent bottle connected / purged
<input type="checkbox"/> NO3 pH adj to pH 5-9
Syringe filter lot # <u>00220660</u>
pH paper Lot #: <u>H2681919</u> | <input checked="" type="checkbox"/> WBL Run
<input type="checkbox"/> Reagents Full
<input type="checkbox"/> Dilution H2O Full
<input checked="" type="checkbox"/> Waste Container Check |
|---|--|

- 1) Workgroup _____
 Plan # 20161209001
- 2) Workgroup _____
 Plan # _____
- 3) Workgroup _____
 Plan # _____
- Instrument: SC1 SC2

Analyte	1 2 3		
	NO3		
SC Prepared Curve	Dilution		
Position			
1-1	ICV		
1-2	Bilk		
1-3	UCS		
1-4	LCSDUP		
1-5	12-260-c8 NO2		
1-6	12-260-c8	1/2	color
* 1-7	09	1/50	
* 1-8	12-352-c1	1/25	
* 1-9	07	1/50	
* 1-10	15	1/4	
1-11	12-377-c1		
1-12	02	1/4	
1-13	12-378-c1		
1-14	02		
1-15	12-349-c1		
1-16	12-379-c3		
1-17	05		
* 1-18	12-425-c1	1/5	
* 1-19	05	1/4	
* 1-20	09	1/20	
* 1-21	19	1/20	
1-22	12-268-c1		
2-1	02		
2-2	03		
2-3	12-441-c1		

Position	Analyte	1 2 3		
2-4	DUP 12-441-c1			
2-5	MS 12-441-c1			
2-6	MS 12-368-c1	12-378-c1		
2-7	Bilk			
2-8	UCS			
2-9	LCSDUP			
2-10	12-441-c2			
2-11	12-270-c1			
2-12	02			
2-13	12-438-c2			
2-14	05			
2-15	12-442-c1			
2-16	02			
2-17	10			
2-18	17			
2-19	12-456-c1			
2-20	DUP 12-490-c1			
2-21	MS 12-456-c1			
2-22	12-456-c2			
2-23	03	1/5	color	
2-24	04	1/5	color	
2-25	MS 12-456-c2			
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

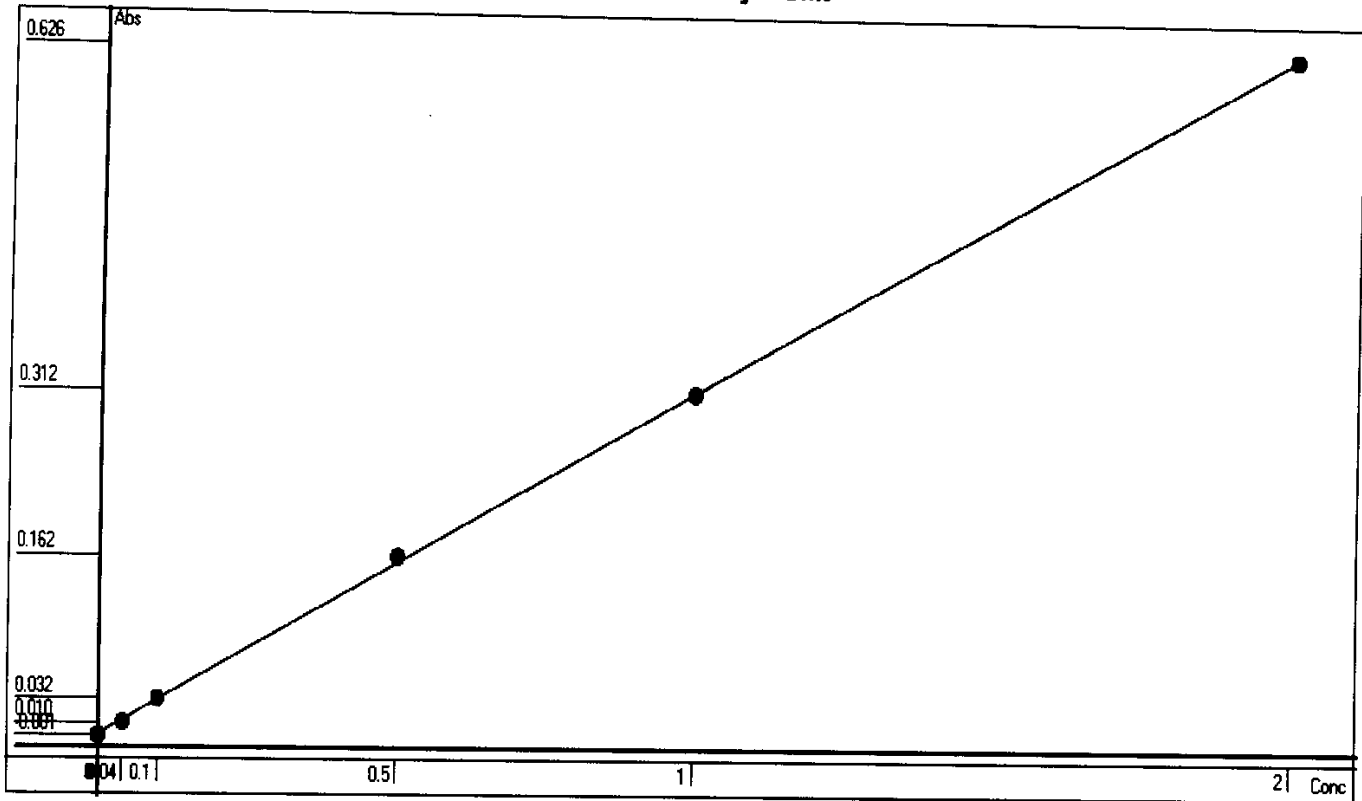
Smp#[Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
45	L16120456-03 (5)	0.138	0.0434	0.00		10:56:24 AM
46	L16120456-04 (5)	0.179	0.0560	0.00		10:57:37 AM
47	WG594212-08 MS	0.917	0.2875	0.00		10:58:48 AM
48	ID 48	0.285	0.0893	0.00		11:00:00 AM
49	ID 49	0.977	0.3064	0.00		11:01:12 AM
50	ID 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*Abso +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: L16120425
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: 120660
Approved By: Deanna Hesson

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

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: PZ06-120616	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/13/2016 09:26
Workgroup #: WG594624	Analyst: DCM	Run Date: 12/13/2016 09:33
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: SC161213002.018
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 #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW11S-120716	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/13/2016 09:26
Workgroup #: WG594624	Analyst: DCM	Run Date: 12/13/2016 09:35
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: SC161213002.021
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0	0.215		0.200	0.100

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW30-120716	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/13/2016 09:26
Workgroup #: WG594624	Analyst: DCM	Run Date: 12/13/2016 09:36
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: SC161213002.022
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0	0.185	J	0.200	0.100
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: PZ03-120716	Prep Method: 365.4	Prep Date: N/A
Matrix: Water	Analytical Method: 365.4	Cal Date: 12/13/2016 09:26
Workgroup #: WG594624	Analyst: DCM	Run Date: 12/13/2016 09:36
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: SC161213002.023
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Phosphorus, Total	7723-14-0	0.157	J	0.200	0.100

Certificate of Analysis

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: 13-DEC-2016
 Analyst: DCM
 Analyst: NA
 Method: PHOS
 Instrument: SC
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG594624

Calibration/Linearity	12-13-2016
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:
16-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 365.4
 Login Number: L16120425

AAB#: WG594624

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
PZ06-120616	01	12/07/16					12/13/2016	5.8	28		12/13/16	5.8	28	
MW11S-120716	05	12/07/16					12/13/2016	6	28		12/13/16	6	28	
MW30-120716	09	12/07/16					12/13/2016	5.8	28		12/13/16	5.8	28	
PZ03-120716	19	12/07/16					12/13/2016	5.8	28		12/13/16	5.8	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5063089
 Report generated 12/14/2016 11:36



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG594624
 Blank File ID: SC161213002.010 Blank Sample ID: WG594624-01
 Prep Date: 12/13/16 09:29 Instrument ID: SMARTCHEM
 Analyzed Date: 12/13/16 09:29 Method: 365.4
 Analyst: DCM

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594624-02	SC161213002.011	12/13/16 09:29	01
PZ06-120616	L16120425-01	SC161213002.018	12/13/16 09:33	01
MW11S-120716	L16120425-05	SC161213002.021	12/13/16 09:35	01
MW30-120716	L16120425-09	SC161213002.022	12/13/16 09:36	01
PZ03-120716	L16120425-19	SC161213002.023	12/13/16 09:36	01
DUP	WG594624-04	SC161213002.026	12/13/16 09:38	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5063090
 Report generated 12/14/2016 11:36



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/13/16 09:29 Sample ID: WG594624-01
Instrument ID: SMARTCHEM Run Date: 12/13/16 09:29 Prep Method: 365.4
File ID: SC161213002.010 Analyst: DCM Method: 365.4
Workgroup (AAB#): WG594624 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-13-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: 5063091
14-DEC-2016 11:36



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Run Date: 12/13/2016 Sample ID: WG594624-02
Instrument ID: SMARTCHEM Run Time: 09:29 Prep Method: 365.4
File ID: SC161213002.011 Analyst: DCM Method: 365.4
Workgroup (AAB#): WG594624 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD79329 Cal ID: SMARTC-13-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Phosphorus, Total	1.00	1.11	111	70 - 130	

LCS - Modified 03/06/2008
PDF File ID: 5063092
Report generated: 12/14/2016 11:36



2.4.5.3 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 checked="" type="checkbox"/> Waste Container Check |
| <input type="checkbox"/> NO3 Reagent bottle connected / purged | |
| <input type="checkbox"/> NO3 pH adj to pH 5-9 | |
| Syringe filter lot # _____ | |
| pH paper Lot #: _____ | |

- 1) Workgroup _____
Plan # 94161213082
- 2) Workgroup _____
Plan # _____
- 3) Workgroup _____
Plan # _____
- Instrument: SC1 SC2

Analyte	1	2	3
	<u>PHCS</u>		
	Dilution		
SC Prepared Curve			
Position			
1-1	<u>ICV</u>		
1-2	<u>Blk</u>		
1-3	<u>LCS</u>		
1-4	<u>12-438-02</u>		
1-5	<u>05</u>		
1-6	<u>12-450-01</u>		
1-7	<u>02</u>		
1-8	<u>03</u>		
1-9	<u>04</u>		
1-10	<u>12-425-01</u>		
1-11	<u>05</u>		
1-12	<u>09</u>		
1-13	<u>19</u>		
1-14	<u>12-511-01</u>	<u>Y25</u>	
1-15	<u>12-445-02</u>		
1-16	<u>DUP 12-456-01</u>		
1-17	<u>MS 12-450-01</u>		
1-18	<u>MS 12-456-02</u>		
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
 * LCS must be run if no MS or Duplicate
 *MS(10% sample): NO3, TKN, NH3, PHOS

DCN#122693



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-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	Phos	Reagents
SOP & Revision	K3654 R19	RET 38164
Curve Stock (SC made)		RET 38162
NO2 STD		RET 37402
ICV	SEE Digest Log	
CCV		
LCS		
MS	Dilution	

Comments: _____

Analyst: David Muehle

Date: 12/13/16

DCN#122693



TKN/Phosphorus Digestion Log

TKN WG: _____ Phos WG: _____
 TKN Std: Std 79382 Phos Std: Std 79382
 TKN CCV: 1/2 (Std 79382) Phos CCV: 1/2 (Std 79382)
 TKN ICV: Std 79115 Phos ICV: Std 79202
 TKN LCS: Std 79026 Phos LCS: Std 79329

MS/MSD: Std 76888

Daily Dilution: 1/25 = 1

Block Digester Temperature: 380 °C

Digest Reagent: Reit 38642

	Sample	Volume	TKN Dilution	Phos Dilution		Sample	Volume	TKN Dilution	Phos Dilution
1	Std				26	12-425-19		✓	✓
2	Std				27	12-511-c1			✓
3	ILWT				28	12-445-c2			✓
4	ICVP				29	DUP 12-456-c1		✓	✓
5	L1ST				30	MS 12-456-c1		✓	✓
6	L1SP				31	TMS 12-456-c2		✓	✓
7	12-438-c2		✓	✓	32	Blk			
8	c5		✓	✓	33				
9	12-540-c2	1/50	✓		34				
10	c5	1/50	✓		35				
11	c8	1/50	✓		36				
12	12-578-c1		✓		37				
13	c2		✓		38				
14	c3		✓		39				
15	c4		✓		40				
16	c5		✓		41				
17	c6		✓		42				
18	12-579-c1		✓		43				
19	12-456-c1		✓	✓	44				
20	c2		✓	✓	45				
21	c3		✓	✓	46				
22	c4		✓	✓	47				
23	12-425-c1		✓	✓	48				
24	c5		✓	✓	49				
25	c9		✓	✓	50				

Analyst: David Merckle Date: 12/12/16

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	0.0578	0.00	R	9:21:49 AM
DIL-1	RBL	0.000	0.0577	0.00	R	9:22:06 AM
DIL-1	RBL	0.000	0.0644	0.00	R	9:23:01 AM
SR5-1	Std-1	0.010	0.0059	0.00		9:23:18 AM
SR5-2	Std-2	0.200	0.0328	0.00		9:24:13 AM
SR5-3	Std-3	0.500	0.0700	0.00		9:24:31 AM
SR5-4	Std-4	1.000	0.1434	0.00		9:25:25 AM
SR5-5	Std-5	1.500	0.2347	0.00		9:25:43 AM
ST-1	Std-6	2.000	0.2957	0.00		9:26:37 AM
ST-3	1CCV (1 mg/L)	0.949	0.1424	94.85		9:26:55 AM
ST-2	2CCB (0 mg/L)	-0.054	-0.0074	0.00	INV,><,LL	9:27:49 AM
1	ICV	1.462	0.2191	0.00		9:28:07 AM
2	WG594624-01 BLK	0.100	0.0157	0.00		9:29:01 AM
3	WG594624-02 LCS	1.107	0.1661	0.00		9:29:19 AM
4	L16120438-02	0.169	0.0260	0.00		9:30:13 AM
5	L16120438-05	0.025	0.0044	0.00	>	9:30:31 AM
6	L16120456-01	-0.002	0.0005	0.00	><,LL	9:31:25 AM
7	L16120456-02	0.474	0.0716	0.00	EPL	9:31:43 AM
8	L16120456-03	0.067	0.0108	0.00		9:32:37 AM
9	L16120456-04	0.146	0.0226	0.00		9:32:55 AM
10	L16120425-01	0.098	0.0154	0.00	EPL	9:33:49 AM
ST-3	1CCV (1 mg/L)	1.046	0.1570	104.63		9:34:07 AM
ST-2	2CCB (0 mg/L)	-0.017	-0.0019	0.00	INV,><,LL	9:35:01 AM
11	L16120425-05	0.215	0.0329	0.00		9:35:19 AM
12	L16120425-09	0.185	0.0284	0.00		9:36:13 AM
13	L16120425-19	0.157	0.0243	0.00		9:36:31 AM
14	L16120511-01 (25)	1.628	0.2438	0.00		9:37:25 AM
15	L16120445-02	×2.018	0.3021	0.00	><,LH	9:37:43 AM
16	WG594624-04 DUP	0.014	0.0029	0.00	>	9:38:37 AM
17	WG594624-05 MS	0.929	0.1395	0.00		9:38:55 AM
18	WG594624-07 MS	0.886	0.1331	0.00		9:39:49 AM
19	ID 19	1.044	0.1566	0.00		9:40:07 AM

Report Date :12/13/2016 Run Date :12/13/2016 Operator : SMARTCHEM1 Plan # :20161213002

Plan Description : PHOS-A1-DCM/12/13/2016

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

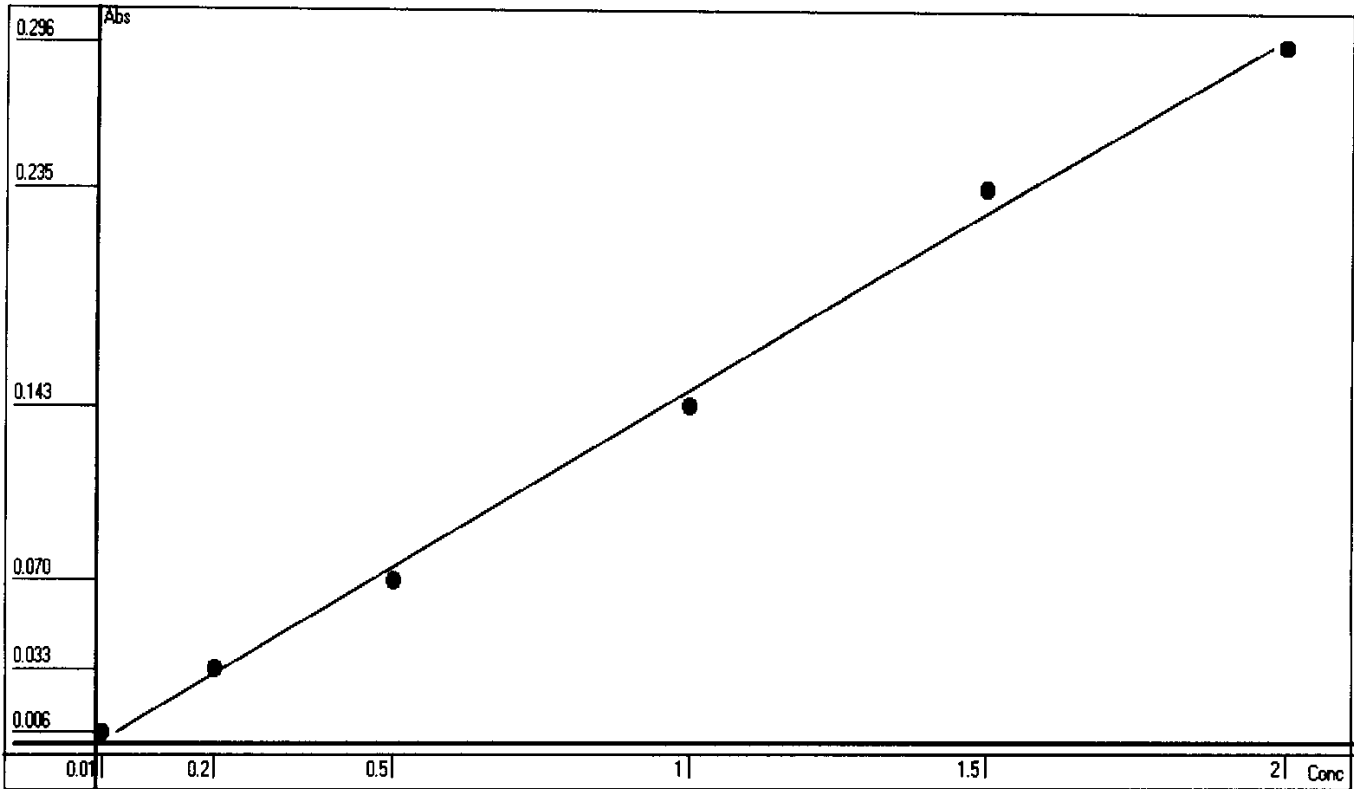
Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
20	ID 20	1.034	0.1551	0.00		9:41:01 AM
ST-3	1CCV (1 mg/L)	1.026	0.1540	102.62	EPL	9:41:19 AM
ST-2	2CCB (0 mg/L)	0.040	0.0067	0.00		9:42:13 AM
15-[1/2]	L16120445-02	1.948	0.1462	0.00		9:49:53 AM
ST-3	1CCV (1 mg/L)	0.964	0.1447	96.39	EPL	9:49:53 AM
ST-2	2CCB (0 mg/L)	0.082	0.0130	0.00		9:50:47 AM

Report Date :12/13/2016 Run Date :12/13/2016 Operator : SMARTCHEM1 Plan # :20161213002
 Plan Description : PHOS-A1-DCM/12/13/2016

Calibrant Report - WTPH -

Calib Lot #:010104 Exp Date:6/18/2020 User:MICROBAC

Plan #: 20161213002 Description: [PHOS-A1-DCM/12/13/2016] Unit



Point	OD	Conc	Recalc Conc	% Error
1	0.0059	0.01	0.0345	245.00
2	0.0327	0.2	0.2140	7.00
3	0.0699	0.5	0.4632	-7.36
4	0.1434	1	0.9555	-4.45
5	0.2347	1.5	1.5670	4.47
6	0.2957	2	1.9756	-1.22

Conc= +6.6981*Abso -0.005 R²=0.9969

RBL
0.0578
0

Report Date 12/13/2016 Run Date 12/13/2016

2.4 General Chemistry Data

2.4.6 Orthophosphate Data

2.4.6.1 Summary Data



Login Number: L16120425
Department: Conventionals
Analyst: April Greene

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: 120662
Approved By: Deanna Hesson

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

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: UV-2600
Client ID: PZ06-120616	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 12/08/2016 13:50
Workgroup #: WG594146	Analyst: ADG	Run Date: 12/08/2016 15:06
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: 00.1612081506-09
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2	0.135		0.0500	0.0250

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: UV-2600
Client ID: MW11S-120716	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 12/08/2016 13:50
Workgroup #: WG594146	Analyst: ADG	Run Date: 12/08/2016 15:06
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: 00.1612081506-10
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2	0.400		0.0500	0.0250

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: UV-2600
Client ID: MW30-120716	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 12/08/2016 13:50
Workgroup #: WG594146	Analyst: ADG	Run Date: 12/08/2016 15:06
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: 00.1612081506-11
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Orthophosphate	14265-44-2	0.279		0.0500	0.0250

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: UV-2600
Client ID: PZ03-120716	Prep Method: SM4500-P-E-1999	Prep Date: N/A
Matrix: Water	Analytical Method: SM4500-P-E-1999	Cal Date: 12/08/2016 13:50
Workgroup #: WG594146	Analyst: ADG	Run Date: 12/08/2016 15:06
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: 00.1612081506-12
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

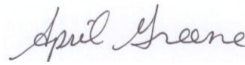
Microbac Laboratories Inc.

Data Checklist

Date: 08-DEC-2016
 Analyst: ADG
 Analyst: NA
 Method: PO4
 Instrument: UV-2600
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG594146

Calibration/Linearity	12/08/16
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	
Case Narratives	
Signed Raw Data	X
STD/LCS on benchsheet	X
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	
Primary Reviewer	ADG
Secondary Reviewer	DIH
Comments	

Primary Reviewer:
08-DEC-2016



Secondary Reviewer:
15-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: SM4500-P-E-1999
 Login Number: L16120425

AAB#: WG594146

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
PZ06-120616	01	12/07/16					12/08/2016	1	2		12/08/16	1	2	
MW11S-120716	05	12/07/16					12/08/2016	1.2	2		12/08/16	1.2	2	
MW30-120716	09	12/07/16					12/08/2016	1	2		12/08/16	1	2	
PZ03-120716	19	12/07/16					12/08/2016	1	2		12/08/16	1	2	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5062476
 Report generated 12/14/2016 09:44



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG594146
 Blank File ID: 00.1612081506-03 Blank Sample ID: WG594146-01
 Prep Date: 12/08/16 15:06 Instrument ID: UV-2600
 Analyzed Date: 12/08/16 15:06 Method: SM4500-P-E-1999
 Analyst: ADG

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594146-02	00.1612081506-04	12/08/16 15:06	
LCS2	WG594146-03	00.1612081506-05	12/08/16 15:06	
PZ06-120616	L16120425-01	00.1612081506-09	12/08/16 15:06	
MW11S-120716	L16120425-05	00.1612081506-10	12/08/16 15:06	
MW30-120716	L16120425-09	00.1612081506-11	12/08/16 15:06	
PZ03-120716	L16120425-19	00.1612081506-12	12/08/16 15:06	
DUP	WG594146-05	00.1612081506-13	12/08/16 15:06	

Report Name: BLANK_SUMMARY
 PDF File ID: 5062477
 Report generated 12/14/2016 09:44



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/08/16 15:06 Sample ID: WG594146-01
Instrument ID: UV-2600 Run Date: 12/08/16 15:06 Prep Method: SM4500-P-E-1999
File ID: 00.1612081506-03 Analyst: ADG Method: SM4500-P-E-1999
Workgroup (AAB#): WG594146 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: UV-260-08-DEC-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: 5062478
14-DEC-2016 09:44



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Analyst: ADG Prep Method: SM4500-P-E-1999
 Instrument ID: UV-2600 Matrix: Water Method: SM4500-P-E-1999
 Workgroup (AAB#): WG594146 Units: mg/L
 QC Key: WATERLOO Lot #: STD79302
 Sample ID: WG594146-02 LCS File ID: 00.1612081506-04 Run Date: 12/08/2016 15:06
 Sample ID: WG594146-03 LCS2 File ID: 00.1612081506-05 Run Date: 12/08/2016 15:06

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Orthophosphate	1.00	0.978	97.8	1.00	0.986	98.6	0.815	90 - 110	20	

LCS_LCS2 - Modified 03/06/2008
 PDF File ID: 5062479
 Report generated: 12/14/2016 09:44



2.4.6.3 Raw Data

W6594148

Curves

Parameter: P04

Spectrophotometer: UV-2600

Calibration (Curve) standard stock: 75790

Concentration: 1000 mg/L

Recipe for preparation of curve standards found in:

SOP: K3653 Revision: _____ Page: 9

Second Source Stock: Std 79302 (concentration: 10)

Daily Preparation: 1000/100

concentration = 10.0

Calibration Standards (mg/L)	Volume (mL)	Cell Size (cm)	Wavelength (nm)	Absorbance
Std 1 1.0	50	1cm	880	0.634
0.7				0.440
0.5				0.323
0.2				0.130
0.1				0.067
0.05				0.038
0.00				0.010
2nd Source 1.0				0.629
				Ag 12/6/11

Analyst: Paul Greene

Date/Time: 2/6/11 @ 1350

DCN#122607



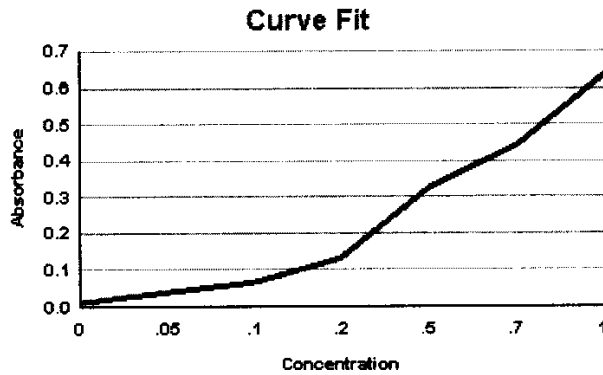
Microbac Laboratories Inc.
INITIAL CALIBRATION

Workgroup: WG594148
Analytical Method: 300
Instrument ID: DV-2600

Analyst: ADG
Initial Calibration Date: 12/08/2016

Analyte: ORTHOPHOSPHATE
Number of Points: 7
Slope: 0.625244
Y-Intercept: 0.00680397
Coef. Of Correlation (R^2): 0.999835
Coef. Of Correlation (R): 0.999918

Concentration X	Absorbance Y	X^2	$X * Y$	Y-Fitted (mX^2+B)
0.00	0.0100	0.00	0.00	0.00680397
0.0500	0.0380	0.00250	0.00190	0.0380662
0.100	0.0670	0.0100	0.00670	0.0693284
0.200	0.130	0.0400	0.0260	0.131853
0.500	0.323	0.250	0.162	0.319426
0.700	0.440	0.490	0.308	0.444475
1.00	0.634	1.00	0.634	0.632048



WG_ICAL_CAL_WET - Modified 03/06/2008
Report generated 12/08/2016 14:41



Microbac Laboratories Inc.
ALTERNATE SOURCE REPORT

Workgroup #: WG594148
File ID: 00.1612081350-08
CCV ID: WG594148-08
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 12/08/2016
Run Time: 13:50
Analyst: ADG
Cal ID: UV-260 - 08-DEC-16 13:50:07

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	1	0.995	0.629	0.5	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_SSCV - Modified 03/06/2008
Report generated 12/08/2016 14:40



Orthophosphate
(orthophosphate1)

EPA 365.2 / SM4500-P E
SOP K3653 Rev 17

CCV: 79303
Daily Dilution: 5(5)/50
Daily Dilution: =0.5
Spectrophotometer: UV-2600
pH paper Lot #: _____

LCS: 79302
Daily Dilution: 10(10)/100
Daily Dilution: =1.0
Curve ID: 12/8/16

Spike: 79302
Daily Dilution: 2(10)/20
Daily Dilution: =0.4

Color Reagent Chemicals
Rgt 38640
Rgt 38086
Rgt 37208
CD# 17313

$MDL = 1(10)/200 = 0.05$

SAMPLE	VOLUME	PH < 8.2	DILUTION	ABSORBANCE @ 880 nm
CCV: 0.5 mg/L	50	✓		0.325
BLK: <u>10CB</u>	50	✓		0.003
LCS: 1.0 ppm	50	✓		0.618
LCSD: 1.0 ppm	50	✓		0.623
<u>12-0201-4</u>	50	✓		0.032
<u>-5</u>	50	✓		0.031
<u>-10</u>	50	✓		0.033
<u>12-425-01</u>	50	✓		0.091
<u>-05</u>	50	✓		0.257
<u>-09</u>	50	✓		0.181
<u>-19</u>	50	✓		0.016
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
	50			
<u>CCB</u>	50	✓		0.008
DUP: <u>425-05</u>	50	✓		0.258
MS: <u>(0.4) 42505</u>	50	✓		0.489
MSD: ()	50	✓		
CCV: () 0.5	0	✓		0.328

Analyst: Amal Greene

Date / Time: 12/8/16 @ 1505

DCN#122612



**Microbac Laboratories Inc.
SAMPLE REPORT**

Workgroup: WG594146

Analyst: ADG

Analyte: ORTHOPHOSPHATE

Date: 12/08/2016

Sample ID	I Vol	F Vol	Response	Slope	Y Intercept	Anal. Conc.	Rep. Conc.	Dil	Units
WG594146-01	50	50	0.00300	0.6252	0.006804	-0.0060840	-0.0060840	1	mg/L
WG594146-02	50	50	0.618	0.6252	0.006804	0.97753	0.97753	1	mg/L
WG594146-03	50	50	0.623	0.6252	0.006804	0.98553	0.98553	1	mg/L
L16120001-04	50	50	0.0320	0.6252	0.006804	0.040298	0.040298	1	mg/L
L16120001-05	50	50	0.0310	0.6252	0.006804	0.038699	0.038699	1	mg/L
L16120001-06	50	50	0.0330	0.6252	0.006804	0.041897	0.041897	1	mg/L
L16120425-01	50	50	0.0910	0.6252	0.006804	0.13466	0.13466	1	mg/L
WG594146-04	50	50	0.257	0.6252	0.006804	0.40016	0.40016	1	mg/L
L16120425-05	50	50	0.257	0.6252	0.006804	0.40016	0.40016	1	mg/L
L16120425-09	50	50	0.181	0.6252	0.006804	0.27860	0.27860	1	mg/L
L16120425-19	50	50	0.0160	0.6252	0.006804	0.014708	ND	1	mg/L
WG594146-05	50	50	0.258	0.6252	0.006804	0.40176	0.40176	1	mg/L
WG594146-06	50	50	0.489	0.6252	0.006804	0.77121	0.77121	1	mg/L

UV_SAMPLE_REPORT - Modified 03/06/2008

Report generated 12/08/2016 17:12



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

Workgroup #: WG594205
File ID: 00.1612081506-01
CCV ID: WG594205-01
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 12/08/2016
Run Time: 15:06
Analyst: ADG
Cal ID: UV-260 - 08-DEC-16

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.509	0.650	1.8	

* Exceeds %D Limit

CCC Calibration Check Compounds

SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 12/08/2016 17:11



Microbac Laboratories Inc.
CONTINUING CALIBRATION REPORT

Workgroup #: WG594205
File ID: 00.1612081506-15
CCV ID: WG594205-03
Units: mg/L
Analyte: ORTHOPHOSPHATE

Instrument ID: UV-2600
Run Date: 12/08/2016
Run Time: 15:06
Analyst: ADG
Cal ID: UV-260 - 08-DEC-16

Analyte	Expected	Found	RF	%D	Q
Orthophosphate	.5	0.514	0.656	2.8	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

WET_WG_CCV - Modified 03/06/2008

Report generated 12/08/2016 17:11



2.4 General Chemistry Data

2.4.7 Sulfide Data

2.4.7.1 Summary Data



Login Number: L16120425
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: 120664
Approved By: Deanna Hesson

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

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: BURET
Client ID: PZ06-120616	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: 12/07/2016 15:00	Dilution: 1	File ID: ET.1612091030-07
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8		U	1.00	0.500
U	Not detected at or above adjusted sample detection limit.				

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: BURET
Client ID: MW11S-120716	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: 12/07/2016 10:18	Dilution: 1	File ID: ET.1612091030-08
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	0.681	J	1.00	0.500
J	The analyte was positively identified, but the quantitation was below the RL.				

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: BURET
Client ID: MW30-120716	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: 12/07/2016 14:06	Dilution: 1	File ID: ET.1612091030-09
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	1.74		1.00	0.500

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: BURET
Client ID: PZ03-120716	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: 12/07/2016 15:10	Dilution: 1	File ID: ET.1612091030-10
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Sulfide	18496-25-8	0.941	J	1.00	0.500

Certificate of Analysis

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:L16120425

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
PZ06-120616	01	12/07/16					12/09/2016	1.8	7		12/09/16	1.8	7	
MW11S-120716	05	12/07/16					12/09/2016	2	7		12/09/16	2	7	
MW30-120716	09	12/07/16					12/09/2016	1.9	7		12/09/16	1.9	7	
PZ03-120716	19	12/07/16					12/09/2016	1.8	7		12/09/16	1.8	7	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5064029
 Report generated 12/14/2016 14:56



METHOD BLANK SUMMARY

Login Number: L16120425 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	
PZ06-120616	L16120425-01	ET.1612091030-07	12/09/16 10:30	
MW11S-120716	L16120425-05	ET.1612091030-08	12/09/16 10:30	
MW30-120716	L16120425-09	ET.1612091030-09	12/09/16 10:30	
PZ03-120716	L16120425-19	ET.1612091030-10	12/09/16 10:30	

Report Name: BLANK_SUMMARY
 PDF File ID: 5064030
 Report generated 12/14/2016 14:56



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5064031
14-DEC-2016 14:56



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5064032
 Report generated: 12/14/2016 14:56



2.4.7.3 Raw Data

SULFIDE
(sulfide1)

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)/1000 = 17.4 mg/L

pH paper lot #: 15A103
1160 = stock conc (mg/L)
Titrant: T- 15A103 1977-2-01
15 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
LCSDUP (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
05	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: Tyrod 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: L16120425
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: 120665
Approved By: Deanna Hesson

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

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: OVEN
Client ID: PZ06-120616	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594207	Analyst: AWE	Run Date: 12/09/2016 08:12
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: EN.1612090812-04
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		1110		20.0	10.0

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: OVEN
Client ID: MW11S-120716	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594207	Analyst: AWE	Run Date: 12/09/2016 08:12
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: EN.1612090812-05
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		1870		20.0	10.0

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: OVEN
Client ID: MW30-120716	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594207	Analyst: AWE	Run Date: 12/09/2016 08:12
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: EN.1612090812-06
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		1670		20.0	10.0

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: OVEN
Client ID: PZ03-120716	Prep Method: 160.1/SM2540C	Prep Date: N/A
Matrix: Water	Analytical Method: SM2540-C-1997	Cal Date:
Workgroup #: WG594207	Analyst: AWE	Run Date: 12/09/2016 08:12
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: EN.1612090812-07
Sample Tag:	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Dissolved Solids		3060		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.

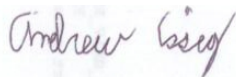
Microbac Laboratories Inc.

Data Checklist

Date: 09-DEC-2016
 Analyst: AWE
 Analyst: NA
 Method: TDS
 Instrument: OVEN
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG594207

Calibration/Linearity	12/09/16
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:
12-DEC-2016



Secondary Reviewer:
13-DEC-2016




Microbac Laboratories Inc.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: SM2540-C-1997
 Login Number: L16120425

AAB#: WG594207

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
PZ06-120616	01	12/07/16					12/09/2016	1.7	7		12/09/16	1.7	7	
MW11S-120716	05	12/07/16					12/09/2016	1.9	7		12/09/16	1.9	7	
MW30-120716	09	12/07/16					12/09/2016	1.8	7		12/09/16	1.8	7	
PZ03-120716	19	12/07/16					12/09/2016	1.7	7		12/09/16	1.7	7	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5061393
 Report generated 12/13/2016 15:52



METHOD BLANK SUMMARY

Login Number: L16120425
 Blank File ID: EN.1612090812-01
 Prep Date: 12/09/16 08:12
 Analyzed Date: 12/09/16 08:12
 Analyst: AWE

Work Group: WG594207
 Blank Sample ID: WG594207-01
 Instrument ID: OVEN
 Method: SM2540-C-1997

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG594207-02	EN.1612090812-02	12/09/16 08:12	
LCS2	WG594207-03	EN.1612090812-03	12/09/16 08:12	
PZ06-120616	L16120425-01	EN.1612090812-04	12/09/16 08:12	
MW11S-120716	L16120425-05	EN.1612090812-05	12/09/16 08:12	
MW30-120716	L16120425-09	EN.1612090812-06	12/09/16 08:12	
PZ03-120716	L16120425-19	EN.1612090812-07	12/09/16 08:12	
DUP	WG594207-05	EN.1612090812-24	12/09/16 08:12	
DUP	WG594207-07	EN.1612090812-25	12/09/16 08:12	

Report Name: BLANK_SUMMARY
 PDF File ID: 5061394
 Report generated 12/13/2016 15:52



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/09/16 08:12 Sample ID: WG594207-01
Instrument ID: OVEN Run Date: 12/09/16 08:12 Prep Method: 160.1/SM2540C
File ID: EN.1612090812-01 Analyst: AWE Method: SM2540-C-1997
Workgroup (AAB#): WG594207 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: 5061395
13-DEC-2016 15:52



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Analyst: AWE Prep Method: 160.1/SM2540C
Instrument ID: OVEN Matrix: Water Method: SM2540-C-1997
Workgroup (AAB#): WG594207 Units: mg/L
QC Key: WATERLOO Lot #: STD79315
Sample ID: WG594207-02 LCS File ID: EN.1612090812-02 Run Date: 12/09/2016 08:12
Sample ID: WG594207-03 LCS2 File ID: EN.1612090812-03 Run Date: 12/09/2016 08:12

Analytes	LCS			LCS2			%RPD	%Rec Limits	RPD Lmt	Q
	Known	Found	% REC	Known	Found	% REC				
Total Dissolved Solids	500	484	96.8	500	476	95.2	1.67	80 - 120	25	

LCS_LCS2 - Modified 03/06/2008
PDF File ID: 5061396
Report generated: 12/13/2016 15:52



2.4.8.3 Raw Data

TOTAL DISSOLVED SOLIDS

WORKGROUP: WG594207

(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 #: 9727603

On Temp/Time:			103 / 0812	180 / 1141	180 / 0825	180 / 11037
SAMPLE	#	VOLUME (mL)	INITIAL WEIGHT WT1 (g)	DRY WEIGHT WT2A (g)	DRY WEIGHT WT2B (g)	DRY WEIGHT WT2C (g)
BLANK	BLK C	100				
LCS: mg/L	LCS1	50				
LCSDUP: mg/L	LCS2	50				
120425-01	1	50				
-05	2	50				
-09	3	50				
-14	4	50				
120427-01	5	50				
-03	6	50				
120434-01	7	50				
120439-01	8	50				
-05	9	50				
120440-01	10	50				
120443-04	11	50				
-06	12	50				
120444-03	13	50				
120447-01	14	50				
120449-01	15	50				
120450-01	16	50				
-03	17	50				
-05	18	50				
-07	19	50				
120452-07	20	50				
DUP: 120427-01	Dup1	50				
DUP: 120450-07	Dup2	50				
Off Temp/Time:			104 / 1141	180 / 1059	180 / 1025	181 / 1150

ANALYST: Andrew Ewing

* Duplicate required on 10% of samples

DATE/TIME: (on) 12-9-16 0812
 DATE/TIME: (off) 12-12-16
 DATE/TIME: (off) 12-12-16
 DATE/TIME: (off) 12-12-16

DCN#122624



Microbac Laboratories Inc.
GRAVIMETRIC REPORT

Workgroup (AAB#): WG594207

Method: 160.1/SM2540C

Analyst: AWE

SOP: Revision

Analyte: TOTAL DISSOLVED SOLIDS

Spike Solution: STD79315

Balance: BAL016

Daily Dilution: _____

SAMPLE ID	Instrument	% OVER	INITIAL VOL	INITIAL WT	DRY WT A	DRY WT B	DRY WT C	Anal. Conc	Rep. Conc.	Units
WG594207-01	B		100	89.5809	89.5804	89.5808			-1.000	mg/L
WG594207-02	L		50	69.055	69.0788	69.0792			484.0	mg/L
WG594207-03	L2		50	61.2379	61.2612	61.2617			476.0	mg/L
L16120425-01	1		50	61.7455	61.8001	61.801	61.8009	1108	1108	mg/L
L16120425-05	2		50	67.2334	67.3264	67.3272	67.3267	1866	1866	mg/L
L16120425-09	3		50	65.4432	65.5267	65.5274	65.5269	1674	1674	mg/L
L16120425-19	4		50	57.6747	57.8276	57.8275			3056	mg/L
L16120427-01	5		50	63.5099	63.52	63.5204			210.0	mg/L
WG594207-04	5		50	63.5099	63.52	63.5204			210.0	mg/L
L16120427-03	6		50	69.8355	69.8401	69.8401			92.00	mg/L
L16120434-01	7		50	66.8628	66.8893	66.8898			540.0	mg/L
L16120439-01	8		50	58.7903	58.8018	58.8022			238.0	mg/L
L16120439-05	9		50	56.7926	56.822	56.8231	56.8229	606.0	606.0	mg/L
L16120440-01	10		50	58.6652	58.6969	58.6974			244.0	mg/L
L16120443-04	11		50	61.8103	61.8516	61.8527	61.8522	838.0	838.0	mg/L
L16120443-06	12		50	53.4097	53.4176	53.4177			160.0	mg/L
L16120444-03	13		50	55.9071	55.9342	55.9344			546.0	mg/L
L16120447-01	14		50	60.9338	60.9835	60.9838			1000	mg/L
L16120449-01	15		50	67.0116	67.0401	67.0404			576.0	mg/L
L16120450-01	16		50	70.4405	70.5828	70.5824			2838	mg/L
L16120450-03	17		50	60.6776	60.7994	60.7989			2426	mg/L
L16120450-05	18		50	72.5915	72.7412	72.7407			2984	mg/L
L16120450-07	19		50	66.3534	66.4921	66.4919			2770	mg/L
WG594207-06	19		50	66.3534	66.4921	66.4919			2762	mg/L
L16120452-07	20		50	58.9846	59.0033	59.0036			380.0	mg/L
WG594207-05	D		50	53.8849	53.8962	53.8963			228.0	mg/L
WG594207-07	D2		50	61.1336	61.2721	61.2716			2760	mg/L

Analyst: Andrew Loef

Date/Time (on) : 12/09/2016 08:12
 Date/Time (off) : 12/12/2016 06:59
 Date/Time (off) : 12/12/2016 09:25
 Date/Time (off) : 12/12/2016 11:50

*Duplicate required on 10% of samples



Microbac Laboratories Inc.
GRAVIMETRIC REPORT

Workgroup (AAB#): WG594207

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
WG594207-01	B		100	89.5809	89.5804	89.5808			-1.000	mg/L
WG594207-02	L		50	69.055	69.0788	69.0792			484.0	mg/L
WG594207-03	L2		50	61.2379	61.2612	61.2617			476.0	mg/L
L16120425-01	1		50	61.7455	61.8001	61.801	61.8009	1108	1108	mg/L
L16120425-05	2		50	67.2334	67.3264	67.3272	67.3267	1866	1866	mg/L
L16120425-09	3		50	65.4432	65.5267	65.5274	65.5269	1674	1674	mg/L
L16120425-19	4		50	57.6747	57.8276	57.8275			3056	mg/L
L16120427-01	5		50	63.5099	63.52	63.5204			210.0	mg/L
WG594207-04	5		50	63.5099	63.52	63.5204			210.0	mg/L
L16120427-03	6		50	69.8355	69.8401	69.8401			92.00	mg/L
L16120434-01	7		50	66.8628	66.8893	66.8898			540.0	mg/L
L16120439-01	8		50	58.7903	58.8018	58.8022			238.0	mg/L
L16120439-05	9		50	56.7926	56.822	56.8231	56.8229	606.0	606.0	mg/L
L16120440-01	10		50	58.6852	58.6969	58.6974			244.0	mg/L
L16120443-04	11		50	61.8103	61.8516	61.8527	61.8522	838.0	838.0	mg/L
L16120443-06	12		50	53.4097	53.4176	53.4177			160.0	mg/L
L16120444-03	13		50	55.9071	55.9342	55.9344			546.0	mg/L
L16120447-01	14		50	60.9338	60.9835	60.9838			1000	mg/L
L16120449-01	15		50	67.0116	67.0401	67.0404			576.0	mg/L
L16120450-01	16		50	70.4405	70.5828	70.5824			2838	mg/L
L16120450-03	17		50	60.6776	60.7994	60.7989			2426	mg/L
L16120450-05	18		50	72.5915	72.7412	72.7407			2984	mg/L
L16120450-07	19		50	66.3534	66.4921	66.4919			2770	mg/L
WG594207-06	19		50	66.3534	66.4921	66.4919			2762	mg/L
L16120452-07	20		50	58.9846	59.0033	59.0036			380.0	mg/L
WG594207-05	D		50	53.8849	53.8962	53.8963			228.0	mg/L
WG594207-07	D2		50	61.1336	61.2721	61.2716			2760	mg/L

Analyst: Andrew Gieg

Date/Time (on) : 12/09/2016 08:12
 Date/Time (off) : 12/12/2016 06:59
 Date/Time (off) : 12/12/2016 09:25
 Date/Time (off) : 12/12/2016 11:50

*Duplicate required on 10% of samples



2.4 General Chemistry Data

2.4.9 TKN Data

2.4.9.1 Summary Data



Login Number: L16120425
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: 120661
Approved By: Deanna Hesson

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

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: PZ06-120616	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/13/2016 08:05
Workgroup #: WG594601	Analyst: DCM	Run Date: 12/13/2016 08:27
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: SC161213001.031
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	0.405		0.200	0.100

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW11S-120716	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/13/2016 08:05
Workgroup #: WG594601	Analyst: DCM	Run Date: 12/13/2016 08:30
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: SC161213001.034
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	0.230		0.200	0.100

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: MW30-120716	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/13/2016 08:05
Workgroup #: WG594601	Analyst: DCM	Run Date: 12/13/2016 08:31
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: SC161213001.035
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	0.448		0.200	0.100

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: SMARTCHEM
Client ID: PZ03-120716	Prep Method: 351.2	Prep Date: N/A
Matrix: Water	Analytical Method: 351.2	Cal Date: 12/13/2016 08:05
Workgroup #: WG594601	Analyst: DCM	Run Date: 12/13/2016 08:32
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: SC161213001.036
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Nitrogen, Total Kjeldahl	7727-37-9	0.696		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: 13-DEC-2016
 Analyst: DCM
 Analyst: NA
 Method: TKN
 Instrument: SC
 Curve Workgroup: NA
 Runlog ID: _____
 Analytical Workgroups: WG594601

Calibration/Linearity	12-13-2016
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.
HOLDING TIMES
 EQUIVALENT TO AFCEE FORM 9

Analytical Method: 351.2
 Login Number: L16120425

AAB#: WG594601

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
PZ06-120616	01	12/07/16					12/13/2016	5.7	28		12/13/16	5.7	28	
MW11S-120716	05	12/07/16					12/13/2016	5.9	28		12/13/16	5.9	28	
MW30-120716	09	12/07/16					12/13/2016	5.8	28		12/13/16	5.8	28	
PZ03-120716	19	12/07/16					12/13/2016	5.7	28		12/13/16	5.7	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5063069
 Report generated 12/14/2016 11:35



METHOD BLANK SUMMARY

Login Number: L16120425 Work Group: WG594601
 Blank File ID: SC161213001.042 Blank Sample ID: WG594601-01
 Prep Date: 12/13/16 08:38 Instrument ID: SMARTCHEM
 Analyzed Date: 12/13/16 08:38 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	WG594601-02	SC161213001.012	12/13/16 08:11	01
PZ06-120616	L16120425-01	SC161213001.031	12/13/16 08:27	01
MW11S-120716	L16120425-05	SC161213001.034	12/13/16 08:30	01
MW30-120716	L16120425-09	SC161213001.035	12/13/16 08:31	01
PZ03-120716	L16120425-19	SC161213001.036	12/13/16 08:32	01
DUP	WG594601-04	SC161213001.037	12/13/16 08:32	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5063070
 Report generated 12/14/2016 11:35



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 Prep Date: 12/13/16 08:38 Sample ID: WG594601-01
Instrument ID: SMARTCHEM Run Date: 12/13/16 08:38 Prep Method: 351.2
File ID: SC161213001.042 Analyst: DCM Method: 351.2
Workgroup (AAB#): WG594601 Matrix: Water Units: mg/L
Contract #: _____ Cal ID: SMARTC-13-DEC-16

Analytes	MDL	RL	Concentration	Dilution	Qualifier
Nitrogen, Total Kjeldahl	0.100	0.200	-0.183	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: 5063071
14-DEC-2016 11:35



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 Run Date: 12/13/2016 Sample ID: WG594601-02
Instrument ID: SMARTCHEM Run Time: 08:11 Prep Method: 351.2
File ID: SC161213001.012 Analyst: DCM Method: 351.2
Workgroup (AAB#): WG594601 Matrix: Water Units: mg/L
QC Key: WATERLOO Lot#: STD79020 Cal ID: SMARTC-13-DEC-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Nitrogen, Total Kjeldahl	1.00	1.01	101	90 - 110	

LCS - Modified 03/06/2008
PDF File ID: 5063072
Report generated: 12/14/2016 11:35



2.4.9.3 Raw Data

SMARTCHEM RUN LOG
(smartchem2, smartchem3)

WORKGROUP: WG594601

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 checked="" type="checkbox"/> Waste Container Check |
| <input type="checkbox"/> NO3 Reagent bottle connected / purged | |
| <input type="checkbox"/> NO3 pH adj to pH 5-9 | |
| Syringe filter lot # _____ | |
| pH paper Lot #: _____ | |

- 1) Workgroup _____
Plan # 24161213021
- 2) Workgroup _____
Plan # _____
- 3) Workgroup _____
Plan # _____
- Instrument: SC1 SC2

Analyte	1	2	3
	TKN		
	Dilution		
SC Prepared Curve			
Position			
1-1	ICV		
1-2	Blk		
1-3	LCS		
1-4	12-438-02		
1-5	05		
1-6	12-510-02	1ml/50	
1-7	05	1ml/50	
1-8	08	1ml/50	
1-9	12-578-01	1/5	
1-10	02		
1-11	03	1/5	
1-12	04		
1-13	05	1/5	
1-14	06		
1-15	12-579-01		
1-16	12-456-01		
1-17	02		
1-18	03		
1-19	04		
1-20	12-425-01		
1-21	05		
1-22	09		
2-1	19		
2-2	DUP 12-451001		
2-3	MS 12-450-01		

Position	Analyte	1	2	3
2-4	MS 12-438-02			
2-5				
2-6				
2-7	Blk			
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#122675



SMARTCHEM RUN LOG
(smartchem2, smartchem3)

WORKGROUP: WG594601

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
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	K3512 R20	RPT 38562
Curve Stock (SC made)		RPT 38624
NO2 STD		RPT 38624
ICV	500 Digest	
CCV	Log	
LCS		
MS	Dilution	

Comments: _____

Analyst: David Meryale

Date: 12/13/16

DCN#122675



TKN/Phosphorus Digestion Log

TKN WG: _____	Phos WG: _____
TKN Std: <u>Std 79382</u>	Phos Std: <u>Std 79382</u>
TKN CCV: <u>1/2 (Std 79382)</u>	Phos CCV: <u>1/2 (Std 79382)</u>
TKN ICV: <u>Std 79115</u>	Phos ICV: <u>Std 79202</u>
TKN LCS: <u>Std 79026</u>	Phos LCS: <u>Std 79329</u>

MS/MSD: Std 76885

Daily Dilution: 1/25 = 1

Block Digester Temperature: 380 °C

Digest Reagent: Refr 38642

	Sample	Volume	TKN Dilution	Phos Dilution		Sample	Volume	TKN Dilution	Phos Dilution
1	Std				26	12-425-19		✓	✓
2	Std				27	12-511-01			✓
3	IWT				28	12-445-02			✓
4	ICVP				29	DUP 12-450-01		✓	✓
5	L1ST				30	MS 12-450-01		✓	✓
6	LCSF				31	TMS 12-450-02		✓	✓
7	12-438-02		✓	✓	32	Blk			
8	C5		✓	✓	33				
9	12-540-02	1/50	✓		34				
10	C5	1/50	✓		35				
11	C8	1/50	✓		36				
12	12-578-01		✓		37				
13	C2		✓		38				
14	C3		✓		39				
15	C4		✓		40				
16	C5		✓		41				
17	C6		✓		42				
18	12-579-01		✓		43				
19	12-450-01		✓	✓	44				
20	C2		✓	✓	45				
21	C3		✓	✓	46				
22	C4		✓	✓	47				
23	12-425-01		✓	✓	48				
24	C5		✓	✓	49				
25	C9		✓	✓	50				

Analyst: David Merkle Date: 12/12/16

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	0.2424	0.00		7:58:28 AM
DIL-1	RBL	0.000	0.2478	0.00		7:58:46 AM
DIL-1	RBL	0.000	0.2413	0.00		8:00:16 AM
DIL-1	Std-1	0.000	0.0003	0.00		8:00:34 AM
SR5-1	Std-2	0.100	0.0172	0.00		8:02:04 AM
SR5-2	Std-3	0.250	0.0319	0.00		8:02:22 AM
SR5-3	Std-4	0.500	0.0628	0.00		8:03:52 AM
SR5-4	Std-5	1.000	0.1363	0.00		8:04:10 AM
SR5-5	Std-6	2.500	0.2921	0.00		8:05:40 AM
ST-1	Std-7	5.000	0.5805	0.00		8:05:58 AM
ST-3	1CCV (2.5 mg/L)	2.433	0.2867	97.33		8:07:28 AM
ST-2	2CCB (0 mg/L)	-0.124	-0.0081	0.00	INV,><,LL	8:07:46 AM
1	ICV	2.123	0.2509	0.00		8:09:16 AM
2	WG594601-01 BLK	✗-0.222	-0.0195	0.00	INV,><,LL	8:09:34 AM
3	WG594601-02 LCS	1.011	0.1228	0.00		8:11:04 AM
4	L16120438-02	1.535	0.1831	0.00		8:11:22 AM
5	L16120438-05	0.986	0.1199	0.00		8:12:52 AM
6	L16120540-02 (50)	2.148	0.2538	0.00		8:13:10 AM
7	L16120540-05 (50)	3.110	0.3647	0.00		8:14:40 AM
8	L16120540-08 (50)	1.660	0.1976	0.00		8:14:58 AM
9	L16120578-01 (5)	3.171	0.3717	0.00		8:16:28 AM
10	L16120578-02	0.442	0.0571	0.00		8:16:46 AM
ST-3	1CCV (2.5 mg/L)	2.438	0.2872	97.51		8:18:16 AM
ST-2	2CCB (0 mg/L)	-0.137	-0.0097	0.00	INV,><,LL	8:18:34 AM
11	L16120578-03 (5)	4.351	0.5077	0.00		8:20:04 AM
12	L16120578-04	0.426	0.0553	0.00		8:20:22 AM
13	L16120578-05 (5)	4.238	0.4947	0.00		8:21:52 AM
14	L16120578-06	0.431	0.0558	0.00		8:22:10 AM
15	L16120579-01	0.197	0.0289	0.00		8:23:40 AM
16	L16120456-01	0.242	0.0341	0.00		8:23:58 AM
17	L16120456-02	-0.089	-0.0041	0.00	INV,><,LL	8:25:29 AM
18	L16120456-03	1.169	0.1410	0.00		8:25:46 AM

Report Date :12/13/2016 Run Date :12/13/2016 Operator : SMARTCHEM1 Plan # :20161213001
 Plan Description : TKN-A1-DCM/12/13/2016

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

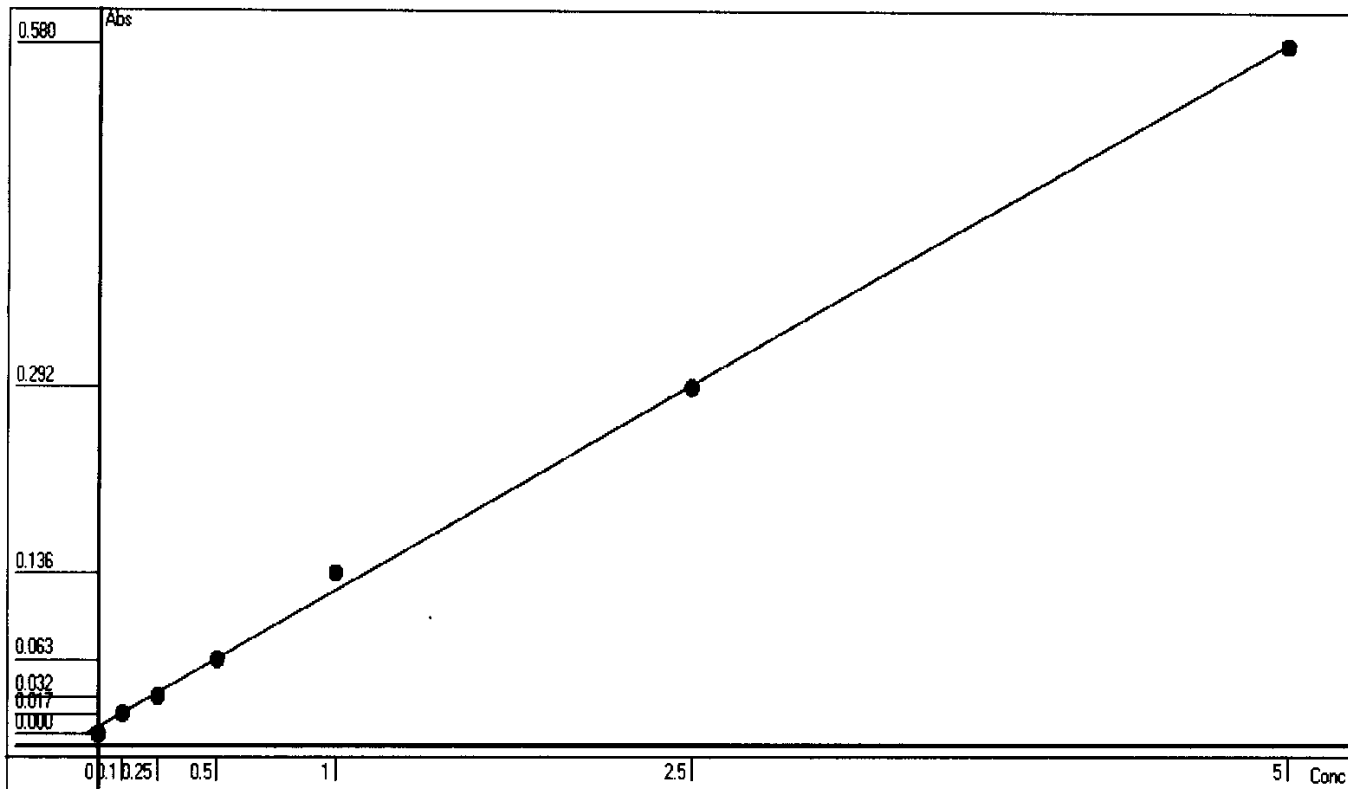
Smp#[/Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Flag	Analysis Time
19	L16120456-04	0.701	0.0869	0.00	EPL	8:27:17 AM
20	L16120425-01	0.405	0.0528	0.00		8:27:34 AM
ST-3	1CCV (2.5 mg/L)	2.436	0.2870	97.44		8:29:05 AM
ST-2	2CCB (0 mg/L)	-0.113	-0.0069	0.00	INV,><,LL	8:29:23 AM
21	L16120425-05	0.231	0.0328	0.00		8:30:53 AM
22	L16120425-09	0.448	0.0578	0.00		8:31:11 AM
23	L16120425-19	0.696	0.0864	0.00		8:32:41 AM
24	WG594601-04 DUP	-0.022	0.0036	0.00	LL	8:32:58 AM
25	WG594601-05 MS	1.005	0.1221	0.00	EPL	8:34:28 AM
26	WG594601-07 MS	1.041	0.1262	0.00		8:34:46 AM
27	ID 27	0.617	0.0772	0.00		8:36:17 AM
28	ID 28	1.057	0.1281	0.00		8:36:35 AM
29	ID 29 <i>ilk</i>	-0.183	-0.0149	0.00	INV,><,LL	8:38:05 AM
ST-3	1CCV (2.5 mg/L)	2.458	0.2895	98.31		8:38:22 AM
ST-2	2CCB (0 mg/L)	-0.102	-0.0055	0.00	INV,><,LL	8:39:53 AM
49	ID 49	-0.094	-0.0046	0.00	INV,><,LL	8:40:11 AM
50	ID 50	-0.041	0.0015	0.00	LL	8:41:41 AM
ST-3	1CCV (2.5 mg/L)	2.449	0.2885	97.96		8:41:59 AM
ST-2	2CCB (0 mg/L)	-0.116	-0.0072	0.00	INV,><,LL	8:43:29 AM

Report Date :12/13/2016 Run Date :12/13/2016 Operator : SMARTCHEM1 Plan # :20161213001
 Plan Description : TKN-A1-DCM/12/13/2016

Calibrant Report - WTKN -

Calib Lot #:010104 Exp Date:6/18/2020 User:MICROBAC

Plan # : 20161213001 Description : [TKN-A1-DCM/12/13/2016] Unit



Point	OD	Conc	Recalc Conc	% Error
1	0.0003	0	-0.0511	-5.11
2	0.0172	0.1	0.0955	-4.50
3	0.0318	0.25	0.2222	-11.12
4	0.0627	0.5	0.4903	-1.94
5	0.1363	1	1.1289	12.89
6	0.2921	2.5	2.4806	-0.78
7	0.5804	5	4.9820	-0.36

Conc = +8.6762*Abso -0.0537 R²=0.9990

RBL
0.2419
0

Report Date 12/13/2016 Run Date 12/13/2016

2.4 General Chemistry Data

2.4.10 Total Organic Carbon Data

2.4.10.1 Summary Data



Login Number: L16120425
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: 120663
Approved By: Deanna Hesson

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

Certificate of Analysis

Sample #: L16120425-01	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: PZ06-120616	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 21:35
Collect Date: 12/07/2016 15:00	Dilution: 1	File ID: TC12152016.049
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	2.93		1.00	0.500

Sample #: L16120425-05	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: MW11S-120716	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 22:10
Collect Date: 12/07/2016 10:18	Dilution: 1	File ID: TC12152016.052
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	3.42		1.00	0.500

Sample #: L16120425-09	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: MW30-120716	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 22:23
Collect Date: 12/07/2016 14:06	Dilution: 1	File ID: TC12152016.053
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	7.41		1.00	0.500

Sample #: L16120425-19	PrePrep Method: N/A	Instrument: TOC-VWP
Client ID: PZ03-120716	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 22:38
Collect Date: 12/07/2016 15:10	Dilution: 1	File ID: TC12152016.054
Sample Tag: 01	Units: mg/L	

Analyte	CAS #	Result	Qual	RL	MDL
Total Organic Carbon	TOC	7.59		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: L16120425

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
PZ06-120616	01	12/07/16					12/15/2016	8.3	28		12/15/16	8.3	28	
MW11S-120716	05	12/07/16					12/15/2016	8.5	28		12/15/16	8.5	28	
MW30-120716	09	12/07/16					12/15/2016	8.3	28		12/15/16	8.3	28	
PZ03-120716	19	12/07/16					12/15/2016	8.3	28		12/15/16	8.3	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
 PDF File ID: 5072282
 Report generated 12/19/2016 13:30



METHOD BLANK SUMMARY

Login Number: L16120425 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
PZ06-120616	L16120425-01	TC12152016.049	12/15/16 21:35	01
MW11S-120716	L16120425-05	TC12152016.052	12/15/16 22:10	01
MW30-120716	L16120425-09	TC12152016.053	12/15/16 22:23	01
PZ03-120716	L16120425-19	TC12152016.054	12/15/16 22:38	01
DUP	WG595004-05	TC12152016.060	12/15/16 23:55	01

Report Name: BLANK_SUMMARY
 PDF File ID: 5072283
 Report generated 12/19/2016 13:30



Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16120425 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: 5072284
19-DEC-2016 13:30



Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16120425 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: 5072285
Report generated: 12/19/2016 13:30



2.4.10.3 Raw Data

Total Organic Carbon

MAKE DAILY

CCV (TOC): Std 79381
(5/200)(1000) = 25mg/L

LCS (TOC): Std 77870
(5/200)(1000) = 25mg/L

CCV (TIC): Std 78236
(5/200)(1000) = 25mg/L

MS (TOC): Std 77870
0.41000
40 = 10

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

WG _____ Instrument: Shimadza TOC-VWP/ASI

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

Position	Sample ID	Dilution
1	TIC	
2	TOC/TIC	
3	CCV	
4	Blk	
5	LCS	
6	LCS/DUP	
7	12-732-C2	
8	04	
9	12-734-C1	
10	02	
11	12-735-C1	
12	02	
13	03	
14	CCV	
15	CCB	
16	12-735-04	
17	09	
18	06	
19	07	
20	12-750-C1	
21	02	
22	12-800-C1	
23	12-590-35	
24	36	
25	37	

Position	Sample ID	Dilution
26	CCV	
27	CCB	
28	12-590-38	
29	39	
30	40	
31	DUP 12-590-41	40 dup
32	MS 12-590-41	40 replicate
33	Blk	
34	LCS	
35	LCS/DUP	
36	12-590-41	
37	42	
38	CCV	
39	CCB	
40	12-715-C1	
41	02	1/2
42	12-352-C1	1/5
43	07	
44	15	
45	12-692-C1	1/25
46	12-762-C1	
47	02	
48	12-790-C1	
49	12-425-C1	
50	CCV	

Position	Sample ID	Dilution
51	CCB	
52	12-425-05	
53	09	
54	19	
55	12-521-C1	
56	03	
57	05	
58	07	1/100
59	09	1/25
60	DUP 12-590-41	
61	MS 12-590-41	
62	CCV	
63	CCB	
64	CCV	
65	CCB	
66	12-352-C1	1/5
67	CCV	
68	CCB	
69		
70		
71		
72		
73		
74		
75		

Analyst: Daniel Horschke 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:4.063mg/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:5.782mg/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:17.63mg/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

735
dcm
12/15/16

12/16/2016 9:26:21 AM

1/2

	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

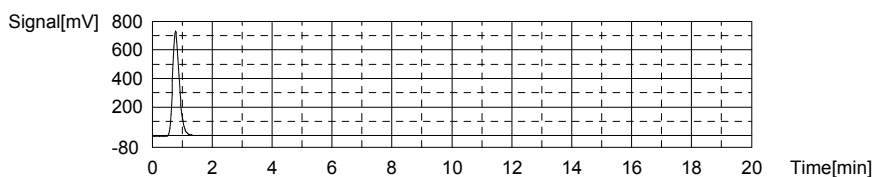
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.899mg/L TC:29.01mg/L IC:25.12mg/L

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

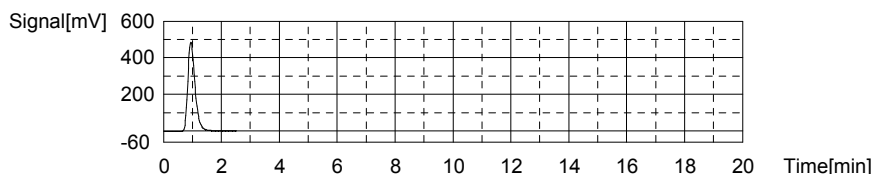
Mean Area: 1135
 Mean Conc.: 29.01mg/L



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

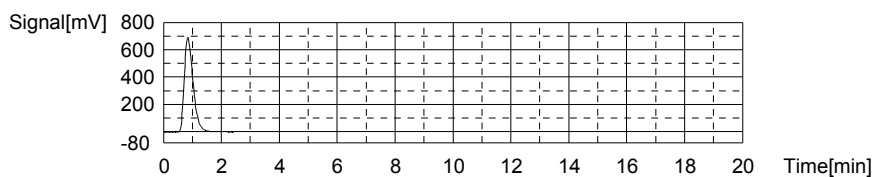
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:28.65mg/L TC:37.31mg/L IC:8.658mg/L

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

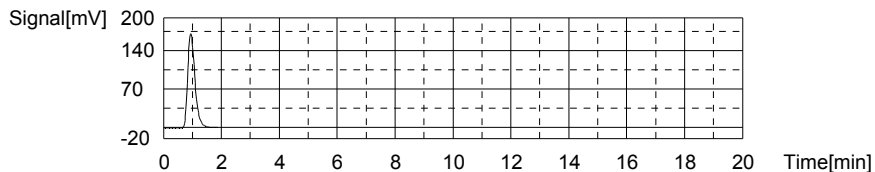
Mean Area 1458
Mean Conc. 37.31mg/L



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

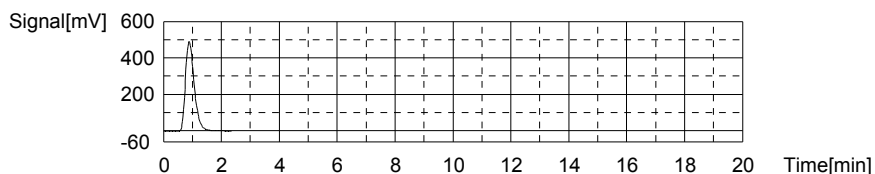
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.41mg/L TC:26.45mg/L IC:0.03974mg/L

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

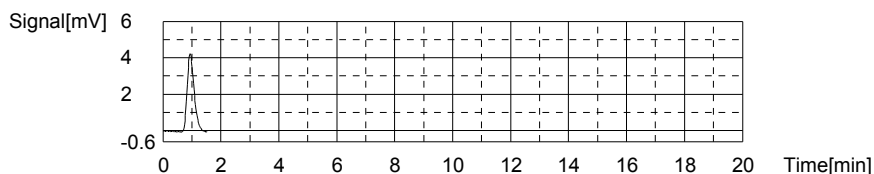
Mean Area 1035
Mean Conc. 26.45mg/L



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

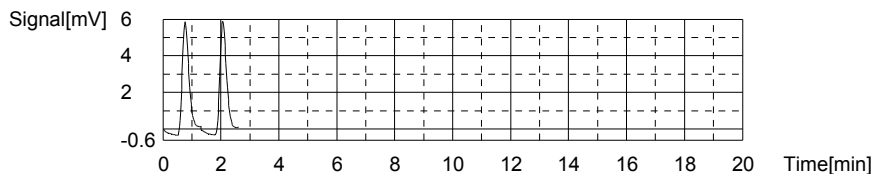
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	!!Error!! TOC:-0.00103mg/L TC:0.1164mg/L IC:0.1175mg/L

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 3	12/15/2016 9:02:46 AM
2	9.457	0.1157mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 9:06:17 AM

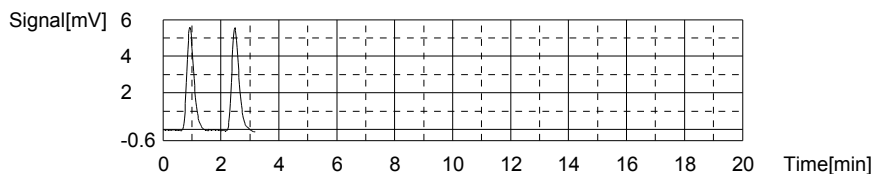
Mean Area 9.488
 Mean Conc. 0.1164mg/L



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 0	12/15/2016 9:10:18 AM
2	10.01	0.1222mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	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

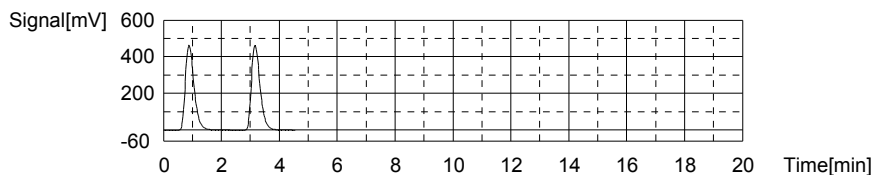
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:24.74mg/L TC:24.78mg/L IC:0.03631mg/L

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_3	12/15/2016 9:22:06 AM
2	968.0	24.73mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 9:26:37 AM

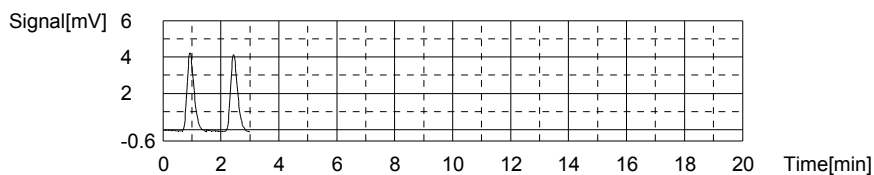
Mean Area 969.9
Mean Conc. 24.78mg/L



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_0	12/15/2016 9:30:59 AM
2	7.063	0.03399mg/L	500uL	1		TICURVE-10-30-2015.2015_10_31_11_55_0	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:

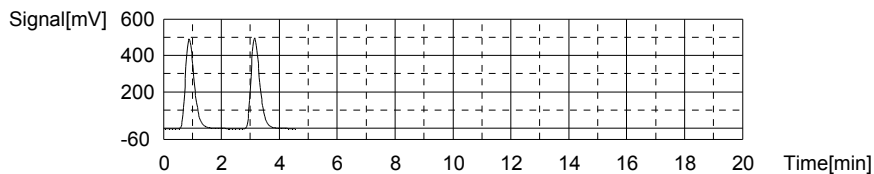
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.67mg/L TC:26.69mg/L IC:0.01660mg/L

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_3	12/15/2016 9:51:16 AM
2	1047	26.75mg/L	500uL	1		TCCURVE-10-30-2015.2015_10_30_16_06_3	12/15/2016 9:55:50 AM

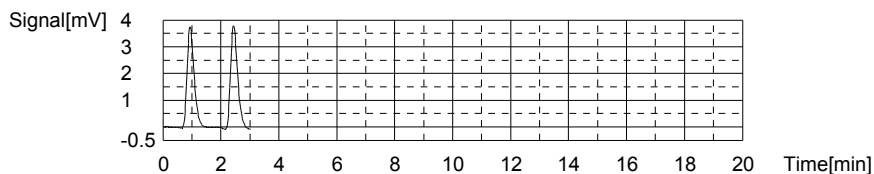
Mean Area 1045
Mean Conc. 26.69mg/L



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

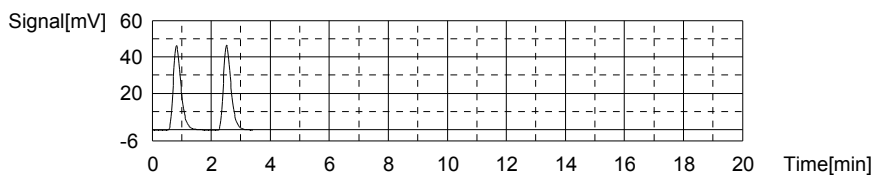
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.810mg/L TC:2.044mg/L IC:0.2350mg/L

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

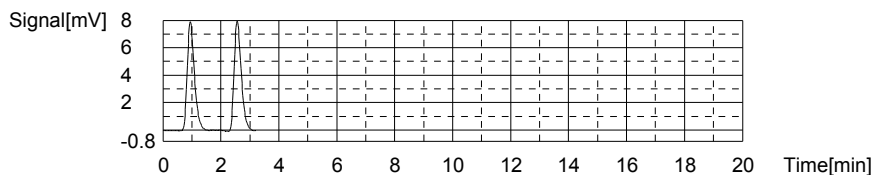
Mean Area 84.58
 Mean Conc. 2.044mg/L



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:

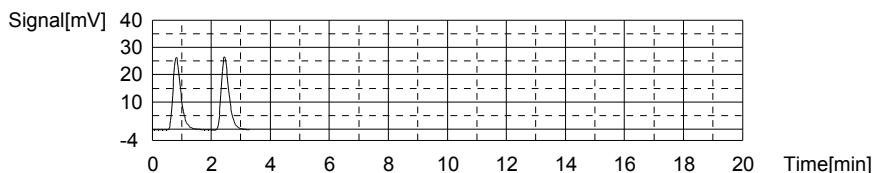
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.9352mg/L TC:1.124mg/L IC:0.1884mg/L

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 3	12/15/2016 10:31:05 AM
2	48.95	1.130mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 10:35:00 AM

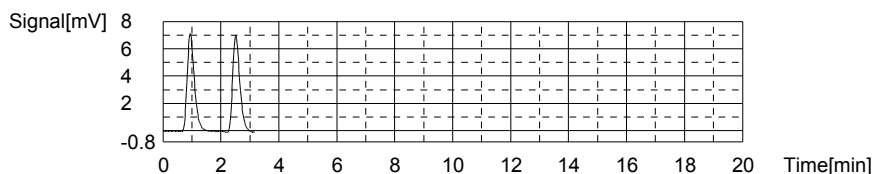
Mean Area 48.72
 Mean Conc. 1.124mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.32	0.1913mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	12/15/2016 10:39:23 AM
2	12.13	0.1856mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	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:

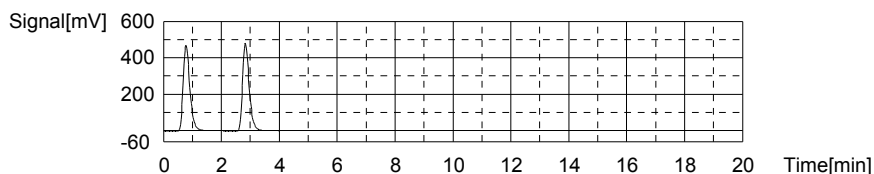
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.081mg/L TC:19.49mg/L IC:14.41mg/L

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 3	12/15/2016 10:51:03 AM
2	771.8	19.69mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 10:55:14 AM

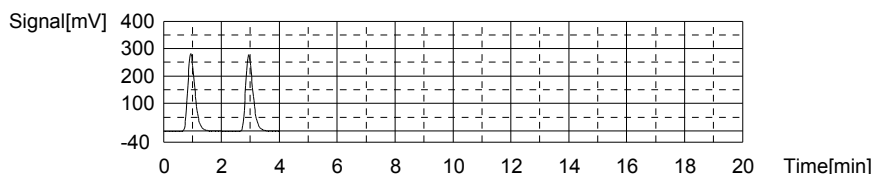
Mean Area 764.1
Mean Conc. 19.49mg/L



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

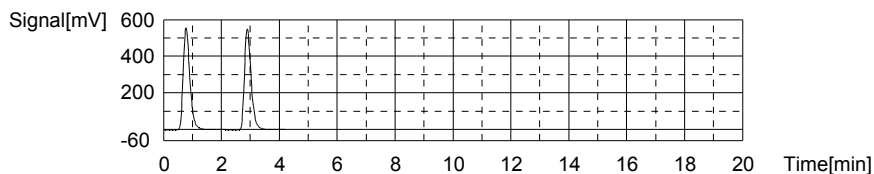
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.607mg/L TC:22.59mg/L IC:14.98mg/L

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

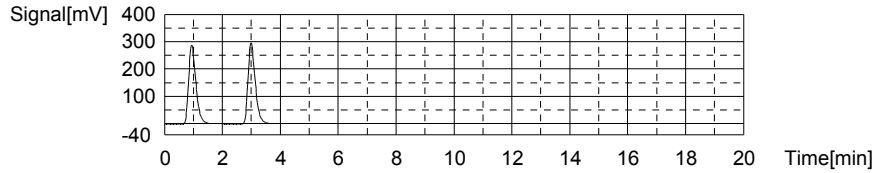
Mean Area 884.7
Mean Conc. 22.59mg/L



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

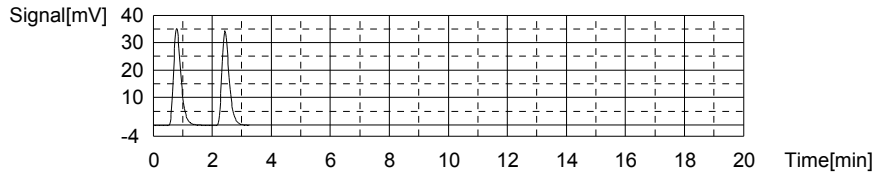
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.8827mg/L TC:1.421mg/L IC:0.5385mg/L

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

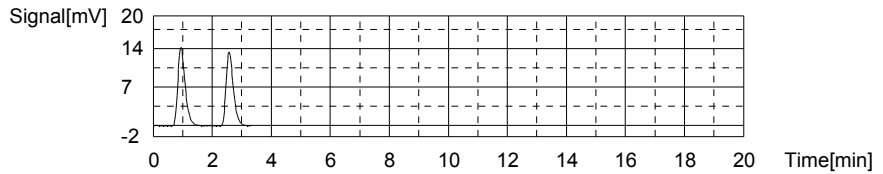
Mean Area 60.31
 Mean Conc. 1.421mg/L



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

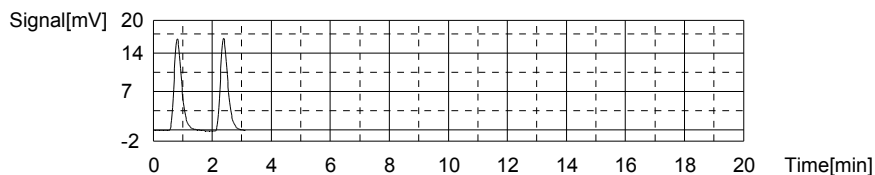
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.5955mg/L TC:0.6367mg/L IC:0.04119mg/L

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

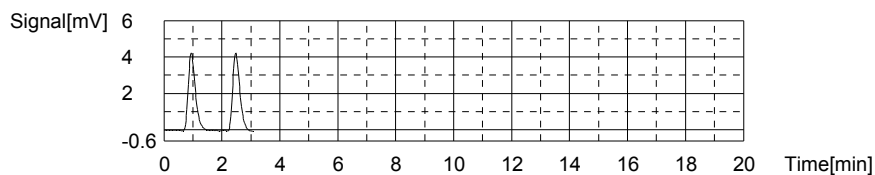
Mean Area 29.75
Mean Conc. 0.6367mg/L



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

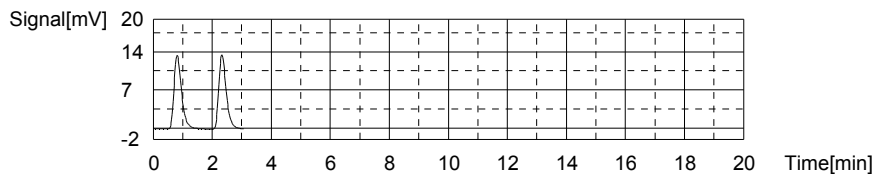
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4522mg/L TC:0.4834mg/L IC:0.03121mg/L

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

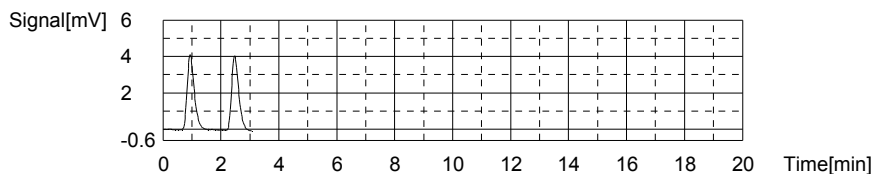
Mean Area 23.78
Mean Conc. 0.4834mg/L



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

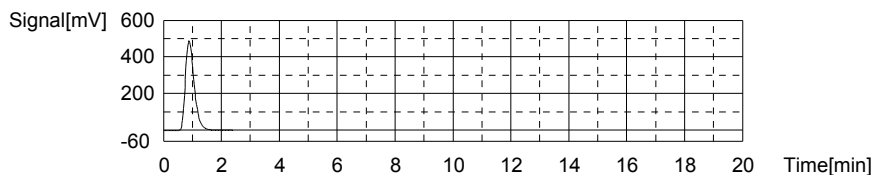
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.46mg/L TC:26.50mg/L IC:0.03570mg/L

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

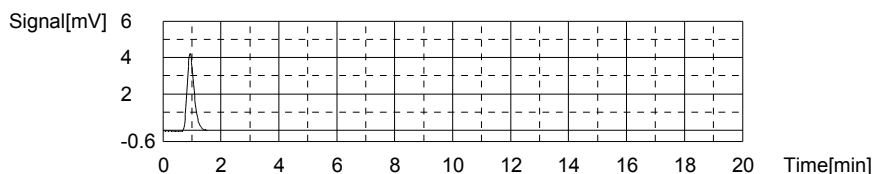
Mean Area 1037
 Mean Conc. 26.50mg/L



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

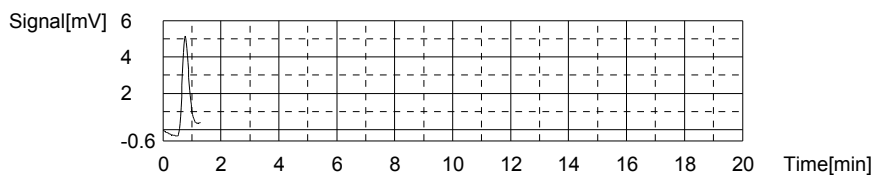
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.03220mg/L TC:0.08391mg/L IC:0.05171mg/L

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

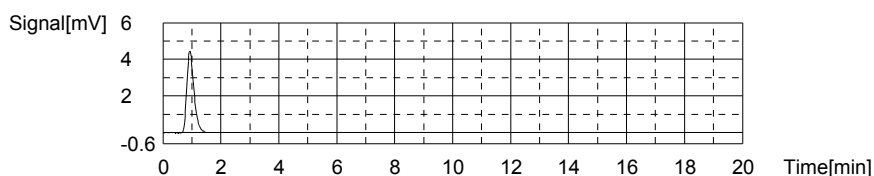
Mean Area 8.220
Mean Conc. 0.08391mg/L



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

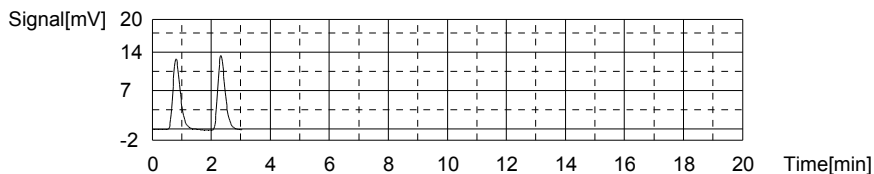
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4271mg/L TC:0.4656mg/L IC:0.03845mg/L

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

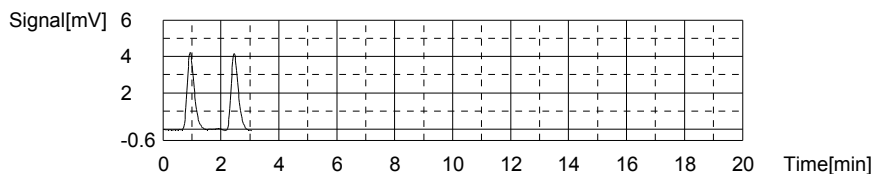
Mean Area 23.09
Mean Conc. 0.4656mg/L



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

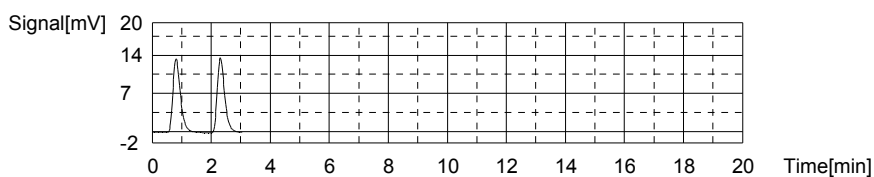
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4515mg/L TC:0.4817mg/L IC:0.03020mg/L

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

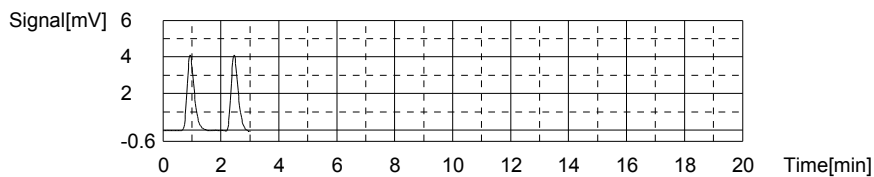
Mean Area 23.72
 Mean Conc. 0.4817mg/L



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:

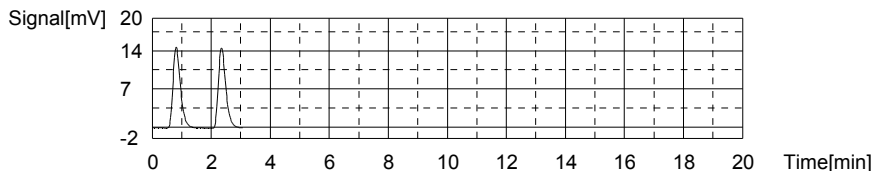
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4970mg/L TC:0.5364mg/L IC:0.03944mg/L

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

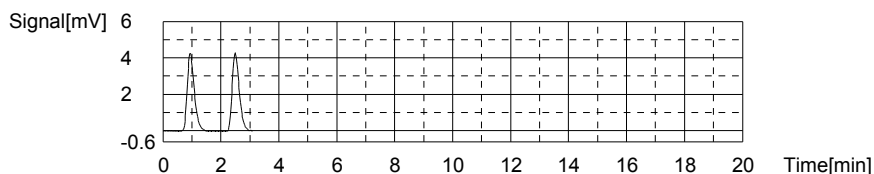
Mean Area 25.85
 Mean Conc. 0.5364mg/L



Anal.: IC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	7.247	0.03950mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 01	12/15/2016 1:39:22 PM
2	7.243	0.03938mg/L	500uL	1		TICCURVE-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:

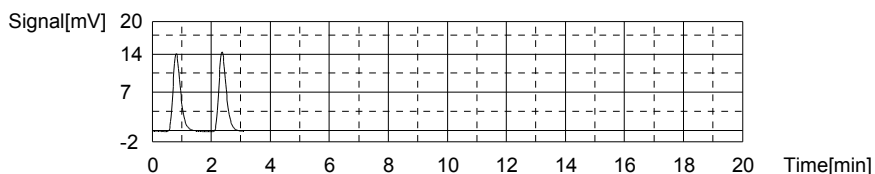
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4800mg/L TC:0.5254mg/L IC:0.04535mg/L

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

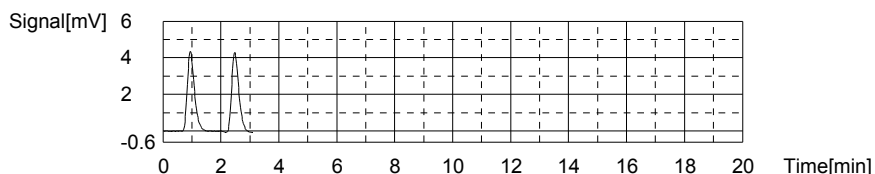
Mean Area 25.41
Mean Conc. 0.5254mg/L



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

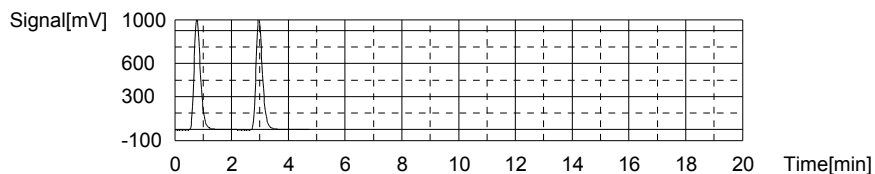
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:8.718mg/L TC:40.93mg/L IC:32.21mg/L

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

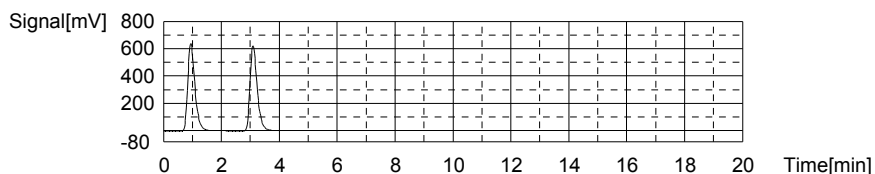
Mean Area 1599
Mean Conc. 40.93mg/L



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

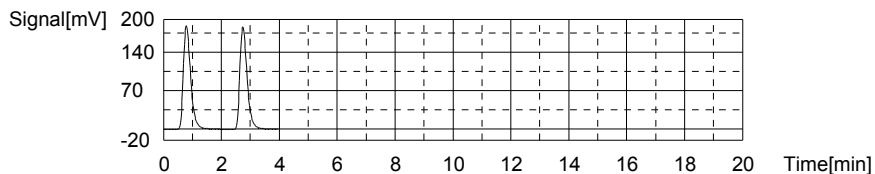
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.063mg/L TC:8.296mg/L IC:4.233mg/L

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 3	12/15/2016 2:33:55 PM
2	327.2	8.274mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 2:38:11 PM

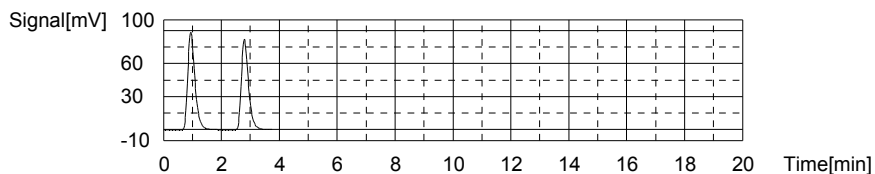
Mean Area 328.1
 Mean Conc. 8.296mg/L



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 0	12/15/2016 2:42:59 PM
2	142.0	4.071mg/L	500uL	1		TICCURVE-10-30-2015.2015 10 31 11 55 0	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

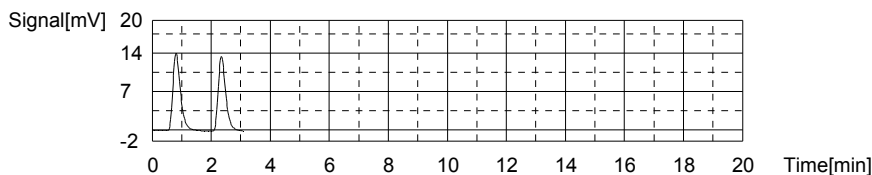
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.4465mg/L TC:0.4979mg/L IC:0.05147mg/L

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

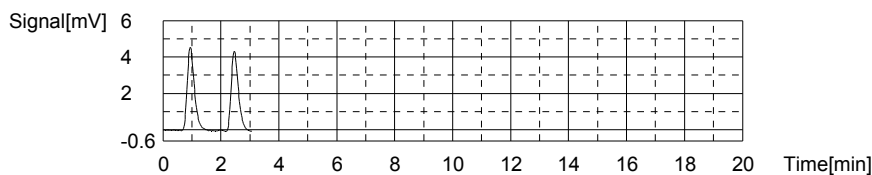
Mean Area 24.34
Mean Conc. 0.4979mg/L



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

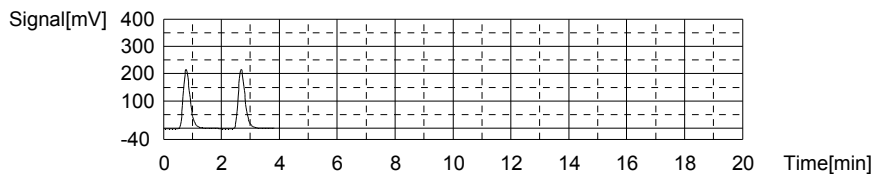
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.700mg/L TC:9.049mg/L IC:6.349mg/L

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

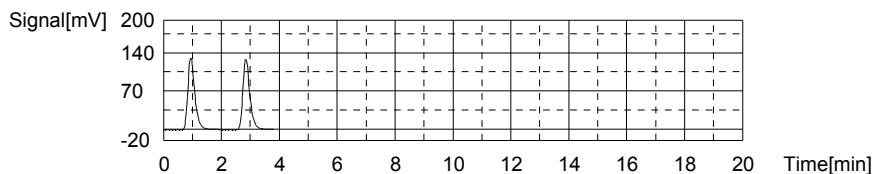
Mean Area 357.4
Mean Conc. 9.049mg/L



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

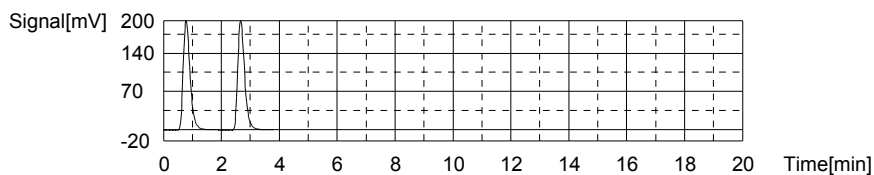
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.715mg/L TC:8.369mg/L IC:5.654mg/L

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

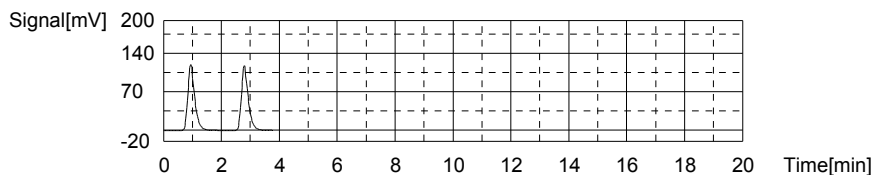
Mean Area 330.9
Mean Conc. 8.369mg/L



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:

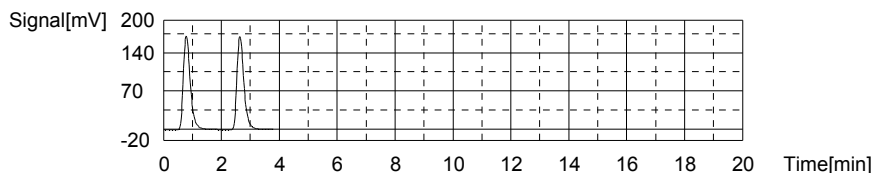
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.862mg/L TC:7.226mg/L IC:4.364mg/L

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 3	12/15/2016 3:56:02 PM
2	287.1	7.244mg/L	500uL	1		TCCURVE-10-30-2015.2015 10 30 16 06 3	12/15/2016 4:00:19 PM

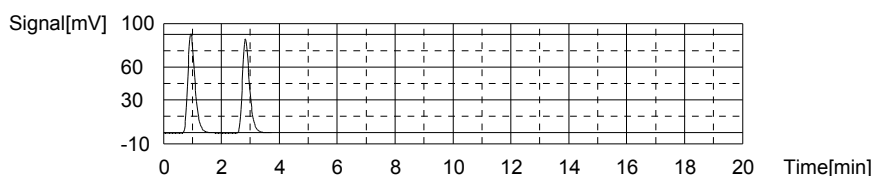
Mean Area 286.4
 Mean Conc. 7.226mg/L



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 0	12/15/2016 4:05:03 PM
2	147.6	4.239mg/L	500uL	1		TICURVE-10-30-2015.2015 10 31 11 55 0	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:

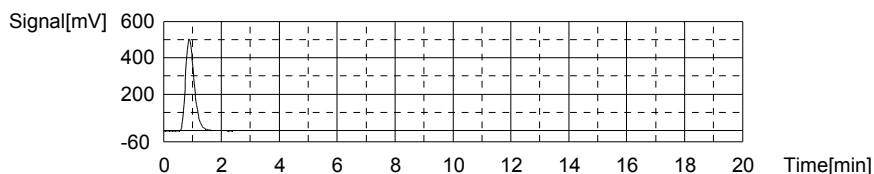
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.92mg/L TC:27.01mg/L IC:0.08863mg/L

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 3	12/15/2016 4:17:25 PM

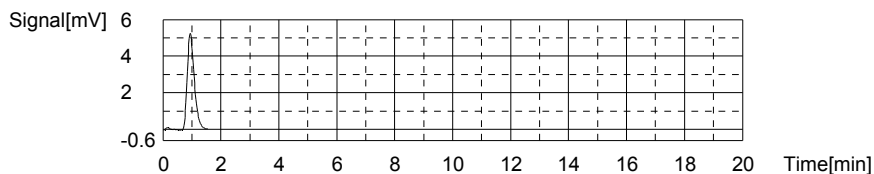
Mean Area 1057
Mean Conc. 27.01mg/L



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

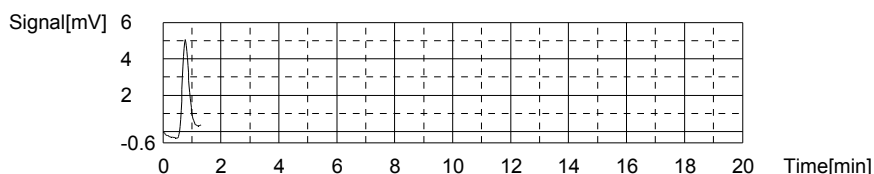
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02460mg/L TC:0.08098mg/L IC:0.05637mg/L

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

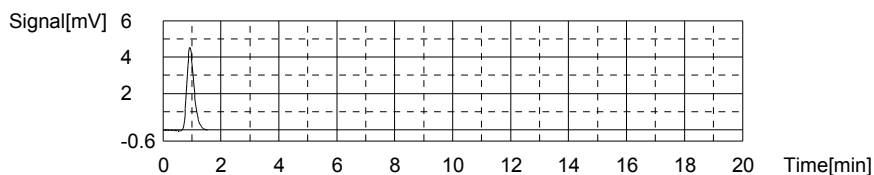
Mean Area 8.106
Mean Conc. 0.08098mg/L



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:

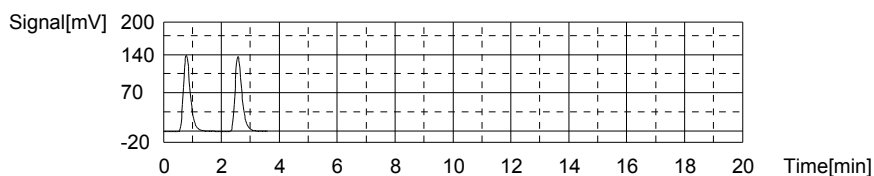
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.617mg/L TC:5.782mg/L IC:3.165mg/L

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

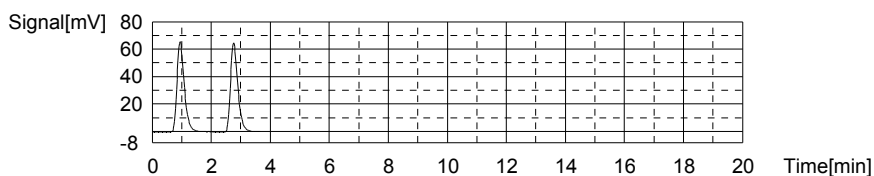
Mean Area 230.2
 Mean Conc. 5.782mg/L



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:

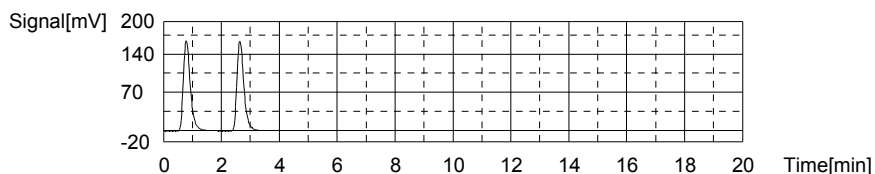
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.788mg/L TC:6.977mg/L IC:4.189mg/L

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

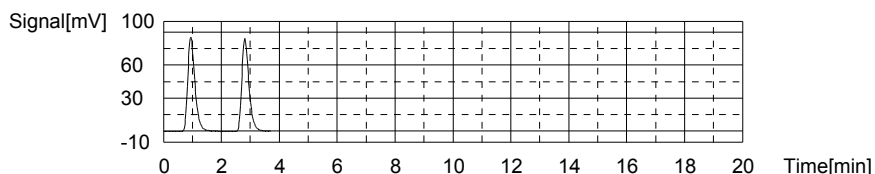
Mean Area 276.7
Mean Conc. 6.977mg/L



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

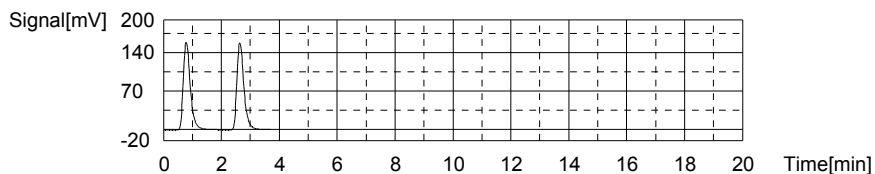
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.903mg/L TC:6.727mg/L IC:3.824mg/L

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

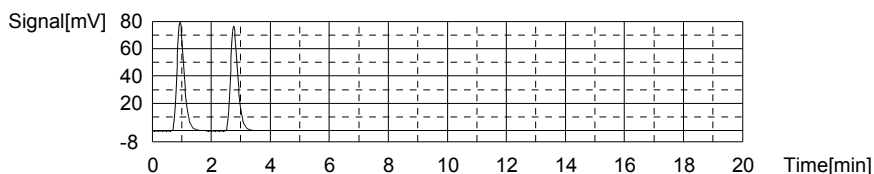
Mean Area 267.0
Mean Conc. 6.727mg/L



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

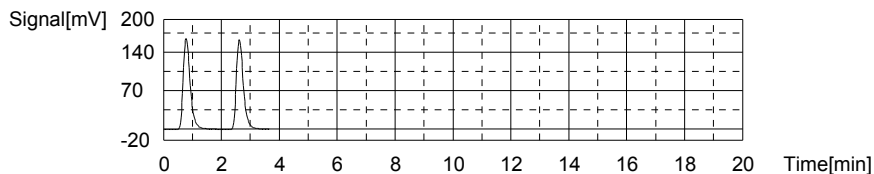
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.864mg/L TC:6.963mg/L IC:4.100mg/L

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

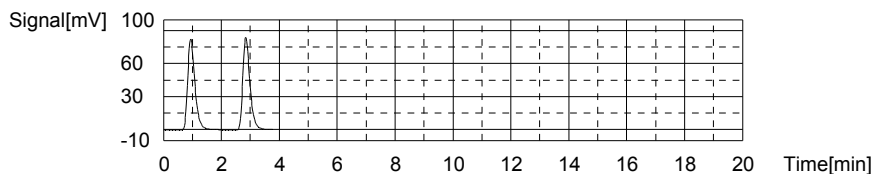
Mean Area 276.1
 Mean Conc. 6.963mg/L



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

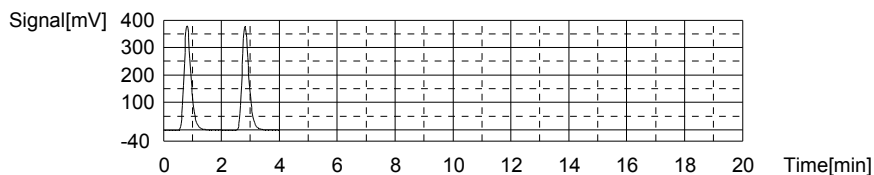
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:14.73mg/L TC:16.18mg/L IC:1.453mg/L

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

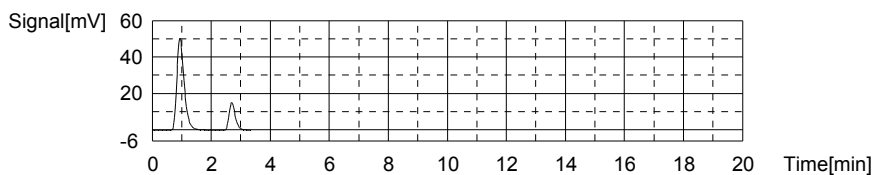
Mean Area 635.3
Mean Conc. 16.18mg/L



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

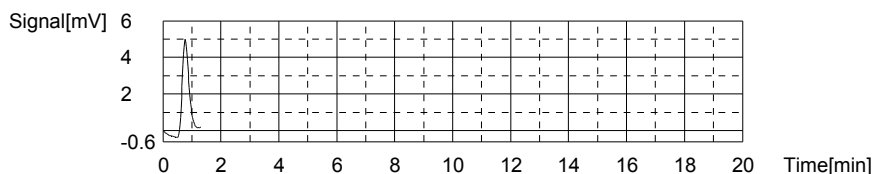
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02137mg/L TC:0.08229mg/L IC:0.06092mg/L

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

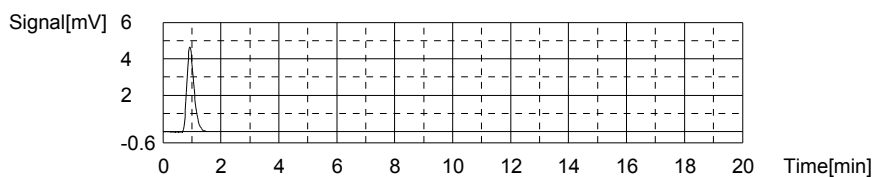
Mean Area 8.157
Mean Conc. 0.08229mg/L



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

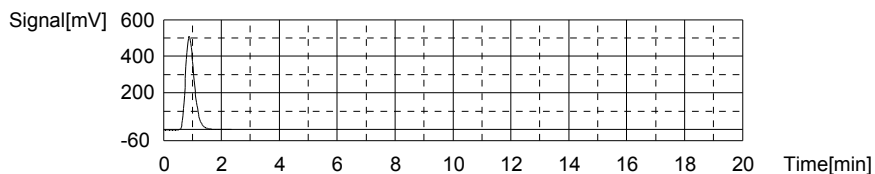
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.29mg/L TC:27.37mg/L IC:0.08163mg/L

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

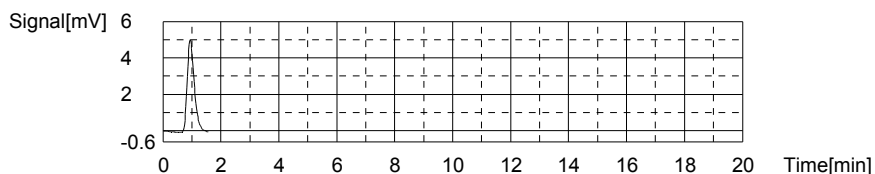
Mean Area 1071
 Mean Conc. 27.37mg/L



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

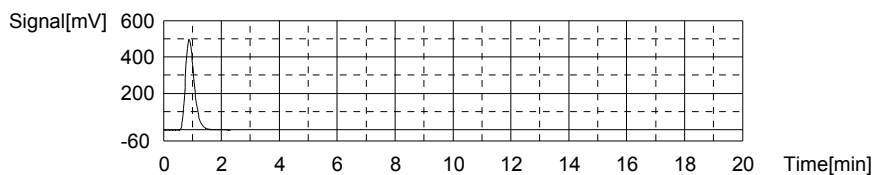
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.86mg/L TC:26.93mg/L IC:0.07759mg/L

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

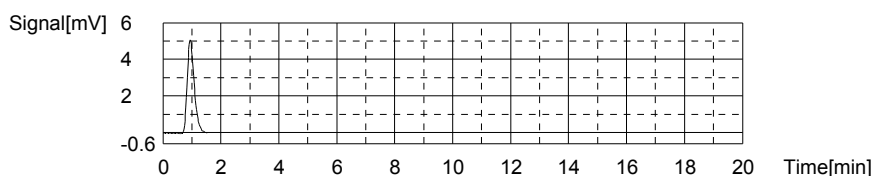
Mean Area 1054
Mean Conc. 26.93mg/L



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

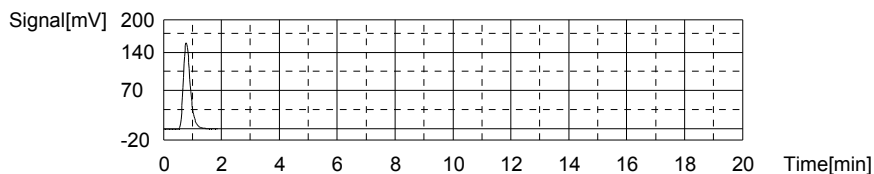
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.746mg/L TC:6.697mg/L IC:3.951mg/L

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

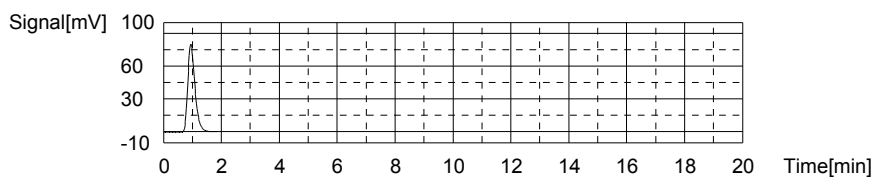
Mean Area 265.8
Mean Conc. 6.697mg/L



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

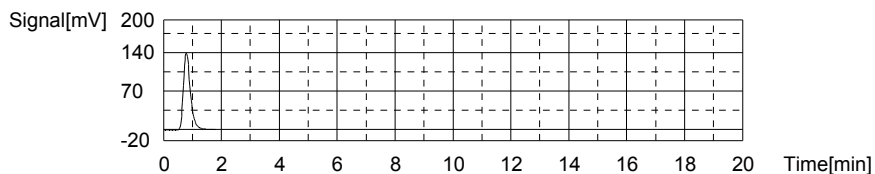
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.565mg/L TC:5.876mg/L IC:3.311mg/L

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

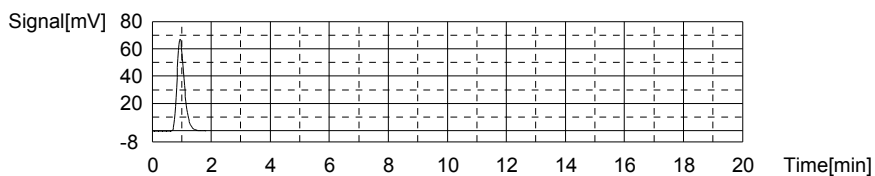
Mean Area 233.8
Mean Conc. 5.876mg/L



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

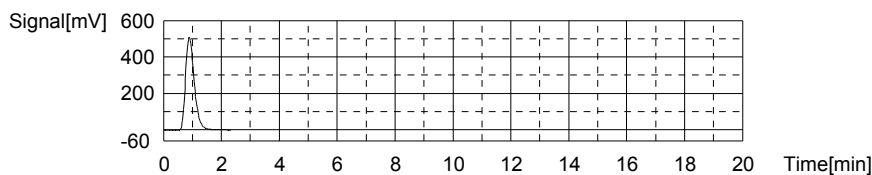
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.13mg/L TC:27.22mg/L IC:0.08964mg/L

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

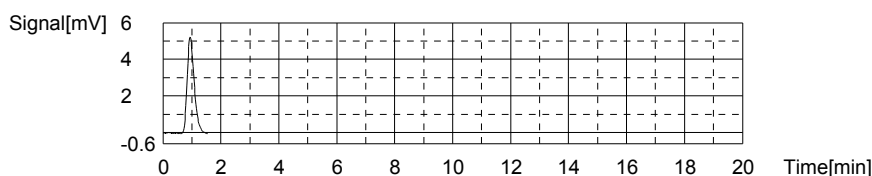
Mean Area 1065
Mean Conc. 27.22mg/L



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

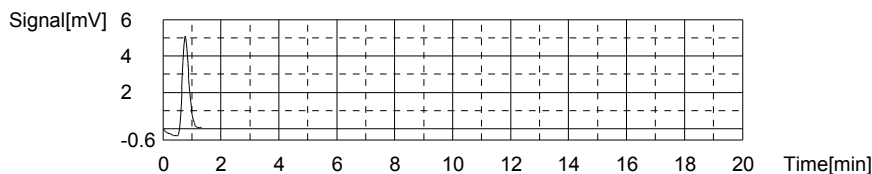
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02425mg/L TC:0.09071mg/L IC:0.06646mg/L

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

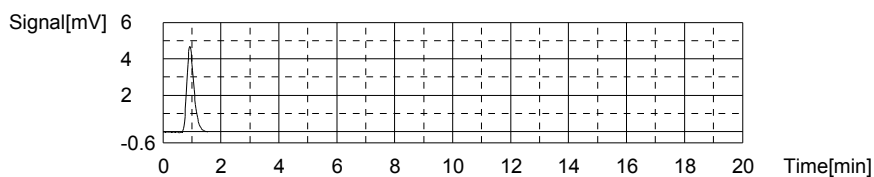
Mean Area 8.485
Mean Conc. 0.09071mg/L



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

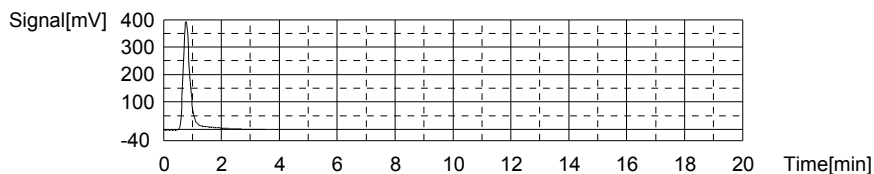
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:4.822mg/L TC:17.63mg/L IC:12.81mg/L

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

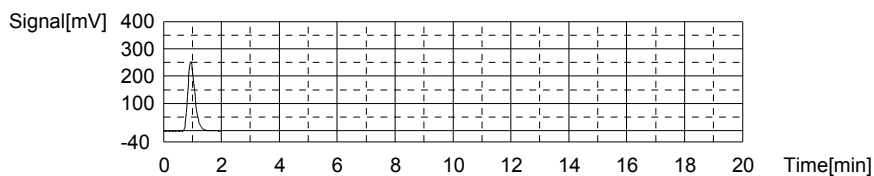
Mean Area 691.7
 Mean Conc. 17.63mg/L



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

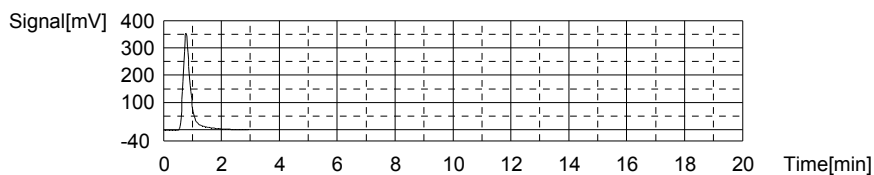
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:5.132mg/L TC:15.88mg/L IC:10.75mg/L

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

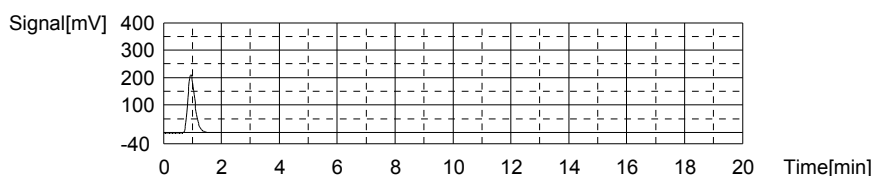
Mean Area 623.6
Mean Conc. 15.88mg/L



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

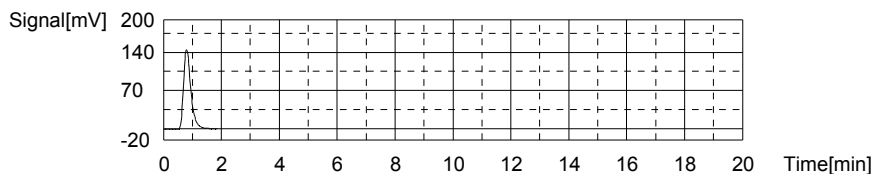
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.544mg/L TC:6.415mg/L IC:2.871mg/L

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

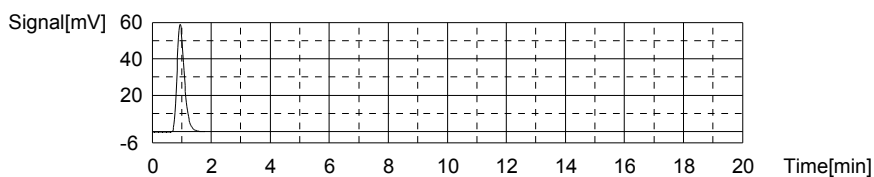
Mean Area 254.8
Mean Conc. 6.415mg/L



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

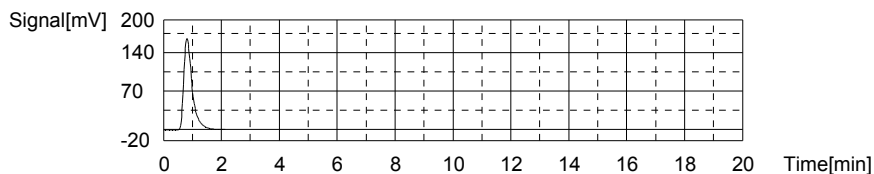
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:6.016mg/L TC:8.464mg/L IC:2.448mg/L

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

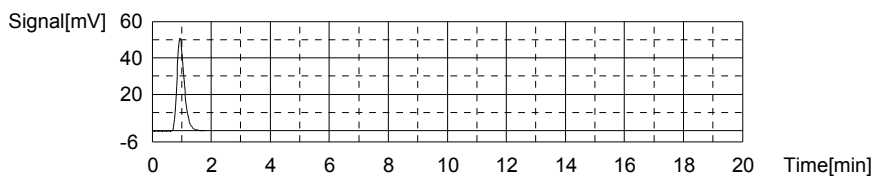
Mean Area 334.6
 Mean Conc. 8.464mg/L



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

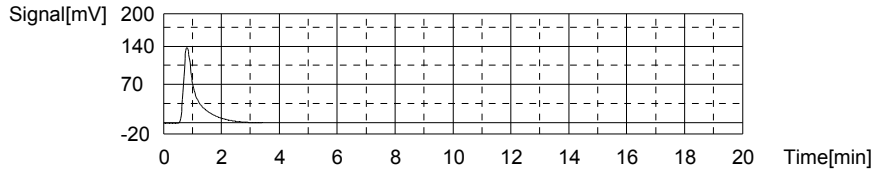
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:8.205mg/L TC:10.54mg/L IC:2.331mg/L

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

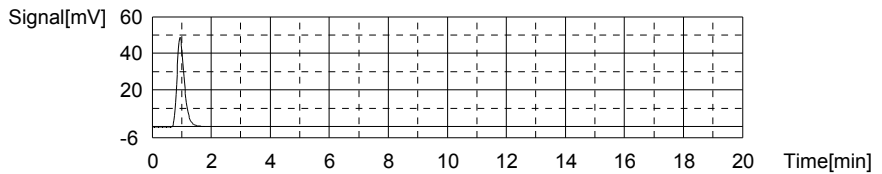
Mean Area 415.3
Mean Conc. 10.54mg/L



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

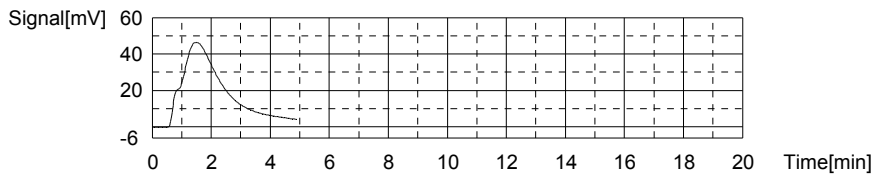
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:10.72mg/L TC:10.92mg/L IC:0.1997mg/L

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

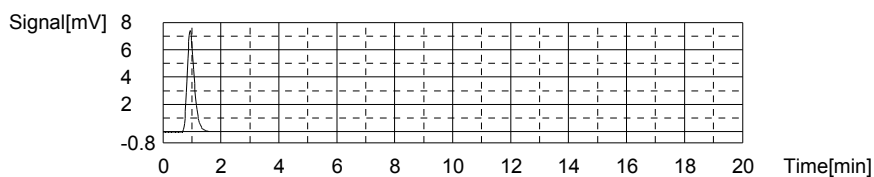
Mean Area 430.3
Mean Conc. 10.92mg/L



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

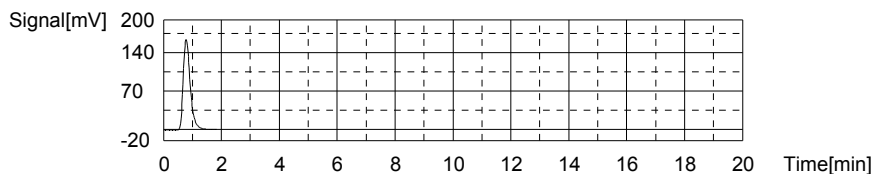
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.287mg/L TC:6.939mg/L IC:4.652mg/L

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

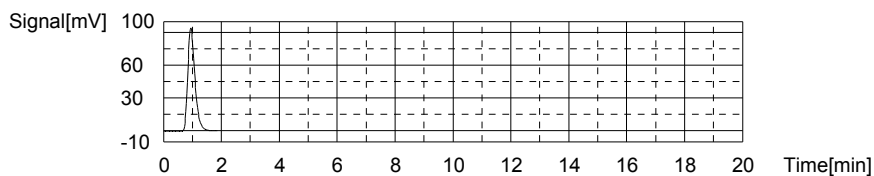
Mean Area 275.2
 Mean Conc. 6.939mg/L



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

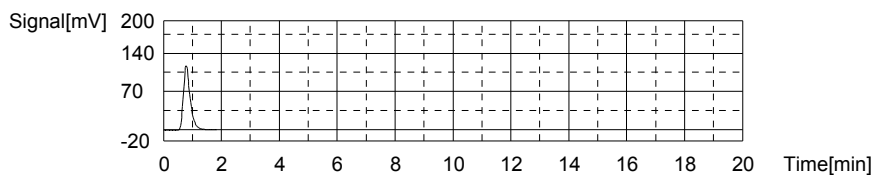
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.118mg/L TC:4.836mg/L IC:2.718mg/L

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

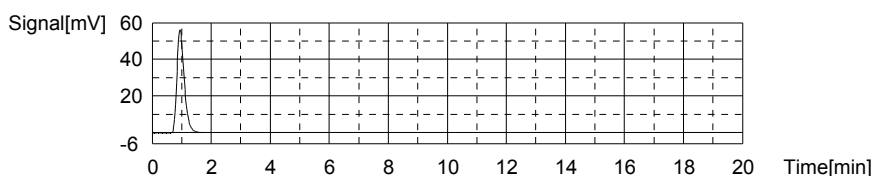
Mean Area 193.3
Mean Conc. 4.836mg/L



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

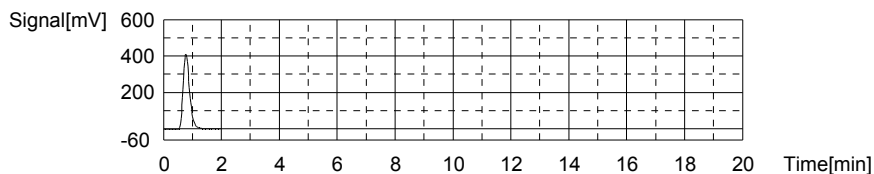
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.583mg/L TC:16.41mg/L IC:12.82mg/L

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

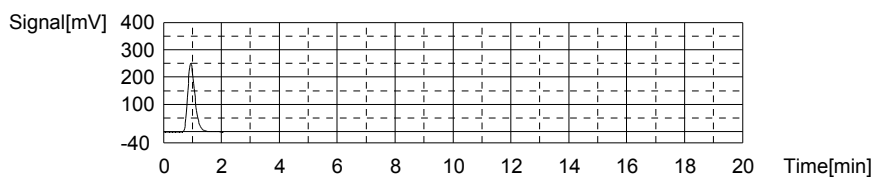
Mean Area 643.9
Mean Conc. 16.41mg/L



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	012/15/2016 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

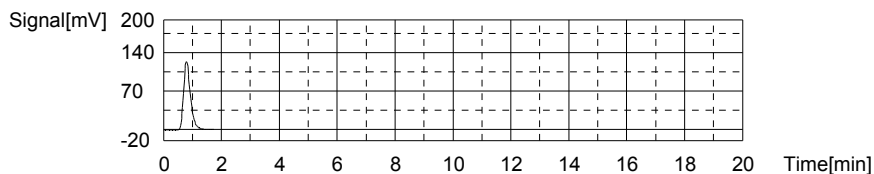
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.927mg/L TC:5.108mg/L IC:2.181mg/L

1. Det

Anal.: TC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	203.9	5.108mg/L	500uL	1		TICCURVE-10-30-2015.2015_10_30_16_06_31	12/15/2016 9:35:42 PM

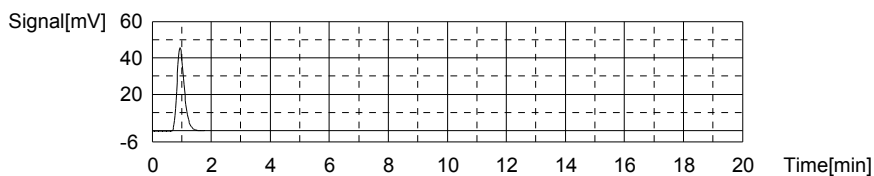
Mean Area 203.9
Mean Conc. 5.108mg/L



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	012/15/2016 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

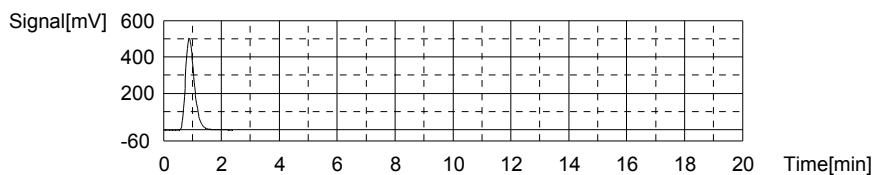
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.13mg/L TC:27.22mg/L IC:0.08602mg/L

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

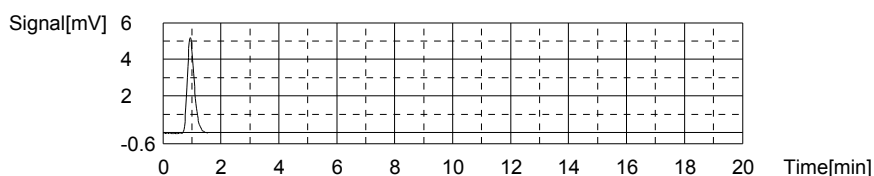
Mean Area 1065
Mean Conc. 27.22mg/L



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

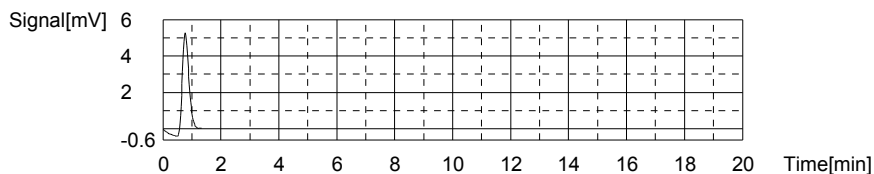
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02210mg/L TC:0.09846mg/L IC:0.07636mg/L

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

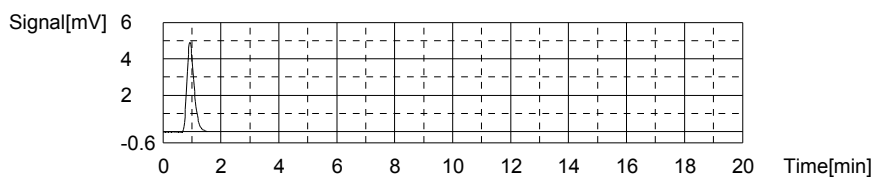
Mean Area 8.787
Mean Conc. 0.09846mg/L



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

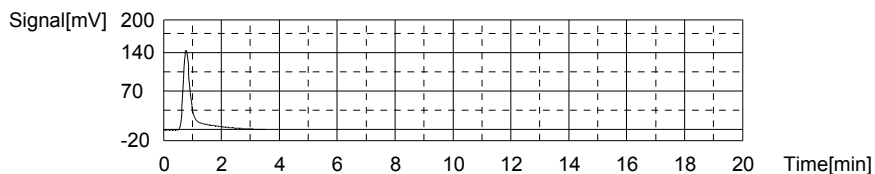
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:3.420mg/L TC:7.670mg/L IC:4.251mg/L

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_31	12/15/2016 10:10:31 PM

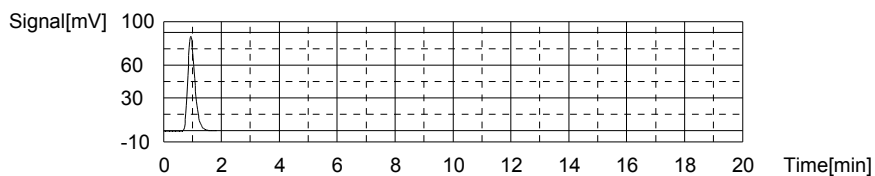
Mean Area 303.7
 Mean Conc. 7.670mg/L



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

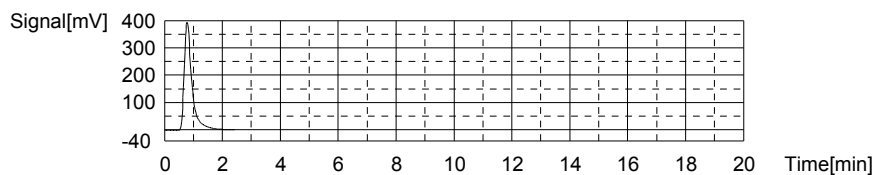
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.406mg/L TC:18.53mg/L IC:11.12mg/L

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

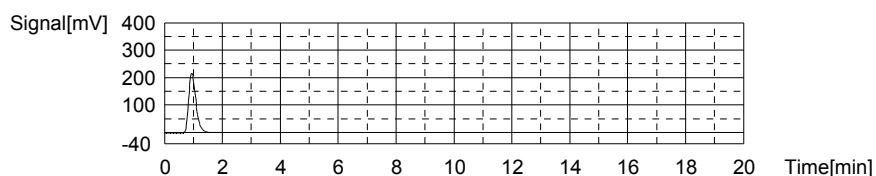
Mean Area 726.5
Mean Conc. 18.53mg/L



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

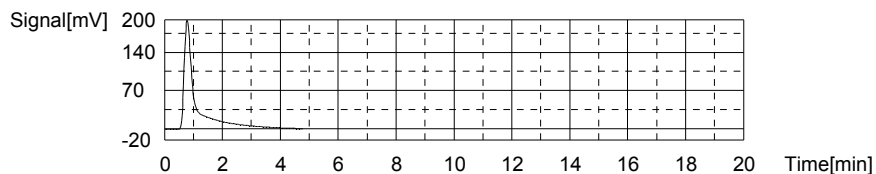
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.591mg/L TC:13.52mg/L IC:5.926mg/L

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

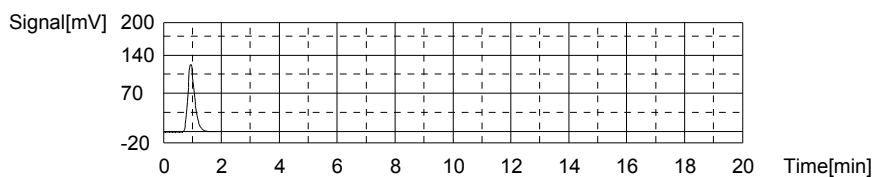
Mean Area 531.4
Mean Conc. 13.52mg/L



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

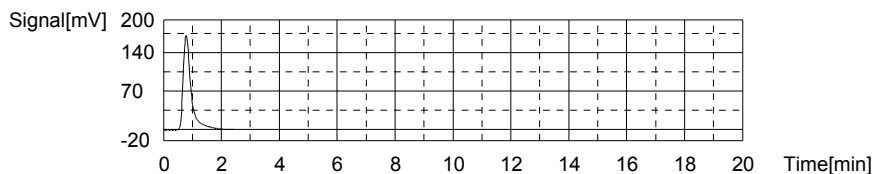
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.967mg/L TC:8.256mg/L IC:5.289mg/L

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

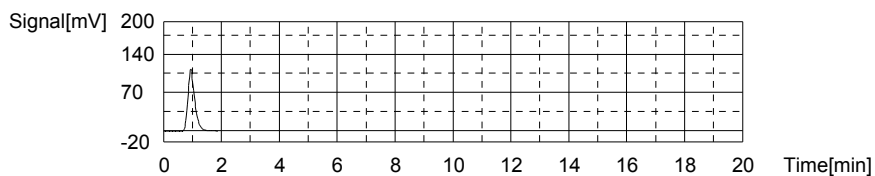
Mean Area 326.5
 Mean Conc. 8.256mg/L



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

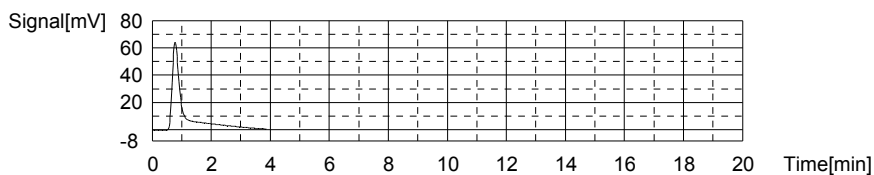
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.023mg/L TC:3.945mg/L IC:1.922mg/L

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

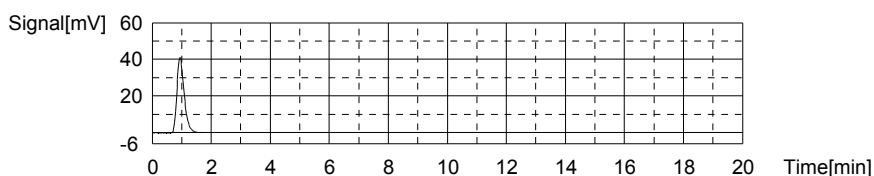
Mean Area 158.6
Mean Conc. 3.945mg/L



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

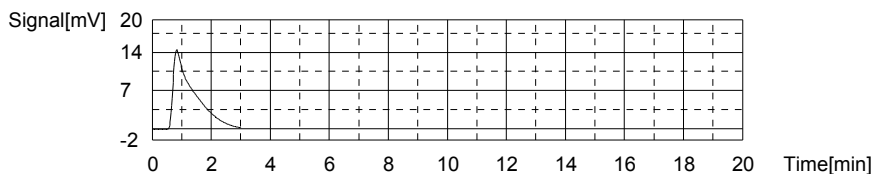
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:1.529mg/L TC:1.651mg/L IC:0.1222mg/L

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

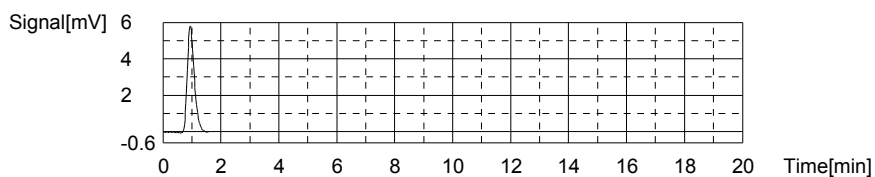
Mean Area 69.25
Mean Conc. 1.651mg/L



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_0	12/15/2016 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

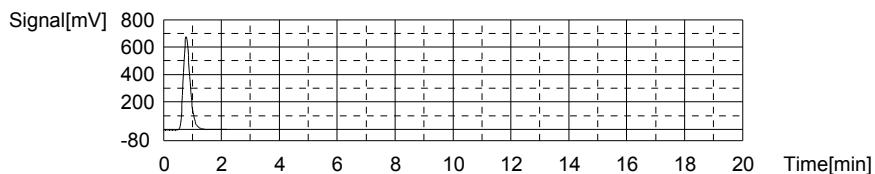
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:7.291mg/L TC:28.30mg/L IC:21.00mg/L

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

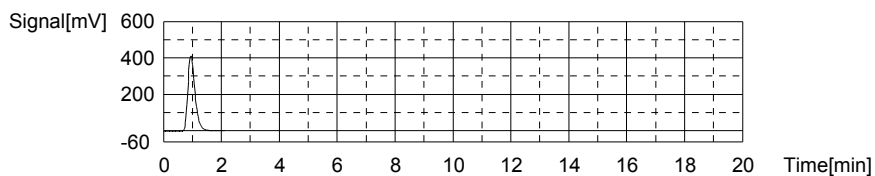
Mean Area 1107
 Mean Conc. 28.30mg/L



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_0	12/15/2016 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

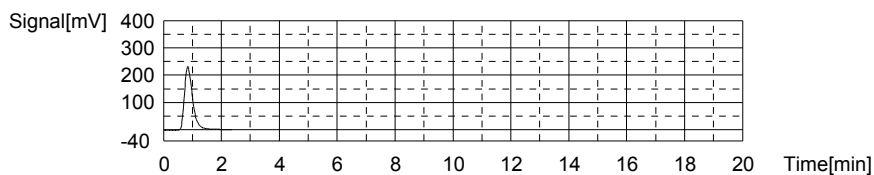
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:10.21mg/L TC:11.56mg/L IC:1.348mg/L

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

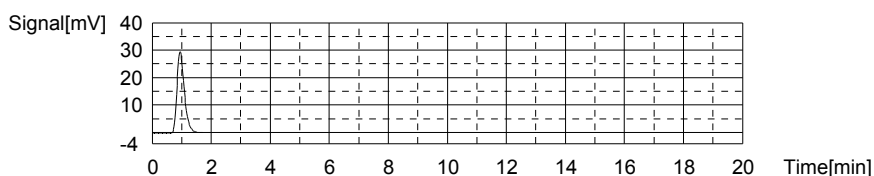
Mean Area 455.0
Mean Conc. 11.56mg/L



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

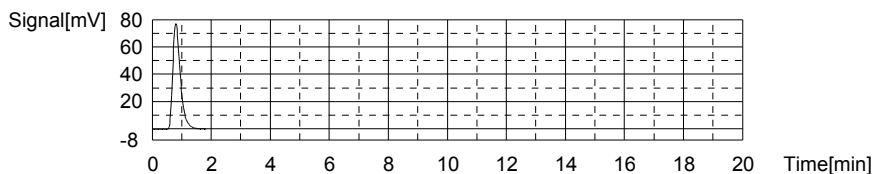
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:2.161mg/L TC:3.439mg/L IC:1.278mg/L

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

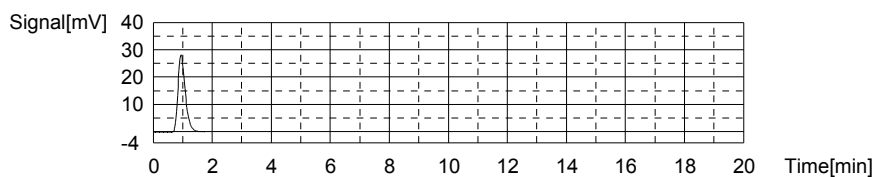
Mean Area 138.9
Mean Conc. 3.439mg/L



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	012/15/2016 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

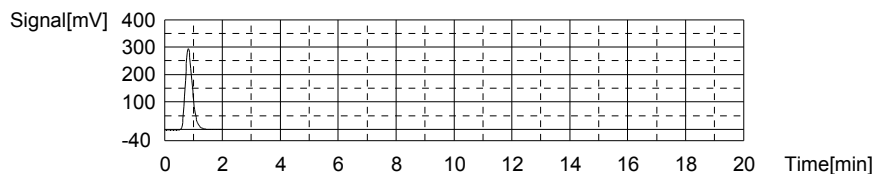
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:12.25mg/L TC:12.85mg/L IC:0.6062mg/L

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

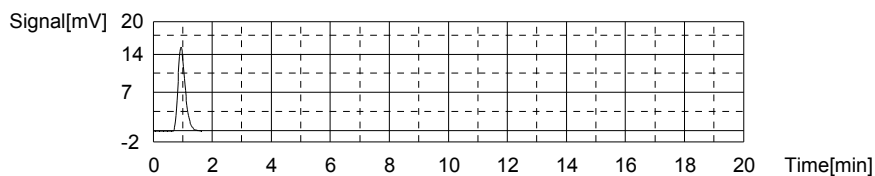
Mean Area 505.6
Mean Conc. 12.85mg/L



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	012/16/2016 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

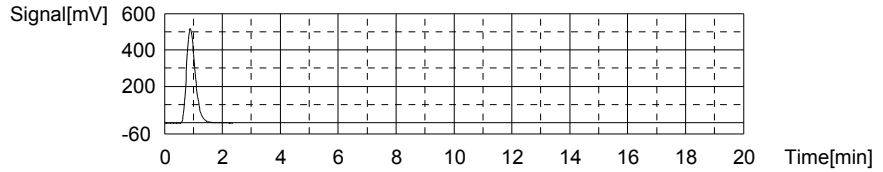
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:27.70mg/L TC:27.78mg/L IC:0.08249mg/L

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

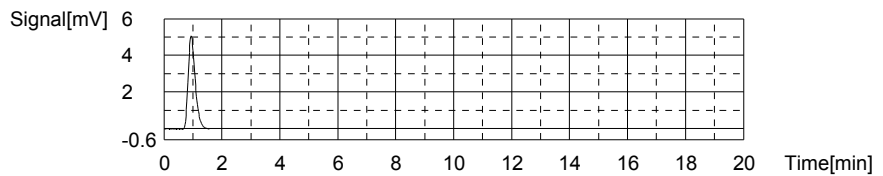
Mean Area 1087
Mean Conc. 27.78mg/L



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

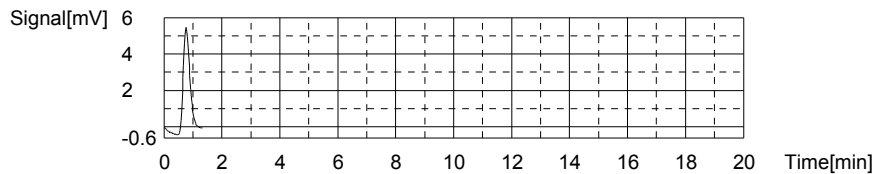
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02470mg/L TC:0.1076mg/L IC:0.08285mg/L

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

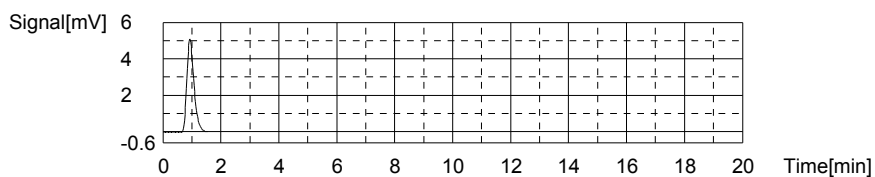
Mean Area 9.141
Mean Conc. 0.1076mg/L



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

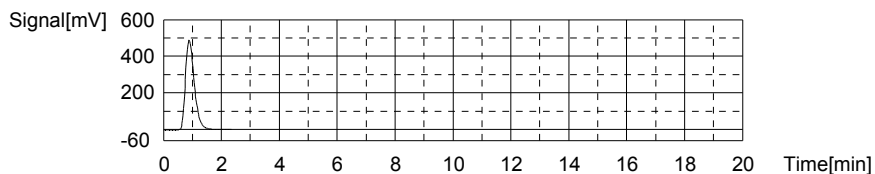
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.47mg/L TC:26.58mg/L IC:0.1015mg/L

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_31	12/16/2016 8:34:40 AM

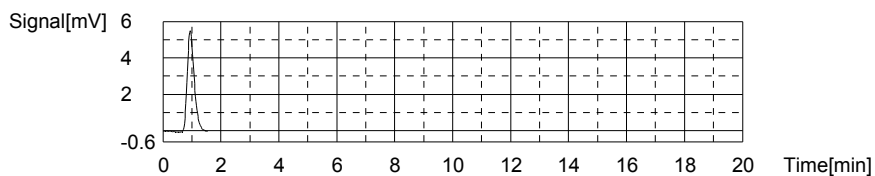
Mean Area 1040
 Mean Conc. 26.58mg/L



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

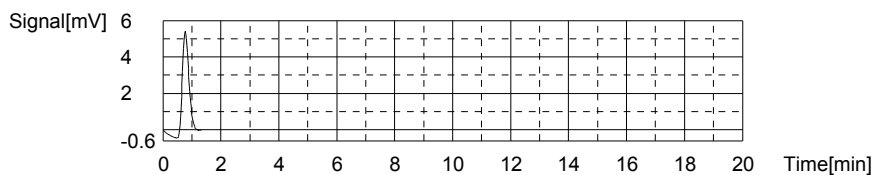
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.02130mg/L TC:0.1051mg/L IC:0.08384mg/L

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

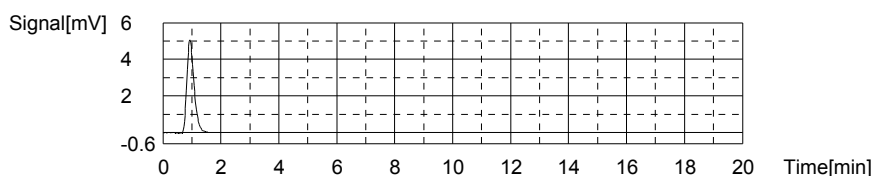
Mean Area 9.047
Mean Conc. 0.1051mg/L



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

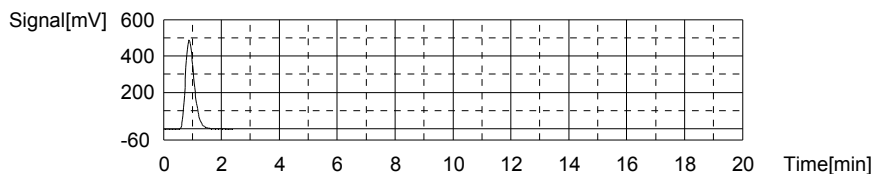
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.31mg/L TC:26.42mg/L IC:0.1125mg/L

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

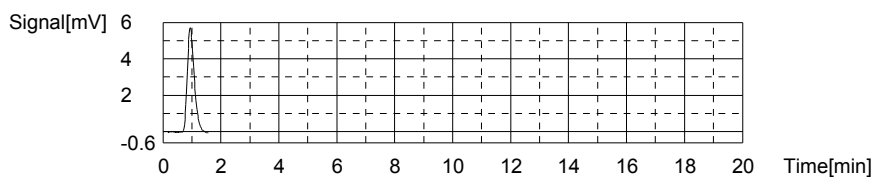
Mean Area 1034
Mean Conc. 26.42mg/L



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

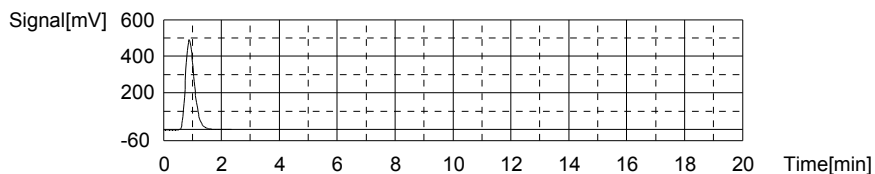
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:26.65mg/L TC:26.70mg/L IC:0.05530mg/L

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

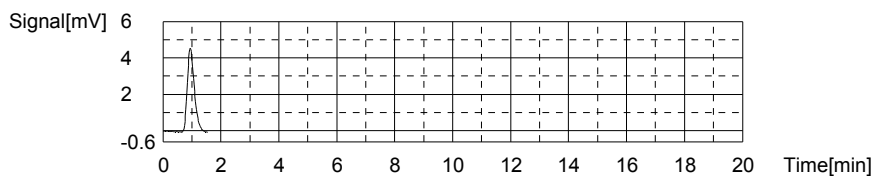
Mean Area 1045
 Mean Conc. 26.70mg/L



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

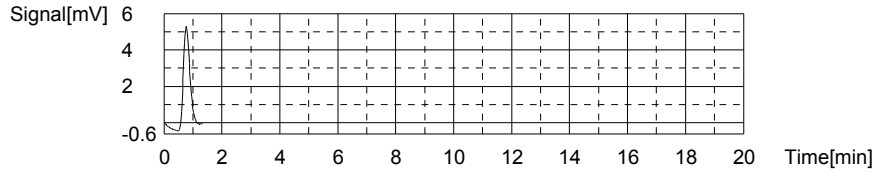
Type	Anal.	Dil.	Result
Unknown	TOC	1.000	TOC:0.01528mg/L TC:0.09959mg/L IC:0.08432mg/L

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

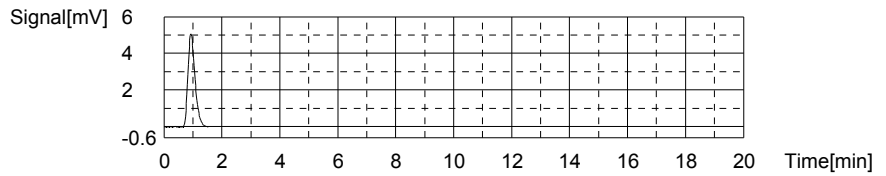
Mean Area 8.831
Mean Conc. 0.09959mg/L



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
January 3, 2017

001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
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

<u>Qualifier</u>	<u>Description</u>
*	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

January 03, 2017

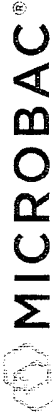
Qualkey: WATERLOO

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



COC No. A 52282

158 Starlite Drive
Marietta, OH 45750



Phone: 740-373-4071
Toll Free: 800-373-4071



CHAIN-OF-CUSTODY RECORD

Company Name: **CH2M**
 Project Contact: **DAVE NEWMAN**
 Turn Around Requirements: **STANDARD**
 Project ID: **E31159**

Contact Phone #: **973-316-3538**
 Location: **WATERLOO NY**

Sampler (print): **THAYER STRIBUCC**
 Signature: *[Signature]*

Sample I.D. No.	Comp	Grab	Date	Time	Matrix*	NUMBER OF CONTAINERS	Hold	VC + TICS 8260C	Metals 6610C → Ar, As, Cd, Cr, Fe, Hg, Mn, Ni, Pb, Se, Zn	Metals 6610C → Ar, As, Cd, Cr, Fe, Hg, Mn, Ni, Pb, Se, Zn	Dissolved Metals 6610C → Ar, As, Cd, Cr, Fe, Hg, Mn, Ni, Pb, Se, Zn	Dissolved Metals 6610C → Ar, As, Cd, Cr, Fe, Hg, Mn, Ni, Pb, Se, Zn	SILICA 2007	ANIONS 300.0 CF 502	NITRATE 353.2/ALKALIN 310.2	TOXIC PHOS/TOC/ATHONIA/	DETD PHS/PHATE/SH/500PF	TDS 512540	TRM SULFIDE SH 4500	SVOC 8270C	PAH 8270D 5117	TOTAL # (LAB USE)	Program <input type="checkbox"/> CWA <input type="checkbox"/> RCRA <input type="checkbox"/> DOD <input type="checkbox"/> AFCEE <input type="checkbox"/> Other	ADDITIONAL REQUIREMENTS
P206-120616	/	/	12/7/16	1500	GW	12	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW18-120616	/	/		1540		17	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW15-120716	/	/		1618		9	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW05E-120716	/	/		930		9	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW30-120716	/	/		1406		9	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW07-120716	/	/		945		9	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW20-120716	/	/		1125		9	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW06-120716	/	/		1355		9	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW10-120716	/	/		1120		9	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
P203-120716	/	/		1510		12	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
DUP-GW-120716-1	/	/		1230		9	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
DUP-GW-120716-2	/	/		1231		2	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
FB-120716	/	/		1501		3	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
TB-120716	/	/		800		2	X	X	X	X	X	X	X	X	X	X	X	X	X	X				

Microbac OVD
 Received: 12/08/2016 10:23
 BY: BRENDA GREENMALT
 221000094412

Brenda Greenmalt

Relinquished by: *[Signature]* Date: 12/7/16 Time: 1700
 Received by: **FEDEX** Date: 12/7/16 Time: 1700

Relinquished by: *[Signature]* Date: _____ Time: _____
 Received by: _____ Date: _____ Time: _____

Remarks: **OPATH PHOSPHATE 48 HOURS**

*Water (W), Soil (S), Solid Waste (SD), Unknown (X)

COOLER TEMP >6° C LOG

Cooler ID 4412

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

69 12/8/16

pH Exceptions

pH Lot # Hc 69 3124

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

69 12/8/16

PRESERVATIVE EXCEPTIONS

NONE
 AS NOTED

69 12/8/16

Internal Chain of Custody Report

Login: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-01 838359 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:57	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:57	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:57	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Samplenum **Container ID** **Products**
L16120425-01 838360 300

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	PREP	W1	SEM	20-DEC-2016 09:46	CAS	BRG	
3	STORE	SEM	A2	03-JAN-2017 13:35	CLS	CAS	

Samplenum **Container ID** **Products**
L16120425-01 838361 NO3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 14:18	EPT	BRG	
3	STORE	WET	A2	14-DEC-2016 10:45	BRG	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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum Container ID Products
L16120425-01 838362 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 14:18	EPT	BRG	
3	STORE	WET	A2	09-DEC-2016 09:17	BRG	AWE	

Samplenum Container ID Products
L16120425-01 838363 TDS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 06:46	AWE	BRG	

Samplenum Container ID Products
L16120425-01 838364 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 08:03	DCM	BRG	
3	STORE	WET	A2	26-DEC-2016 13:23	AZH	DCM	

Samplenum Container ID Products
L16120425-01 838366 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	08-DEC-2016 13:57	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	STORE	DIG	A2	13-DEC-2016 13:36	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	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



Internal Chain of Custody Report

Login: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-01 838367 S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 09:18	TB	BRG	
3	STORE	WET	A2	12-DEC-2016 09:26	BRG	TB	

Samplenum **Container ID** **Products**
L16120425-02 838368 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	08-DEC-2016 13:57	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	STORE	DIG	A2	13-DEC-2016 13:36	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	

*Sample extract/digestate/leachate

Samplenum **Container ID** **Products**
L16120425-03 838369 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:57	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:57	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:57	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

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: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-03 838370 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	08-DEC-2016 13:57	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	08-DEC-2016 13:57	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

Samplenum **Container ID** **Products**
L16120425-03 838371 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	STORE	DIG	A2	13-DEC-2016 13:36	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120425-04 838372 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	STORE	DIG	A2	13-DEC-2016 13:36	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120425-05 838373 300

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	PREP	W1	SEM	20-DEC-2016 09:46	CAS	BRG	
3	STORE	SEM	A2	03-JAN-2017 13:35	CLS	CAS	

- 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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-05 838374 NO3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 14:18	EPT	BRG	
3	STORE	WET	A2	14-DEC-2016 10:46	BRG	DCM	

Samplenum **Container ID** **Products**
L16120425-05 838375 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 14:18	EPT	BRG	
3	STORE	WET	A2	09-DEC-2016 09:17	BRG	AWE	

Samplenum **Container ID** **Products**
L16120425-05 838376 TDS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 06:46	AWE	BRG	

Samplenum **Container ID** **Products**
L16120425-05 838377 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:57	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 08:03	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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-05 838379 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	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	STORE	DIG	A2	13-DEC-2016 13:36	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	

**Sample extract/digestate/leachate*

Samplenum **Container ID** **Products**
L16120425-05 838380 S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 09:18	TB	BRG	
3	STORE	WET	A2	12-DEC-2016 09:26	BRG	TB	

Samplenum **Container ID** **Products**
L16120425-06 838381 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	STORE	DIG	A2	13-DEC-2016 13:36	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	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: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-07 838382 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Samplenum **Container ID** **Products**
L16120425-07 838383 827-SPE-DIOX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	EXT	12-DEC-2016 16:40	CPD	BRG	
3	ANALYZ*	EXT	SEMI	13-DEC-2016 17:17	SCB	CPD	
4	DISP	EXT	DISP	21-DEC-2016 15:47	BJO	BJO	

****Sample extract/digestate/leachate***

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

****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: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-07 838384 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	08-DEC-2016 13:58	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	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

Samplenum **Container ID** **Products**
L16120425-07 838385 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	STORE	DIG	A2	13-DEC-2016 13:36	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120425-08 838386 AL-D MN-D AS-MSD FE-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	STORE	DIG	A2	13-DEC-2016 13:36	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120425-09 838387 300

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	SEM	20-DEC-2016 09:46	CAS	BRG	
3	STORE	SEM	A2	03-JAN-2017 13:35	CLS	CAS	

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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-09 838388 NO3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 14:18	EPT	BRG	
3	STORE	WET	A2	14-DEC-2016 10:46	BRG	DCM	

Samplenum **Container ID** **Products**
L16120425-09 838389 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 14:18	EPT	BRG	
3	STORE	WET	A2	09-DEC-2016 09:17	BRG	AWE	

Samplenum **Container ID** **Products**
L16120425-09 838390 TDS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 06:46	AWE	BRG	

Samplenum **Container ID** **Products**
L16120425-09 838391 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 08:03	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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-09 838393 CA 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	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	STORE	DIG	A2	13-DEC-2016 13:36	BRG	ERP	
4	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	

**Sample extract/digestate/leachate*

Samplenum **Container ID** **Products**
L16120425-09 838394 S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 09:18	TB	BRG	
3	STORE	WET	A2	12-DEC-2016 09:26	BRG	TB	

Samplenum **Container ID** **Products**
L16120425-10 838395 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-11 **838396** **8260C**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Samplenum **Container ID** **Products**
L16120425-11 **838397** **827-SPE-DIOX**

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	EXT	12-DEC-2016 16:40	CPD	BRG	
3	ANALYZ*	EXT	SEMI	13-DEC-2016 17:17	SCB	CPD	
4	DISP	EXT	DISP	21-DEC-2016 15:47	BJO	BJO	

**Sample extract/digestate/leachate*

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

**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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-11 838398 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	08-DEC-2016 13:58	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	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

Samplenum **Container ID** **Products**
L16120425-11 838399 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	BRG	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120425-12 838400 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	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



Microbac Laboratories Inc.
Internal Chain of Custody Report

Login: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-13 838401 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Samplenum **Container ID** **Products**
L16120425-13 838402 827-SPE-DIOX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	EXT	12-DEC-2016 16:40	CPD	BRG	
3	ANALYZ*	EXT	SEMI	13-DEC-2016 17:17	SCB	CPD	
4	DISP	EXT	DISP	21-DEC-2016 15:47	BJO	BJO	

****Sample extract/digestate/leachate***

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

****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: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-13 838403 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	08-DEC-2016 13:58	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		08-DEC-2016 13:58	BRG		

Samplenum **Container ID** **Products**
L16120425-13 838404 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	BRG	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120425-14 838405 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	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



Microbac Laboratories Inc.
Internal Chain of Custody Report

Login: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-15 838406 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Samplenum **Container ID** **Products**
L16120425-15 838407 827-SPE-DIOX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	EXT	09-DEC-2016 13:59	JDH	CLS	
3	ANALYZ*	EXT	SEMI	12-DEC-2016 09:39	SCB	JDH	
4	DISP	EXT	DISP	21-DEC-2016 15:49	BJO	BJO	

****Sample extract/digestate/leachate***

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

****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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-15 838408 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	08-DEC-2016 13:58	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	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

Samplenum **Container ID** **Products**
L16120425-15 838409 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	BRG	ERP	

***Sample extract/digestate/leachate**

Samplenum **Container ID** **Products**
L16120425-16 838410 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 14:40	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	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: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-17 838411 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:20	CLS	AWE	

Samplenum **Container ID** **Products**
L16120425-17 838412 827-SPE-DIOX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	EXT	12-DEC-2016 16:40	CPD	BRG	
3	ANALYZ*	EXT	SEMI	13-DEC-2016 17:17	SCB	CPD	
4	DISP	EXT	DISP	21-DEC-2016 15:47	BJO	BJO	

****Sample extract/digestate/leachate***

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

****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: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-17 838413 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	08-DEC-2016 13:58	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	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

Samplenum **Container ID** **Products**
L16120425-17 838414 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 15:35	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	BRG	ERP	

****Sample extract/digestate/leachate***

Samplenum **Container ID** **Products**
L16120425-18 838415 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 15:35	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-19 838416 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

Samplenum **Container ID** **Products**
L16120425-19 838417 300

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	SEM	20-DEC-2016 09:46	CAS	BRG	
3	STORE	SEM	A2	03-JAN-2017 13:34	CLS	CAS	

Samplenum **Container ID** **Products**
L16120425-19 838418 NO3

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 14:18	EPT	BRG	
3	STORE	WET	A2	14-DEC-2016 10:44	BRG	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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum Container ID Products
L16120425-19 838419 PO4

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	08-DEC-2016 14:18	EPT	BRG	
3	STORE	WET	A2	09-DEC-2016 09:17	BRG	AWE	

Samplenum Container ID Products
L16120425-19 838420 TDS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 06:46	AWE	BRG	

Samplenum Container ID Products
L16120425-19 838421 TOC

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 08:03	DCM	BRG	
3	STORE	WET	A2	26-DEC-2016 13:23	AZH	DCM	

Samplenum Container ID Products
L16120425-19 838423 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	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 15:35	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-19 838424 S

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	ANALYZ	W1	WET	09-DEC-2016 09:18	TB	BRG	
3	STORE	WET	A2	12-DEC-2016 09:26	BRG	TB	

Samplenum **Container ID** **Products**
L16120425-20 838425 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	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 15:35	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:59	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	BRG	ERP	

*Sample extract/digestate/leachate

Samplenum **Container ID** **Products**
L16120425-21 838426 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

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: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-21 838427 827-SPE-DIOX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	08-DEC-2016 13:58	BRG		
2	DISP	EXT	DISP	21-DEC-2016 15:47	BJO	BJO	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

Samplenum **Container ID** **Products**
L16120425-21 838428 827-PAHL

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	EXT	08-DEC-2016 13:58	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	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

Samplenum **Container ID** **Products**
L16120425-21 838429 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	DIG	08-DEC-2016 13:58	BRG		
2	STORE	DIG	A2	14-DEC-2016 13:17	BRG	ERP	

Samplenum **Container ID** **Products**
L16120425-22 838430 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 15:35	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:51	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	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



Microbac Laboratories Inc.
Internal Chain of Custody Report

Login: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-23 838431 AL AS-MS CA FE K MG MN NA

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 15:35	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:51	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	BRG	ERP	

**Sample extract/digestate/leachate*

Samplenum **Container ID** **Products**
L16120425-24 838432 AL-D AS-MSD FE-D MN-D

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	DIG	08-DEC-2016 15:35	ERP	BRG	
3	ANALYZ*	DIG	METALS	14-DEC-2016 11:51	KKB	ERP	
4	STORE	DIG	A2	14-DEC-2016 13:17	BRG	ERP	

**Sample extract/digestate/leachate*

Samplenum **Container ID** **Products**
L16120425-25 838433 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

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: L16120425
Account: 2736
Project: 2736.061
Samples: 28
Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-26 838434 8260C

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	ORG4	08-DEC-2016 13:58	BRG		
2	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	08-DEC-2016 13:58	BRG		
2	ANALYZ	V1	ORG4	08-DEC-2016 14:51	TMB	BRG	
3	STORE	ORG4	A2	21-DEC-2016 07:19	CLS	AWE	

Samplenum **Container ID** **Products**
L16120425-27 838435 827-SPE-DIOX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	EXT	12-DEC-2016 16:40	CPD	BRG	
3	ANALYZ*	EXT	SEMI	14-DEC-2016 15:08	LJH	CPD	
4	DISP	EXT	DISP	21-DEC-2016 15:48	BJO	BJO	

****Sample extract/digestate/leachate***

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:52	CLS	CLS	

****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: L16120425

Account: 2736

Project: 2736.061

Samples: 28

Due Date: 22-DEC-2016

Samplenum **Container ID** **Products**
L16120425-28 838436 827-SPE-DIOX

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	PREP	W1	EXT	12-DEC-2016 16:40	CPD	BRG	
3	ANALYZ*	EXT	SEMI	14-DEC-2016 15:08	LJH	CPD	
4	DISP	EXT	DISP	21-DEC-2016 15:49	BJO	BJO	

****Sample extract/digestate/leachate***

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	08-DEC-2016 13:58	BRG		
2	STORE	W1	A1	20-DEC-2016 07:53	CLS	CLS	

****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)