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Date: January 19, 2015

Subject: Data Validation for Lab Report L14120172
Radford Army Ammunition Plant

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OVERVIEW

Microbac Laboratories Inc., Marietta, Ohio, received 10 field samples associated with the project work described in the *Radford Army Ammunition Plant Final SWMU 40 (RAAP-009) Landfill Nitro Area IMWP (August 2011)* (project QAPP) on December 3, 2014. The field samples were assigned laboratory sample delivery group (SDG) number L14120172 and included four normal water samples, one field duplicate water sample, one matrix spike pair, one equipment blank, one field blank, and one trip blank. The samples were analyzed for volatile organic compounds (VOCs) by EPA method 8260B, perchlorates by EPA method 6850, and total metals by EPA methods 6010B and 6020 as detailed in *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods (SW-846)*, Third Edition, Final Update III.

SUMMARY

The samples were analyzed according to the quality control (QC) criteria of the applicable analytical method. The data for these samples were found to be compliant with the requirements of the project QAPP and/or EPA Region III's *Innovative Approaches to Data Validation* (June 1995) and *EPA Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994) or *EPA Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses* (April 1993) (Region III NFG, collectively), as applicable, and the results for all target analytes are considered usable.

MAJOR PROBLEMS

(Refer to Appendix B – Data Qualifier Summary)

- There were no major problems associated with the samples in this data package.

MINOR PROBLEMS

(Refer to Appendix B – Data Qualifier Summary)

- 40MW7GW12214:
  Acetone (UJ)
  Manganese, total (0.00135 L)
  Selenium, total (UL)
  Lead, total (UL)
- 40EQR12214:
  Acetone (UJ)
  Manganese, total (UL)
  Selenium, total (UL)
  Lead, total (UL)
- 40FB12214:
  Acetone (UJ)
  Manganese, total (UL)
  Selenium, total (UL)
  Lead, total (UL)
- 40MW5GW12214:
  Acetone (UJ)
  Manganese, total (UL)

	Selenium, total (UL) Lead, total (UL)
• 40DUPGW12214:	Acetone (UJ) Manganese, total (UL) Selenium, total (UL) Lead, total (UL)
• 40MW6GW12214:	Acetone (UJ) Manganese, total (0.00265 L) Selenium, total (UL) Lead, total (UL)
• LFMW01GW12214:	Acetone (UJ) Manganese, total (0.00368 L) Selenium, total (0.000738 L) Lead, total (UL)
• 40TB12214:	Acetone (UJ)

NOTES

(Refer to Appendix D – Support Documentation)

Sample Chain of Custody (COC) Records

- The samples were listed on COC #A6140. Data were reported for all required analytes.

Preservation and Holding Times

- The samples were correctly preserved and analyzed within the holding times specified in the project QAPP and the Region III NFG with the following exception.

  - The samples were not preserved for VOC analysis. The samples were analyzed within the holding time for unpreserved samples and, therefore, no sample data were qualified.

Instrument Tune

- The instrument tunes for all applicable analyses were within the criteria specified in the project QAPP and the Region III NFG with the following exception.

  - The perchlorate tune data were not included in the data package. The laboratory previously stated that the instrument was tuned after maintenance was performed and that the ion ratio was verified with every sample reported to demonstrate that the instrument was working properly. No sample data were qualified based on professional judgment.

Initial Calibration (ICAL)

- The ICAL relative response factors (RRFs), percent relative standard deviations (%RSDs), and/or correlation coefficients, as applicable, for all analyses were within the criteria specified in the project QAPP and the Region III NFG with the following exceptions.

  - The ICAL relative response factors (RRFs) were <0.05 for acetone. Because acetone is considered to be a poor responder and the RRFs were >0.01, the associated non-detect sample results were **qualified UJ** based on professional judgment**.**

Initial Calibration Verification (ICV)/Continuing Calibration Verification (CCV)

- The ICV and/or CCV RRFs, percent differences (%Ds), and/or recoveries, as applicable, for all analyses were within the criteria specified in the project QAPP and the Region III NFG with the following exceptions.

  - The ICV/CCV RRFs were <0.05 for acetone. Because acetone is considered to be a poor responder and the RRFs were >0.01, the associated non-detect sample results were **qualified UJ** based on professional judgment**.**

Contract Required Detection Limit (CRDL)

- The perchlorate CRDL was analyzed at the reporting limit (RL) and not at 2X the RL. No sample data were qualified as a result.

- A CRDL standard was not analyzed for method 6010B. The laboratory calibration curve was linear with a standard at or near the reporting limit (RL) and, therefore, no sample results were qualified. The laboratory analyzed a low level ICV (LLICV) for the calcium dilutions. However the results were not reported in the data package and it was not possible to recalculate the results due to insufficient information available.

- A CRDL standard was not analyzed for method 6020. The laboratory analyzed an LLICV, and the recoveries were reported in the raw data. The LLICV recoveries were >50% but <89% for manganese, selenium and lead. The manganese results for samples 40MW7GW12214 and 40MW6GW12214 and the manganese and selenium results for sample LFMW01GW12214 were detects > the method detection limit (MDL) but <2X the RL and were **qualified L**. The remaining associated sample results were non-detects and were **qualified UL**.

Inductively Coupled Plasma (ICP) Interference Check Sample

- ICP/ICP-MS interference check sample recoveries were not applicable because the results for interferents aluminum, calcium, magnesium, and iron were < the ICS spike amounts for all samples.

- Perchlorate interference check samples were not analyzed or reported in the data package. The laboratory analyzed and reported an MCT sample that met criteria.

Field Blanks

- No target analytes were detected in the field blank, equipment blank, or trip blank.

Laboratory Method Blanks

- No target analytes were detected in the method blanks.

Laboratory Calibration Blanks

- Sodium was detected in a calibration blank. The associated sample results were either detects >5X the calibration blank concentration or non-detects and, therefore, were not qualified.

Laboratory Control Samples (LCSs)

- The LCS recoveries met project QAPP- and Region III-specified QC acceptance criteria.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Samples

- One MS/MSD pair was analyzed on sample 40MW5GW12214 for all analyses and met project QAPP- and Region III-specified QC acceptance criteria with the following exceptions.

  The MS/MSD recoveries were > the upper acceptance limit for calcium. The parent sample concentration was >4X the spike amount and, therefore, no sample results were qualified.

ICP Serial Dilution Analyses

- The serial dilution %Ds met project QAPP- and Region III-specified QC acceptance criteria. It should be noted that the method 6020 serial dilution was performed on the equipment blank.

Laboratory Sample Duplicate

- MSDs were analyzed as the laboratory duplicates for all analyses and met project QAPP- and Region III-specified QC acceptance criteria for precision.

Field Sample Duplicate

- Sample 40MW5GW12214 was collected and analyzed in duplicate (sample 40DUPGW12214) for all analyses. The relative percent differences (RPDs) between the sample and duplicate results were within the project QAPP-specified control limits.

	40MW5GW12214		40DUPGW12214			
Analyte	Result	RL	Result	RL	RPD	>25%
Perchlorate	0.883	0.2	0.856	0.2	3.11	
Al, total	0.256	0.2	0.3	0.2	15.83	
Ca, total (10X)	41.4	5	40.63	5	1.88	
Fe, total	0.155	0.1	0.177	0.1	13.25	
Mg, total	13.2	0.5	12.4	0.5	6.25	
K, total	0.764	1	0.817	1	<RL	
Na, total	6.58	0.5	6.35	0.5	3.56	
Ba, total	0.024	0.003	0.0241	0.003	0.42	

NOTE: All results not listed in the table were non-detects.

Sample Surrogate Spikes

- Surrogate spikes added to all field samples analyzed for VOCs were within the project QAPP-specified control limits.

Sample Internal Standard Recoveries

- The internal standard recoveries for VOCs and perchlorates were within the project QAPP- and Region III-specified control limits.

- The internal standard recoveries for metals by method 6020 were within the 60-125% limits provided in the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (NFG) (October 2004).

Sample Results

- The samples were analyzed for the methods requested on the COC. Method detection limits (MDLs) and RLs were reported for all analyses and met project-specified MDLs and RLs with the following exceptions.

  - The MDLs and/or RLs for potassium, aluminum, calcium, and iron were > the MDLs/RLs specified in the project QAPP.

  - The MDLs for arsenic, barium, cobalt, lead and manganese were > the MDLs specified in the project QAPP; however, their associated RLs were ≤ the RLs specified in the project QAPP.

Action Level Notification

- No results were above the action levels specified in the EPA Region III's *Innovative Approaches to Data Validation* (June 1995).

Usability Statement

- There were 146 field sample data points associated with the data package for SDG L14120172. Of these field sample data points, 109 (74.66% of the total) were assessed and left unqualified, 10 (6.85% of the total) were assessed and qualified UJ, 4 (2.74% of the total) were assessed and qualified L, and 23 (15.75% of the total) were assessed and qualified UL.

- The field sample data points that were qualified UJ can be categorized as definitive data with non-detectable analyte concentrations that are only estimates due to QC deficiencies.

- The field sample data points that were qualified UL can be categorized as definitive data with non-detectable analyte concentrations that are only estimates and possibly biased low due to QC deficiencies.

- The field sample data points that were qualified L can be categorized as definitive data with positively identified analyte concentrations that are only estimates and possibly biased low due to QC deficiencies.

- The unqualified field sample data points can be categorized as definitive data with no associated QC deficiencies. Based on the number of unqualified data points, the percent completeness is 74.66%.

Report Content Statement

This report has been formatted for consistency with Appendix B, Region III Standard Operating Procedures for Data Validation Reports, contained in the guidance *EPA Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994). The laboratory data were reviewed in accordance with the EPA Region III's *Innovative Approaches to Data Validation* (June 1995) and *EPA Region III Modifications to the National Functional Guidelines for Organic Data Review* (September 1994) or *EPA Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses* (April 1993) (Region III NFG, collectively), as applicable; and the *Radford Army Ammunition Plant Final SWMU 40 (RAAP-009) Landfill Nitro Area IMWP* (August 2011) (project QAPP); and the applicable SW-846 methods. This report only addresses those problems and issues that may affect data usability.

Attachments

Appendix A – Glossary of Data Qualifiers

Appendix B – Data Qualifier Summary

Appendix C – Laboratory Report Results/Data Summary

Appendix D – Support Documentation

Appendix A – Glossary of Data Qualifiers

Data Qualifier Codes

Codes Related to Identification

U Not detected. The associated number indicates the approximate sample concentration necessary to be detected.

B Not detected substantially above the level reported in laboratory or field blanks.

R Unusable result. Analyte may or may not be present in the sample.

Codes Related to Quantitation

J Analyte present. Reported value may or may not be accurate or precise.

K Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ Not detected. Quantitation limit may be inaccurate or imprecise.

UL The analyte was not detected, and the reported quantitation limit is probably higher than reported.

Appendix B – Data Qualifier Summary

Data Qualifier Summary

Note: The results listed in this table are detects and qualified non-detects only. Unqualified non-detects are not listed.

FIELD SAMPLE ID/ LAB SAMPLE ID	ANALYTE	FINAL VALIDATION QUALIFIER	INITIAL LAB QUALIFIER	REASON
40TB12214 L14120172-01	Acetone	UJ	U	ICAL/ICV/CCV RRFs <0.05
40MW7GW12214 L14120172-02	Acetone Manganese, total Selenium, total Lead, total	UJ L UL UL	U J U U	ICAL/ICV/CCV RRFs <0.05 LLICV recovery >50% but <89% LLICV recovery >50% but <89% LLICV recovery >50% but <89%
40EQR12214 L14120172-03	Acetone Manganese, total Selenium, total Lead, total	UJ UL UL UL	U U U U	ICAL/ICV/CCV RRFs <0.05 LLICV recovery >50% but <89% LLICV recovery >50% but <89% LLICV recovery >50% but <89%
40FB12214 L14120172-04	Acetone Manganese, total Selenium, total Lead, total	UJ UL UL UL	U U U U	ICAL/ICV/CCV RRFs <0.05 LLICV recovery >50% but <89% LLICV recovery >50% but <89% LLICV recovery >50% but <89%
40MW5GW12214 L14120172-05	Acetone Manganese, total Selenium, total Lead, total	UJ UL UL UL	U U U U	ICAL/ICV/CCV RRFs <0.05 LLICV recovery >50% but <89% LLICV recovery >50% but <89% LLICV recovery >50% but <89%
40DUPGW12214 L14120172-06	Acetone Manganese, total Selenium, total Lead, total	UJ UL UL UL	U U U U	ICAL/ICV/CCV RRFs <0.05 LLICV recovery >50% but <89% LLICV recovery >50% but <89% LLICV recovery >50% but <89%
40MW6GW12214 L14120172-09	Acetone Manganese, total Selenium, total Lead, total	UJ L UL UL	U U U	ICAL/ICV/CCV RRFs <0.05 LLICV recovery >50% but <89% LLICV recovery >50% but <89% LLICV recovery >50% but <89%

Data Qualifier Summary (Cont.)

FIELD SAMPLE ID/ LAB SAMPLE ID	ANALYTE	FINAL VALIDATION QUALIFIER	INITIAL LAB QUALIFIER	REASON
LFMW01GW12214 L14120172-10	Acetone	UJ	U	ICAL/ICV/CCV RRFs <0.05
	Manganese, total	L		LLICV recovery >50% but <89%
	Selenium, total	L	J	LLICV recovery >50% but <89%
	Lead, total	UL	U	LLICV recovery >50% but <89%

Appendix C – Laboratory Report Results/Data Summary

Certificate of Analysis

Sample #: L14120172-01 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40TB12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 18:52
Collect Date: 12/02/2014 00:01 **Dilution:** 1 **File ID:** 8M401510
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	93.1	70	120	
4-Bromofluorobenzene	89.9	75	120	
Dibromofluoromethane	96.2	85	115	
Toluene-d8	88.4	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-02 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40MW7GW12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 20:48
Collect Date: 12/02/2014 09:17 **Dilution:** 1 **File ID:** 8M401514
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	91.0	70	120	
4-Bromofluorobenzene	89.4	75	120	
Dibromofluoromethane	95.9	85	115	
Toluene-d8	89.1	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-02 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40MW7GW12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/11/2014 10:45
Collect Date: 12/02/2014 09:17 **Dilution:** 1 **File ID:** 1LM.LM27939
Sample Tag: 01 **Units:** ug/L

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	3.14		0.200	0.100

Sample #: L14120172-02 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW7GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 14:32
Collect Date: 12/02/2014 09:17 **Dilution:** 1 **File ID:** P2.121014.143245
Sample Tag: 01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5		U	0.200	0.100
Iron, Total	7439-89-6	0.198		0.100	0.0500
Magnesium, Total	7439-95-4	29.7		0.500	0.250
Potassium, Total	7440-09-7	1.55		1.00	0.500
Sodium, Total	7440-23-5	3.81	B	0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

B	The reported result is associated with a contaminated method blank.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-02 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW7GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/11/2014 08:56
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/11/2014 10:24
Collect Date: 12/02/2014 09:17 **Dilution:** 10 **File ID:** P2.121114.102418
Sample Tag: DL01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Calcium, Total	7440-70-2	77.0		5.00	2.50

Sample #: L14120172-02 **PrePrep Method:** N/A **Instrument:** ICP-MS2
Client ID: 40MW7GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 07:25
Matrix: Water **Analytical Method:** 6020 **Cal Date:** 12/15/2014 12:19
Workgroup #: WG504176 **Analyst:** JYH **Run Date:** 12/15/2014 12:59
Collect Date: 12/02/2014 09:17 **Dilution:** 1 **File ID:** NI.121514.125957
Sample Tag: 03 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3	0.114		0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5	0.00135	J	0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-03 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40EQR12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 19:21
Collect Date: 12/02/2014 10:50 **Dilution:** 1 **File ID:** 8M401511
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	91.2	70	120	
4-Bromofluorobenzene	90.8	75	120	
Dibromofluoromethane	94.9	85	115	
Toluene-d8	91.1	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-03 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40EQR12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 19:17
Collect Date: 12/02/2014 10:50 **Dilution:** 1 **File ID:** 1LM.LM27910
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0		U	0.200	0.100

U	Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #:	L14120172-03	**PrePrep Method:**	N/A	**Instrument:**	PE-ICP2
Client ID:	40EQR12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 09:19
Matrix:	Water	**Analytical Method:**	6010B	**Cal Date:**	12/10/2014 08:18
Workgroup #:	WG504197	**Analyst:**	KHR	**Run Date:**	12/10/2014 14:36
Collect Date:	12/02/2014 10:50	**Dilution:**	1	**File ID:**	P2.121014.143607
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2		U	0.500	0.250
Iron, Total	7439-89-6		U	0.100	0.0500
Magnesium, Total	7439-95-4		U	0.500	0.250
Potassium, Total	7440-09-7		U	1.00	0.500
Sodium, Total	7440-23-5			0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-03	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	40EQR12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 07:25
Matrix:	Water	**Analytical Method:**	6020	**Cal Date:**	12/15/2014 12:19
Workgroup #:	WG504176	**Analyst:**	JYH	**Run Date:**	12/15/2014 13:03
Collect Date:	12/02/2014 10:50	**Dilution:**	1	**File ID:**	NI.121514.130305
Sample Tag:	03	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3		U	0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5		U	0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-04	**PrePrep Method:**	N/A	**Instrument:**	HPMS8
Client ID:	40FB12214	**Prep Method:**	5030B/5030C/5035A	**Prep Date:**	N/A
Matrix:	Water	**Analytical Method:**	8260B	**Cal Date:**	11/19/2014 00:08
Workgroup #:	WG503275	**Analyst:**	TMB	**Run Date:**	12/03/2014 19:50
Collect Date:	12/02/2014 11:05	**Dilution:**	1	**File ID:**	8M401512
Sample Tag:	01	**Units:**	ug/L		

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	90.9	70	120	
4-Bromofluorobenzene	90.9	75	120	
Dibromofluoromethane	95.4	85	115	
Toluene-d8	90.6	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-04 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40FB12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 19:36
Collect Date: 12/02/2014 11:05 **Dilution:** 1 **File ID:** 1LM.LM27911
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0		U	0.200	0.100

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-04 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40FB12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 14:39
Collect Date: 12/02/2014 11:05 **Dilution:** 1 **File ID:** P2.121014.143928
Sample Tag: 01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2		U	0.500	0.250
Iron, Total	7439-89-6		U	0.100	0.0500
Magnesium, Total	7439-95-4		U	0.500	0.250
Potassium, Total	7440-09-7		U	1.00	0.500
Sodium, Total	7440-23-5			0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

U	Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #:	L14120172-04	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	40FB12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 07:25
Matrix:	Water	**Analytical Method:**	6020	**Cal Date:**	12/15/2014 12:19
Workgroup #:	WG504176	**Analyst:**	JYH	**Run Date:**	12/15/2014 13:21
Collect Date:	12/02/2014 11:05	**Dilution:**	1	**File ID:**	NI.121514.132157
Sample Tag:	03	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3		U	0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5		U	0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-05	**PrePrep Method:**	N/A	**Instrument:**	HPMS8
Client ID:	40MW5GW12214	**Prep Method:**	5030B/5030C/5035A	**Prep Date:**	N/A
Matrix:	Water	**Analytical Method:**	8260B	**Cal Date:**	11/19/2014 00:08
Workgroup #:	WG503275	**Analyst:**	TMB	**Run Date:**	12/03/2014 20:19
Collect Date:	12/02/2014 11:58	**Dilution:**	1	**File ID:**	8M401513
Sample Tag:	01	**Units:**	ug/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	91.9	70	120	
4-Bromofluorobenzene	90.9	75	120	
Dibromofluoromethane	95.3	85	115	
Toluene-d8	90.1	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-05	**PrePrep Method:**	N/A	**Instrument:**	LCMS1
Client ID:	40MW5GW12214	**Prep Method:**	6850	**Prep Date:**	12/10/2014 10:00
Matrix:	Water	**Analytical Method:**	6850	**Cal Date:**	11/17/2014 14:53
Workgroup #:	WG504286	**Analyst:**	ADC	**Run Date:**	12/10/2014 19:55
Collect Date:	12/02/2014 11:58	**Dilution:**	1	**File ID:**	1LM.LM27912
Sample Tag:	01	**Units:**	ug/L		

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	0.883		0.200	0.100

Sample #: L14120172-05 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW5GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 14:42
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** P2.121014.144249
Sample Tag: 01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	0.256		0.200	0.100
Iron, Total	7439-89-6	0.155		0.100	0.0500
Magnesium, Total	7439-95-4	13.2		0.500	0.250
Potassium, Total	7440-09-7	0.764	J	1.00	0.500
Sodium, Total	7440-23-5	6.58	B	0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

B	The reported result is associated with a contaminated method blank.
J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-05 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW5GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/11/2014 08:56
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/11/2014 10:27
Collect Date: 12/02/2014 11:58 **Dilution:** 10 **File ID:** P2.121114.102740
Sample Tag: DL01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Calcium, Total	7440-70-2	41.4		5.00	2.50

Sample #: L14120172-05 **PrePrep Method:** N/A **Instrument:** ICP-MS2
Client ID: 40MW5GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 07:25
Matrix: Water **Analytical Method:** 6020 **Cal Date:** 12/15/2014 12:19
Workgroup #: WG504176 **Analyst:** JYH **Run Date:** 12/15/2014 12:50
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** NI.121514.125033
Sample Tag: 03 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3	0.0240		0.00300	0.00150

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5		U	0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-06 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40DUPGW12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 21:16
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 8M401515
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	91.2	70	120	
4-Bromofluorobenzene	90.0	75	120	
Dibromofluoromethane	95.4	85	115	
Toluene-d8	89.3	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-06 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40DUPGW12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 20:14
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 1LM.LM27913
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	0.856		0.200	0.100

Sample #: L14120172-06 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40DUPGW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 14:46
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** P2.121014.144610
Sample Tag: 01 **Units:** mg/L

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	0.300		0.200	0.100
Iron, Total	7439-89-6	0.177		0.100	0.0500
Magnesium, Total	7439-95-4	12.4		0.500	0.250
Potassium, Total	7440-09-7	0.817	J	1.00	0.500
Sodium, Total	7440-23-5	6.35	B	0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

B	The reported result is associated with a contaminated method blank.
J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-06 **PrePrep Method:** N/A **Instrument:** ICP-MS2
Client ID: 40DUPGW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 07:25
Matrix: Water **Analytical Method:** 6020 **Cal Date:** 12/15/2014 12:19
Workgroup #: WG504176 **Analyst:** JYH **Run Date:** 12/15/2014 13:25
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** NI.121514.132506
Sample Tag: 02 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3	0.0241		0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5		U	0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-07 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40MW5MSGW12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 17:54
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 8M401508
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8	23.9		10.0	2.00
Acetone	67-64-1	20.1		10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	91.9	70	120	
4-Bromofluorobenzene	84.3	75	120	
Dibromofluoromethane	96.1	85	115	

Toluene-d8	88.8	85	120	

Sample #: L14120172-07 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40MW5MSGW12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 21:29
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 1LM.LM27917
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	1.05		0.200	0.100

Sample #: L14120172-07 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW5MSGW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 15:03
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** P2.121014.150311
Sample Tag: 01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	6.17		0.200	0.100
Iron, Total	7439-89-6	2.57		0.100	0.0500
Magnesium, Total	7439-95-4	19.1		0.500	0.250
Potassium, Total	7440-09-7	30.0		1.00	0.500
Sodium, Total	7440-23-5	35.6	B	0.500	0.250
Vanadium, Total	7440-62-2	0.626		0.0100	0.00500

B	The reported result is associated with a contaminated method blank.

Sample #: L14120172-07 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW5MSGW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/11/2014 08:56
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/11/2014 10:40
Collect Date: 12/02/2014 11:58 **Dilution:** 10 **File ID:** P2.121114.104008
Sample Tag: DL01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Calcium, Total	7440-70-2	50.0		5.00	2.50

Certificate of Analysis

Sample #: L14120172-07 **PrePrep Method:** N/A **Instrument:** ICP-MS2
Client ID: 40MW5MSGW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 07:24
Matrix: Water **Analytical Method:** 6020 **Cal Date:** 12/15/2014 12:19
Workgroup #: WG504176 **Analyst:** JYH **Run Date:** 12/15/2014 12:53
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** NI.121514.125341
Sample Tag: 03 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2	0.0666		0.00100	0.000500
Barium, Total	7440-39-3	0.0897		0.00300	0.00150
Cobalt, Total	7440-48-4	0.0646		0.00100	0.000500
Lead, Total	7439-92-1	0.0662		0.00100	0.000500
Manganese, Total	7439-96-5	0.0650		0.00200	0.00100
Selenium, Total	7782-49-2	0.0675		0.00100	0.000500

Sample #: L14120172-08 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40MW5MSDGW12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 18:23
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 8M401509
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8	22.9		10.0	2.00
Acetone	67-64-1	19.5		10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	90.8	70	120	
4-Bromofluorobenzene	85.8	75	120	
Dibromofluoromethane	96.3	85	115	
Toluene-d8	87.9	85	120	

Sample #: L14120172-08 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40MW5MSDGW12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 21:48
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 1LM.LM27918
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	1.09		0.200	0.100

Certificate of Analysis

Sample #:	L14120172-08	**PrePrep Method:**	N/A	**Instrument:**	PE-ICP2
Client ID:	40MW5MSDGW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 09:19
Matrix:	Water	**Analytical Method:**	6010B	**Cal Date:**	12/10/2014 08:18
Workgroup #:	WG504197	**Analyst:**	KHR	**Run Date:**	12/10/2014 15:05
Collect Date:	12/02/2014 11:58	**Dilution:**	1	**File ID:**	P2.121014.150537
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	6.26		0.200	0.100
Iron, Total	7439-89-6	2.60		0.100	0.0500
Magnesium, Total	7439-95-4	19.4		0.500	0.250
Potassium, Total	7440-09-7	30.8		1.00	0.500
Sodium, Total	7440-23-5	36.6	B	0.500	0.250
Vanadium, Total	7440-62-2	0.631		0.0100	0.00500

B	The reported result is associated with a contaminated method blank.

Sample #:	L14120172-08	**PrePrep Method:**	N/A	**Instrument:**	PE-ICP2
Client ID:	40MW5MSDGW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 09:19
Matrix:	Water	**Analytical Method:**	6010B	**Cal Date:**	12/11/2014 08:56
Workgroup #:	WG504197	**Analyst:**	KHR	**Run Date:**	12/11/2014 10:43
Collect Date:	12/02/2014 11:58	**Dilution:**	10	**File ID:**	P2.121114.104330
Sample Tag:	DL01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Calcium, Total	7440-70-2	51.3		5.00	2.50

Sample #:	L14120172-08	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	40MW5MSDGW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 07:25
Matrix:	Water	**Analytical Method:**	6020	**Cal Date:**	12/15/2014 12:19
Workgroup #:	WG504176	**Analyst:**	JYH	**Run Date:**	12/15/2014 12:56
Collect Date:	12/02/2014 11:58	**Dilution:**	1	**File ID:**	NI.121514.125649
Sample Tag:	03	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2	0.0669		0.00100	0.000500
Barium, Total	7440-39-3	0.101		0.00300	0.00150
Cobalt, Total	7440-48-4	0.0657		0.00100	0.000500
Lead, Total	7439-92-1	0.0658		0.00100	0.000500
Manganese, Total	7439-96-5	0.0661		0.00200	0.00100
Selenium, Total	7782-49-2	0.0680		0.00100	0.000500

Certificate of Analysis

Sample #:	L14120172-09	**PrePrep Method:**	N/A	**Instrument:**	HPMS8
Client ID:	40MW6GW12214	**Prep Method:**	5030B/5030C/5035A	**Prep Date:**	N/A
Matrix:	Water	**Analytical Method:**	8260B	**Cal Date:**	11/19/2014 00:08
Workgroup #:	WG503275	**Analyst:**	TMB	**Run Date:**	12/03/2014 21:45
Collect Date:	12/02/2014 14:06	**Dilution:**	1	**File ID:**	8M401516
Sample Tag:	01	**Units:**	ug/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	93.6	70	120	
4-Bromofluorobenzene	89.2	75	120	
Dibromofluoromethane	96.8	85	115	
Toluene-d8	89.5	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-09	**PrePrep Method:**	N/A	**Instrument:**	LCMS1
Client ID:	40MW6GW12214	**Prep Method:**	6850	**Prep Date:**	12/10/2014 10:00
Matrix:	Water	**Analytical Method:**	6850	**Cal Date:**	11/17/2014 14:53
Workgroup #:	WG504286	**Analyst:**	ADC	**Run Date:**	12/10/2014 22:07
Collect Date:	12/02/2014 14:06	**Dilution:**	1	**File ID:**	1LM.LM27919
Sample Tag:	01	**Units:**	ug/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	1.03		0.200	0.100

Sample #:	L14120172-09	**PrePrep Method:**	N/A	**Instrument:**	PE-ICP2
Client ID:	40MW6GW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 09:19
Matrix:	Water	**Analytical Method:**	6010B	**Cal Date:**	12/10/2014 08:18
Workgroup #:	WG504197	**Analyst:**	KHR	**Run Date:**	12/10/2014 15:08
Collect Date:	12/02/2014 14:06	**Dilution:**	1	**File ID:**	P2.121014.150803
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	0.466		0.200	0.100
Calcium, Total	7440-70-2	22.2		0.500	0.250
Iron, Total	7439-89-6	0.451		0.100	0.0500
Magnesium, Total	7439-95-4	6.79		0.500	0.250
Potassium, Total	7440-09-7	1.12		1.00	0.500
Sodium, Total	7440-23-5	7.98	B	0.500	0.250

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Vanadium, Total	7440-62-2		U	0.0100	0.00500

B	The reported result is associated with a contaminated method blank.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-09 **PrePrep Method:** N/A **Instrument:** ICP-MS2
Client ID: 40MW6GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 07:25
Matrix: Water **Analytical Method:** 6020 **Cal Date:** 12/15/2014 12:19
Workgroup #: WG504176 **Analyst:** JYH **Run Date:** 12/15/2014 13:28
Collect Date: 12/02/2014 14:06 **Dilution:** 1 **File ID:** NI.121514.132814
Sample Tag: 03 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3	0.0122		0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5	0.00265		0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-10 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: LFMW01GW12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 22:14
Collect Date: 12/02/2014 15:45 **Dilution:** 1 **File ID:** 8M401517
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	90.3	70	120	
4-Bromofluorobenzene	89.8	75	120	
Dibromofluoromethane	95.2	85	115	
Toluene-d8	89.5	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #:	L14120172-10	**PrePrep Method:**	N/A	**Instrument:**	LCMS1
Client ID:	LFMW01GW12214	**Prep Method:**	6850	**Prep Date:**	12/10/2014 10:00
Matrix:	Water	**Analytical Method:**	6850	**Cal Date:**	11/17/2014 14:53
Workgroup #:	WG504286	**Analyst:**	ADC	**Run Date:**	12/10/2014 22:26
Collect Date:	12/02/2014 15:45	**Dilution:**	1	**File ID:**	1LM.LM27920
Sample Tag:	01	**Units:**	ug/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	3.04		0.200	0.100

Sample #:	L14120172-10	**PrePrep Method:**	N/A	**Instrument:**	PE-ICP2
Client ID:	LFMW01GW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 09:19
Matrix:	Water	**Analytical Method:**	6010B	**Cal Date:**	12/10/2014 08:18
Workgroup #:	WG504197	**Analyst:**	KHR	**Run Date:**	12/10/2014 15:15
Collect Date:	12/02/2014 15:45	**Dilution:**	1	**File ID:**	P2.121014.151536
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	0.526		0.200	0.100
Iron, Total	7439-89-6	0.527		0.100	0.0500
Magnesium, Total	7439-95-4	22.3		0.500	0.250
Potassium, Total	7440-09-7	1.29		1.00	0.500
Sodium, Total	7440-23-5	6.08	B	0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

B	The reported result is associated with a contaminated method blank.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-10	**PrePrep Method:**	N/A	**Instrument:**	PE-ICP2
Client ID:	LFMW01GW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 09:19
Matrix:	Water	**Analytical Method:**	6010B	**Cal Date:**	12/11/2014 08:56
Workgroup #:	WG504197	**Analyst:**	KHR	**Run Date:**	12/11/2014 10:46
Collect Date:	12/02/2014 15:45	**Dilution:**	10	**File ID:**	P2.121114.104651
Sample Tag:	DL01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Calcium, Total	7440-70-2	63.9		5.00	2.50

Certificate of Analysis

Sample #:	L14120172-10	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	LFMW01GW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 07:25
Matrix:	Water	**Analytical Method:**	6020	**Cal Date:**	12/15/2014 12:19
Workgroup #:	WG504176	**Analyst:**	JYH	**Run Date:**	12/15/2014 13:31
Collect Date:	12/02/2014 15:45	**Dilution:**	1	**File ID:**	NI.121514.133122
Sample Tag:	03	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3	0.0494		0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5	0.00368		0.00200	0.00100
Selenium, Total	7782-49-2	0.000738	J	0.00100	0.000500

J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Appendix D – Support Documentation

Microbac

Laboratory Report Number: L14120172

Mary Lou Rochette
Kemron Environmental Services
2343-A State Rt 821
Marietta, OH 45750

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:
Stephanie Mossburg – Team Chemist/Data Specialist
(740) 373-4071
Stephanie.Mossburg@microbac.com

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

This report was certified on December 17 2014

David E. Vandenberg

David Vandenberg – Managing Director

State of Origin: VA
Accrediting Authority: Common Wealth of Virginia ID:460187
QAPP: DOD Ver 4.1

Microbac

Lab Report #: L14120172
Lab Project #: 2820.216
Project Name: Radford AAP
Lab Contact: Stephanie Mossburg

Record of Sample Receipt and Inspection

Comments/Discrepancies

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

There were no discrepancies.

Discrepancy	Resolution

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0019428	H	1.0			X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	NA
2	Were custody seals intact?	NA
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	Yes

Microbac

Lab Report #: L14120172
Lab Project #: 2820.216
Project Name: Radford AAP
Lab Contact: Stephanie Mossburg

Samples Received

Client ID	Laboratory ID	Date Collected	Date Received
40TB12214	L14120172-01	12/02/2014 00:01	12/03/2014 13:00
40MW7GW12214	L14120172-02	12/02/2014 09:17	12/03/2014 13:00
40EQR12214	L14120172-03	12/02/2014 10:50	12/03/2014 13:00
40FB12214	L14120172-04	12/02/2014 11:05	12/03/2014 13:00
40MW5GW12214	L14120172-05	12/02/2014 11:58	12/03/2014 13:00
40DUPGW12214	L14120172-06	12/02/2014 11:58	12/03/2014 13:00
40MW5MSGW12214	L14120172-07	12/02/2014 11:58	12/03/2014 13:00
40MW5MSDGW12214	L14120172-08	12/02/2014 11:58	12/03/2014 13:00
40MW6GW12214	L14120172-09	12/02/2014 14:06	12/03/2014 13:00
LFMW01GW12214	L14120172-10	12/02/2014 15:45	12/03/2014 13:00

COC No. A 8140

2343-A State Route 821
Marietta, OH 45750

KEMRON
ENVIRONMENTAL SERVICES

CHAIN-OF-CUSTODY RECORD

Phone: 740-373-4308
Fax: 740-376-2536

Company Name: KEMRON

Project Contact: MARY LOU ROCHOTTE
Contact Phone #: 740-373-4308

Turn Around Requirements: 14-DAY
Location: RADFORD, VA

Project ID: MR0669-300-004 SWMU 40 (RFAAP) GTM YR 4

Sampler (print): JONAH ANDERSON
Signature:

Program: ☐ CWA ☐ RCRA ☐ DOD ☐ AFCEE ☐ Other

Sample I.D. No.	Comp	Grab	Date	Time	Matrix*	NUMBER OF CONTAINERS	Hold	VOC-8260 *UNPRESERVED	PERCHLORATE	METALS - (TOTAL)	TOTAL # (LAB USE)
40TB12214	/		12-2-14	—	W	2		2			
40MW7GW12214		X	12-2-14	917	W	5		3	1	1	
40EQR12214		X	12-2-14	1050	W	5		3	1	1	
40FB12214		X	12-2-14	1105	W	5		3	1	1	
40MW5GW12214		X	12-2-14	1158	W	5		3	1	1	
40DUPGW12214		X	12-2-14	1158	W	5		3	1	1	
40MW5MSGW12214		X	12-2-14	1205	W	5		3	1	1	
40MW5MSDGW12214		X	12-2-14	1205	W	5		3	1	1	
40MW4GW12214		X	12-2-14	1406	W	5		3	1	1	
LFMW01GW12214		X	12-2-14	1545	W	5		3	1	1	

ADDITIONAL REQUIREMENTS

★ PER QAPP SWMU 40 RFAAP ★

★ VOA's ARE UNPRESERVED ★

-METALS LIST:
Al, Ar, Ba, Ca, Co, Fe, Pb, Mg, Mn, K, Se, Na, V

-8260 LIST:
-2-chloroethyl Vinyl Ether
-Acetone

Microbac OVD
Received: 12/03/2014 13:00
By: CARA STRICKLER
221000062835

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	12-3-14	1257	Cara Strickler
Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)

Date: 12/3/14 Time: 1257 Remarks:

*Water (W), Soil (S), Solid Waste (SD), Unknown (X)

Page _____ of _____

Login Number: L14120172
Department: Volatiles
Analyst: Tiffany Bailey

METHOD

Preparation SW-846 5030C/5035A

Analysis SW-846 8260B

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: Non-target calibration check compound (CCC) vinyl chloride exceeded the upper control limit, however, the target analytes met CCC acceptance criteria.

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.

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 area counts 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: 92859
Approved By: Michael Albertson

Login Number: L14120172
Department: General Chromatography
Analyst: Anthony Canter

METHOD

Analysis SW-846 6850

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: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

Internal Standards: All acceptance criteria were met.

Manual Integration Reason Codes

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

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

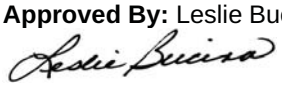
Reason #3: Improperly Integrated Isomers and/or coeluting compounds. This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene 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 Laboratory Director or the QA/QC Supervisor 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: 93199
Approved By: Leslie Bucina



Login Number: L14120172
Department: Metals
Analyst: Kim Rhodes

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: All acceptance criteria were met.

Continuing Calibration Blank: WG504197 - The continuing calibration blank analyzed on 10-DEC-2014 at 14:15 yielded a result for sodium of 0.217mg/L which exceeded the LOD. However, the reported sample results exceeded that of the CCB by greater than a factor of ten with the exception of fractions 03 and 04. Fractions 03 and 04 yielded results that were below the LOD, therefore, no further action was taken. The sodium results were reported with a 'B' qualifier to indicate the association with a noncompliant CCB.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Serial Dilution/Post Digestion Spikes: WG504197 - All acceptance criteria were met.

Matrix Spikes: WG504197 - Sample 05 was chosen by the client for MS/MSD analysis. Samples 07(MS) and 08(MSD) yielded noncompliant recoveries for calcium.

SAMPLES

Samples: WG504197 - Client samples 02, 05, 06, 07MS, 08MSD and 10 as well as the batch post digestion spike required dilution analyses in order to obtain results for calcium within the calibration range.

Narrative ID: 93050
Approved By: Sheri Pfalzgraf

Login Number: L14120172
Department: Metals
Analyst: Ji Hu
Analyst #2: Pierce Morris

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: All acceptance criteria were met.

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: WG504176 - All acceptance criteria were met.

Matrix Spikes: WG504176 - Sample 05 was chosen by the client for MS/MSD analysis. Samples 07 (MS) and 08 (MSD) yielded a noncompliant recovery for barium.

SAMPLES

Samples: All acceptance criteria were met.

Narrative ID: 93175
Approved By: Maren Beery

Microbac Laboratories Inc.
SURROGATE STANDARDS

Login Number:L14120172
Instrument Id:HPMS8
Workgroup (AAB#):WG503275

Method:8260
CAL ID: HPMS8-19-NOV-14
Matrix:Water

Sample Number	Dilution	Tag	1	2	3	4
L14120172-01	1.00	01	93.1	96.2	89.9	88.4
L14120172-02	1.00	01	91.0	95.9	89.4	89.1
L14120172-03	1.00	01	91.2	94.9	90.8	91.1
L14120172-04	1.00	01	90.9	95.4	90.9	90.6
L14120172-05	1.00	01	91.9	95.3	90.9	90.1
L14120172-06	1.00	01	91.2	95.4	90.0	89.3
L14120172-07	1.00	01	91.9	96.1	84.3	88.8
L14120172-08	1.00	01	90.8	96.3	85.8	87.9
L14120172-09	1.00	01	93.6	96.8	89.2	89.5
L14120172-10	1.00	01	90.3	95.2	89.8	89.5
WG503275-02	1.00	01	91.5	93.9	92.1	89.8
WG503275-03	1.00	01	92.3	96.3	84.0	88.7

Surrogates	Surrogate Limits		
1 - 1,2-Dichloroethane-d4	70	-	120
2 - Dibromofluoromethane	85	-	115
3 - 4-Bromofluorobenzene	75	-	120
4 - Toluene-d8	85	-	120

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

SURROGATES - Modified 03/06/2008
PDF File ID: 3903590
Report generated: 12/04/2014 14:57

Microbac Laboratories Inc.

METHOD BLANK SUMMARY

Login Number: L14120172 Work Group: WG503275
Blank File ID: 8M401506 Blank Sample ID: WG503275-02
Prep Date: 12/03/14 16:56 Instrument ID: HPMS8
Analyzed Date: 12/03/14 16:56 Method: 8260B
Analyst: TMB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG503275-03	8M401507	12/03/14 17:26	01
40MW5MSGW12214	L14120172-07	8M401508	12/03/14 17:54	01
40MW5MSDGW12214	L14120172-08	8M401509	12/03/14 18:23	01
40TB12214	L14120172-01	8M401510	12/03/14 18:52	01
40EQR12214	L14120172-03	8M401511	12/03/14 19:21	01
40FB12214	L14120172-04	8M401512	12/03/14 19:50	01
40MW5GW12214	L14120172-05	8M401513	12/03/14 20:19	01
40MW7GW12214	L14120172-02	8M401514	12/03/14 20:48	01
40DUPGW12214	L14120172-06	8M401515	12/03/14 21:16	01
40MW6GW12214	L14120172-09	8M401516	12/03/14 21:45	01
LFMW01GW12214	L14120172-10	8M401517	12/03/14 22:14	01

Report Name: BLANK_SUMMARY
PDF File ID: 3903663
Report generated 12/04/2014 14:57

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number:L14120172 Prep Date:12/03/14 16:56 Sample ID:WG503275-02
Instrument ID:HPMS8 Run Date:12/03/14 16:56 Prep Method:5030B/5030C/503
File ID:8M401506 Analyst:TMB Method:8260B
Workgroup (AAB#):WG503275 Matrix:Water Units:ug/L
Contract #: Cal ID: HPMS8-19-NOV-14

Analytes	LOD	LOQ	Concentration	Dilution	Qualifier
2-Chloroethyl vinyl ether	2.00	10.0	2.00	1	U
Acetone	2.50	10.0	2.50	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	91.5	70 - 120	PASS
4-Bromofluorobenzene	92.1	75 - 120	PASS
Dibromofluoromethane	93.9	85 - 115	PASS
Toluene-d8	89.8	85 - 120	PASS

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

Report Name:BLANK
PDF ID: 3903664
04-DEC-2014 14:57

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L14120172 Run Date: 12/03/2014 Sample ID: WG503275-03
Instrument ID: HPMS8 Run Time: 17:26 Prep Method: 5030B/5030C/503
File ID: 8M401507 Analyst: TMB Method: 8260B
Workgroup (AAB#): WG503275 Matrix: Water Units: ug/L
QC Key: DOD4 Lot#: STD67765 Cal ID: HPMS8-19-NOV-14

Analytes	Expected	Found	% Rec	LCS Limits	Q
2-Chloroethyl vinyl ether	20.0	23.5	117	45 - 160	
Acetone	20.0	20.4	102	40 - 140	

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	92.3	70 - 120	PASS
4-Bromofluorobenzene	84.0	75 - 120	PASS
Dibromofluoromethane	96.3	85 - 115	PASS
Toluene-d8	88.7	85 - 120	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
PDF File ID: 3903586
Report generated: 12/04/2014 14:57

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum:L14120172 Cal ID:HPMS8- 19-NOV-14 Worknum:WG503275

Instrument ID:HPMS8 Contract #: Prep Method:5030B/5030C/

Parent ID:L14120172-05 File ID:8M401513 Dil:1 Method:5035A

Sample ID:L14120172-07 MS File ID:8M401508 Dil:1 Matrix:8260B

Sample ID:L14120172-08 MSD File ID:8M401509 Dil:1 Units:Water

ug/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
2-Chloroethyl vinyl ether	U	20.0	23.9	120	20.0	22.9	114	4.37	58 - 160	20	
Acetone	U	20.0	20.1	100	20.0	19.5	97.4	3.03	40 - 140	30	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008

PDF File ID: 3903587

Report generated 12/04/2014 14:57

Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L14120172
Instrument: HPMS8
Analyst: FJB
Workgroup: WG501514

Tune ID: WG501514-01
Run Date: 11/18/2014
Run Time: 18:53
File ID: 8M401217
Cal ID: HPMS8 - 19-NOV-14

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	21.4	7468	PASS
75.0	95.0	30.0	60.0	51.8	18035	PASS
95.0	95.0	100	100	100	34826	PASS
96.0	95.0	5.00	9.00	6.45	2248	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	72.8	25368	PASS
175	174	5.00	9.00	7.54	1912	PASS
176	174	95.0	101	96.8	24555	PASS
177	176	5.00	9.00	6.92	1698	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG501514-02	STD	01	11/18/2014 19:46	
WG501514-03	STD	01	11/18/2014 20:15	
WG501514-04	STD	01	11/18/2014 20:44	
WG501514-05	STD	01	11/18/2014 21:13	
WG501514-06	STD	01	11/18/2014 21:43	
WG501514-07	STD	01	11/18/2014 22:13	
WG501514-08	STD-CCV	01	11/18/2014 22:42	
WG501514-09	STD	01	11/18/2014 23:11	
WG501514-10	STD	01	11/18/2014 23:40	
WG501514-11	STD	01	11/19/2014 00:08	
WG501514-12	SSCV	01	11/19/2014 01:06	

* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008
PDF File ID: 3903665
Report generated 12/04/2014 14:57

Microbac Laboratories Inc.
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L14120172
Instrument: HPMS8
Analyst: TMB
Workgroup: WG503066

Tune ID: WG503066-01
Run Date: 12/03/2014
Run Time: 15:05
File ID: 8M401502
Cal ID: HPMS8 - 19-NOV-14

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50.0	95.0	15.0	40.0	21.0	6245	PASS
75.0	95.0	30.0	60.0	53.6	15942	PASS
95.0	95.0	100	100	100	29741	PASS
96.0	95.0	5.00	9.00	7.53	2240	PASS
173	174	0	2.00	0	0	PASS
174	95.0	50.0	100	77.2	22968	PASS
175	174	5.00	9.00	7.64	1755	PASS
176	174	95.0	101	97.3	22344	PASS
177	176	5.00	9.00	6.77	1513	PASS

This check relates to the following samples:

Lab ID	Client ID	Tag	Date Analyzed	Q
WG503066-02	CCV	01	12/03/2014 15:58	
WG503275-02	BLANK	01	12/03/2014 16:56	
WG503275-03	LCS	01	12/03/2014 17:26	
L14120172-07	40MW5MSGW12214	01	12/03/2014 17:54	
L14120172-08	40MW5MSDGW12214	01	12/03/2014 18:23	
L14120172-01	40TB12214	01	12/03/2014 18:52	
L14120172-03	40EQR12214	01	12/03/2014 19:21	
L14120172-04	40FB12214	01	12/03/2014 19:50	
L14120172-05	40MW5GW12214	01	12/03/2014 20:19	
L14120172-02	40MW7GW12214	01	12/03/2014 20:48	
L14120172-06	40DUPGW12214	01	12/03/2014 21:16	
L14120172-09	40MW6GW12214	01	12/03/2014 21:45	
L14120172-10	LFMW01GW12214	01	12/03/2014 22:14	

* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008
PDF File ID: 3903665
Report generated 12/04/2014 14:57

Calibration Table Report
Method: 8260WT.M
Title: Method 8260B/624 WTR-SOP:OVLMSV01 11-18-14 HPMS 8
Last Calibration: Wed Nov 19 12:08:00 2014
Curve: WG501514
Calibration Files

	Compound	0.3 8M401219.D	0.4 8M401220.D	1 8M401221.D	2 8M401222.D	5 8M401223.D	20 8M401224.D	50 8M401225.D	100 8M401226.D	200 8M401227.D	300 8M401228.D	Avg	%RSD	Linear	Quad
I	Fluorobenzene	ISTD													
T	Dichlorodifluoromethane			0.237	0.284	0.252	0.314	0.327	0.316	0.313	0.285	0.291	11.275		
P	Chloromethane			0.392	0.370	0.311	0.334	0.347	0.336	0.329	0.300	0.340	8.811		
C	Vinyl Chloride		0.297	0.261	0.283	0.244	0.268	0.276	0.260	0.253	0.229	0.263	7.824		
T	1,3-Butadiene				0.248	0.209	0.258	0.214	0.127	0.129	0.124	0.187	31.549		0.991
T	Bromomethane			0.118	0.124	0.117	0.140	0.165	0.174	0.183	0.181	0.150	18.978		0.998
T	Chloroethane			0.162	0.176	0.164	0.176	0.186	0.182	0.185	0.175	0.176	5.157		
T	Trichlorofluoromethane		0.327	0.333	0.367	0.336	0.372	0.402	0.387	0.391	0.381	0.366	7.581		
T	Diethyl ether			0.136	0.141	0.137	0.128	0.142	0.145		0.145	0.139	4.363		
T	Isoprene					0.308	0.375	0.375	0.375	0.390	0.373	0.366	7.886		
T	Acrolein						0.001	0.001	0.002		0.002	0.002	37.668		
T	1,1,2-Trichloro-1,2,2-Trifluoroethane			0.180	0.220	0.205	0.218	0.243	0.249	0.256	0.245	0.227	11.515		
T	Acetone					0.034	0.033	0.037	0.037	0.038	0.037	0.036	5.884		
C	1,1-Dichloroethene		0.328	0.334	0.359	0.333	0.360	0.385	0.373	0.376	0.361	0.357	5.766		
T	Tert-Butyl Alcohol				0.011	0.010	0.009	0.008	0.009		0.009	0.009	10.115		
T	Dimethyl Sulfide				0.184	0.171	0.205	0.203	0.204	0.212	0.205	0.198	7.403		
T	Iodomethane					0.048	0.120	0.153	0.155	0.167	0.154	0.133	33.528	0.998	
T	Methyl acetate				0.114	0.095	0.099	0.095	0.095	0.095	0.094	0.098	7.199		
T	Methylene Chloride			0.229	0.241	0.218	0.223	0.241	0.237	0.236	0.225	0.231	3.798		
T	Carbon Disulfide			0.706	0.765	0.696	0.846	0.839	0.795	0.782	0.700	0.766	7.896		
T	Acrylonitrile			0.037	0.043	0.043	0.042	0.047	0.048		0.053	0.045	11.752		
T	Methyl Tert Butyl Ether			0.499	0.506	0.431	0.442	0.477	0.479	0.487	0.461	0.473	5.605		
T	trans-1,2-Dichloroethene		0.360	0.331	0.382	0.341	0.367	0.403	0.397	0.398	0.371	0.372	6.810		
T	n-Hexane					0.366	0.437	0.421	0.402	0.400	0.382	0.401	6.428		
T	Diisopropyl ether			0.851	0.854	0.830	0.761	0.813	0.782		0.724	0.802	6.066		
T	Vinyl Acetate					0.312	0.340	0.344	0.345	0.333	0.325	0.333	3.850		
P	1,1-Dichloroethane		0.485	0.449	0.477	0.439	0.460	0.499	0.491	0.486	0.453	0.471	4.514		
T	Ethyl-Tert-Butyl ether			0.719	0.725	0.697	0.639	0.685	0.665		0.624	0.679	5.666		
T	2-Butanone					0.051	0.054	0.056	0.055	0.057	0.054	0.055	3.407		
T	Propionitrile				0.016	0.015	0.015	0.015	0.016		0.016	0.016	3.470		
T	2,2-Dichloropropane		0.423	0.415	0.418	0.379	0.393	0.422	0.421	0.416	0.386	0.408	4.187		
T	cis-1,2-Dichloroethene		0.239	0.248	0.258	0.235	0.258	0.277	0.272	0.273	0.259	0.258	5.734		
C	Chloroform	0.486	0.447	0.455	0.470	0.417	0.443	0.474	0.467	0.455	0.417	0.453	5.075		
T	1-Bromopropane			0.012	0.034	0.037	0.044	0.044	0.044	0.044	0.042	0.038	29.667	0.999	
T	Bromochloromethane		0.095	0.126	0.137	0.122	0.130	0.138	0.139	0.140	0.131	0.129	10.924		
T	Tetrahydrofuran			0.039	0.038	0.034	0.031	0.033	0.033		0.034	0.035	8.416		
S	Dibromofluoromethane			0.200	0.220	0.231	0.241	0.240	0.247	0.247	0.239	0.233	6.844		
T	1,1,1-Trichloroethane		0.446	0.390	0.428	0.383	0.404	0.437	0.431	0.429	0.397	0.416	5.471		
T	Cyclohexane			0.448	0.502	0.454	0.532	0.524	0.505	0.513	0.481	0.495	6.276		
T	1,1-Dichloropropene			0.364	0.388	0.361	0.373	0.402	0.393	0.387	0.364	0.379	4.076		
T	Tert-Amyl-Methyl ether			0.577	0.571	0.542	0.496	0.527	0.521		0.492	0.532	6.244		
T	Carbon Tetrachloride		0.318	0.323	0.354	0.327	0.345	0.374	0.377	0.38	0.355	0.3505	6.80094		
S	1,2-Dichloroethane-d4			0.257	0.271	0.253	0.26	0.262	0.266	0.267	0.253	0.2613	2.62832		
T	Heptane											0	0		
T	1,2-Dichloroethane		0.324	0.318	0.345	0.301	0.314	0.332	0.328	0.323	0.297	0.3205	4.645		
T	Benzene	1.212	1.14	1.036	1.092	0.981	0.992	1.045	0.999	0.905	0.778	1.018	11.8999		
T	Trichloroethene		0.222	0.234	0.25	0.23	0.24	0.258	0.255	0.258	0.246	0.2436	5.32919		
T	Methylcyclohexane					0.414	0.494	0.48	0.46	0.46	0.434	0.4568	6.40441		
C	1,2-Dichloropropane		0.238	0.265	0.282	0.249	0.256	0.277	0.276	0.277	0.265	0.265	5.56586		
T	Bromodichloromethane		0.324	0.322	0.332	0.295	0.321	0.349	0.347	0.345	0.323	0.3286	5.19377		
T	1,4-Dioxane				0.001	0.001	0.001	0.001	0.001		0.001	0.0009	15.6565	0.994	
T	Dibromomethane		0.089	0.114	0.122	0.106	0.114	0.123	0.123	0.125	0.118	0.1148	9.96736		
T	2-Chloroethyl Vinyl Ether				0.101	0.09	0.104	0.103	0.091	0.088	0.087	0.0949	7.94583		
T	4-Methyl-2-Pentanone					0.04	0.045	0.05	0.048	0.05	0.048	0.0468	8.52012		
T	cis-1,3-Dichloropropene		0.381	0.38	0.4	0.346	0.373	0.401	0.394	0.388	0.36	0.3804	4.8369		

T	Dimethyl Disulfide				0.356	0.32	0.405	0.408	0.405	0.409	0.384	0.384	8.86103	
I	Chlorobenzene-d5	ISTD												
S	Toluene-d8			1.141	1.321	1.305	1.298	1.297	1.291	1.217	1.141	1.2514	5.97636	
C	Toluene		1.684	1.514	1.606	1.463	1.493	1.572	1.448	1.262	1.047	1.4544	13.2692	
T	Ethyl Methacrylate			0.311	0.314	0.284	0.336	0.329	0.325	0.317	0.3	0.3146	5.2992	
T	Paraldehyde											0	0	
T	trans-1,3-Dichloropropene			0.466	0.467	0.433	0.456	0.499	0.48	0.464	0.428	0.4615	5.00645	
T	1,1,2-Trichloroethane		0.172	0.217	0.245	0.206	0.215	0.234	0.222	0.221	0.21	0.2157	9.34583	
T	2-Hexanone					0.054	0.06	0.068	0.063	0.064	0.06	0.0613	7.25961	
T	1,3-Dichloropropane		0.411	0.416	0.457	0.405	0.403	0.431	0.414	0.403	0.377	0.413	5.29214	
T	Tetrachloroethene		0.301	0.284	0.308	0.291	0.301	0.325	0.312	0.316	0.303	0.3045	4.0681	
T	Dibromochloromethane		0.198	0.249	0.271	0.239	0.257	0.295	0.291	0.293	0.279	0.2636	11.9908	
T	1,2-Dibromoethane		0.218	0.205	0.227	0.209	0.214	0.235	0.226	0.224	0.213	0.2192	4.37399	
T	1-Chlorohexane		0.604	0.522	0.561	0.496	0.591	0.578	0.54	0.519	0.483	0.5439	7.81351	
P	Chlorobenzene		1.04	0.951	1.017	0.926	0.957	1.021	0.974	0.899	0.773	0.9508	8.54628	
T	1,1,1,2-Tetrachloroethane		0.278	0.323	0.318	0.299	0.321	0.358	0.352	0.349	0.323	0.3246	7.92839	
C	Ethylbenzene		0.555	0.528	0.593	0.537	0.55	0.6	0.591	0.581	0.525	0.5623	5.20373	
T	m-,p-Xylene		0.693	0.644	0.686	0.624	0.648	0.698	0.661	0.581	0.479	0.6348	10.89	
T	o-Xylene			0.621	0.65	0.596	0.63	0.684	0.664	0.646	0.594	0.6355	4.9616	
T	Styrene	1.035	1.007	1.018	1.066	0.984	1.029	1.119	1.071	0.979	0.842	1.015	7.28557	
P	Bromoform			0.111	0.131	0.125	0.139	0.167	0.168	0.172	0.168	0.1479	16.1456	0.999
T	Isopropylbenzene		1.72	1.648	1.762	1.593	1.632	1.718	1.58	1.339	1.091	1.5648	13.8199	
I	1,4-Dichlorobenzene-d4	ISTD												
P	1,1,2,2-Tetrachloroethane		0.45	0.491	0.521	0.474	0.477	0.522	0.49	0.486	0.469	0.4868	4.78291	
S	p-Bromofluorobenzene			1.091	1.077	1.132	1.089	1.054	1.051	1.028	1.01	1.0666	3.63654	
T	1,2,3-Trichloropropane			0.08	0.142	0.132	0.133	0.145	0.137	0.138	0.133	0.13	15.8307	0.999
T	trans-1,4-Dichloro-2-Butene			0.111	0.133	0.133	0.179	0.152	0.157	0.155	0.169	0.1487	14.6669	
T	n-Propylbenzene		4.701	4.133	4.525	4.171	4.275	4.299	3.819	3.05		4.1216	12.2903	
T	Bromobenzene	0.786	0.755	0.756	0.846	0.755	0.771	0.81	0.78	0.773	0.744	0.7776	3.95372	
T	1,3,5-Trimethylbenzene	3.014	2.933	2.746	2.98	2.717	2.87	2.992	2.805	2.468	2.068	2.7592	10.6544	
T	2-Chlorotoluene		2.743	2.962	3.177	2.519	2.563	2.648	2.484	2.158		2.6568	11.7113	
T	4-Chlorotoluene		2.59	2.506	2.487	2.574	2.629	2.72	2.461	2.167		2.5167	6.53729	
T	a-Methylstyrene					1.334	1.629	1.567	1.531	1.468	1.352	1.4803	7.99335	
T	tert-Butylbenzene			0.517	0.601	0.546	0.581	0.612	0.611	0.621	0.605	0.5866	6.27242	
T	1,2,4-Trimethylbenzene		2.792	2.533	2.736	2.52	2.703	2.885	2.752	2.427	2.025	2.597	10.0178	
T	sec-Butylbenzene		3.76	3.378	3.799	3.395	3.543	3.643	3.392	2.867	2.346	3.3472	13.9298	
T	p-Isopropyltoluene		2.807	2.502	2.727	2.549	2.753	2.95	2.83	2.475	2.059	2.628	10.1658	
T	1,3-Dichlorobenzene		1.688	1.467	1.629	1.47	1.515	1.586	1.532	1.469	1.329	1.5206	6.937	
T	1,4-Dichlorobenzene	1.643	1.436	1.559	1.539	1.418	1.455	1.547	1.487	1.428	1.292	1.4805	6.57069	
T	n-Butylbenzene			2.223	2.43	2.258	2.561	2.741	2.615	2.316	1.938	2.3853	10.7478	
T	1,2-Dichlorobenzene	1.329	1.321	1.314	1.375	1.245	1.281	1.355	1.305	1.267	1.169	1.2962	4.59392	
T	1,2-Dibromo-3-Chloropropane				0.071	0.078	0.08	0.091	0.086	0.089	0.085	0.0828	8.57009	
T	1,2,4-Trichlorobenzene		0.803	0.693	0.795	0.733	0.761	0.808	0.777	0.784	0.745	0.7667	4.89524	
T	Hexachlorobutadiene		0.518	0.485	0.526	0.504	0.523	0.549	0.537	0.54	0.515	0.5218	3.73555	
T	Naphthalene		1.33	1.241	1.301	1.106	1.044	1.031	0.951	0.924		1.1159	14.0454	
T	1,2,3-Trichlorobenzene	0.564	0.618	0.547	0.597	0.545	0.56	0.57	0.538	0.531	0.498	0.5572	6.08187	

Wed Nov 19 12:17:29 2014

Microbac Laboratories Inc.

ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L14120172 Run Date: 11/19/2014 Sample ID: WG501514-12

Instrument ID: HPMS8 Run Time: 01:06 Method: 8260B

File ID: 8M401230 Analyst: FJB QC Key: DOD4

ICal Workgroup: WG501514 Cal ID: HPMS8 - 19-NOV-14

Analyte		Expected	Found	Units	RF	%D	UCL	Q
Chlorobenzene	SPCC	20.0	20.7	ug/L	0.984	3.50	20	
Chloromethane	SPCC	20.0	22.9	ug/L	0.389	14.4	20	
1,1,2,2-Tetrachloroethane	SPCC	20.0	20.2	ug/L	0.492	1.00	20	
1,1-Dichloroethane	SPCC	20.0	19.5	ug/L	0.460	2.30	20	
Bromoform	SPCC	20.0	19.4	ug/L	0.159	3.00	20	
2-Chloroethyl Vinyl Ether		20.0	23.8	ug/L	0.113	19.2	30	
Acetone		20.0	21.1	ug/L	0.0380	5.70	20	

* Exceeds %D Limit

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

ALT - Modified 09/06/2007
Version 1.5 PDF File ID: 3903588
Report generated 12/04/2014 14:57

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/03/2014 Sample ID: WG503066-02

Instrument ID: HPMS8 Run Time: 15:58 Method: 8260B

File ID: 8M401504 Analyst: TMB QC Key: DOD4

Workgroup (AAB#): WG503275 Cal ID: HPMS8 - 19-NOV-14

Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
1,1-Dichloroethene	CCC	50.0	52.2	ug/L	0.372	4.33	20	
1,2-Dichloropropane	CCC	50.0	54.7	ug/L	0.290	9.37	20	
Chloroform	CCC	50.0	54.6	ug/L	0.495	9.25	20	
Ethylbenzene	CCC	50.0	50.0	ug/L	0.562	0.0722	20	
Toluene	CCC	50.0	50.3	ug/L	1.46	0.537	20	
Vinyl Chloride	CCC	50.0	62.6	ug/L	0.330	25.2	20	*
1,1,2,2-Tetrachloroethane	SPCC	50.0	50.6	ug/L	0.492	1.10	20	
1,1-Dichloroethane	SPCC	50.0	53.8	ug/L	0.507	7.69	20	
Bromoform	SPCC	50.0	53.0	ug/L	0.177	5.94	20	
Chlorobenzene	SPCC	50.0	50.7	ug/L	0.964	1.34	20	
Chloromethane	SPCC	50.0	55.2	ug/L	0.376	10.5	20	
2-Chloroethyl Vinyl Ether		50.0	54.7	ug/L	0.104	9.47	40	
Acetone		50.0	50.0	ug/L	0.0359	0.0360	20	

* Exceeds %D Criteria

CCC Calibration Check Compounds
SPCC System Performance Check Compounds

CCV - Modified 03/05/2008
PDF File ID: 3903589
Report generated 12/04/2014 14:57

Microbac Laboratories Inc.

INTERNAL STANDARD AREA SUMMARY
(COMPARED TO MIDPOINT OF ICAL)

Login Number:L14120172
Instrument ID:HPMS8
Workgroup (AAB#):WG503275

ICAL CCV Number:WG501514-08
CAL ID: HPMS8-19-NOV-14
Matrix:WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG501514-08	NA	NA	193228	397868	585193
Upper Limit	NA	NA	386456	795736	1170386
Lower Limit	NA	NA	96614	198934	292597
L14120172-01	1.00	01	298530	639738	858256
L14120172-02	1.00	01	271161	586193	787841
L14120172-03	1.00	01	279523	603865	829586
L14120172-04	1.00	01	274052	596277	810763
L14120172-05	1.00	01	270192	589901	798744
L14120172-06	1.00	01	266906	579178	772738
L14120172-07	1.00	01	328850	655220	860783
L14120172-08	1.00	01	330184	663423	868814
L14120172-09	1.00	01	268890	580879	771173
L14120172-10	1.00	01	263789	570515	773416
WG503275-02	1.00	01	286593	624624	845713
WG503275-03	1.00	01	330257	660284	876342

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

Underline = Response outside limits

INTERNAL_STD_ICAL - Modified 03/06/2008
PDF File ID: 3903666
Report generated 12/04/2014 14:57

Microbac Laboratories Inc.

INTERNAL STANDARD RETENTION TIME SUMMARY
(COMPARED TO MIDPOINT OF ICAL)

Login Number:L14120172
Instrument ID:HPMS8
Workgroup (AAB#):WG503275

ICAL CCV Number:WG501514-08
CAL ID: HPMS8-19-NOV-14
Matrix:WATER

Sample Number	Dilution	Tag	IS-1	IS-2	IS-3
WG501514-08	NA	NA	17.73	14.7	10.84
Upper Limit	NA	NA	18.23	15.2	11.34
Lower Limit	NA	NA	17.23	14.2	10.34
L14120172-01	1.00	01	17.73	14.7	10.83
L14120172-02	1.00	01	17.72	14.7	10.84
L14120172-03	1.00	01	17.73	14.7	10.84
L14120172-04	1.00	01	17.73	14.7	10.84
L14120172-05	1.00	01	17.73	14.7	10.84
L14120172-06	1.00	01	17.72	14.7	10.84
L14120172-07	1.00	01	17.73	14.7	10.83
L14120172-08	1.00	01	17.72	14.7	10.84
L14120172-09	1.00	01	17.73	14.7	10.83
L14120172-10	1.00	01	17.72	14.7	10.84
WG503275-02	1.00	01	17.73	14.7	10.84
WG503275-03	1.00	01	17.72	14.7	10.84

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

Underline = Response outside limits

INTERNAL_STD_RT_ICAL - Modified 03/06/2008
PDF File ID: 3903667
Report generated: 12/04/2014 14:57

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number:L14120172 Prep Date:12/10/14 10:00 Sample ID:WG504286-02
Instrument ID:LCMS1 Run Date:12/10/14 17:42 Prep Method:6850
File ID:1LM.LM27905 Analyst:ADC Method:6850
Workgroup (AAB#):WG504286 Matrix:Water Units:ug/L
Contract #: Cal ID: LCMS1-17-NOV-14

Analytes	LOD	LOQ	Concentration	Dilution	Qualifier
Perchlorate	0.100	0.200	0.100	1	U

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

Report Name:BLANK
PDF ID: 3916581
12-DEC-2014 14:36

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504286-03
Instrument ID: LCMS1 Run Time: 18:01 Prep Method: 6850
File ID: 1LM.LM27906 Analyst: ADC Method: 6850
Workgroup (AAB#): WG504286 Matrix: Water Units: ug/L
QC Key: DOD4 Lot#: STD67080 Cal ID: LCMS1-17-NOV-14

Analytes	Expected	Found	% Rec	LCS Limits	Q
Perchlorate	0.200	0.215	108	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 3916582
Report generated: 12/12/2014 14:36

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum:L14120172 Cal ID:LCMS1- 17-NOV-14 Worknum:WG504286

Instrument ID:LCMS1 Contract #: Prep Method:6850

Parent ID:L14120172-05 File ID:1LM.LM27912 Dil:1 Method:6850

Sample ID:L14120172-07 MS File ID:1LM.LM27917 Dil:1 Matrix:Water

Sample ID:L14120172-08 MSD File ID:1LM.LM27918 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
Perchlorate	0.883	0.200	1.05	83.5	0.200	1.09	104	3.74	80 - 120	15	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008
PDF File ID: 3916583
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

INITIAL CALIBRATION SUMMARY

Login Number: L14120172
Analytical Method: 6850
ICAL Workgroup: WG501146

Instrument ID: LCMS1
Initial Calibration Date: 17-NOV-14 14:53
Column ID: F

Analyte		AVG RF	% RSD	LINEAR (R)	QUAD (R^2)
Perchlorate		1.387	10.9	1.00000	

R = Correlation coefficient; 0.995 minimum
R^2 = Coefficient of determination; 0.99 minimum

INT_CAL - Modified 03/06/2008
PDF File ID: 3917574
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

INITIAL CALIBRATION DATA

Login Number:L14120172

Analytical Method:6850

Instrument ID:LCMS1

Initial Calibration Date:17-NOV-14 14:53

Column ID:F

Analyte	WG501146-02			WG501146-03			WG501146-04		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	0.100	11100.0000	1.719	0.200	17300.0000	1.339	0.500	44100.0000	1.338

INT_CAL - Modified 03/06/2008
PDF File ID: 3917574
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

INITIAL CALIBRATION DATA

Login Number:L14120172 Instrument ID:LCMS1

Analytical Method:6850 Initial Calibration Date:17-NOV-14 14:53

Column ID:F

Analyte	WG501146-05			WG501146-06			WG501146-07		
	CONC	RESP	RF	CONC	RESP	RF	CONC	RESP	RF
Perchlorate	1.00	84400.0000	1.290	2.00	173000.000	1.337	5.00	420000.000	1.337

INT_CAL - Modified 03/06/2008
PDF File ID: 3917574
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

INITIAL CALIBRATION DATA

Login Number:L14120172

Analytical Method:6850

Instrument ID:LCMS1

Initial Calibration Date:17-NOV-14 14:53

Column ID:F

Analyte	WG501146-08		
	CONC	RESP	RF
Perchlorate	10.0	841000.000	1.347

INT_CAL - Modified 03/06/2008

PDF File ID: 3917574

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

ALTERNATE SOURCE CALIBRATION REPORT

Login Number: L14120172 Run Date: 11/17/2014 Sample ID: WG501146-09

Instrument ID: LCMS1 Run Time: 15:12 Method: 6850

File ID: 1LM.LM27611 Analyst: ADC QC Key: DOD4

ICal Workgroup: WG501146 Cal ID: LCMS1 - 17-NOV-14

Analyte		Expected	Found	Units	RF	%D	UCL	Q
Perchlorate		1.00	1.01	ug/L	1.36	1.00	15	

* Exceeds %D Limit

ALT - Modified 09/06/2007
Version 1.5 PDF File ID: 3916585
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504287-01

Instrument ID: LCMS1 Run Time: 16:26 Method: 6850

File ID: 1LM.LM27901 Analyst: ADC Units: ug/L

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.200	0.100	U

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

CCB - Modified 03/05/2008
PDF File ID: 3916587
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504287-04

Instrument ID: LCMS1 Run Time: 21:10 Method: 6850

File ID: 1LM.LM27916 Analyst: ADC Units: ug/L

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.200	0.100	U

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

CCB - Modified 03/05/2008
PDF File ID: 3916587
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504287-06

Instrument ID: LCMS1 Run Time: 00:20 Method: 6850

File ID: 1LM.LM27926 Analyst: ADC Units: ug/L

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.200	0.100	U

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

CCB - Modified 03/05/2008
PDF File ID: 3916587
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504287-08

Instrument ID: LCMS1 Run Time: 02:32 Method: 6850

File ID: 1LM.LM27933 Analyst: ADC Units: ug/L

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.200	0.100	U

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

CCB - Modified 03/05/2008
PDF File ID: 3916587
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504287-10

Instrument ID: LCMS1 Run Time: 09:48 Method: 6850

File ID: 1LM.LM27936 Analyst: ADC Units: ug/L

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.200	0.100	U

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

CCB - Modified 03/05/2008
PDF File ID: 3916587
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504287-12

Instrument ID: LCMS1 Run Time: 11:41 Method: 6850

File ID: 1LM.LM27942 Analyst: ADC Units: ug/L

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Perchlorate	0.100	0.200	0.100	U

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

CCB - Modified 03/05/2008
PDF File ID: 3916587
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504287-02

Instrument ID: LCMS1 Run Time: 16:45 Method: 6850

File ID: 1LM.LM27902 Analyst: ADC QC Key: DOD4

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate		1.00	1.05	ug/L	1.42	5.00	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008

PDF File ID: 3916586

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504287-03

Instrument ID: LCMS1 Run Time: 20:33 Method: 6850

File ID: 1LM.LM27914 Analyst: ADC QC Key: DOD4

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate		1.00	1.02	ug/L	1.38	2.00	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008

PDF File ID: 3916586

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504287-05

Instrument ID: LCMS1 Run Time: 23:42 Method: 6850

File ID: 1LM.LM27924 Analyst: ADC QC Key: DOD4

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate		1.00	1.01	ug/L	1.36	1.00	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008

PDF File ID: 3916586

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504287-07

Instrument ID: LCMS1 Run Time: 01:55 Method: 6850

File ID: 1LM.LM27931 Analyst: ADC QC Key: DOD4

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate		1.00	1.02	ug/L	1.38	2.00	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008

PDF File ID: 3916586

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504287-09

Instrument ID: LCMS1 Run Time: 09:10 Method: 6850

File ID: 1LM.LM27934 Analyst: ADC QC Key: DOD4

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate		1.00	1.05	ug/L	1.42	5.00	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008

PDF File ID: 3916586

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504287-11

Instrument ID: LCMS1 Run Time: 11:03 Method: 6850

File ID: 1LM.LM27940 Analyst: ADC QC Key: DOD4

Workgroup (AAB#): WG504286 Cal ID: LCMS1 - 17-NOV-14

Matrix: WATER

Analyte		Expected	Found	UNITS	RF	%D	UCL	Q
Perchlorate		1.00	1.00	ug/L	1.36	0	15	

* Exceeds %D Criteria

CCV - Modified 03/05/2008

PDF File ID: 3916586

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

QCMRL SAMPLE

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504286-07

Instrument ID: LCMS1 Run Time: 17:04 Prep Method: 6850

File ID: 1LM.LM27903 Analyst: ADC Method: 6850

Workgroup (AAB#): WG504286 Matrix: Water Units: ug/L

Contract #: Cal ID: LCMS1-17-NOV-14

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.210	105	70 - 130	

QCMRL - Modified 03/06/2007

PDF File ID: 3916584

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

QCMRL SAMPLE

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504286-08

Instrument ID: LCMS1 Run Time: 20:51 Prep Method: 6850

File ID: 1LM.LM27915 Analyst: ADC Method: 6850

Workgroup (AAB#): WG504286 Matrix: Water Units: ug/L

Contract #: Cal ID: LCMS1-17-NOV-14

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.203	102	70 - 130	

QCMRL - Modified 03/06/2007

PDF File ID: 3916584

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

QCMRL SAMPLE

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504286-09

Instrument ID: LCMS1 Run Time: 00:01 Prep Method: 6850

File ID: 1LM.LM27925 Analyst: ADC Method: 6850

Workgroup (AAB#): WG504286 Matrix: Water Units: ug/L

Contract #: Cal ID: LCMS1-17-NOV-14

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.197	98.5	70 - 130	

QCMRL - Modified 03/06/2007

PDF File ID: 3916584

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

QCMRL SAMPLE

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504286-10

Instrument ID: LCMS1 Run Time: 02:13 Prep Method: 6850

File ID: 1LM.LM27932 Analyst: ADC Method: 6850

Workgroup (AAB#): WG504286 Matrix: Water Units: ug/L

Contract #: Cal ID: LCMS1-17-NOV-14

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.191	95.5	70 - 130	

QCMRL - Modified 03/06/2007

PDF File ID: 3916584

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

QCMRL SAMPLE

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504286-11

Instrument ID: LCMS1 Run Time: 09:29 Prep Method: 6850

File ID: 1LM.LM27935 Analyst: ADC Method: 6850

Workgroup (AAB#): WG504286 Matrix: Water Units: ug/L

Contract #: Cal ID: LCMS1-17-NOV-14

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

QCMRL - Modified 03/06/2007

PDF File ID: 3916584

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

QCMRL SAMPLE

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504286-12

Instrument ID: LCMS1 Run Time: 11:22 Prep Method: 6850

File ID: 1LM.LM27941 Analyst: ADC Method: 6850

Workgroup (AAB#): WG504286 Matrix: Water Units: ug/L

Contract #: Cal ID: LCMS1-17-NOV-14

Analytes	Expected	Found	% Rec	Limits	Q
Perchlorate	0.200	0.198	99.0	70 - 130	

QCMRL - Modified 03/06/2007

PDF File ID: 3916584

Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

INTERNAL STANDARD AREA SUMMARY

(COMPARED TO AVERAGE OF ICAL)

Login Number:L14120172

Instrument ID:LCMS1

Workgroup (AAB#):WG504286

ICAL CCV Number:WG501146-05

CAL ID: LCMS1-17-NOV-14

Matrix:WATER

Sample Number	Dilution	Tag	IS-1
WG501146	NA	NA	321000
Upper Limit	NA	NA	481500
Lower Limit	NA	NA	160500
L14120172-02	1.00	01	317000
L14120172-03	1.00	01	356000
L14120172-04	1.00	01	358000
L14120172-05	1.00	01	353000
L14120172-06	1.00	01	358000
L14120172-07	1.00	01	364000
L14120172-08	1.00	01	349000
L14120172-09	1.00	01	349000
L14120172-10	1.00	01	355000
WG504286-02	1.00	01	347000
WG504286-03	1.00	01	346000

IS-1 - O18LP

Underline = Response outside limits

INTERNAL_STD_AVG_ICAL - Modified 03/10/2010

PDF File ID: 3916588

Report generated 12/12/2014 14:36

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-02
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27939
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 10:45	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	267000	88100	3.03	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-03
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27910
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 19:17	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	527	223	2.36	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-04
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27911
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 19:36	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	722	332	2.17	2.3	3.8	*

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-05
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27912
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 19:55	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	84500	28500	2.96	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-06
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27913
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 20:14	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	83300	29400	2.83	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-07
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27917
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 21:29	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	104000	33800	3.08	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-08
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27918
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 21:48	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	103000	34600	2.98	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-09
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27919
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 22:07	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	97400	32600	2.99	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-10
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27920
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 22:26	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	290000	98600	2.94	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-02
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27604
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 13:00	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	11100	3370	3.29	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-03
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27605
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 13:19	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	17300	5740	3.01	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-04
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27606
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 13:38	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	44100	14600	3.02	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-05
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27607
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 13:56	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	84400	29400	2.87	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-06
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27608
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 14:15	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	173000	54700	3.16	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-07
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27609
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 14:34	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	420000	140000	3.00	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-08
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27610
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 14:53	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	841000	276000	3.05	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-09
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27611
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 15:12	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	88800	29400	3.02	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-01
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27904
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 17:23	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	20600	7320	2.81	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-02
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27905
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 17:42	**Units:**	ug/L

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

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-03
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27906
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 18:01	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	21200	7360	2.88	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-07
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27903
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 17:04	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	19500	6490	3.00	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-08
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27915
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 20:51	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	21200	6500	3.26	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-09
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27925
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 00:01	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	20100	6670	3.01	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-10
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27932
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 02:13	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	19900	6850	2.91	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-11
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27935
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 09:29	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	19400	6380	3.04	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-12
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27941
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 11:22	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	19500	6330	3.08	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-01
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27901
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 16:26	**Units:**	ug/L

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

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-02
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27902
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 16:45	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	102000	33100	3.08	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-03
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27914
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 20:33	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	106000	34000	3.12	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-04
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27916
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 21:10	**Units:**	ug/L

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

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-05
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27924
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 23:42	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	105000	35600	2.95	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-06
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27926
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 00:20	**Units:**	ug/L

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

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-07
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27931
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 01:55	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	103000	33200	3.10	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-08
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27933
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 02:32	**Units:**	ug/L

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

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-09
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27934
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 09:10	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	101000	33700	3.00	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-10
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27936
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 09:48	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	171	0.000	2.3	3.8	*

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-11
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27940
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 11:03	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	101000	33500	3.01	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-12
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27942
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 11:41	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	218	0.000	2.3	3.8	*

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number:L14120172 Prep Date:12/10/14 09:19 Sample ID:WG504169-02
Instrument ID:PE-ICP2 Run Date:12/10/14 14:26 Prep Method:3015
File ID:P2.121014.142656 Analyst:KHR Method:6010B
Workgroup (AAB#):WG504197 Matrix:Water Units:mg/L
Contract #: Cal ID:PE-ICP-10-DEC-14

Analytes	LOD	LOQ	Concentration	Dilution	Qualifier
Aluminum, Total	0.100	0.200	0.100	1	U
Calcium, Total	0.250	0.500	0.250	1	U
Iron, Total	0.0500	0.100	0.0500	1	U
Magnesium, Total	0.250	0.500	0.250	1	U
Potassium, Total	0.500	1.00	0.500	1	U
Sodium, Total	0.250	0.500	0.250	1	U
Vanadium, Total	0.00500	0.0100	0.00500	1	U

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

Report Name:BLANK
PDF ID: 3912480
11-DEC-2014 08:50

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504169-03
Instrument ID: PE-ICP2 Run Time: 14:30 Prep Method: 3015
File ID: P2.121014.143019 Analyst: KHR Method: 6010B
Workgroup (AAB#): WG504197 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD67718 Cal ID: PE-ICP-10-DEC-14

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Total	6.25	6.17	98.7	80 - 120	
Calcium, Total	6.25	6.26	100	80 - 120	
Iron, Total	2.50	2.56	103	80 - 120	
Magnesium, Total	6.25	6.38	102	80 - 120	
Potassium, Total	31.3	29.5	94.3	80 - 120	
Sodium, Total	31.3	29.5	94.3	80 - 120	
Vanadium, Total	0.625	0.637	102	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 3912481
Report generated: 12/11/2014 08:50

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum:L14120172 Cal ID:PE-ICP2- 10-DEC-14 Worknum:WG504197

Instrument ID:PE-ICP2 Contract #: Prep Method:3015

Parent ID:L14120172-05 File ID:P2.121014.144249 Dil:1 Method:6010B

Sample ID:L14120172-07 MS File ID:P2.121014.150311 Dil:1 Matrix:Water

Sample ID:L14120172-08 MSD File ID:P2.121014.150537 Dil:1 Units:mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum, Total	0.256	6.25	6.17	94.7	6.25	6.26	96.1	1.40	80 - 120	20	
Iron, Total	0.155	2.50	2.57	96.7	2.50	2.60	97.6	0.916	80 - 120	20	
Magnesium, Total	13.2	6.25	19.1	94.4	6.25	19.4	99.3	1.58	80 - 120	20	
Potassium, Total	0.764	31.3	30.0	93.7	31.3	30.8	96.1	2.48	80 - 120	20	
Sodium, Total	6.58	31.3	35.6	93	31.3	36.6	96.2	2.77	80 - 120	20	
Vanadium, Total	U	0.625	0.626	100	0.625	0.631	101	0.858	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008
PDF File ID: 3912482
Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum:L14120172 Cal ID:PE-ICP2- 11-DEC-14 Worknum:WG504197

Instrument ID:PE-ICP2 Contract #: Prep Method:3015

Parent ID:L14120172-05 File ID:P2.121114.102740 Dil:10 Method:6010B

Sample ID:L14120172-07 MS File ID:P2.121114.104008 Dil:10 Matrix:Water

Sample ID:L14120172-08 MSD File ID:P2.121114.104330 Dil:10 Units:mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Calcium, Total	41.4	6.25	50.0	138	6.25	51.3	159	2.54	80 - 120	20	*

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008
PDF File ID: 3912482
Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

Serial Dilution Report

Login: L14120172 **Worknum:** WG504197

Instrument: PE-ICP2 **Method:** 6010B

Serial Dil: WG504197-02 **File ID:** P2.121014.145157 **Dil:** 5 **Units:** mg/L

Sample: L14120172-06 **File ID:** P2.121014.144610 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	0.240	X	ND	U		
Calcium	32.8		32.9		0.32	
Iron	0.141	X	ND	U		
Magnesium	9.92	X	10.4		4.85	
Potassium	0.654	F	ND	U		
Sodium	5.08	X	5.55	X	9.18	
Vanadium	ND	U	ND	U		

U = Result is below MDL.
F = Result is greater than or equal to MDL and less than the RL.
X = Result is greater than or equal to RL and less than 50 times the MDL.
E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 50 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 3912476

12/11/2014 12:42

Microbac Laboratories Inc.

Serial Dilution Report

Login: L14120172 **Worknum:** WG504197

Instrument: PE-ICP2 **Method:** 6010B

Serial Dil: WG504197-02 **File ID:** P2.121114.103647 **Dil:** 50 **Units:** mg/L

Sample: L14120172-06 **File ID:** P2.121114.103101 **Dil:** 10

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Aluminum	ND	U	ND	U		
Calcium	32.5	X	42.4	X	30.60	
Iron	ND	U	ND	U		
Magnesium	10.5	X	10.4	F	0.58	
Potassium	ND	U	ND	U		
Sodium	5.15	X	ND	U		
Vanadium	ND	U	ND	U		

U = Result is below MDL.
F = Result is greater than or equal to MDL and less than the RL.
X = Result is greater than or equal to RL and less than 50 times the MDL.
E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 50 times the MDL.

SERIAL_DIL - Modified 09/22/2008

PDF File ID: 3912476

12/11/2014 12:42

Microbac Laboratories Inc.

POST SPIKE REPORT

Sample Login ID: L14120172 **Worknum:** WG504197

Instrument ID: PE-ICP2 **Method:** 6010B

Post Spike ID: WG504197-01 **File ID:** P2.121014.144931 **Dil:** 1 **Units:** mg/L

Sample ID: L14120172-06 **File ID:** P2.121014.144610 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	5.16		0.240		5	98.9	75 - 125	
CALCIUM	34.6		32.8		5	100.8	75 - 125	
IRON	2.16		0.141		2	101.7	75 - 125	
MAGNESIUM	13.9		9.92		5	99.8	75 - 125	
POTASSIUM	24.1		0.654	F	25	94.1	75 - 125	
SODIUM	28.0		5.08		25	93.8	75 - 125	
VANADIUM	0.500		0	U	.5	100.0	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: 3912477
Report generated: 12/11/2014 12:42

Microbac Laboratories Inc.

POST SPIKE REPORT

Sample Login ID: L14120172 **Worknum:** WG504197

Instrument ID: PE-ICP2 **Method:** 6010B

Post Spike ID: WG504197-01 **File ID:** P2.121114.103422 **Dil:** 10 **Units:** mg/L

Sample ID: L14120172-06 **File ID:** P2.121114.103101 **Dil:** 10 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ALUMINUM	4.86		0	U	5	97.3	75 - 125	
CALCIUM	8.02		3.25		5	95.4	75 - 125	
IRON	2.02		0	U	2	101.2	75 - 125	
MAGNESIUM	5.96		1.05		5	98.3	75 - 125	
POTASSIUM	24.5		0	U	25	97.9	75 - 125	
SODIUM	24.5		0.515		25	95.8	75 - 125	
VANADIUM	0.476		0	U	.5	95.3	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: 3912477
Report generated: 12/11/2014 12:42

Microbac Laboratories Inc.
Initial Calibration Summary

Login:	L14120172	Workgroup (AAB#):	WG504197
Analytical Method:	6010B	Instrument ID:	PE-ICP2
ICAL Worknum:	WG504225	Initial Calibration Date:	10-DEC-2014 08:18

	WG504225-01		WG504225-02		WG504225-03		WG504225-04		WG504225-05			
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT	R	Q
ALUMINUM	0	132	.1	334	.2	478	10	32600	20	65200	.999999	
CALCIUM	0	24.3	NA	NA	.2	12.3	10	1160	20	2350	.999988	
IRON	0	6.15	.04	67.0	.08	136	4	8200	8	16600	.999983	
MAGNESIUM	0	13.4	.1	102	.2	197	10	11500	20	23500	.999951	
POTASSIUM	0	475	.5	742	1	1750	50	98800	100	192000	1	
SODIUM	0	1410	.5	4560	1	9770	50	569000	100	1080000	1	
VANADIUM	0	5270	.01	1620	.02	3420	1	207000	2	416000	.999996	

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: 3912486
Report generated: 11-DEC-2014 12:43

Microbac Laboratories Inc.
Initial Calibration Summary

Login:	L14120172	Workgroup (AAB#):	WG504197
Analytical Method:	6010B	Instrument ID:	PE-ICP2
ICAL Worknum:	WG504449	Initial Calibration Date:	11-DEC-2014 08:56

	WG504449-01		WG504449-02		WG504449-03		WG504449-04		WG504449-05			
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	Conc	INT	R	Q
ALUMINUM	0	152	.1	213	.2	507	10	31000	20	61900	1	
CALCIUM	0	18.0	NA	NA	.2	12.1	10	1090	20	2280	.999782	
IRON	0	3.44	.04	66.7	.08	130	4	7870	8	15800	.999996	
MAGNESIUM	0	16.6	.1	90.2	.2	182	10	11100	20	22200	.999999	
POTASSIUM	0	573	.5	768	1	1610	50	94100	100	188000	1	
SODIUM	0	1730	.5	4570	1	9040	50	541000	100	1050000	1	
VANADIUM	0	5040	.01	1450	.02	3220	1	196000	2	397000	.999988	

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: 3912486
Report generated: 11-DEC-2014 12:43

Microbac Laboratories Inc.

INITIAL CALIBRATION BLANK (ICB)

Login Number:L14120172 Run Date:12/10/2014 Sample ID: WG504225-09

Instrument ID:PE-ICP2 Run Time:08:29 Method: 6010B

File ID:P2.121014.082931 Analyst:KHR Units: mg/L

Workgroup (AAB#):WG504197 Cal ID:PE-ICP2 - 10-DEC-14

Matrix:WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	U
IRON	.04	.08	.04	U
MAGNESIUM	.2	.4	.2	U
POTASSIUM	.4	.8	.4	U
SODIUM	.2	.4	.2	U
VANADIUM	.004	.008	.004	U

U = Result is less than 2 x MDL

F = Result is between MDL and 2 x MDL

* = Result is above 2 x MDL

ICB - Modified 07/14/2009

PDF File ID: 3912488

Report generated 12/11/2014 12:42

Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number:L14120172 Run Date:12/11/2014 Sample ID: WG504449-07
Instrument ID:PE-ICP2 Run Time:09:00 Method: 6010B
File ID:P2.121114.090052 Analyst:KHR Units: mg/L
Workgroup (AAB#):WG504197 Cal ID:PE-ICP2 - 11-DEC-14
Matrix:WATER

Analytes	MDL	RDL	Concentration	Qualifier
ALUMINUM	.08	.16	.08	U
CALCIUM	.2	.4	.2	U
IRON	.04	.08	.04	U
MAGNESIUM	.2	.4	.2	U
POTASSIUM	.4	.8	.4	U
SODIUM	.2	.4	.214	F
VANADIUM	.004	.008	.004	U

U = Result is less than 2 x MDL

F = Result is between MDL and 2 x MDL

* = Result is above 2 x MDL

ICB - Modified 07/14/2009
PDF File ID: 3912488
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-13

Instrument ID: PE-ICP2 Run Time: 08:40 Method: 6010B

File ID: P2.121014.084003 Analyst: KHR Units: mg/L

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U
Vanadium	0.00400	0.00800	0.00400	U

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

CCB - Modified 03/05/2008
PDF File ID: 3912491
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-33

Instrument ID: PE-ICP2 Run Time: 14:15 Method: 6010B

File ID: P2.121014.141536 Analyst: KHR Units: mg/L

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.217	F
Vanadium	0.00400	0.00800	0.00400	U

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

CCB - Modified 03/05/2008
PDF File ID: 3912491
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-35

Instrument ID: PE-ICP2 Run Time: 14:57 Method: 6010B

File ID: P2.121014.145744 Analyst: KHR Units: mg/L

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U
Vanadium	0.00400	0.00800	0.00400	U

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

CCB - Modified 03/05/2008
PDF File ID: 3912491
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-37

Instrument ID: PE-ICP2 Run Time: 15:38 Method: 6010B

File ID: P2.121014.153830 Analyst: KHR Units: mg/L

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U
Vanadium	0.00400	0.00800	0.00400	U

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

CCB - Modified 03/05/2008
PDF File ID: 3912491
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-65

Instrument ID: PE-ICP2 Run Time: 23:10 Method: 6010B

File ID: P2.121014.231004 Analyst: KHR Units: mg/L

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U
Vanadium	0.00400	0.00800	0.00400	U

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

CCB - Modified 03/05/2008
PDF File ID: 3912491
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-68

Instrument ID: PE-ICP2 Run Time: 23:29 Method: 6010B

File ID: P2.121014.232927 Analyst: KHR Units: mg/L

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U
Vanadium	0.00400	0.00800	0.00400	U

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

CCB - Modified 03/05/2008
PDF File ID: 3912491
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504449-12

Instrument ID: PE-ICP2 Run Time: 09:14 Method: 6010B

File ID: P2.121114.091445 Analyst: KHR Units: mg/L

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 11-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U
Vanadium	0.00400	0.00800	0.00400	U

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

CCB - Modified 03/05/2008
PDF File ID: 3912491
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504449-14

Instrument ID: PE-ICP2 Run Time: 09:57 Method: 6010B

File ID: P2.121114.095710 Analyst: KHR Units: mg/L

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 11-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U
Vanadium	0.00400	0.00800	0.00400	U

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

CCB - Modified 03/05/2008
PDF File ID: 3912491
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504449-17

Instrument ID: PE-ICP2 Run Time: 10:56 Method: 6010B

File ID: P2.121114.105601 Analyst: KHR Units: mg/L

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 11-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Aluminum	0.0800	0.160	0.0800	U
Calcium	0.200	0.400	0.200	U
Iron	0.0400	0.0800	0.0400	U
Magnesium	0.200	0.400	0.200	U
Potassium	0.400	0.800	0.400	U
Sodium	0.200	0.400	0.200	U
Vanadium	0.00400	0.00800	0.00400	U

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

CCB - Modified 03/05/2008
PDF File ID: 3912491
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.

INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-08
Instrument ID: PE-ICP2 Run Time: 08:27 Method: 6010B
File ID: P2.121014.082706 Analyst: KHR Units: mg/L
Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14
QC Key: DOD4

Analyte		Expected	Found	%REC	LIMITS	Q
Aluminum		10	10.2	102	90 - 110	
Calcium		10	10.2	102	90 - 110	
Iron		4	4.09	102	90 - 110	
Magnesium		10	9.96	99.6	90 - 110	
Potassium		50	49.5	99.1	90 - 110	
Sodium		50	49.0	98.1	90 - 110	
Vanadium		1	1.01	101	90 - 110	

* Exceeds LIMITS Limit

ICV - Modified 03/06/2008
PDF File ID: 3912487
Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504449-06
Instrument ID: PE-ICP2 Run Time: 08:58 Method: 6010B
File ID: P2.121114.085827 Analyst: KHR Units: mg/L
Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 11-DEC-14
QC Key: DOD4

Analyte		Expected	Found	%REC	LIMITS	Q
Aluminum		10	10.1	101	90 - 110	
Calcium		10	10.1	101	90 - 110	
Iron		4	4.03	101	90 - 110	
Magnesium		10	9.91	99.1	90 - 110	
Potassium		50	50.9	102	90 - 110	
Sodium		50	50.5	101	90 - 110	
Vanadium		1	1.01	101	90 - 110	

* Exceeds LIMITS Limit

ICV - Modified 03/06/2008
PDF File ID: 3912487
Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-12

Instrument ID: PE-ICP2 Run Time: 08:37 Method: 6010B

File ID: P2.121014.083736 Analyst: KHR QC Key: DOD4

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.1	mg/L	101	90 - 110		
Calcium		10.0	10.1	mg/L	101	90 - 110		
Iron		4.00	4.04	mg/L	101	90 - 110		
Magnesium		10.0	10.1	mg/L	101	90 - 110		
Potassium		50.0	50.3	mg/L	101	90 - 110		
Sodium		50.0	50.3	mg/L	101	90 - 110		
Vanadium		1.00	0.999	mg/L	99.9	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3912490

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-32

Instrument ID: PE-ICP2 Run Time: 14:13 Method: 6010B

File ID: P2.121014.141310 Analyst: KHR QC Key: DOD4

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

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		
Iron		4.00	4.07	mg/L	102	90 - 110		
Magnesium		10.0	10.2	mg/L	102	90 - 110		
Potassium		50.0	51.5	mg/L	103	90 - 110		
Sodium		50.0	51.6	mg/L	103	90 - 110		
Vanadium		1.00	1.01	mg/L	101	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3912490

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-34

Instrument ID: PE-ICP2 Run Time: 14:55 Method: 6010B

File ID: P2.121014.145518 Analyst: KHR QC Key: DOD4

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.0	mg/L	100	90 - 110		
Calcium		10.0	10.3	mg/L	103	90 - 110		
Iron		4.00	4.03	mg/L	101	90 - 110		
Magnesium		10.0	10.1	mg/L	101	90 - 110		
Potassium		50.0	49.2	mg/L	98.4	90 - 110		
Sodium		50.0	49.1	mg/L	98.2	90 - 110		
Vanadium		1.00	1.01	mg/L	101	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3912490

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-36

Instrument ID: PE-ICP2 Run Time: 15:36 Method: 6010B

File ID: P2.121014.153604 Analyst: KHR QC Key: DOD4

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.2	mg/L	102	90 - 110		
Calcium		10.0	10.3	mg/L	103	90 - 110		
Iron		4.00	4.03	mg/L	101	90 - 110		
Magnesium		10.0	10.1	mg/L	101	90 - 110		
Potassium		50.0	50.5	mg/L	101	90 - 110		
Sodium		50.0	50.6	mg/L	101	90 - 110		
Vanadium		1.00	1.03	mg/L	103	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3912490

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-64

Instrument ID: PE-ICP2 Run Time: 23:07 Method: 6010B

File ID: P2.121014.230737 Analyst: KHR QC Key: DOD4

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

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		
Iron		4.00	4.11	mg/L	103	90 - 110		
Magnesium		10.0	10.4	mg/L	104	90 - 110		
Potassium		50.0	49.7	mg/L	99.4	90 - 110		
Sodium		50.0	49.3	mg/L	98.7	90 - 110		
Vanadium		1.00	1.02	mg/L	102	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3912490

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225-67

Instrument ID: PE-ICP2 Run Time: 23:27 Method: 6010B

File ID: P2.121014.232700 Analyst: KHR QC Key: DOD4

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 10-DEC-14

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.0	mg/L	100	90 - 110		
Calcium		10.0	10.3	mg/L	103	90 - 110		
Iron		4.00	3.97	mg/L	99.3	90 - 110		
Magnesium		10.0	10.0	mg/L	100	90 - 110		
Potassium		50.0	50.5	mg/L	101	90 - 110		
Sodium		50.0	50.3	mg/L	101	90 - 110		
Vanadium		1.00	1.00	mg/L	100	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3912490

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504449-11

Instrument ID: PE-ICP2 Run Time: 09:12 Method: 6010B

File ID: P2.121114.091219 Analyst: KHR QC Key: DOD4

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 11-DEC-14

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.2	mg/L	102	90 - 110		
Calcium		10.0	9.87	mg/L	98.7	90 - 110		
Iron		4.00	4.08	mg/L	102	90 - 110		
Magnesium		10.0	10.2	mg/L	102	90 - 110		
Potassium		50.0	51.1	mg/L	102	90 - 110		
Sodium		50.0	50.8	mg/L	102	90 - 110		
Vanadium		1.00	0.985	mg/L	98.5	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3912490

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504449-13

Instrument ID: PE-ICP2 Run Time: 09:54 Method: 6010B

File ID: P2.121114.095444 Analyst: KHR QC Key: DOD4

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 11-DEC-14

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.4	mg/L	104	90 - 110		
Calcium		10.0	10.4	mg/L	104	90 - 110		
Iron		4.00	4.15	mg/L	104	90 - 110		
Magnesium		10.0	10.4	mg/L	104	90 - 110		
Potassium		50.0	50.9	mg/L	102	90 - 110		
Sodium		50.0	50.4	mg/L	101	90 - 110		
Vanadium		1.00	1.03	mg/L	103	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3912490

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/11/2014 Sample ID: WG504449-16

Instrument ID: PE-ICP2 Run Time: 10:53 Method: 6010B

File ID: P2.121114.105335 Analyst: KHR QC Key: DOD4

Workgroup (AAB#): WG504197 Cal ID: PE-ICP - 11-DEC-14

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Aluminum		10.0	10.2	mg/L	102	90 - 110		
Calcium		10.0	10.3	mg/L	103	90 - 110		
Iron		4.00	4.05	mg/L	101	90 - 110		
Magnesium		10.0	10.1	mg/L	101	90 - 110		
Potassium		50.0	50.1	mg/L	100	90 - 110		
Sodium		50.0	49.7	mg/L	99.5	90 - 110		
Vanadium		1.00	1.03	mg/L	103	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3912490

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L14120172 **Workgroup (AAB#):** WG504197
Instrument ID: PE-ICP2 **Method:** 6010B
Sol. A : WG504225-10 **File ID:** P2.121014.083251 **Units:** mg/L
Sol. AB : WG504225-11 **File ID:** P2.121014.083513 **Matrix:** Water

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Aluminum	250	250	100	250	256	102	
Calcium	250	287	115	250	286	114	
Iron	100	95.1	95.1	100	96.3	96.3	
Magnesium	250	246	98.4	250	248	99.2	
Potassium	NS	0.0514	NS	5.00	5.21	104	
Sodium	NS	0.0481	NS	5.00	5.06	101	
Vanadium	NS	-0.00465	NS	0.250	0.249	99.6	

NS = Not spiked
*** = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.**
 # = Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).
+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.

ICS - Modified 03/06/2008
PDF File ID: 3912489
Report generated 12/11/2014 12:42

Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L14120172 **Workgroup (AAB#):** WG504197
Instrument ID: PE-ICP2 **Method:** 6010B
Sol. A : WG504449-09 **File ID:** P2.121114.090734 **Units:** mg/L
Sol. AB : WG504449-10 **File ID:** P2.121114.090956 **Matrix:** Water

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Aluminum	250	243	97.2	250	250	100	
Calcium	250	280	112	250	273	109	
Iron	100	95.8	95.8	100	95.3	95.3	
Magnesium	250	247	98.8	250	246	98.4	
Potassium	NS	0.0271	NS	5.00	5.10	102	
Sodium	NS	0.0442	NS	5.00	4.87	97.4	
Vanadium	NS	-0.00229	NS	0.250	0.246	98.4	

NS = Not spiked
*** = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.**
 # = Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).
+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.

ICS - Modified 03/06/2008
PDF File ID: 3912489
Report generated 12/11/2014 12:42

LRC SAMPLE

Login Number: L14120172 Run Date: 12/10/2014 Sample ID: WG504225
Instrument ID: PE-ICP2 Run Time: 08:18 Prep Method: 3015
Analyst: KHR Method: 6010B
Workgroup (AAB#): WG504197 Matrix: Water Units: mg/L
Cal ID: 10-DEC-14 - 10-DEC-2014 08:18

Analytes	Expected	Found	% Rec	Limits	Q
Calcium, Total	900	1020	113	90 - 110	*
Magnesium, Total	900	919	102	90 - 110	

KEMRON FORMS - Modified 08/28/2006
Version 1.5 PDF File ID: 3912485
Report generated 12/11/2014 08:51

Microbac Laboratories Inc.

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L14120172 **Date:** 01/02/2014

Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	AG	AL	AS	B	BA
ALUMINUM	396.15	0	0	0.206	0	0
ANTIMONY	206.84	0	0	-0.740	0	0
ARSENIC	188.98	0	0.0753	0	0	0
BARIUM	233.53	0	0	0	0	0
BERYLLIUM	234.86	0	0	0	0	0
BORON	249.68	0	0	0	0	0
CADMIUM	228.80	0	0	5.00	0	0
CALCIUM	227.55	0	-0.158	10.0	0	0
CHROMIUM	267.72	0	-0.0395	0	0	0
COBALT	228.62	0	0	0	0	0.337
COPPER	327.39	0	0	0	0	0
IRON	239.56	0	0	0	0	0
LEAD	220.35	0	-0.153	0	0	0
LITHIUM	670.78	0	0	0	0	0
MAGNESIUM	279.08	0	0	0	0	0
MANGANESE	257.61	0	0	0	0	0
MOLYBDENUM	202.03	0	0	0	0	0
NICKEL	231.60	0	0	0	0	0
POTASSIUM	766.49	0	0	0	0	0
SELENIUM	196.03	0	-0.00743	0	0	0
SILICON	251.61	0	0	0	0	0
SILVER	328.07	0	0	0	0	0
SODIUM	589.59	0	0	0	0	0
STRONTIUM	407.77	0.200	0	0	0	0
THALLIUM	190.80	0	-0.0270	0	0	0
TIN	189.93	0	0	0	0	0
TITANIUM	334.94	0	0	0	0	0
VANADIUM	290.88	0	0	0.200	0	0.0400
ZINC	206.20	0	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 3912484
Report generated: 12/11/2014 12:42

Microbac Laboratories Inc.

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L14120172 **Date:** 01/02/2014

Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	BE	CA	CD	CO	CR
ALUMINUM	396.15	0	0	0	0	0
ANTIMONY	206.84	0	0	0	0.730	8.46
ARSENIC	188.98	0	-0.0220	0	0	-0.490
BARIUM	233.53	0	0	0	-0.192	0
BERYLLIUM	234.86	0	0	0	0	-0.0220
BORON	249.68	0	0	24.1	5.90	1.50
CADMIUM	228.80	0	0	0	-3.64	0
CALCIUM	227.55	0	0	0	180	0
CHROMIUM	267.72	0	0	0	0	0
COBALT	228.62	0	0	0	0	-0.200
COPPER	327.39	0	0	0	0.280	-0.0400
IRON	239.56	0	0	0	2.77	0
LEAD	220.35	0	0	0	0.462	0.0550
LITHIUM	670.78	0	0	0	0	0
MAGNESIUM	279.08	0	0	0	0	0
MANGANESE	257.61	0	0	0	0	-0.110
MOLYBDENUM	202.03	0	0	0	0	0
NICKEL	231.60	0	0	0	1.05	0
POTASSIUM	766.49	0	0	0	0	0
SELENIUM	196.03	0	0	0	-0.250	0
SILICON	251.61	0	0	0	0	0
SILVER	328.07	0	0	0	0	0
SODIUM	589.59	0	0	0	0	0
STRONTIUM	407.77	0	0.0319	0	0	0
THALLIUM	190.80	0	0	0	1.00	0
TIN	189.93	0	0	0	0	0
TITANIUM	334.94	0	-0.150	0	0	0.297
VANADIUM	290.88	0	0	0	0	0
ZINC	206.20	0	0	0	0	-8.16

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 3912484
Report generated: 12/11/2014 12:42

Microbac Laboratories Inc.

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L14120172 **Date:** 01/02/2014

Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	CU	FE	K	LI	MG
ALUMINUM	396.15	0	-0.119	0	0	0
ANTIMONY	206.84	0	-0.0367	0	0	0
ARSENIC	188.98	0	-0.234	0	0	0
BARIUM	233.53	0	0.0503	0	0	0
BERYLLIUM	234.86	0	0.250	0	0	0
BORON	249.68	0	0.430	0	0	0
CADMIUM	228.80	0	0.00198	0	0	0
CALCIUM	227.55	0	-24.0	0	0	0.104
CHROMIUM	267.72	0	0.119	0	0	0
COBALT	228.62	0	0.0262	0	0	0
COPPER	327.39	0	-0.0650	0	0.154	0
IRON	239.56	0	0	0	0	0.0200
LEAD	220.35	0	0.0327	0	0	0
LITHIUM	670.78	0	0	0	0	0
MAGNESIUM	279.08	0	0.540	0	0	0
MANGANESE	257.61	0	-0.0564	0	0	0
MOLYBDENUM	202.03	0	-0.0156	0	0	0
NICKEL	231.60	0	0	0	0	0
POTASSIUM	766.49	0	0	0	0	0
SELENIUM	196.03	0	-0.200	0	0	0
SILICON	251.61	0	0	0	0	0
SILVER	328.07	0.0710	-0.464	0	0	0
SODIUM	589.59	0	0	0	0	0
STRONTIUM	407.77	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.93	0	0	0	0	0
TITANIUM	334.94	0	0	0	0	0
VANADIUM	290.88	0	0.0955	0	0	0.0260
ZINC	206.20	-0.200	0.00500	0	0	0

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 3912484
Report generated: 12/11/2014 12:42

Microbac Laboratories Inc.

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L14120172 **Date:** 01/02/2014

Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	MN	MO	NA	NI	PB
ALUMINUM	396.15	0	69.0	0	0	0
ANTIMONY	206.84	0	-1.46	0	-0.745	0
ARSENIC	188.98	0	5.34	0	0	0
BARIUM	233.53	0	-0.750	0	0	0
BERYLLIUM	234.86	-0.100	-0.376	0	-0.00970	0
BORON	249.68	0	-1.00	0	0	0
CADMIUM	228.80	0	0.0420	0	-0.0400	0
CALCIUM	227.55	0	10.6	0	-831	0
CHROMIUM	267.72	0	0.170	0	0	0
COBALT	228.62	0	-1.80	0	0.129	0
COPPER	327.39	0	-0.0774	0	0.151	0
IRON	239.56	0	0	0	0	0
LEAD	220.35	0.600	-0.500	0	-0.190	0
LITHIUM	670.78	0	0	0	0	0
MAGNESIUM	279.08	0	-18.0	0	0	0
MANGANESE	257.61	0	-0.197	0	0	0.600
MOLYBDENUM	202.03	-0.209	0	0	0	0
NICKEL	231.60	0	-1.80	0	0	0
POTASSIUM	766.49	0	0	1.00	0	0
SELENIUM	196.03	0.300	0	0	-0.376	0
SILICON	251.61	0	11.1	0	0	0
SILVER	328.07	0.130	0	0	0	0
SODIUM	589.59	0	0	0	0	0
STRONTIUM	407.77	0	0	0	0	0
THALLIUM	190.80	1.00	-0.120	0	0	0
TIN	189.93	0	0	0	0	0
TITANIUM	334.94	0	0	0	0	0
VANADIUM	290.88	0	0.178	0	0	0
ZINC	206.20	0	0	0	-0.200	-0.100

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 3912484
Report generated: 12/11/2014 12:42

Microbac Laboratories Inc.

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L14120172 **Date:** 01/02/2014

Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	SB	SE	SI	SN	SR
ALUMINUM	396.15	0	0	0	0	0
ANTIMONY	206.84	0	0	0	0	0
ARSENIC	188.98	0	0	0	0	0
BARIUM	233.53	0	0	0	0	0
BERYLLIUM	234.86	0	0	0	0	0
BORON	249.68	0	0	0	0	0
CADMIUM	228.80	0	0	0	0	0
CALCIUM	227.55	0	0	0	0	0
CHROMIUM	267.72	0	0	0	0	0
COBALT	228.62	0	0	0	0	0
COPPER	327.39	0	0.0700	0	0	0
IRON	239.56	0	0	0	0	0
LEAD	220.35	-0.0100	0	0	0	0
LITHIUM	670.78	0	0	0	0	0
MAGNESIUM	279.08	0	0	0	0	0
MANGANESE	257.61	0	0.300	0	0	0
MOLYBDENUM	202.03	0	0	0	0	0
NICKEL	231.60	-0.0500	0	0	0	0
POTASSIUM	766.49	0	0	0	0	0
SELENIUM	196.03	0	0	0	0	0
SILICON	251.61	0	0	0	0	0
SILVER	328.07	0	0	0	0	0.200
SODIUM	589.59	0	0	0	0	0
STRONTIUM	407.77	0	0	0	0	0
THALLIUM	190.80	0	0	0	0	0
TIN	189.93	0	0	0	0	0
TITANIUM	334.94	0	0	0	0	0
VANADIUM	290.88	0	0	0	0	0
ZINC	206.20	-0.300	0	0	0	0

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 3912484
Report generated: 12/11/2014 12:42

Microbac Laboratories Inc.

INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Login Number: L14120172 **Date:** 01/02/2014

Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Wave Length	TI	TL	V	ZN
ALUMINUM	396.15	0	0	0	0
ANTIMONY	206.84	0	0	-0.920	0
ARSENIC	188.98	0	0	0.0990	0
BARIUM	233.53	0	0	0.360	0
BERYLLIUM	234.86	0	0	0	0
BORON	249.68	0	0	0	0
CADMIUM	228.80	0	0	0.0800	0
CALCIUM	227.55	3.00	0	0	0
CHROMIUM	267.72	0	0	-0.567	-0.0400
COBALT	228.62	2.21	0	0	0
COPPER	327.39	-1.05	0	-0.440	-0.0600
IRON	239.56	0	0	0	0
LEAD	220.35	0	0	-0.224	0
LITHIUM	670.78	0	0	0	0
MAGNESIUM	279.08	0	0	0	0
MANGANESE	257.61	0	0	-0.200	-0.0550
MOLYBDENUM	202.03	0	0	-0.480	0
NICKEL	231.60	0	0.400	0	0
POTASSIUM	766.49	0	0	0	0
SELENIUM	196.03	-0.220	0	-0.100	0
SILICON	251.61	0	0	0	0
SILVER	328.07	0	0	-2.05	0
SODIUM	589.59	0	0	0	0
STRONTIUM	407.77	0	0	0	0
THALLIUM	190.80	-12.0	0	-2.76	0
TIN	189.93	0	0	0	0
TITANIUM	334.94	0	0	0	0
VANADIUM	290.88	0	0	0	0
ZINC	206.20	0	0	-0.100	0

CORR_FACTORS - Modified 03/05/2008
PDF File ID: 3912484
Report generated: 12/11/2014 12:42

Microbac Laboratories Inc.
LINEAR RANGE (QUARTERLY)

Login Number: L14120172 **Date:** 10/23/2014
Insturment ID: PE-ICP2 **Method:** 6010B

Analyte	Integration Time (Sec.)	Concentration (mg/L)
Aluminum	10.00	630.0
Antimony	10.00	45.0
Arsenic	10.00	90.0
Barium	10.00	72.0
Beryllium	10.00	4.5
Boron	10.00	45.0
Cadmium	10.00	4.5
Calcium	10.00	810.0
Chromium	10.00	45.0
Cobalt	10.00	45.0
Copper	10.00	90.0
Iron	10.00	900.0
Lead	10.00	162.0
Lithium	10.00	0.9
Magnesium	10.00	810.0
Manganese	10.00	18.0
Molybdenum	10.00	45.0
Nickel	10.00	90.0
Phosphorus	10.00	72.0
Potassium	10.00	90.0
Selenium	10.00	45.0
Silicon	10.00	22.5
Silver	10.00	4.5
Sodium	10.00	180.0
Strontium	10.00	4.5
Thallium	10.00	9.0
Tin	10.00	45.0
Titanium	10.00	18.0
Vanadium	10.00	90.0
Zinc	10.00	45.0

Comments:
All analytes passed acceptance criteria at the specified concentration.

LINEAR_RANGE - Modified 03/06/2008
PDF File ID: 3912483
Report generated: 12/11/2014 12:42

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number:L14120172 Prep Date:12/10/14 07:25 Sample ID:WG504133-03
Instrument ID:ICP-MS2 Run Date:12/15/14 12:44 Prep Method:3015
File ID:NI.121514.124417 Analyst:JYH Method:6020
Workgroup (AAB#):WG504176 Matrix:Water Units:mg/L
Contract #: Cal ID:ICP-MS-15-DEC-14

Analytes	LOD	LOQ	Concentration	Dilution	Qualifier
Arsenic, Total	0.000500	0.00100	0.000500	1	U
Barium, Total	0.00150	0.00300	0.00150	1	U
Cobalt, Total	0.000500	0.00100	0.000500	1	U
Lead, Total	0.000500	0.00100	0.000500	1	U
Manganese, Total	0.00100	0.00200	0.00100	1	U
Selenium, Total	0.000500	0.00100	0.000500	1	U

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

Report Name:BLANK
PDF ID: 3914979
15-DEC-2014 14:09

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L14120172 Run Date: 12/15/2014 Sample ID: WG504133-04
Instrument ID: ICP-MS2 Run Time: 12:47 Prep Method: 3015
File ID: NI.121514.124725 Analyst: JYH Method: 6020
Workgroup (AAB#): WG504176 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD65967 Cal ID: ICP-MS - 15-DEC-14

Analytes	Expected	Found	% Rec	LCS Limits	Q
Arsenic, Total	0.0625	0.0680	109	80 - 120	
Barium, Total	0.0625	0.0663	106	80 - 120	
Cobalt, Total	0.0625	0.0673	108	80 - 120	
Lead, Total	0.0625	0.0685	110	80 - 120	
Manganese, Total	0.0625	0.0682	109	80 - 120	
Selenium, Total	0.0625	0.0690	110	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 3914980
Report generated: 12/15/2014 14:09

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum:L14120172 Cal ID:ICP-MS2- 15-DEC-14 Worknum:WG504176

Instrument ID:ICP-MS2 Contract #: Prep Method:3015

Parent ID:L14120172-05 File ID:NI.121514.125033 Dil:1 Method:6020

Sample ID:L14120172-07 MS File ID:NI.121514.125341 Dil:1 Matrix:Water

Sample ID:L14120172-08 MSD File ID:NI.121514.125649 Dil:1 Units:mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, Total	U	0.0625	0.0666	107	0.0625	0.0669	107	0.363	80 - 120	20	
Barium, Total	0.0240	0.0625	0.0897	105	0.0625	0.101	123	11.4	80 - 120	20	*
Cobalt, Total	U	0.0625	0.0646	103	0.0625	0.0657	105	1.71	80 - 120	20	
Lead, Total	U	0.0625	0.0662	106	0.0625	0.0658	105	0.625	80 - 120	20	
Manganese, Total	U	0.0625	0.0650	104	0.0625	0.0661	106	1.71	80 - 120	20	
Selenium, Total	U	0.0625	0.0675	108	0.0625	0.0680	109	0.693	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008
PDF File ID: 3915559
Report generated 12/15/2014 14:09

Microbac Laboratories Inc.

Serial Dilution Report

Login: L14120172 **Worknum:** WG504176

Instrument: ICP-MS2 **Method:** 6020

Serial Dil: WG504176-06 **File ID:** NI.121514.130921 **Dil:** 5 **Units:** ug/L

Sample: L14120172-03 **File ID:** NI.121514.130305 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Arsenic	ND	U	ND	U		
Barium	ND	U	ND	U		
Cobalt	ND	U	ND	U		
Lead	ND	U	ND	U		
Manganese	ND	U	ND	U		
Selenium	ND	U	ND	U		

U = Result is below MDL.

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

X = Result is greater than or equal to RL and less than 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: 3914973

12/15/2014 14:14

Microbac Laboratories Inc.

POST SPIKE REPORT

Sample Login ID: L14120172 **Worknum:** WG504176

Instrument ID: ICP-MS2 **Method:** 6020

Post Spike ID: WG504176-05 **File ID:** NI.121514.130613 **Dil:** 1 **Units:** ug/L

Sample ID: L14120172-03 **File ID:** NI.121514.130305 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ARSENIC	53.3		0	U	50	106.6	75 - 125	
BARIUM	52.7		0	U	50	105.4	75 - 125	
COBALT	53.5		0	U	50	107.1	75 - 125	
LEAD	53.2		0	U	50	106.4	75 - 125	
MANGANESE	54.0		0	U	50	107.9	75 - 125	
SELENIUM	53.4		0	U	50	106.9	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: 3914974
Report generated: 12/15/2014 14:14

Microbac Laboratories Inc.
Initial Calibration Summary

Login:	L14120172	Workgroup (AAB#):	WG504176
Analytical Method:	6020	Instrument ID:	ICP-MS2
ICAL Worknum:	WG504857	Initial Calibration Date:	15-DEC-2014 12:19

	WG504857-01		WG504857-02		WG504857-03		WG504857-04			
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	R	Q
ARSENIC	0	-136	.4	-31.6	50	75200	100	147000	.999998	
BARIUM	0	66.3	.4	230	50	108000	100	210000	.999993	
COBALT	0	149	.4	699	50	486000	100	941000	.999998	
LEAD	0	852	.4	2670	50	639000	100	1240000	1	
MANGANESE	0	2590	.4	6120	50	654000	100	1250000	.999988	
SELENIUM	0	27.8	.4	47.9	50	7360	100	14300	.999998	

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: 3914986
Report generated: 15-DEC-2014 14:09

Microbac Laboratories Inc.

INITIAL CALIBRATION BLANK (ICB)

Login Number: L14120172 Run Date: 12/15/2014 Sample ID: WG504857-06

Instrument ID: ICP-MS2 Run Time: 12:25 Method: 6020

File ID: NI.121514.122521 Analyst: JYH Units: ug/L

Workgroup (AAB#): WG504176 Cal ID: ICP-MS2 - 15-DEC-14

Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ARSENIC	.2	.4	.2	U
BARIUM	.6	1.2	.6	U
COBALT	.2	.4	.2	U
MANGANESE	.4	.8	.4	U
LEAD	.2	.4	.2	U
SELENIUM	.2	.4	.2	U

U = Result is less than 2 x MDL

F = Result is between MDL and 2 x MDL

* = Result is above 2 x MDL

ICB - Modified 07/14/2009

PDF File ID: 3914988

Report generated 12/15/2014 14:09

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/15/2014 Sample ID: WG504857-11

Instrument ID: ICP-MS2 Run Time: 12:41 Method: 6020

File ID: NI.121514.124106 Analyst: JYH Units: ug/L

Workgroup (AAB#): WG504176 Cal ID: ICP-MS - 15-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Barium	0.600	1.20	0.600	U
Cobalt	0.200	0.400	0.200	U
Lead	0.200	0.400	0.200	U
Manganese	0.400	0.800	0.400	U
Selenium	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: 3914991
Report generated 12/15/2014 14:09

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/15/2014 Sample ID: WG504857-13

Instrument ID: ICP-MS2 Run Time: 13:18 Method: 6020

File ID: NI.121514.131848 Analyst: JYH Units: ug/L

Workgroup (AAB#): WG504176 Cal ID: ICP-MS - 15-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Barium	0.600	1.20	0.600	U
Cobalt	0.200	0.400	0.200	U
Lead	0.200	0.400	0.200	U
Manganese	0.400	0.800	0.400	U
Selenium	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: 3914991
Report generated 12/15/2014 14:09

Microbac Laboratories Inc.

CONTINUING CALIBRATION BLANK (CCB)

Login Number: L14120172 Run Date: 12/15/2014 Sample ID: WG504857-15

Instrument ID: ICP-MS2 Run Time: 13:37 Method: 6020

File ID: NI.121514.133740 Analyst: JYH Units: ug/L

Workgroup (AAB#): WG504176 Cal ID: ICP-MS - 15-DEC-14

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.400	0.200	U
Barium	0.600	1.20	0.600	U
Cobalt	0.200	0.400	0.200	U
Lead	0.200	0.400	0.200	U
Manganese	0.400	0.800	0.400	U
Selenium	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: 3914991
Report generated 12/15/2014 14:09

Microbac Laboratories Inc.

INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L14120172 Run Date: 12/15/2014 Sample ID: WG504857-05
Instrument ID: ICP-MS2 Run Time: 12:22 Method: 6020
File ID: NI.121514.122211 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG504176 Cal ID: ICP-MS - 15-DEC-14
QC Key: DOD4

Analyte		Expected	Found	%REC	LIMITS	Q
Arsenic		50	50.4	101	90 - 110	
Barium		50	50.4	101	90 - 110	
Cobalt		50	50.7	101	90 - 110	
Lead		50	50.2	100	90 - 110	
Manganese		50	50.2	100	90 - 110	
Selenium		50	51.6	103	90 - 110	

* Exceeds LIMITS Limit

ICV - Modified 03/06/2008
PDF File ID: 3914987
Report generated 12/15/2014 14:09

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/15/2014 Sample ID: WG504857-10

Instrument ID: ICP-MS2 Run Time: 12:37 Method: 6020

File ID: NI.121514.123758 Analyst: JYH QC Key: DOD4

Workgroup (AAB#): WG504176 Cal ID: ICP-MS - 15-DEC-14

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.0500	0.0501	mg/L	100	90 - 110		
Barium		0.0500	0.0497	mg/L	99.4	90 - 110		
Cobalt		0.0500	0.0491	mg/L	98.1	90 - 110		
Lead		0.0500	0.0502	mg/L	100	90 - 110		
Manganese		0.0500	0.0492	mg/L	98.3	90 - 110		
Selenium		0.0500	0.0511	mg/L	102	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3914990

Report generated 12/15/2014 14:09

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/15/2014 Sample ID: WG504857-12

Instrument ID: ICP-MS2 Run Time: 13:15 Method: 6020

File ID: NI.121514.131539 Analyst: JYH QC Key: DOD4

Workgroup (AAB#): WG504176 Cal ID: ICP-MS - 15-DEC-14

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.0500	0.0505	mg/L	101	90 - 110		
Barium		0.0500	0.0492	mg/L	98.4	90 - 110		
Cobalt		0.0500	0.0499	mg/L	99.8	90 - 110		
Lead		0.0500	0.0497	mg/L	99.3	90 - 110		
Manganese		0.0500	0.0500	mg/L	100	90 - 110		
Selenium		0.0500	0.0508	mg/L	102	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3914990

Report generated 12/15/2014 14:09

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L14120172 Run Date: 12/15/2014 Sample ID: WG504857-14

Instrument ID: ICP-MS2 Run Time: 13:34 Method: 6020

File ID: NI.121514.133433 Analyst: JYH QC Key: DOD4

Workgroup (AAB#): WG504176 Cal ID: ICP-MS - 15-DEC-14

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.0500	0.0514	mg/L	103	90 - 110		
Barium		0.0500	0.0498	mg/L	99.5	90 - 110		
Cobalt		0.0500	0.0504	mg/L	101	90 - 110		
Lead		0.0500	0.0508	mg/L	102	90 - 110		
Manganese		0.0500	0.0512	mg/L	102	90 - 110		
Selenium		0.0500	0.0514	mg/L	103	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 3914990

Report generated 12/15/2014 14:09

Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L14120172 **Workgroup (AAB#):** WG504176
Instrument ID: ICP-MS2 **Method:** 6020
Sol. A : WG504857-08 **File ID:** NI.121514.123139 **Units:** ug/L
Sol. AB : WG504857-09 **File ID:** NI.121514.123447 **Matrix:** Water

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Arsenic	NS	0.00230	NS	100	95.8	95.8	
Barium	NS	0.0507	NS	100	93.9	93.9	
Cobalt	NS	0.0169	NS	100	94.1	94.1	
Lead	NS	-0.0193	NS	100	97.0	97.0	
Manganese	NS	0.109	NS	100	95.5	95.5	
Selenium	NS	-0.0708	NS	100	95.8	95.8	

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.

ICS - Modified 03/06/2008
PDF File ID: 3914989
Report generated 12/15/2014 14:09

Microbac Laboratories Inc.

INTERNAL STANDARD REPORT

Login: L14120172 **Analytical Method:** 6020
Analytical Workgroup: WG504176 **Matrix:** 1
Instrument: ICP-MS2 **Analyst:** JYH
ICAL Date: 15-DEC-2014 12:09

			BISMUTH	GERMANIUM	INDIUM
Sample	Type	Run Date	% Rec	% Rec	% Rec
L14120172-02	SAMP	15-DEC-2014 12:59	96.864	99.281	98.102
L14120172-03	SAMP	15-DEC-2014 13:03	98.921	100.055	97.966
L14120172-04	SAMP	15-DEC-2014 13:21	97.318	97.863	96.581
L14120172-05	SAMP	15-DEC-2014 12:50	97.395	97.53	96.579
L14120172-06	SAMP	15-DEC-2014 13:25	95.42	97.531	96.558
L14120172-07	SAMP	15-DEC-2014 12:53	97.099	99.289	97.318
L14120172-08	SAMP	15-DEC-2014 12:56	98.811	101.212	98.54
L14120172-09	SAMP	15-DEC-2014 13:28	97.556	99.122	97.914
L14120172-10	SAMP	15-DEC-2014 13:31	95.357	97.801	96.683
WG504133-03	BLANK	15-DEC-2014 12:44	98.48	98.784	97.669
WG504133-04	LCS	15-DEC-2014 12:47	98.252	99.263	98.156
WG504176-05	PSPK	15-DEC-2014 13:06	98.724	100.492	99.545
WG504176-06	SERIAL	15-DEC-2014 13:09	92.959	88.774	88.958
WG504857-05	ICV	15-DEC-2014 12:22	97.2	97.986	97.171
WG504857-06	ICB	15-DEC-2014 12:25	98.091	98.014	97.948
WG504857-07	LLICV	15-DEC-2014 12:28	96.48	96.077	96.473
WG504857-08	ICS	15-DEC-2014 12:31	90.576	87.581	88.227
WG504857-09	ICS	15-DEC-2014 12:34	95.415	97.86	96.255
WG504857-10	CCV	15-DEC-2014 12:37	96.888	96.609	94.944
WG504857-11	CCB	15-DEC-2014 12:41	96.464	95.161	93.705
WG504857-12	CCV	15-DEC-2014 13:15	97.345	99.621	97.748
WG504857-13	CCB	15-DEC-2014 13:18	99.057	100.142	97.733
WG504857-14	CCV	15-DEC-2014 13:34	94.792	96.141	94.787
WG504857-15	CCB	15-DEC-2014 13:37	97.039	99.829	97.06

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

INT_STD_ICPMS - Modified 07/28/2010
PDF File ID: 3914984
Report generated: 12/15/2014 14:09

Microbac Laboratories Inc.
LINEAR RANGE (QUARTERLY)

Login Number: L14120172 **Date:** 10/07/2014
Insturment ID: ICP-MS2 **Method:** 6020

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.

LINEAR_RANGE - Modified 03/06/2008
PDF File ID: 3914983
Report generated: 12/15/2014 14:09

Kemron–Radford Army Ammunition Plant Data Validation Summary Worksheet

SDG#: L14120172	Laboratory: Microbac	Validator: Linda Thal	Validation Start Date: 01/05/2015
Site: Radford	AR/COC#: A6140 (first # poorly legible due to poor copy quality)		Validation Level: ☐ III ☒ IV
Matrix: Water	# of Samples: 10	Tracking docs present: See sample receipt and log-in documentation	
COCs present: yes	COCs signed: yes	COCs dated: yes	Sample Container Integrity: OK

Analyses:
☒ VOCs ☐ SVOCs ☐ PAHs ☐ GRO ☐ DRO ☐ Pests ☐ PCBs ☒ Metals ☐ Gen Chem
☒ Other: CLO4

Requested Analyses Not Reported

Client Sample ID	Lab Sample ID	Analysis	Comments
None			

Hold Time/Preservation Outliers

Client Sample ID	Lab Sample ID	Analysis	Pres.	Collection Date	Preparation Date	Analysis Date	Analysis <2X HT	Analysis ≥2X HT
None								

Comments: Collected 12/02/2014

Revised 12/2010

Kemron–Radford Army Ammunition Plant Organic Worksheet (GCMS)

SDG: L14120172	Method: 8260	Matrix: Water	Level III Lab Sample IDs: NA
Batch #s: WG469134			Level IV Lab Sample IDs: L14120172-01 thru -10

Tuning: ☒ Pass ☐ Fail TICs Required? ☐ Yes ☒ No (*EPA Region III Limits*[1])

Analyte (outliers)	Calibration				Method Blank	5X (10X) Method Blank	LCS %R	MS %R (-07)	MSD %R (-08)	MS/D RPD	TB (-01)	FB (-04)	EQR (-03)	FD (-06)
	RF ≥0.05	RSD/r ≤30% ≥0.995	ICV %D ±25%	CCV %D ±25%										
Acetone	0.036	✓	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓

(*Limits*[1]*: 1,2-DCA-d4 76-114%*) **Surrogate Recovery Outliers** (*BFB 86-115% Tol-d8 88-110%*)

Sample ID	1,2-DCA-d4	DBFM	BFB	Tol-d8	Sample ID	1,2-DCA-d4	DBFM	BFB	Tol-d8
MS	✓	✓	84.3*	✓					
MSD	✓	✓	85.8*	✓					
LCS	✓	✓	84*	✓					

IS Outliers (*-50% to +100% of CCV*)

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None												

Comments: Samples unpreserved; analyzed within HT for unpreserved samples; OK.
Acetone and 2-CEVE only.
Lab used midpoint std for IS summary; DV uses CCV; both OK.
*Met lab limits < QAPP limits – not associated with target analytes

[1]Derived laboratory limits used for compounds not listed.

Revised 12/2010

Kemron–Radford Army Ammunition Plant Organic Worksheet (GCMS)

SDG	Method: 8270C SIM	Matrix:	Level III Lab Sample IDs: NA
Batch #s:			Level IV Lab Sample IDs:

Tuning: ☒ Pass ☐ Fail TICs Required? ☐ Yes ☒ No (*EPA Region III Limits*[1])

Analyte (outliers)	Calibration				Method Blank	5X (10X) Method Blank	LCS/D %R	MS %R	MSD %R	MS/D RPD	FB	FB X5	EQR	EQR X5
	RF *≥0.05*	RSD/r *≤30% ≥0.995*	ICV %D *±25%*	CCV %D *±25%*										

(Limits: NB-d5 35-114%) **Surrogate Recovery Outliers** (*2-Flbiph 43-116% p-Terph-d14 33-141%)*

Sample ID	2-FlBP	NB-d5	p-Terp-d14						

IS Outliers (*-50% to +100%)*

Sample ID	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT	Area	RT
None												

Comments:

[1]Derived laboratory limits used for compounds not listed.

Revised 12/2010

Kemron–Radford Army Ammunition Plant Organic Worksheet (LCMS)

SDG: L14120172	Method: 6850	Matrix: Water	Level III Lab Sample IDs: NA
Batch #s: WG504286			Level IV Lab Sample IDs: L14120172-02 thru -10

Tuning: ☐ Pass ☐ Fail Mass Calib: ☐ Pass ☐ Fail (*75-125%*) (*≤30%*)

Analyte (outliers)	**Calibration**				**Method Blank**	**5X (10X) Method Blank**	**LCS %R** *[1](80-120%)*	**MS %R (-07)**	**MSD %R (-8)**	**MS/D RPD**	**FB (-04)**	**EQR (-03)**	**FD (-06)**	
	RSD/r *≤20% ≥0.995*	**ICV/ CCV %R** *±15%*	**[2]CRDL %R** *±30%*	**ICS %R** *±20%*										
None														

$_{35}Cl/_{37}Cl$ Isotope Ratio *(Theoretical ratio ~3.06; window: 2.3-3.8)*

Sample ID	**Ratio**								
None									

(Area: ±50% of ICAL avg) **IS Outliers** *(RRT: 0.98 - 1.02)*

Sample ID	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**	**Area**	**RT**
None												

Comments: HTs OK; Tune not included in data package
CCBs OK
CRIs all at the RL not 2X the RL; Calculated CRIs > reported CRIs

[1]Or method-specified limits, whichever is more stringent [2]CRA at CRDL at beginning of run; CRI 2X CRDL every 10 samples

Revised 01/2015

Kemron–Radford Army Ammunition Plant Inorganic Metals Worksheet

SDG: L14120172	Matrix: Water	Level III Lab Sample IDs: NA
Method/Batch #s: 6010B: WG504169/WG504197 6020: WG504133/WG504176		Level IV Lab Sample IDs: L14120172-02 thru -10

ICPMS Mass Cal: ☒ Pass ☐ Fail ☐ NA ICPMS Resolution: ☒ Pass ☐ Fail ☐ NA ICPMS %RSD: ☒ Pass ☐ Fail ☐ NA

Analyte (outliers)	Calibration						ICP CRDL ±10%	Method Blank (<MDL)	5X MB	ICS A <IDL	ICS AB ±20%	LCS %R (80-120%)	MS %R (75-125%)	MSD %R (75-125%)	MS/D RPD (≤20%)	Serial Dil. %D (±10%)	PS (75-125%)	FD RPD (≤20%)
	r ≥0.995	ICV ±10%[1]	CCV ±10%[1]	ICB ug/L	CCB (<IDL)	5X CB												
WG504197		**Al Fe Mg K Na V Ca**											**-07**	**-08**		**-06**		**-06**
Ca	✓	✓	✓	✓	✓	NA	✓	✓	NA	✓	✓	✓	138*	159*	✓	✓	36*	✓
Na	✓	✓	✓	✓	.217J[a]	1.09	✓	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓	✓
WG504176		**As Ba Co Pb Mn Se**											**-07**	**-08**		**-03 EQR**		**-06**
Mn	✓	✓	✓	✓	✓	NA	58	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓	✓
Se	✓	✓	✓	✓	✓	NA	81	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pb	✓	✓	✓	✓	✓	NA	61	✓	NA	✓	✓	✓	✓	✓	✓	✓	✓	✓
[a]2 thru 6	ND	Or >5X																

IS Outliers[3] (60-120%)				IS Outliers[3] (60-120%)			
Sample ID	**%Recovery**	**%Recovery**	**%Recovery**	**CCV/CCB ID**	**%Recovery**	**%Recovery**	**%Recovery**
None				None			

Comments: HTs OK.; LOD and/or LOQ slightly > QAPP for Al, Ca, Fe, K (6010B); As, Ba, Co, Pb, Mn, (6020) all LOQs OK, LOD 2X>QAPP; *>4X spike amount
Ca diluted 10X -02, -05, -06, -10,-07MS,-08MSD
-03(EQR): ND but no result or qualifier reported for Na (calc from raw data)
-04(FB): ND but no result or qualifier reported for Na (calc from raw data)
Ca and Mg calc PS do not agree with lab result. Calculated results used for DV
6010: No CRIs but low standard at RL; LLICV with Ca dilutions no results reported
6020: SD and PS on EQR
ICS not performed at end of analysis; NA since results for Al, Ca, Mg and Fe are < ICS spiked amounts
-06 missing Ca result (calc from raw data)

[1]20% for Hg [2]For sample results <5X RL, ±RL; [3]Standard CLP NFG criteria used; no criteria specified in QAPP or Region III NFG; CRI and ICS beginning and end of run

VOC Calibration Verification for SDG L14120172

Calibration: WG501514 HPMS8 11/18/2014

Average RF | Int. Std. = 25 | 13 | 53 | 37 | 43

				Acetone		2-CEVE		Dibromofluoromethane		1,2-DCE-d4	
Conc.	Internal Area #1	Internal Area #1	Internal Area #1	Area	RRF		RRF	Area	RRF	Area	RRF
0.3											
0.4											
1	590621	590621	590621					2363	0.200	3031	0.257
2	595588	595588	595588			4813	0.101	5249	0.220	6465	0.271
5	593360	593360	593360	3981	0.034	10738	0.090	13714	0.231	15014	0.253
20	591637	591637	591637	15631	0.033	49354	0.104	56949	0.241	61595	0.260
50	585193	585193	585193	42974	0.037	120775	0.103	140183	0.240	153462	0.262
100	594161	594161	594161	88402	0.037	215207	0.091	293318	0.247	316482	0.266
200	587557	587557	587557	179909	0.038	412065	0.088	580668	0.247	628514	0.267
300	600387	600387	600387	263814	0.037	629490	0.087	862565	0.239	910420	0.253
Multiplier				1		1		1		1	
AveRF				0.036		0.0949		0.233		0.261	
RSD				5.884		7.9458		6.844		2.62832	

	ICV 11/19/2014		CCV 12/03/2014	
	Acetone	2-CEVE	Acetone	2-CEVE
Int. Std. Response	585224	585224	909351	909351
Analyte Response	17768	52962	65261	189011
Analyte Concentration	20	20	50	50
Int. Std. Concentration	25	25	25	25
CCRF	0.038	0.113	0.036	0.104
Ave RF	0.036	0.0949	0.036	0.0949
Calc'd Concentration	21.1	23.8	50.0	54.7
CCV %D	5.725	19.16	-0.04	9.47

Lab does not indicate bias on their summary forms

12/3/2014	MB	LCS	-01	-02	-03	-04	-05	-06	-09	-07	-08	-10
Dilution/DF	1	1	1	1	1	1	1	1	1	1	1	1
Final Volume (mL)	5	5	5	5	5	5	5	5	5	5	5	5
Sample Aliquot (mL)	5	5	5	5	5	5	5	5	5	5	5	5
IS Response	845713	876342	858256	787841	829586	810763	798744	772738	771173	860783	868814	773416
Surr Response	185049	211330	192402	187399	183492	192613	177423	184099	174091	206640	195039	182371
Surrogate #	1	2	1	2	1	2	1	2	1	2	1	2
Calibration R.F.	0.233	0.261	0.233	0.261	0.233	0.261	0.233	0.261	0.233	0.261	0.233	0.261
Surr spike Conc. (ug/L)	25	25	25	25	25	25	25	25	25	25	25	25
Surr spike Conc. (ug/L)	25	25	25	25	25	25	25	25	25	25	25	25
Surr Conc. (ug/L)	23.5	23.1	24.0	22.8	23.7	22.7	23.8	22.8	24.2	23.0	24.1	22.6
Surr %REC	94	92	96	91	95	91	95	91	97	92	96	90
	TC	Acetone	*TC*	*TC*	*TC*	*TC*	*TC*	*TC*	*TC*	2-CEVE	2-CEVE	*TC*
IS Response		876342								860783	868814	
TC Response		25705								78171	75524	
Calibration R.F.		0.036				0.095	0.095			0.095	0.095	
TC Conc. (ug/L)		20.428								23.914	22.891	
Amount Spiked		20								20	20	
%R		102.14								119.57	114.46	
RPD										4.37		

Regression Calculator for a Linear RF Curve - Conc. Ratio On X-Axis WG501146 Perchlorate for SDG L14120172

6/8/2013	ICAL1	ICAL2	ICAL3	ICAL4	ICAL5	ICAL6	ICAL7	ICAL8	ICAL9	ICAL10
Counts Analyte (^{35}Cl)	11100	17300	44100	84400	173000	420000	841000	0	0	0
Counts IS	322000	322000	329000	327000	323000	314000	312000	1	1	1
Conc Analyte	0.10	0.20	0.50	1.00	2.00	5.00	10.00	0	0	0
Conc IS	5.00	5.00	5.00	5.00	5.00	5.00	5.00	1	1	1
RF	1.724	1.343	1.340	1.291	1.339	1.338	1.348			
x-axis	0.020	0.040	0.100	0.200	0.400	1.000	2.000	0.000	0.000	0.000
y-axis	0.03447	0.05373	0.13404	0.25810	0.53560	1.33758	2.69551	0.00000	0.00000	0.00000

Perform Regression

Perform Regression (Forced Zero)

Enter 0 for Counts Analyte and Conc Analyte if a standard is not used
Enter 1 for Counts IS and Conc IS if a standard is not used
Unused standards must be on the far right (no gaps in the used standards)

Calcs slightly off due to rounding. Results match when lab reported coefficients are used in calcs.

	Offset b	Slope m1	r^2
	-1.9988E-03	1.3466E+00	0.99996
Lab reported	3.87E-03	1.33E+00	0.9998

LOD= 0.100
LOQ= 0.200

$$C_X = C_{IS}\left[\frac{(A_X)}{(A_{IS})(m1)} - \frac{b}{m1}\right]$$

MRL results do not match the labs
Is the MCT = to the ICS?

	SSV	CCB1	CCV1	QCMRL 1	MCT	CCV2	QCMRL 2	CCB2	CCV3	QCMRL 3	CCB3	CCV4	QCMRL 4	CCB4	CCV5	QCMRL 5	CCB5	CCV6	QCMRL 6	CCB6
Counts Analyte (^{35}Cl)	88800	0	102000	19500	20600	106000	21200	0	105000	20100	0	103000	19900	0	101000	19400	0	101000	19500	0
Counts IS	326000		358000	326000	332000	383000	365000		386000	356000		375000	363000		356000	349000		371000	343000	
Conc IS	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Amount On Col (ug/L)	1.0189	0	1.0654	0.2295	0.2378	1.0351	0.2231	0	1.0175	0.2171	0	1.0273	0.2110	0	1.0609	0.2138	0	1.0183	0.2185	0
True value	1.0		1.0	0.2	0.2	1.0	0.2		1.0	0.2		1.0	0.2		1.0	0.2		1.0	0.2	
%R	101.89		106.54	114.76	118.91	103.51	111.55	<LOD	101.75	108.54		102.73	105.49		106.09	106.91		101.83	109.26	
%D	1.89		6.54	14.76	18.91	3.51	11.55		1.75	8.54		2.73	5.49		6.09	6.91		1.83	9.26	
Perchlorate Conf (^{37}Cl)	29400		33100	6490	7320	34000	6500		35600	6670		33200	6850		33700	6380		33500	6330	
Ion Ratio	3.02		3.08	3.00	2.81	3.12	3.26		2.95	3.01		3.10	2.91		3.00	3.04		3.01	3.08	

	MB	LCS		-02	-03	-04	-09	-06	-05	-07 MS	-08 MSD	-10	
Counts Analyte (^{35}Cl)	0	21200		267000	527	722	97400	83300	84500	104000	103000	290000	
Counts IS		346000		317000	356000	358000	349000	358000	353000	364000	349000	355000	
Conc IS	5	5	5	5	5	5	5	5	5	5	5	5	
Amount On Col (ug/L)	0	0.2349		3.1349	0.0129	0.0149	1.0437	0.8714	0.8963	1.0683	1.1033	3.0407	
Dilution factor	1	1	1	1	1	1	1	1	1	1	1	1	
Sample Aliquot (mL)	10	10	10	10	10	10	10	10	10	10	10	10	
Final Volume (mL)	10	10	10	10	10	10	10	10	10	10	10	10	
Final Conc (ug/L)	0.00	0.235		3.13	0.01	0.015	1.044	0.871	0.896	1.07	1.10	3.04	
Amount Spiked		0.2								0.2	0.2		
%Rec	<LOD	117.47			<LOD	<LOD				86.03	103.51		
RPD										-0.83			
Perchlorate Conf (^{37}Cl)		7360		88100	223	332	32600	29400	28500	33800	34600	98600	
Ion Ratio		2.88		3.03	2.36	2.17	2.99	2.83	2.96	3.08	2.98	2.94	2.3-3.8

ICAL							
Perchlorate Conf (^{37}Cl)	3370	5740	14600	29400	54700	140000	276000
Ion Ratio	3.29	3.01	3.02	2.87	3.16	3.00	3.05

RRT	MB	LCS		-02	-03	-04	-09	-06	-05	-07 MS	-08 MSD	-10
Perchlorate RT	0	9.8		9.61	9.82	9.81	9.68	9.6	9.6	9.61	9.61	9.58
IS RT	9.78	9.79		9.6	9.8	9.8	9.67	9.59	9.59	9.59	9.6	9.58
0.98-1.02	0.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

CALCULATION WORKSHEET FOR 6010 METALS WATER RESULTS FOR SDG L14120172

Water Sample Calculations:

	MDL (mg/L)	CRQL (mg/L)			MB		LCS		-02		-03		-04		-09	
Final Volume (ml)					50		50		50		50		50		50	
Sample Aliquot (ml)					40		40		40		40		40		40	
					ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L
					DF	1	DF	1	DF	1	DF	1	DF	1	DF	1
Al	0.100	0.200			0.00605	U	4.94	6.175	0.0353	U	0.0115	U	0.01	U	0.373	0.466
Ca	0.250	0.500			-0.0215	U	5.01	6.263			-0.0272	U	0.101	U	17.7	22.125
Fe	0.050	0.100			0.00659	U	2.05	2.563	0.158	0.198	0.00846	U	0.0369	U	0.361	0.451
Mg	0.250	0.500			0.0244	U	5.1	6.375	23.7	29.625	0.0233	U	0.0295	U	5.43	6.7875
K	0.500	1.000			0.00637	U	23.6	29.500	1.24	1.550	0.0354	U	-0.0363	U	0.892	1.1150
Na	0.250	0.500			0.0161	U	23.6	29.500	3.04	3.800	0.0764	U	0.0215	U	6.38	7.975
V	0.005	0.010			0.00136	U	0.51	0.638	-0.00034	U	0.00003	U	0.00113	U	-0.00012	U

	MDL (mg/L)	CRQL (mg/L)			-10		-06		-05		-07ms		-08 msd	
Final Volume (ml)					50		50		50		50		50	
Sample Aliquot (ml)					40		40		40		40		40	
					ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L
					DF	1	DF	1	DF	1	DF	1	DF	1
Al	0.100	0.200			0.421	0.526	0.24	0.300	0.205	0.256	4.94	6.175	5.01	6.26
Ca	0.250	0.500												
Fe	0.050	0.100			0.422	0.5275	0.141	0.176	0.124	0.155	2.06	2.5750	2.08	2.60
Mg	0.250	0.500			17.9	22.375	9.92	12.400	10.6	13.250	15.3	19.125	15.5	19.38
K	0.500	1.000			1.03	1.288	0.654	0.818	0.611	0.764	24	30.000	24.6	30.75
Na	0.250	0.500			4.86	6.075	5.08	6.350	5.26	6.575	28.5	35.625	29.3	36.63
V	0.005	0.010			0.00028	U	0.00125	U	0.00094	U	0.501	0.626	0.505	0.63

	MDL (mg/L)	CRQL (mg/L)			-02		10		06		05		07 ms		-08 msd	
Final Volume (ml)					50		50		50		50		50		50	
Sample Aliquot (ml)					40		40		40		40		40		40	
					ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L
					DF	10	DF	10	DF	10	DF	10	DF	10	DF	10
Ca	0.250	0.500			6.16	77.00	5.11	63.88	3.25	40.63	3.31	41.38	4	50.00	4.1	51.25

CALCULATION WORKSHEET FOR METALS RESULTS FOR SDG L14120172

6010 Water:

	8.27			8.37	14.13	14.55	15.36
12/10/2014	ICV	ICSA	ICSAB	CCV	CCV	CCV	CCV
Analyte	Al	Ca	Fe	Mg	K	Na	V
True Conc	10.0	250.0	100.0	10.0	50.0	50.0	1.0
Reported Conc	10.2	287	96	10.1	51.5	49.1	1.0
%D	1.98	13.78	-3.77	1.00	2.96	-1.82	2.96
%R	102.0	114.8	96.3	101.0	103.0	98.2	103.0

	8.58				9.12	9.54	10.53
12/11/2014	ICV	LLICV	ICSA	ICSAB	CCV	CCV	CCV
Analyte	Ca	Ca	Ca	Ca	Ca	Ca	Ca
True Conc	10.0		250.0	250.0	10.0	10.0	10.0
Reported Conc	10.1	0.0369	280	273.0	9.9	10.4	10.3
%D	1.00	200.00	11.32	8.80	-1.31	3.92	2.96
%R	101.0	#DIV/0!	112.0	109.2	98.7	104.0	103.0

	LCS	-07 MS	-08 MSD
Analyte	Al	Fe	Fe
True Conc	6.250	2.500	2.500
Reported Conc	6.170	2.570	2.600
Sample Conc		0.155	0.155
%R	98.72	96.60	97.80
RPD		1.16	

Analyte	MDL	PS	-06	Spike Added	%R
Al	0.100	5.16	0.24	5.000	98.9
Ca	0.250	34.6	32.8	5.000	101.6
Fe	0.050	2.16	0.141	2.000	101.7
Mg	0.250	13.9	9.92	5.0	99.4
K	0.500	24.1	0.654	25.000	94.0
Na	0.250	28	5.08	25.000	93.7
V	0.005	0.5	0	0.500	100.0

Analyte	-6	Serial Dilution 5x		IDL	50 * IDL	> 50*IDL?	RPD Limit	%D	>Limit?
	mg/L	mg/L	mg/L	mg/L	mg/L				
Al	0.24	0.0554	0.277	0.100	5.000		10		
Ca	32.8	6.59	32.95	0.250	12.500	Y	10	0.46	
Fe	0.141	0.0343	0.1715	0.050	2.500		10		
Mg	9.92	2.08	10.4	0.250	12.500		10		
K	0.654	0.166	0.83	0.500	25.000		10		
Na	5.08	1.11	5.55	0.250	12.500		10		
V	0	0.00043	0.00215	0.005	0.250		10		

CALCULATION WORKSHEET FOR 6020 METALS WATER RESULTS FOR SDG L14120172

Water Sample Calculations:

	MDL (mg/L)	CRQL (mg/L)			MB		LCS		-02		-03		-04	
Final Volume (ml)					100		100		100		100		100	
Sample Aliquot (ml)					40		40		40		40		40	
					ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L
					DF	1	DF	1	DF	1	DF	1	DF	1
As	0.00050	0.0010			0.011	U	27.1995	0.0680	0.0542	U	0.0061	U	0.0026	U
Ba	0.00150	0.0030			0.1321	U	26.5266	0.0663	45.5368	0.1138	0.1083	U	0.0528	U
Co	0.00050	0.0010			0.0137	U	26.927	0.0673	0.0747	U	0.0004	U	0.0007	U
Pb (208)	0.00050	0.0010			-0.0508	U	27.3904	0.0685	-0.0307	U	-0.0675	U	-0.067	U
Mn	0.00100	0.0020			-0.0857	U	27.2998	0.0682	0.541	0.0014	0.0132	U	-0.0875	U
Se (82)	0.00050	0.0010			-0.0149	U	27.585	0.0690	0.1392	U	-0.013	U	-0.0508	U

	MDL (mg/L)	CRQL (mg/L)			05		-06		-07 MS		-08 MSD		-09		-10	
Final Volume (ml)					100		100		100		100		100		100	
Sample Aliquot (ml)					40		40		40		40		40		40	
					ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L	ug/L	mg/L
					DF	1	DF	1	DF	1	DF	1	DF	1	DF	1
As	0.00050	0.0010			0.01	U	0.058	U	26.6526	0.0666	26.7495	0.0669	0.0639	U	0.1138	#DIV/0!
Ba	0.00150	0.0030			9.5888	0.0240	9.6256	0.0241	35.8873	0.0897	40.2235	0.1006	4.8834	0.0122	19.761	#DIV/0!
Co	0.00050	0.0010			0.0447	U	0.0545	U	25.8268	0.0646	26.2735	0.0657	0.0454	U	0.1074	#DIV/0!
Pb (208)	0.00050	0.0010			-0.0336	U	-0.0379	U	26.4671	0.0662	26.3022	0.0658	0.1163	U	0.0884	#DIV/0!
Mn	0.00100	0.0020			0.1529	U	0.1752	U	25.9927	0.0650	26.4403	0.0661	1.0619	0.0027	1.4709	#DIV/0!
Se (82)	0.00050	0.0010			0.1102	U	0.1089	U	27.0041	0.0675	27.1919	0.0680	0.0639	U	0.2952	#DIV/0!

Low level initial calibration

		Assumed conc	
Sb		0.4000	0
As	0.4209	0.4000	105.225
Ba	0.7002	0.7500	93.36
Cd (111)		0.2400	0
Cr (52)		0.8000	0
Co	0.3969	0.4000	99.225
Cu		0.8000	0
Pb (208)	0.1222	0.2000	61.1
Mn	0.29	0.5000	58
Ni		1.6000	0
Se (82)	0.3234	0.4000	80.85
Ag		0.4000	0
Tl (203)		0.0800	0

CALCULATION WORKSHEET FOR METALS RESULTS FOR SDG L14120172

6020 Water:

				12.37	13.15	13.34
12/15/2014	**ICV**	**ICSAB**	**ICSAB**	**CCV**	**CCV**	**CCV**
Analyte	**As**	**Ba**	**Co**	**Pb**	**Mn**	**Se**
True Conc	50.0	100.0	100.0	50.0	50.0	50.0
Reported Conc	50.38	93.88	94.06	50.16	49.98	51.41
%D	0.75	-6.31	-6.13	0.32	-0.04	2.78
%R	100.8	93.9	94.1	100.3	100.0	102.8

	LCS	**-07 MS**	**-08 MSD**
Analyte	**Pb**	**Ba**	**Ba**
True Conc	0.0625	0.0625	0.0625
Reported Conc	0.0685	0.0897	0.1010
Sample Conc		0.0240	0.0240
%R	109.60	105.12	123.20
RPD		11.85	

Analyte	**MDL**	**-03 PS**	**-03**	**Spike Added**	**%R**
As	0.00050	53.32	0	50.000	106.6
Ba	0.00150	52.68	0	50.000	105.4
Co	0.00050	53.54	0	50.000	107.1
Pb (208)	0.00050	53.22	0	50.000	106.4
Mn	0.00100	53.97	0	50.000	107.9
Se (82)	0.00050	53.43	0	50.000	106.9

Analyte	**-3**	**Serial Dilution 5x**		**IDL**	**50 * IDL**	**> 50*IDL?**	**RPD Limit**	**%D**	**>Limit?**
	ug/L	**ug/L**	**ug/L**	**mg/L**	**mg/L**				
As	0			0.00050	0.025		10		
Ba	0			0.00150	0.075		10		
Co	0			0.00050	0.025		10		
Pb (208)	0			0.00050	0.025		10		
Mn	0			0.00100	0.050		10		
Se (82)	0			0.00050	0.025		10		

SD performed on EQR

Microbac

Laboratory Report Number: L14120172 *(Revised)*

Revised to include a missing calcium result for the duplicate sample

Mary Lou Rochette
Kemron Environmental Services
2343-A State Rt 821
Marietta, OH 45750

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:
Stephanie Mossburg – Team Chemist/Data Specialist
(740) 373-4071
Stephanie.Mossburg@microbac.com

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

This report was certified on January 22 2015

David L. Vandenberg

David Vandenberg – Managing Director

State of Origin: VA
Accrediting Authority: Common Wealth of Virginia ID:460187
QAPP: DOD Ver 4.1

Microbac

Lab Report #: L14120172
Lab Project #: 2820.216
Project Name: Radford AAP
Lab Contact: Stephanie Mossburg

Record of Sample Receipt and Inspection

Comments/Discrepancies

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

There were no discrepancies.

Discrepancy	Resolution

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
0019428	H	1.0			X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	NA
2	Were custody seals intact?	NA
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	Yes

Microbac

Lab Report #: L14120172
Lab Project #: 2820.216
Project Name: Radford AAP
Lab Contact: Stephanie Mossburg

Samples Received

Client ID	Laboratory ID	Date Collected	Date Received
40TB12214	L14120172-01	12/02/2014 00:01	12/03/2014 13:00
40MW7GW12214	L14120172-02	12/02/2014 09:17	12/03/2014 13:00
40EQR12214	L14120172-03	12/02/2014 10:50	12/03/2014 13:00
40FB12214	L14120172-04	12/02/2014 11:05	12/03/2014 13:00
40MW5GW12214	L14120172-05	12/02/2014 11:58	12/03/2014 13:00
40DUPGW12214	L14120172-06	12/02/2014 11:58	12/03/2014 13:00
40MW5MSGW12214	L14120172-07	12/02/2014 11:58	12/03/2014 13:00
40MW5MSDGW12214	L14120172-08	12/02/2014 11:58	12/03/2014 13:00
40MW6GW12214	L14120172-09	12/02/2014 14:06	12/03/2014 13:00
LFMW01GW12214	L14120172-10	12/02/2014 15:45	12/03/2014 13:00

Login Number: L14120172
Department: Volatiles
Analyst: Tiffany Bailey

METHOD

Preparation SW-846 5030C/5035A

Analysis SW-846 8260B

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: Non-target calibration check compound (CCC) vinyl chloride exceeded the upper control limit, however, the target analytes met CCC acceptance criteria.

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.

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 area counts 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: 92859
Approved By: Michael Albertson

Login Number: L14120172
Department: General Chromatography
Analyst: Anthony Canter

METHOD

Analysis SW-846 6850

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: All acceptance criteria were met.

Matrix Spikes: All acceptance criteria were met.

SAMPLES

Samples: All acceptance criteria were met.

Internal Standards: All acceptance criteria were met.

Manual Integration Reason Codes

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

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

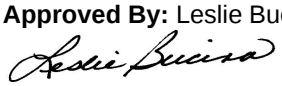
Reason #3: Improperly Integrated Isomers and/or coeluting compounds. This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene 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 Laboratory Director or the QA/QC Supervisor 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: 93199
Approved By: Leslie Bucina



Login Number: L14120172
Department: Metals
Analyst: Kim Rhodes

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: All acceptance criteria were met.

Continuing Calibration Blank: WG504197 - The continuing calibration blank analyzed on 10-DEC-2014 at 14:15 yielded a result for sodium of 0.217mg/L which exceeded the LOD. However, the reported sample results exceeded that of the CCB by greater than a factor of ten with the exception of fractions 03 and 04. Fractions 03 and 04 yielded results that were below the LOD, therefore, no further action was taken. The sodium results were reported with a 'B' qualifier to indicate the association with a noncompliant CCB.

BATCH QA/QC

Method Blank: All acceptance criteria were met.

Laboratory Control Sample: All acceptance criteria were met.

Serial Dilution/Post Digestion Spikes: WG504197 - All acceptance criteria were met.

Matrix Spikes: WG504197 - Sample 05 was chosen by the client for MS/MSD analysis. Samples 07(MS) and 08(MSD) yielded noncompliant recoveries for calcium.

SAMPLES

Samples: WG504197 - Client samples 02, 05, 06, 07MS, 08MSD and 10 as well as the batch post digestion spike required dilution analyses in order to obtain results for calcium within the calibration range.

Narrative ID: 93050
Approved By: Sheri Pfalzgraf

Login Number: L14120172
Department: Metals
Analyst: Ji Hu
Analyst #2: Pierce Morris

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: All acceptance criteria were met.

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: WG504176 - All acceptance criteria were met.

Matrix Spikes: WG504176 - Sample 05 was chosen by the client for MS/MSD analysis. Samples 07 (MS) and 08 (MSD) yielded a noncompliant recovery for barium.

SAMPLES

Samples: All acceptance criteria were met.

Narrative ID: 93175
Approved By: Maren Beery

Certificate of Analysis

Sample #: L14120172-01 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40TB12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 18:52
Collect Date: 12/02/2014 00:01 **Dilution:** 1 **File ID:** 8M401510
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	93.1	70	120	
4-Bromofluorobenzene	89.9	75	120	
Dibromofluoromethane	96.2	85	115	
Toluene-d8	88.4	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-02 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40MW7GW12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 20:48
Collect Date: 12/02/2014 09:17 **Dilution:** 1 **File ID:** 8M401514
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	91.0	70	120	
4-Bromofluorobenzene	89.4	75	120	
Dibromofluoromethane	95.9	85	115	
Toluene-d8	89.1	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-02 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40MW7GW12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/11/2014 10:45
Collect Date: 12/02/2014 09:17 **Dilution:** 1 **File ID:** 1LM.LM27939
Sample Tag: 01 **Units:** ug/L

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	3.14		0.200	0.100

Sample #: L14120172-02 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW7GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 14:32
Collect Date: 12/02/2014 09:17 **Dilution:** 1 **File ID:** P2.121014.143245
Sample Tag: 01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5		U	0.200	0.100
Iron, Total	7439-89-6	0.198		0.100	0.0500
Magnesium, Total	7439-95-4	29.7		0.500	0.250
Potassium, Total	7440-09-7	1.55		1.00	0.500
Sodium, Total	7440-23-5	3.81	B	0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

B	The reported result is associated with a contaminated method blank.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-02 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW7GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/11/2014 08:56
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/11/2014 10:24
Collect Date: 12/02/2014 09:17 **Dilution:** 10 **File ID:** P2.121114.102418
Sample Tag: DL01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Calcium, Total	7440-70-2	77.0		5.00	2.50

Sample #: L14120172-02 **PrePrep Method:** N/A **Instrument:** ICP-MS2
Client ID: 40MW7GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 07:25
Matrix: Water **Analytical Method:** 6020 **Cal Date:** 12/15/2014 12:19
Workgroup #: WG504176 **Analyst:** JYH **Run Date:** 12/15/2014 12:59
Collect Date: 12/02/2014 09:17 **Dilution:** 1 **File ID:** NI.121514.125957
Sample Tag: 03 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3	0.114		0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5	0.00135	J	0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-03 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40EQR12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 19:21
Collect Date: 12/02/2014 10:50 **Dilution:** 1 **File ID:** 8M401511
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	91.2	70	120	
4-Bromofluorobenzene	90.8	75	120	
Dibromofluoromethane	94.9	85	115	
Toluene-d8	91.1	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-03 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40EQR12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 19:17
Collect Date: 12/02/2014 10:50 **Dilution:** 1 **File ID:** 1LM.LM27910
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0		U	0.200	0.100

U	Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #:	L14120172-03	**PrePrep Method:**	N/A	**Instrument:**	PE-ICP2
Client ID:	40EQR12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 09:19
Matrix:	Water	**Analytical Method:**	6010B	**Cal Date:**	12/10/2014 08:18
Workgroup #:	WG504197	**Analyst:**	KHR	**Run Date:**	12/10/2014 14:36
Collect Date:	12/02/2014 10:50	**Dilution:**	1	**File ID:**	P2.121014.143607
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2		U	0.500	0.250
Iron, Total	7439-89-6		U	0.100	0.0500
Magnesium, Total	7439-95-4		U	0.500	0.250
Potassium, Total	7440-09-7		U	1.00	0.500
Sodium, Total	7440-23-5			0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-03	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	40EQR12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 07:25
Matrix:	Water	**Analytical Method:**	6020	**Cal Date:**	12/15/2014 12:19
Workgroup #:	WG504176	**Analyst:**	JYH	**Run Date:**	12/15/2014 13:03
Collect Date:	12/02/2014 10:50	**Dilution:**	1	**File ID:**	NI.121514.130305
Sample Tag:	03	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3		U	0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5		U	0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-04	**PrePrep Method:**	N/A	**Instrument:**	HPMS8
Client ID:	40FB12214	**Prep Method:**	5030B/5030C/5035A	**Prep Date:**	N/A
Matrix:	Water	**Analytical Method:**	8260B	**Cal Date:**	11/19/2014 00:08
Workgroup #:	WG503275	**Analyst:**	TMB	**Run Date:**	12/03/2014 19:50
Collect Date:	12/02/2014 11:05	**Dilution:**	1	**File ID:**	8M401512
Sample Tag:	01	**Units:**	ug/L		

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	90.9	70	120	
4-Bromofluorobenzene	90.9	75	120	
Dibromofluoromethane	95.4	85	115	
Toluene-d8	90.6	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-04 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40FB12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 19:36
Collect Date: 12/02/2014 11:05 **Dilution:** 1 **File ID:** 1LM.LM27911
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0		U	0.200	0.100

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-04 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40FB12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 14:39
Collect Date: 12/02/2014 11:05 **Dilution:** 1 **File ID:** P2.121014.143928
Sample Tag: 01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5		U	0.200	0.100
Calcium, Total	7440-70-2		U	0.500	0.250
Iron, Total	7439-89-6		U	0.100	0.0500
Magnesium, Total	7439-95-4		U	0.500	0.250
Potassium, Total	7440-09-7		U	1.00	0.500
Sodium, Total	7440-23-5			0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

U	Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #:	L14120172-04	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	40FB12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 07:25
Matrix:	Water	**Analytical Method:**	6020	**Cal Date:**	12/15/2014 12:19
Workgroup #:	WG504176	**Analyst:**	JYH	**Run Date:**	12/15/2014 13:21
Collect Date:	12/02/2014 11:05	**Dilution:**	1	**File ID:**	NI.121514.132157
Sample Tag:	03	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3		U	0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5		U	0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-05	**PrePrep Method:**	N/A	**Instrument:**	HPMS8
Client ID:	40MW5GW12214	**Prep Method:**	5030B/5030C/5035A	**Prep Date:**	N/A
Matrix:	Water	**Analytical Method:**	8260B	**Cal Date:**	11/19/2014 00:08
Workgroup #:	WG503275	**Analyst:**	TMB	**Run Date:**	12/03/2014 20:19
Collect Date:	12/02/2014 11:58	**Dilution:**	1	**File ID:**	8M401513
Sample Tag:	01	**Units:**	ug/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	91.9	70	120	
4-Bromofluorobenzene	90.9	75	120	
Dibromofluoromethane	95.3	85	115	
Toluene-d8	90.1	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-05	**PrePrep Method:**	N/A	**Instrument:**	LCMS1
Client ID:	40MW5GW12214	**Prep Method:**	6850	**Prep Date:**	12/10/2014 10:00
Matrix:	Water	**Analytical Method:**	6850	**Cal Date:**	11/17/2014 14:53
Workgroup #:	WG504286	**Analyst:**	ADC	**Run Date:**	12/10/2014 19:55
Collect Date:	12/02/2014 11:58	**Dilution:**	1	**File ID:**	1LM.LM27912
Sample Tag:	01	**Units:**	ug/L		

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	0.883		0.200	0.100

Sample #: L14120172-05 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW5GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 14:42
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** P2.121014.144249
Sample Tag: 01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	0.256		0.200	0.100
Iron, Total	7439-89-6	0.155		0.100	0.0500
Magnesium, Total	7439-95-4	13.2		0.500	0.250
Potassium, Total	7440-09-7	0.764	J	1.00	0.500
Sodium, Total	7440-23-5	6.58	B	0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

B	The reported result is associated with a contaminated method blank.
J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-05 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW5GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/11/2014 08:56
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/11/2014 10:27
Collect Date: 12/02/2014 11:58 **Dilution:** 10 **File ID:** P2.121114.102740
Sample Tag: DL01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Calcium, Total	7440-70-2	41.4		5.00	2.50

Sample #: L14120172-05 **PrePrep Method:** N/A **Instrument:** ICP-MS2
Client ID: 40MW5GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 07:25
Matrix: Water **Analytical Method:** 6020 **Cal Date:** 12/15/2014 12:19
Workgroup #: WG504176 **Analyst:** JYH **Run Date:** 12/15/2014 12:50
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** NI.121514.125033
Sample Tag: 03 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3	0.0240		0.00300	0.00150

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5		U	0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-06 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40DUPGW12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 21:16
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 8M401515
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	91.2	70	120	
4-Bromofluorobenzene	90.0	75	120	
Dibromofluoromethane	95.4	85	115	
Toluene-d8	89.3	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-06 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40DUPGW12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 20:14
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 1LM.LM27913
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	0.856		0.200	0.100

Sample #: L14120172-06 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40DUPGW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 14:46
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** P2.121014.144610
Sample Tag: 01 **Units:** mg/L

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	0.300		0.200	0.100
Calcium, Total	7440-70-2	41.0		0.500	0.250
Iron, Total	7439-89-6	0.177		0.100	0.0500
Magnesium, Total	7439-95-4	12.4		0.500	0.250
Potassium, Total	7440-09-7	0.817	J	1.00	0.500
Sodium, Total	7440-23-5	6.35	B	0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

B	The reported result is associated with a contaminated method blank.
J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-06 **PrePrep Method:** N/A **Instrument:** ICP-MS2
Client ID: 40DUPGW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 07:25
Matrix: Water **Analytical Method:** 6020 **Cal Date:** 12/15/2014 12:19
Workgroup #: WG504176 **Analyst:** JYH **Run Date:** 12/15/2014 13:25
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** NI.121514.132506
Sample Tag: 02 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3	0.0241		0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5		U	0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-07 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40MW5MSGW12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 17:54
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 8M401508
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8	23.9		10.0	2.00
Acetone	67-64-1	20.1		10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	91.9	70	120	
4-Bromofluorobenzene	84.3	75	120	

Dibromofluoromethane	96.1	85	115	
Toluene-d8	88.8	85	120	

Sample #: L14120172-07 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40MW5MSGW12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 21:29
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 1LM.LM27917
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	1.05		0.200	0.100

Sample #: L14120172-07 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW5MSGW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 15:03
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** P2.121014.150311
Sample Tag: 01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	6.17		0.200	0.100
Iron, Total	7439-89-6	2.57		0.100	0.0500
Magnesium, Total	7439-95-4	19.1		0.500	0.250
Potassium, Total	7440-09-7	30.0		1.00	0.500
Sodium, Total	7440-23-5	35.6	B	0.500	0.250
Vanadium, Total	7440-62-2	0.626		0.0100	0.00500

B	The reported result is associated with a contaminated method blank.

Sample #: L14120172-07 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: 40MW5MSGW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/11/2014 08:56
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/11/2014 10:40
Collect Date: 12/02/2014 11:58 **Dilution:** 10 **File ID:** P2.121114.104008
Sample Tag: DL01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Calcium, Total	7440-70-2	50.0		5.00	2.50

Certificate of Analysis

Sample #: L14120172-07 **PrePrep Method:** N/A **Instrument:** ICP-MS2
Client ID: 40MW5MSGW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 07:24
Matrix: Water **Analytical Method:** 6020 **Cal Date:** 12/15/2014 12:19
Workgroup #: WG504176 **Analyst:** JYH **Run Date:** 12/15/2014 12:53
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** NI.121514.125341
Sample Tag: 03 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2	0.0666		0.00100	0.000500
Barium, Total	7440-39-3	0.0897		0.00300	0.00150
Cobalt, Total	7440-48-4	0.0646		0.00100	0.000500
Lead, Total	7439-92-1	0.0662		0.00100	0.000500
Manganese, Total	7439-96-5	0.0650		0.00200	0.00100
Selenium, Total	7782-49-2	0.0675		0.00100	0.000500

Sample #: L14120172-08 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: 40MW5MSDGW12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 18:23
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 8M401509
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8	22.9		10.0	2.00
Acetone	67-64-1	19.5		10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	90.8	70	120	
4-Bromofluorobenzene	85.8	75	120	
Dibromofluoromethane	96.3	85	115	
Toluene-d8	87.9	85	120	

Sample #: L14120172-08 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: 40MW5MSDGW12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 21:48
Collect Date: 12/02/2014 11:58 **Dilution:** 1 **File ID:** 1LM.LM27918
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	1.09		0.200	0.100

Certificate of Analysis

Sample #:	L14120172-08	**PrePrep Method:**	N/A	**Instrument:**	PE-ICP2
Client ID:	40MW5MSDGW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 09:19
Matrix:	Water	**Analytical Method:**	6010B	**Cal Date:**	12/10/2014 08:18
Workgroup #:	WG504197	**Analyst:**	KHR	**Run Date:**	12/10/2014 15:05
Collect Date:	12/02/2014 11:58	**Dilution:**	1	**File ID:**	P2.121014.150537
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	6.26		0.200	0.100
Iron, Total	7439-89-6	2.60		0.100	0.0500
Magnesium, Total	7439-95-4	19.4		0.500	0.250
Potassium, Total	7440-09-7	30.8		1.00	0.500
Sodium, Total	7440-23-5	36.6	B	0.500	0.250
Vanadium, Total	7440-62-2	0.631		0.0100	0.00500

B	The reported result is associated with a contaminated method blank.

Sample #:	L14120172-08	**PrePrep Method:**	N/A	**Instrument:**	PE-ICP2
Client ID:	40MW5MSDGW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 09:19
Matrix:	Water	**Analytical Method:**	6010B	**Cal Date:**	12/11/2014 08:56
Workgroup #:	WG504197	**Analyst:**	KHR	**Run Date:**	12/11/2014 10:43
Collect Date:	12/02/2014 11:58	**Dilution:**	10	**File ID:**	P2.121114.104330
Sample Tag:	DL01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Calcium, Total	7440-70-2	51.3		5.00	2.50

Sample #:	L14120172-08	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	40MW5MSDGW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 07:25
Matrix:	Water	**Analytical Method:**	6020	**Cal Date:**	12/15/2014 12:19
Workgroup #:	WG504176	**Analyst:**	JYH	**Run Date:**	12/15/2014 12:56
Collect Date:	12/02/2014 11:58	**Dilution:**	1	**File ID:**	NI.121514.125649
Sample Tag:	03	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2	0.0669		0.00100	0.000500
Barium, Total	7440-39-3	0.101		0.00300	0.00150
Cobalt, Total	7440-48-4	0.0657		0.00100	0.000500
Lead, Total	7439-92-1	0.0658		0.00100	0.000500
Manganese, Total	7439-96-5	0.0661		0.00200	0.00100
Selenium, Total	7782-49-2	0.0680		0.00100	0.000500

Certificate of Analysis

Sample #:	L14120172-09	**PrePrep Method:**	N/A	**Instrument:**	HPMS8
Client ID:	40MW6GW12214	**Prep Method:**	5030B/5030C/5035A	**Prep Date:**	N/A
Matrix:	Water	**Analytical Method:**	8260B	**Cal Date:**	11/19/2014 00:08
Workgroup #:	WG503275	**Analyst:**	TMB	**Run Date:**	12/03/2014 21:45
Collect Date:	12/02/2014 14:06	**Dilution:**	1	**File ID:**	8M401516
Sample Tag:	01	**Units:**	ug/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	93.6	70	120	
4-Bromofluorobenzene	89.2	75	120	
Dibromofluoromethane	96.8	85	115	
Toluene-d8	89.5	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #:	L14120172-09	**PrePrep Method:**	N/A	**Instrument:**	LCMS1
Client ID:	40MW6GW12214	**Prep Method:**	6850	**Prep Date:**	12/10/2014 10:00
Matrix:	Water	**Analytical Method:**	6850	**Cal Date:**	11/17/2014 14:53
Workgroup #:	WG504286	**Analyst:**	ADC	**Run Date:**	12/10/2014 22:07
Collect Date:	12/02/2014 14:06	**Dilution:**	1	**File ID:**	1LM.LM27919
Sample Tag:	01	**Units:**	ug/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	1.03		0.200	0.100

Sample #:	L14120172-09	**PrePrep Method:**	N/A	**Instrument:**	PE-ICP2
Client ID:	40MW6GW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 09:19
Matrix:	Water	**Analytical Method:**	6010B	**Cal Date:**	12/10/2014 08:18
Workgroup #:	WG504197	**Analyst:**	KHR	**Run Date:**	12/10/2014 15:08
Collect Date:	12/02/2014 14:06	**Dilution:**	1	**File ID:**	P2.121014.150803
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	0.466		0.200	0.100
Calcium, Total	7440-70-2	22.2		0.500	0.250
Iron, Total	7439-89-6	0.451		0.100	0.0500
Magnesium, Total	7439-95-4	6.79		0.500	0.250
Potassium, Total	7440-09-7	1.12		1.00	0.500
Sodium, Total	7440-23-5	7.98	B	0.500	0.250

Certificate of Analysis

Analyte	CAS #	Result	Qual	LOQ	LOD
Vanadium, Total	7440-62-2		U	0.0100	0.00500

B	The reported result is associated with a contaminated method blank.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-09 **PrePrep Method:** N/A **Instrument:** ICP-MS2
Client ID: 40MW6GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 07:25
Matrix: Water **Analytical Method:** 6020 **Cal Date:** 12/15/2014 12:19
Workgroup #: WG504176 **Analyst:** JYH **Run Date:** 12/15/2014 13:28
Collect Date: 12/02/2014 14:06 **Dilution:** 1 **File ID:** NI.121514.132814
Sample Tag: 03 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3	0.0122		0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5	0.00265		0.00200	0.00100
Selenium, Total	7782-49-2		U	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-10 **PrePrep Method:** N/A **Instrument:** HPMS8
Client ID: LFMW01GW12214 **Prep Method:** 5030B/5030C/5035A **Prep Date:** N/A
Matrix: Water **Analytical Method:** 8260B **Cal Date:** 11/19/2014 00:08
Workgroup #: WG503275 **Analyst:** TMB **Run Date:** 12/03/2014 22:14
Collect Date: 12/02/2014 15:45 **Dilution:** 1 **File ID:** 8M401517
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
2-Chloroethyl vinyl ether	110-75-8		U	10.0	2.00
Acetone	67-64-1		U	10.0	2.50

Surrogate	Recovery	Lower Limit	Upper Limit	Q
1,2-Dichloroethane-d4	90.3	70	120	
4-Bromofluorobenzene	89.8	75	120	
Dibromofluoromethane	95.2	85	115	
Toluene-d8	89.5	85	120	

U	Analyte was not detected. The concentration is below the reported LOD.

Certificate of Analysis

Sample #: L14120172-10 **PrePrep Method:** N/A **Instrument:** LCMS1
Client ID: LFMW01GW12214 **Prep Method:** 6850 **Prep Date:** 12/10/2014 10:00
Matrix: Water **Analytical Method:** 6850 **Cal Date:** 11/17/2014 14:53
Workgroup #: WG504286 **Analyst:** ADC **Run Date:** 12/10/2014 22:26
Collect Date: 12/02/2014 15:45 **Dilution:** 1 **File ID:** 1LM.LM27920
Sample Tag: 01 **Units:** ug/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Perchlorate	14797-73-0	3.04		0.200	0.100

Sample #: L14120172-10 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: LFMW01GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/10/2014 08:18
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/10/2014 15:15
Collect Date: 12/02/2014 15:45 **Dilution:** 1 **File ID:** P2.121014.151536
Sample Tag: 01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Aluminum, Total	7429-90-5	0.526		0.200	0.100
Iron, Total	7439-89-6	0.527		0.100	0.0500
Magnesium, Total	7439-95-4	22.3		0.500	0.250
Potassium, Total	7440-09-7	1.29		1.00	0.500
Sodium, Total	7440-23-5	6.08	B	0.500	0.250
Vanadium, Total	7440-62-2		U	0.0100	0.00500

B	The reported result is associated with a contaminated method blank.
U	Analyte was not detected. The concentration is below the reported LOD.

Sample #: L14120172-10 **PrePrep Method:** N/A **Instrument:** PE-ICP2
Client ID: LFMW01GW12214 **Prep Method:** 3015 **Prep Date:** 12/10/2014 09:19
Matrix: Water **Analytical Method:** 6010B **Cal Date:** 12/11/2014 08:56
Workgroup #: WG504197 **Analyst:** KHR **Run Date:** 12/11/2014 10:46
Collect Date: 12/02/2014 15:45 **Dilution:** 10 **File ID:** P2.121114.104651
Sample Tag: DL01 **Units:** mg/L

Analyte	CAS #	Result	Qual	LOQ	LOD
Calcium, Total	7440-70-2	63.9		5.00	2.50

Certificate of Analysis

Sample #:	L14120172-10	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	LFMW01GW12214	**Prep Method:**	3015	**Prep Date:**	12/10/2014 07:25
Matrix:	Water	**Analytical Method:**	6020	**Cal Date:**	12/15/2014 12:19
Workgroup #:	WG504176	**Analyst:**	JYH	**Run Date:**	12/15/2014 13:31
Collect Date:	12/02/2014 15:45	**Dilution:**	1	**File ID:**	NI.121514.133122
Sample Tag:	03	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD
Arsenic, Total	7440-38-2		U	0.00100	0.000500
Barium, Total	7440-39-3	0.0494		0.00300	0.00150
Cobalt, Total	7440-48-4		U	0.00100	0.000500
Lead, Total	7439-92-1		U	0.00100	0.000500
Manganese, Total	7439-96-5	0.00368		0.00200	0.00100
Selenium, Total	7782-49-2	0.000738	J	0.00100	0.000500

J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Microbac Laboratories Inc.

METHOD BLANK SUMMARY

Login Number: L14120172
Work Group: WG503275
Blank File ID: 8M401506
Blank Sample ID: WG503275-02
Prep Date: 12/03/14 16:56
Instrument ID: HPMS8
Analyzed Date: 12/03/14 16:56
Method: 8260B
Analyst: TMB

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG503275-03	8M401507	12/03/14 17:26	01
40MW5MSGW12214	L14120172-07	8M401508	12/03/14 17:54	01
40MW5MSDGW12214	L14120172-08	8M401509	12/03/14 18:23	01
40TB12214	L14120172-01	8M401510	12/03/14 18:52	01
40EQR12214	L14120172-03	8M401511	12/03/14 19:21	01
40FB12214	L14120172-04	8M401512	12/03/14 19:50	01
40MW5GW12214	L14120172-05	8M401513	12/03/14 20:19	01
40MW7GW12214	L14120172-02	8M401514	12/03/14 20:48	01
40DUPGW12214	L14120172-06	8M401515	12/03/14 21:16	01
40MW6GW12214	L14120172-09	8M401516	12/03/14 21:45	01
LFMW01GW12214	L14120172-10	8M401517	12/03/14 22:14	01

Report Name: BLANK_SUMMARY
PDF File ID: 3903663
Report generated 12/04/2014 14:57

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number: L14120172 Prep Date: 12/03/14 16:56 Sample ID: WG503275-02
Instrument ID: HPMS8 Run Date: 12/03/14 16:56 Prep Method: 5030B/5030C/503
File ID: 8M401506 Analyst: TMB Method: 8260B
Workgroup (AAB#): WG503275 Matrix: Water Units: ug/L
Contract #: Cal ID: HPMS8-19-NOV-14

Analytes	LOD	LOQ	Concentration	Dilution	Qualifier
2-Chloroethyl vinyl ether	2.00	10.0	2.00	1	U
Acetone	2.50	10.0	2.50	1	U

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	91.5	70 - 120	PASS
4-Bromofluorobenzene	92.1	75 - 120	PASS
Dibromofluoromethane	93.9	85 - 115	PASS
Toluene-d8	89.8	85 - 120	PASS

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

Report Name:BLANK
PDF ID: 3903664
04-DEC-2014 14:57

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L14120172 Run Date: 12/03/2014 Sample ID: WG503275-03
Instrument ID: HPMS8 Run Time: 17:26 Prep Method: 5030B/5030C/503
File ID: 8M401507 Analyst: TMB Method: 8260B
Workgroup (AAB#): WG503275 Matrix: Water Units: ug/L
QC Key: DOD4 Lot#: STD67765 Cal ID: HPMS8-19-NOV-14

Analytes	Expected	Found	% Rec	LCS Limits	Q
2-Chloroethyl vinyl ether	20.0	23.5	117	45 - 160	
Acetone	20.0	20.4	102	40 - 140	

Surrogates	% Recovery	Surrogate Limits	Qualifier
1,2-Dichloroethane-d4	92.3	70 - 120	PASS
4-Bromofluorobenzene	84.0	75 - 120	PASS
Dibromofluoromethane	96.3	85 - 115	PASS
Toluene-d8	88.7	85 - 120	PASS

* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008
PDF File ID: 3903586
Report generated: 12/04/2014 14:57

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum: L14120172 Cal ID: HPMS8- 19-NOV-14 Worknum: WG503275

Instrument ID: HPMS8 Contract #: Prep Method: 5030B/5030C/

Parent ID: L14120172-05 File ID: 8M401513 Dil: 1 Method: 5035A

Sample ID: L14120172-07 MS File ID: 8M401508 Dil: 1 Matrix: 8260B

Sample ID: L14120172-08 MSD File ID: 8M401509 Dil: 1 Units: Water

ug/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
2-Chloroethyl vinyl ether	U	20.0	23.9	120	20.0	22.9	114	4.37	58 - 160	20	
Acetone	U	20.0	20.1	100	20.0	19.5	97.4	3.03	40 - 140	30	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008

PDF File ID: 3903587

Report generated 12/04/2014 14:57

Microbac Laboratories Inc.

METHOD BLANK SUMMARY

Login Number: L14120172
Work Group: WG504286
Blank File ID: 1LM.LM27905
Blank Sample ID: WG504286-02
Prep Date: 12/10/14 10:00
Instrument ID: LCMS1
Analyzed Date: 12/10/14 17:42
Method: 6850
Analyst: ADC

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
QCMRL	WG504286-07	1LM.LM27903	12/10/14 17:04	01
MCT	WG504286-01	1LM.LM27904	12/10/14 17:23	01
LCS	WG504286-03	1LM.LM27906	12/10/14 18:01	01
40EQR12214	L14120172-03	1LM.LM27910	12/10/14 19:17	01
40FB12214	L14120172-04	1LM.LM27911	12/10/14 19:36	01
40MW5GW12214	L14120172-05	1LM.LM27912	12/10/14 19:55	01
40DUPGW12214	L14120172-06	1LM.LM27913	12/10/14 20:14	01
QCMRL	WG504286-08	1LM.LM27915	12/10/14 20:51	01
40MW5MSGW12214	L14120172-07	1LM.LM27917	12/10/14 21:29	01
40MW5MSDGW12214	L14120172-08	1LM.LM27918	12/10/14 21:48	01
40MW6GW12214	L14120172-09	1LM.LM27919	12/10/14 22:07	01
LFMW01GW12214	L14120172-10	1LM.LM27920	12/10/14 22:26	01
QCMRL	WG504286-09	1LM.LM27925	12/11/14 00:01	01
QCMRL	WG504286-10	1LM.LM27932	12/11/14 02:13	01
QCMRL	WG504286-11	1LM.LM27935	12/11/14 09:29	01
40MW7GW12214	L14120172-02	1LM.LM27939	12/11/14 10:45	01
QCMRL	WG504286-12	1LM.LM27941	12/11/14 11:22	01

Report Name: BLANK_SUMMARY
PDF File ID: 3916580
Report generated 12/12/2014 14:36

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number: L14120172 Prep Date: 12/10/14 10:00 Sample ID: WG504286-02
Instrument ID: LCMS1 Run Date: 12/10/14 17:42 Prep Method: 6850
File ID: 1LM.LM27905 Analyst: ADC Method: 6850
Workgroup (AAB#): WG504286 Matrix: Water Units: ug/L
Contract #: Cal ID: LCMS1-17-NOV-14

Analytes	LOD	LOQ	Concentration	Dilution	Qualifier
Perchlorate	0.100	0.200	0.100	1	U

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

Report Name:BLANK
PDF ID: 3916581
12-DEC-2014 14:36

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L14120172 **Run Date:** 12/10/2014 **Sample ID:** WG504286-03
Instrument ID: LCMS1 **Run Time:** 18:01 **Prep Method:** 6850
File ID: 1LM.LM27906 **Analyst:** ADC **Method:** 6850
Workgroup (AAB#): WG504286 **Matrix:** Water **Units:** ug/L
QC Key: DOD4 **Lot#:** STD67080 **Cal ID:** LCMS1-17-NOV-14

Analytes	Expected	Found	% Rec	LCS Limits	Q
Perchlorate	0.200	0.215	108	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 3916582
Report generated: 12/12/2014 14:36

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum:L14120172 Cal ID:LCMS1- 17-NOV-14 Worknum:WG504286

Instrument ID:LCMS1 Contract #: Prep Method:6850

Parent ID:L14120172-05 File ID:1LM.LM27912 Dil:1 Method:6850

Sample ID:L14120172-07 MS File ID:1LM.LM27917 Dil:1 Matrix:Water

Sample ID:L14120172-08 MSD File ID:1LM.LM27918 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
Perchlorate	0.883	0.200	1.05	83.5	0.200	1.09	104	3.74	80 - 120	15	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008

PDF File ID: 3916583

Report generated 12/12/2014 14:36

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-02
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27939
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 10:45	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	267000	88100	3.03	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-03
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27910
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 19:17	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	527	223	2.36	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-04
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27911
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 19:36	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	722	332	2.17	2.3	3.8	*

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-05
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27912
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 19:55	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	84500	28500	2.96	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-06
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27913
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 20:14	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	83300	29400	2.83	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-07
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27917
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 21:29	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	104000	33800	3.08	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-08
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27918
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 21:48	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	103000	34600	2.98	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-09
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27919
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 22:07	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	97400	32600	2.99	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	L14120172-10
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27920
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 22:26	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	290000	98600	2.94	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-02
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27604
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 13:00	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	11100	3370	3.29	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-03
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27605
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 13:19	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	17300	5740	3.01	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-04
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27606
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 13:38	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	44100	14600	3.02	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-05
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27607
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 13:56	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	84400	29400	2.87	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-06
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27608
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 14:15	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	173000	54700	3.16	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-07
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27609
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 14:34	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	420000	140000	3.00	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-08
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27610
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 14:53	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	841000	276000	3.05	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG501146-09
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27611
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	11/17/2014 15:12	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	88800	29400	3.02	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-01
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27904
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 17:23	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	20600	7320	2.81	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-02
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27905
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 17:42	**Units:**	ug/L

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

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-03
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27906
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 18:01	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	21200	7360	2.88	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-07
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27903
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 17:04	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	19500	6490	3.00	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-08
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27915
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 20:51	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	21200	6500	3.26	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-09
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27925
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 00:01	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	20100	6670	3.01	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-10
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27932
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 02:13	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	19900	6850	2.91	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-11
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27935
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 09:29	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	19400	6380	3.04	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**	6850	**Samplenum:**	WG504286-12
Instrument:	LCMS1	**Prep Date:**	12/10/2014 10:00	**File ID:**	1LM.LM27941
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 11:22	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	19500	6330	3.08	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-01
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27901
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 16:26	**Units:**	ug/L

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

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-02
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27902
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 16:45	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	102000	33100	3.08	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-03
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27914
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 20:33	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	106000	34000	3.12	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-04
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27916
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 21:10	**Units:**	ug/L

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

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-05
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27924
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/10/2014 23:42	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	105000	35600	2.95	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-06
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27926
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 00:20	**Units:**	ug/L

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

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-07
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27931
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 01:55	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	103000	33200	3.10	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-08
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27933
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 02:32	**Units:**	ug/L

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

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-09
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27934
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 09:10	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	101000	33700	3.00	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-10
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27936
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 09:48	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	171	0.000	2.3	3.8	*

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-11
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27940
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 11:03	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	101000	33500	3.01	2.3	3.8	

Perchlorate Ion Ratios

Microbac Laboratories Inc.

Login #:	L14120172	**Prep Method:**		**Samplenum:**	WG504287-12
Instrument:	LCMS1	**Prep Date:**		**File ID:**	1LM.LM27942
Analyst:	ADC	**Anal Method:**	6850	**Matrix:**	Water
Worknum:	WG504286	**Analysis Date:**	12/11/2014 11:41	**Units:**	ug/L

Analyte	Res #1	Res #2	Ratio	Lower	Upper	Q
PERCHLORATE	0.000	218	0.000	2.3	3.8	*

Microbac Laboratories Inc.

METHOD BLANK SUMMARY

Login Number: L14120172
Work Group: WG504197
Blank File ID: P2.121014.142656
Blank Sample ID: WG504169-02
Prep Date: 12/10/14 09:19
Instrument ID: PE-ICP2
Analyzed Date: 12/10/14 14:26
Method: 6010B
Analyst: KHR

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG504169-03	P2.121014.143019	12/10/14 14:30	01
40MW7GW12214	L14120172-02	P2.121014.143245	12/10/14 14:32	01
40EQR12214	L14120172-03	P2.121014.143607	12/10/14 14:36	01
40FB12214	L14120172-04	P2.121014.143928	12/10/14 14:39	01
40MW5GW12214	L14120172-05	P2.121014.144249	12/10/14 14:42	01
40DUPGW12214	L14120172-06	P2.121014.144610	12/10/14 14:46	01
40MW5MSGW12214	L14120172-07	P2.121014.150311	12/10/14 15:03	01
40MW5MSDGW12214	L14120172-08	P2.121014.150537	12/10/14 15:05	01
40MW6GW12214	L14120172-09	P2.121014.150803	12/10/14 15:08	01
LFMW01GW12214	L14120172-10	P2.121014.151536	12/10/14 15:15	01
40MW7GW12214	L14120172-02	P2.121114.102418	12/11/14 10:24	DL01
40MW5GW12214	L14120172-05	P2.121114.102740	12/11/14 10:27	DL01
40DUPGW12214	L14120172-06	P2.121114.103101	12/11/14 10:31	DL01
40MW5MSGW12214	L14120172-07	P2.121114.104008	12/11/14 10:40	DL01
40MW5MSDGW12214	L14120172-08	P2.121114.104330	12/11/14 10:43	DL01
LFMW01GW12214	L14120172-10	P2.121114.104651	12/11/14 10:46	DL01

Report Name: BLANK_SUMMARY
PDF File ID: 3912479
Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number: L14120172 Prep Date: 12/10/14 09:19 Sample ID: WG504169-02
Instrument ID: PE-ICP2 Run Date: 12/10/14 14:26 Prep Method: 3015
File ID: P2.121014.142656 Analyst: KHR Method: 6010B
Workgroup (AAB#): WG504197 Matrix: Water Units: mg/L
Contract #: Cal ID: PE-ICP-10-DEC-14

Analytes	LOD	LOQ	Concentration	Dilution	Qualifier
Aluminum, Total	0.100	0.200	0.100	1	U
Calcium, Total	0.250	0.500	0.250	1	U
Iron, Total	0.0500	0.100	0.0500	1	U
Magnesium, Total	0.250	0.500	0.250	1	U
Potassium, Total	0.500	1.00	0.500	1	U
Sodium, Total	0.250	0.500	0.250	1	U
Vanadium, Total	0.00500	0.0100	0.00500	1	U

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

Report Name:BLANK
PDF ID: 3912480
11-DEC-2014 08:50

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L14120172 **Run Date:** 12/10/2014 **Sample ID:** WG504169-03
Instrument ID: PE-ICP2 **Run Time:** 14:30 **Prep Method:** 3015
File ID: P2.121014.143019 **Analyst:** KHR **Method:** 6010B
Workgroup (AAB#): WG504197 **Matrix:** Water **Units:** mg/L
QC Key: DOD4 **Lot#:** STD67718 **Cal ID:** PE-ICP-10-DEC-14

Analytes	Expected	Found	% Rec	LCS Limits	Q
Aluminum, Total	6.25	6.17	98.7	80 - 120	
Calcium, Total	6.25	6.26	100	80 - 120	
Iron, Total	2.50	2.56	103	80 - 120	
Magnesium, Total	6.25	6.38	102	80 - 120	
Potassium, Total	31.3	29.5	94.3	80 - 120	
Sodium, Total	31.3	29.5	94.3	80 - 120	
Vanadium, Total	0.625	0.637	102	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 3912481
Report generated: 12/11/2014 08:50

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum:L14120172 Cal ID:PE-ICP2- 10-DEC-14 Worknum:WG504197

Instrument ID:PE-ICP2 Contract #: Prep Method:3015

Parent ID:L14120172-05 File ID:P2.121014.144249 Dil:1 Method:6010B

Sample ID:L14120172-07 MS File ID:P2.121014.150311 Dil:1 Matrix:Water

Sample ID:L14120172-08 MSD File ID:P2.121014.150537 Dil:1 Units:mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Aluminum, Total	0.256	6.25	6.17	94.7	6.25	6.26	96.1	1.40	80 - 120	20	
Iron, Total	0.155	2.50	2.57	96.7	2.50	2.60	97.6	0.916	80 - 120	20	
Magnesium, Total	13.2	6.25	19.1	94.4	6.25	19.4	99.3	1.58	80 - 120	20	
Potassium, Total	0.764	31.3	30.0	93.7	31.3	30.8	96.1	2.48	80 - 120	20	
Sodium, Total	6.58	31.3	35.6	93	31.3	36.6	96.2	2.77	80 - 120	20	
Vanadium, Total	U	0.625	0.626	100	0.625	0.631	101	0.858	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008

PDF File ID: 3912482

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum:L14120172 Cal ID:PE-ICP2- 11-DEC-14 Worknum:WG504197

Instrument ID:PE-ICP2 Contract #: Prep Method:3015

Parent ID:L14120172-05 File ID:P2.121114.102740 Dil:10 Method:6010B

Sample ID:L14120172-07 MS File ID:P2.121114.104008 Dil:10 Matrix:Water

Sample ID:L14120172-08 MSD File ID:P2.121114.104330 Dil:10 Units:mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Calcium, Total	41.4	6.25	50.0	138	6.25	51.3	159	2.54	80 - 120	20	*

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008

PDF File ID: 3912482

Report generated 12/11/2014 12:43

Microbac Laboratories Inc.

METHOD BLANK SUMMARY

Login Number: L14120172
Work Group: WG504176
Blank File ID: NI.121514.124417
Blank Sample ID: WG504133-03
Prep Date: 12/10/14 07:25
Instrument ID: ICP-MS2
Analyzed Date: 12/15/14 12:44
Method: 6020
Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG504133-04	NI.121114.130334	12/11/14 13:03	01
DUP	WG504133-07	NI.121114.140005	12/11/14 14:00	01
LCS	WG504133-04	NI.121214.121018	12/12/14 12:10	02
LCS	WG504133-04	NI.121514.124725	12/15/14 12:47	03
40MW5GW12214	L14120172-05	NI.121514.125033	12/15/14 12:50	03
40MW5MSGW12214	L14120172-07	NI.121514.125341	12/15/14 12:53	03
40MW5MSDGW12214	L14120172-08	NI.121514.125649	12/15/14 12:56	03
40MW7GW12214	L14120172-02	NI.121514.125957	12/15/14 12:59	03
40EQR12214	L14120172-03	NI.121514.130305	12/15/14 13:03	03
40FB12214	L14120172-04	NI.121514.132157	12/15/14 13:21	03
40DUPGW12214	L14120172-06	NI.121514.132506	12/15/14 13:25	02
40MW6GW12214	L14120172-09	NI.121514.132814	12/15/14 13:28	03
LFMW01GW12214	L14120172-10	NI.121514.133122	12/15/14 13:31	03

Report Name: BLANK_SUMMARY
PDF File ID: 3914978
Report generated 12/15/2014 14:09

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number: L14120172 Prep Date: 12/10/14 07:25 Sample ID: WG504133-03
Instrument ID: ICP-MS2 Run Date: 12/15/14 12:44 Prep Method: 3015
File ID: NI.121514.124417 Analyst: JYH Method: 6020
Workgroup (AAB#): WG504176 Matrix: Water Units: mg/L
Contract #: Cal ID: ICP-MS-15-DEC-14

Analytes	LOD	LOQ	Concentration	Dilution	Qualifier
Arsenic, Total	0.000500	0.00100	0.000500	1	U
Barium, Total	0.00150	0.00300	0.00150	1	U
Cobalt, Total	0.000500	0.00100	0.000500	1	U
Lead, Total	0.000500	0.00100	0.000500	1	U
Manganese, Total	0.00100	0.00200	0.00100	1	U
Selenium, Total	0.000500	0.00100	0.000500	1	U

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

Report Name:BLANK
PDF ID: 3914979
15-DEC-2014 14:09

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L14120172 **Run Date:** 12/15/2014 **Sample ID:** WG504133-04
Instrument ID: ICP-MS2 **Run Time:** 12:47 **Prep Method:** 3015
File ID: NI.121514.124725 **Analyst:** JYH **Method:** 6020
Workgroup (AAB#): WG504176 **Matrix:** Water **Units:** mg/L
QC Key: DOD4 **Lot#:** STD65967 **Cal ID:** ICP-MS-15-DEC-14

Analytes	Expected	Found	% Rec	LCS Limits	Q
Arsenic, Total	0.0625	0.0680	109	80 - 120	
Barium, Total	0.0625	0.0663	106	80 - 120	
Cobalt, Total	0.0625	0.0673	108	80 - 120	
Lead, Total	0.0625	0.0685	110	80 - 120	
Manganese, Total	0.0625	0.0682	109	80 - 120	
Selenium, Total	0.0625	0.0690	110	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 3914980
Report generated: 12/15/2014 14:09

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum:L14120172 Cal ID:ICP-MS2- 15-DEC-14 Worknum:WG504176

Instrument ID:ICP-MS2 Contract #: Prep Method:3015

Parent ID:L14120172-05 File ID:NI.121514.125033 Dil:1 Method:6020

Sample ID:L14120172-07 MS File ID:NI.121514.125341 Dil:1 Matrix:Water

Sample ID:L14120172-08 MSD File ID:NI.121514.125649 Dil:1 Units:mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, Total	U	0.0625	0.0666	107	0.0625	0.0669	107	0.363	80 - 120	20	
Barium, Total	0.0240	0.0625	0.0897	105	0.0625	0.101	123	11.4	80 - 120	20	*
Cobalt, Total	U	0.0625	0.0646	103	0.0625	0.0657	105	1.71	80 - 120	20	
Lead, Total	U	0.0625	0.0662	106	0.0625	0.0658	105	0.625	80 - 120	20	
Manganese, Total	U	0.0625	0.0650	104	0.0625	0.0661	106	1.71	80 - 120	20	
Selenium, Total	U	0.0625	0.0675	108	0.0625	0.0680	109	0.693	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008

PDF File ID: 3915559

Report generated 12/15/2014 14:09

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
January 22, 2015

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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
ADC - ANTHONY D. CANTER
ADG - APRIL D. GREENE
AED - ALLEN E. DAVIS
ALS - ADRIANE L. STEED
AWE - ANDREW W. ESSIG
AZH - AFTER HOURS
BJO - BRIAN J. OGDEN
BKT - BRENDAN TORRENCE
BLG - BRENDA L. GREENWALT
BRG - BRENDA R. GREGORY
CAA - CASSIE A. AUGENSTEIN
CAF - CHERYL A. FLOWERS
CEB - CHAD E. BARNES
CJR - COURTNEY J. REXROAD
CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER
CLW - CHARISSA L. WINTERS
CPD - CHAD P. DAVIS
CSH - CHRIS S. HILL
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
ECL - ERIC C. LAWSON
ENY - EMILY N. YOAK
EPT - ETHAN P. TIDD
ERP - ERIN R. PORTER
FJB - FRANCES J. BOLDEN
JBK - JEREMY B. KINNEY
JDH - JUSTIN D. HESSON
JDS - JARED D. SMITH
JJS - JOHN J. STE MARIE
JKP - JACQUELINE K. PARSONS
JLL - JOHN L. LENT
JMW - JEANA M. WHITE
JTP - JOSHUA T. PEMBERTON
JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES
JYH - JI Y. HU
KAJ - KELLIE A. JOHNSON
KAT - KATHY A. TUCKER
KDW - KATHRYN D. WELCH
KEB - KATIE E. BARNES
KHR - KIM H. RHODES
KRA - KATHY R. ALBERTSON
KRB - KAELY R. BECKER
KRP - KATHY R. PARSONS
LEC - LAURA E. CARPENTER
LKN - LINDA K. NEDEFF
LLS - LARRY L. STEPHENS
LSB - LESLIE S. BUCINA
MBK - MORGAN B. KNOWLTON
MDA - MIKE D. ALBERTSON
MDC - MIKE D. COCHRAN
MES - MARY E. SCHILLING
MLB - MEGAN L. BACHE
MMB - MAREN M. BEERY
MRT - MICHELLE R. TAYLOR
MSW - MATT S. WILSON
PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE
PRL - PAIGE R. LAMB
PSW - PEGGY S. WEBB
QX - QIN XU
RAH - ROY A. HALSTEAD
REK - BOB E. KYER
RLB - BOB BUCHANAN
RM - RAYMOND MALEKE
RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG
SDC - SHALYN D. CONLEY
SLM - STEPHANIE L. MOSSBURG
SLP - SHERI L. PFALZGRAF
TB - TODD BOYLE
TMB - TIFFANY M. BAILEY
TMM - TAMMY M. MORRIS
VC - VICKI COLLIER
WJB - WILL J. BEASLEY
WRR - WESLEY R. RICHARDS
WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT

Microbac Laboratories Inc.
List of Valid Qualifiers
January 22, 2015

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
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 sample matrix interference
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
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value; the analyte concentration was less than the RL/LOQ.
J,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentativlely identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL/MDL).
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
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.

Microbac Laboratories Inc.
List of Valid Qualifiers
January 22, 2015

Qualkey: DOD

U	Analyte was not detected. The concentration is below the reported LOD.
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below

COC No. A 8140

2343-A State Route 821
Marietta, OH 45750

KEMRON
ENVIRONMENTAL SERVICES

CHAIN-OF-CUSTODY RECORD

Phone: 740-373-4308
Fax: 740-376-2536

Company Name: KEMRON

Project Contact: MARY LOU ROCHOTTE | Contact Phone #: 740-373-4308

Turn Around Requirements: 14-DAY | Location: RADFORD, VA

Project ID: MR01669-300-004 SWMU 40(RFAAP) GTM YR 4

Sampler (print): JOHN ANDERSON | Signature:

Program: ☐ CWA ☐ RCRA ☐ DOD ☐ AFCEE ☐ Other

Sample I.D. No.	Comp	Grab	Date	Time	Matrix*	NUMBER OF CONTAINERS	Hold	VOC-8260 *UNPRESERVED	PERCHLORATE	METALS - (TOTAL)	TOTAL # (LAB USE)
40TB12214	/		12-2-14	—	W	2		2			
40MW76GW12214		X	12-2-14	917	W	5		3	1	1	
40EQR12214		X	12-2-14	1050	W	5		3	1	1	
40FB12214		X	12-2-14	1105	W	5		3	1	1	
40MW5GW12214		X	12-2-14	1158	W	5		3	1	1	
40DUPGW12214		X	12-2-14	1158	W	5		3	1	1	
40MW5MSGW12214		X	12-2-14	1205	W	5		3	1	1	
40MW5MSDGW12214		X	12-2-14	1205	W	5		3	1	1	
40MW6GW12214		X	12-2-14	1406	W	5		3	1	1	
LFMW01GW12214		X	12-2-14	1545	W	5		3	1	1	

ADDITIONAL REQUIREMENTS

★ PER QAPP SWMU 40 RFAAP ★

★ VOA's ARE UNPRESERVED ★

-METALS LIST!
Al, Sb, Ba, Ca, Co, Fe, Pb, Mg, Mn, K, Se, Na, V

-8260 LIST!
-2-chloroethyl Vinyl Ether
-Acetone

Microbac OVD
Received: 12/03/2014 13:00
By: CARA STRICKLER
221000062835

Cara Strickler

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	12-3-14	1257	

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
				12/3/14	1257	

*Water (W), Soil (S), Solid Waste (SD), Unknown (X)

Page _____ of _____

Internal Chain of Custody Report

Login: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-01	484964	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:31	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:31	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Samplenum	Container ID	Products
L14120172-02	484965	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:31	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:31	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:31	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Samplenum	Container ID	Products
L14120172-02	484966	6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	ANALYZ	W1	SEM	10-DEC-2014 11:34	ADC	CLS	
3	STORE	SEM	A2	12-DEC-2014 11:39	CLS	ADC	

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: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-02	484967	CA CO-MS FE K MG MN-MS NA PB-MS SE-MS V AL AS-

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	PREP	W1	DIG	05-DEC-2014 09:57	VC	BRG	
3	ANALYZ*	DIG	METALS	10-DEC-2014 09:35	PDM	VC	
4	STORE	DIG	A2	10-DEC-2014 15:28	CLS	ERP	

Sample extract/digestate/leachate

Samplenum	Container ID	Products
L14120172-03	484968	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER		03-DEC-2014 14:32	CLS		NA
5	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-17

6	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-17

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:31	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:31	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	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: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-03	484969	6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
5	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-18

6	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-18

Samplenum	Container ID	Products
L14120172-03	484970	AL AS-MS BA-MS CA CO-MS FE K MG MN-MS NA PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
5	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-19

6	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-19

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: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-04	484971	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER		03-DEC-2014 14:32	CLS		NA
5	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-20

6	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-20

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:31	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:31	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Samplenum	Container ID	Products
L14120172-04	484972	6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	ANALYZ	W1	SEM	10-DEC-2014 11:34	ADC	CLS	
3	STORE	SEM	A2	12-DEC-2014 11:39	CLS	ADC	

Samplenum	Container ID	Products
L14120172-04	484973	AL AS-MS BA-MS CA CO-MS FE K MG MN-MS NA PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	PREP	W1	DIG	05-DEC-2014 09:57	VC	BRG	
3	ANALYZ*	DIG	METALS	10-DEC-2014 09:35	PDM	VC	
4	STORE	DIG	A2	10-DEC-2014 15:28	CLS	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: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-05	484974	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Samplenum	Container ID	Products
L14120172-05	484975	6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	ANALYZ	W1	SEM	10-DEC-2014 11:34	ADC	CLS	
3	STORE	SEM	A2	12-DEC-2014 11:39	CLS	ADC	

Samplenum	Container ID	Products
L14120172-05	484976	AL AS-MS BA-MS CA CO-MS FE K MG MN-MS NA PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	PREP	W1	DIG	05-DEC-2014 09:57	VC	BRG	
3	ANALYZ*	DIG	METALS	10-DEC-2014 09:35	PDM	VC	
4	STORE	DIG	A2	10-DEC-2014 15:28	CLS	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: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-06	484977	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Samplenum	Container ID	Products
L14120172-06	484978	6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
5	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-27

6	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-27

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: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-06	484979	AL AS-MS BA-MS CA CO-MS FE K MG MN-MS NA PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
5	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-28

6	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-28

Samplenum	Container ID	Products
L14120172-07	484980	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER		03-DEC-2014 14:32	CLS		NA
5	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-29

6	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-29

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	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: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-07	484981	6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
5	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-30

6	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-30

Samplenum	Container ID	Products
L14120172-07	484982	AL AS-MS BA-MS CA CO-MS FE K MG MN-MS NA PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		

Samplenum	Container ID	Products
L14120172-08	484983	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	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: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-08	484984	6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	ANALYZ	W1	SEM	10-DEC-2014 11:34	ADC	CLS	
3	STORE	SEM	A2	12-DEC-2014 11:39	CLS	ADC	

Samplenum	Container ID	Products
L14120172-08	484985	AL AS-MS BA-MS CA CO-MS FE K MG MN-MS NA PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	PREP	W1	DIG	05-DEC-2014 09:57	VC	BRG	
3	ANALYZ*	DIG	METALS	10-DEC-2014 09:35	PDM	VC	
4	STORE	DIG	A2	10-DEC-2014 15:28	CLS	ERP	

Sample extract/digestate/leachate

Samplenum	Container ID	Products
L14120172-09	484986	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	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

Internal Chain of Custody Report

Login: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-09	484987	6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	ANALYZ	W1	SEM	10-DEC-2014 11:33	ADC	CLS	
3	STORE	SEM	A2	12-DEC-2014 11:39	CLS	ADC	

Samplenum	Container ID	Products
L14120172-09	484988	AL AS-MS BA-MS CA CO-MS FE K MG MN-MS NA PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
5	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-37

6	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-37

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: L14120172
Account: 2820
Project: 2820.216
Samples: 10
Due Date: 12-DEC-2014

Samplenum	Container ID	Products
L14120172-10	484989	826-SPE

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER		03-DEC-2014 14:32	CLS		NA
5	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-38

6	STORE	A1	BUILDIN	08-MAR-2010 13:13	RB	RB	

Comments:AUTO-ICOC

Sample number changed: L08070621-38

Bottle: 2

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Bottle: 3

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	V1	03-DEC-2014 14:32	CLS		NA
2	ANALYZ	V1	ORG4	03-DEC-2014 15:32	TMB	CLS	
3	STORE	ORG4	A2	18-DEC-2014 08:24	CLS	AWE	

Samplenum	Container ID	Products
L14120172-10	484990	6850

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	ANALYZ	W1	SEM	10-DEC-2014 11:34	ADC	CLS	
3	STORE	SEM	A2	12-DEC-2014 11:39	CLS	ADC	

Samplenum	Container ID	Products
L14120172-10	484991	AL AS-MS BA-MS CA CO-MS FE K MG MN-MS NA PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	03-DEC-2014 14:32	CLS		
2	PREP	W1	DIG	05-DEC-2014 09:57	VC	BRG	
3	ANALYZ*	DIG	METALS	10-DEC-2014 09:35	PDM	VC	
4	STORE	DIG	A2	10-DEC-2014 15:28	CLS	ERP	

***Sample extract/digestate/leachate**

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

NELAP Addendum - May 22, 2014

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVL 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)
Thiodiglycol (TDG-LCMS)
Acetate (HPLC-UV)
Formate (HPLC-UV)
Acetaldehyde (HPLC-UV)
Propionaldehyde (HPLC-UV)
Fluoroborate (ISE)

SOLID AND HAZARDOUS CHEMICALS
Nitrogen, Ammonia by Method 350.1
Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
Phenolics, Total by Method 420.1

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVL HPLC02/HPLC-UV

Nitroglycerin
Acetic acid
Butyric acid
Lactic acid
Propionic acid
Pyruvic acid

OVL 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

OVL MSV0I/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)

OVL RSKOI/GC-FID

Isobutane
n-Butane
Propane
Propylene
Propyne

OVL HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

SOLID AND HAZARDOUS CHEMICALS

OVL MSS0I/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP

SOLID AND HAZARDOUS CHEMICALS

OVL MSV0I/GC-MS

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