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United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: 12/23/2016

Subject: Analytical Testing Results - Project R17S19
SDG: 16334A

From: Peter Husby, Director
EPA Region 9 Laboratory
EMD-3-1

To: Karen Jurist
California Site Cleanup Section 3
SFD-7-3

Attached are the results from the analysis of samples from the **Jervis Webb 2016 New Wells Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Don Gruber, Gilbane, Inc.
Tom Beer, Gilbane, Inc.

Analyses included in this report:

Alkalinity	Anions by Ion Chromatography
Total Organic Carbon	Total Dissolved Solids

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Karen Jurist	**California Site Cleanup Section 3**	**SDG:** 16334A
Project Number: R17S19	**75 Hawthorne Street**	**Reported:** 12/23/16 13:22
Project: Jervis Webb 2016 New Wells Sampling	**San Francisco CA, 94105**	

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
JWMW-11A-1116	1611066-01	Water	11/29/16 12:48	11/30/16 11:45
JWMW-11B-1116	1611066-02	Water	11/29/16 11:03	11/30/16 11:45
JWMW-11C-1116	1611066-03	Water	11/29/16 09:27	11/30/16 11:45
JWMW-12-1116	1611066-04	Water	11/29/16 08:11	11/30/16 11:45
JWMW-911B-1116	1611066-05	Water	11/29/16 11:13	11/30/16 11:45

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Karen Jurist
Project Number: R17S19
Project: Jervis Webb 2016 New Wells Sampling

California Site Cleanup Section 3
75 Hawthorne Street
San Francisco CA, 94105

SDG: 16334A
Reported: 12/23/16 13:22

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 1611066-01									**Water - Sampled: 11/29/16 12:48**
Sample ID: JWMW-11A-1116									**Conventional Chemistry Parameters by APHA/EPA Methods**
Hydroxide Alkalinity		ND	U	10	mg/L	B16L051	12/08/16	12/08/16	SM2320
Carbonate Alkalinity		ND	U	10	"	"	"	"	SM2320
Bicarbonate Alkalinity		680		10	"	"	"	"	SM2320
Total Alkalinity		680		10	"	"	"	"	SM2320
Chloride	RE1	140		10	"	B16L005	12/01/16	12/01/16	300.0
Sulfate		1,200		50	"	"	"	12/01/16	300.0
Total Organic Carbon		4.5		0.50	"	B16L061	12/09/16	12/10/16	415.3
Total Dissolved Solids		2,600		20	"	B16L039	12/06/16	12/06/16	2540C
Lab ID: 1611066-02									**Water - Sampled: 11/29/16 11:03**
Sample ID: JWMW-11B-1116									**Conventional Chemistry Parameters by APHA/EPA Methods**
Hydroxide Alkalinity		ND	U	10	mg/L	B16L051	12/08/16	12/08/16	SM2320
Carbonate Alkalinity		ND	U	10	"	"	"	"	SM2320
Bicarbonate Alkalinity		720		10	"	"	"	"	SM2320
Total Alkalinity		720		10	"	"	"	"	SM2320
Chloride	RE1	120		10	"	B16L005	12/01/16	12/01/16	300.0
Sulfate		2,600		50	"	"	"	12/01/16	300.0
Total Organic Carbon		4.8		0.50	"	B16L061	12/09/16	12/10/16	415.3
Total Dissolved Solids		4,600		20	"	B16L039	12/06/16	12/06/16	2540C
Lab ID: 1611066-03									**Water - Sampled: 11/29/16 09:27**
Sample ID: JWMW-11C-1116									**Conventional Chemistry Parameters by APHA/EPA Methods**
Hydroxide Alkalinity		ND	U	10	mg/L	B16L051	12/08/16	12/08/16	SM2320
Carbonate Alkalinity		ND	U	10	"	"	"	"	SM2320
Bicarbonate Alkalinity		420		10	"	"	"	"	SM2320
Total Alkalinity		420		10	"	"	"	"	SM2320
Chloride	RE1	330		10	"	B16L005	12/01/16	12/01/16	300.0
Sulfate		1,900		50	"	"	"	12/01/16	300.0
Total Organic Carbon		8.0		0.50	"	B16L061	12/09/16	12/10/16	415.3
Total Dissolved Solids		3,300		20	"	B16L039	12/06/16	12/06/16	2540C
Lab ID: 1611066-04									**Water - Sampled: 11/29/16 08:11**
Sample ID: JWMW-12-1116									**Conventional Chemistry Parameters by APHA/EPA Methods**
Hydroxide Alkalinity		ND	U	10	mg/L	B16L051	12/08/16	12/08/16	SM2320
Carbonate Alkalinity		ND	U	10	"	"	"	"	SM2320
Bicarbonate Alkalinity		400		10	"	"	"	"	SM2320
Total Alkalinity		400		10	"	"	"	"	SM2320
Chloride	RE1	350		20	"	B16L005	12/01/16	12/01/16	300.0
Sulfate		1,900		50	"	"	"	12/01/16	300.0
Total Organic Carbon		2.6		0.50	"	B16L061	12/09/16	12/10/16	415.3
Total Dissolved Solids		3,700		20	"	B16L039	12/06/16	12/06/16	2540C
Lab ID: 1611066-05									**Water - Sampled: 11/29/16 11:13**

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Karen Jurist	**California Site Cleanup Section 3**	**SDG:** 16334A
Project Number: R17S19	**75 Hawthorne Street**	**Reported:** 12/23/16 13:22
Project: Jervis Webb 2016 New Wells Sampling	**San Francisco CA, 94105**	

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 1611066-05									**Water - Sampled: 11/29/16 11:13**
Sample ID: JWMW-911B-1116									
Conventional Chemistry Parameters by APHA/EPA Methods									
Hydroxide Alkalinity		ND	U	10	mg/L	B16L051	12/08/16	12/08/16	SM2320
Carbonate Alkalinity		ND	U	10	"	"	"	"	SM2320
Bicarbonate Alkalinity		710		10	"	"	"	"	SM2320
Total Alkalinity		710		10	"	"	"	"	SM2320
Chloride	RE1	120		10	"	B16L005	12/01/16	12/01/16	300.0
Sulfate		2,600		50	"	"	"	12/01/16	300.0
Total Organic Carbon		4.6		0.50	"	B16L061	12/09/16	12/10/16	415.3
Total Dissolved Solids		4,600		20	"	B16L039	12/06/16	12/06/16	2540C

United States Environmental Protection Agency
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Project Manager:	Karen Jurist	**California Site Cleanup Section 3**		**SDG:**	16334A
Project Number:	R17S19	**75 Hawthorne Street**		**Reported:**	12/23/16 13:22
Project:	Jervis Webb 2016 New Wells Sampling	**San Francisco CA, 94105**			

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

EPA Region 9 Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B16L005 - - General Inorganic										
Blank (B16L005-BLK1)				Prepared & Analyzed: 12/01/16						
Chloride	ND	1.0	mg/L							U
Sulfate	ND	0.50	mg/L							U
Blank (B16L005-BLK2)				Prepared & Analyzed: 12/01/16						
Chloride	ND	1.0	mg/L							U
Sulfate	ND	0.50	mg/L							U
LCS (B16L005-BS1)				Prepared & Analyzed: 12/01/16						
Chloride	10.2		mg/L	10.0		102	90-110			
Sulfate	10.5		mg/L	10.0		105	90-110			
Duplicate (B16L005-DUP1)		**Source: 1611066-03**		Prepared & Analyzed: 12/01/16						
Sulfate	1960	50	mg/L		1920			2	20	
Duplicate (B16L005-DUP2)		**Source: 1611066-03RE1**		Prepared & Analyzed: 12/01/16						
Chloride	335	10	mg/L		335			0.2	20	
Batch B16L039 - - General Biology										
Blank (B16L039-BLK1)				Prepared & Analyzed: 12/06/16						
Total Dissolved Solids	ND	20	mg/L							U
Duplicate (B16L039-DUP1)		**Source: 1611066-03**		Prepared & Analyzed: 12/06/16						
Total Dissolved Solids	3300	20	mg/L		3300			1	5	
Reference (B16L039-SRM1)				Prepared & Analyzed: 12/06/16						
Total Dissolved Solids	610		mg/L	608		100	85-115			

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Project Manager:	Karen Jurist	**California Site Cleanup Section 3**		**SDG:**	16334A
Project Number:	R17S19	**75 Hawthorne Street**		**Reported:**	12/23/16 13:22
Project:	Jervis Webb 2016 New Wells Sampling	**San Francisco CA, 94105**			

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

EPA Region 9 Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B16L051 - Alkalinity										
Blank (B16L051-BLK1)				Prepared & Analyzed: 12/08/16						
Hydroxide Alkalinity	ND	10	mg/L							U
Carbonate Alkalinity	ND	10	mg/L							U
Bicarbonate Alkalinity	ND	10	mg/L							U
Total Alkalinity	ND	10	mg/L							U
LCS (B16L051-BS1)				Prepared & Analyzed: 12/08/16						
Total Alkalinity	102		mg/L	101		101	85-115			
Duplicate (B16L051-DUP1)		**Source: 1611066-03**		Prepared & Analyzed: 12/08/16						
Hydroxide Alkalinity	ND	10	mg/L		ND				20	U
Carbonate Alkalinity	ND	10	mg/L		ND				20	U
Bicarbonate Alkalinity	429	10	mg/L		425			0.9	20	
Total Alkalinity	429	10	mg/L		425			0.9	20	
Duplicate (B16L051-DUP3)		**Source: 1612025-02**		Prepared & Analyzed: 12/08/16						
Hydroxide Alkalinity	ND	10	mg/L		ND				20	U
Carbonate Alkalinity	ND	10	mg/L		ND				20	U
Bicarbonate Alkalinity	562	10	mg/L		558			0.7	20	
Total Alkalinity	562	10	mg/L		558			0.7	20	
Batch B16L061 - - General Inorganic										
Blank (B16L061-BLK1)				Prepared & Analyzed: 12/09/16						
Total Organic Carbon	ND	0.50	mg/L							U
LCS (B16L061-BS1)				Prepared & Analyzed: 12/09/16						
Total Organic Carbon	2.91	0.50	mg/L	2.86		102	80-120			

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1337 S. 46th Street, Building 201, Richmond, CA 94804
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Project Manager: Karen Jurist	**California Site Cleanup Section 3**	**SDG:** 16334A
Project Number: R17S19	**75 Hawthorne Street**	**Reported:** 12/23/16 13:22
Project: Jervis Webb 2016 New Wells Sampling	**San Francisco CA, 94105**	

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

EPA Region 9 Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B16L061 - - General Inorganic										
Matrix Spike (B16L061-MS1)		**Source: 1611066-03**		Prepared: 12/09/16 Analyzed: 12/10/16						
Total Organic Carbon	10.9	0.50	mg/L	2.86	7.98	103	70-130			
Matrix Spike Dup (B16L061-MSD1)		**Source: 1611066-03**		Prepared: 12/09/16 Analyzed: 12/10/16						
Total Organic Carbon	11.1	0.50	mg/L	2.86	7.98	108	70-130	1	20	

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager:	Karen Jurist	**California Site Cleanup Section 3**		**SDG:**	16334A
Project Number:	R17S19	**75 Hawthorne Street**		**Reported:**	12/23/16 13:22
Project:	Jervis Webb 2016 New Wells Sampling	**San Francisco CA, 94105**			

Qualifiers and Comments

U	Not Detected
NR	Not Reported
RE1, RE2, etc:	Result is from a sample re-analysis.

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Karen Jurist	**California Site Cleanup Section 3**	**SDG:** 16334A
Project Number: R17S19	**75 Hawthorne Street**	**Reported:** 12/23/16 13:22
Project: Jervis Webb 2016 New Wells Sampling	**San Francisco CA, 94105**	

WORK ORDER

Printed: 11/30/2016 2:38:53PM

1611066

EPA Region 9 Laboratory

Client: California Site Cleanup Section 3
Project: Jervis Webb 2016 New Wells Sampling
Project Number: R17S19

Report To:
California Site Cleanup Section 3
Karen Jurist
75 Hawthorne Street
San Francisco, CA 94105
Phone: (415) 972-3219
Fax: xx

Project Contact
Gilbane, Inc., Rancho Cordova
Don Gruber
2934 Gold Pan Court, Suite 12
Rancho Cordova, CA 95670
Phone :(916) 853-1839
Fax: (916) 853-9824

Shipping Containers	Description	Temp C	Custody Seals?	Containers Intact?	Labels COC Agree?	Preservation Confirmed?	Received on Ice?	Comments
Cooler 1	Default Cooler	1	Yes	Yes	Yes	Yes	Yes	

Date Due:	12/21/16 17:00 (21 day TAT)	SDG:	16334A
Received By:	Tatyana Dadiomov	Date Received:	11/30/16 11:45
Logged In By:	Tatyana Dadiomov	Date Logged In:	11/30/16 13:55

Analysis	Hold Time Expires	Comments
1611066-01 JWMW-11A-1116 [Water] Sampled 11/29/16 12:48 (GMT-08:00) Pacific Time (US &		
Solids, Total Dissolved	12/06/16	
Alkalinity	12/13/16	
Carbon, Total Organic by 415.3	12/27/16	
Anions	12/01/16	Cl, SO4
1611066-02 JWMW-11B-1116 [Water] Sampled 11/29/16 11:03 (GMT-08:00) Pacific Time (US &		
Alkalinity	12/13/16	
Solids, Total Dissolved	12/06/16	
Anions	12/01/16	Cl, SO4
Carbon, Total Organic by 415.3	12/27/16	
1611066-03 JWMW-11C-1116 [Water] Sampled 11/29/16 09:27 (GMT-08:00) Pacific Time (US &		**LAB QC**
Anions	12/01/16	Cl, SO4
Solids, Total Dissolved	12/06/16	
Carbon, Total Organic by 415.3	12/27/16	
Alkalinity	12/13/16	

WORK ORDER

Printed: 11/30/2016 2:38:53PM

1611066

EPA Region 9 Laboratory

Client: California Site Cleanup Section 3 **Project Number:** R17S19
Project: Jervis Webb 2016 New Wells Sampling

Analysis	Hold Time Expires	Comments

Analysis	Expires	Comments
1611066-04 JWMW-12-1116 [Water] Sampled 11/29/16 08:11 (GMT-08:00) Pacific Time (US &		
Anions	12/01/16	Cl, SO4
Carbon, Total Organic by 415.3	12/27/16	
Solids, Total Dissolved	12/06/16	
Alkalinity	12/13/16	
1611066-05 JWMW-911B-1116 [Water] Sampled 11/29/16 11:13 (GMT-08:00) Pacific Time (US &		
Carbon, Total Organic by 415.3	12/27/16	
Alkalinity	12/13/16	
Solids, Total Dissolved	12/06/16	
Anions	12/01/16	Cl, SO4

Reviewed By Date

USEPA
DateShipped: 11/29/2016
CarrierName: FedEx
AirbillNo: 7778 1908 9704

CHAIN OF CUSTODY RECORD
Site #: NA
Contact Name:
Contact Phone:

No: 9-112916-131155-0004
Case # R17S19
Lab: US EPA Region 9 Laboratory
Lab Phone: 510-412-2389

Lab #	Sample #	Analyses	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Lab QC
	JWMW-11A-1116	Alkalinity by SM3320	Ground Water	11/29/2016	12:48	1	1 liter plastic	4 C	
	JWMW-11A-1116	Anions (Cl,SO4) by E300	Ground Water	11/29/2016	12:48	1	1 liter plastic	4 C	
	JWMW-11A-1116	Total Dissolved Solids by SM2540C	Ground Water	11/29/2016	12:48	1	1 liter plastic	4 C	
	JWMW-11A-1116	Total Organic Carbon by E415.3	Ground Water	11/29/2016	12:48	1	125 mL amber	H2SO4 pH<2	
	JWMW-11B-1116	Alkalinity by SM3320	Ground Water	11/29/2016	11:03	1	1 liter plastic	4 C	
	JWMW-11B-1116	Anions (Cl,SO4) by E300	Ground Water	11/29/2016	11:03	1	1 liter plastic	4 C	
	JWMW-11B-1116	Total Dissolved Solids by SM2540C	Ground Water	11/29/2016	11:03	1	1 liter plastic	4 C	
	JWMW-11B-1116	Total Organic Carbon by E415.3	Ground Water	11/29/2016	11:03	1	125 mL amber	H2SO4 pH<2	
	JWMW-11C-1116	Alkalinity by SM3320	Ground Water	11/29/2016	09:27	2	1 liter plastic	4 C	Y
	JWMW-11C-1116	Anions (Cl,SO4) by E300	Ground Water	11/29/2016	09:27	2	1 liter plastic	4 C	Y
	JWMW-11C-1116	Total Dissolved Solids by SM2540C	Ground Water	11/29/2016	09:27	2	1 liter plastic	4 C	Y
	JWMW-11C-1116	Total Organic Carbon by E415.3	Ground Water	11/29/2016	09:27	2	125 mL amber	H2SO4 pH<2	Y
	JWMW-12-1116	Alkalinity by SM3320	Ground Water	11/29/2016	08:11	1	1 liter plastic	4 C	
	JWMW-12-1116	Anions (Cl,SO4) by E300	Ground Water	11/29/2016	08:11	1	1 liter plastic	4 C	
	JWMW-12-1116	Total Dissolved Solids by SM2540C	Ground Water	11/29/2016	08:11	1	1 liter plastic	4 C	

Special Instructions:

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Rogerio Lery	11/29/16 1560	Fedex	11/29/16 1570	
			[illegible]	11:45 11-29-16	

Table of Contents

USEPA
DateShipped: 11/29/2016
CarrierName: FedEx
AirbillNo: 7778 1908 9704

CHAIN OF CUSTODY RECORD
Site #: NA
Contact Name:
Contact Phone:

No: 9-112916-131155-0004
Case # R17S19
Lab: US EPA Region 9 Laboratory
Lab Phone: 510-412-2389

Lab #	Sample #	Analyses	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Lab QC
	JWMW-12-1116	Total Organic Carbon by E415.3	Ground Water	11/29/2016	08:11	1	125 mL amber	H2SO4 pH<2	
	JWMW-911B-1116	Alkalinity by SM3320	Ground Water	11/29/2016	11:13	1	1 liter plastic	4 C	
	JWMW-911B-1116	Anions (Cl,SO4) by E300	Ground Water	11/29/2016	11:13	1	1 liter plastic	4 C	
	JWMW-911B-1116	Total Dissolved Solids by SM2540C	Ground Water	11/29/2016	11:13	1	1 liter plastic	4 C	
	JWMW-911B-1116	Total Organic Carbon by E415.3	Ground Water	11/29/2016	11:13	1	125 mL amber	H2SO4 pH<2	

Special Instructions:

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Raymond Cay	11/29/16 1515	Fedex	11/29/16 1520	
			[illegible] 11:45	11-29-16	1 °C

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Cooler/Box/Env 1 of 1

U.S. Environmental Protection Agency
Region 9 Richmond Laboratory

1337 South 46th Street
Richmond, CA 94804

Sample Receipt Checklist

Project No: 217519 **Work Order No(s):** 1611066 **Date:** 11/30/16 **by** TD

CUSTODY SEALS Intact

☒ Yes ☐ No ☐ N/A- None

Check if applies: ☒ External Seals ☐ Internal Seals ☐ Hand Delivered

TEMPERATURE 1 °C Within Acceptable Range

☒ Yes ☐ No ☐ Ambient OK

Check if applies:
☒ Provided Temp Blank ☐ Between 6°C to 10°C ☐ Still cooling (sampled today & iced)
☐ Previously Frozen ☐ Insufficient/Melted Ice ☐ Delivery Delay

SAMPLE CONTAINERS Intact

☒ Yes ☐ No

If not intact, was volume recoverable for analysis? ☐ Yes ☐ No ☒ N/A

Check if applies: ☐ Bottle/Jar/Vial broken ☐ Cap broken or loose ☐ Other _____

CHAIN OF CUSTODY Received

☒ Yes ☐ No

COC complete and consistent with labels ☒ Yes ☐ No ☐ N/A

Check if applies: ☐ Not relinquished ☐ Inconsistency resolved ☐ Follow-up needed (see comments)

TAT and analyses match scheduling ☒ Yes ☐ No ☐ N/A

Check if applies: ☐ Preliminary Results ☐ Rush Request ☐ 7-day TAT

Within hold times ☐ Expires today ☒ Yes ☐ No ☐ N/A

All shipping and sample containers accounted for ☒ Yes ☐ No ☐ N/A

PRESERVATION / FILTRATION

☐ N/A No chem. pres./filtra.

Check if applies: ☐ Sample Receiving to preserve
☐ Analyst to filter and/or preserve

Preserved and/or filtered samples correctly identified ☒ Yes ☐ No ☐ N/A

Preserved samples (non-VOA vials) measured at correct pH ☒ Yes ☐ No ☐ N/A

Preservation/measured pH TOC <2

Sample Receiving Preservation and/or pH Adjustments*

Sample ID	Initial pH	Pres.	Date/time Pres. added	Adjusted pH	pH after 16-hrs (metals)	Date/time of pH recheck	Rechecked by

*(continue on back, if needed)

FOLLOW-UP / COMMENTS

BATCH

B16L051

pH 4 Source: 1640028
pH 7 Source: 1544030
pH 10 Source: 1607183

EPA Region 9 Laboratory
Alkalinity Spreadsheet

Batch: B16L051
Meter ID: OrionStar A211
Slope: 99.8

LabNumber	Buffer Check 4	Buffer Check 7	Buffer Check 10	Aliquot (mL)	Initial pH	Normality (N)	Buret Initial (mL)	Buret pH=8.30 (mL)	Buret pH=4.50 (mL)	Buret pH=4.20 (mL)	Hydroxide (mg/L)	Carbonate (mg/L)	Bicarbonate (mg/L)	Total (mg/L)
1611061-05	4.03	7.00	10.01	100	7.67	0.02022	0.00		45.70		0.00	0.00	462.03	462.03
1611061-06				25	7.96	0.02022	0.00		7.70		0.00	0.00	311.39	311.39
1611066-01				25	8.22	0.02022	0.00		16.70		0.00	0.00	675.35	675.35
1611066-02				25	8.13	0.02022	0.00		17.90		0.00	0.00	723.88	723.88
1611066-03				25	7.71	0.02022	0.00		10.50		0.00	0.00	424.62	424.62
1611066-04				25	8.17	0.02022	0.00		10.00		0.00	0.00	404.40	404.40
1611066-05	4.06	7.02	10.01	25	8.10	0.02022	0.00		17.50		0.00	0.00	707.70	707.70
1612001-01				25	8.22	0.02022	0.00		15.20		0.00	0.00	614.69	614.69
1612001-02				25	7.95	0.02022	0.00		14.50		0.00	0.00	586.38	586.38
1612001-03				25	7.86	0.02022	0.00		15.40		0.00	0.00	622.78	622.78
1612001-04				25	7.80	0.02022	0.00		9.70		0.00	0.00	392.27	392.27
1612001-05				25	7.87	0.02022	0.00		14.10		0.00	0.00	570.20	570.20
1612025-01				25	7.96	0.02022	0.00		14.90		0.00	0.00	602.56	602.56
1612025-02				25	7.88	0.02022	0.00		13.80		0.00	0.00	558.07	558.07
1612025-03	4.06	7.01	9.99	25	8.39	0.02022	0.00	0.30	11.20		0.00	24.26	428.66	452.93
1612025-04				25	8.34	0.02022	0.00	0.10	16.20		0.00	8.09	647.04	655.13
1612025-05				25	8.29	0.02022	16.20		27.20		0.00	0.00	444.84	444.84
1612025-06				25	8.37	0.02022	27.20	27.30	38.30		0.00	8.09	440.80	448.88
1612025-07				25	8.30	0.02022	11.00		21.70		0.00	0.00	432.71	432.71
B16L051-BLK1				100	5.15	0.02022	11.30		11.40	11.50	0.00	0.00	0.00	0.00
B16L051-BS1				100	9.07	0.02022	0.00	6.10	10.10		21.23	80.88	0.00	102.11
B16L051-DUP1				25	7.74	0.02022	10.50		21.10		0.00	0.00	428.66	428.66
B16L051-DUP2				25	8.28	0.02022	15.20		30.70		0.00	0.00	626.82	626.82
B16L051-DUP3				25	7.91	0.02022	13.80		27.70		0.00	0.00	562.12	562.12
B16L051-MRL1	4.07	7.04	10.00	100	8.73	0.02022	10.10	10.40	11.20	11.30	0.00	6.07	5.05	10.11

Calculation verified by OS 12/12/16

REVIEWED
By OS at 4:18 pm, Dec 12, 2016

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Alkalinity Benchsheet

Project.: Standardization of 0.02N H_2SO_4 | Analyst: SUC | Date: 12/05/16

SDG: — | Reviewer: [illegible] | Date: 12-06-16

Site Name: — | LIMS Batch: —

pH Calibration - Orion Star A211 S/N SNX29860

Slope: 99.9 % | ATC Reading: 20.4 °C | Thermometer Reading: 20 °C

Limit 85 - 115%	Source	T.V. mg/L	Result mg/L	% Rec
BS				
MRL				

Thermometer S/N: T051 | 5N H2SO4 Source: 1650005 | 0.02N H2SO4 Source: 1650006

Sample				Base ~~Acid~~	Buret Volume Readings			
Laboratory ID	Sample ID	Aliquot (mL)	Initial pH	Normality (N)	Initial (mL)	pH=8.3 (mL)	pH=4.5 (mL)	pH=4.2 (mL)
Na_2CO_3	1650004	10	11.22	0.05020	0.0		24.9	
↓	↓	↓	11.16		0.0		24.8	
			11.17		0.0		24.8	
						$\bar{x}$=	24.83	
N, H_2SO_4 =	10mL x 0.05020N / 24.83mL	=	0.02022 N					
pH 4	1640028							
pH 7	1644030							
pH 10	1607183							

SUC 12/05/16

Alkalinity Benchsheet

Project: R17519
SDG: 16334A, 16338A
Site Name: Jervis Webb 2016

Analyst: SVL
Date: 12/08/16
Reviewer:
LIMS Batch: B16L051

REVIEWED
By OS at 4:19 pm, Dec 12, 2016

pH Calibration - Orion Star A211 S/N SNX29860
Slope: 99.8 %
ATC Reading: 20.0 °C
Thermometer Reading: 20 °C

Limit 85 - 115%	Source	T.V. mg/L	Result mg/L	% Rec
BS	1628055	101	102.11	101
MRL	1650056	10	10.11	101

Thermometer S/N: T051
5N H2SO4 Source: 1650005
0.02N H2SO4 Source: 1650006

Sample				Acid	Buret Volume Readings			
Laboratory ID	Sample ID	Aliquot (mL)	Initial pH	Normality (N)	Initial (mL)	pH=8.3 (mL)	pH=4.5 (mL)	pH=4.2 (mL)
pH 4	1640028		4.03					
pH 7	1544030		7.00					
pH 10	1607183		10.01					
B16L051-BS1		100	9.07	0.02022	0.0	6.1	10.1	—
↓ -MRL1		100	8.73	↓	10.1	10.4	11.2	11.3
↓ -BLK1		100	5.15	↓	11.3	—	11.4	11.5
1611061-05		100	7.67	↓	0.0	—	45.7	—
↓ -06		25	7.96	↓	0.0	—	7.7	—
1611066-01		25	8.22	↓	0.0	—	16.7	—
↓ -02		25	8.13	↓	0.0	—	17.9	—
↓ -03		25	7.71	↓	0.0	—	10.5	—
B16L051-DUP1	1611066-03	25	7.74	↓	10.5	—	21.1	—
1611066-04		25	8.17	↓	0.0	—	10.0	—
pH 4			4.06					
pH 7			7.02					
pH 10			10.01					
1611066-05		25	8.10	0.02022	0.0	—	17.5	—
1612001-01		25	8.22	↓	0.0	—	15.2	—
B16L051-DUP2	1612001-01	25	8.28	↓	15.2	—	30.7	—
1612001-02		25	7.95	↓	0.0	—	14.5	—
↓ -03		25	7.86	↓	0.0	—	15.4	—
↓ -04		25	7.80	↓	0.0	—	9.7	—
↓ -05		25	7.87	↓	0.0	—	14.1	—
1612025-01		25	7.96	↓	0.0	—	14.9	—
↓ -02		25	7.88	↓	0.0	—	13.8	—

See page 07

Alkalinity Benchsheet

Project.: _____ Analyst: SU Date: 12/08/16

SDG: _____ Reviewer: REVIEWED By OS at 4:19 pm, Dec 12, 2016

Site Name: _____ LIMS Batch: _____

pH Calibration - Orion _____ S/N _____

Slope: _____ % ATC Reading: _____ °C Thermometer Reading: _____ °C

Limit 85 - 115%	Source	T.V. mg/L	Result mg/L	% Rec
BS				
MRL				

Thermometer S/N: _____ 5N H2SO4 Source: _____ 0.02N H2SO4 Source: _____

Sample				Acid	Buret Volume Readings			
Laboratory ID	Sample ID	Aliquot (mL)	Initial pH	Normality (N)	Initial (mL)	pH=8.3 (mL)	pH=4.5 (mL)	pH=4.2 (mL)
B16L051-DB3	16 12025-02	25	7.91	0.02022	13.8	—	27.7	—
pH 4			4.06					
pH 7			7.01					
pH 10			9.99					
16 12025-03		25	8.39	0.02022	0.0	0.3	11.2	—
-04		25	8.34		0.0	0.1	16.2	—
-05		25	8.29		16.2	—	27.2	—
-06		25	8.37		27.2	27.3	38.3	—
-07		25	8.30		11.0	—	21.7	—
pH 4			4.07					
pH 7			7.04					
pH 10			10.00					

SU 12/08/16

PREPARATION BENCH SHEET

B16L051

EPA Region 9 Laboratory

Project: R17S19

Printed: 12/9/2016 7:58:21AM

Matrix: Water **Analysis: Alkalinity** **Prepared using: Inorganics - Alkalinity**

Lab Number	SampleName	Prepared	Initial (mL)	Final (mL)	Source ID	Spike ID 1	ul Spike 1	Prepared by	Extraction Comments
1611061-05 A	JWMW-09C-1116	12/08/16 06:22	100	100				SUL	
1611061-06 A	JWMW-10-1116	12/08/16 06:22	25	25				SUL	
1611066-01 A	JWMW-11A-1116	12/08/16 06:22	25	25				SUL	
1611066-02 A	JWMW-11B-1116	12/08/16 06:22	25	25				SUL	
1611066-03 A	JWMW-11C-1116	12/08/16 06:22	25	25				SUL	
1611066-04 A	JWMW-12-1116	12/08/16 06:22	25	25				SUL	
1611066-05 A	JWMW-911B-1116	12/08/16 06:22	25	25				SUL	
1612001-01 A	JWMW-05-1116	12/08/16 06:22	25	25				SUL	
1612001-02 A	JWMW-08A-1116	12/08/16 06:22	25	25				SUL	
1612001-03 A	JWMW-08B-1116	12/08/16 06:22	25	25				SUL	
1612001-04 A	JWMW-08C-1116	12/08/16 06:22	25	25				SUL	
1612001-05 A	JWMW-98B-1116	12/08/16 06:22	25	25				SUL	
1612025-01 A	JWMW-06A-1116	12/08/16 06:22	25	25				SUL	
1612025-02 A	JWMW-06B-1116	12/08/16 06:22	25	25				SUL	
1612025-03 A	JWMW-06C-1116	12/08/16 06:22	25	25				SUL	
1612025-04 A	JWMW-07A-1116	12/08/16 06:22	25	25				SUL	
1612025-05 A	JWMW-07B-1116	12/08/16 06:22	25	25				SUL	
1612025-06 A	JWMW-07C-1116	12/08/16 06:22	25	25				SUL	
1612025-07 A	JWMW-97C-1116	12/08/16 06:22	25	25				SUL	
B16L051-BLK1	Blank	12/08/16 06:22	100	100				SUL	

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PREPARATION BENCH SHEET

B16L051

EPA Region 9 Laboratory

Project: R17S19

Printed: 12/9/2016 7:58:21AM

Matrix: Water **Analysis: QC** **Prepared using: Inorganics - Alkalinity**

Lab Number	SampleName	Prepared	Initial (mL)	Final (mL)	Source ID	Spike ID 1	ul Spike 1	Prepared by	Extraction Comments
B16L051-BS1	LCS	12/08/16 06:22	100	100		1628055	1	SUL	
B16L051-DUP1	Duplicate	12/08/16 06:22	25	25	1611066-03			SUL	
B16L051-DUP2	Duplicate	12/08/16 06:22	25	25	1612001-01			SUL	
B16L051-DUP3	Duplicate	12/08/16 06:22	25	25	1612025-02			SUL	
B16L051-MRL1	MRL Check	12/08/16 06:22	100	100		1650055	1	SUL	

Batch Comments

Reagents

Reagent #	Description
1544030	pH buffer, 7.00 pH unit
1607183	pH buffer, 10.01 pH unit
1640028	pH buffer, 4.01 pH unit
1650005	Alkalinity, 5N Sulfuric Acid
1650006	Alkalinity, 0.02N Sulfuric Acid

Thermometer #/Temp: T051

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ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	B16L051	SEQUENCE #:	N/A
BATCH #:	N/A	ANALYSIS:	Alkalinity by SM 2320

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
DOCUMENTATION	ANALYST: Bench sheet(s) attached? REVIEWER: Bench sheet(s) reviewed?	☐	Y	Y	
	ANALYST: Sequence log(s) attached? REVIEWER: Sequence log(s) reviewed?	☑			
	ANALYST: Every run has a PDF in LIMS? REVIEWER: Every PDF reviewed?	☐	Y	Y	Run log attached
INITIAL CALIBRATION	Date of Initial Calibration used: If applicable, note date of "Last Update" in Comments.	12/08/16			Calibration of pH meter
	Initial Calibration ID (LIMS number):	N/A			
	ICAL within QC criteria?	☐	Y	Y	
	SCV within QC criteria?	☑			
INSTRUMENT / QC CHECKS	Tune or degradation checks within QC criteria?	☑			
	CCV(s) within QC criteria?	☐	Y	Y	pH checks OK
	QLS(s) within QC criteria?	☐	Y	Y	
	CB(s) or storage blank(s) within QC criteria?	☑			
	Other instrument checks within QC criteria? Specify if applicable.	☑			
BATCH QCs	Method blanks < 1/2 QL?	☐	Y	Y	
	LCS(s) or SRM(s) within QC criteria?	☐	Y	Y	
	MSs/MSDs and/or DUPs within QC criteria?	☐	Y	Y	
	Other method-specific QCs within QC criteria? Specify if applicable.	☑			

ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	B16L051	SEQUENCE #:	N/A
BATCH #:	N/A	ANALYSIS:	Alkalinity by SM 2320

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
IS / SS	Internal standards within QC criteria?	✔			
	Surrogates within QC criteria?	✔			
SAMPLE DATA	Were samples prepared & analyzed within holding time?		Y	Y	
	If samples need to be re-run, were RE(s) made in LIMS?	✔			
	Do any samples need to be re-digested or re-extracted?	✔			
	Were all data qualifiers appropriately applied?	✔			
	Are problems, anomalies, discrepancies documented in LIMS? Specify if applicable.	✔			
MANUAL INT	Were manual integrations performed and documented? Specify if applicable.	✔			

APPROVALS	ANALYST INITIALS & DATE:	SUL 12/09/16
	REVIEWED BY:	Osellie Salvador (affiliate) Digitally signed by Osellie Salvador (affiliate) Date: 2016.12.12 16:20:56 -08'00' SIGN HERE

COMMENTS

BATCH

B16L039

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Analyst: KT Batch: 161039

EPA REGION 9 LABORATORY
TOTAL DISSOLVED SOLIDS (SM 2540C)

Case No: 61715 #1QC Source Solution: (low) 161039

SDG No: 161034A #2QC Source Solution: (high) 161025

Date: 12/6/16 Conductivity Check (tv=) 100

180°C Oven In: 12/7/16 1535 Date/Time Oven out: 12/7/16 0840 Date/Time

180°C Oven In: 12/7/16 0840 Date/Time Oven out: 12/8/16 1325 Date/Time KT

180°C Oven In: 12/8/16 1325 Date/Time Oven out: 12/9/16 0750 Date/Time

LAB SAMPLE NUMBER	CLIENT SAMPLE NUMBER	CRUCIBLE #	SAMPLE VOL. VOL(mL)	WT. DRIED RES. + CRUC. (g) (A)	WT. CRUCIBLE (g) (B)	WT. RESIDUE (g) (A-B)	TDS (mg/L)	SAMPLE COND. (umhos/cm)	COMMENTS
LRB		169	100	1. 81.96 83 2. 81.96 86 3.	81.9681 KT	-.0014	-14		
QL		381	100	1. 79.06 75 2. 79.06 72 3.	79.0654	.0015	15		TV 20 mg/L Rep. R
QCS		7	50	1. 82.4421 2. 82.4427 3.	82.4421	.0305	610		TV 600 mg/L Rep. R
1611066-01	JWMW-11A-1116	184	50	1. 75.0915 ✓ 2. 75.0950 3. 75.0935	74.8723	2.1315	5630	3,910	
1611066-02	JWMW-11B-1116	9	20	1. 78.9545 2. 78.9549 3.	78.7631	.0914	4570	4,840	
1611066-03	JWMW-11C-1116	16	25	1. 75.9641 2. 75.9549 3. 75.9537 ✓	75.3710	.0837	3348	3,750	
1611066-03	"	25	25	1. 76.9722 2. 76.9726 3.	77.9896	.0826	3304	3,760	
1611066-04	JWMW-12-1-1116	76	25	1. 76.9637 2. 76.9651 3. 76.9635 ✓	78.8719	.0916	3664	3,800	
1611066-05	JWMW-11B-1116	76	20	1. 81.5223 2. 81.5225 3.	81.4300	.0923	4615	4,840	
1612021-01	JWMW-05-1116	44	20	1. 77.9359 2. 77.9341 3.	77.7472	.0947	4735	5320	
1612021-01	"	395	20	1. 77.9146 2. 77.9149 3.	76.9182	.0964	4820	5320	
1612021-02	JWMW-08A-1116	04	50	1. 81.9123 2. 81.9131 ✓ 3. 81.9125	81.7804	.1267	2534	2,750	
1612021-03	JWMW-08B-1116	415	20	1. 83.1690 2. 83.1682 3.	83.0964	.0724	3620	3,930	

TDSLOG_061715 Reviewed by: KT Date: 12/19/16

③ 180°C oven in 12/14/16 1200 out 12/14/16 1400

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Analyst: [illegible] Batch: 161057

EPA REGION 9 LABORATORY
TOTAL DISSOLVED SOLIDS (SM 2540C)

Case No: 51759

SDG No: 16234A

Date: 12/6/16

#1QC Source Solution: (low) 1647629

#2QC Source Solution: (high) 1647628

Conductivity Check (tv=) 1027

104°C Oven In: 12/6/16 1555 Date/Time Oven out: 12/7/16 0700 Date/Time

180°C Oven In: 12/7/16 0700 Date/Time Oven out: 12/8/16 0910 Date/Time

150°C Oven In: 12/8/16 1035 Date/Time Oven out: 12/9/16 0750 Date/Time

LAB SAMPLE NUMBER	CLIENT SAMPLE NUMBER	CRUCIBLE #	SAMPLE VOL. VOL(mL)	WT. DRIED RES. + CRUC. (g) (A)	WT. CRUCIBLE (g) (B)	WT. RESIDUE (g) (A-B)	TDS (mg/L)	SAMPLE COND. (umhos/cm)	COMMENTS
16120-04	JWMW-05C -1116	77	100	1. 79.6541 2. 79.9861 3.	79.8337	.1524	1524	2105	
16120-05	JWMW-05B -1116	711	25	1. 86.3511 2. 86.3515 3.	86.3873	X .0538	3352	3760	
16120-0	JWMW-06A -1116	145	25	1. 75.4911 2. 75.4930 3.	75.4118	4 .0848	3392	3740	
~~16120-03~~	JWMW-06B -1116	110	100	1. 80.3312 2. 80.3360 3.	~~80.3050~~	~~.0262~~	~~<~~	~~257~~	~~error~~ R
16120-03	JWMW-06C -1116	15	100	1. 80.4662 2. 80.4654 3.	80.3994	.0994	994	1305	
16120-04	JWMW-07A -1116	18	20	1. 106.1457 2. 106.1457 3.	106.0350	5 .1077	5385	5730	
16120-05	JWMW-07B -1116	11	100	1. 107.5507 2. 107.5504 3.	107.7522	.1284	1284	1602	
16120-06	JWMW-07C -1116	6	100	1. 102.2201 2. 102.2206 3.	102.1062	.1139	1139	1484	
16120-07	JWMW-07C -1116	13	100	1. 106.6765 2. 106.6797 3. 106.6793 ✓	106.5572	.1129	1129	1479	
16120-02	JWMW-06B -1116	78	20	1. 79.9510 2. 79.9506 3.	79.9602	.0904	4520	4730	re analyze
				1. 2. 3.					
				1. 2. 3.					
				1. 2. 3.					

TDSLOG_061715

Reviewed by: [illegible] Date: 12/15/16

(5) 180°C oven in 12/9/16 1200 out 12/14/16 14[illegible]

US EPA REGION 9 LABORATORY

BALANCE CALIBRATION AND MAINTENANCE

MANUFACTURER: DENVER INST. MODEL#: PI-225D SERIAL #: 24308100 WT SET ID: C

DATE	TIME	ANALYST	ZERO	0.1 g	1.0 g	10.0 g	100.0 g	COMMENTS
11/3/16	0920	PH	✓	0.10005	1.00025	10.00038	100.0006	
11/4/16	0925	PH	✓	0.10003	1.00020	10.00032	100.0005	
11/7/16	1430	PH	✓	0.10006	1.00023	10.00034	100.0005	
11/15/16	1000	RT	0	0.10006	1.00024	10.00035	100.0005	
11/16/16	1100	RT	0	0.10003	1.00009	10.00026	100.0003	
11/17/16	0820	RT	0	0.10010	1.00025	10.00044	100.0006	
11/18/16	0900	RT	0	0.10010	1.00025	10.00045	100.0004	
Reviewed RJ 11/23/16								
11/22/16	0905	RT	0	0.10003	1.00052	10.00069	100.0005	
11/30/16	1115	RT	0	0.10011	1.00010	10.00042	100.0004	
12/1/16	0840	RT	0	0.10010	1.00035	10.00049	100.0006	
12/2/16	1010	RT	0	0.10005	1.00010	10.00034	100.0003	
12/6/16	0805	RT	0	0.10015	1.00045	10.00058	100.0006	
12/7/16	0850	RT	0	0.10014	1.00032	10.00051	100.0005	
12/8/16	0840	RT	0	0.10015	1.00033	10.00048	100.0007	

INSTRUCTIONS: At a minimum, balances must be verified each day of use, every time the power is turned off and on each day, and anytime they are moved. Specific SOPs provide more detail. Complete the information at the top of each page prior to beginning that page. Select appropriate calibration verification weights and record their weight at the top of each column. At a minimum, balances are verified at zero and in the range of use.

LOGBOOK # 15017 REVIEWED BY: RZ DATE: 12/14/16

US EPA REGION 9 LABORATORY

BALANCE CALIBRATION AND MAINTENANCE

MANUFACTURER: DENVER INST. MODEL#: PI-225D SERIAL #: 24308100 WT SET ID: C

DATE	TIME	ANALYST	ZERO	0.1 g	1.0 g	10.0 g	100.0 g	COMMENTS
12/9/16	0900	RT	0	0.1001	1.0003	10.0004	100.0006	
12/13/16	1100	RT	0	0.1002	1.0030	10.0069	100.0004	
— Removed RZ				12/14/16				
12/14/16	1000	RT	0	0.1001	1.0001	10.0004	100.0005	
— Removed RZ				12/15/16				

INSTRUCTIONS: At a minimum, balances must be verified each day of use, every time the power is turned off and on each day, and anytime they are moved. Specific SOPs provide more detail. Complete the information at the top of each page prior to beginning that page. Select appropriate calibration verification weights and record their weight at the top of each column. At a minimum, balances are verified at zero and in the range of use.

LOGBOOK # 15017

REVIEWED BY: _____ DATE: _____

US EPA REGION 9 LABORATORY

OVEN TEMPERATURE LOG

THELCO LAB OVEN _____ S/N: 600041029

DATE	TIME	INITIALS	SET POINT (°C)	RANGE (°C)	READING (°C)	COMMENTS
12/6/16	1505	RT	104	104±1	104	TDS in
12/7/16	0820	RT	104	104±1	104	TDS out
12/8/16	1555	RT	104	104±1	104	SSC in
12/9/16	0955	RT	104	104±1	104	SSC out
12/12/16	1000	RT	104	104±1	104	SSC in
12/13/16	1130	RT	104	104±1	104	SSC out
12/13/16	1300	RT	104	104±1	104	SSC in
12/13/16	1430	RT	104	104±1	104	SSC out
12/13/16	1410	RT	104	104±1	104	TDS in
12/14/16	0945	RT	104	104±1	104	TDS out
— Reviewed RZ 12/14/16 —						

LOGBOOK # 13002 REVIEWED BY: _____ DATE: _____

US EPA REGION 9 LABORATORY

OVEN TEMPERATURE LOG

THELCO LAB OVEN C S/N: 696110526

DATE	TIME	INITIALS	SET POINT (°C)	RANGE (°C)	READING (°C)	COMMENTS
10/27/16	1435	SL	180	180±1	180	NH4 Cl3 & Na2Cr2O7 out
11/1/16	1425	PJA	180	180±1	180	Cr Mass out
11/3/16	910	PJA	180	180±1	180	TDS in
11/3/16	1040	PJA	180	180±1	180	TDS out
11/3/16	1520	PJA	180	180±1	180	TDS in
11/4/16	920	PJA	180	180±1	181	TDS out
11/4/16	1400	PJA	180	180±1	180	TDS in
11/5/16	840	PJA	180	180±1	180	TDS out
11/16/16	0725	RT	180	180±1	180	TDS in
11/16/16	0910	RT	180	180±1	180	TDS out
11/16/16	1110	RT	180	180±1	180	TDS in
11/16/16	1300	RT	180	180±1	180	TDS out
11/16/16	1440	RT	180	180±1	180	TDS in
11/17/16	0720	RT	180	180±1	180	TDS out
Reviewed		QZ		11/23/16		
12/1/16	0720	RT	180	180±1	180	TDS in
12/1/16	0920	RT	180	180±1	180	TDS out
12/1/16	1415	RT	180	180±1	180	TDS in
12/2/16	0800	RT	180	180±1	180	TDS out & in
12/2/16	1030	RT	180	180±1	180	TDS in
12/2/16	1320	RT	180	180±1	180	TDS out
12/6/16	0830	RT	180	180±1	180	TDS out
12/7/16	0820	RT	180	180±1	180	TDS in
12/7/16	1115	RT	180	180±1	180	TDS in & out
12/8/16	0910	RT	180	180±1	180	TDS in & out
12/9/16	1235	RT	180	180±1	180	TDS in & out
12/9/16	0750	RT	180	180±1	180	TDS out

LOGBOOK # 14004 REVIEWED BY: QZ DATE: 12/19/16

US EPA REGION 9 LABORATORY

OVEN TEMPERATURE LOG

THELCO LAB OVEN _____ S/N: 696110526

DATE	TIME	INITIALS	SET POINT (°C)	RANGE (°C)	READING (°C)	COMMENTS
12/14/16	0945	RT	180	180±1	180	TDS in
	Removed	AZ	12/14/16			
12/14/16	1010	RT	180	180±1	180	TDS out
12/14/16	1230	RT	180	180±1	180	TDS in
12/14/16	1400	RT	180	180±1	180	TDS out
	Removed	AZ	12/15/16			

LOGBOOK # 14004

REVIEWED BY: _____ DATE: _____

ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	16L039	SEQUENCE #:	
BATCH #:		ANALYSIS:	TDS

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
DOCUMENTATION	ANALYST: Bench sheet(s) attached? REVIEWER: Bench sheet(s) reviewed?	☐	y	y	
	ANALYST: Sequence log(s) attached? REVIEWER: Sequence log(s) reviewed?	☑			
	ANALYST: Every run has a PDF in LIMS? REVIEWER: Every PDF reviewed?	☐	y	y	
INITIAL CALIBRATION	Date of Initial Calibration used: If applicable, note date of "Last Update" in Comments.				
	Initial Calibration ID (LIMS number):				
	ICAL within QC criteria?	☑			
	SCV within QC criteria?	☑			
INSTRUMENT / QC CHECKS	Tune or degradation checks within QC criteria?	☑			
	CCV(s) within QC criteria?	☑			
	QLS(s) within QC criteria?	☑			
	CB(s) or storage blank(s) within QC criteria?	☑			
	Other instrument checks within QC criteria? Specify if applicable.	☑			
BATCH QCs	Method blanks < 1/2 QL?	☐	y	y	
	LCS(s) or SRM(s) within QC criteria?	☐	y	y	
	MSs/MSDs and/or DUPs within QC criteria?	☐	y	y	
	Other method-specific QCs within QC criteria? Specify if applicable.	☐	y	y	Balance and oven QC.

ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	16L039	SEQUENCE #:	
BATCH #:		ANALYSIS:	TDS

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
IS / SS	Internal standards within QC criteria?	✔			
	Surrogates within QC criteria?	✔			
SAMPLE DATA	Were samples prepared & analyzed within holding time?		y	y	
	If samples need to be re-run, were RE(s) made in LIMS?	✔			
	Do any samples need to be re-digested or re-extracted?	✔			
	Were all data qualifiers appropriately applied?		y	y	
	Are problems, anomalies, discrepancies documented in LIMS? Specify if applicable.				
MANUAL INT	Were manual integrations performed and documented? Specify if applicable.	✔			

APPROVALS	ANALYST INITIALS & DATE:	rt 12/15/16
	REVIEWED BY:	Andrew Lincoff Digitally signed by Andrew Lincoff Date: 2016.12.23 12:08:59 -08'00' SIGN HERE

COMMENTS

FORM #: Q015
REV #: 1

PREPARATION BENCH SHEET

B16L039

EPA Region 9 Laboratory

Project: R17S19

Printed: 12/23/2016 12:13:01PM

Matrix: Water **Analysis: Solids, Total Dissolved** **Prepared using: Biology - - General Biology**

Lab Number	SampleName	Prepared	Initial (mL)	Final (mL)	Source ID	Spike ID 1	ul Spike 1	Spike ID 2	ul Spike 2	Prepared by	Extraction Comments
1611066-01 -	JWMW-11A-1116	12/06/16 15:17	100	100						RT	
1611066-02 -	JWMW-11B-1116	12/06/16 15:17	100	100						RT	
1611066-03 -	JWMW-11C-1116	12/06/16 15:17	100	100						RT	
1611066-04 -	JWMW-12-1116	12/06/16 15:17	100	100						RT	
1611066-05 -	JWMW-911B-1116	12/06/16 15:17	100	100						RT	
1612001-01 -	JWMW-05-1116	12/06/16 15:17	100	100						RT	
1612001-02 -	JWMW-08A-1116	12/06/16 15:17	100	100						RT	
1612001-03 -	JWMW-08B-1116	12/06/16 15:17	100	100						RT	
1612001-04 -	JWMW-08C-1116	12/06/16 15:17	100	100						RT	
1612001-05 -	JWMW-98B-1116	12/06/16 15:17	100	100						RT	
1612025-01 -	JWMW-06A-1116	12/06/16 15:17	100	100						RT	
1612025-02 -	JWMW-06B-1116	12/06/16 15:17	100	100						RT	
1612025-03 -	JWMW-06C-1116	12/06/16 15:17	100	100						RT	
1612025-04 -	JWMW-07A-1116	12/06/16 15:17	100	100						RT	
1612025-05 -	JWMW-07B-1116	12/06/16 15:17	100	100						RT	
1612025-06 -	JWMW-07C-1116	12/06/16 15:17	100	100						RT	
1612025-07 -	JWMW-97C-1116	12/06/16 15:17	100	100						RT	
B16L039-BLK1	Blank	12/06/16 15:17	100	100						RT	
B16L039-CCV1	Calibration Check	12/06/16 15:17	100	100		1646029	100000			RT	
B16L039-DUP1	Duplicate	12/06/16 15:17	100	100	1611066-03					RT	
B16L039-DUP2	Duplicate	12/06/16 15:17	100	100	1612001-01					RT	

PREPARATION BENCH SHEET

B16L039

EPA Region 9 Laboratory

Project: R17S19

Printed: 12/23/2016 12:13:01PM

Matrix: Water **Analysis: QC** **Prepared using: Biology - - General Biology**

Lab Number	SampleName	Prepared	Initial (mL)	Final (mL)	Source ID	Spike ID 1	ul Spike 1	Spike ID 2	ul Spike 2	Prepared by	Extraction Comments
B16L039-SRM1	Reference	12/06/16 15:17	50	50		1646028	50000			RT	

Batch Comments

Reagents

Reagent #	Description

BATCH

B16L005

PREPARATION BENCH SHEET

B16L005

EPA Region 9 Laboratory

Project: R17S19

Printed: 12/2/2016 10:02:52AM

Matrix: Water **Analysis: Anions** **Prepared using: Inorganics - - General Inorganic**

Lab Number	SampleName	Prepared	Initial (mL)	Final (mL)	Source ID	Spike ID 1	ul Spike 1	Spike ID 2	ul Spike 2	Prepared by	Extraction Comments
1611066-01 A	JWMW-11A-1116	12/01/16 07:44	5	5						SUL	SO4. Filtered
1611066-01RE1 A	JWMW-11A-1116	12/01/16 07:44	5	5						SUL	Cl. Filtered
1611066-02 A	JWMW-11B-1116	12/01/16 07:44	5	5						SUL	SO4. Filtered
1611066-02RE1 A	JWMW-11B-1116	12/01/16 07:44	5	5						SUL	Cl. Filtered
1611066-03 A	JWMW-11C-1116	12/01/16 07:44	5	5						SUL	SO4. Filtered
1611066-03RE1 A	JWMW-11C-1116	12/01/16 07:44	5	5						SUL	Cl. Filtered
1611066-04 A	JWMW-12-1116	12/01/16 07:44	5	5						SUL	SO4. Filtered
1611066-04RE1 A	JWMW-12-1116	12/01/16 07:44	5	5						SUL	Cl. Filtered
1611066-05 A	JWMW-911B-1116	12/01/16 07:44	5	5						SUL	SO4. Filtered
1611066-05RE1 A	JWMW-911B-1116	12/01/16 07:44	5	5						SUL	Cl. Filtered
1612001-01 A	JWMW-05-1116	12/01/16 12:56	5	5						SUL	SO4. Filtered
1612001-01RE1 A	JWMW-05-1116	12/01/16 12:56	5	5						SUL	Cl. Filtered
1612001-02 A	JWMW-08A-1116	12/01/16 12:56	5	5						SUL	SO4. Filtered
1612001-02RE1 A	JWMW-08A-1116	12/01/16 12:56	5	5						SUL	Cl. Filtered
1612001-03 A	JWMW-08B-1116	12/01/16 12:56	5	5						SUL	SO4. Filtered
1612001-03RE1 A	JWMW-08B-1116	12/01/16 12:56	5	5						SUL	Cl. Filtered
1612001-04 A	JWMW-08C-1116	12/01/16 12:56	5	5						SUL	Too dilute
1612001-04RE1 A	JWMW-08C-1116	12/01/16 12:56	5	5						SUL	Cl, SO4. Filtered
1612001-04RE2 A	JWMW-08C-1116	12/01/16 12:56	5	5						SUL	Not needed
1612001-05 A	JWMW-98B-1116	12/01/16 12:56	5	5						SUL	SO4. Filtered

Page 38 of 324 1611066 DATA_PKG (Rev0).PDF 12/23/16 13:25:24

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PREPARATION BENCH SHEET

B16L005

EPA Region 9 Laboratory

Project: R17S19

Printed: 12/2/2016 10:02:52AM

Matrix: Water **Analysis: Anions** **Prepared using: Inorganics - - General Inorganic**

Lab Number	SampleName	Prepared	Initial (mL)	Final (mL)	Source ID	Spike ID 1	ul Spike 1	Spike ID 2	ul Spike 2	Prepared by	Extraction Comments
1612001-05RE1 A	JWMW-98B-1116	12/01/16 12:56	5	5						SUL	Cl. Filtered
B16L005-BLK1	Blank	12/01/16 07:44	5	5						SUL	
B16L005-BLK2	Blank	12/01/16 07:44	5	5						SUL	Filtered
B16L005-BS1	LCS	12/01/16 07:44	5	5		1649108	1			SUL	
B16L005-DUP1	Duplicate	12/01/16 07:44	5	5	1611066-03					SUL	SO4. Filtered
B16L005-DUP2	Duplicate	12/01/16 07:44	5	5	1611066-03RE1					SUL	Cl. Filtered
B16L005-DUP3	Duplicate	12/01/16 12:56	5	5	1612001-01					SUL	SO4. Filtered
B16L005-DUP4	Duplicate	12/01/16 12:56	5	5	1612001-01RE1					SUL	Cl. Filtered

Batch Comments

Reagents

Reagent #	Description

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BATCH

B16L061

PREPARATION BENCH SHEET

B16L061

EPA Region 9 Laboratory

Project: R17S19

Printed: 12/14/2016 2:15:15PM

Matrix: Water **Analysis: Carbon, Total Organic** **Prepared using: Inorganics - - General Inorganic**

Lab Number	SampleName	Prepared	Initial (mL)	Final (mL)	Source ID	Spike ID 1	ul Spike 1	Prepared by	Extraction Comments
1611061-01 B	JW-EL01-1116	12/09/16 09:59	35	35				SUL	
1611061-02 B	JWMW-04-1116	12/09/16 09:59	35	35				SUL	
1611061-03 B	JWMW-09A-1116	12/09/16 09:59	35	35				SUL	
1611061-04 B	JWMW-09B-1116	12/09/16 09:59	35	35				SUL	
1611061-05 B	JWMW-09C-1116	12/09/16 09:59	35	35				SUL	
1611061-06 B	JWMW-10-1116	12/09/16 09:59	35	35				SUL	
1611066-01 A	JWMW-11A-1116	12/09/16 09:59	35	35				SUL	
1611066-02 A	JWMW-11B-1116	12/09/16 09:59	35	35				SUL	
1611066-03 A	JWMW-11C-1116	12/09/16 09:59	35	35				SUL	
1611066-04 A	JWMW-12-1116	12/09/16 09:59	35	35				SUL	
1611066-05 A	JWMW-911B-1116	12/09/16 09:59	35	35				SUL	
1612001-01 B	JWMW-05-1116	12/09/16 09:59	35	35				SUL	
1612001-02 B	JWMW-08A-1116	12/09/16 09:59	35	35				SUL	
1612001-03 B	JWMW-08B-1116	12/09/16 09:59	35	35				SUL	
1612001-04 B	JWMW-08C-1116	12/09/16 09:59	35	35				SUL	
1612001-05 B	JWMW-98B-1116	12/09/16 09:59	35	35				SUL	
B16L061-BLK1	Blank	12/09/16 09:59	35	35				SUL	
B16L061-BS1	LCS	12/09/16 09:59	35	35		1637061	50	SUL	
B16L061-MS1	Matrix Spike	12/09/16 09:59	35	35	1611066-03	1637061	50	SUL	
B16L061-MS2	Matrix Spike	12/09/16 09:59	35	35	1612001-01	1637061	50	SUL	

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PREPARATION BENCH SHEET

B16L061

EPA Region 9 Laboratory

Project: R17S19

Printed: 12/14/2016 2:15:15PM

Matrix: Water **Analysis: QC** **Prepared using: Inorganics - - General Inorganic**

Lab Number	SampleName	Prepared	Initial (mL)	Final (mL)	Source ID	Spike ID 1	ul Spike 1	Prepared by	Extraction Comments
B16L061-MSD1	Matrix Spike Dup	12/09/16 09:59	35	35	1611066-03	1637061	50	SUL	
B16L061-MSD2	Matrix Spike Dup	12/09/16 09:59	35	35	1612001-01	1637061	50	SUL	

Batch Comments

TOC

Reagents

Reagent #	Description

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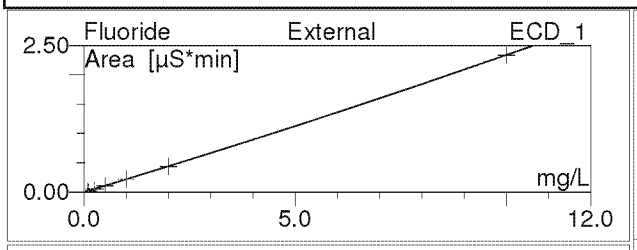
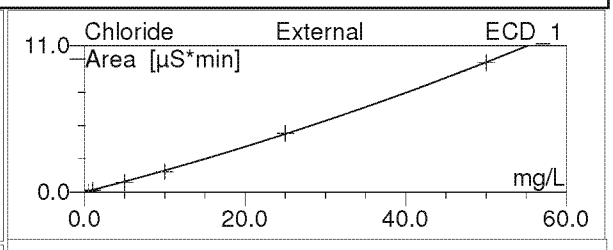
Calibration

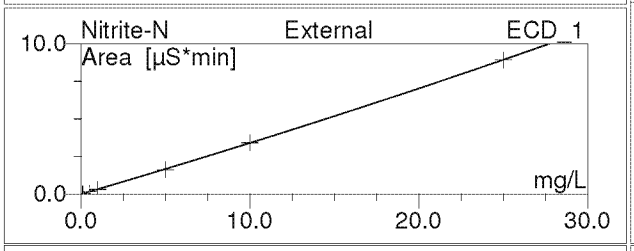
1608012

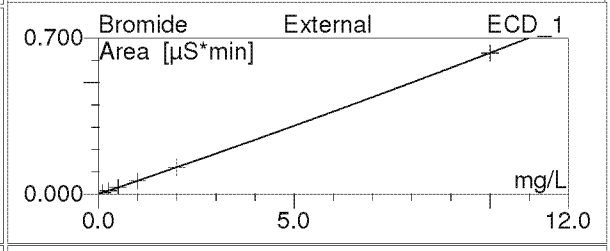
4 S16H083-CAL4

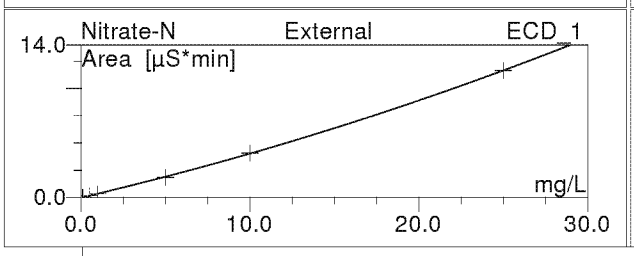
Sample Name:	**S16H083-CAL4**	*Injection Volume:*	**25.0**
Vial Number:	**4**	*Channel:*	**ICS1100**
Sample Type:	**standard**		
Control Program:	**ICS1100**	*System Operator:*	**SUL**
Quantif. Method:	**AnionsB**	*Dilution Factor:*	**1.0000**
Recording Time:	**8/17/2016 10:57**	*Sample Weight:*	**1.0000**
Run Time (min):	**13.00**	*Sample Amount:*	**1.0000**

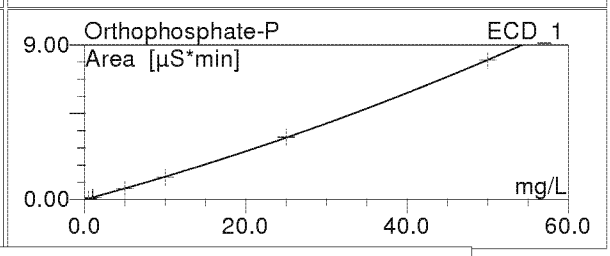


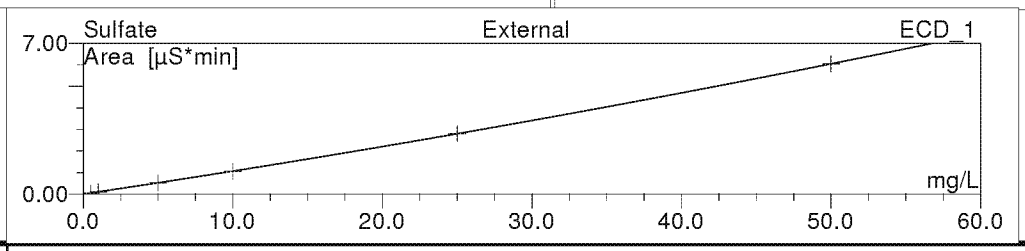












No.	Ret.Time min	Peak Name	Cal.Type	Points	r-Squared r^2	Offset	Slope	Curve
1	3.114	Fluoride	Quad	6	0.99999	0.0000	0.2159	0.0018
2	4.460	Chloride	Quad	6	0.99980	0.0000	0.1529	0.0008
3	5.357	Nitrite-N	Quad	6	0.99992	0.0000	0.3275	0.0012
4	6.367	Bromide	Quad	6	1.00000	0.0000	0.0591	0.0004
5	7.164	Nitrate-N	Quad	6	0.99994	0.0000	0.3607	0.0042
6	9.764	Orthophosphate-P	Quad	6	0.99996	0.0000	0.1251	0.0007
7	11.017	Sulfate	Quad	6	0.99999	0.0000	0.1031	0.0004
Average:					0.9999	0.0000	0.1920	0.0014

SEQUENCE

S16H083

REVIEWED
By OS at 2:23 pm, Aug 17, 2016

Sequence: 1608171
Operator: INS_DX120
Printed: 8/17/2016 12:46:42 PM

Title:
Datasource: 9LI207HWFM51_local
Location: Room207\ICS1100_Anions\2016\Data
Timebase: ICS1100
#Samples: 8

Created: 8/17/2016 10:11:13 AM by INS_DX120
Last Update: 8/17/2016 11:15:26 AM by INS_DX120

No.	Name	Pos.	Type	Std. Add. Group	Inj. Vol.	Method	Program	Status	Inj. Date/Time	Comment
1	S16H083-CAL1	1	Standard	1634065	25.0	AnionsB	ICS1100	Finished	8/17/2016 10:11:28 AM	SUL
2	S16H083-CAL2	2	Standard	1634066	25.0	AnionsB	ICS1100	Finished	8/17/2016 10:26:52 AM	SUL
3	S16H083-CAL3	3	Standard	1634067	25.0	AnionsB	ICS1100	Finished	8/17/2016 10:42:16 AM	SUL
4	S16H083-CAL4	4	Standard	1634068	25.0	AnionsB	ICS1100	Finished	8/17/2016 10:57:40 AM	SUL
5	S16H083-CAL5	5	Standard	1634069	25.0	AnionsB	ICS1100	Finished	8/17/2016 11:13:04 AM	SUL
6	S16H083-CAL6	6	Standard	1634070	25.0	AnionsB	ICS1100	Finished	8/17/2016 11:28:28 AM	SUL
7	S16H083-CCB1	7	Unknown	DI H2O	25.0	AnionsB	ICS1100	Finished	8/17/2016 11:43:52 AM	SUL
8	S16H083-SCV1	8	Unknown	1634071	25.0	AnionsB	ICS1100	Finished	8/17/2016 11:59:16 AM	SUL

Chromeleon © Dionex Corporation, Version 6.80 SR10 Build 2818 (166959)

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Current Retention Time window for ICS1100

Anion Calibration on 08/17/16 (Ret. Time Window based on 5% of ICAL Standard S4)

No.	Peak Name	S4 Ret. Time (min)	% Window	Min. Ret. Time (min)	Max. Ret. Time (min)	Cal Type
1	**Fluoride**	3.114	5	2.958	3.270	Quadratic
2	**Chloride**	4.460	5	4.237	4.683	Quadratic
3	**Nitrite-N**	5.357	5	5.089	5.625	Quadratic
4	**Bromide**	6.367	5	6.049	6.685	Quadratic
5	**Nitrate-N**	7.164	5	6.806	7.522	Quadratic
6	**Orthophosphate-P**	9.764	5	9.276	10.252	Quadratic
7	**Sulfate**	11.017	5	10.466	11.568	Quadratic

5% Ret. Time Window against the initial CCV on 00/00/16

No.	Peak Name	First CCV Ret. Time (min)	% Window	Min. Ret. Time (min)	Max. Ret. Time (min)	Cal Type
1	**Fluoride**		5	0.000	0.000	Quadratic
2	**Chloride**		5	0.000	0.000	Quadratic
3	**Nitrite-N**		5	0.000	0.000	Quadratic
4	**Bromide**		5	0.000	0.000	Quadratic
5	**Nitrate-N**		5	0.000	0.000	Quadratic
6	**Orthophosphate-P**		5	0.000	0.000	Quadratic
7	**Sulfate**		5	0.000	0.000	Quadratic

Method File: AnionsB
Operator: INS_DX120
Printed: 8/17/2016 12:52:59 PM

Title:
Datasource: 9LI207HWFM51_local
Location: Room207\ICS1100_Anions\2016\Data\1608171.SEQ
Created: 10/18/2004 3:01:27 PM by ins_dx120
Last Update: 8/17/2016 12:21:37 PM by INS_DX120

Peak Table:

Use Recently Detected Retention Times: Off
Peak Retention Time Determination: Absolute
Dead time:
Delay Time of 2'nd Detector: <None>
Delay Time of 3'rd Detector: <None>

No.	Peak Name	Ret.Time	Window	Comment	Amount S16H083-CAL1	Amount S16H083-CAL2	Amount S16H083-CAL3	Amount S16H083-CAL4	Amount S16H083-CAL5	Amount S16H083-CAL6
1	*Fluoride*	*3.114 min*	*5.000 RN*	*Autogenerated*	*0.100000*	*0.250000*	*0.500000*	*1.000000*	*2.000000*	*10.000000*
2	Chloride	4.460 min	5.000 RG	Autogenerated	0.500000	1.000000	5.000000	10.000000	25.000000	50.000000
3	Nitrite-N	5.357 min	5.000 RN	Autogenerated	0.100000	0.500000	1.000000	5.000000	10.000000	25.000000
4	Bromide	6.367 min	5.000 RN	Autogenerated	0.100000	0.250000	0.500000	1.000000	2.000000	10.000000
5	Nitrate-N	7.164 min	5.000 RN	Autogenerated	0.100000	0.500000	1.000000	5.000000	10.000000	25.000000
6	Orthophosphate-P	9.764 min	5.000 RN	Autogenerated	0.500000	1.000000	5.000000	10.000000	25.000000	50.000000
7	Sulfate	11.017 min	5.000 RN	Autogenerated	0.500000	1.000000	5.000000	10.000000	25.000000	50.000000

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Analysis Sequence

S16H083

Project:
Analysis:

Instrument: ICS1100 **Calibration ID:** 1608012 Printed: 08/17/2016 12:57 pm

Lab Number	Sample Name	Order	Analyzed Date	STD ID	ISTD ID	Sequenced By	File ID	Comments
S16H083-CAL1	Cal Standard	1	8/17/16 10:11	1634065		SUL	1608171.seq-01	
S16H083-CAL2	Cal Standard	2	8/17/16 10:26	1634066		SUL	1608171.seq-02	
S16H083-CAL3	Cal Standard	3	8/17/16 10:42	1634067		SUL	1608171.seq-03	
S16H083-CAL4	Cal Standard	4	8/17/16 10:57	1634068		SUL	1608171.seq-04	
S16H083-CAL5	Cal Standard	5	8/17/16 11:13	1634069		SUL	1608171.seq-05	
S16H083-CAL6	Cal Standard	6	8/17/16 11:28	1634070		SUL	1608171.seq-06	
S16H083-CCB1	Calibration Blank	7	8/17/16 11:43			SUL	1608171.seq-07	
S16H083-SCV1	Secondary Cal Check	8	8/17/16 11:59	1634071		SUL	1608171.seq-08	

Sequence Comments

Reagents

Reagent #	Description
1634063	Anions, Eluent (4.5 mM Na2CO3/1.4 mM NaHCO3)

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ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	N/A	SEQUENCE #:	S16H083
BATCH #:	N/A	ANALYSIS:	Anions by Method 300.0 - ICS1100 ICAL

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
DOCUMENTATION	ANALYST: Bench sheet(s) attached? REVIEWER: Bench sheet(s) reviewed?	✔			
	ANALYST: Sequence log(s) attached? REVIEWER: Sequence log(s) reviewed?		Y	Y	
	ANALYST: Every run has a PDF in LIMS? REVIEWER: Every PDF reviewed?		Y	Y	
INITIAL CALIBRATION	Date of Initial Calibration used: If applicable, note date of "Last Update" in Comments.	08/17/16			
	Initial Calibration ID (LIMS number):	1608012			
	ICAL within QC criteria?		Y	Y	
	SCV within QC criteria?		Y	Y	
INSTRUMENT / QC CHECKS	Tune or degradation checks within QC criteria?	✔			
	CCV(s) within QC criteria?	✔			
	QLS(s) within QC criteria?	✔			
	CB(s) or storage blank(s) within QC criteria?		Y	Y	
	Other instrument checks within QC criteria? Specify if applicable.	✔			
BATCH QCs	Method blanks < 1/2 QL?	✔			
	LCS(s) or SRM(s) within QC criteria?	✔			
	MSs/MSDs and/or DUPs within QC criteria?	✔			
	Other method-specific QCs within QC criteria? Specify if applicable.	✔			

ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	N/A	SEQUENCE #:	S16H083
BATCH #:	N/A	ANALYSIS:	Anions by Method 300.0 - ICS1100 ICAL

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
IS / SS	Internal standards within QC criteria?	✔			
	Surrogates within QC criteria?	✔			
SAMPLE DATA	Were samples prepared & analyzed within holding time?	✔			
	If samples need to be re-run, were RE(s) made in LIMS?	✔			
	Do any samples need to be re-digested or re-extracted?	✔			
	Were all data qualifiers appropriately applied?	✔			
	Are problems, anomalies, discrepancies documented in LIMS? Specify if applicable.	✔			
MANUAL INT	Were manual integrations performed and documented? Specify if applicable.		Y	Y	

APPROVALS	ANALYST INITIALS & DATE:	SUL 08/17/16
	REVIEWED BY:	Osellie Salvador (affiliate) Digitally signed by Osellie Salvador (affiliate) Date: 2016.08.17 14:25:20 -07'00' SIGN HERE

COMMENTS

SEQUENCE DATA

S16H083

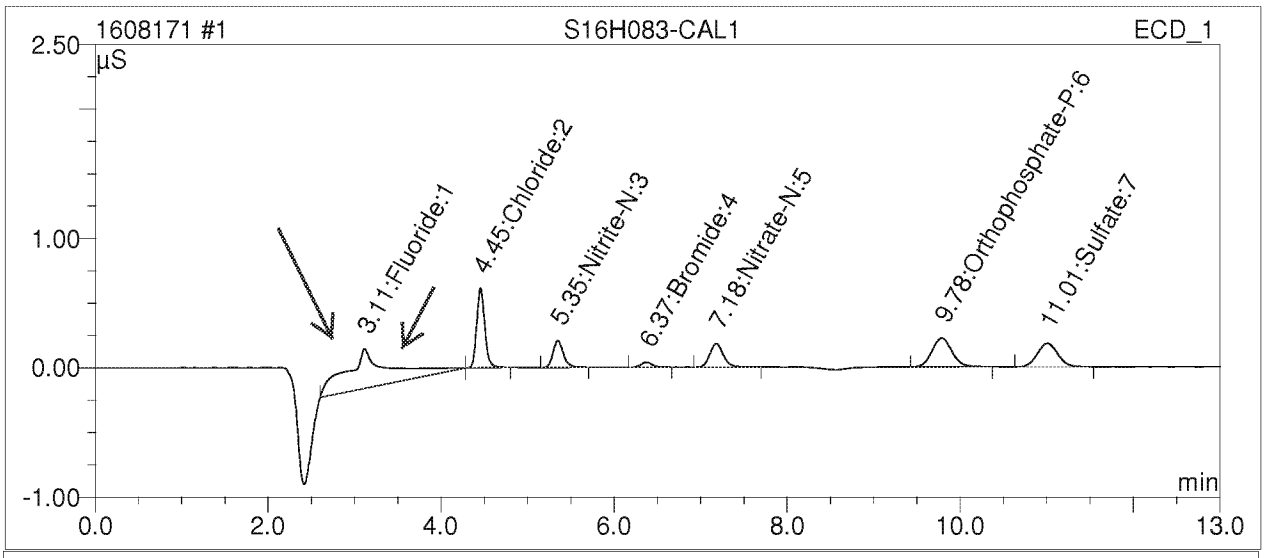
S16H083-CAL1

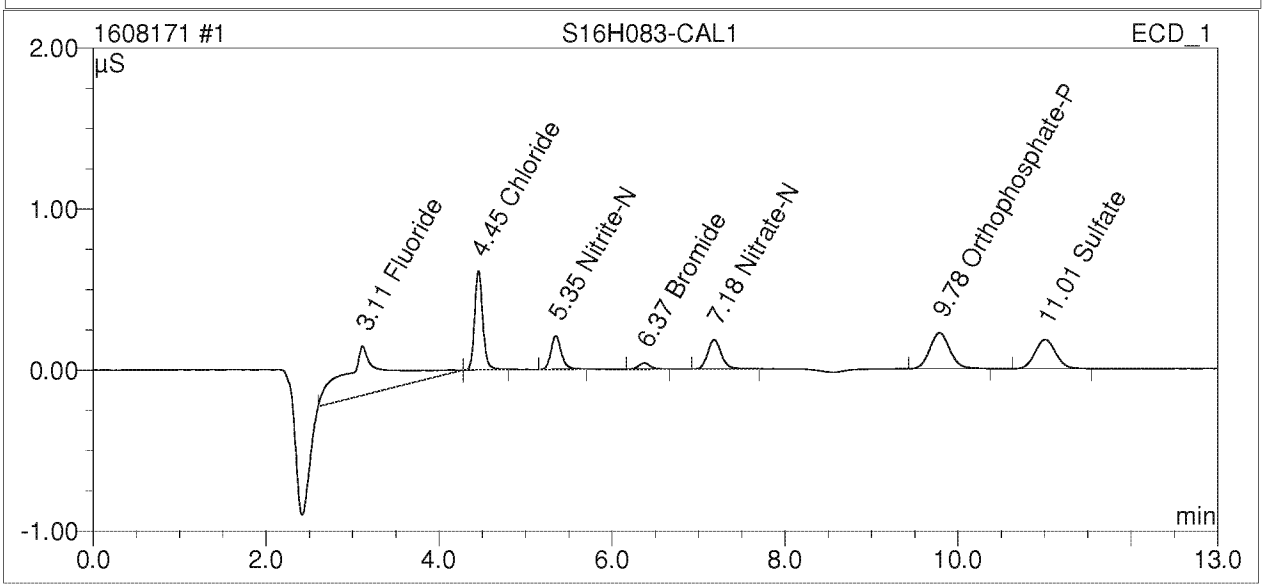
Before Manual Integration
Fronting and tailing

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	1
Sample Name:	S16H083-CAL1	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	1
Quantitation Method:	AnionsB	**Sample Type:**	standard
Date Time Collected:	8/17/2016 10:11 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.114	0.179	0.307	0.792	BMB
2	Chloride	4.454	0.067	0.613	0.435	bMB
3	Nitrite-N	5.347	0.029	0.208	0.089	BMB
4	Bromide	6.370	0.006	0.038	0.101	BMB
5	Nitrate-N	7.180	0.033	0.181	0.092	BMB
6	Orthophosphate-P	9.784	0.060	0.223	0.478	BMB
7	Sulfate	11.007	0.050	0.182	0.489	BMB





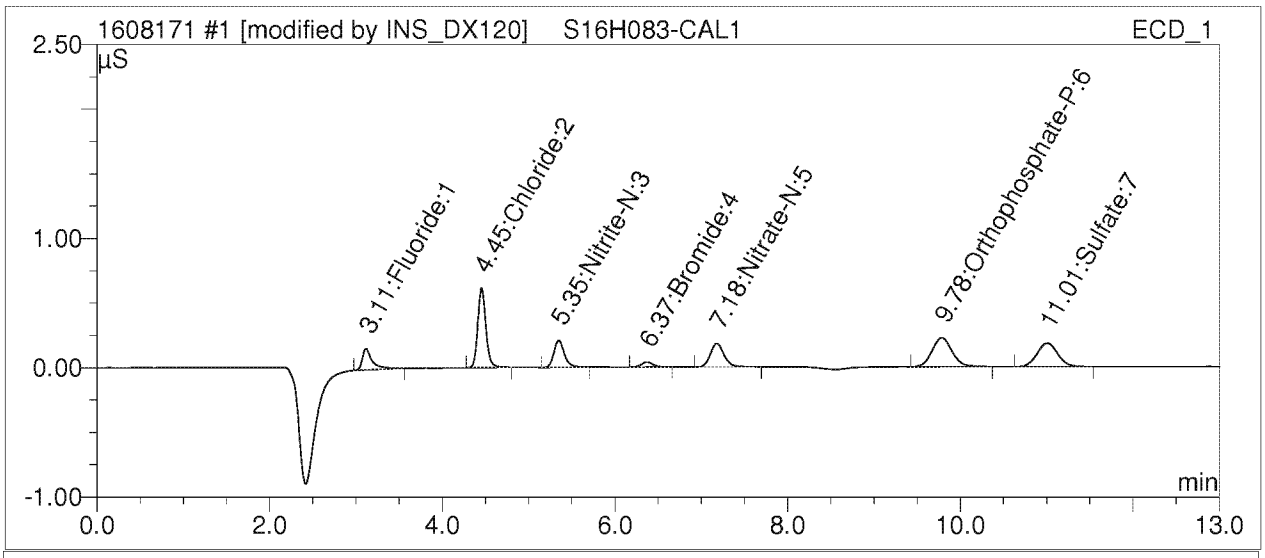
Current date: 8/17/2016
Current time: 12:23 PM
6.80 SR10 Build 2818 (166959)

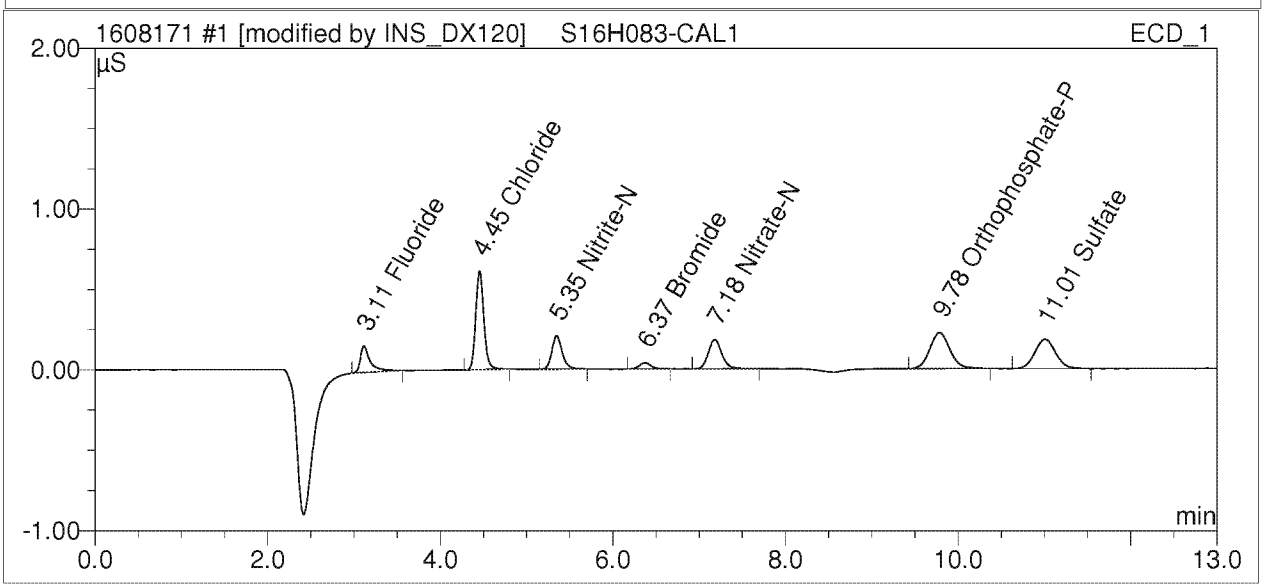
M.I. Performed By:	M.I. Approved By:
SUL at 12:35 pm, Aug 17, 201	OS at 2:17 pm, Aug 17, 2016

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	1
Sample Name:	S16H083-CAL1	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	1
Quantitation Method:	AnionsB	**Sample Type:**	standard
Date Time Collected:	8/17/2016 10:11 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.114	0.022	0.165	0.101	BMB*
2	Chloride	4.454	0.067	0.613	0.435	BMB*
3	Nitrite-N	5.347	0.029	0.208	0.089	BMB
4	Bromide	6.370	0.006	0.038	0.101	BMB
5	Nitrate-N	7.180	0.033	0.181	0.092	BMB
6	Orthophosphate-P	9.784	0.060	0.223	0.478	BMB
7	Sulfate	11.007	0.050	0.182	0.489	BMB





Current date: 8/17/2016
Current time: 12:34 PM
6.80 SR10 Build 2818 (166959)

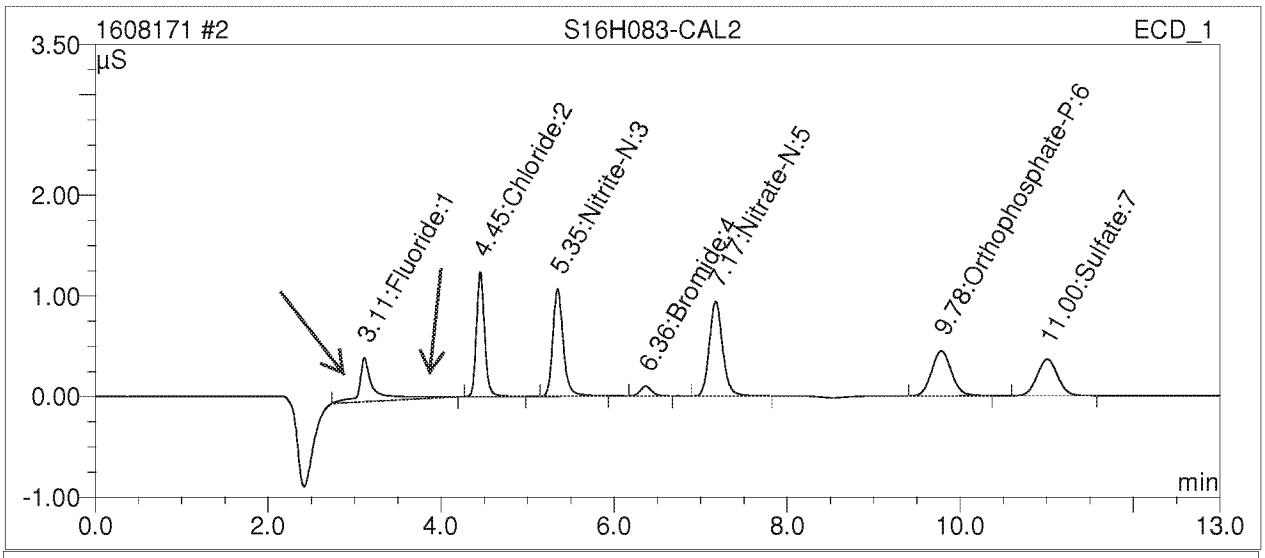
S16H083-CAL2

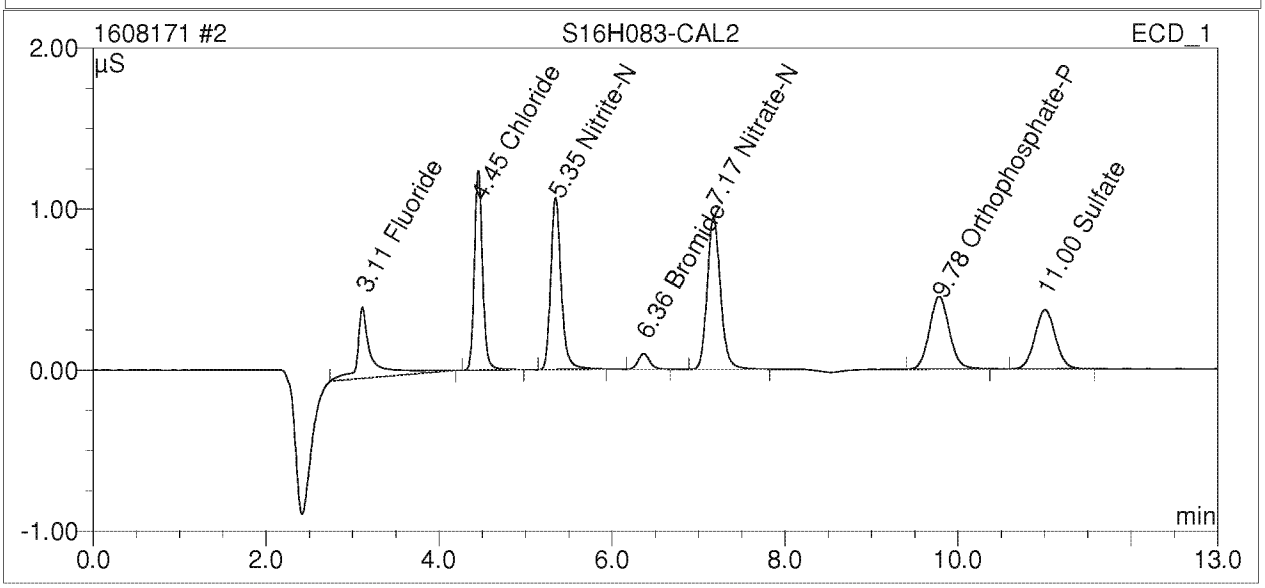
Before Manual Integration
Fronting and tailing

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	2
Sample Name:	S16H083-CAL2	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	2
Quantitation Method:	AnionsB	**Sample Type:**	standard
Date Time Collected:	8/17/2016 10:26 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.114	0.085	0.441	0.379	BMB
2	Chloride	4.454	0.135	1.240	0.882	BMB
3	Nitrite-N	5.347	0.150	1.068	0.457	BMB
4	Bromide	6.364	0.015	0.097	0.253	BMB
5	Nitrate-N	7.174	0.168	0.940	0.465	BMB
6	Orthophosphate-P	9.780	0.119	0.449	0.950	BMB
7	Sulfate	11.004	0.101	0.367	0.977	BMB





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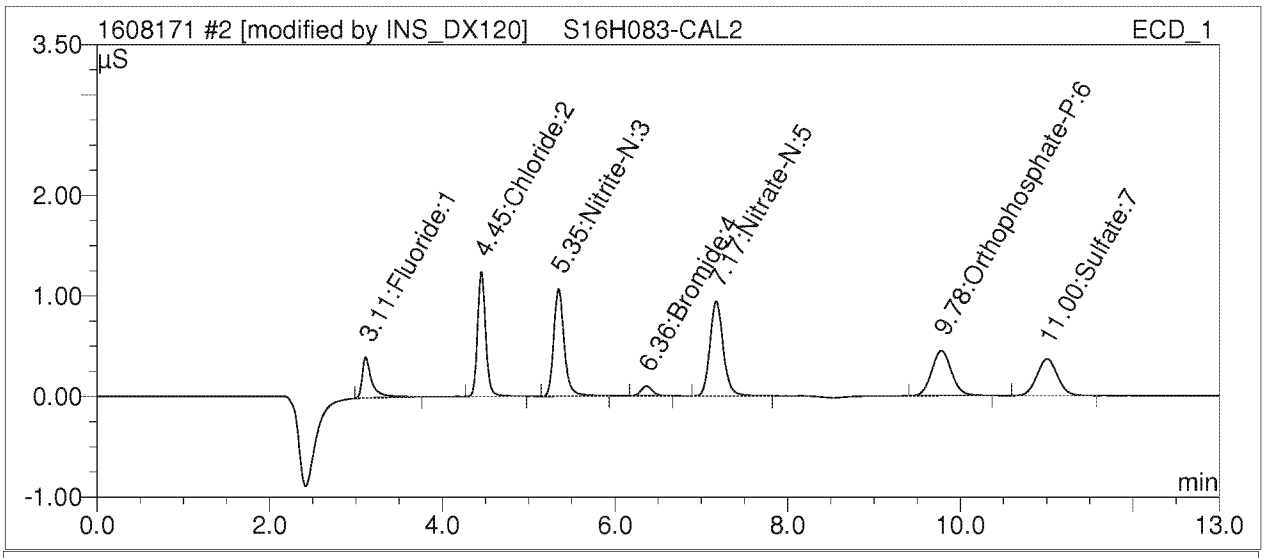
6.80 SR10 Build 2818 (166959)

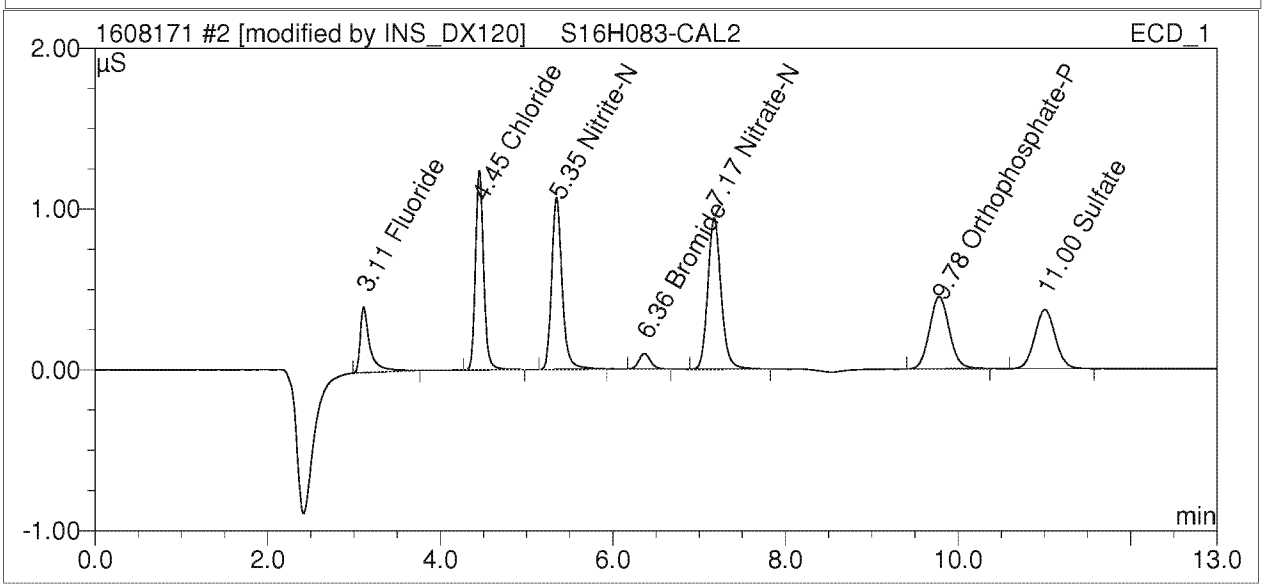
M.I. Performed By:	M.I. Approved By:
SUL at 12:35 pm, Aug 17, 201	OS at 2:18 pm, Aug 17, 2016

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	2
Sample Name:	S16H083-CAL2	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	2
Quantitation Method:	AnionsB	**Sample Type:**	standard
Date Time Collected:	8/17/2016 10:26 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.114	0.053	0.406	0.245	BMB*
2	Chloride	4.454	0.135	1.240	0.882	BMB
3	Nitrite-N	5.347	0.150	1.068	0.457	BMB
4	Bromide	6.364	0.015	0.097	0.253	BMB
5	Nitrate-N	7.174	0.168	0.940	0.465	BMB
6	Orthophosphate-P	9.780	0.119	0.449	0.950	BMB
7	Sulfate	11.004	0.101	0.367	0.977	BMB





Current date: 8/17/2016
Current time: 12:35 PM
6.80 SR10 Build 2818 (166959)

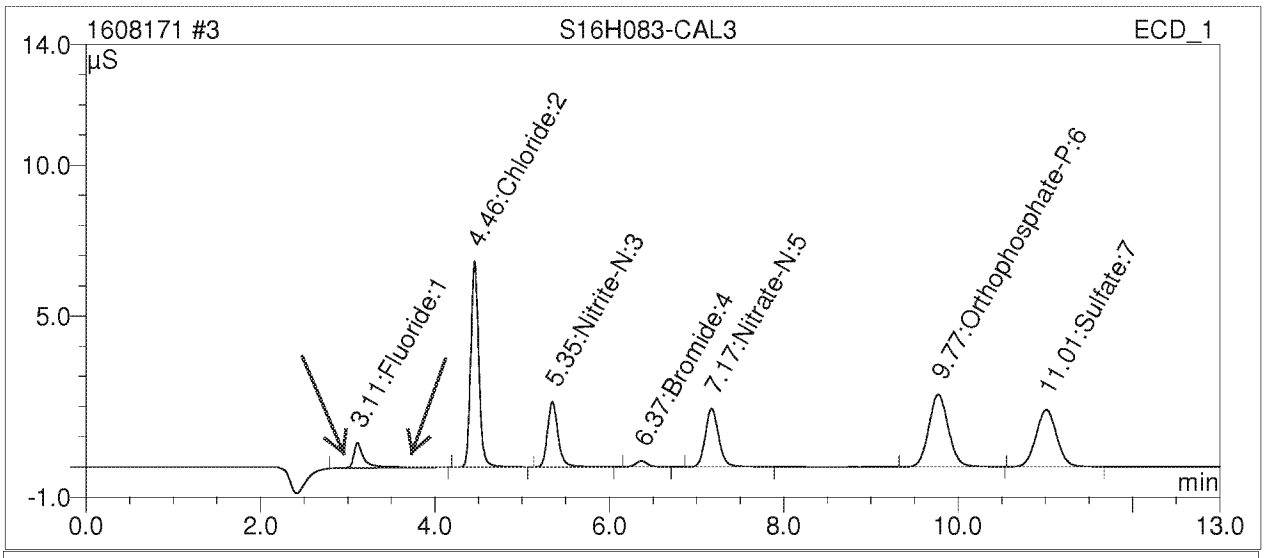
S16H083-CAL3

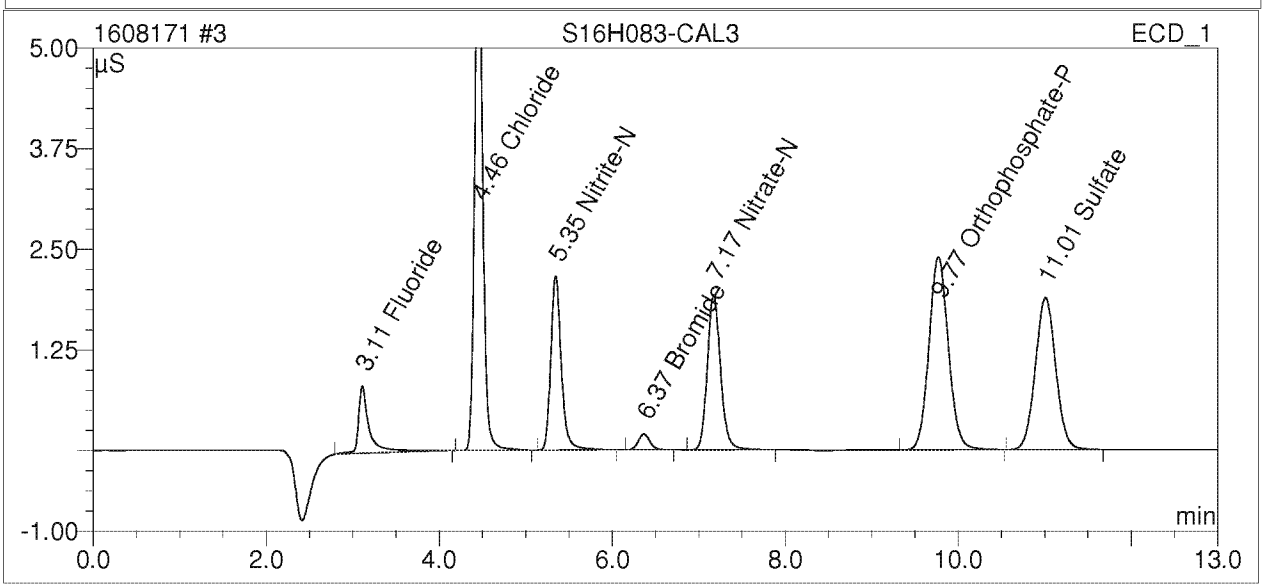
Before Manual Integration
Fronting and tailing

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	3
Sample Name:	S16H083-CAL3	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	3
Quantitation Method:	AnionsB	**Sample Type:**	standard
Date Time Collected:	8/17/2016 10:42 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.110	0.123	0.839	0.548	BMB
2	Chloride	4.457	0.728	6.809	4.643	BMB
3	Nitrite-N	5.347	0.304	2.160	0.925	BMB
4	Bromide	6.367	0.030	0.195	0.510	BMB
5	Nitrate-N	7.173	0.342	1.928	0.938	BMB
6	Orthophosphate-P	9.770	0.624	2.396	4.848	BMB
7	Sulfate	11.010	0.518	1.890	4.939	BMB





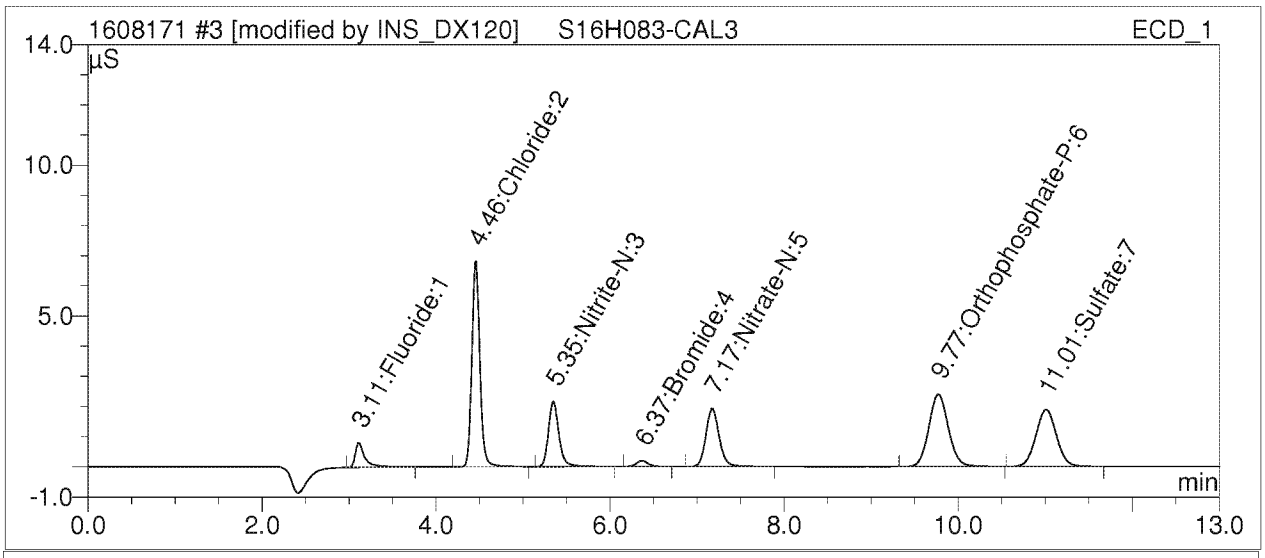
Current date: 8/17/2016
Current time: 12:26 PM
6.80 SR10 Build 2818 (166959)

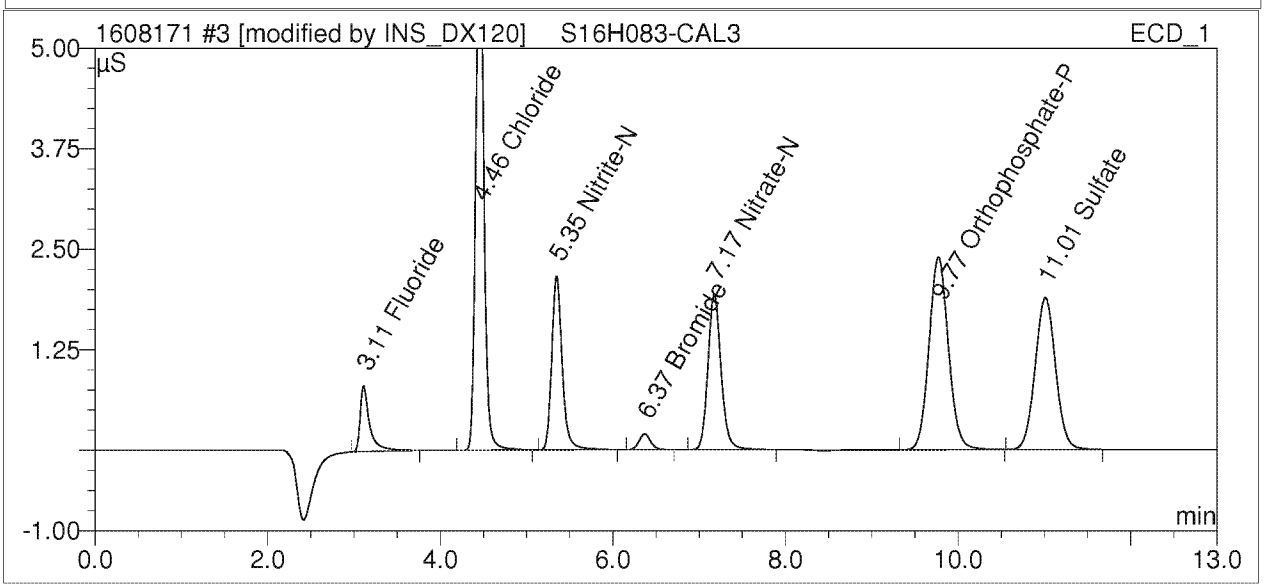
M.I. Performed By:	M.I. Approved By:
SUL at 12:36 pm, Aug 17, 201	OS at 2:19 pm, Aug 17, 2016

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	3
Sample Name:	S16H083-CAL3	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	3
Quantitation Method:	AnionsB	**Sample Type:**	standard
Date Time Collected:	8/17/2016 10:42 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.110	0.105	0.819	0.484	BMB*
2	Chloride	4.457	0.728	6.809	4.643	BMB
3	Nitrite-N	5.347	0.304	2.160	0.925	BMB
4	Bromide	6.367	0.030	0.195	0.510	BMB
5	Nitrate-N	7.173	0.342	1.928	0.938	BMB
6	Orthophosphate-P	9.770	0.624	2.396	4.848	BMB
7	Sulfate	11.010	0.518	1.890	4.939	BMB





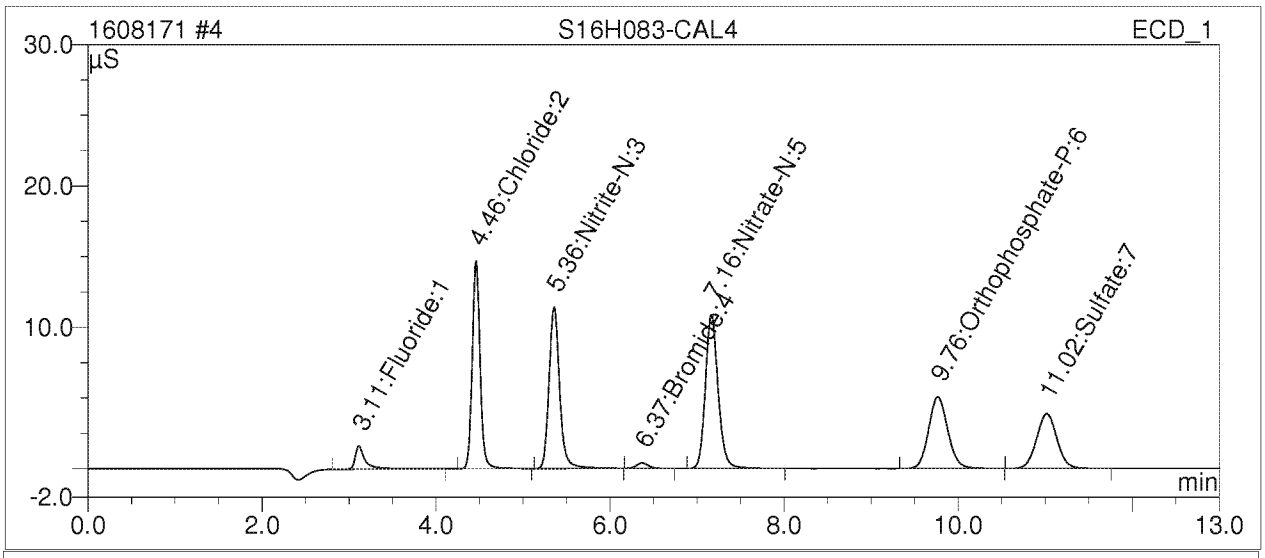
Current date: 8/17/2016
Current time: 12:36 PM
6.80 SR10 Build 2818 (166959)

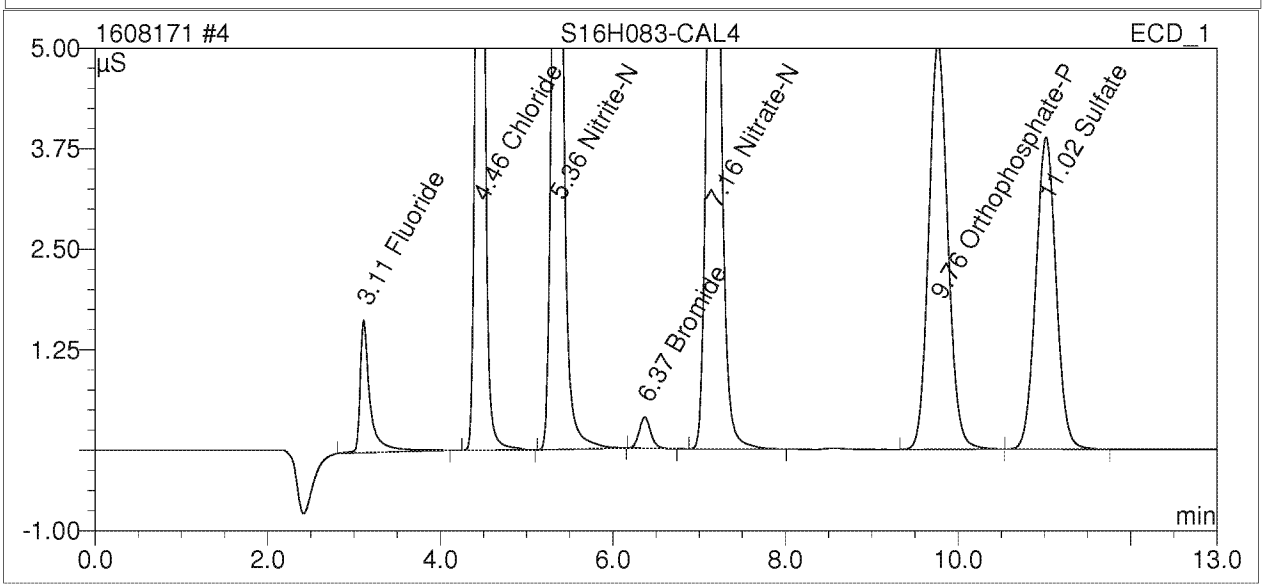
S16H083-CAL4

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	4
Sample Name:	S16H083-CAL4	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	4
Quantitation Method:	AnionsB	**Sample Type:**	standard
Date Time Collected:	8/17/2016 10:57 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.114	0.222	1.648	1.021	BMB
2	Chloride	4.460	1.540	14.696	9.569	BMB
3	Nitrite-N	5.357	1.617	11.426	4.853	BMB
4	Bromide	6.367	0.059	0.385	0.994	BMB
5	Nitrate-N	7.164	1.849	10.865	4.851	BMB
6	Orthophosphate-P	9.764	1.296	5.064	9.786	BMB
7	Sulfate	11.017	1.054	3.877	9.883	BMB





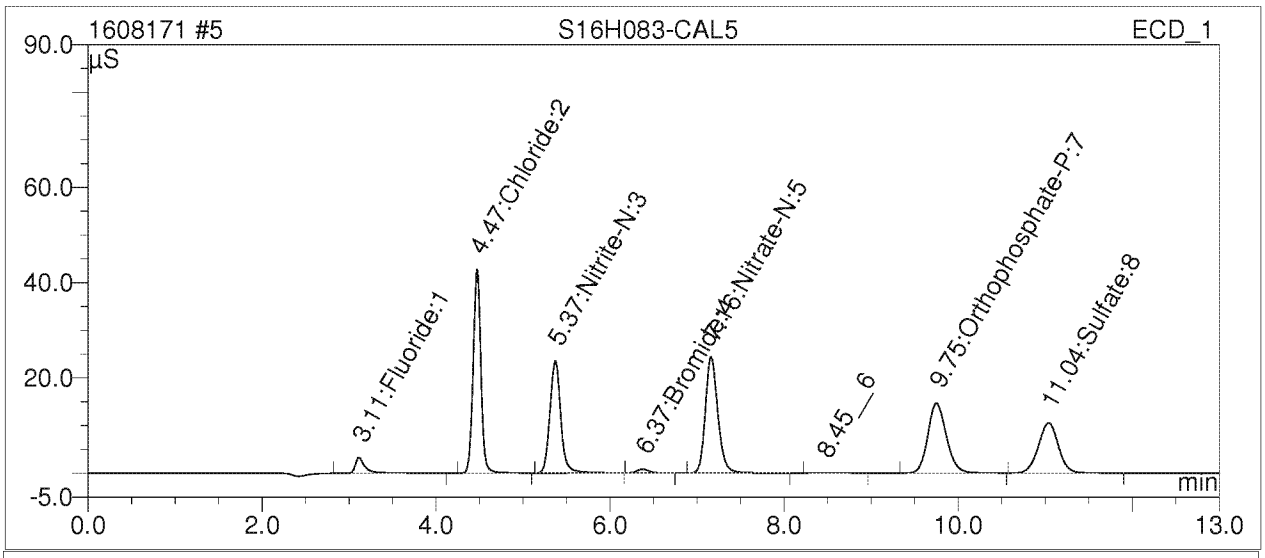
Current date: 8/17/2016
Current time: 12:36 PM
6.80 SR10 Build 2818 (166959)

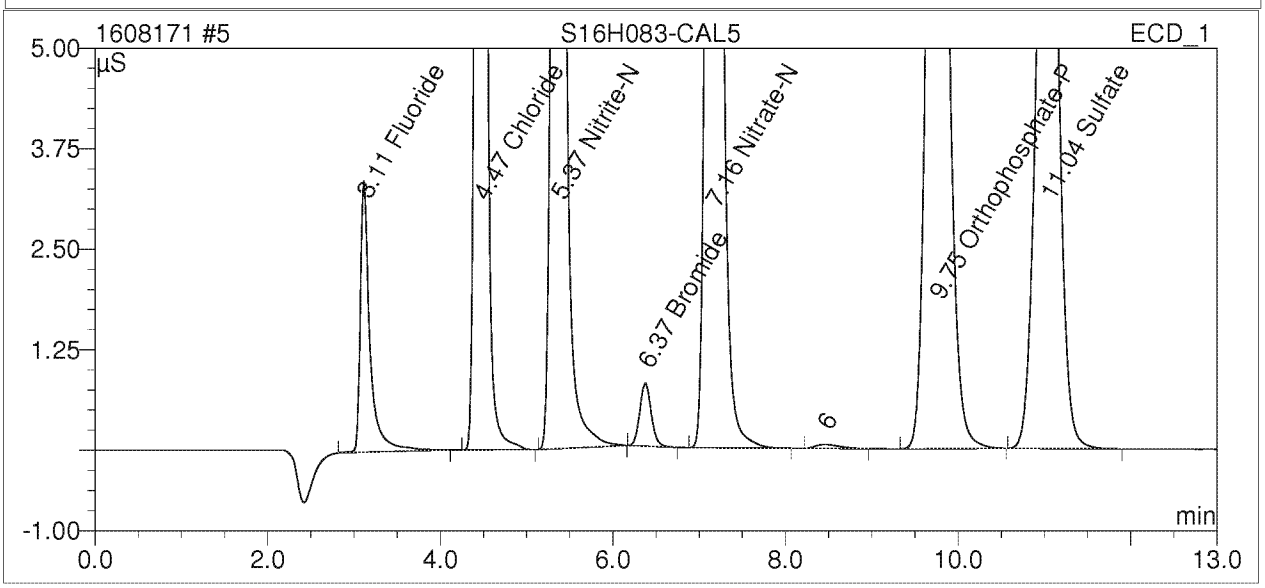
S16H083-CAL5

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	5
Sample Name:	S16H083-CAL5	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	5
Quantitation Method:	AnionsB	**Sample Type:**	standard
Date Time Collected:	8/17/2016 11:13 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.113	0.438	3.371	1.994	BMB
2	Chloride	4.473	4.414	42.816	25.355	BMB
3	Nitrite-N	5.370	3.432	23.584	10.109	BMB
4	Bromide	6.373	0.120	0.782	2.000	BMB
5	Nitrate-N	7.160	4.073	24.424	10.100	BMB
7	Orthophosphate-P	9.750	3.621	14.648	25.166	BMB
8	Sulfate	11.040	2.812	10.564	25.090	BMB



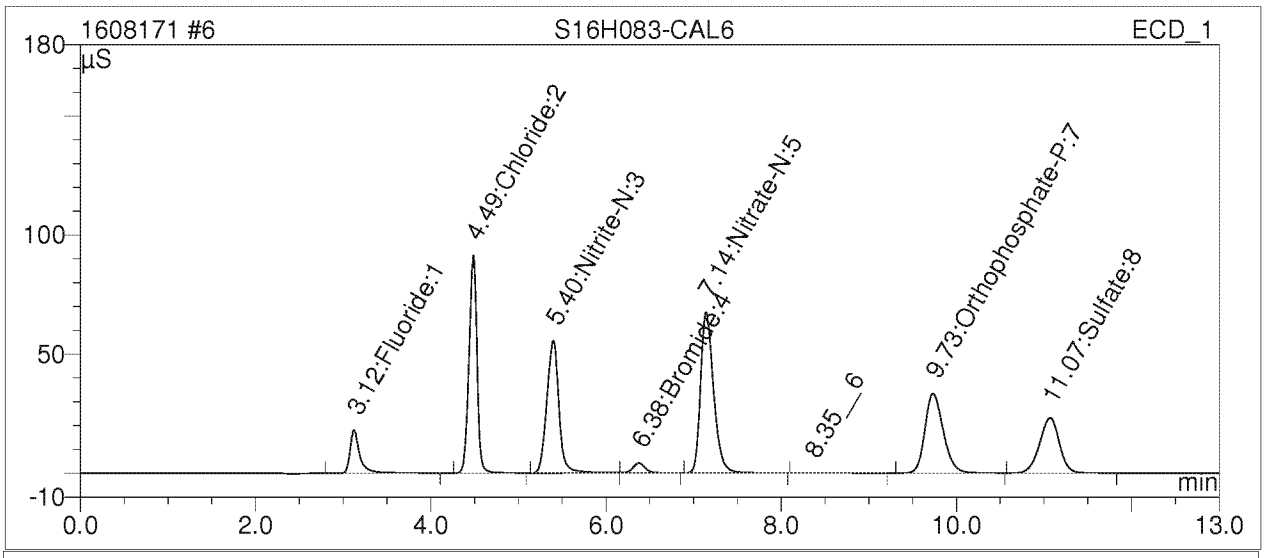


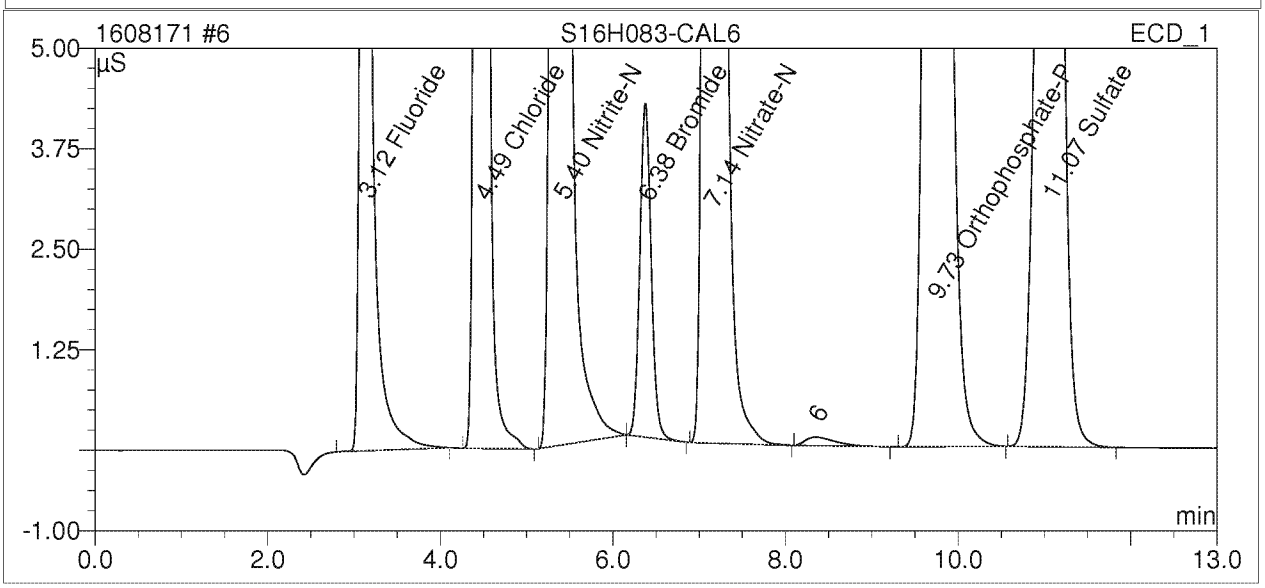
S16H083-CAL6

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	6
Sample Name:	S16H083-CAL6	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	6
Quantitation Method:	AnionsB	**Sample Type:**	standard
Date Time Collected:	8/17/2016 11:28 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.124	2.338	18.147	10.000	BMB
2	Chloride	4.487	9.723	91.465	49.942	BMB
3	Nitrite-N	5.400	8.927	55.604	24.989	BMB
4	Bromide	6.377	0.633	4.153	10.000	BMB
5	Nitrate-N	7.140	11.647	67.472	24.992	BMB
7	Orthophosphate-P	9.730	8.114	33.384	49.973	BMB
8	Sulfate	11.067	6.044	23.208	49.985	BMB





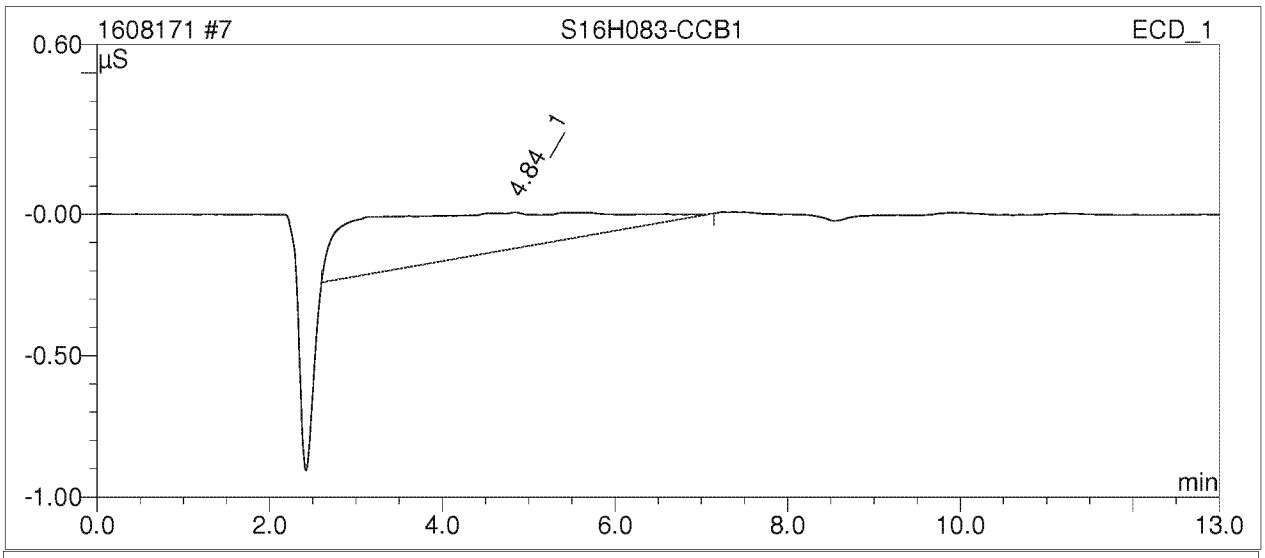
S16H083-CCB1

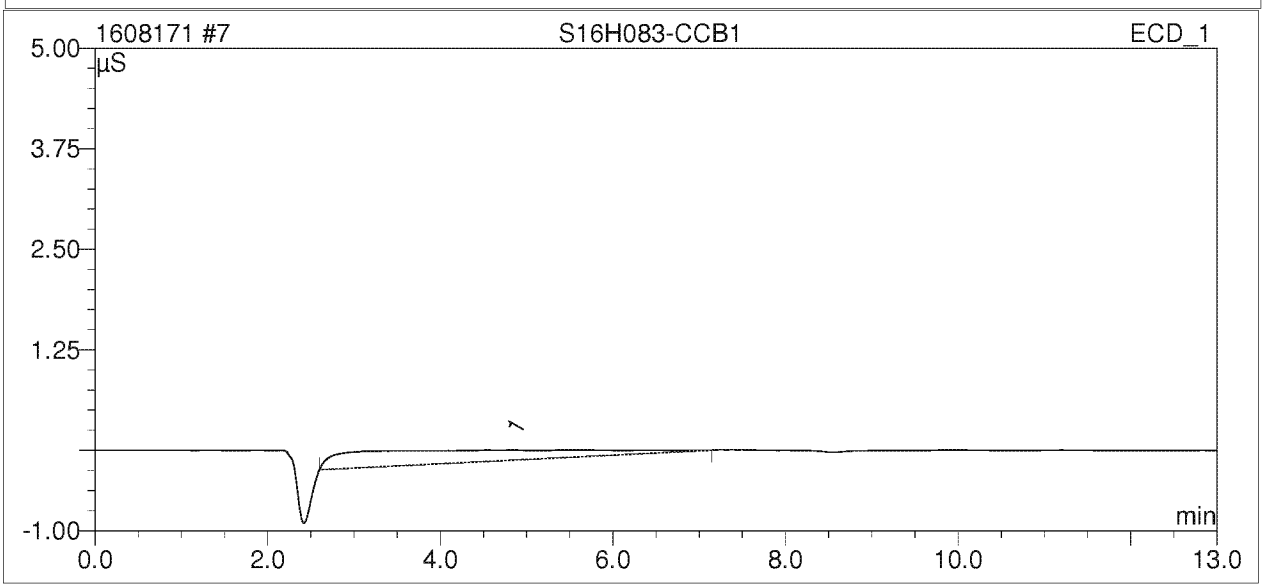
Before Manual Integration
Not a peak

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	7
Sample Name:	S16H083-CCB1	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	7
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	8/17/2016 11:43 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type





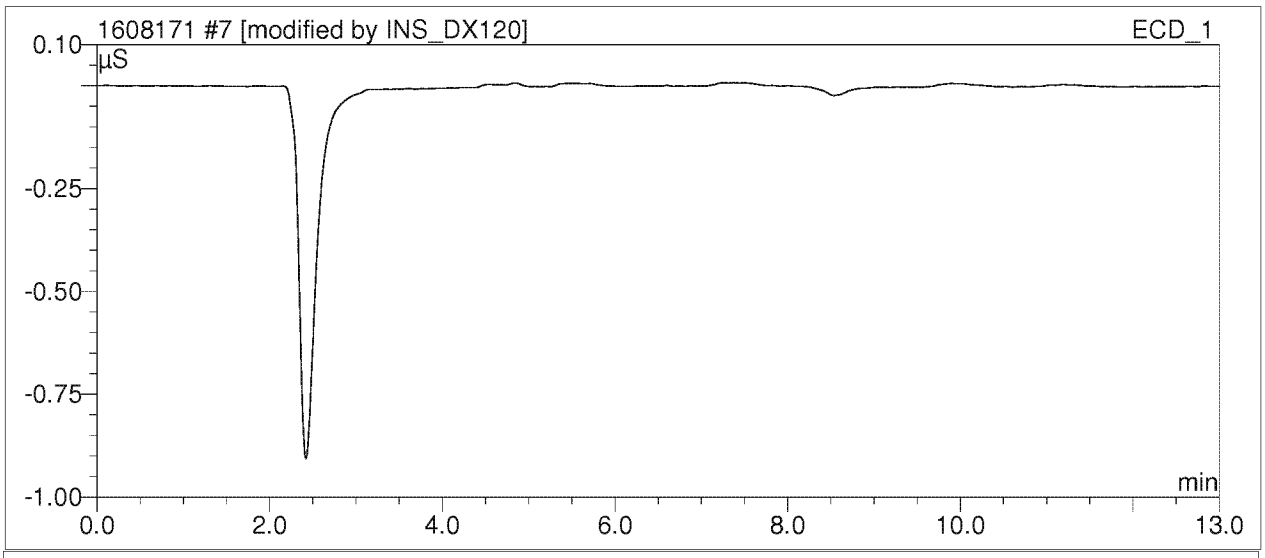
Current date: 8/17/2016
Current time: 12:41 PM
6.80 SR10 Build 2818 (166959)

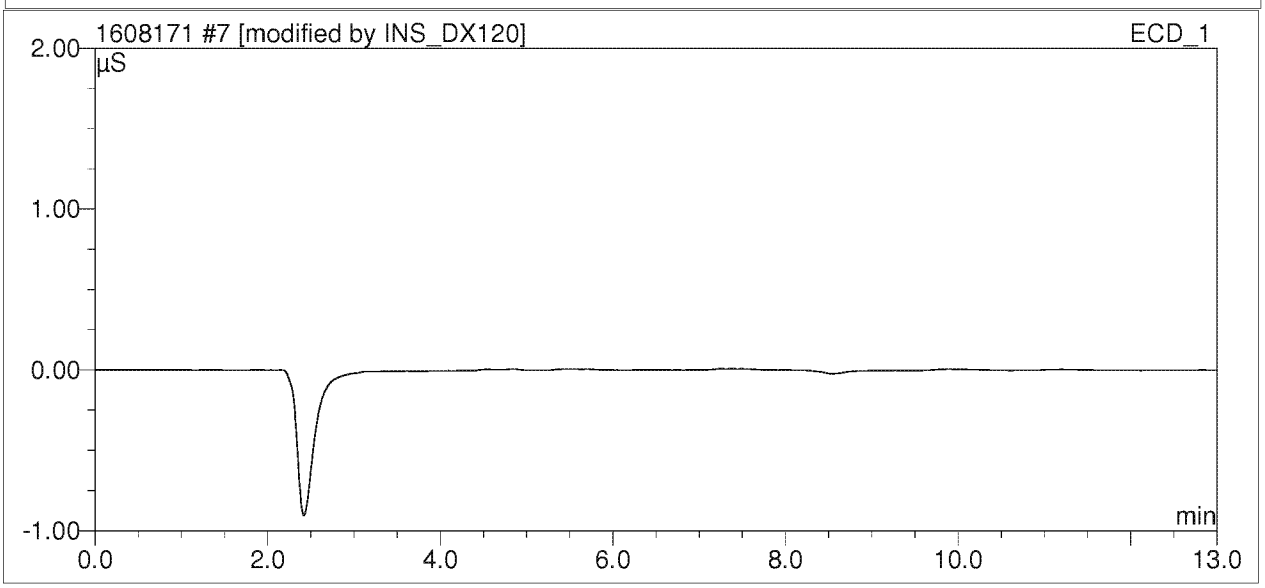
M.I. Performed By:	M.I. Approved By:
SUL at 12:43 pm, Aug 17, 201	OS at 3:16 pm, Oct 07, 2016

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	7
Sample Name:	S16H083-CCB1	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	7
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	8/17/2016 11:43 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type





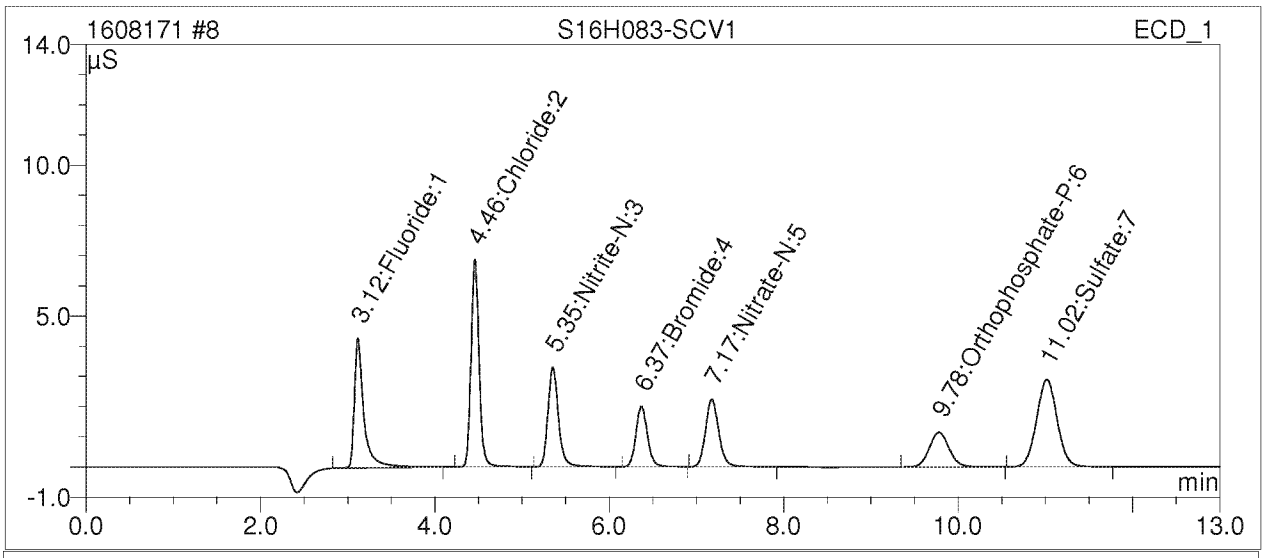
Current date: 8/17/2016
Current time: 12:43 PM
6.80 SR10 Build 2818 (166959)

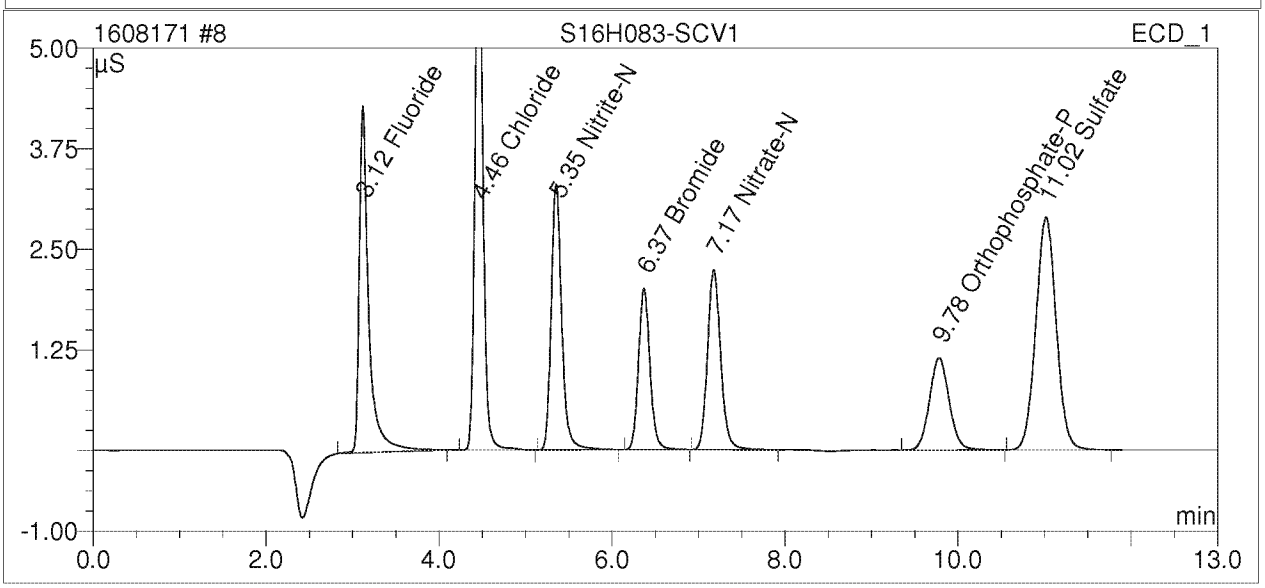
S16H083-SCV1

Sample Analysis Report

Sequence Name:	1608171	**Position No.:**	8
Sample Name:	S16H083-SCV1	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	8
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	8/17/2016 11:59 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.117	0.544	4.303	2.471	BMB
2	Chloride	4.460	0.734	6.871	4.680	BMB
3	Nitrite-N	5.354	0.465	3.305	1.413	BMB
4	Bromide	6.367	0.308	2.003	5.026	BMB
5	Nitrate-N	7.174	0.395	2.235	1.081	BMB
6	Orthophosphate-P	9.780	0.302	1.146	2.383	BMB
7	Sulfate	11.017	0.791	2.890	7.472	BMB





Current date: 8/17/2016
Current time: 12:43 PM
6.80 SR10 Build 2818 (166959)

SEQUENCE

S16L001

Sequence: 1612011
Operator: INS_DX120
Printed: 12/2/2016 9:08:57 AM

Title:
Datasource: 9LI207HWFM51_local
Location: Room207\ICS1100_Anions\2016\Data
Timebase: ICS1100
#Samples: 46

REVIEWED
By OS at 12:15 pm, Dec 02, 2016

Created: 12/1/2016 6:56:26 AM by INS_DX120
Last Update: 12/2/2016 8:59:15 AM by INS_DX120

No.	Name	Pos.	Type	Std. Add. Group	Inj. Vol.	Method	Program	Status	Inj. Date/Time	Comment
1	S16H083-CAL1	1	Standard	1634065	25.0	AnionsB	ICS1100	Finished	8/17/2016 10:11:28 AM	SUL
2	S16H083-CAL2	2	Standard	1634066	25.0	AnionsB	ICS1100	Finished	8/17/2016 10:26:52 AM	SUL
3	S16H083-CAL3	3	Standard	1634067	25.0	AnionsB	ICS1100	Finished	8/17/2016 10:42:16 AM	SUL
4	S16H083-CAL4	4	Standard	1634068	25.0	AnionsB	ICS1100	Finished	8/17/2016 10:57:40 AM	SUL
5	S16H083-CAL5	5	Standard	1634069	25.0	AnionsB	ICS1100	Finished	8/17/2016 11:13:04 AM	SUL
6	S16H083-CAL6	6	Standard	1634070	25.0	AnionsB	ICS1100	Finished	8/17/2016 11:28:28 AM	SUL
7	S16H083-CCB1	7	Unknown	DI H2O	25.0	AnionsB	ICS1100	Finished	8/17/2016 11:43:52 AM	SUL
8	S16H083-SCV1	8	Unknown	1634071	25.0	AnionsB	ICS1100	Finished	8/17/2016 11:59:16 AM	SUL
9	S16L001-CCV1@B16L005-BS1	1	Unknown	1649108	25.0	AnionsB	ICS1100	Finished	12/1/2016 7:48:51 AM	SUL
10	S16L001-CCB1@B16L005-BLK1	2	Unknown	DI H2O	25.0	AnionsB	ICS1100	Finished	12/1/2016 8:04:16 AM	SUL
11	S16L001-CRL1	3	Unknown	1649109	25.0	AnionsB	ICS1100	Finished	12/1/2016 8:19:40 AM	SUL
12	B16L005-BLK2	4	Unknown	Filtered DI H2O	25.0	AnionsB	ICS1100	Finished	12/1/2016 8:35:04 AM	SUL
13	1611066-01@100X	5	Unknown	Filtered. 0.05+4.95mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 8:50:28 AM	SUL
14	1611066-02@100X	6	Unknown	Filtered. 0.05+4.95mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 9:05:53 AM	SUL
15	1611066-03@100X	7	Unknown	Filtered. 0.05+4.95mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 9:21:17 AM	SUL
16	1611066-04@100X	8	Unknown	Filtered. 0.05+4.95mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 9:36:41 AM	SUL
17	1611066-05@100X	9	Unknown	Filtered. 0.05+4.95mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 9:52:05 AM	SUL
18	B16L005-DUP1@100X	10	Unknown	1611066-03@100X	25.0	AnionsB	ICS1100	Finished	12/1/2016 10:07:29 AM	SUL
19	S16L001-CCV2	11	Unknown	1649108	25.0	AnionsB	ICS1100	Finished	12/1/2016 10:22:54 AM	SUL
20	S16L001-CCB2	12	Unknown	DI H2O	25.0	AnionsB	ICS1100	Finished	12/1/2016 10:38:18 AM	SUL
21	1611066-01RE1@10X	13	Unknown	Filtered. 0.5+4.5mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 10:53:42 AM	SUL
22	1611066-02RE1@10X	14	Unknown	Filtered. 0.5+4.5mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 11:09:06 AM	SUL
23	1611066-03RE1@10X	15	Unknown	Filtered. 0.5+4.5mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 11:24:30 AM	SUL
24	B16L005-DUP2@10X	16	Unknown	1611066-03RE1@10X	25.0	AnionsB	ICS1100	Finished	12/1/2016 11:39:54 AM	SUL
25	1611066-04RE1@20X	17	Unknown	Filtered. 0.25+4.75mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 11:55:19 AM	SUL
26	1611066-05RE1@10X	18	Unknown	Filtered. 0.5+4.5mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 12:10:43 PM	SUL
27	S16L001-CCV3	19	Unknown	1649108	25.0	AnionsB	ICS1100	Finished	12/1/2016 12:26:08 PM	SUL
28	S16L001-CCB3	20	Unknown	DI H2O	25.0	AnionsB	ICS1100	Finished	12/1/2016 12:41:32 PM	SUL
29	1612001-01@100X	21	Unknown	Filtered. 0.05+4.95mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 12:56:56 PM	SUL

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Sequence: 1612011
Operator: INS_DX120
Printed: 12/2/2016 9:08:58 AM

Title:
Datasource: 9LI207HWFM51_local
Location: Room207\ICS1100_Anions\2016\Data
Timebase: ICS1100
#Samples: 46

Created: 12/1/2016 6:56:26 AM by INS_DX120
Last Update: 12/2/2016 8:59:15 AM by INS_DX120

No.	Name	Pos.	Type	Std. Add. Group	Inj. Vol.	Method	Program	Status	Inj. Date/Time	Comment
30	1612001-02@100X	22	Unknown	Filtered. 0.05+4.95mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 1:12:20 PM	SUL
31	1612001-03@100X	23	Unknown	Filtered. 0.05+4.95mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 1:27:44 PM	SUL
32	1612001-04@100X	24	Unknown	Filtered. 0.05+4.95mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 1:43:09 PM	SUL
33	1612001-05@100X	25	Unknown	Filtered. 0.05+4.95mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 1:58:33 PM	SUL
34	B16L005-DUP3@100X	26	Unknown	1612001-01@100X	25.0	AnionsB	ICS1100	Finished	12/1/2016 2:13:57 PM	SUL
35	S16L001-CCV4	27	Unknown	1649108	25.0	AnionsB	ICS1100	Finished	12/1/2016 2:29:21 PM	SUL
36	S16L001-CCB4	28	Unknown	DI H2O	25.0	AnionsB	ICS1100	Finished	12/1/2016 2:44:45 PM	SUL
37	1612001-01RE1@5X	29	Unknown	Filtered. 1+4mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 3:00:10 PM	SUL
38	B16L005-DUP4@5X	30	Unknown	1612001-01RE1@5X	25.0	AnionsB	ICS1100	Finished	12/1/2016 3:15:34 PM	SUL
39	1612001-02RE1@10X	31	Unknown	Filtered. 0.5+4.5mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 3:30:58 PM	SUL
40	1612001-03RE1@20X	32	Unknown	Filtered. 0.25+4.75mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 3:46:22 PM	SUL
41	1612001-04RE1@20X	33	Unknown	Filtered. 0.25+4.75mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 4:01:46 PM	SUL
42	1612001-04RE2@10X	34	Unknown	Filtered. 0.5+4.5mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 4:17:10 PM	SUL
43	1612001-05RE1@20X	35	Unknown	Filtered. 0.25+4.75mL	25.0	AnionsB	ICS1100	Finished	12/1/2016 4:32:34 PM	SUL
44	S16L001-CCV5	36	Unknown	1649108	25.0	AnionsB	ICS1100	Finished	12/1/2016 4:47:58 PM	SUL
45	S16L001-CCB5	37	Unknown	DI H2O	25.0	AnionsB	ICS1100	Finished	12/1/2016 5:03:23 PM	SUL
46	END	38	Unknown		25.0	AnionsB	ICS1100STOP	Finished	12/1/2016 5:18:47 PM	SUL

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Current Retention Time window for ICS1100

Anion Calibration on 08/17/16 (Ret. Time Window based on 5% of ICAL Standard S4)

No.	Peak Name	S4 Ret. Time (min)	% Window	Min. Ret. Time (min)	Max. Ret. Time (min)	Cal Type
1	**Fluoride**	3.114	5	2.958	3.270	Quadratic
2	**Chloride**	4.460	5	4.237	4.683	Quadratic
3	**Nitrite-N**	5.357	5	5.089	5.625	Quadratic
4	**Bromide**	6.367	5	6.049	6.685	Quadratic
5	**Nitrate-N**	7.164	5	6.806	7.522	Quadratic
6	**Orthophosphate-P**	9.764	5	9.276	10.252	Quadratic
7	**Sulfate**	11.017	5	10.466	11.568	Quadratic

5% Ret. Time Window against the initial CCV on 12/01/16

No.	Peak Name	First CCV Ret. Time (min)	% Window	Min. Ret. Time (min)	Max. Ret. Time (min)	Cal Type
1	**Fluoride**	3.107	5	2.952	3.262	Quadratic
2	**Chloride**	4.414	5	4.193	4.635	Quadratic
3	**Nitrite-N**	5.277	5	5.013	5.541	Quadratic
4	**Bromide**	6.240	5	5.928	6.552	Quadratic
5	**Nitrate-N**	6.997	5	6.647	7.347	Quadratic
6	**Orthophosphate-P**	9.500	5	9.025	9.975	Quadratic
7	**Sulfate**	10.777	5	10.238	11.316	Quadratic

Method File: AnionsB
Operator: INS_DX120
Printed: 12/1/2016 1:05:12 PM

Title:
Datasource: 9LI207HWFM51_local
Location: Room207\ICS1100_Anions\2016\Data\1612011.SEQ
Created: 10/18/2004 3:01:27 PM by ins_dx120
Last Update: 12/1/2016 1:04:34 PM by INS_DX120

Peak Table:

Use Recently Detected Retention Times: Off
Peak Retention Time Determination: Absolute
Dead time:
Delay Time of 2'nd Detector: <None>
Delay Time of 3'rd Detector: <None>

No.	Peak Name	Ret.Time	Window	Comment	Amount S16H083-CAL1	Amount S16H083-CAL2	Amount S16H083-CAL3	Amount S16H083-CAL4	Amount S16H083-CAL5	Amount S16H083-CAL6
1	*Fluoride*	*3.107 min*	*5.000 RN*	*Autogenerated*	*0.100000*	*0.250000*	*0.500000*	*1.000000*	*2.000000*	*10.000000*
2	Chloride	4.414 min	5.000 RG	Autogenerated	0.500000	1.000000	5.000000	10.000000	25.000000	50.000000
3	Nitrite-N	5.277 min	5.000 RN	Autogenerated	0.100000	0.500000	1.000000	5.000000	10.000000	25.000000
4	Bromide	6.240 min	5.000 RN	Autogenerated	0.100000	0.250000	0.500000	1.000000	2.000000	10.000000
5	Nitrate-N	6.997 min	5.000 RN	Autogenerated	0.100000	0.500000	1.000000	5.000000	10.000000	25.000000
6	Orthophosphate-P	9.500 min	5.000 RN	Autogenerated	0.500000	1.000000	5.000000	10.000000	25.000000	50.000000
7	Sulfate	10.777 min	5.000 RN	Autogenerated	0.500000	1.000000	5.000000	10.000000	25.000000	50.000000

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Analysis Sequence

S16L001

Project: R17S19
Analysis: Anions

Instrument: ICS1100 **Calibration ID:** 1608012 Printed: 12/02/2016 10:58 am

Lab Number	Sample Name	Order	Analyzed Date	STD ID	ISTD ID	Sequenced By	File ID	Comments
S16L001-CCV1	Calibration Verification	1	12/1/16 7:48	1649108		SUL	1612011.seq-09	
B16L005-BS1	LCS	2	12/1/16 7:48			SUL	1612011.seq-01	
S16L001-CCB1	Calibration Blank	3	12/1/16 8:04			SUL	1612011.seq-10	
B16L005-BLK1	Blank	4	12/1/16 8:04			SUL	1612011.seq-02	
S16L001-CRL1	MRL Check	5	12/1/16 8:19	1649109		SUL	1612011.seq-11	
B16L005-BLK2	Blank	6	12/1/16 8:35			SUL	1612011.seq-12	
1611066-01 A	JWMW-11A-1116	7	12/1/16 8:50			SUL	1612011.seq-13	100X
1611066-02 A	JWMW-11B-1116	8	12/1/16 9:05			SUL	1612011.seq-14	100X
1611066-03 A	JWMW-11C-1116	9	12/1/16 9:21			SUL	1612011.seq-15	100X
1611066-04 A	JWMW-12-1116	10	12/1/16 9:36			SUL	1612011.seq-16	100X
1611066-05 A	JWMW-911B-1116	11	12/1/16 9:52			SUL	1612011.seq-17	100X
B16L005-DUP1	Duplicate	12	12/1/16 10:07			SUL	1612011.seq-18	
S16L001-CCV2	Calibration Verification	13	12/1/16 10:22	1649108		SUL	1612011.seq-19	
S16L001-CCB2	Calibration Blank	14	12/1/16 10:38			SUL	1612011.seq-20	
1611066-01RE1 A	JWMW-11A-1116	15	12/1/16 10:53			SUL	1612011.seq-21	10X
1611066-02RE1 A	JWMW-11B-1116	16	12/1/16 11:09			SUL	1612011.seq-22	10X
1611066-03RE1 A	JWMW-11C-1116	17	12/1/16 11:24			SUL	1612011.seq-23	10X
B16L005-DUP2	Duplicate	18	12/1/16 11:39			SUL	1612011.seq-24	
1611066-04RE1 A	JWMW-12-1116	19	12/1/16 11:55			SUL	1612011.seq-25	20X
1611066-05RE1 A	JWMW-911B-1116	20	12/1/16 12:10			SUL	1612011.seq-26	10X
S16L001-CCV3	Calibration Verification	21	12/1/16 12:26	1649108		SUL	1612011.seq-27	
S16L001-CCB3	Calibration Blank	22	12/1/16 12:41			SUL	1612011.seq-28	

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Analysis Sequence

S16L001

(Continued)

Project: R17S19
Analysis: Anions

Instrument: ICS1100 **Calibration ID:** 1608012 Printed: 12/02/2016 10:58 am

Lab Number	Sample Name	Order	Analyzed Date	STD ID	ISTD ID	Sequenced By	File ID	Comments
1612001-01 A	JWMW-05-1116	23	12/1/16 12:56			SUL	1612011.seq-29	100X
1612001-02 A	JWMW-08A-1116	24	12/1/16 13:12			SUL	1612011.seq-30	100X
1612001-03 A	JWMW-08B-1116	25	12/1/16 13:27			SUL	1612011.seq-31	100X
1612001-04 A	JWMW-08C-1116	26	12/1/16 13:43			SUL	1612011.seq-32	100X
1612001-05 A	JWMW-98B-1116	27	12/1/16 13:58			SUL	1612011.seq-33	100X
B16L005-DUP3	Duplicate	28	12/1/16 14:13			SUL	1612011.seq-34	
S16L001-CCV4	Calibration Verification	29	12/1/16 14:29	1649108		SUL	1612011.seq-35	
S16L001-CCB4	Calibration Blank	30	12/1/16 14:44			SUL	1612011.seq-36	
1612001-01RE1 A	JWMW-05-1116	31	12/1/16 15:00			SUL	1612011.seq-37	5X
B16L005-DUP4	Duplicate	32	12/1/16 15:15			SUL	1612011.seq-38	
1612001-02RE1 A	JWMW-08A-1116	33	12/1/16 15:30			SUL	1612011.seq-39	10X
1612001-03RE1 A	JWMW-08B-1116	34	12/1/16 15:46			SUL	1612011.seq-40	20X
1612001-04RE1 A	JWMW-08C-1116	35	12/1/16 16:01			SUL	1612011.seq-41	20X
1612001-04RE2 A	JWMW-08C-1116	36	12/1/16 16:17			SUL	1612011.seq-42	10X
1612001-05RE1 A	JWMW-98B-1116	37	12/1/16 16:32			SUL	1612011.seq-43	20X
S16L001-CCV5	Calibration Verification	38	12/1/16 16:47	1649108		SUL	1612011.seq-44	
S16L001-CCB5	Calibration Blank	39	12/1/16 17:03			SUL	1612011.seq-45	

Sequence Comments

Analysis Sequence

S16L001

(Continued)

Project: R17S19
Analysis: Anions

Instrument: ICS1100 **Calibration ID:** 1608012 Printed: 12/02/2016 10:58 am

Lab Number	Sample Name	Order	Analyzed Date	STD ID	ISTD ID	Sequenced By	File ID	Comments

Reagents

Reagent #	Description
1649110	Anions, Eluent (4.5 mM Na2CO3/1.4 mM NaHCO3)

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Page 80 of 324 1611066 DATA_PKG (Rev0).PDF 12/23/16 13:25:24

ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	B16L005	SEQUENCE #:	S16L001
BATCH #:	N/A	ANALYSIS:	Anions by Method 300.0

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
DOCUMENTATION	ANALYST: Bench sheet(s) attached? REVIEWER: Bench sheet(s) reviewed?	☐	Y	Y	
	ANALYST: Sequence log(s) attached? REVIEWER: Sequence log(s) reviewed?	☐	Y	Y	
	ANALYST: Every run has a PDF in LIMS? REVIEWER: Every PDF reviewed?	☐	Y	Y	
INITIAL CALIBRATION	Date of Initial Calibration used: If applicable, note date of "Last Update" in Comments.	08/17/16			
	Initial Calibration ID (LIMS number):	1608012			
	ICAL within QC criteria?	☐	Y	Y	
	SCV within QC criteria?	☐	Y	Y	
INSTRUMENT / QC CHECKS	Tune or degradation checks within QC criteria?	☑			
	CCV(s) within QC criteria?	☐	Y	Y	
	QLS(s) within QC criteria?	☐	Y	Y	
	CB(s) or storage blank(s) within QC criteria?	☐	Y	Y	
	Other instrument checks within QC criteria? Specify if applicable.	☑			
BATCH QCs	Method blanks < 1/2 QL?	☐	Y	Y	
	LCS(s) or SRM(s) within QC criteria?	☐	Y	Y	
	MSs/MSDs and/or DUPs within QC criteria?	☐	Y	Y	
	Other method-specific QCs within QC criteria? Specify if applicable.	☑			

ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	B16L005	SEQUENCE #:	S16L001
BATCH #:	N/A	ANALYSIS:	Anions by Method 300.0

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
IS / SS	Internal standards within QC criteria?	✔			
	Surrogates within QC criteria?	✔			
SAMPLE DATA	Were samples prepared & analyzed within holding time?		Y	Y	
	If samples need to be re-run, were RE(s) made in LIMS?	✔			
	Do any samples need to be re-digested or re-extracted?	✔			
	Were all data qualifiers appropriately applied?	✔			
	Are problems, anomalies, discrepancies documented in LIMS? Specify if applicable.	✔			
MANUAL INT	Were manual integrations performed and documented? Specify if applicable.		Y	Y	

APPROVALS	ANALYST INITIALS & DATE:	SUL 12/02/16
	REVIEWED BY:	Osellie Salvador (affiliate) Digitally signed by Osellie Salvador (affiliate) Date: 2016.12.02 13:40:35 -08'00' SIGN HERE

COMMENTS

SEQUENCE DATA

S16L001

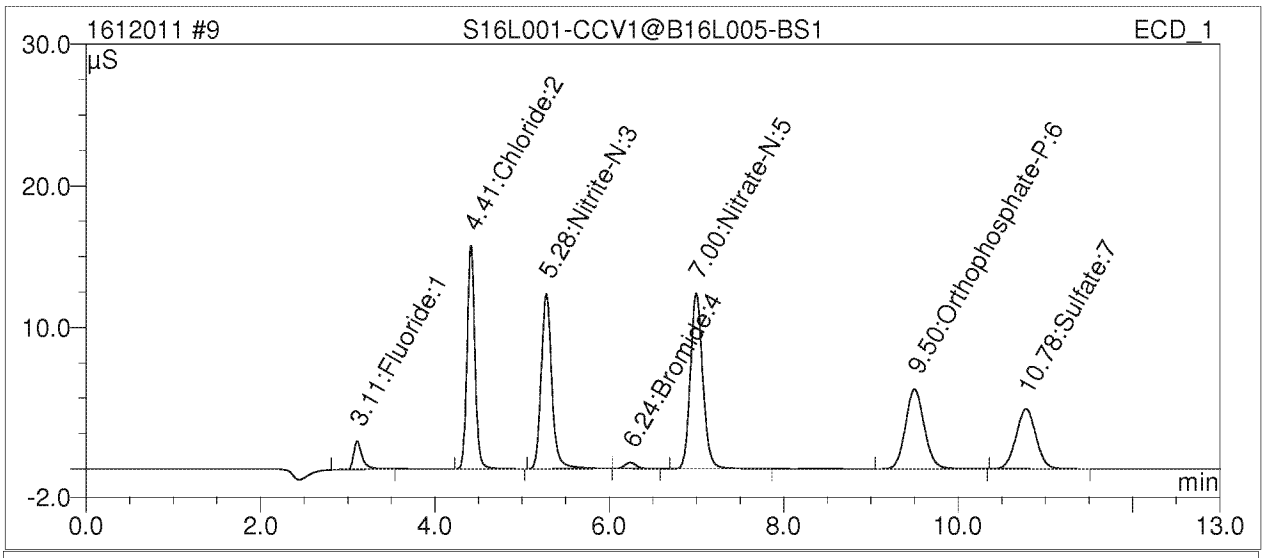
S16L001-CCV1

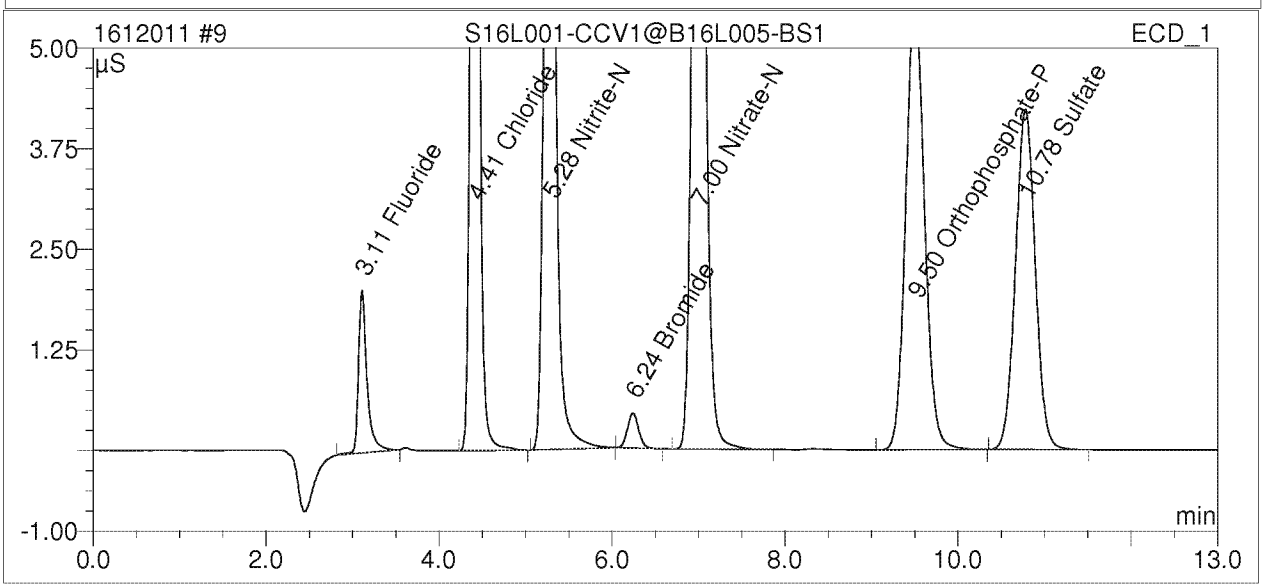
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	9
Sample Name:	S16L001-CCV1@B16L005-BS1	**ection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	1
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 7:48 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.107	0.230	2.018	1.057	BMB
2	Chloride	4.414	1.651	15.765	10.226	BMB
3	Nitrite-N	5.277	1.755	12.372	5.259	BMB
4	Bromide	6.240	0.064	0.432	1.082	BMB
5	Nitrate-N	6.997	2.050	12.396	5.349	BMB
6	Orthophosphate-P	9.500	1.410	5.621	10.598	BMB
7	Sulfate	10.777	1.120	4.224	10.481	BMB





Current date: 12/1/2016
Current time: 1:07 PM
6.80 SR10 Build 2818 (166959)

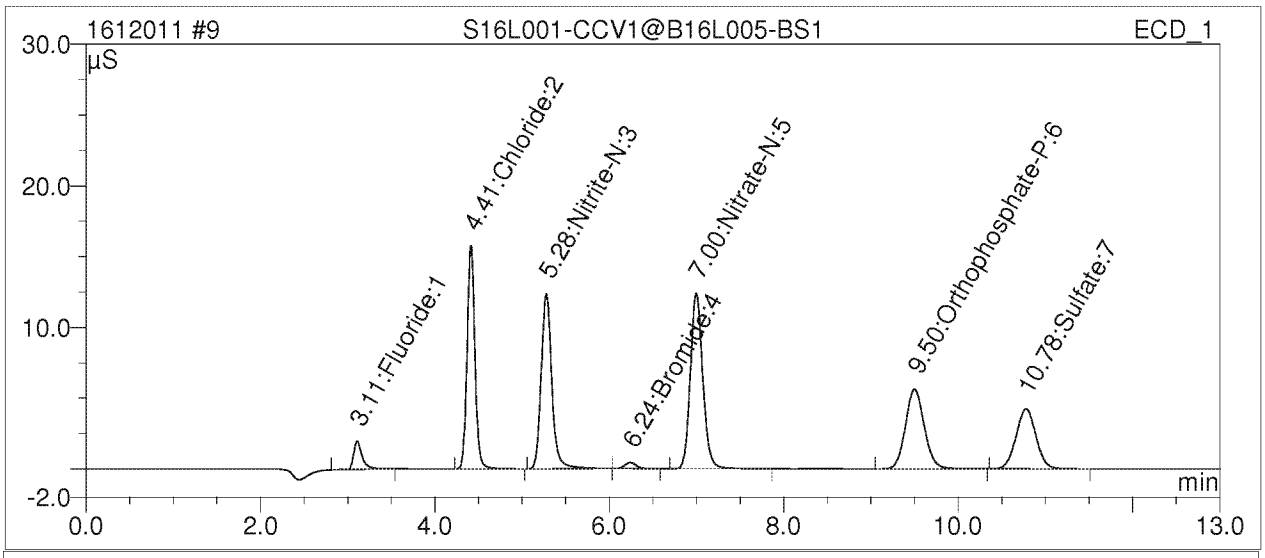
B16L005-BS1

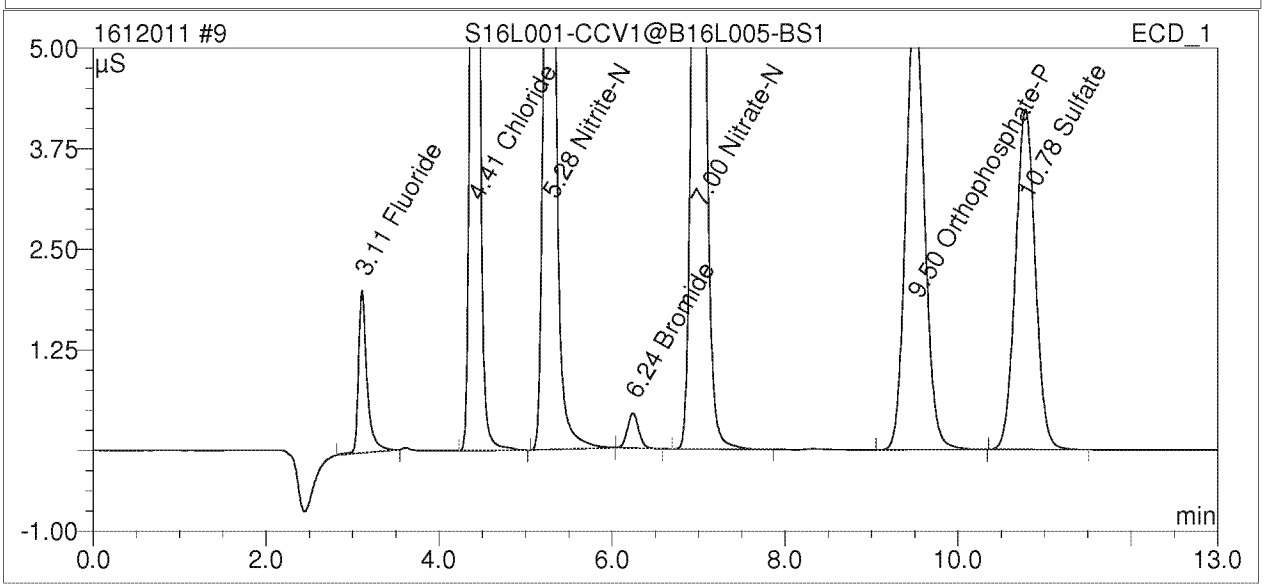
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	9
Sample Name:	S16L001-CCV1@B16L005-BS1	**ection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	1
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 7:48 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.107	0.230	2.018	1.057	BMB
2	Chloride	4.414	1.651	15.765	10.226	BMB
3	Nitrite-N	5.277	1.755	12.372	5.259	BMB
4	Bromide	6.240	0.064	0.432	1.082	BMB
5	Nitrate-N	6.997	2.050	12.396	5.349	BMB
6	Orthophosphate-P	9.500	1.410	5.621	10.598	BMB
7	Sulfate	10.777	1.120	4.224	10.481	BMB





Current date: 12/1/2016
Current time: 1:07 PM
6.80 SR10 Build 2818 (166959)

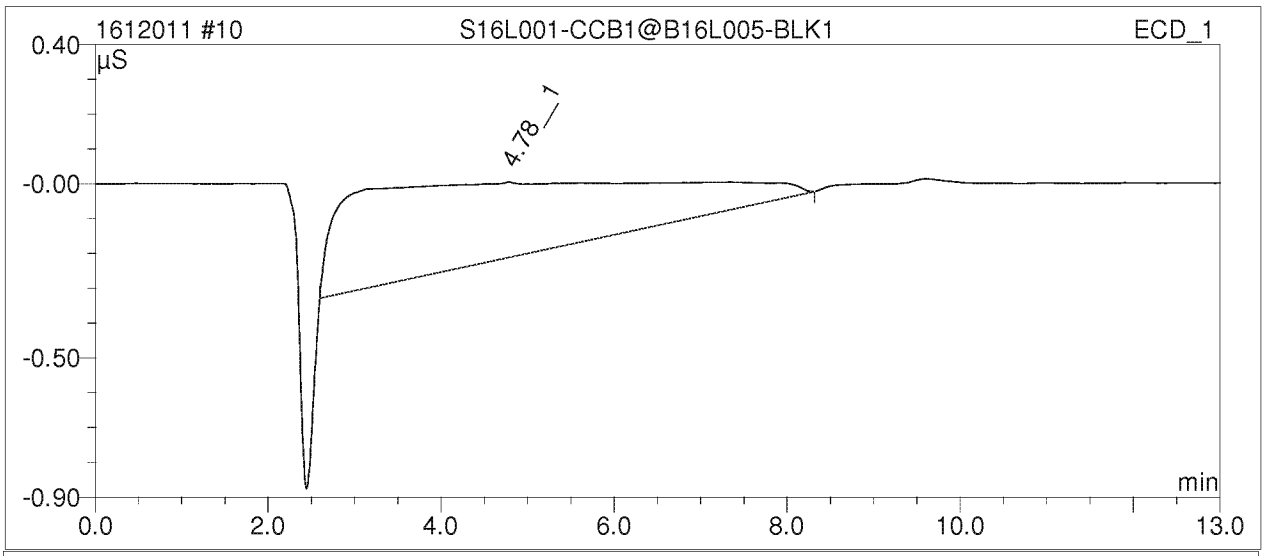
S16L001-CCB1

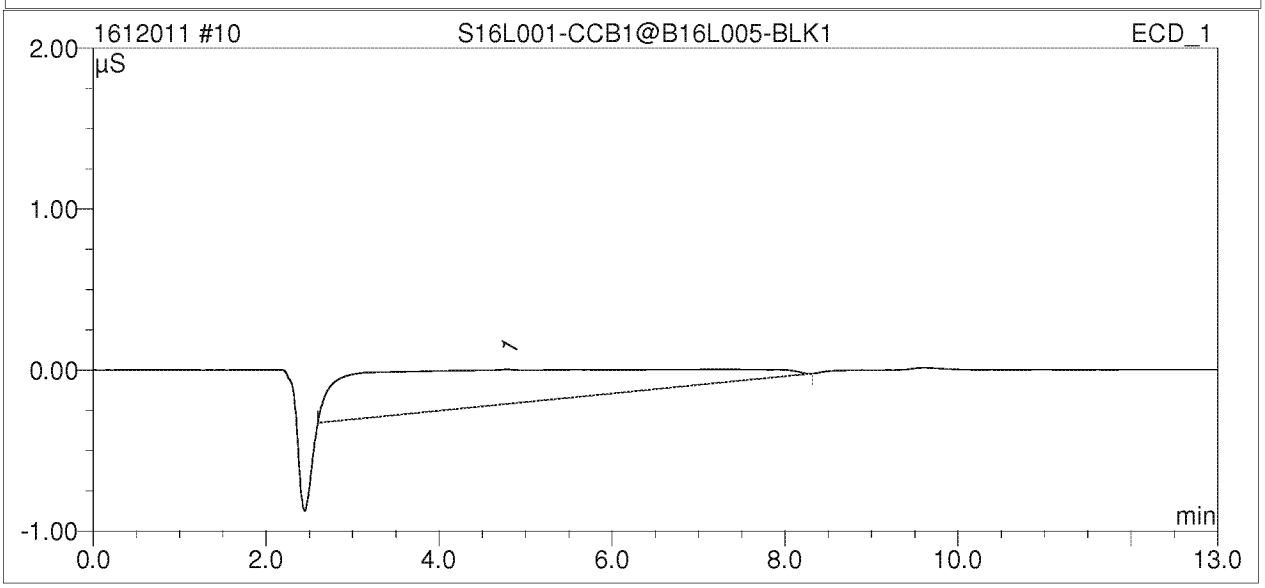
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	10
Sample Name:	S16L001-CCB1@B16L005-BLK1	**ection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	2
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 8:04 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type





Current date: 12/1/2016
Current time: 1:08 PM
6.80 SR10 Build 2818 (166959)

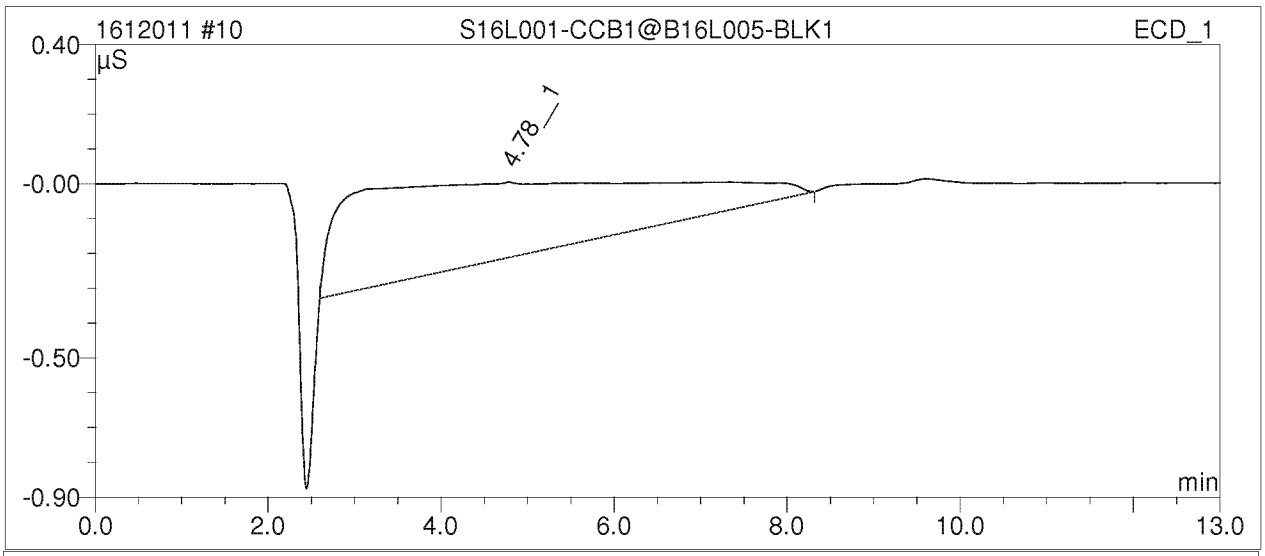
B16L005-BLK1

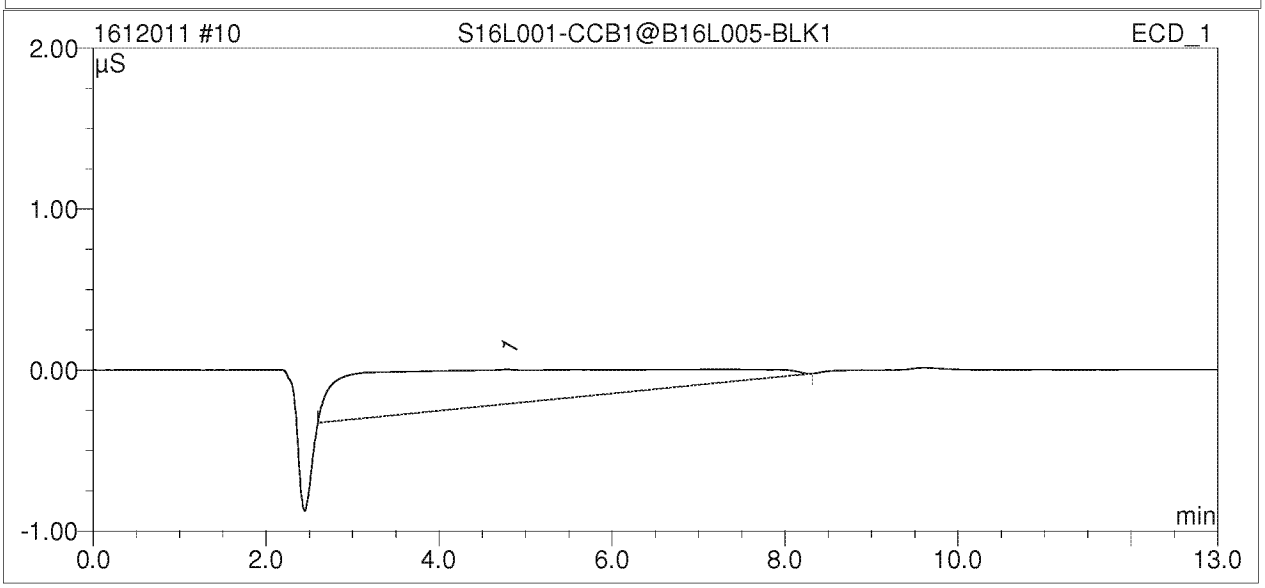
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	10
Sample Name:	S16L001-CCB1@B16L005-BLK1	**ection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	2
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 8:04 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type





Current date: 12/1/2016
Current time: 1:08 PM
6.80 SR10 Build 2818 (166959)

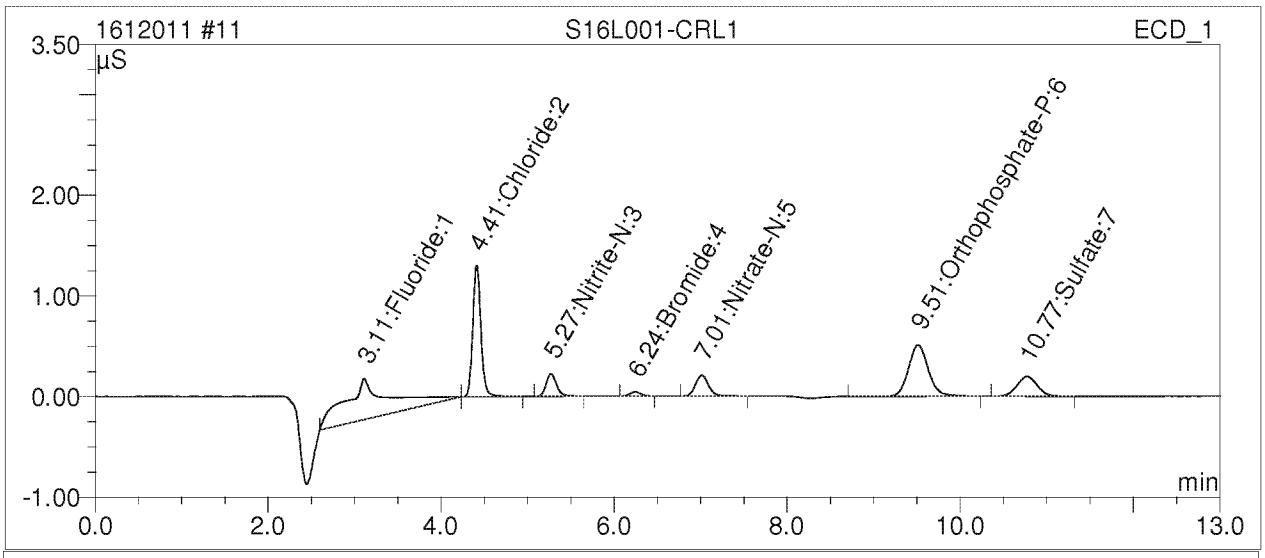
S16L001-CRL1

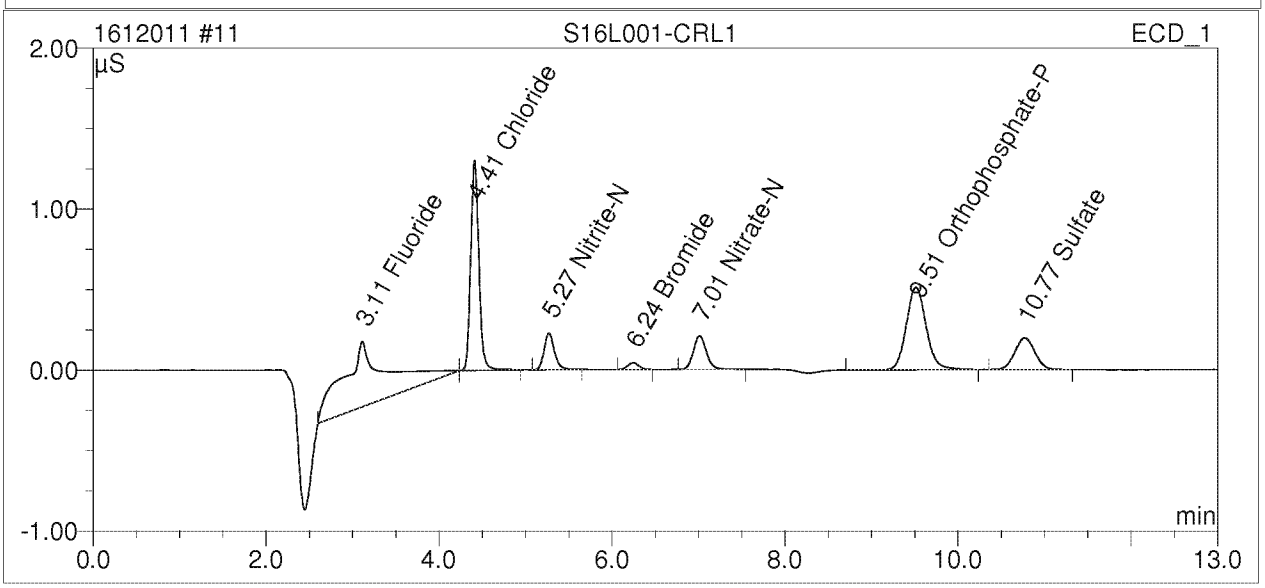
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	11
Sample Name:	S16L001-CRL1	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	3
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 8:19 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.110	0.241	0.406	1.108	BMB
2	Chloride	4.410	0.143	1.304	0.927	bMB
3	Nitrite-N	5.270	0.031	0.226	0.095	BMB
4	Bromide	6.244	0.006	0.042	0.107	BMB
5	Nitrate-N	7.010	0.036	0.208	0.101	BMB
6	Orthophosphate-P	9.510	0.137	0.512	1.084	BMB
7	Sulfate	10.770	0.053	0.197	0.516	BMB





Current date: 12/1/2016
Current time: 1:09 PM
6.80 SR10 Build 2818 (166959)

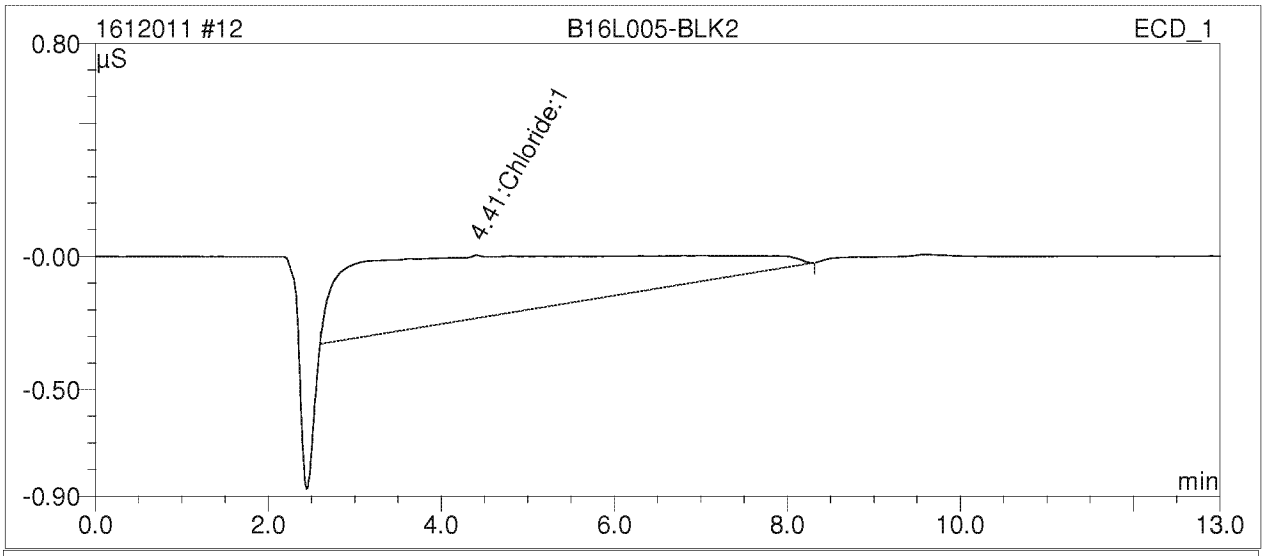
B16L005-BLK2

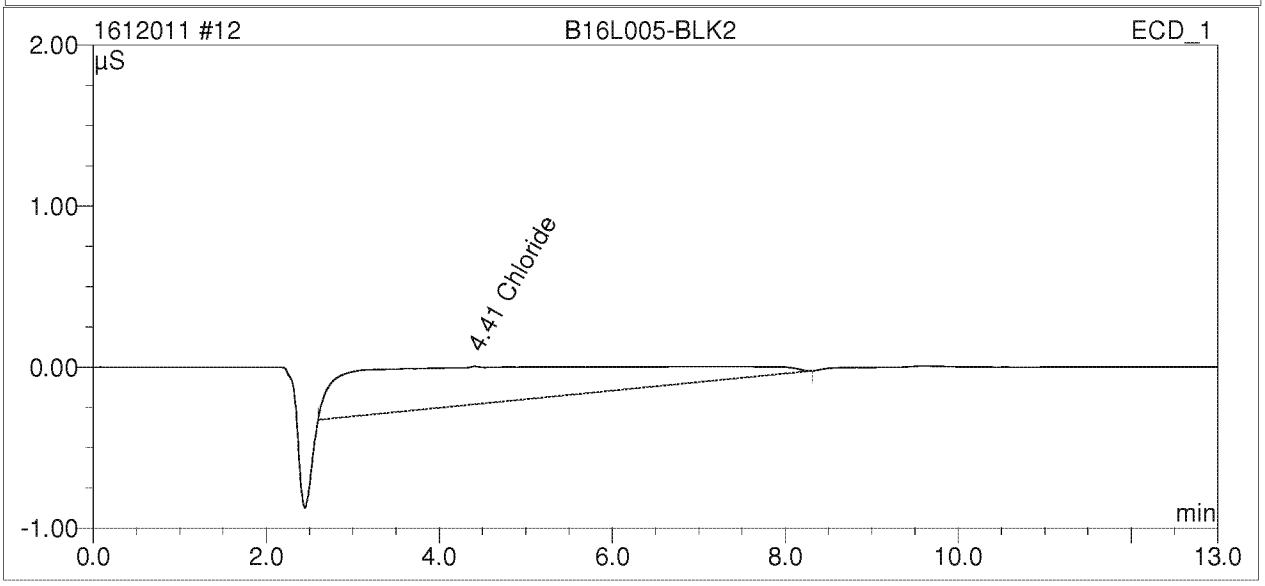
Before Manual Integration
Fronting and tailing

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	12
Sample Name:	B16L005-BLK2	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	4
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 8:35 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Chloride	4.410	0.949	0.236	6.007	BMB





Current date: 12/1/2016
Current time: 1:09 PM
6.80 SR10 Build 2818 (166959)

M.I. Performed By:	M.I. Approved By:
SUL at 10:42 am, Dec 02, 201	OS at 12:01 pm, Dec 02, 2016

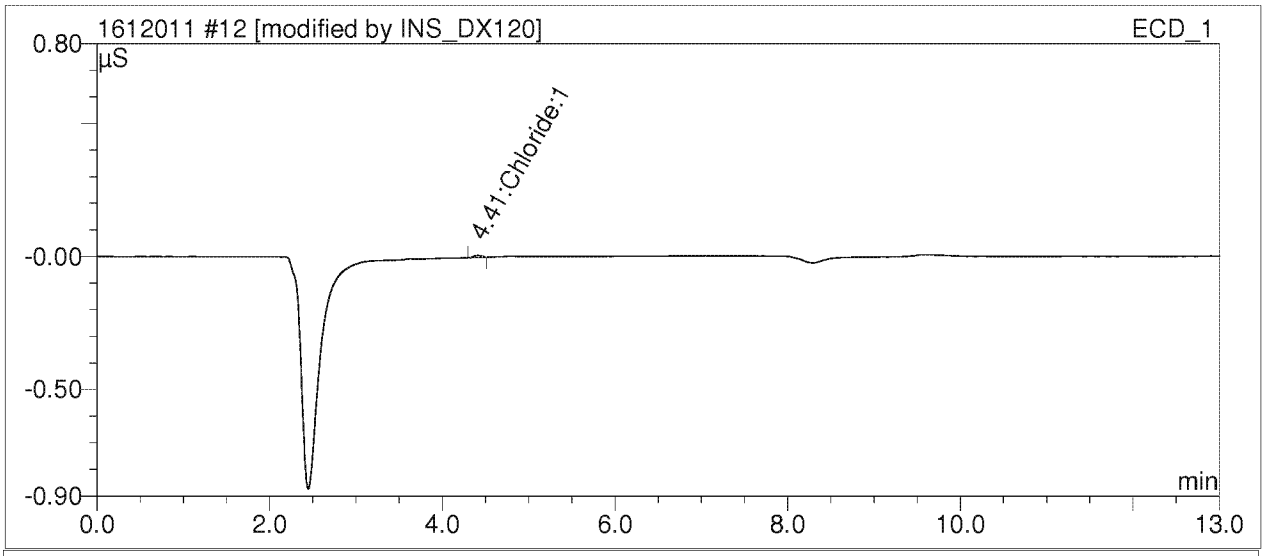
Sample Analysis Report

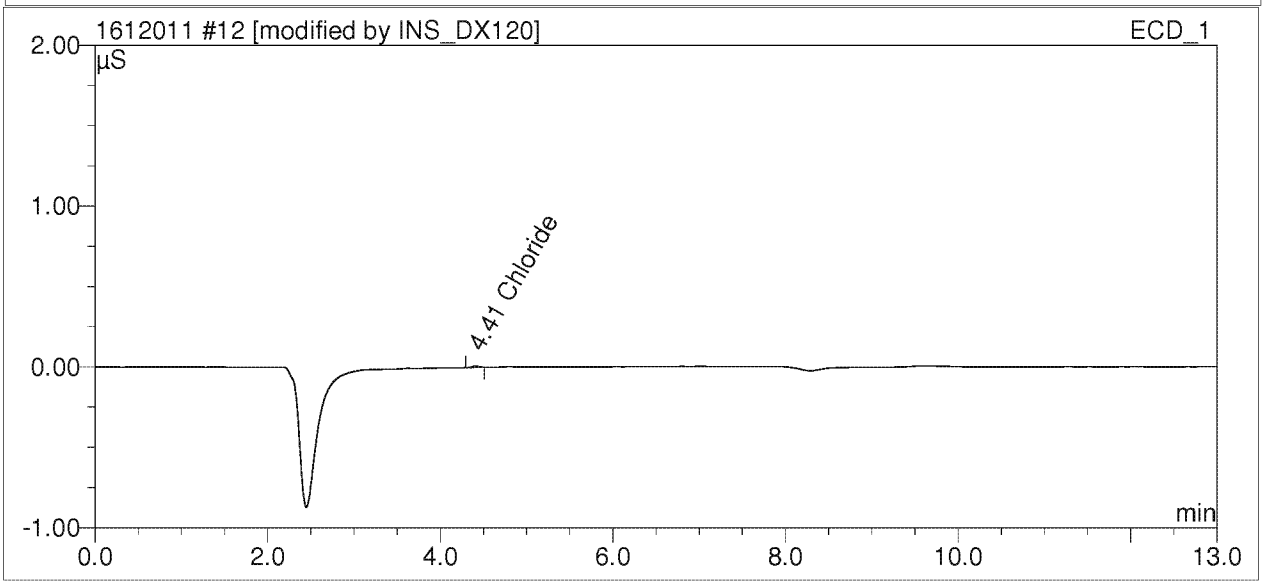
Cl, SO4

Sequence Name:	1612011	**Position No.:**	12
Sample Name:	B16L005-BLK2	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	4
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 8:35 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Filtered

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Chloride	4.410	0.001	0.008	0.005	BMB*





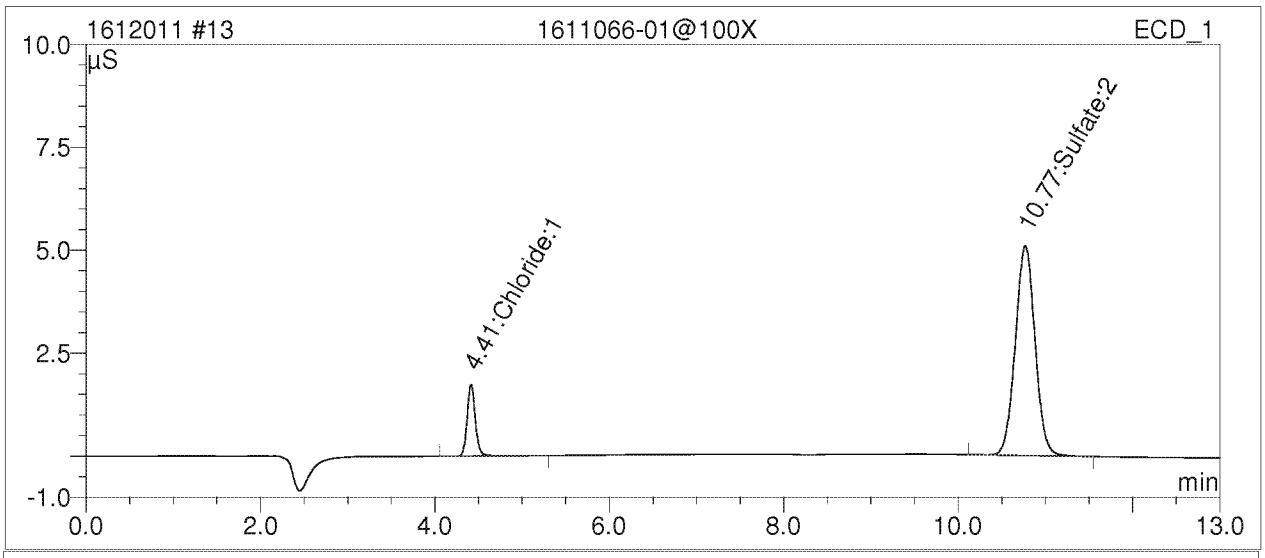
1611066-01

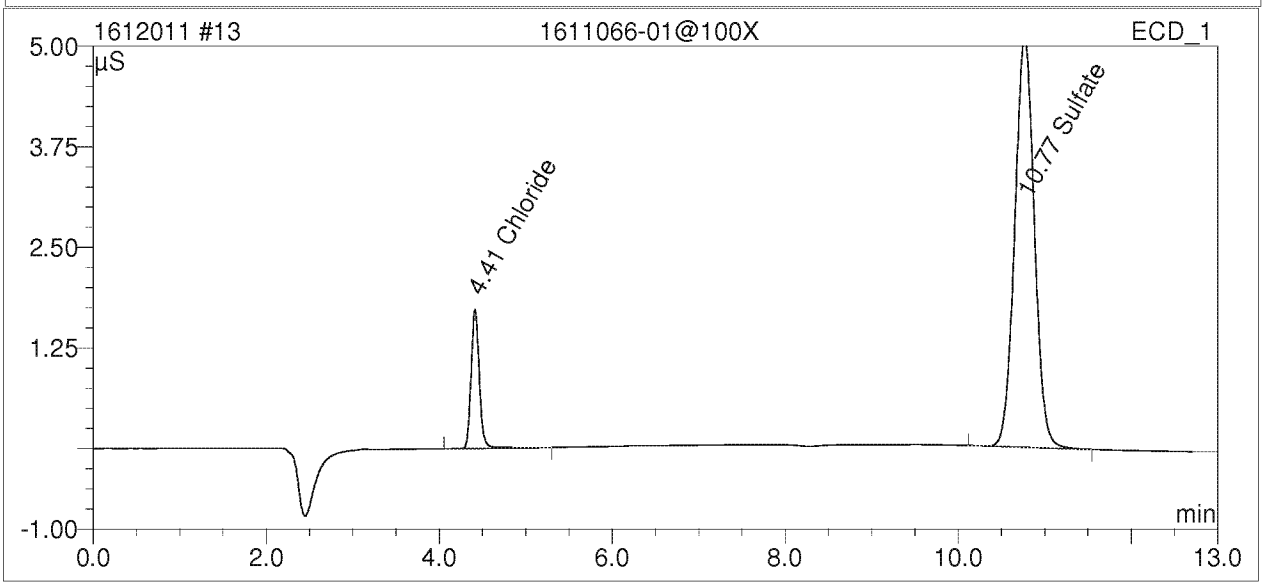
SO4

Sample Analysis Report

Sequence Name:	1612011		**Position No.:**	13
Sample Name:	1611066-01@100X	0.05+4.95mL	**Injection volume:**	25.0
Program Method:	ICS1100		**Vial #:**	5
Quantitation Method:	AnionsB	Filtered	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 8:50 AM		**Dilution Factor:**	1.0000
System Operator:	SUL		**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Chloride	4.413	0.189	1.729	1.230	BMB
2	Sulfate	10.770	1.336	5.094	12.425	BMB





Current date: 12/1/2016
Current time: 1:10 PM
6.80 SR10 Build 2818 (166959)

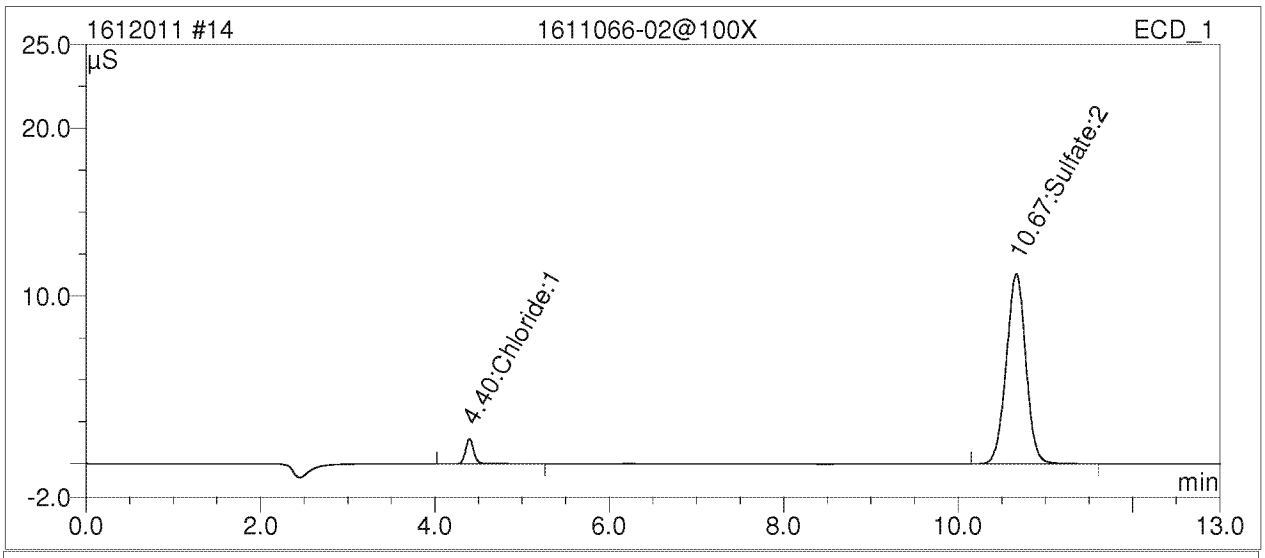
1611066-02

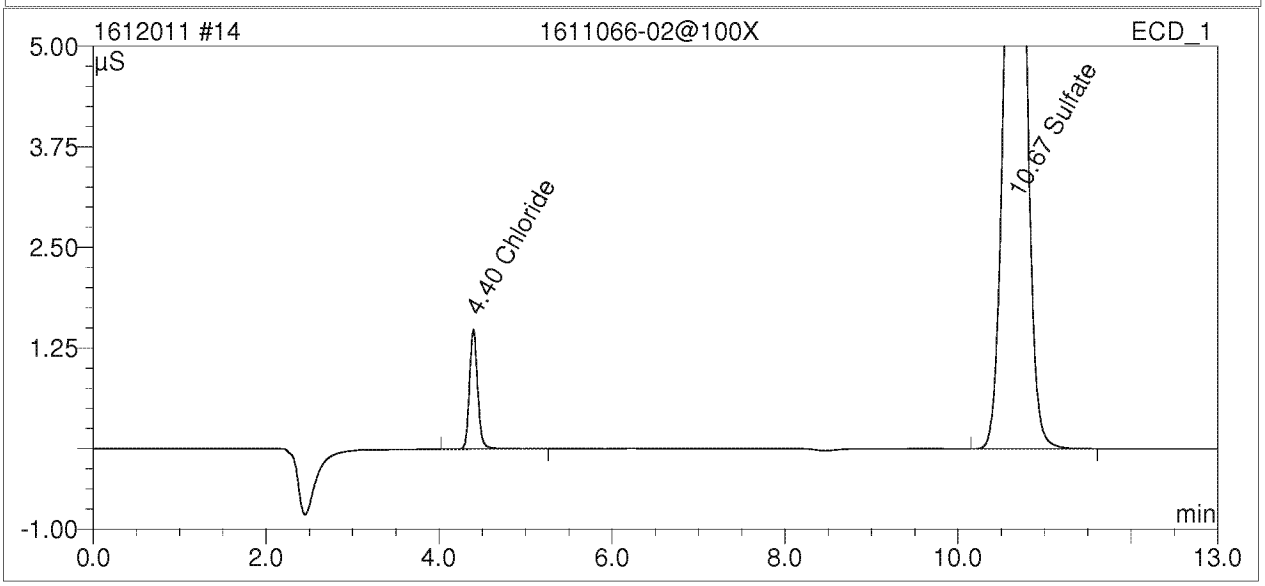
SO4

Sample Analysis Report

Sequence Name:	1612011		**Position No.:**	14
Sample Name:	1611066-02@100X	0.05+4.95mL	**Injection volume:**	25.0
Program Method:	ICS1100		**Vial #:**	6
Quantitation Method:	AnionsB	Filtered	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 9:05 AM		**Dilution Factor:**	1.0000
System Operator:	SUL		**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Chloride	4.397	0.163	1.486	1.061	BMB
2	Sulfate	10.667	2.943	11.327	26.175	BMB





Current date: 12/1/2016
Current time: 1:11 PM
6.80 SR10 Build 2818 (166959)

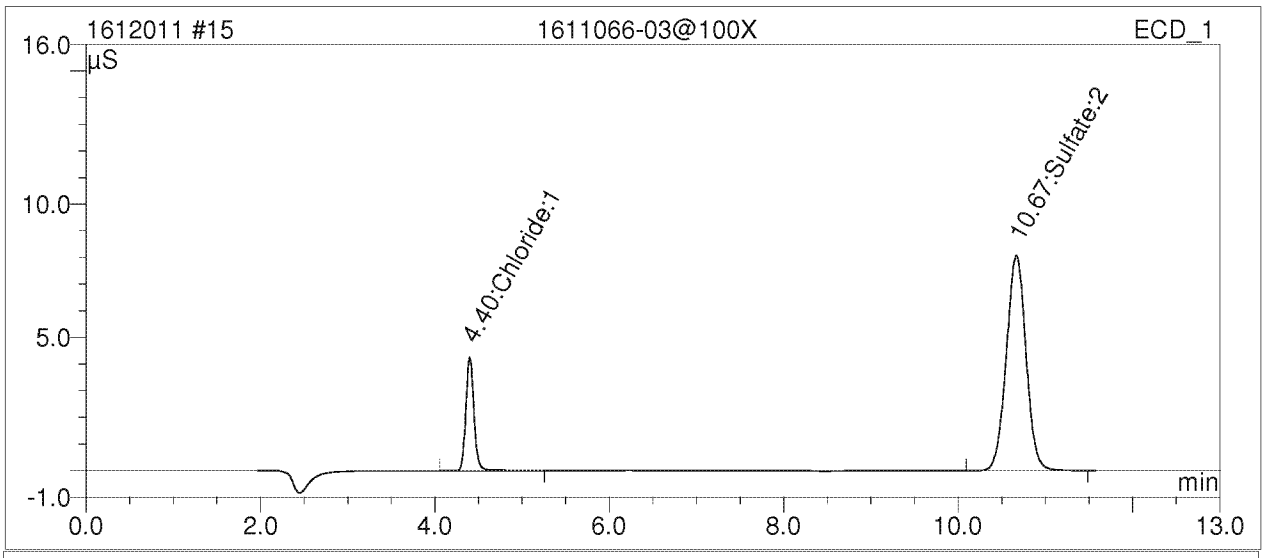
1611066-03

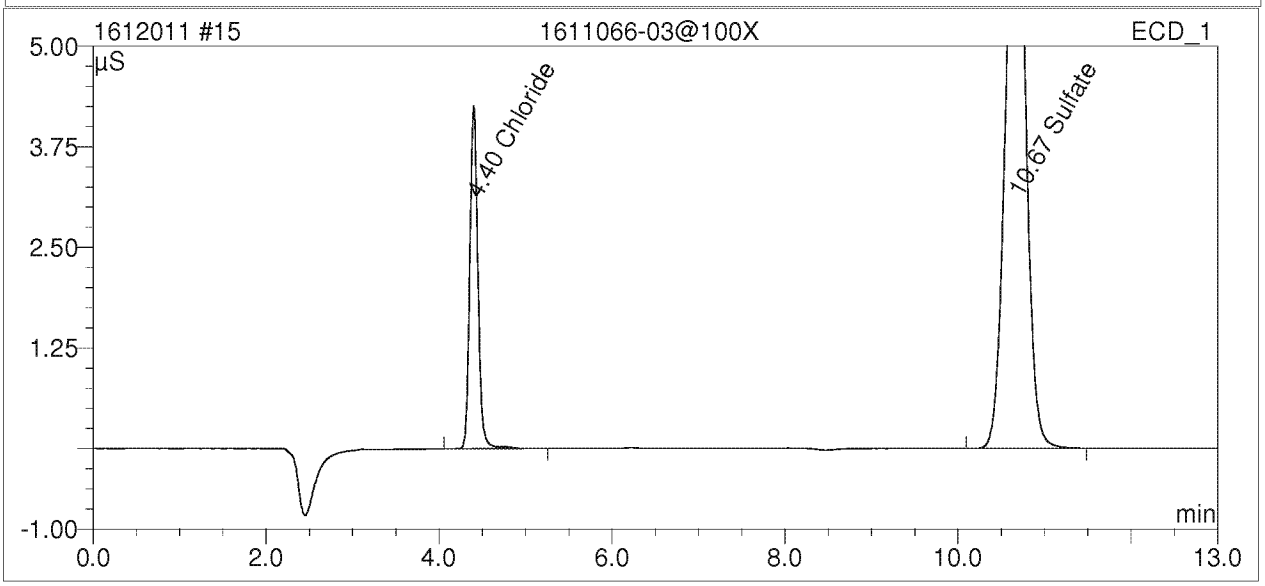
SO4

Sample Analysis Report

Sequence Name:	1612011		**Position No.:**	15
Sample Name:	1611066-03@100X		**Injection volume:**	25.0
Program Method:	ICS1100	0.05+4.95mL	**Vial #:**	7
Quantitation Method:	AnionsB		**Sample Type:**	unknown
Date Time Collected:	12/1/2016 9:21 AM	Filtered	**Dilution Factor:**	1.0000
System Operator:	SUL		**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Chloride	4.400	0.463	4.261	2.978	BMB
2	Sulfate	10.667	2.117	8.075	19.247	BMB





Current date: 12/1/2016
Current time: 1:12 PM
6.80 SR10 Build 2818 (166959)

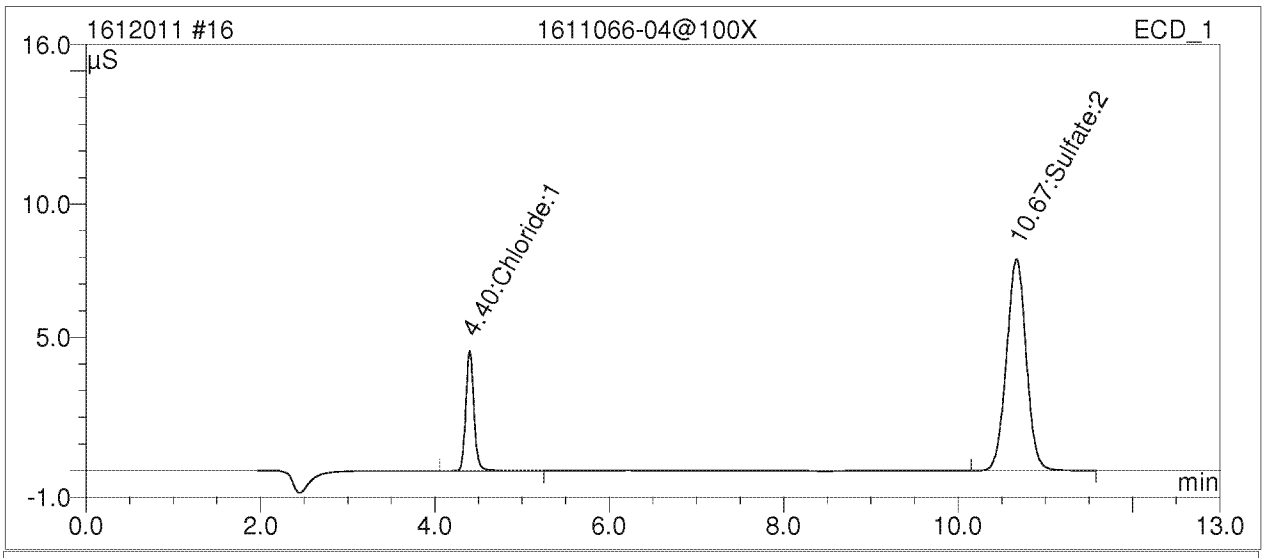
1611066-04

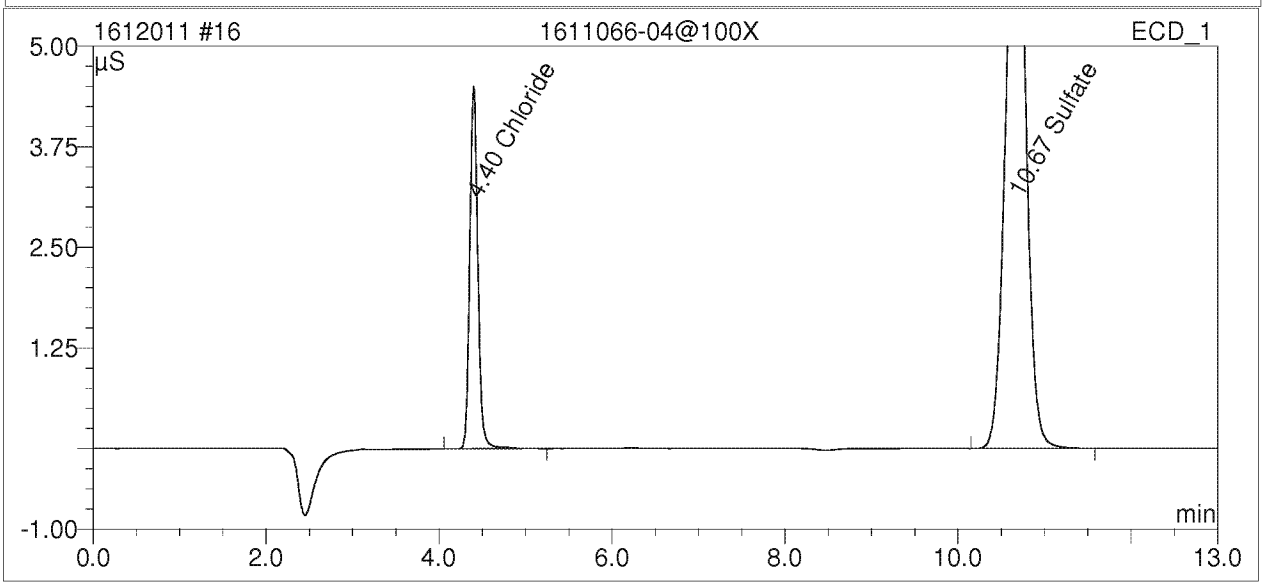
SO4

Sample Analysis Report

Sequence Name:	1612011		**Position No.:**	16
Sample Name:	1611066-04@100X		**Injection volume:**	25.0
Program Method:	ICS1100	0.05+4.95mL	**Vial #:**	8
Quantitation Method:	AnionsB		**Sample Type:**	unknown
Date Time Collected:	12/1/2016 9:36 AM	Filtered	**Dilution Factor:**	1.0000
System Operator:	SUL		**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Chloride	4.400	0.488	4.501	3.138	BMB
2	Sulfate	10.670	2.083	7.942	18.959	BMB





Current date: 12/1/2016
Current time: 1:12 PM
6.80 SR10 Build 2818 (166959)

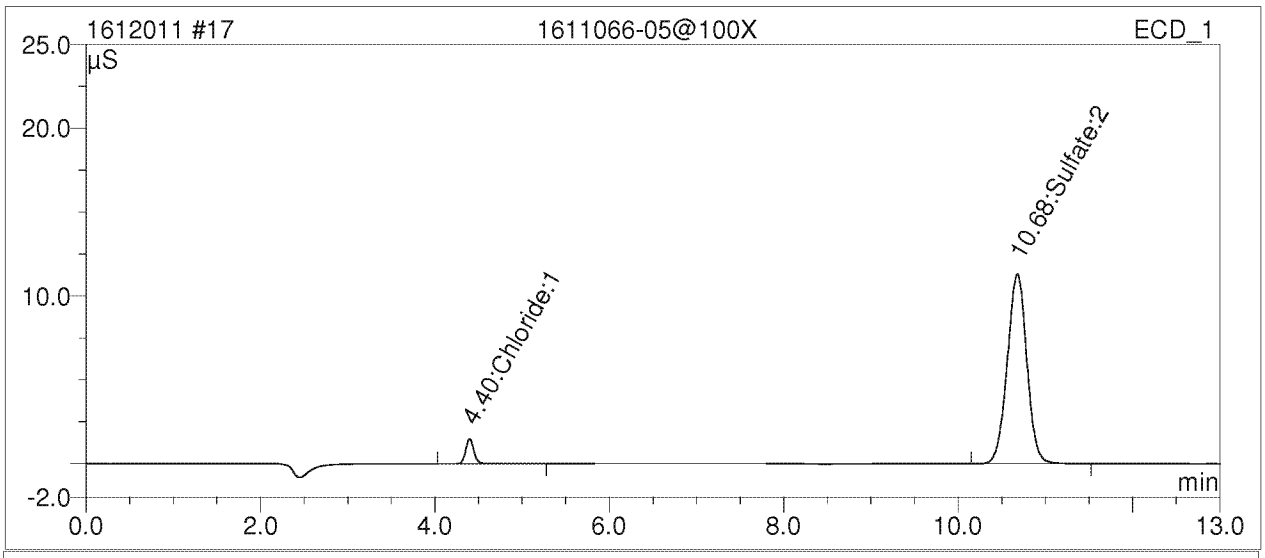
1611066-05

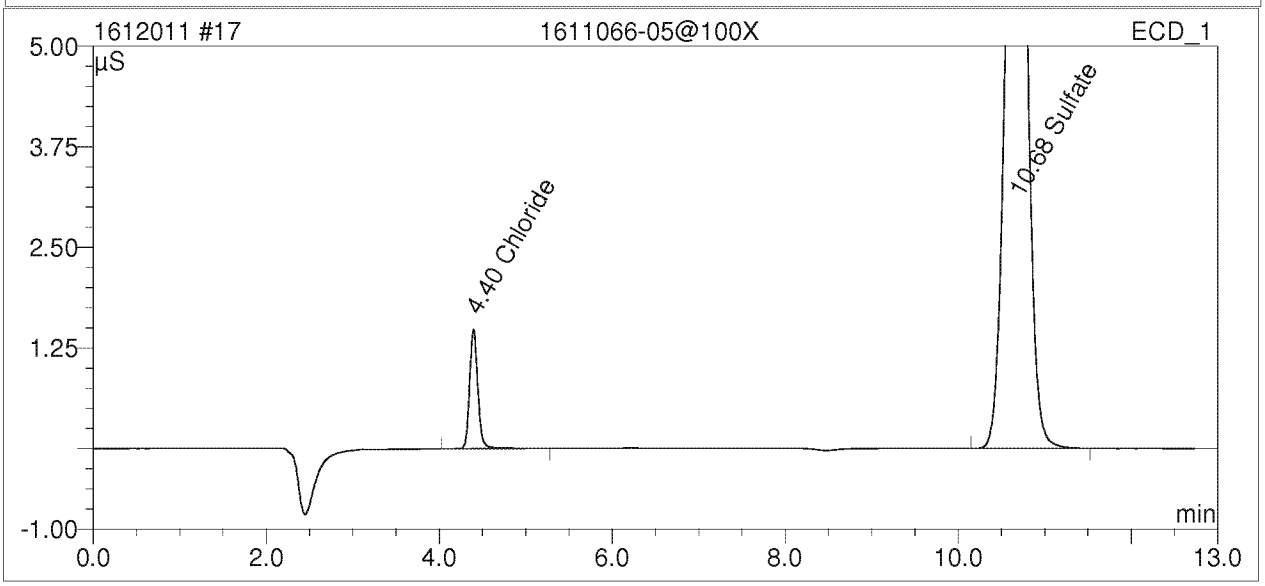
SO4

Sample Analysis Report

Sequence Name:	1612011		**Position No.:**	17
Sample Name:	1611066-05@100X		**Injection volume:**	25.0
Program Method:	ICS1100	0.05+4.95mL	**Vial #:**	9
Quantitation Method:	AnionsB	Filtered	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 9:52 AM		**Dilution Factor:**	1.0000
System Operator:	SUL		**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Chloride	4.397	0.164	1.485	1.069	BMB
2	Sulfate	10.677	2.943	11.311	26.169	BMB





Current date: 12/1/2016
Current time: 1:13 PM
6.80 SR10 Build 2818 (166959)

B16L005-DUP1

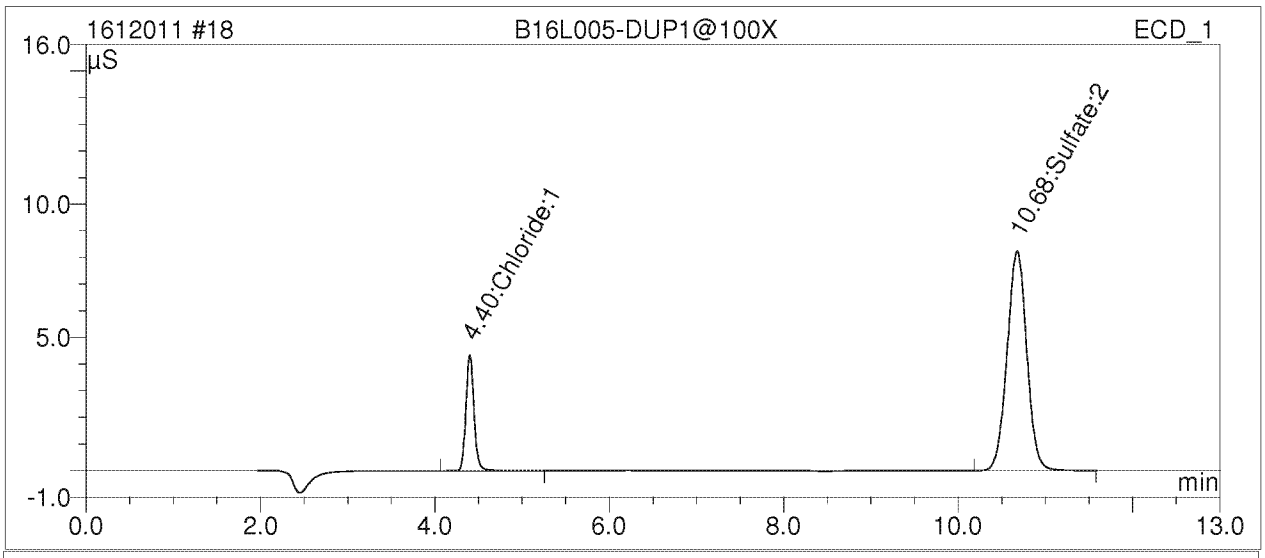
SO4

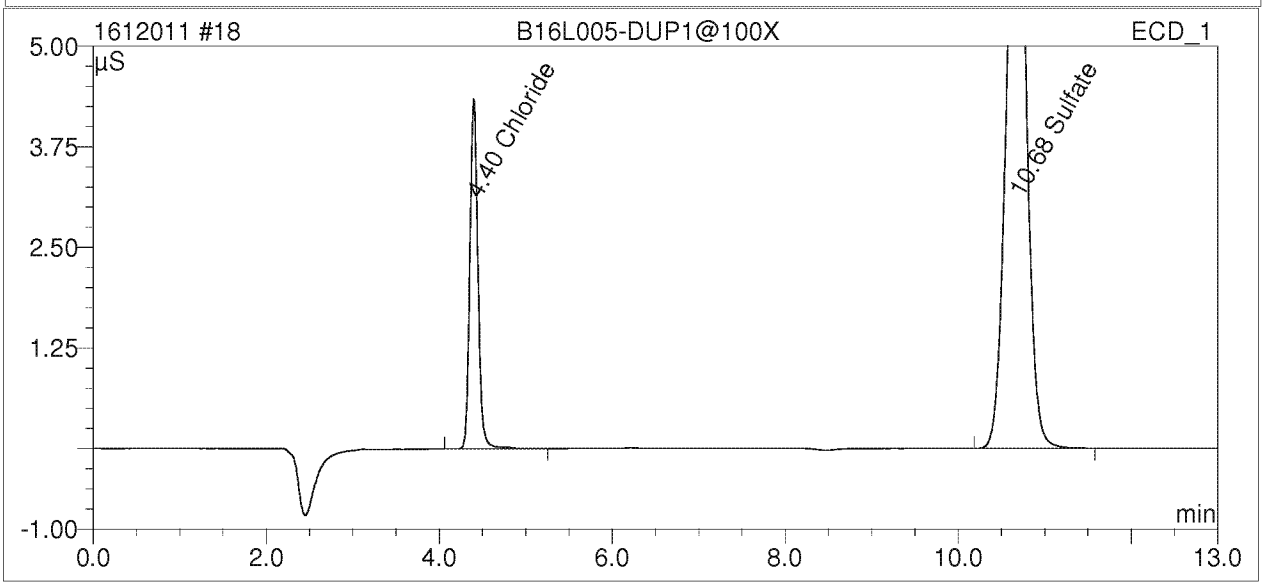
Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	18
Sample Name:	B16L005-DUP1@100X	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	10
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 10:07 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

1611066-03@100X

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Chloride	4.400	0.471	4.347	3.032	BMB
2	Sulfate	10.677	2.159	8.236	19.605	BMB





Current date: 12/1/2016
Current time: 1:13 PM
6.80 SR10 Build 2818 (166959)

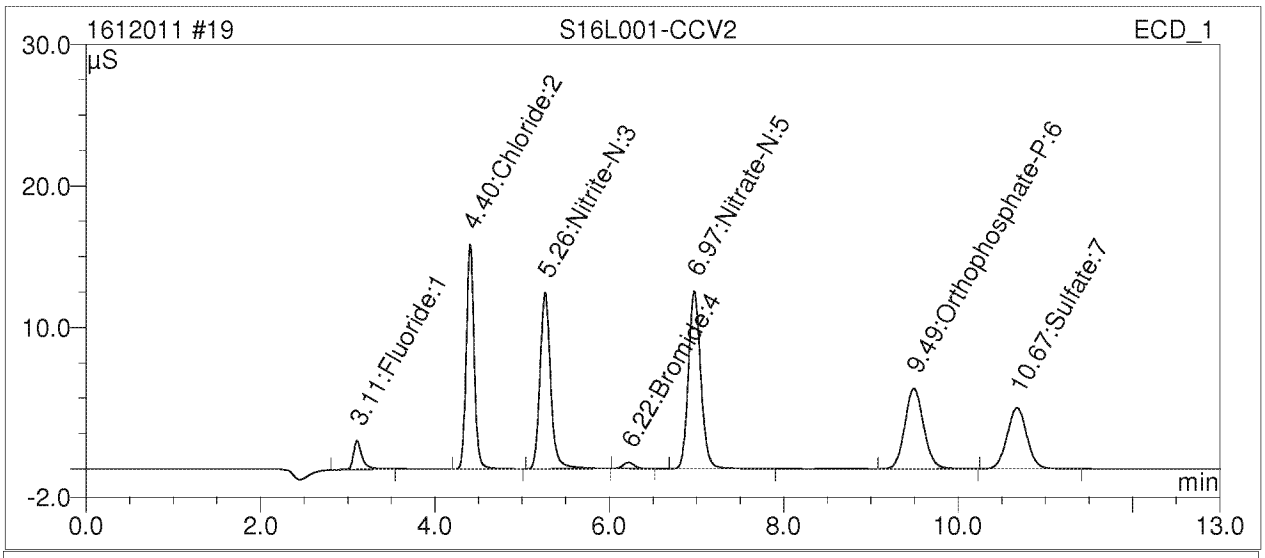
S16L001-CCV2

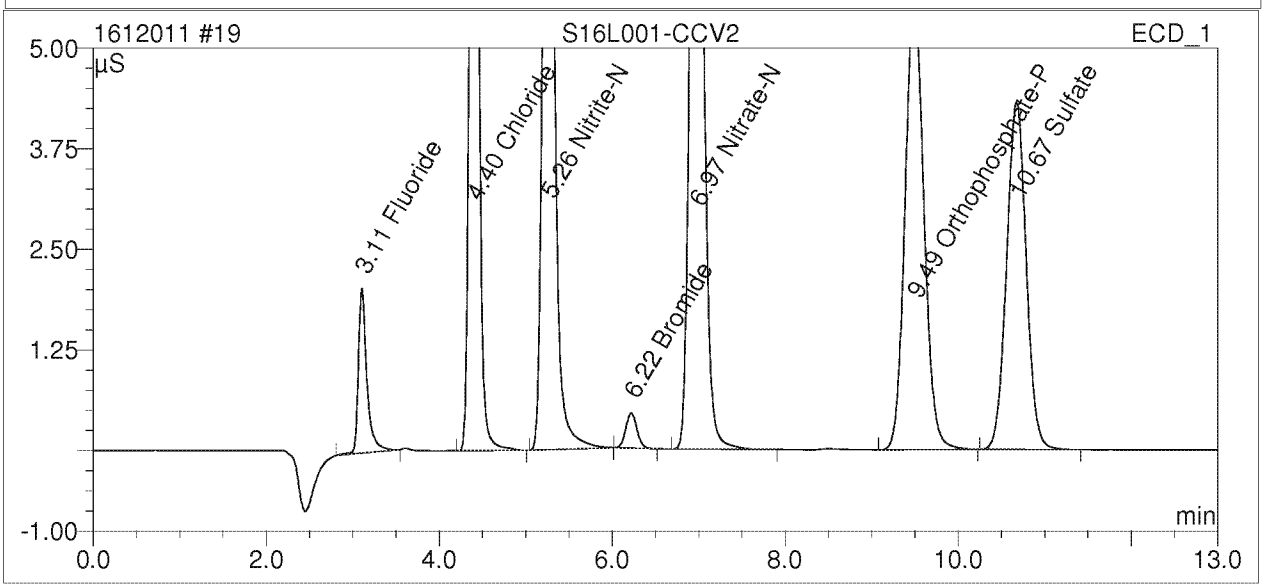
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	19
Sample Name:	S16L001-CCV2	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	11
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 10:22 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.107	0.234	2.049	1.073	BMB
2	Chloride	4.403	1.663	15.864	10.298	BMB
3	Nitrite-N	5.263	1.769	12.450	5.300	BMB
4	Bromide	6.220	0.065	0.435	1.085	BMB
5	Nitrate-N	6.973	2.070	12.561	5.399	BMB
6	Orthophosphate-P	9.490	1.426	5.683	10.712	BMB
7	Sulfate	10.673	1.132	4.313	10.589	BMB





Current date: 12/1/2016
Current time: 1:14 PM
6.80 SR10 Build 2818 (166959)

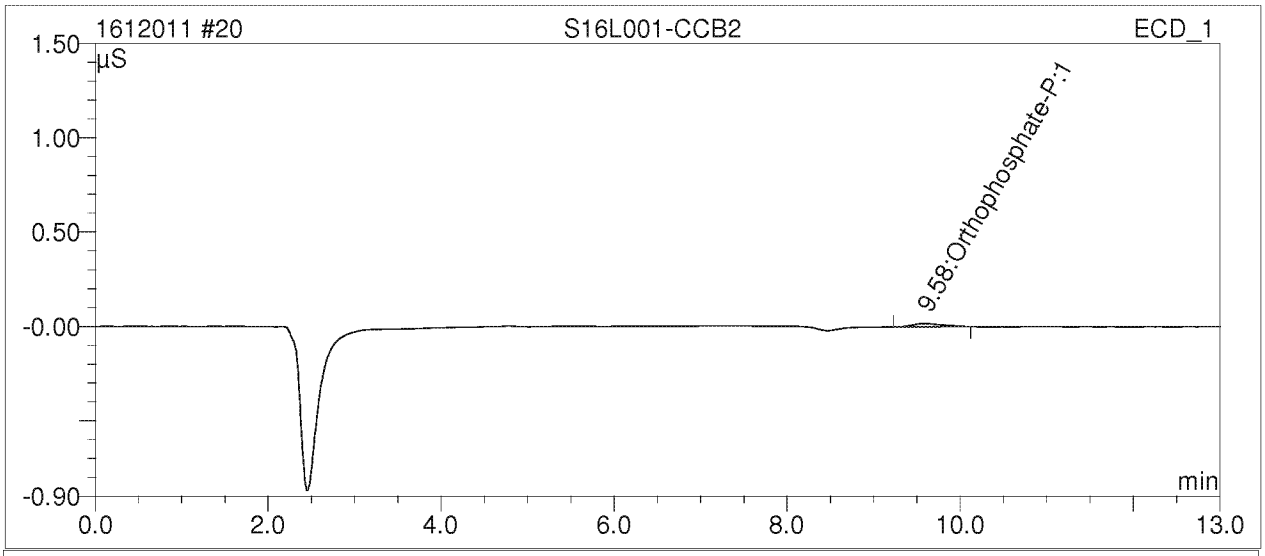
S16L001-CCB2

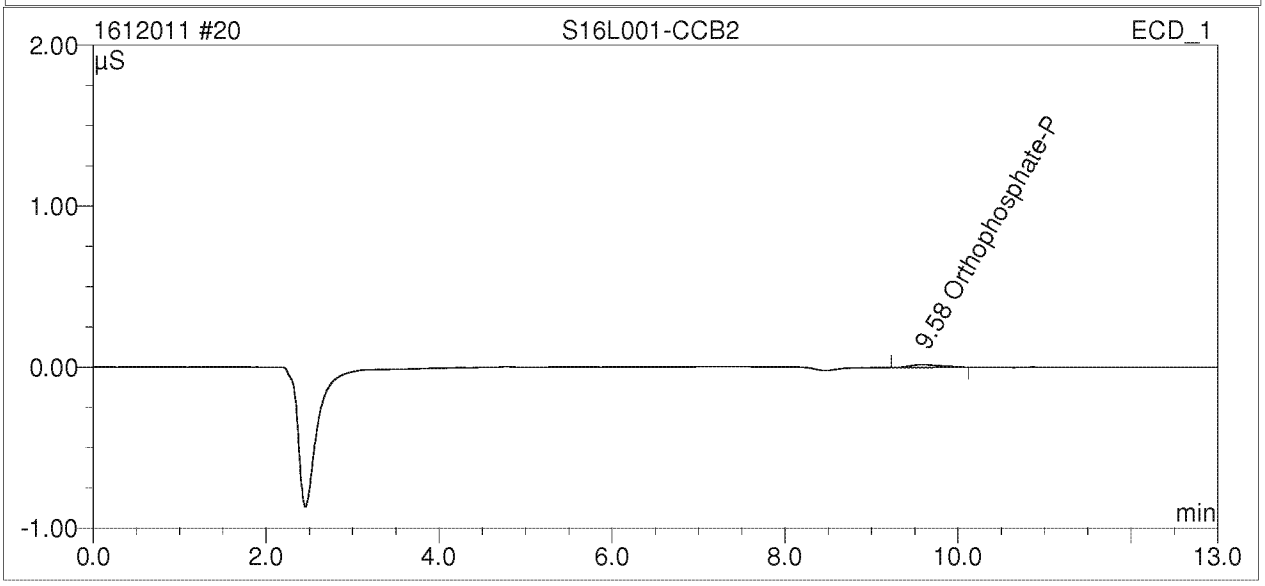
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	20
Sample Name:	S16L001-CCB2	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	12
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 10:38 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Orthophosphate-P	9.584	0.007	0.018	0.057	BMB





Current date: 12/1/2016
Current time: 1:15 PM
6.80 SR10 Build 2818 (166959)

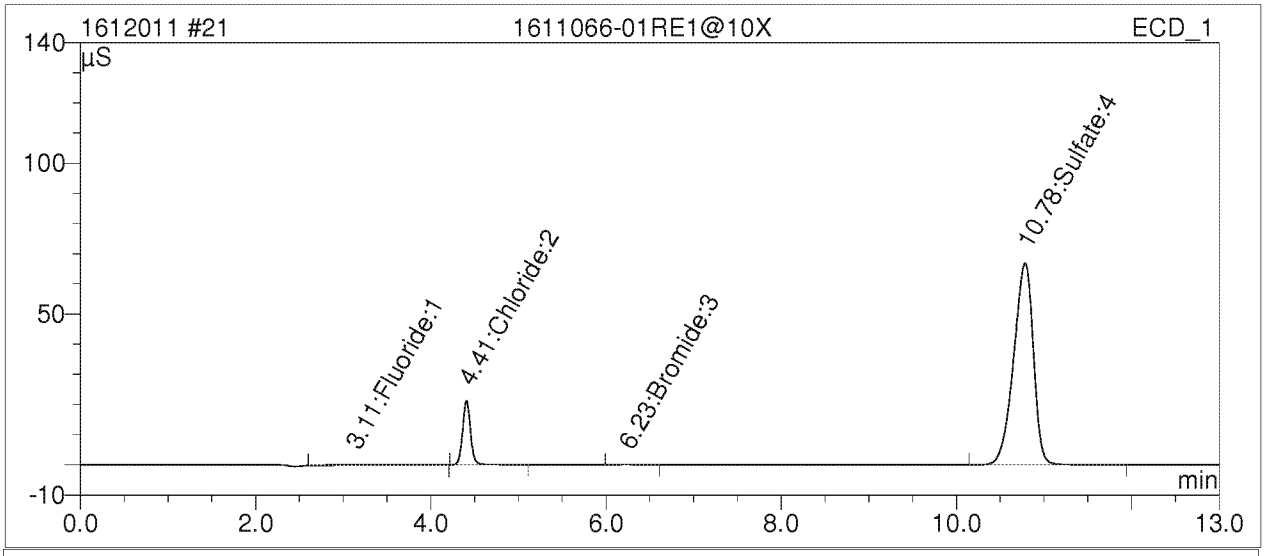
1611066-01RE1

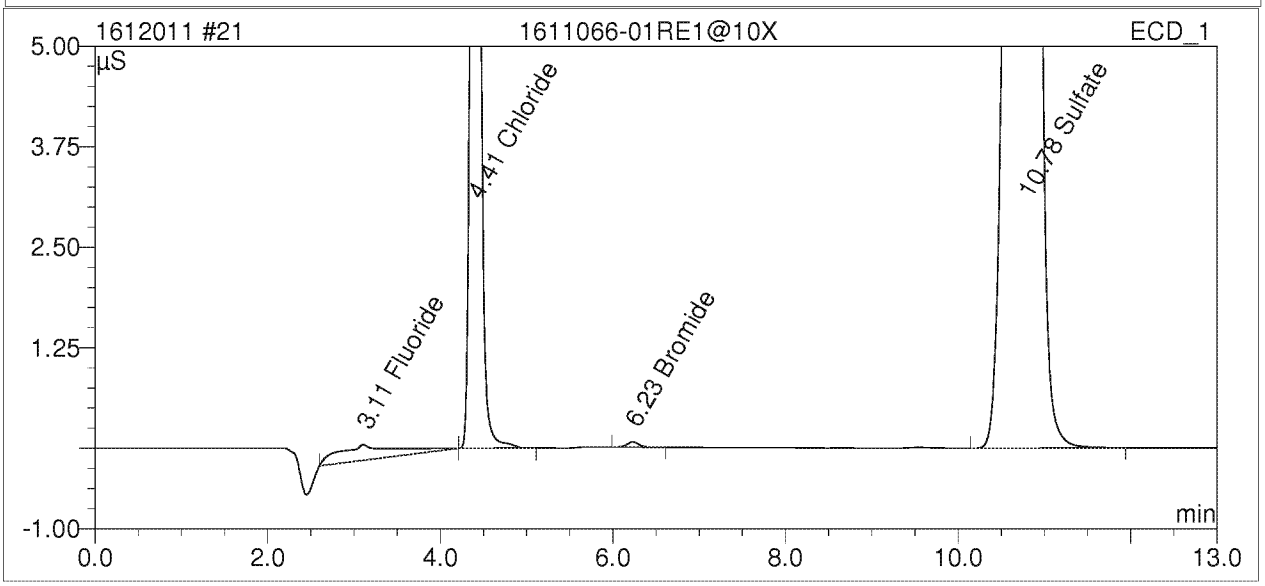
Cl

Sample Analysis Report

Sequence Name:	1612011		**Position No.:**	21
Sample Name:	1611066-01RE1@10X		**Injection volume:**	25.0
Program Method:	ICS1100	0.5+4.5mL	**Vial #:**	13
Quantitation Method:	AnionsB		**Sample Type:**	unknown
Date Time Collected:	12/1/2016 10:53 AM	Filtered	**Dilution Factor:**	1.0000
System Operator:	SUL		**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.107	0.149	0.196	0.688	BMB
2	Chloride	4.407	2.237	21.312	13.619	BMB
3	Bromide	6.230	0.010	0.064	0.167	BMB
4	Sulfate	10.783	17.435	66.841	119.661	BMB





Current date: 12/1/2016
Current time: 1:15 PM
6.80 SR10 Build 2818 (166959)

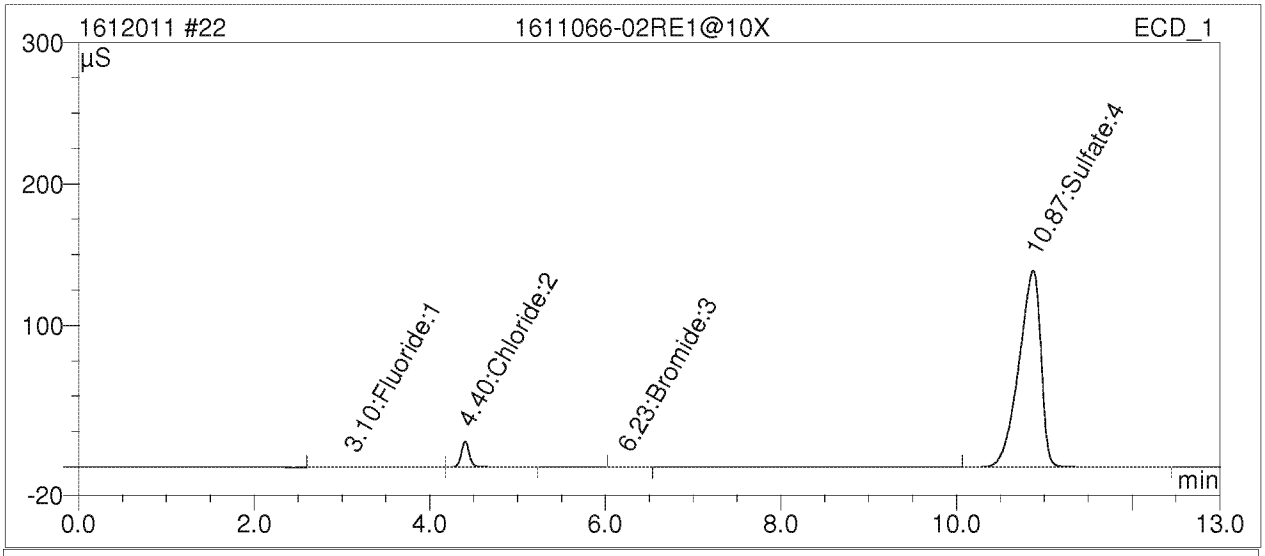
1611066-02RE1

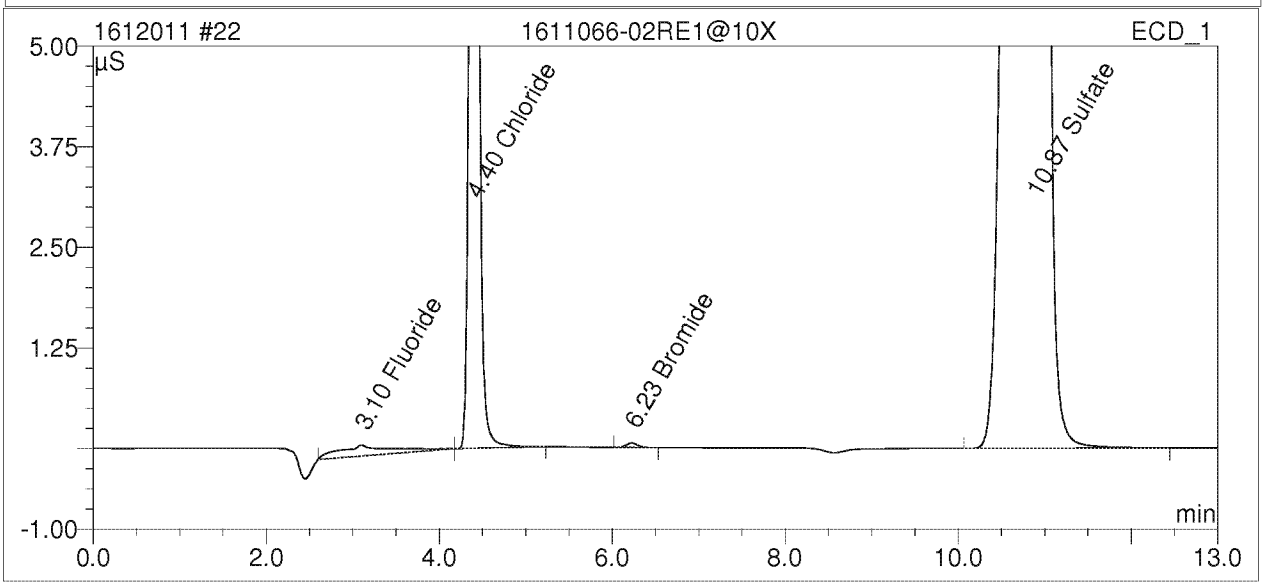
Cl

Sample Analysis Report

Sequence Name:	1612011			**Position No.:**	22
Sample Name:	1611066-02RE1@10X			**Injection volume:**	25.0
Program Method:	ICS1100		0.5+4.5mL	**Vial #:**	14
Quantitation Method:	AnionsB			**Sample Type:**	unknown
Date Time Collected:	12/1/2016	11:09 AM	Filtered	**Dilution Factor:**	1.0000
System Operator:	SUL			**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.103	0.095	0.138	0.437	BMB
2	Chloride	4.403	1.905	17.965	11.707	bMB
3	Bromide	6.227	0.008	0.056	0.141	BMB
4	Sulfate	10.873	40.125	138.691	220.842	BMB





Current date: 12/1/2016
Current time: 1:16 PM
6.80 SR10 Build 2818 (166959)

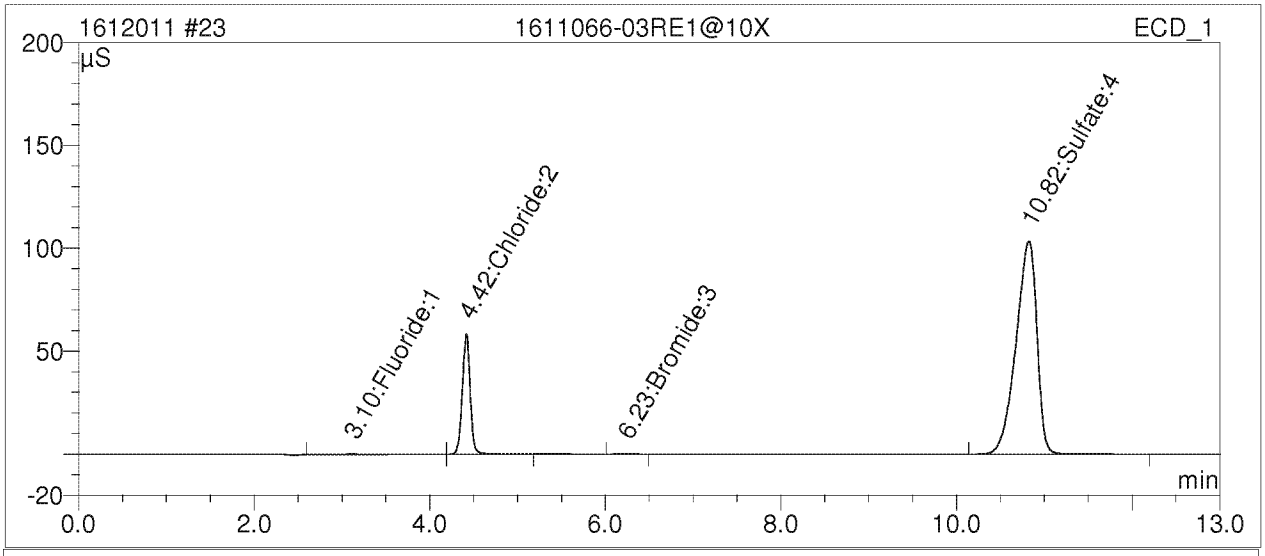
1611066-03RE1

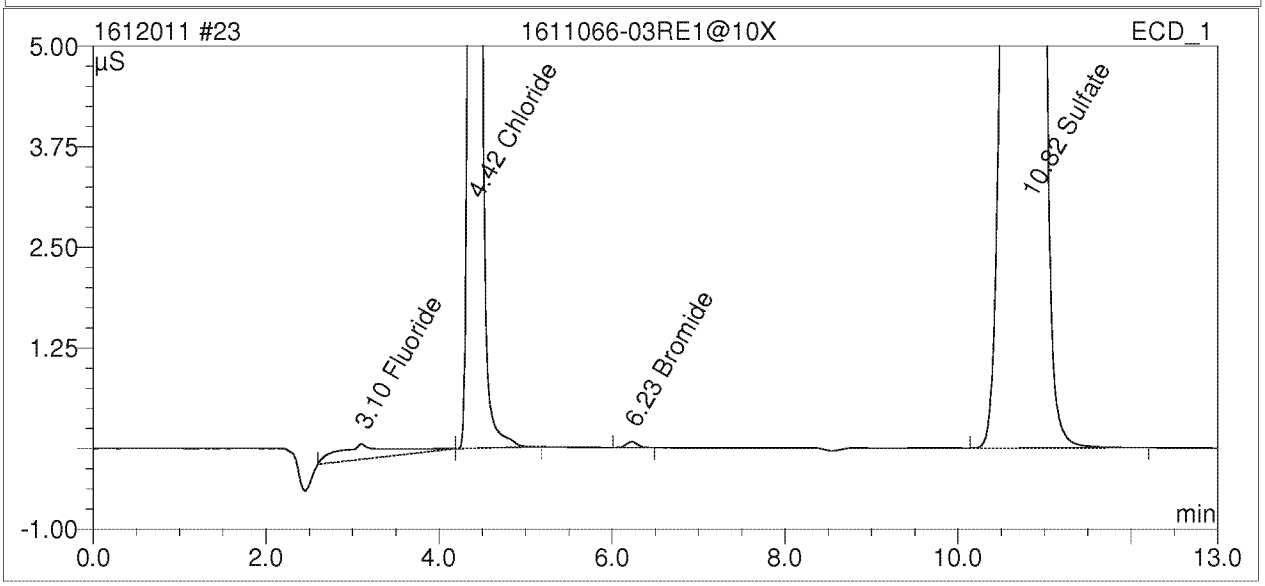
Cl

Sample Analysis Report

Sequence Name:	1612011		**Position No.:**	23
Sample Name:	1611066-03RE1@10X		**Injection volume:**	25.0
Program Method:	ICS1100	0.5+4.5mL	**Vial #:**	15
Quantitation Method:	AnionsB		**Sample Type:**	unknown
Date Time Collected:	12/1/2016 11:24 AM	Filtered	**Dilution Factor:**	1.0000
System Operator:	SUL		**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.104	0.134	0.188	0.615	BMb
2	Chloride	4.417	6.055	58.276	33.473	bMB
3	Bromide	6.227	0.011	0.073	0.189	BMB
4	Sulfate	10.824	28.483	103.409	172.975	BMB





Current date: 12/1/2016
Current time: 1:17 PM
6.80 SR10 Build 2818 (166959)

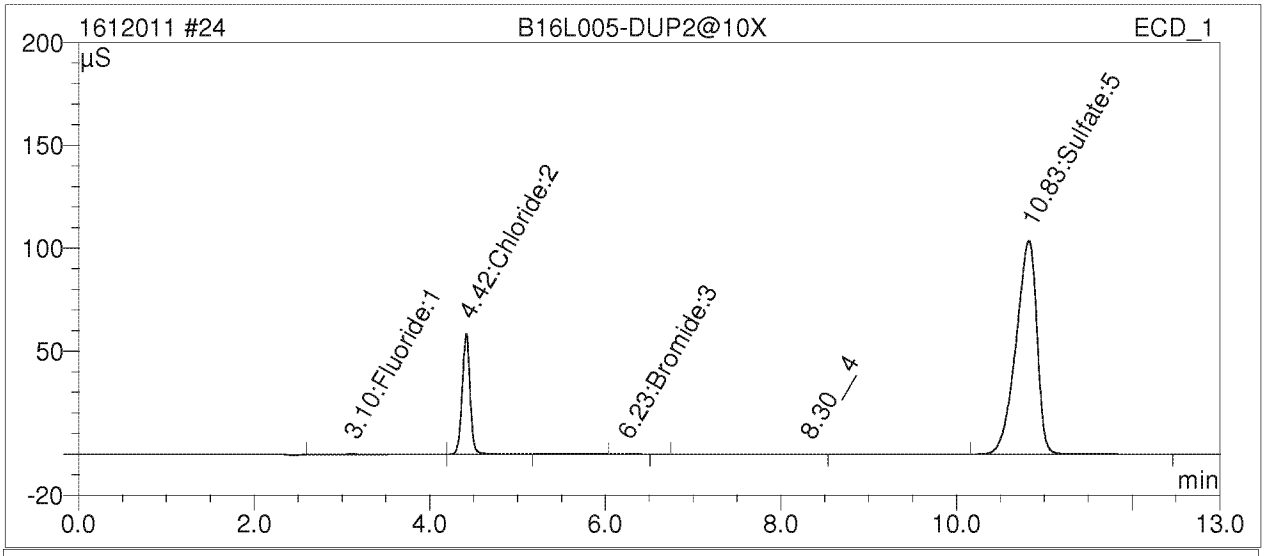
B16L005-DUP2

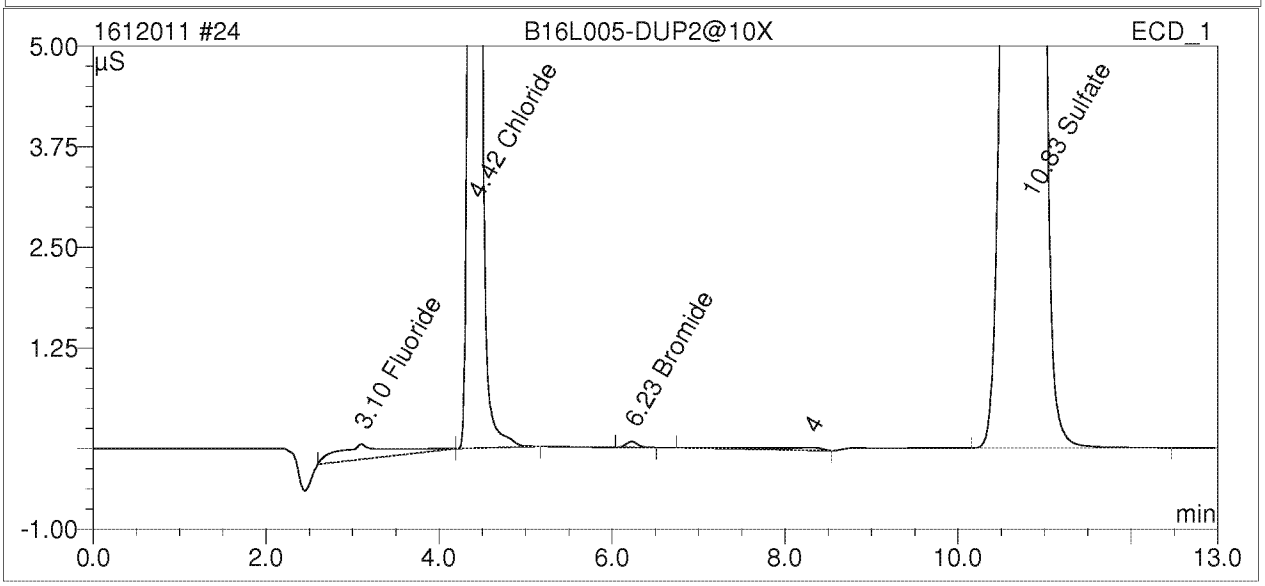
Cl

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	24
Sample Name:	B16L005-DUP2@10X	**Injection volume:**	25.0
Program Method:	ICS1100 1611066-03RE1@10X	**Vial #:**	16
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 11:39 AM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.100	0.133	0.187	0.611	BMb
2	Chloride	4.417	6.068	58.422	33.536	bMB
3	Bromide	6.227	0.011	0.073	0.187	BMB
5	Sulfate	10.827	28.541	103.591	173.231	BMB





Current date: 12/1/2016
Current time: 1:17 PM
6.80 SR10 Build 2818 (166959)
Page 1 of 1

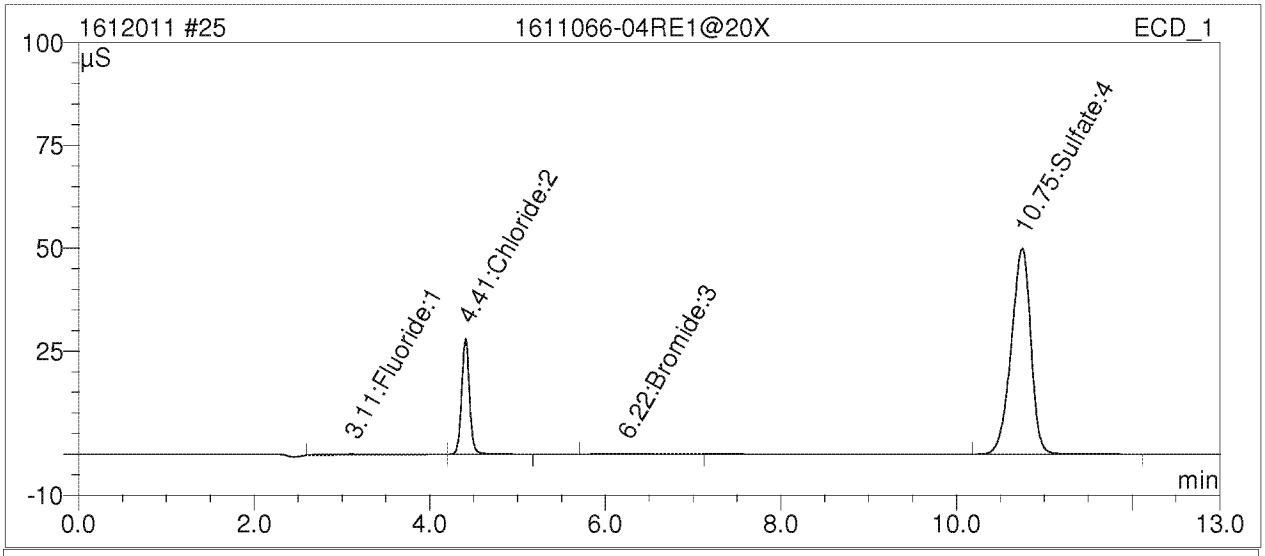
1611066-04RE1

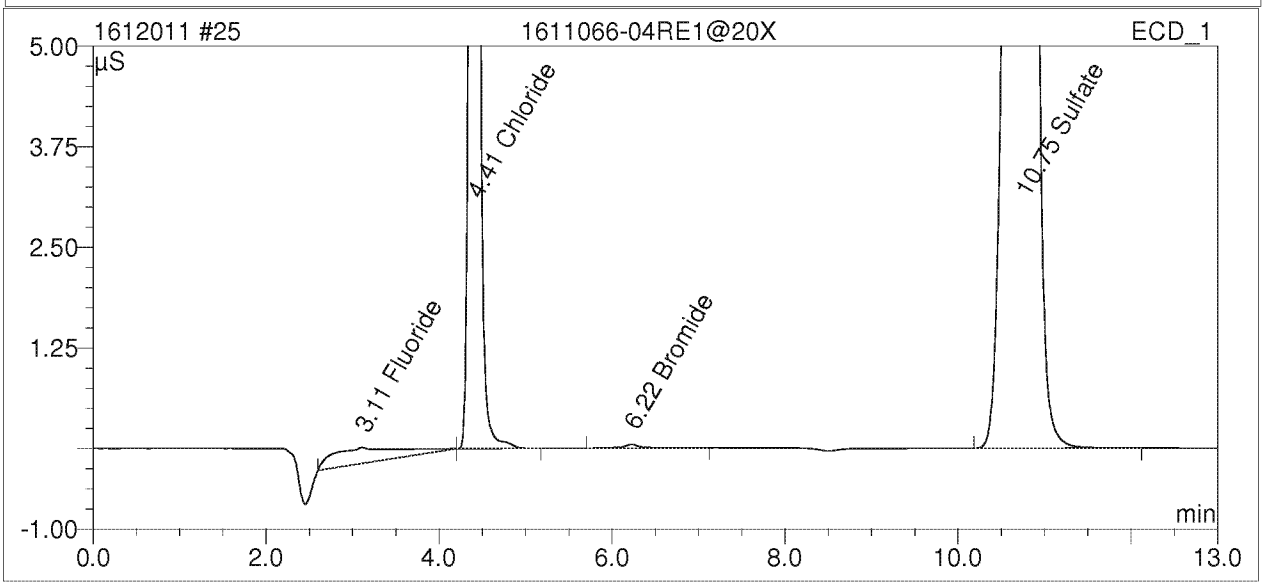
Cl

Sample Analysis Report

Sequence Name:	1612011		**Position No.:**	25
Sample Name:	1611066-04RE1@20X		**Injection volume:**	25.0
Program Method:	ICS1100	0.25+4.75mL	**Vial #:**	17
Quantitation Method:	AnionsB		**Sample Type:**	unknown
Date Time Collected:	12/1/2016 11:55 AM	Filtered	**Dilution Factor:**	1.0000
System Operator:	SUL		**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.107	0.180	0.200	0.830	BMB
2	Chloride	4.407	2.910	28.038	17.379	bMB
3	Bromide	6.224	0.014	0.047	0.235	BMB
4	Sulfate	10.750	12.897	49.948	94.348	BMB





Current date: 12/1/2016
Current time: 1:18 PM
6.80 SR10 Build 2818 (166959)

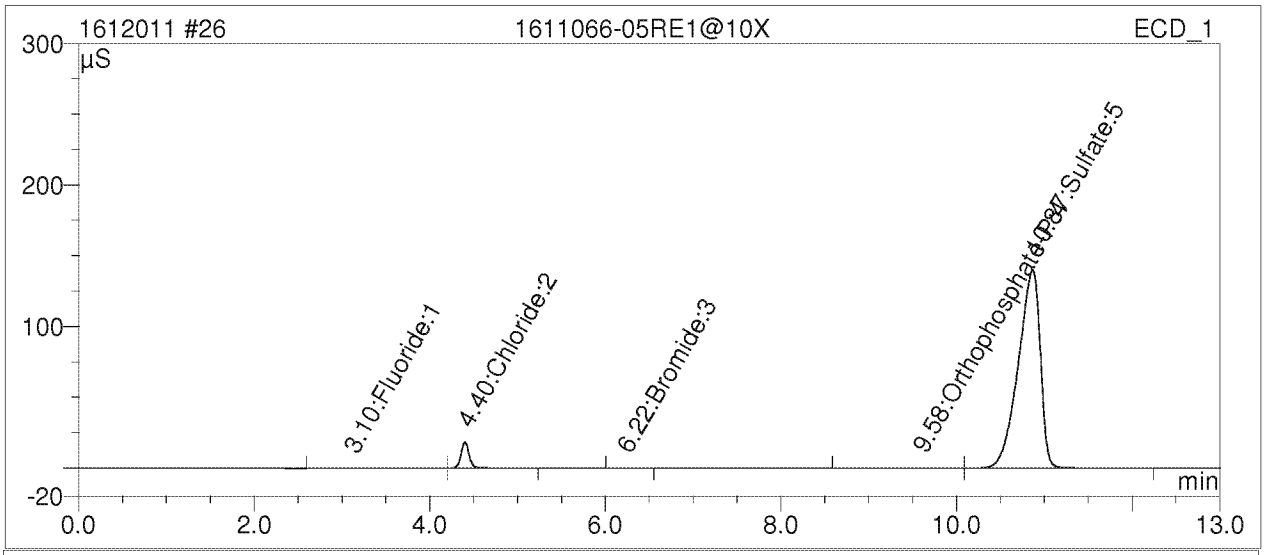
1611066-05RE1

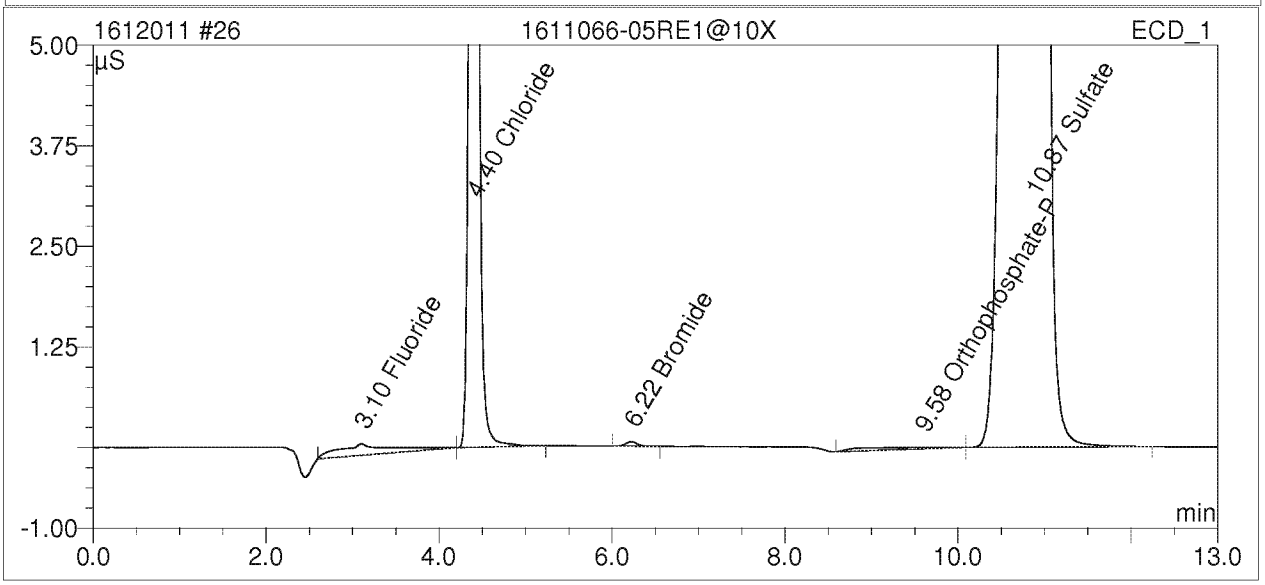
Cl

Sample Analysis Report

Sequence Name:	1612011			**Position No.:**	26
Sample Name:	1611066-05RE1@10X			**Injection volume:**	25.0
Program Method:	ICS1100		0.5+4.5mL	**Vial #:**	18
Quantitation Method:	AnionsB			**Sample Type:**	unknown
Date Time Collected:	12/1/2016	12:10 PM	Filtered	**Dilution Factor:**	1.0000
System Operator:	SUL			**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.100	0.098	0.141	0.451	BMB
2	Chloride	4.400	1.927	18.166	11.837	bMB
3	Bromide	6.220	0.009	0.056	0.147	BMB
4	Orthophosphate-P	9.580	0.031	0.020	0.248	BMB
5	Sulfate	10.867	40.583	139.881	222.596	bMB





Current date: 12/1/2016
Current time: 1:18 PM
6.80 SR10 Build 2818 (166959)

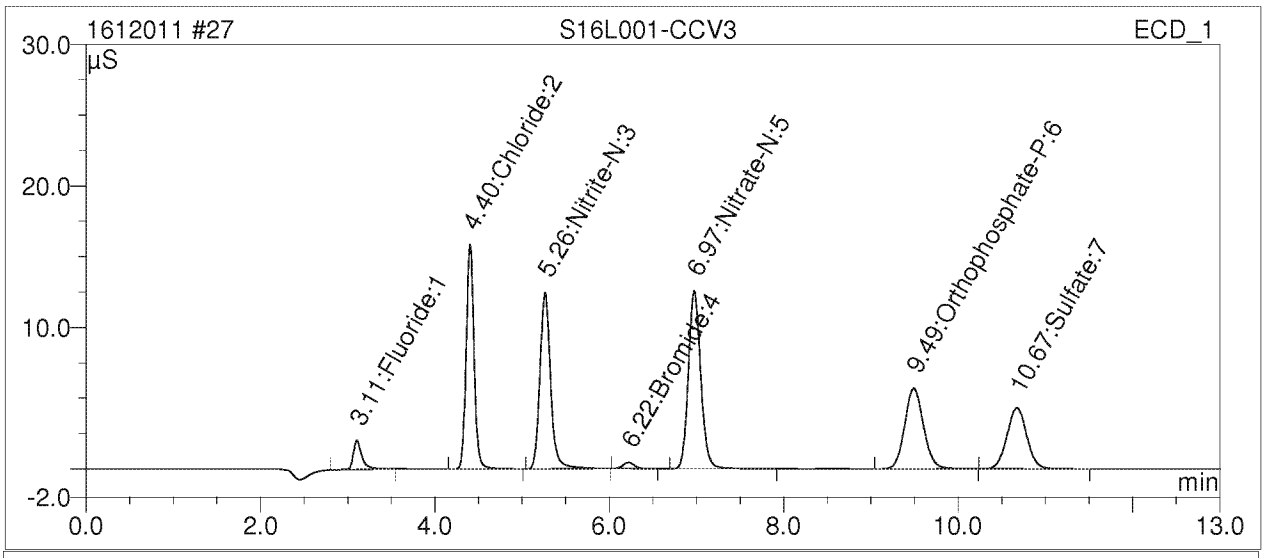
S16L001-CCV3

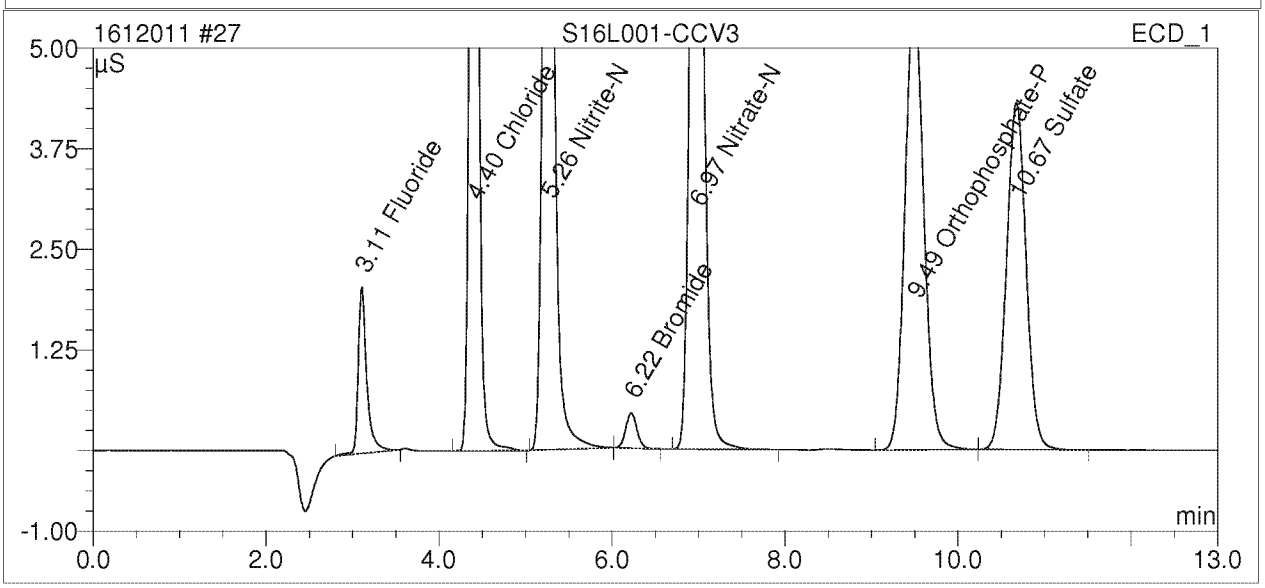
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	27
Sample Name:	S16L001-CCV3	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	19
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 12:26 PM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.107	0.235	2.064	1.080	BMB
2	Chloride	4.404	1.668	15.866	10.328	BMB
3	Nitrite-N	5.264	1.775	12.458	5.317	BMB
4	Bromide	6.220	0.065	0.435	1.087	BMB
5	Nitrate-N	6.974	2.073	12.575	5.406	BMB
6	Orthophosphate-P	9.490	1.427	5.690	10.723	BMB
7	Sulfate	10.674	1.132	4.310	10.587	BMB





Current date: 12/1/2016
Current time: 1:19 PM
6.80 SR10 Build 2818 (166959)

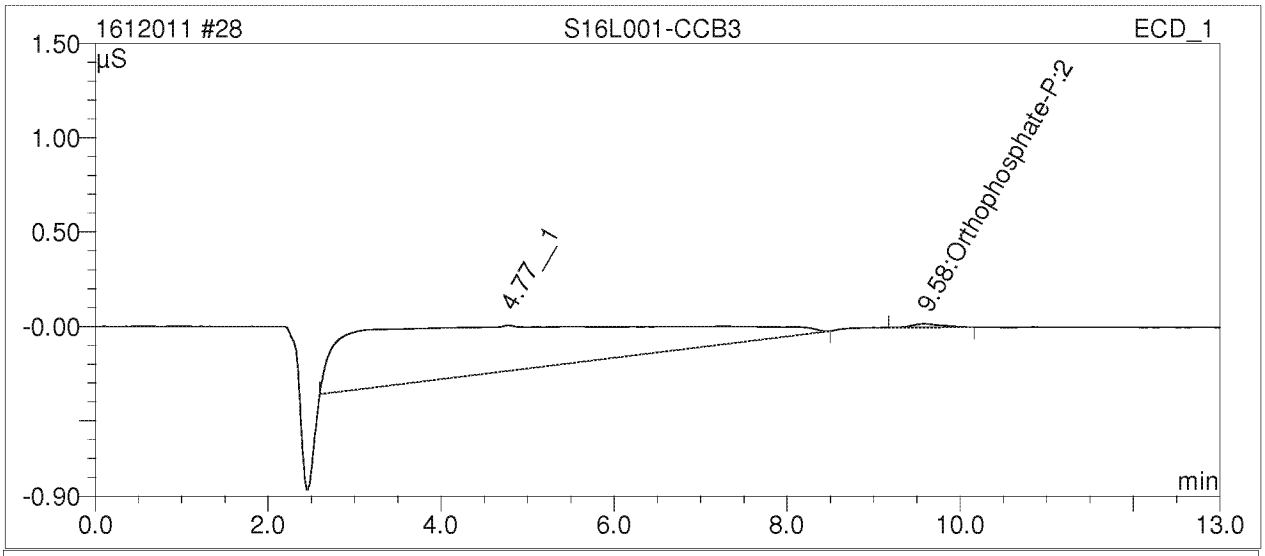
S16L001-CCB3

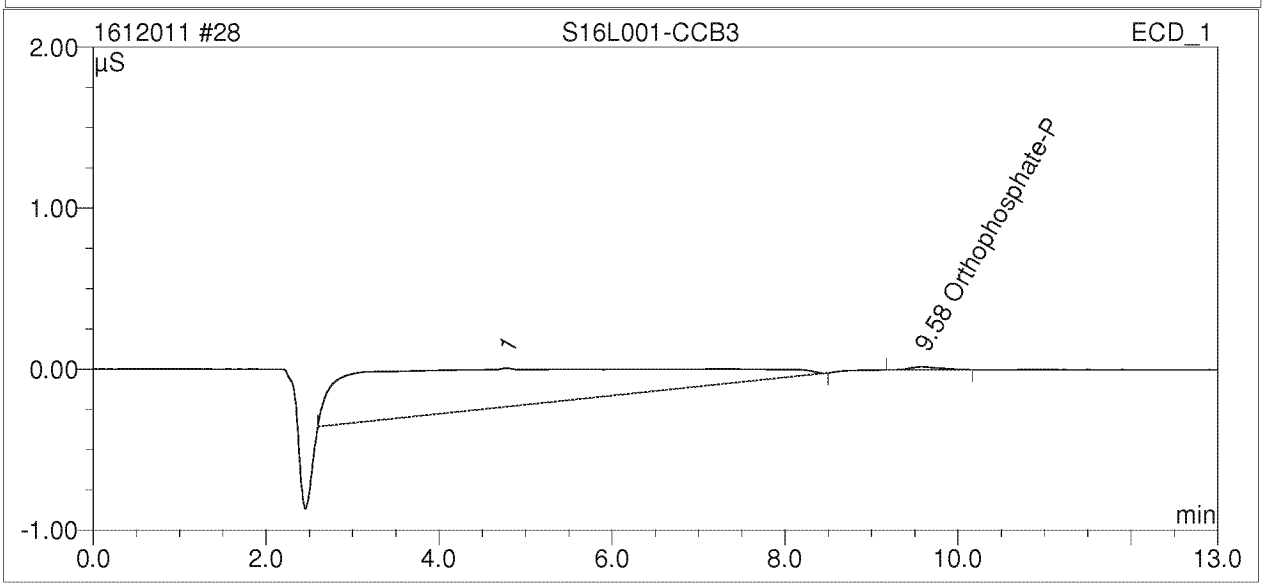
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	28
Sample Name:	S16L001-CCB3	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	20
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 12:41 PM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
2	Orthophosphate-P	9.580	0.008	0.019	0.063	BMB





Current date: 12/1/2016
Current time: 1:20 PM
6.80 SR10 Build 2818 (166959)

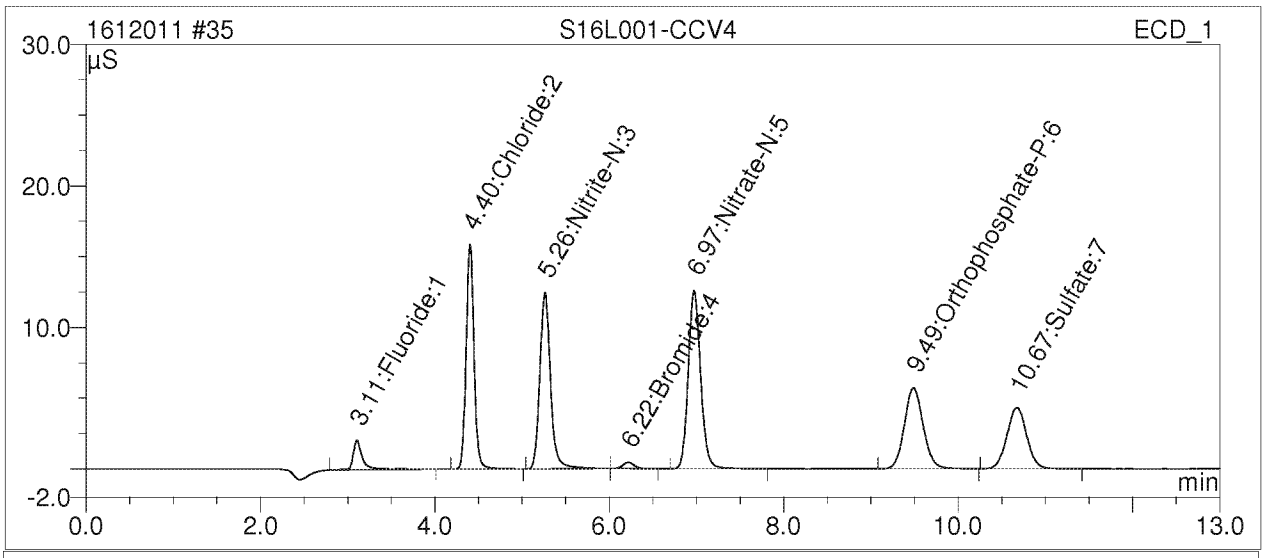
S16L001-CCV4

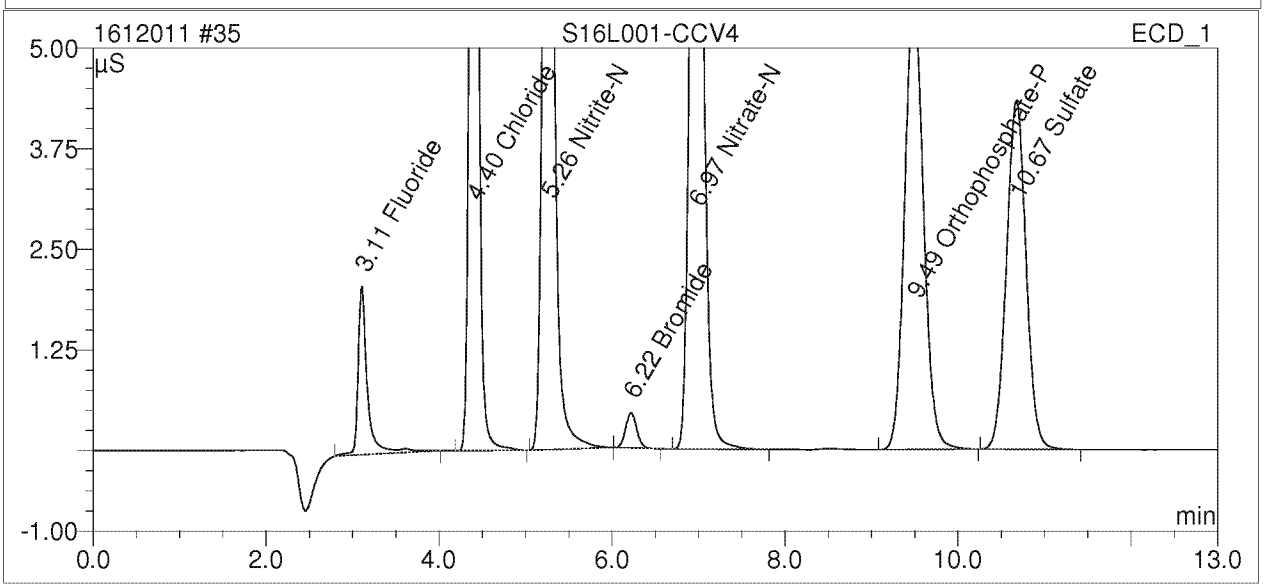
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	35
Sample Name:	S16L001-CCV4	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	27
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 2:29 PM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.107	0.260	2.087	1.191	BMB
2	Chloride	4.404	1.668	15.873	10.329	BMB
3	Nitrite-N	5.264	1.774	12.452	5.315	BMB
4	Bromide	6.217	0.065	0.436	1.089	BMB
5	Nitrate-N	6.970	2.077	12.589	5.417	BMB
6	Orthophosphate-P	9.487	1.431	5.712	10.752	BMB
7	Sulfate	10.674	1.135	4.325	10.619	BMB





Current date: 12/2/2016
Current time: 8:56 AM
6.80 SR10 Build 2818 (166959)

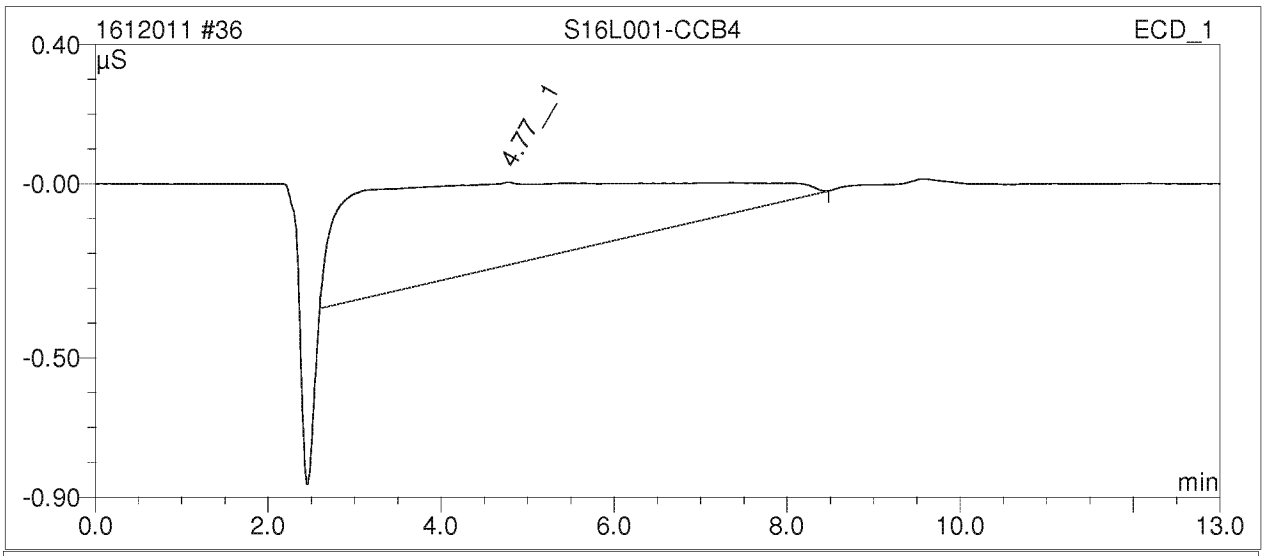
S16L001-CCB4

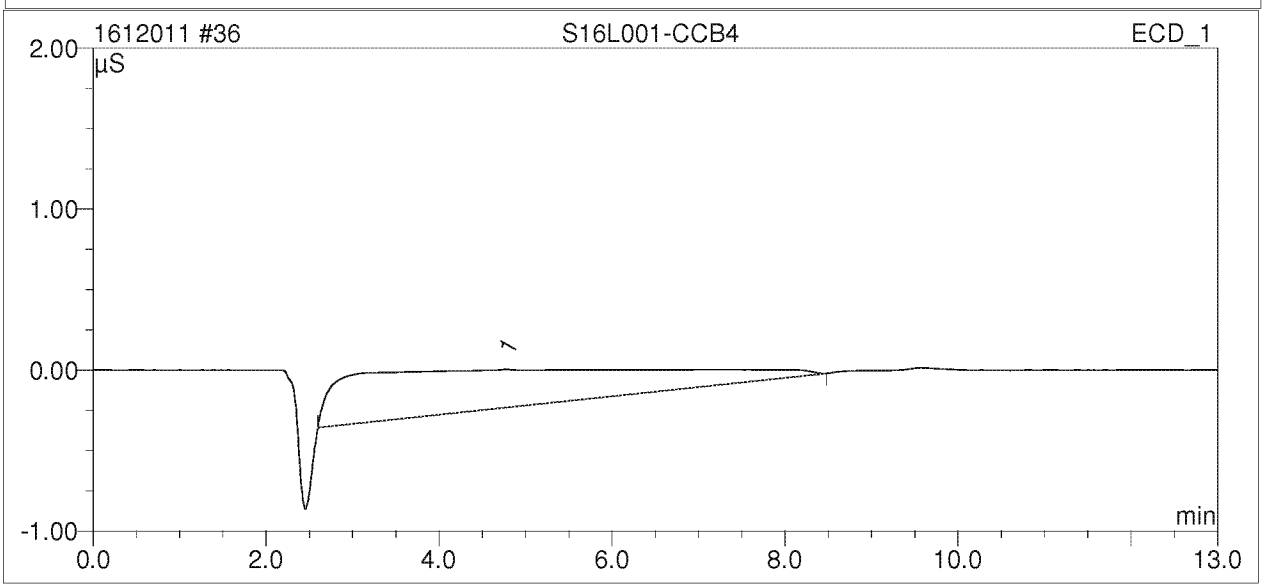
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	36
Sample Name:	S16L001-CCB4	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	28
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 2:44 PM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type





Current date: 12/2/2016
Current time: 8:57 AM
6.80 SR10 Build 2818 (166959)

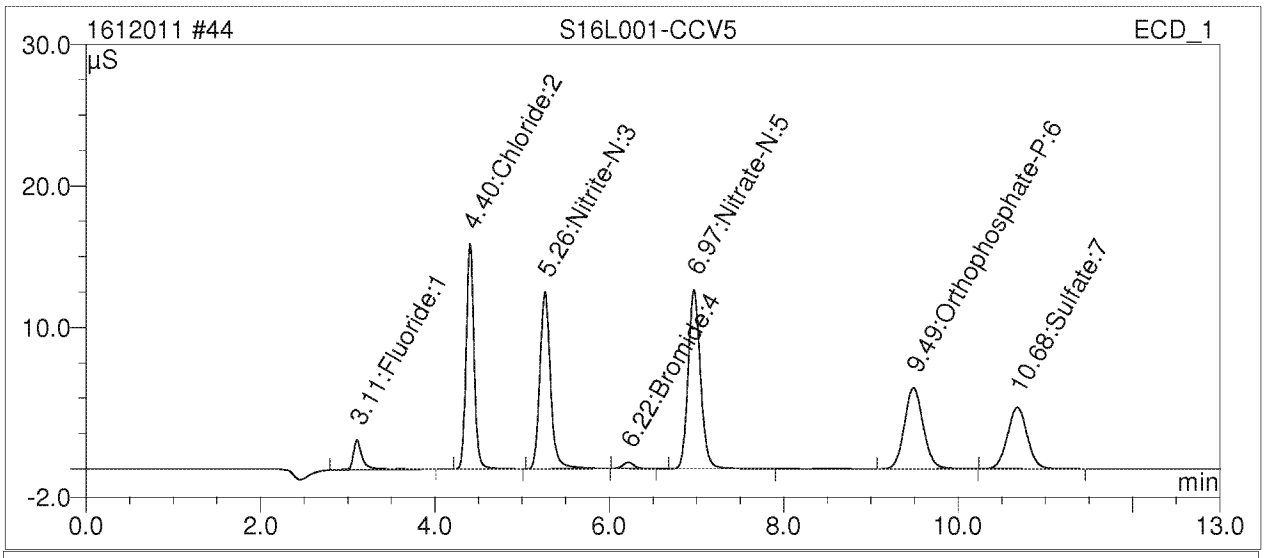
S16L001-CCV5

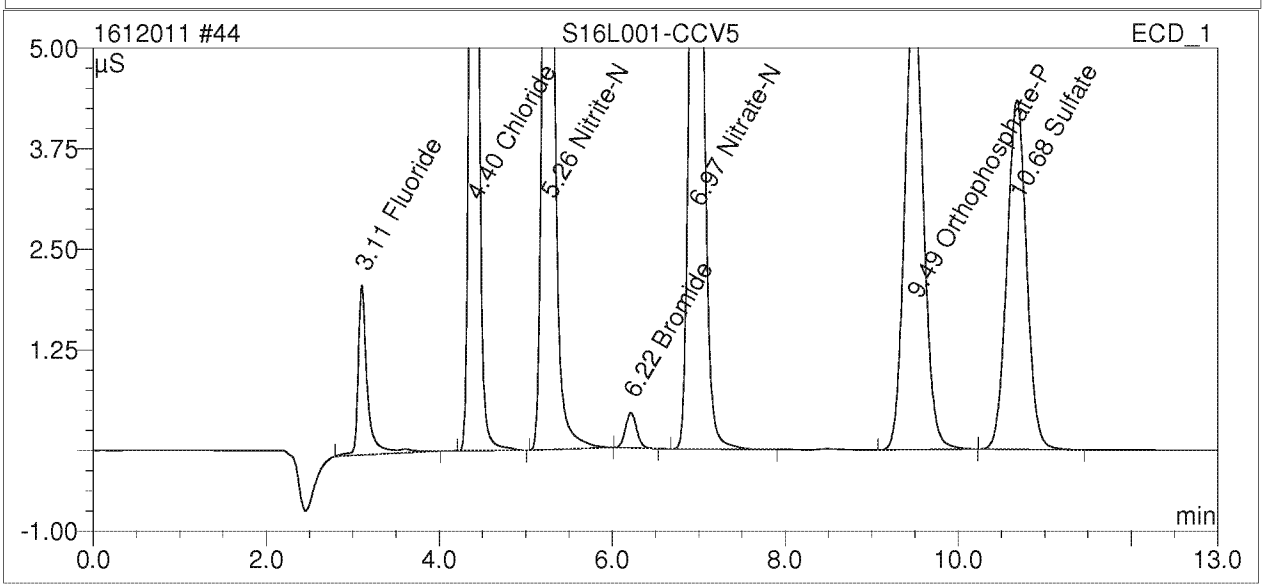
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	44
Sample Name:	S16L001-CCV5	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	36
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 4:47 PM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type
1	Fluoride	3.107	0.261	2.104	1.195	BMB
2	Chloride	4.403	1.670	15.915	10.341	BMB
3	Nitrite-N	5.263	1.778	12.489	5.328	BMB
4	Bromide	6.217	0.065	0.437	1.090	BMB
5	Nitrate-N	6.970	2.080	12.638	5.423	BMB
6	Orthophosphate-P	9.487	1.433	5.729	10.767	BMB
7	Sulfate	10.677	1.140	4.334	10.657	BMB





Current date: 12/2/2016
Current time: 9:04 AM
6.80 SR10 Build 2818 (166959)

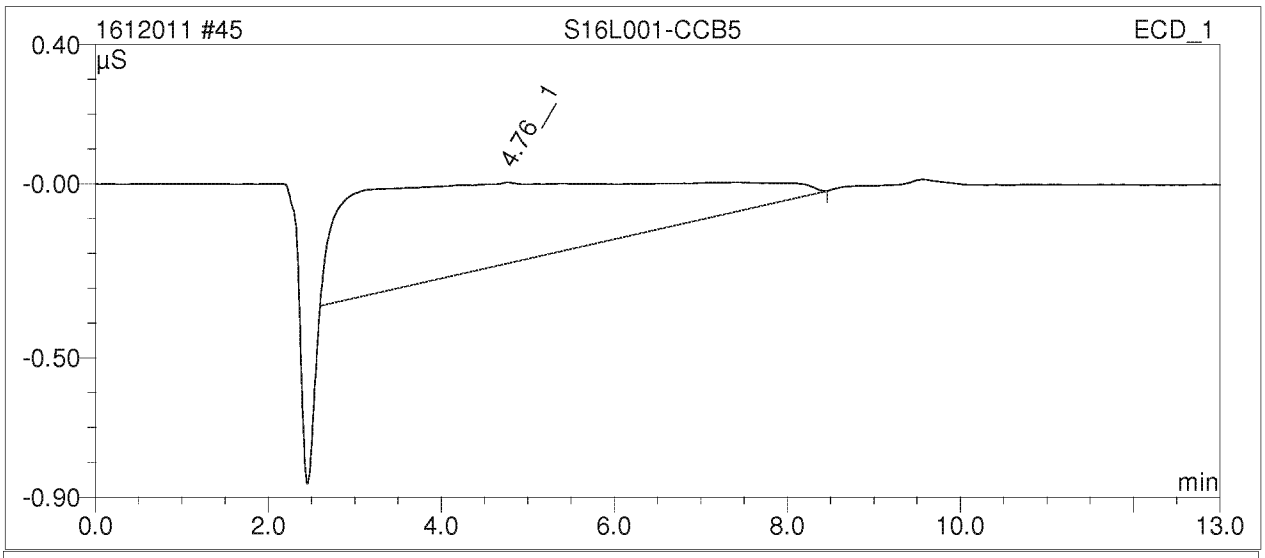
S16L001-CCB5

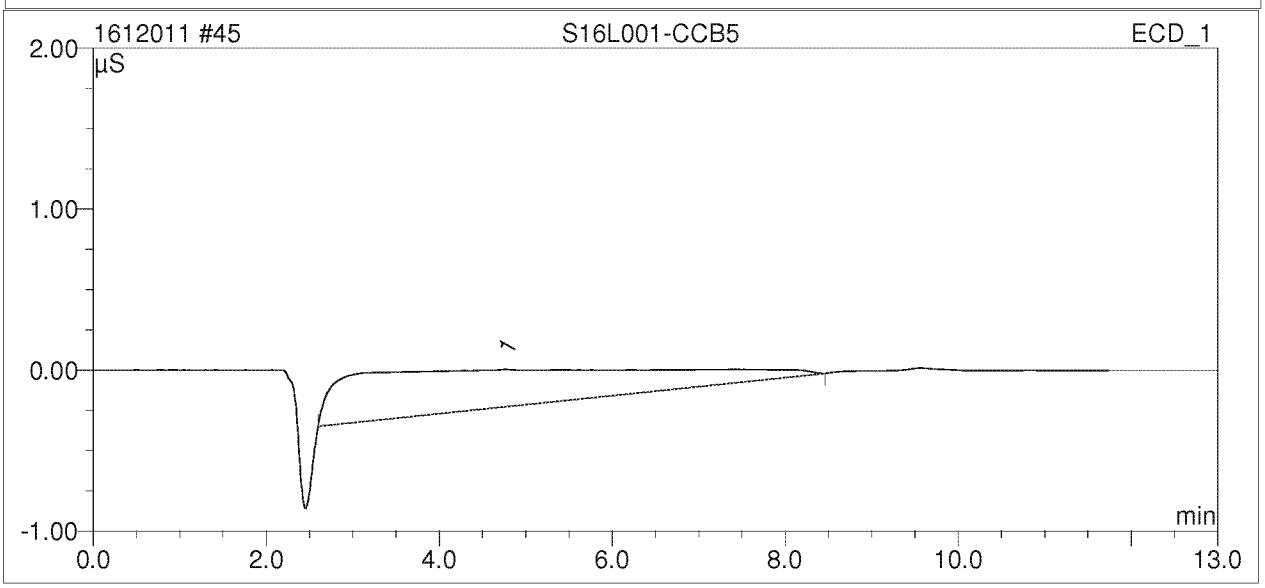
Cl, SO4

Sample Analysis Report

Sequence Name:	1612011	**Position No.:**	45
Sample Name:	S16L001-CCB5	**Injection volume:**	25.0
Program Method:	ICS1100	**Vial #:**	37
Quantitation Method:	AnionsB	**Sample Type:**	unknown
Date Time Collected:	12/1/2016 5:03 PM	**Dilution Factor:**	1.0000
System Operator:	SUL	**Channel:**	ICS1100

Peak No.	Component Name	Retention Time	Area µS*min	Height µS	Amount mg/L	Type





Current date: 12/2/2016
Current time: 9:05 AM
6.80 SR10 Build 2818 (166959)

Calibration

1609012

Cal. Curve

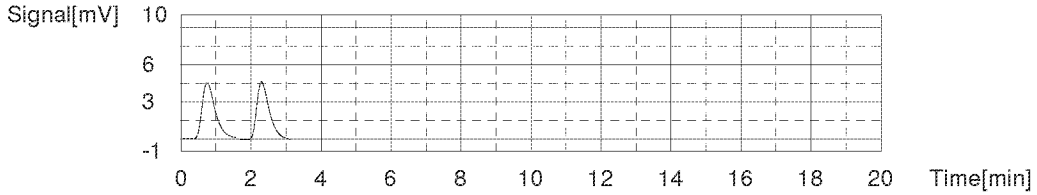
Sample Name: Low Calibration
Sample ID: Low cal -
Cal. Curve: TOC_Low.2016_09_12_11_50_29.cal
Status Completed

Type	Anal.
Standard	NPOC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	11.40	2500uL	1	*******		9/12/2016 12:08:24 PM
2	11.46	2500uL	1	*******		9/12/2016 12:12:14 PM

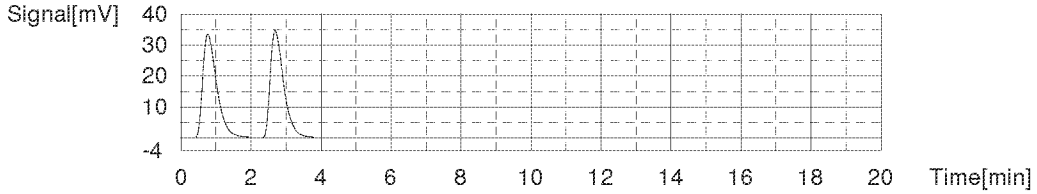
Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 11.43



Conc: 0.5000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	91.76	2500uL	1	*******		9/12/2016 12:30:39 PM
2	91.50	2500uL	1	*******		9/12/2016 12:34:50 PM

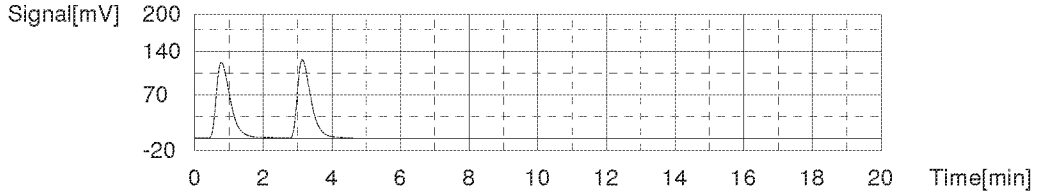
Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 91.63



Conc: 2.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	343.0	2500uL	1	*******		9/12/2016 12:52:57 PM
2	342.8	2500uL	1	*******		9/12/2016 12:57:28 PM

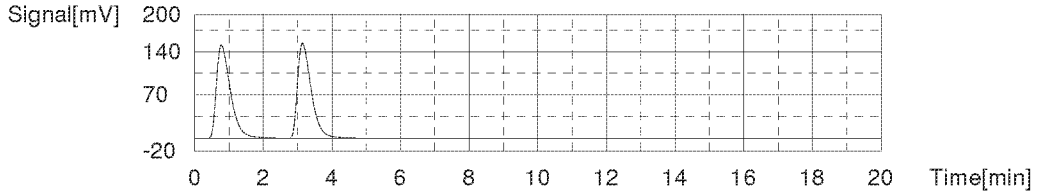
Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 342.9



Conc: 2.500mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	422.7	2500uL	1	*******		9/12/2016 1:14:49 PM
2	421.8	2500uL	1	*******		9/12/2016 1:19:25 PM

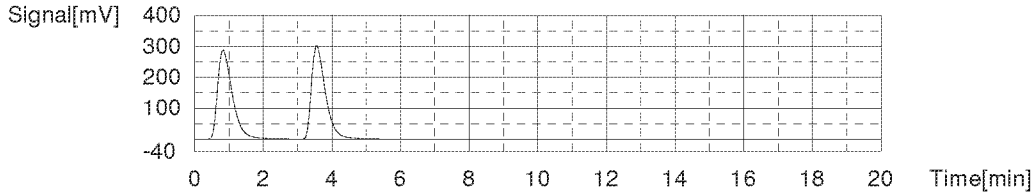
Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 422.3



Conc: 5.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	849.2	2500uL	1	*******		9/12/2016 1:37:04 PM
2	845.0	2500uL	1	*******		9/12/2016 1:41:58 PM

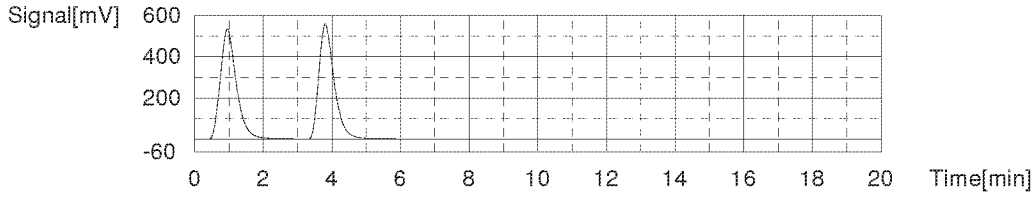
Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 847.1



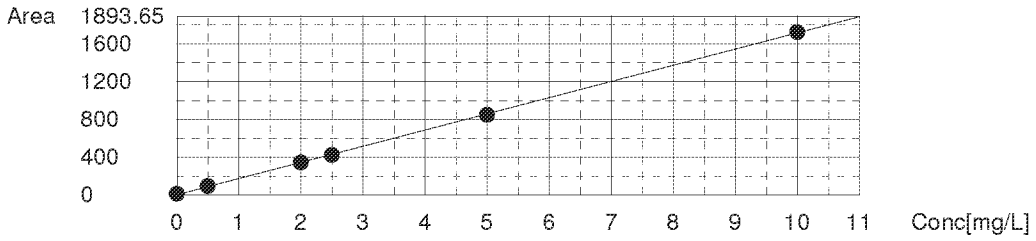
Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1718	2500uL	1	*******		9/12/2016 1:59:05 PM
2	1725	2500uL	1	*******		9/12/2016 2:04:19 PM

Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 1722



Slope: 171.2
Intercept 2.259
r^2 0.999830
r 0.999915
Zero Shift No



Cal. Curve

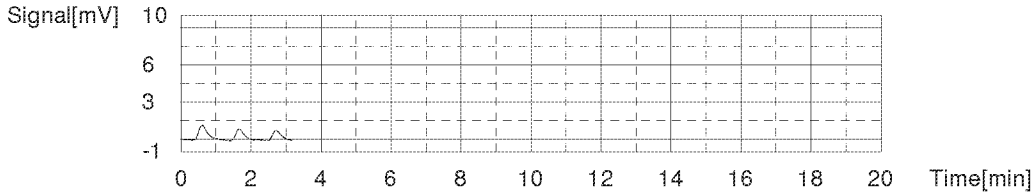
Sample Name: Mid Calibration
Sample ID: Mid Cal -
Cal. Curve: TOC_Mid.2016_09_12_15_07_10.cal
Status Completed

Type	Anal.
Standard	NPOC

Conc: 0.000mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1.884	350uL	2	*******	E	9/12/2016 3:27:00 PM
2	1.502	350uL	2	*******		9/12/2016 3:30:21 PM
3	1.364	350uL	2	*******		9/12/2016 3:34:49 PM

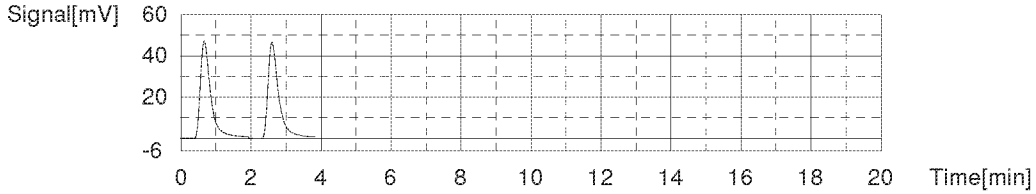
Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 1.433



Conc: 10.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	95.20	350uL	2	*******		9/12/2016 3:49:44 PM
2	96.74	350uL	2	*******		9/12/2016 3:53:55 PM

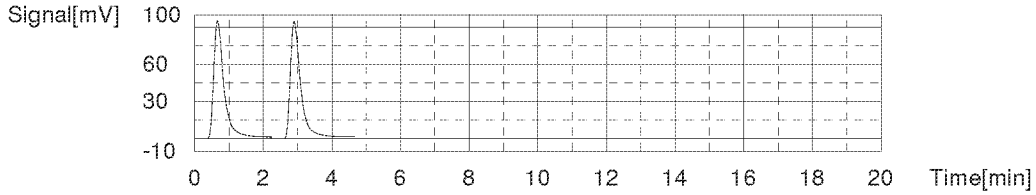
Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 95.97



Conc: 20.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	194.1	350uL	2	*******		9/12/2016 4:11:54 PM
2	195.9	350uL	2	*******		9/12/2016 4:17:13 PM

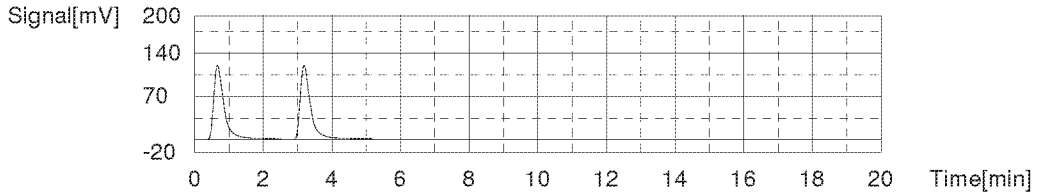
Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 195.0



Conc: 25.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	246.3	350uL	2	*******		9/12/2016 4:34:03 PM
2	250.0	350uL	2	*******		9/12/2016 4:39:36 PM

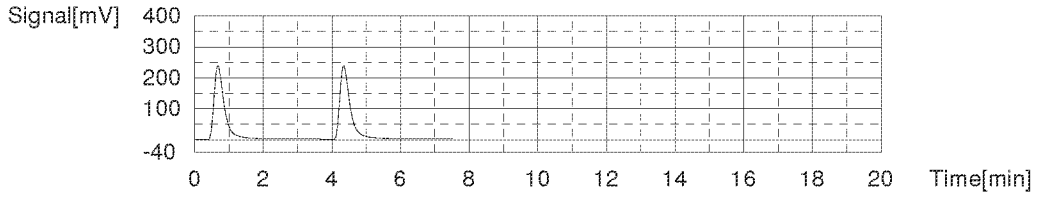
Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 248.2



Conc: 50.00mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	506.6	350uL	2	*******		9/12/2016 4:57:04 PM
2	516.3	350uL	2	*******		9/12/2016 5:03:09 PM

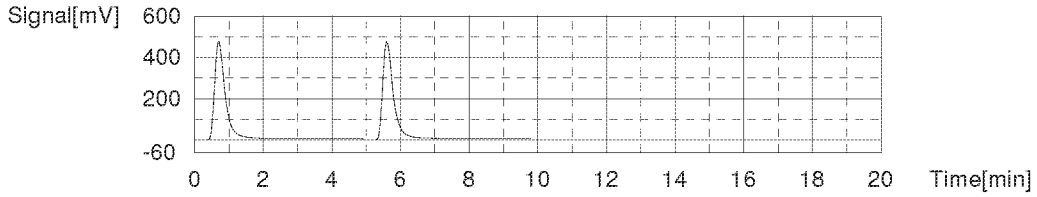
Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 511.5



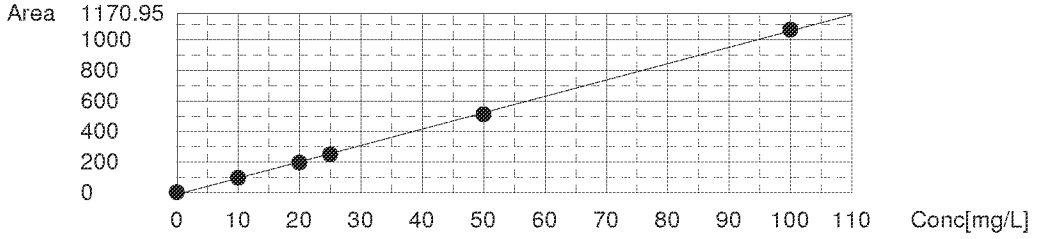
Conc: 100.0mg/L

No.	Area	Inj. Vol.	Aut. Dil.	Rem.	Ex.	Date / Time
1	1061	350uL	2	T******		9/12/2016 5:20:10 PM
2	1068	350uL	2	T******		9/12/2016 5:27:25 PM

Acid Add. 7.500%
Sp. Time 1200sec
Mean Area 1065



Slope: 10.69
Intercept -12.47
r^2 0.999399
r 0.999699
Zero Shift No



SEQUENCE

S16I040

Table of Contents

	Analysi	Sample Name	Sample ID	Result	Comment	Status	Date / Time	Vial
1	NPOC	S16I040-IBL1	IB	NPOC:0.08632mg/L		Completed	9/12/2016 11:12:19 AM	1
2	NPOC	S16I040-IBL2	IB	NPOC:0.09123mg/L		Completed	9/12/2016 11:28:41 AM	2
3	NPOC	S16I040-IBL3	IB	NPOC:0.08917mg/L		Completed	9/12/2016 11:50:29 AM	3
4	NPOC	Low Calibration	Low cal -		r^2=0.9998	Completed	9/12/2016 2:04:19 PM	4, 5, 6, 7, 8, 9
5	NPOC	S16I040-IBL4	IB	NPOC:0.09316mg/L		Completed	9/12/2016 2:23:35 PM	10
6	NPOC	S16I040-IBL5	IB	NPOC:0.06188mg/L		Completed	9/12/2016 2:45:18 PM	11
7	NPOC	S16I040-IBL6	IB	NPOC:0.06158mg/L		Completed	9/12/2016 3:07:10 PM	12
8	NPOC	Mid Calibration	Mid Cal -		r^2=0.9994	Completed	9/12/2016 5:27:25 PM	13, 14, 15, 16, 17
9	NPOC	S16I040-IBL7	IB	NPOC:0.1016mg/L		Completed	9/12/2016 5:41:03 PM	19
10	NPOC	S16I040-IBL8	IB	NPOC:0.04453mg/L		Completed	9/12/2016 6:02:00 PM	20
11	NPOC	S16I040-IBL9	IB	NPOC:0.03123mg/L		Completed	9/12/2016 6:23:46 PM	21
12	NPOC	S16I040-LCV1	1637063 2.5 mg/L	NPOC:2.486mg/L	99%	Completed	9/12/2016 6:48:06 PM	22
13	NPOC	S16I040-CCV1	1637064 25 mg/L	NPOC:24.67mg/L	99%	Completed	9/12/2016 7:12:01 PM	23
14	NPOC	S16I040-CCB1	1638007 CB	NPOC:0.03797mg/L	< 1/2 QL	Completed	9/12/2016 7:29:25 PM	24
15	NPOC	S16I040-CRL1	1637062 0.5 mg/L	NPOC:0.4933mg/L	99%	Completed	9/12/2016 7:52:10 PM	25
16	NPOC	S16I040-SCV1	1638022 2.5 mg/L	NPOC:2.439mg/L	98%	Completed	9/12/2016 8:14:32 PM	26

REVIEWED
By OS at 11:48 am, Sep 13, 2016

Analysis Sequence

S16I040

Project:
Analysis:

Instrument: TOC-VWS **Calibration ID:** 1609012 Printed: 09/13/2016 8:38 am

Lab Number	Sample Name	Order	Analyzed Date	STD ID	ISTD ID	Sequenced By	File ID	Comments
S16I040-IBL1	Instrument Blank	1	9/12/16 11:12			SUL	TOC_2016_09_12-001	
S16I040-IBL2	Instrument Blank	2	9/12/16 11:28			SUL	TOC_2016_09_12-002	
S16I040-IBL3	Instrument Blank	3	9/12/16 11:50			SUL	TOC_2016_09_12-003	
S16I040-CAL1	Cal Standard	4		1638007				
S16I040-CAL2	Cal Standard	5		1637062				
S16I040-CAL3	Cal Standard	6		1638008				
S16I040-CAL4	Cal Standard	7		1637063				
S16I040-CAL5	Cal Standard	8		1638009				
S16I040-CAL6	Cal Standard	9		1638010				
S16I040-IBL4	Instrument Blank	10	9/12/16 14:23			SUL	TOC_2016_09_12-005	
S16I040-IBL5	Instrument Blank	11	9/12/16 14:45			SUL	TOC_2016_09_12-006	
S16I040-IBL6	Instrument Blank	12	9/12/16 15:07			SUL	TOC_2016_09_12-007	
S16I040-CAL7	Cal Standard	13		1638007				
S16I040-CAL8	Cal Standard	14		1638010				
S16I040-CAL9	Cal Standard	15		1638014				
S16I040-CALA	Cal Standard	16		1637064				
S16I040-CALB	Cal Standard	17		1638018				
S16I040-CALC	Cal Standard	18		1638020				
S16I040-IBL7	Instrument Blank	19	9/12/16 17:41			SUL	TOC_2016_09_12-009	
S16I040-IBL8	Instrument Blank	20	9/12/16 18:02			SUL	TOC_2016_09_12-010	
S16I040-IBL9	Instrument Blank	21	9/12/16 18:23			SUL	TOC_2016_09_12-011	
S16I040-LCV1	Low Cal Check	22	9/12/16 18:48	1637063		SUL	TOC_2016_09_12-012	

Page 144 of 324 1611066 DATA_PKG (Rev0).PDF 12/23/16 13:25:24

Table of Contents

Analysis Sequence

S16I040

(Continued)

Project:
Analysis:

Instrument: TOC-VWS **Calibration ID:** 1609012 Printed: 09/13/2016 8:38 am

Lab Number	Sample Name	Order	Analyzed Date	STD ID	ISTD ID	Sequenced By	File ID	Comments
S16I040-CCV1	Calibration Check	23	9/12/16 19:12	1637064		SUL	TOC_2016_09_12-013	
S16I040-CCB1	Calibration Blank	24	9/12/16 19:29	1638007		SUL	TOC_2016_09_12-014	
S16I040-CRL1	Instrument RL Check	25	9/12/16 19:52	1637062		SUL	TOC_2016_09_12-015	
S16I040-SCV1	Secondary Cal Check	26	9/12/16 20:14	1638022		SUL	TOC_2016_09_12-016	

Sequence Comments

Reagents

Reagent #	Description
1635108	TOC, 2:5 Phosphoric Acid
1635110	TOC, Sodium Persulfate Solution

ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	N/A	SEQUENCE #:	S16I040
BATCH #:	N/A	ANALYSIS:	TOC/DOC by Method 415.3 - ICAL

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
DOCUMENTATION	ANALYST: Bench sheet(s) attached? REVIEWER: Bench sheet(s) reviewed?	✔			
	ANALYST: Sequence log(s) attached? REVIEWER: Sequence log(s) reviewed?		Y	Y	
	ANALYST: Every run has a PDF in LIMS? REVIEWER: Every PDF reviewed?		Y	Y	
INITIAL CALIBRATION	Date of Initial Calibration used: If applicable, note date of "Last Update" in Comments.	09/12/16			
	Initial Calibration ID (LIMS number):	1609012			
	ICAL within QC criteria?		Y	Y	
	SCV within QC criteria?		Y	Y	
INSTRUMENT / QC CHECKS	Tune or degradation checks within QC criteria?	✔			
	CCV(s) within QC criteria?		Y	Y	
	QLS(s) within QC criteria?		Y	Y	
	CB(s) or storage blank(s) within QC criteria?		Y	Y	
	Other instrument checks within QC criteria? Specify if applicable.	✔			
BATCH QCs	Method blanks < 1/2 QL?	✔			
	LCS(s) or SRM(s) within QC criteria?	✔			
	MSs/MSDs and/or DUPs within QC criteria?	✔			
	Other method-specific QCs within QC criteria? Specify if applicable.	✔			

ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	N/A	SEQUENCE #:	S16I040
BATCH #:	N/A	ANALYSIS:	TOC/DOC by Method 415.3 - ICAL

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
IS / SS	Internal standards within QC criteria?	✔			
	Surrogates within QC criteria?	✔			
SAMPLE DATA	Were samples prepared & analyzed within holding time?	✔			
	If samples need to be re-run, were RE(s) made in LIMS?	✔			
	Do any samples need to be re-digested or re-extracted?	✔			
	Were all data qualifiers appropriately applied?	✔			
	Are problems, anomalies, discrepancies documented in LIMS? Specify if applicable.	✔			
MANUAL INT	Were manual integrations performed and documented? Specify if applicable.	✔			

APPROVALS	ANALYST INITIALS & DATE:	SUL 09/13/16
	REVIEWED BY:	Osellie Salvador (affiliate) Digitally signed by Osellie Salvador (affiliate) Date: 2016.09.13 11:52:24 -07'00' SIGN HERE

COMMENTS

SEQUENCE DATA

S16I040

S16I040-LCV1

Sample

Sample Name: S16I040-LCV1
Sample ID: 1637063 2.5 mg/L
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

99%

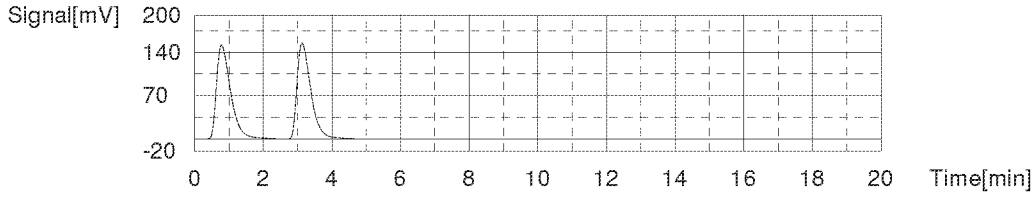
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:2.486mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	427.7	2.486mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	9/12/2016 6:42:48 PM
2	427.7	2.486mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	9/12/2016 6:48:06 PM

Mean Area 427.7
Mean Conc. 2.486mg/L
CV Area 0.00%



S16I040-CCV1

Sample

99%

Sample Name: S16I040-CCV1
Sample ID: 1637064 25 mg/L
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

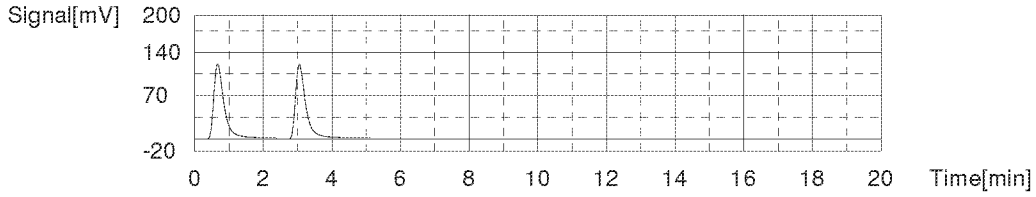
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:24.67mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	251.1	24.66mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	9/12/2016 7:06:59 PM
2	251.4	24.69mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	9/12/2016 7:12:01 PM

Mean Area 251.3
Mean Conc. 24.67mg/L
CV Area 0.08%



S16I040-CCB1

Sample

< 1/2 QL

Sample Name: S16I040-CCB1
Sample ID: 1638007 CB
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

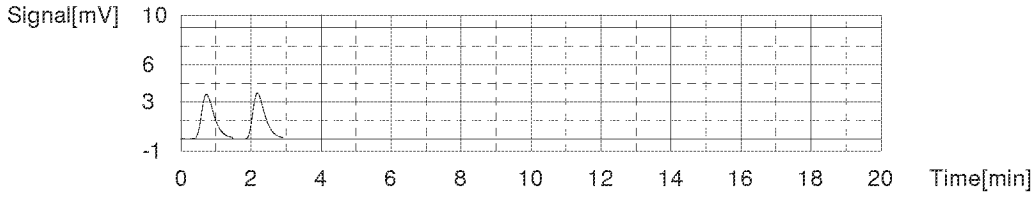
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.03797mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	8.684	0.03754mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	9/12/2016 7:25:39 PM
2	8.833	0.03841mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	9/12/2016 7:29:25 PM

Mean Area 8.759
Mean Conc. 0.03797mg/L
CV Area 1.20%



S16I040-CRL1

Sample

99%

Sample Name: S16I040-CRL1
Sample ID: 1637062 0.5 mg/L
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

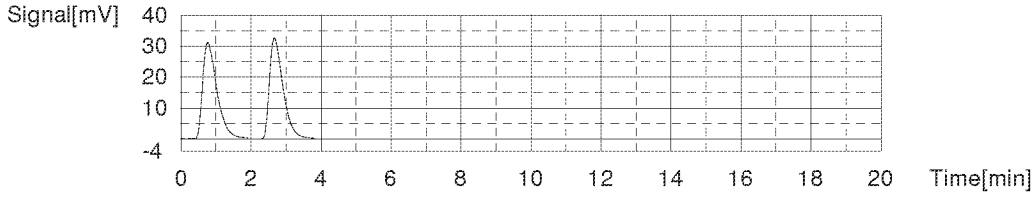
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.4933mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	86.65	0.4930mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	9/12/2016 7:47:58 PM
2	86.75	0.4936mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	9/12/2016 7:52:10 PM

Mean Area 86.70
Mean Conc. 0.4933mg/L
CV Area 0.08%



S16I040-SCV1

Sample

98%

Sample Name: S16I040-SCV1
Sample ID: 1638022 2.5 mg/L
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

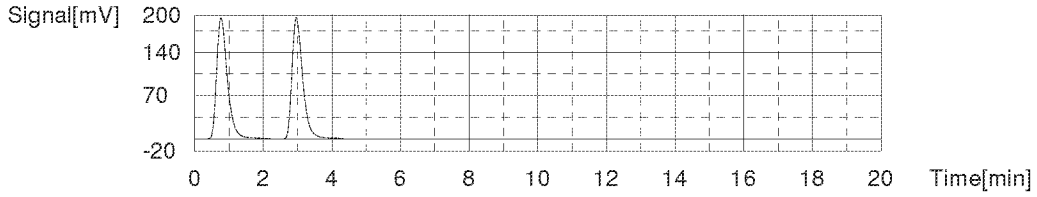
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:2.439mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	420.2	2.442mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	9/12/2016 8:10:07 PM
2	419.4	2.437mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	9/12/2016 8:14:32 PM

Mean Area 419.8
Mean Conc. 2.439mg/L
CV Area 0.13%



SEQUENCE

S16L055

Table of Contents

	Analy	Sample Name	Sample ID	Result	Comment	Status	Date / Time	Vial
1	NPO	S16L055-IBL1		NPOC:0.09173mg/L		Completed	12/9/2016 3:28:34 PM	1
2	NPO	S16L055-IBL2		NPOC:0.1489mg/L		Completed	12/9/2016 3:45:17 PM	2
3	NPO	S16L055-IBL3		NPOC:0.08653mg/L		Completed	12/9/2016 4:06:59 PM	3
4	NPO	S16L055-LCV1	2.5mg/L 1647126	NPOC:2.433mg/L	97%	Completed	12/9/2016 4:30:16 PM	4
5	NPO	S16L055-CCV1	25mg/L 1650099	NPOC:23.61mg/L	94%	Completed	12/9/2016 4:54:27 PM	5
6	NPO	B16L061-BLK1	CCB1 1650096	NPOC:0.09971mg/L	< 1/2 QL	Completed	12/9/2016 5:12:31 PM	6
7	NPO	S16L055-CRL1	0.5mg/L 1650097	NPOC:0.5103mg/L	102%	Completed	12/9/2016 5:34:54 PM	7
S16L055- 8	NPO	~~S16L044~~-IFA1	7mL to 35mL 1647044	NPOC:0.1188mg/L	< 1/2 QL	Completed	12/9/2016 5:55:31 PM	8
9	NPO	B16L061-BS1	50uL spike 2.857mg/L	NPOC:2.906mg/L	102%	Completed	12/9/2016 6:19:11 PM	9
10	NPO	1611061-01		NPOC:0.3352mg/L		Completed	12/9/2016 6:40:31 PM	10
11	NPO	1611061-02		NPOC:5.139mg/L		Completed	12/9/2016 7:07:23 PM	11
12	NPO	1611061-03		NPOC:5.646mg/L		Completed	12/9/2016 7:29:04 PM	12
13	NPO	1611061-04		NPOC:17.65mg/L		Completed	12/9/2016 8:11:31 PM	13
14	NPO	1611061-05		NPOC:3.570mg/L		Completed	12/9/2016 8:33:26 PM	14
15	NPO	1611061-06		NPOC:3.308mg/L		Completed	12/9/2016 8:55:02 PM	15
16	NPO	1611065-01		NPOC:0.9064mg/L		Completed	12/9/2016 9:17:25 PM	16
17	NPO	S16L055-LCV2	2.5mg/L 1650098	NPOC:2.387mg/L	95%	Completed	12/9/2016 9:35:14 PM	17
18	NPO	S16L055-CCV2	25mg/L 1650099	NPOC:23.52mg/L	94%	Completed	12/9/2016 9:59:37 PM	18
19	NPO	B16L063-BLK1	CCB2 1650096	NPOC:0.08157mg/L	< 1/2 QL	Completed	12/9/2016 10:18:21 PM	19
20	NPO	B16L063-BS1	50uL spike 2.857mg/L	NPOC:2.885mg/L	101%	Completed	12/9/2016 10:41:18 PM	20
21	NPO	1611065-03		NPOC:1.028mg/L		Completed	12/9/2016 11:03:20 PM	21
22	NPO	1611065-05		NPOC:1.050mg/L		Completed	12/9/2016 11:24:31 PM	22
23	NPO	1611065-07		NPOC:1.019mg/L		Completed	12/9/2016 11:46:08 PM	23
24	NPO	1611065-09		NPOC:1.012mg/L		Completed	12/10/2016 12:08:36 A	24
25	NPO	1611065-11		NPOC:1.110mg/L		Completed	12/10/2016 12:30:00 A	25
26	NPO	1611065-13		NPOC:0.8386mg/L		Completed	12/10/2016 12:51:43 A	26
27	NPO	1611065-15		NPOC:1.288mg/L		Completed	12/10/2016 1:25:38 AM	27
28	NPO	B16L063-MS1	1611065-15	NPOC:4.219mg/L		Completed	12/10/2016 1:48:09 AM	28
29	NPO	B16L063-MSD1	1611065-15	NPOC:4.145mg/L		Completed	12/10/2016 2:10:39 AM	29
30	NPO	S16L055-LCV3	2.5mg/L 1650098	NPOC:2.326mg/L	93%	Completed	12/10/2016 2:31:08 AM	30
31	NPO	S16L055-CCV3	25mg/L 1650099	NPOC:23.25mg/L	93%	Completed	12/10/2016 2:54:55 AM	31
32	NPO	S16L055-CCB3	1650096	NPOC:0.08452mg/L	< 1/2 QL	Completed	12/10/2016 3:13:42 AM	32
33	NPO	1611065-17		NPOC:0.9975mg/L		Completed	12/10/2016 3:36:23 AM	33
34	NPO	1611065-19		NPOC:0.7919mg/L		Completed	12/10/2016 3:57:36 AM	34
35	NPO	1611065-21		NPOC:1.727mg/L		Completed	12/10/2016 4:21:03 AM	35
36	NPO	1611065-23		NPOC:1.782mg/L		Completed	12/10/2016 4:42:34 AM	36
37	NPO	1611065-25		NPOC:6.554mg/L		Completed	12/10/2016 5:05:52 AM	37
38	NPO	1611065-29		NPOC:0.8772mg/L		Completed	12/10/2016 5:26:18 AM	38
39	NPO	1611065-27	7mL to 35mL	NPOC:8.520mg/L		Completed	12/10/2016 5:51:32 AM	39
40	NPO	16110065-27RE1		NPOC:41.33mg/L		Completed	12/10/2016 6:35:26 AM	40
41	NPO	S16L055-IBL4		NPOC:0.1038mg/L		Completed	12/10/2016 6:56:17 AM	41
42	NPO	S16L055-IBL5		NPOC:0.1144mg/L		Completed	12/10/2016 7:13:34 AM	42
43	NPO	S16L055-LCV4	2.5mg/L 1650098	NPOC:2.367mg/L	95%	Completed	12/10/2016 7:36:53 AM	43
44	NPO	S16L055-CCV4	25mg/L 1650099	NPOC:23.58mg/L	94%	Completed	12/10/2016 8:01:35 AM	44
45	NPO	S16L055-CCB4	1650096	NPOC:0.08563mg/L	< 1/2 QL	Completed	12/10/2016 8:19:49 AM	45
46	NPO	1611066-01		NPOC:4.535mg/L		Completed	12/10/2016 8:48:41 AM	46
47	NPO	1611066-02		NPOC:4.818mg/L		Completed	12/10/2016 9:27:58 AM	47
48	NPO	1611066-03		NPOC:7.985mg/L		Completed	12/10/2016 9:53:23 AM	48
49	NPO	B16L061-MS1	1611066-03	NPOC:10.92mg/L		Completed	12/10/2016 10:14:50 A	49
50	NPO	B16L061-MSD1	1611066-03	NPOC:11.07mg/L		Completed	12/10/2016 10:37:30 A	50
51	NPO	1611066-04		NPOC:2.594mg/L		Completed	12/10/2016 10:58:03 A	51
52	NPO	1611066-05		NPOC:4.617mg/L		Completed	12/10/2016 11:16:49 A	52
53	NPO	1612001-01		NPOC:4.724mg/L		Completed	12/10/2016 11:37:39 A	53
54	NPO	B16L061-MS2	1612001-01	NPOC:7.658mg/L		Completed	12/10/2016 11:59:23 A	54
55	NPO	B16L061-MSD2	1612001-01	NPOC:7.643mg/L		Completed	12/10/2016 12:20:53 P	55
56	NPO	S16L055-LCV5	2.5mg/L 1650098	NPOC:2.364mg/L	95%	Completed	12/10/2016 12:39:13 P	56
57	NPO	S16L055-CCV5	25mg/L 1650099	NPOC:23.55mg/L	94%	Completed	12/10/2016 1:03:19 PM	57
58	NPO	S16L055-CCB5	1650096	NPOC:0.05828mg/L	< 1/2 QL	Completed	12/10/2016 1:22:02 PM	58
59	NPO	1612001-02		NPOC:4.470mg/L		Completed	12/10/2016 1:50:48 PM	59
60	NPO	1612001-03		NPOC:138.5mg/L	over range	Completed	12/10/2016 3:01:36 PM	60
61	NPO	1612001-04		NPOC:27.49mg/L		Completed	12/10/2016 4:00:48 PM	61
62	NPO	1612001-05		NPOC:139.6mg/L	over range	Completed	12/10/2016 4:54:20 PM	62
63	NPO	S16L055-LCV6	2.5mg/L 1650098	NPOC:2.687mg/L	107%	Completed	12/10/2016 5:06:50 PM	63
64	NPO	S16L055-CCV6	25mg/L 1650099	NPOC:23.93mg/L	96%	Completed	12/10/2016 5:30:46 PM	64
65	NPO	S16L055-CCB6	1650096	NPOC:0.1001mg/L	< 1/2 QL	Completed	12/10/2016 5:48:58 PM	65

REVIEWED
By OS at 9:56 am, Dec 16, 2016

Analysis Sequence

S16L055

Project: R17S14
R17S19
Analysis: Carbon, Total Organic by 415.3

Instrument: TOC-VWS **Calibration ID:** 1609012 Printed: 12/14/2016 2:32 pm

Lab Number	Sample Name	Order	Analyzed Date	STD ID	ISTD ID	Sequenced By	File ID	Comments
S16L055-IBL1	Instrument Blank	1	12/9/16 15:28			SUL	TOC_2016_12_09-001	
S16L055-IBL2	Instrument Blank	2	12/9/16 15:45			SUL	TOC_2016_12_09-002	
S16L055-IBL3	Instrument Blank	3	12/9/16 16:06			SUL	TOC_2016_12_09-003	
S16L055-LCV1	Low Cal Check	4	12/9/16 16:30	1647126		SUL	TOC_2016_12_09-004	
S16L055-CCV1	Calibration Check	5	12/9/16 16:54	1650099		SUL	TOC_2016_12_09-005	
S16L055-CCB1	Calibration Blank	6	12/9/16 17:12	1650096		SUL	TOC_2016_12_09-006	
B16L061-BLK1	Blank	7	12/9/16 17:12			SUL	TOC_2016_12_09-006	
S16L055-CRL1	Instrument RL Check	8	12/9/16 17:34	1650097		SUL	TOC_2016_12_09-007	
S16L055-IFA1	IC test	9	12/9/16 17:55	1647044		SUL	TOC_2016_12_09-008	
B16L061-BS1	LCS	10	12/9/16 18:19			SUL	TOC_2016_12_09-009	
1611061-01 B	JW-EL01-1116	11	12/9/16 18:40			SUL	TOC_2016_12_09-010	
1611061-02 B	JWMW-04-1116	12	12/9/16 19:07			SUL	TOC_2016_12_09-011	
1611061-03 B	JWMW-09A-1116	13	12/9/16 19:29			SUL	TOC_2016_12_09-012	
1611061-04 B	JWMW-09B-1116	14	12/9/16 20:11			SUL	TOC_2016_12_09-013	
1611061-05 B	JWMW-09C-1116	15	12/9/16 20:33			SUL	TOC_2016_12_09-014	
1611061-06 B	JWMW-10-1116	16	12/9/16 20:55			SUL	TOC_2016_12_09-015	
1611065-01 B	10I-1116	17	12/9/16 21:17			SUL	TOC_2016_12_09-016	
S16L055-LCV2	Low Cal Check	18	12/9/16 21:35	1650098		SUL	TOC_2016_12_09-017	
S16L055-CCV2	Calibration Check	19	12/9/16 21:59	1650099		SUL	TOC_2016_12_09-018	
S16L055-CCB2	Calibration Blank	20	12/9/16 22:18	1650096		SUL	TOC_2016_12_09-019	
B16L063-BLK1	Blank	21	12/9/16 22:18			SUL	TOC_2016_12_09-019	

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Analysis Sequence

S16L055

(Continued)

Project: R17S14
R17S19

Analysis: Carbon, Total Organic by 415.3

Instrument: TOC-VWS **Calibration ID:** 1609012 Printed: 12/14/2016 2:32 pm

Lab Number	Sample Name	Order	Analyzed Date	STD ID	ISTD ID	Sequenced By	File ID	Comments
B16L063-BS1	LCS	22	12/9/16 22:41			SUL	TOC_2016_12_09-020	
1611065-03 B	12B-1116	23	12/9/16 23:03			SUL	TOC_2016_12_09-021	
1611065-05 B	12N-1116	24	12/9/16 23:24			SUL	TOC_2016_12_09-022	
1611065-07 B	12O-1116	25	12/9/16 23:46			SUL	TOC_2016_12_09-023	
1611065-09 B	12P-1116	26	12/10/16 0:08			SUL	TOC_2016_12_09-024	
1611065-11 B	12P-1116FD	27	12/10/16 0:30			SUL	TOC_2016_12_09-025	
1611065-13 B	1J-1116	28	12/10/16 0:51			SUL	TOC_2016_12_09-026	
1611065-15 B	1U-1116	29	12/10/16 1:25			SUL	TOC_2016_12_09-027	
B16L063-MS1	Matrix Spike	30	12/10/16 1:48			SUL	TOC_2016_12_09-028	
B16L063-MSD1	Matrix Spike Dup	31	12/10/16 2:10			SUL	TOC_2016_12_09-029	
S16L055-LCV3	Low Cal Check	32	12/10/16 2:31	1650098		SUL	TOC_2016_12_09-030	
S16L055-CCV3	Calibration Check	33	12/10/16 2:54	1650099		SUL	TOC_2016_12_09-031	
S16L055-CCB3	Calibration Blank	34	12/10/16 3:13	1650096		SUL	TOC_2016_12_09-032	
1611065-17 B	3A-1116	35	12/10/16 3:36			SUL	TOC_2016_12_09-033	
1611065-19 B	4A2-Pipe-1116	36	12/10/16 3:57			SUL	TOC_2016_12_09-034	
1611065-21 B	5PZ-1-1116	37	12/10/16 4:21			SUL	TOC_2016_12_09-035	
1611065-23 B	5PZ-1-1116FD	38	12/10/16 4:42			SUL	TOC_2016_12_09-036	
1611065-25 B	PondValve-1116	39	12/10/16 5:05			SUL	TOC_2016_12_09-037	
1611065-29 B	Nino001-1116	40	12/10/16 5:26			SUL	TOC_2016_12_09-038	
1611065-27 B	PreNW-1116	41	12/10/16 5:51			SUL	TOC_2016_12_09-039	
1611065-27RE1 B	PreNW-1116	42	12/10/16 6:35			SUL	TOC_2016_12_09-040	

Analysis Sequence

S16L055

(Continued)

Project: R17S14
R17S19

Analysis: Carbon, Total Organic by 415.3

Instrument: TOC-VWS **Calibration ID:** 1609012 Printed: 12/14/2016 2:32 pm

Lab Number	Sample Name	Order	Analyzed Date	STD ID	ISTD ID	Sequenced By	File ID	Comments
S16L055-IBL4	Instrument Blank	43	12/10/16 6:56	1647044		SUL	TOC_2016_12_09-041	
S16L055-IBL5	Instrument Blank	44	12/10/16 7:13			SUL	TOC_2016_12_09-042	
S16L055-LCV4	Low Cal Check	45	12/10/16 7:36	1650098		SUL	TOC_2016_12_09-043	
S16L055-CCV4	Calibration Check	46	12/10/16 8:01	1650099		SUL	TOC_2016_12_09-044	
S16L055-CCB4	Calibration Blank	47	12/10/16 8:19	1650096		SUL	TOC_2016_12_09-045	
1611066-01 A	JWMW-11A-1116	48	12/10/16 8:48			SUL	TOC_2016_12_09-046	
1611066-02 A	JWMW-11B-1116	49	12/10/16 9:27			SUL	TOC_2016_12_09-047	
1611066-03 A	JWMW-11C-1116	50	12/10/16 9:53			SUL	TOC_2016_12_09-048	
B16L061-MS1	Matrix Spike	51	12/10/16 10:14			SUL	TOC_2016_12_09-049	
B16L061-MSD1	Matrix Spike Dup	52	12/10/16 10:37			SUL	TOC_2016_12_09-050	
1611066-04 A	JWMW-12-1116	53	12/10/16 10:58			SUL	TOC_2016_12_09-051	
1611066-05 A	JWMW-911B-1116	54	12/10/16 11:16			SUL	TOC_2016_12_09-052	
1612001-01 B	JWMW-05-1116	55	12/10/16 11:37			SUL	TOC_2016_12_09-053	
B16L061-MS2	Matrix Spike	56	12/10/16 11:59			SUL	TOC_2016_12_09-054	
B16L061-MSD2	Matrix Spike Dup	57	12/10/16 12:20			SUL	TOC_2016_12_09-055	
S16L055-LCV5	Low Cal Check	58	12/10/16 12:39	1650098		SUL	TOC_2016_12_09-056	
S16L055-CCV5	Calibration Check	59	12/10/16 13:03	1650099		SUL	TOC_2016_12_09-057	
S16L055-CCB5	Calibration Blank	60	12/10/16 13:22	1650096		SUL	TOC_2016_12_09-058	
1612001-02 B	JWMW-08A-1116	61	12/10/16 13:50			SUL	TOC_2016_12_09-059	
1612001-03 B	JWMW-08B-1116	62	12/10/16 15:01			SUL	TOC_2016_12_09-060	
1612001-04 B	JWMW-08C-1116	63	12/10/16 16:00			SUL	TOC_2016_12_09-061	

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Analysis Sequence

S16L055

(Continued)

Project: R17S14
R17S19

Analysis: Carbon, Total Organic by 415.3

Instrument: TOC-VWS **Calibration ID:** 1609012 Printed: 12/14/2016 2:32 pm

Lab Number	Sample Name	Order	Analyzed Date	STD ID	ISTD ID	Sequenced By	File ID	Comments
1612001-05 B	JWMW-98B-1116	64	12/10/16 16:54			SUL	TOC_2016_12_09-062	
S16L055-LCV6	Low Cal Check	65	12/10/16 17:06	1650098		SUL	TOC_2016_12_09-063	
S16L055-CCV6	Calibration Check	66	12/10/16 17:30	1650099		SUL	TOC_2016_12_09-064	
S16L055-CCB6	Calibration Blank	67	12/10/16 17:48	1650096		SUL	TOC_2016_12_09-065	

Sequence Comments

Reagents

Reagent #	Description
1647104	TOC, Sodium Persulfate Solution
1647115	TOC, 2:5 Phosphoric Acid

ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	B16L061	SEQUENCE #:	S16L055
BATCH #:	B16L063	ANALYSIS:	TOC by Method 415.3

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
DOCUMENTATION	ANALYST: Bench sheet(s) attached? REVIEWER: Bench sheet(s) reviewed?	☐	Y	Y	
	ANALYST: Sequence log(s) attached? REVIEWER: Sequence log(s) reviewed?	☐	Y	Y	
	ANALYST: Every run has a PDF in LIMS? REVIEWER: Every PDF reviewed?	☐	Y	Y	
INITIAL CALIBRATION	Date of Initial Calibration used: If applicable, note date of "Last Update" in Comments.	09/12/16			
	Initial Calibration ID (LIMS number):	1609012			
	ICAL within QC criteria?	☐	Y	Y	
	SCV within QC criteria?	☐	Y	Y	
INSTRUMENT / QC CHECKS	Tune or degradation checks within QC criteria?	☑			
	CCV(s) within QC criteria?	☐	Y	Y	
	QLS(s) within QC criteria?	☐	Y	Y	
	CB(s) or storage blank(s) within QC criteria?	☐	Y	Y	
	Other instrument checks within QC criteria? Specify if applicable.	☐	Y	Y	IFA < 1/2 QL
BATCH QCs	Method blanks < 1/2 QL?	☐	Y	Y	
	LCS(s) or SRM(s) within QC criteria?	☐	Y	Y	
	MSs/MSDs and/or DUPs within QC criteria?	☐	Y	Y	See comments.
	Other method-specific QCs within QC criteria? Specify if applicable.	☑			

ANALYST / REVIEWER - DATA REVIEW CHECKLIST

BATCH #:	B16L061	SEQUENCE #:	S16L055
BATCH #:	B16L063	ANALYSIS:	TOC by Method 415.3

	CHECKLIST ITEM	N/A	ANALYST Y/N	REVIEWER Y/N	IDENTIFY OUTLIERS / COMMENTS
IS / SS	Internal standards within QC criteria?	✔			
	Surrogates within QC criteria?	✔		Y	
SAMPLE DATA	Were samples prepared & analyzed within holding time?		Y	Y	
	If samples need to be re-run, were RE(s) made in LIMS?		Y	Y	1612001-03 and -05 need to be run at dilutions. 1612001-04 needs to be run for confirmation
	Do any samples need to be re-digested or re-extracted?	✔			
	Were all data qualifiers appropriately applied?		Y	Y	
	Are problems, anomalies, discrepancies documented in LIMS? Specify if applicable.	✔			
MANUAL INT	Were manual integrations performed and documented? Specify if applicable.	✔			

APPROVALS	ANALYST INITIALS & DATE:	SUL 12/15/16
	REVIEWED BY:	Osellie Salvador (affiliate) Digitally signed by Osellie Salvador (affiliate) Date: 2016.12.16 09:58:00 -08'00' SIGN HERE

COMMENTS

B16L061-MS1/MSD1 were analyzed using the wrong calibration curve but will be reported, as the source sample was analyzed on the correct curve.

SEQUENCE DATA

S16L055

S16L055-LCV1

Sample

97%

Sample Name: S16L055-LCV1
Sample ID: 2.5mg/L 1647126
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

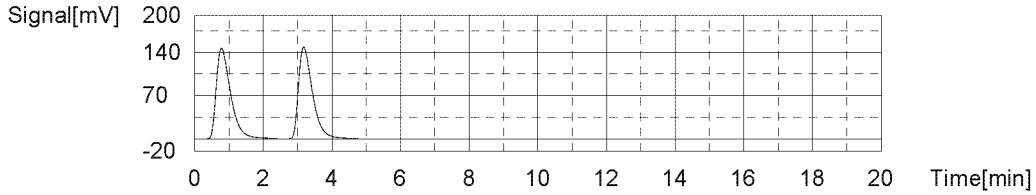
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:2.433mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	419.1	2.435mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 4:24:55 PM
2	418.3	2.431mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 4:30:16 PM

Mean Area 418.7
Mean Conc. 2.433mg/L
CV Area 0.14%



S16L055-CCV1

94%

Sample

Sample Name:	S16L055-CCV1
Sample ID:	25mg/L 1650099
Origin:	TOC_0_5to100.met
Status	Completed
Chk. Result	

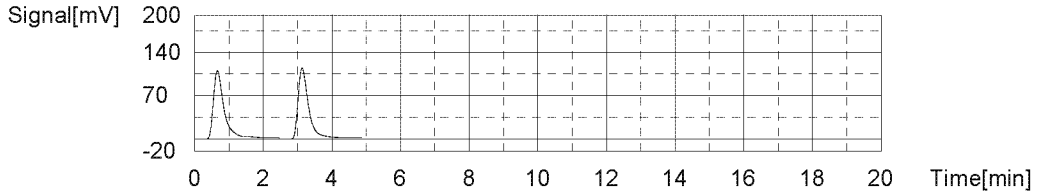
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:23.61mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	238.6	23.49mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/9/2016 4:49:09 PM
2	241.2	23.73mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/9/2016 4:54:27 PM

Mean Area	239.9
Mean Conc.	23.61mg/L
CV Area	0.77%



S16L055-CCB1

Sample

< 1/2 QL

Sample Name: B16L061-BLK1
Sample ID: CCB1 1650096
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

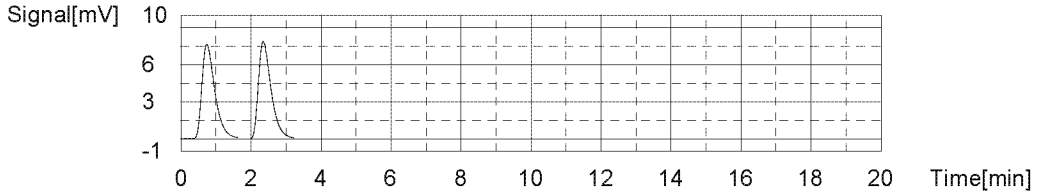
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.09971mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	19.07	0.09822mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 5:07:52 PM
2	19.58	0.1012mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 5:12:31 PM

Mean Area 19.33
Mean Conc. 0.09971mg/L
CV Area 1.87%



B16L061-BLK1

Sample

< 1/2 QL

Sample Name: B16L061-BLK1
Sample ID: CCB1 1650096
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

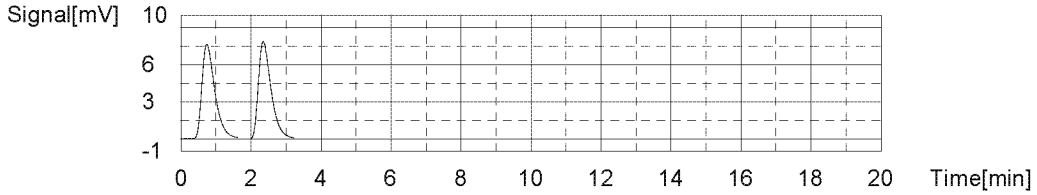
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.09971mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	19.07	0.09822mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 5:07:52 PM
2	19.58	0.1012mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 5:12:31 PM

Mean Area 19.33
Mean Conc. 0.09971mg/L
CV Area 1.87%



S16L055-CRL1

Sample

102%

Sample Name: S16L055-CRL1
Sample ID: 0.5mg/L 1650097
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

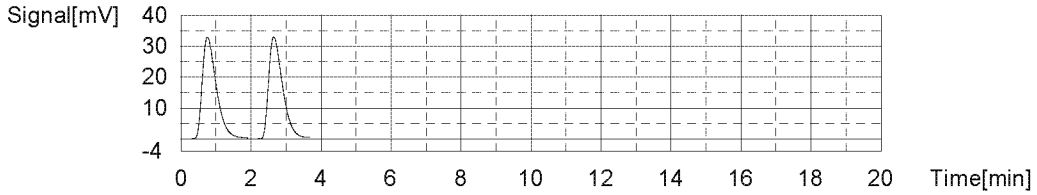
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.5103mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	90.22	0.5139mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 5:30:01 PM
2	88.98	0.5067mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 5:34:54 PM

Mean Area 89.60
Mean Conc. 0.5103mg/L
CV Area 0.98%



S16L055-IFA1

Sample S16L055-IFA1 < 1/2 QL

Sample Name: ~~S16L044~~-IFA1
Sample ID: 7mL to 35mL 1647044
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

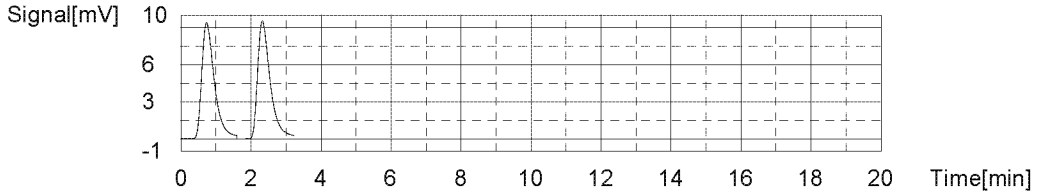
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.1188mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	22.39	0.1176mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 5:51:36 PM
2	22.79	0.1200mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 5:55:31 PM

Mean Area 22.59
Mean Conc. 0.1188mg/L
CV Area 1.25%



B16L061-BS1

Sample

102%

Sample Name:	B16L061-BS1
Sample ID:	50uL spike 2.857mg/L
Origin:	TOC_0_5to100.met
Status	Completed
Chk. Result	

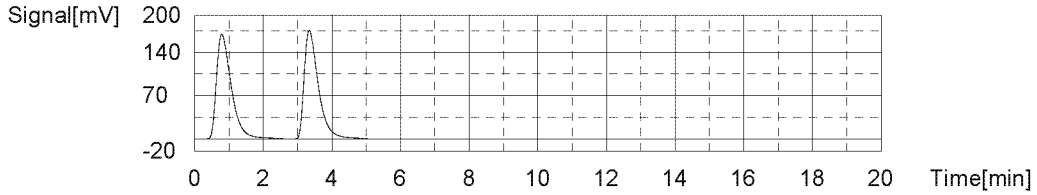
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:2.906mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	501.0	2.914mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 6:14:25 PM
2	498.3	2.898mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 6:19:11 PM

Mean Area	499.6
Mean Conc.	2.906mg/L
CV Area	0.38%



S16L055-LCV2

Sample

95%

Sample Name: S16L055-LCV2
Sample ID: 2.5mg/L 1650098
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

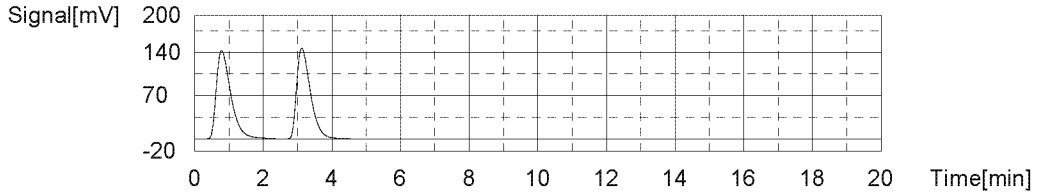
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:2.387mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	415.0	2.411mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 9:30:45 PM
2	406.5	2.362mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 9:35:14 PM

Mean Area 410.8
Mean Conc. 2.387mg/L
CV Area 1.46%



S16L055-CCV2

Sample

94%

Sample Name: S16L055-CCV2
Sample ID: 25mg/L 1650099
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

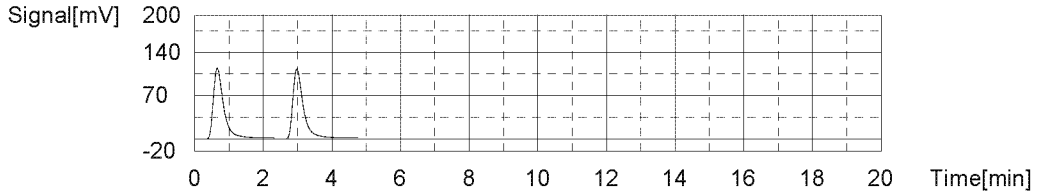
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:23.52mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	237.8	23.41mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/9/2016 9:54:53 PM
2	240.0	23.62mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/9/2016 9:59:37 PM

Mean Area 238.9
Mean Conc. 23.52mg/L
CV Area 0.65%



S16L055-CCB2

Sample

< 1/2 QL

Sample Name: B16L063-BLK1
Sample ID: CCB2 1650096
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

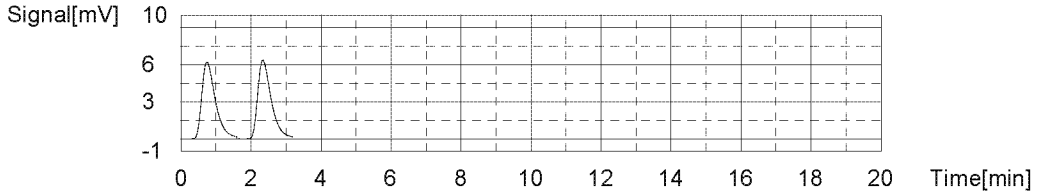
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.08157mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	16.06	0.08063mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 10:13:45 PM
2	16.38	0.08250mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/9/2016 10:18:21 PM

Mean Area 16.22
Mean Conc. 0.08157mg/L
CV Area 1.40%



S16L055-LCV3

Sample

93%

Sample Name: S16L055-LCV3
Sample ID: 2.5mg/L 1650098
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

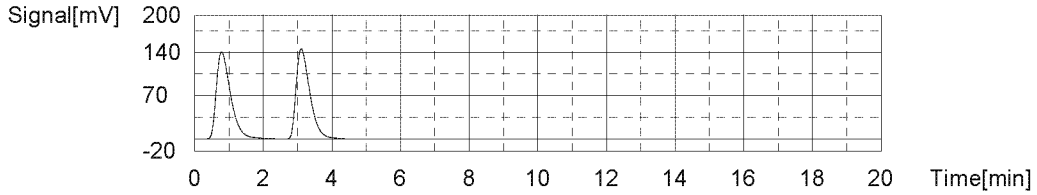
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:2.326mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	402.6	2.339mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 2:26:05 AM
2	398.2	2.313mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 2:31:08 AM

Mean Area 400.4
Mean Conc. 2.326mg/L
CV Area 0.78%



S16L055-CCV3

Sample

93%

Sample Name: S16L055-CCV3
Sample ID: 25mg/L 1650099
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

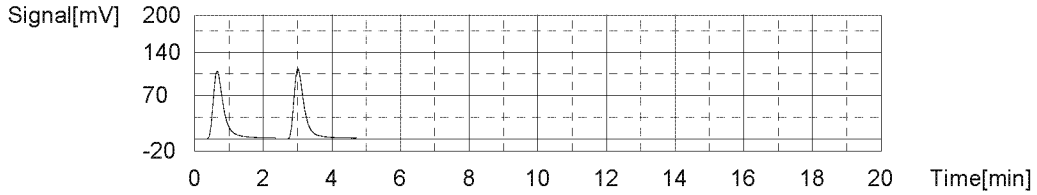
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:23.25mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	234.3	23.09mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/10/2016 2:50:16 AM
2	237.9	23.42mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/10/2016 2:54:55 AM

Mean Area 236.1
Mean Conc. 23.25mg/L
CV Area 1.08%



S16L055-CCB3

Sample

< 1/2 QL

Sample Name: S16L055-CCB3
Sample ID: 1650096
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

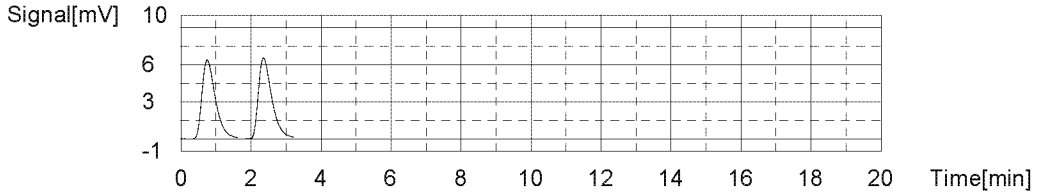
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.08452mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	16.56	0.08355mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 3:09:08 AM
2	16.89	0.08548mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 3:13:42 AM

Mean Area 16.73
Mean Conc. 0.08452mg/L
CV Area 1.40%



S16L055-LCV4

Sample

95%

Sample Name: S16L055-LCV4
Sample ID: 2.5mg/L 1650098
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

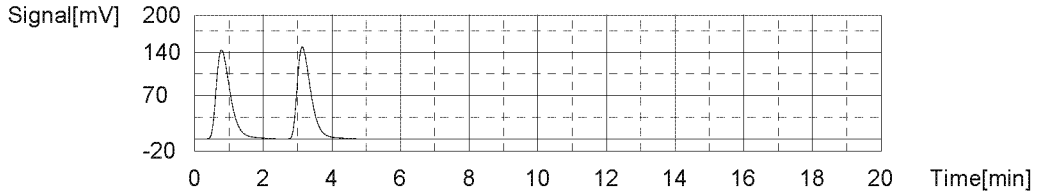
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:2.367mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	407.0	2.365mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 7:32:14 AM
2	407.9	2.370mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 7:36:53 AM

Mean Area 407.5
Mean Conc. 2.367mg/L
CV Area 0.16%



S16L055-CCV4

Sample

94%

Sample Name: S16L055-CCV4
Sample ID: 25mg/L 1650099
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

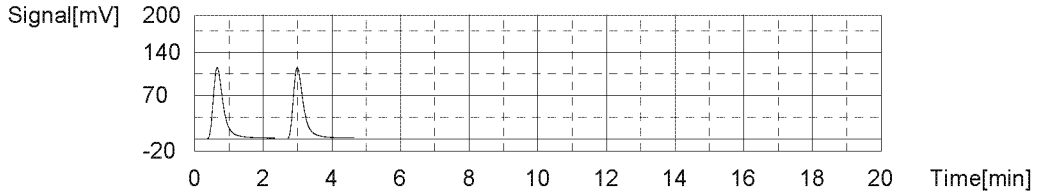
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:23.58mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	238.0	23.43mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/10/2016 7:56:23 AM
2	241.1	23.72mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/10/2016 8:01:35 AM

Mean Area 239.6
Mean Conc. 23.58mg/L
CV Area 0.92%



S16L055-CCB4

Sample

< 1/2 QL

Sample Name: S16L055-CCB4
Sample ID: 1650096
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

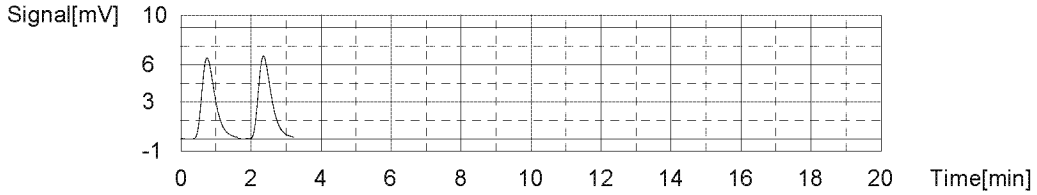
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.08563mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	16.82	0.08507mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 8:15:15 AM
2	17.01	0.08618mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 8:19:49 AM

Mean Area 16.91
Mean Conc. 0.08563mg/L
CV Area 0.79%



1611066-01

Sample

Sample Name: 1611066-01
Sample ID:
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

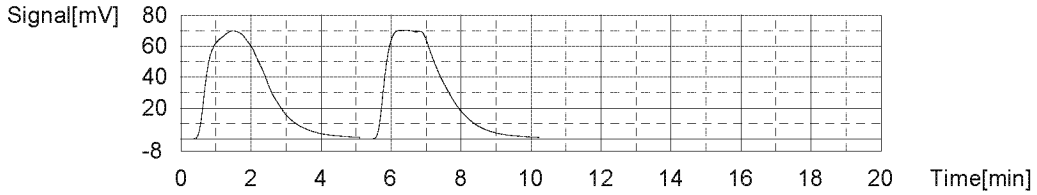
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:4.535mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	778.0	4.532mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 8:40:38 AM
2	778.9	4.537mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 8:48:41 AM

Mean Area 778.5
Mean Conc. 4.535mg/L
CV Area 0.08%



1611066-02

Sample

Sample Name: 1611066-02
Sample ID:
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

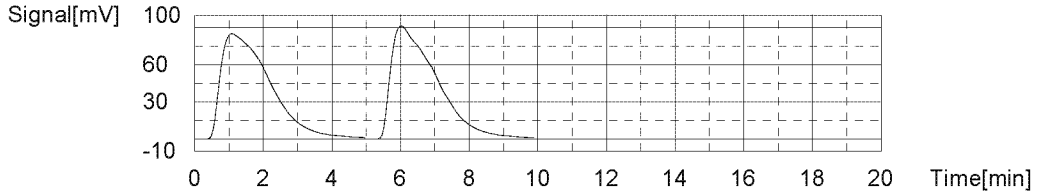
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:4.818mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	827.0	4.818mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 9:20:04 AM
2	826.7	4.817mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 9:27:58 AM

Mean Area 826.9
Mean Conc. 4.818mg/L
CV Area 0.03%



1611066-03

Sample

Sample Name: 1611066-03
Sample ID:
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

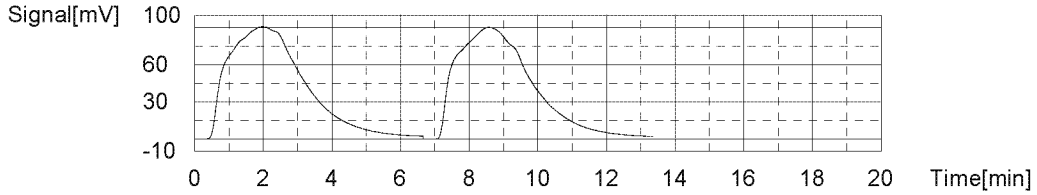
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:7.985mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1379	8.043mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 9:43:40 AM
2	1359	7.927mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 9:53:23 AM

Mean Area 1369
Mean Conc. 7.985mg/L
CV Area 1.03%



B16L061-MS1

Analyzed using incorrect cal. curve.
Data is reportable, as source sample
was analyzed using correct cal. curve.

Sample

Sample Name:	B16L061-MS1
Sample ID:	1611066-03
Origin:	TOC_0_5to100.met
Status	Completed
Chk. Result	

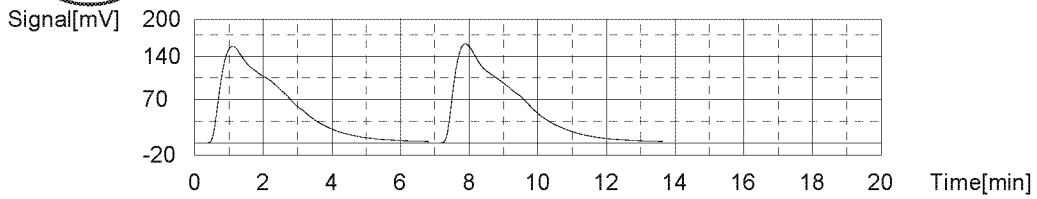
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:10.92mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1882	10.98mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 10:05:43 AM
2	1862	10.87mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 10:14:50 AM

Mean Area	1872
Mean Conc.	10.92mg/L
CV Area	0.76%



B16L061-MSD1

SUL 12/14/2016 1:16:44 PM TOC_2016_12_09_09_58_27_0.t32

Analyzed using incorrect cal. curve.
Data is reportable, as source sample
was analyzed using correct cal. curve.

Sample

Sample Name:	B16L061-MSD1
Sample ID:	1611066-03
Origin:	TOC_0_5to100.met
Status	Completed
Chk. Result	

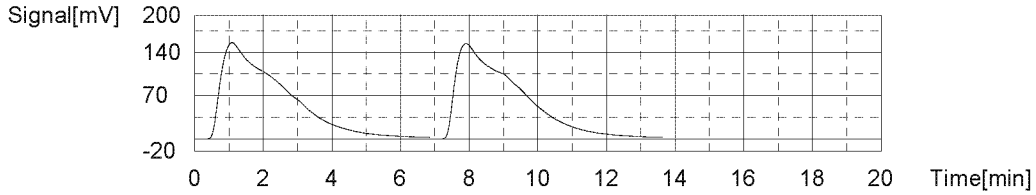
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:11.07mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	1906	11.12mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 10:27:39 AM
2	1889	11.02mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 10:37:30 AM

Mean Area	1898
Mean Conc.	11.07mg/L
CV Area	0.63%



1611066-04

Sample

Sample Name: 1611066-04
Sample ID:
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

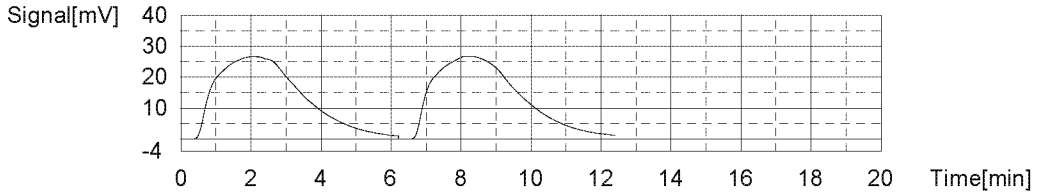
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:2.594mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	447.7	2.602mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 10:48:55 AM
2	444.9	2.586mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 10:58:03 AM

Mean Area 446.3
Mean Conc. 2.594mg/L
CV Area 0.44%



1611066-05

Sample

Sample Name: 1611066-05
Sample ID:
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

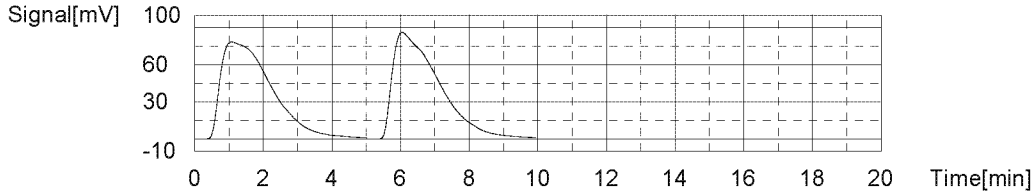
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:4.617mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	792.9	4.619mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 11:09:37 AM
2	792.2	4.615mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 11:16:49 AM

Mean Area 792.6
Mean Conc. 4.617mg/L
CV Area 0.06%



S16L055-LCV5

Sample

95%

Sample Name: S16L055-LCV5
Sample ID: 2.5mg/L 1650098
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

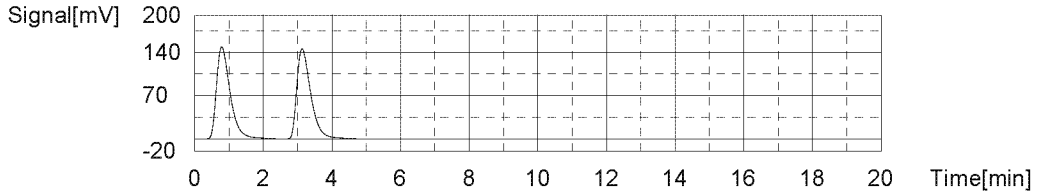
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:2.364mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	407.5	2.368mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 12:34:34 PM
2	406.4	2.361mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 12:39:13 PM

Mean Area 407.0
Mean Conc. 2.364mg/L
CV Area 0.19%



S16L055-CCV5

Sample

94%

Sample Name: S16L055-CCV5
Sample ID: 25mg/L 1650099
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

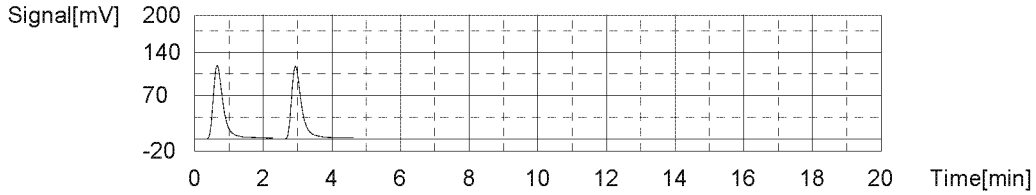
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:23.55mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	239.5	23.57mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/10/2016 12:58:41 PM
2	239.0	23.53mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/10/2016 1:03:19 PM

Mean Area 239.3
Mean Conc. 23.55mg/L
CV Area 0.15%



S16L055-CCB5

Sample

< 1/2 QL

Sample Name: S16L055-CCB5
Sample ID: 1650096
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

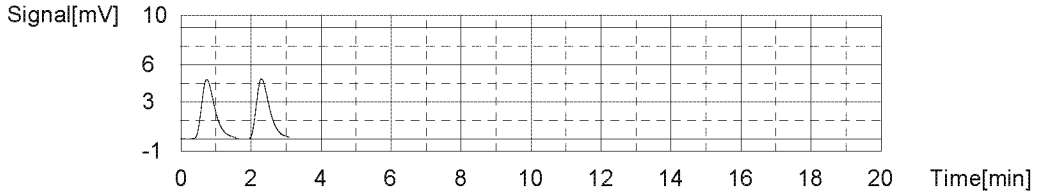
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.05828mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	12.21	0.05814mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 1:17:35 PM
2	12.26	0.05843mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 1:22:02 PM

Mean Area 12.23
Mean Conc. 0.05828mg/L
CV Area 0.29%



S16L055-LCV6

Sample

107%

Sample Name: S16L055-LCV6
Sample ID: 2.5mg/L 1650098
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

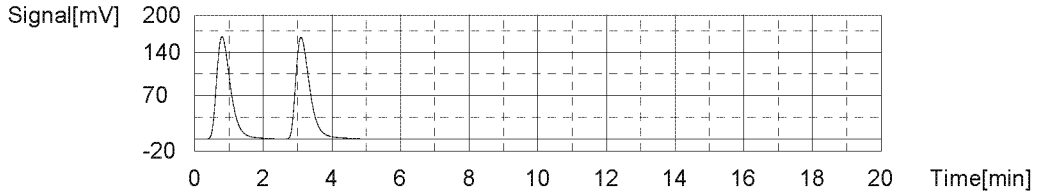
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:2.687mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	462.5	2.689mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 5:01:12 PM
2	462.0	2.686mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 5:06:50 PM

Mean Area 462.3
Mean Conc. 2.687mg/L
CV Area 0.08%



S16L055-CCV6

Sample

96%

Sample Name: S16L055-CCV6
Sample ID: 25mg/L 1650099
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

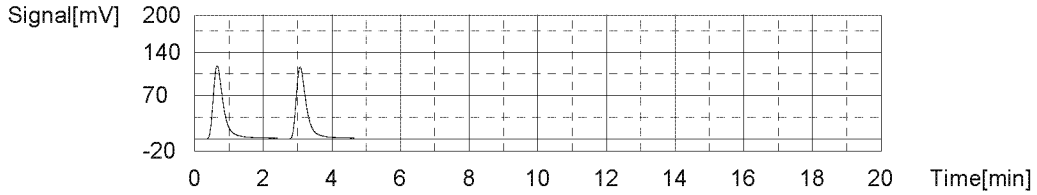
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:23.93mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	245.0	24.09mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/10/2016 5:25:30 PM
2	241.7	23.78mg/L	350uL	2		TOC_Mid.2016_09_12_15_07_10.cal	12/10/2016 5:30:46 PM

Mean Area 243.4
Mean Conc. 23.93mg/L
CV Area 0.96%



S16L055-CCB6

Sample

< 1/2 QL

Sample Name: S16L055-CCB6
Sample ID: 1650096
Origin: TOC_0_5to100.met
Status Completed
Chk. Result

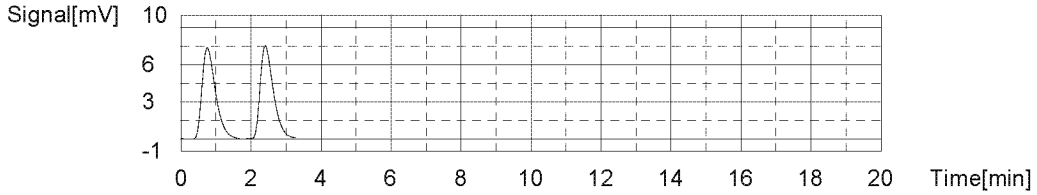
Type	Anal.	Dil.	Result
Unknown	NPOC	1.000	NPOC:0.1001mg/L

1. Det

Anal.: NPOC

No.	Area	Conc.	Inj. Vol.	Aut. Dil.	Ex.	Cal. Curve	Date / Time
1	19.54	0.1010mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 5:44:23 PM
2	19.26	0.09933mg/L	2500uL	1		TOC_Low.2016_09_12_11_50_29.cal	12/10/2016 5:48:58 PM

Mean Area 19.40
Mean Conc. 0.1001mg/L
CV Area 1.02%



Certificate of Analysis

Lot No. P169-516

WasteWatR™ Demand

Catalog No. 516
Issue Date: May 8, 2009
Revision Date: Original

Certification

Parameter	Certified Value [1] (mg/l)	Uncertainty [2]	QC PALs™ [3] (mg/l)	PT PALs™ [4] (mg/l)
BOD	56.4	2.5%	35.0 - 75.6	28.3 - 84.5
CBOD	48.6	2.5%	33.5 - 67.6	21.8 - 75.4
COD	91.1	2.5%	72.5 - 106	67.0 - 107
TOC	36.0	1.6%	31.4 - 40.6	30.0 - 41.6

Analytical Verification

Parameter	Round Robin Data [5] Mean (mg/l)	Recovery (%)	n	NIST Traceability SRM Number	Recovery (%)
BOD	55.3	98.0%	115	SRM not available	-
CBOD	50.5	104%	76	SRM not available	-
COD	89.5	98.2%	72	SRM 917a	95.4%
TOC	36.0	100%	55	SRM 185h	98.8%

Please see footnotes on back

6000 West 54th Ave., Arvada, CO 80002 800-372-0122 fax: 303-421-0159 www.eraqc.com

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

1. The **Certified Values** are the actual "made-to" concentrations confirmed by ERA analytical verification. The **Certified Values** for BOD and CBOD are the predicted interlaboratory means calculated from the USEPA/NELAC regression equations used for evaluating proficiency testing study data.

2. The stated **Uncertainty** is the total propagated uncertainty at the 95% confidence interval. The uncertainty is based on the preparation and internal analytical verification of the product by ERA, multiplied by a coverage factor which is equal to the Student t factor at a 95% confidence interval at n-1 degrees of freedom. The uncertainty applies to the product as supplied and does not take into account any required or optional dilution and/or preparations the laboratory may perform while using this product.

3. The **QC Performance Acceptance Limits (QC PALs™)** are based on actual historical data collected in ERA's Proficiency Testing program. The **QC PALs™** reflect any inherent biases in the methods used to establish the limits and closely approximate a 95% confidence interval of the performance that experienced laboratories should achieve using accepted environmental methods. Use the **QC PALs™** to realistically evaluate your performance against your peers.

4. The **PT Performance Acceptance Limits (PT PALs™)** are calculated using the regression equations and fixed acceptance criteria specified in the NELAC proficiency testing requirements. Use the **PT PALs™** when analyzing this QC standard alongside USEPA and NELAC compliant PT standards. Please note that many PT study acceptance limits are concentration dependent (some non-linearly) and, therefore, the acceptance limits of this QC standard and any PT standard may differ relative to their difference in concentrations.

5. The **Analytical Verification** data include the mean value, percent recovery and number of data points reported by the laboratories in our Proficiency Testing study compared to the Certified Values. In addition, where NIST Standard Reference Materials (SRMs) are available, each analyte has been analytically traced to the NIST SRM listed.

Traceability Recovery (%) = [(% recovery certified standard)/(% recovery NIST SRM)]*100

The traceability data shown were compiled by analyzing the ERA standards or their associated stock solutions against the applicable NIST SRMs.

6. This standard **expires 7/2012**. The certified values are monitored and purchasers will be notified of any significant changes resulting in recertification or withdrawal of this certified reference material during the period of validity of this certificate.

If you have any questions or need technical assistance, please call ERA technical assistance at 1-800-372-0122 or email to info@eraqc.com.

Certifying Officer: Tom Widera

APPENDIX A.
DOCUMENTATION OF RECERTIFICATION – CALIBRATION STANDARD

	LIMS ID	Manu. Expiration Date	Dilution LIMS ID
Standard, Expired	OE19012	7/31/12	2J09023
Standard, Verification	2B20011	02/20/13	2J09005

Analysis: TOC 415.3	**SOP #** 553, **Rev.** 2	**SCV Criteria %R or %D**	104 % R
Analysis Date: 10/9/12	**Instrument:** Shimadzu	**Analyst:** W.D.	

Analyte	Ave Response, Expired	Ave. Response, Verification	%R or %D	Fail criteria?
TOC Secondary Stock Standard	5.139 mg/L / 5.04 mg/L = 102%	4.898 mg/L / 5 mg/L = 98%	104 %	NO acceptable
File ID (1)	TOC-2012-10-09-14-12-26-0.633		----------	----------
File ID (2)			----------	----------
File ID (3)			----------	----------

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Approval Signatures	Approve (Y/N)	Print Name	Signature	Date
Group Leader/Supervisor	Y	[illegible]	[illegible]	[illegible]
Technical Director	YES	[illegible]	Richard Bauer	10/10/12
Lab QAO	YES	LUCRINA JONES	LJones	10/10/12

The use of this exact layout is not required. However, the form title must be used, and the information in the header blocks must appear on the first page of the documentation. In most instances, it will be best to use Element DataTool to create an Excel file and manipulate the data to obtain average responses, percent recovery or difference (section 5.2.5), and failing flags.

NEW EXPIRATION DATE:
JULY 31, 2015. LCJ 10/10/12

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APPENDIX A.
DOCUMENTATION OF RECERTIFICATION – CALIBRATION STANDARD

	LIMS ID	Manu. Expiration Date	Dilution LIMS ID
Standard, Expired	OE19012	7/31/~~15~~ 2012	1538001
Standard, Verification	1439001	9/22/15	1536039

Analysis: Total Organic Carbon	SOP # 553, Rev. 3	SCV Criteria %R or %D	94.5 - 105.5%
Analysis Date: 9/14/15	Instrument: Shimadzu	Analyst: W.D.	

Analyte	Ave Response, Expired	Ave. Response, Verification	%R or %D	Fail criteria?
TOC	2.432 mg/L	2.445 mg/L	99.5%	NO
	Area = 378.47	Area = 380.55		
Std. OE19012 was re-certified on 10/10/12 for 3 more years from expiration date (7/31/12 extended to 7/31/15). This is the second re-certification for an extension of another 3 years (7/31/15 to 7/31/18). AS 9/15/15				
File ID (1) TOC_2015_09_14			----------	----------
File ID (2)			----------	----------
File ID (3)			----------	----------

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[redacted]

V [illegible] Sta (LCV) LIMS ID: 15360 [illegible] 9/22/15. [illegible]
1M 2

Starting sequence run successfully (all QC passed) Expired SCV run 3 times and area compared to 2 LCV standards, both std at same concentration.

TOC	Area = 378.47	99.45 %	NO (90-110%)
		37847	1/2 is [illegible]
		380.55	[illegible] 9-18-15

Standard OE19012 was re-certified on 10/10/12 for 3 re years from expiration date (7/31/12 extended to 7/31/15). This is the second re-certificati[illegible] for an extension of another 3 years (7/31/15 to 7/31/18 W.D. 9/16/15

Approval Signature	Approval Date	Signature	Date
Group Leader/Supervisor			
Technical Director			
Laboratory Director			

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Analytical Standard Record

EPA Region 9 Laboratory

0E19012

Description:	TOC, Secondary Stock Standard	**Expires:**	07/31/18
Standard Type:	Analyte Spike	**Prepared:**	05/19/10
Solvent:	Solvent Lot #	**Prepared By:**	** Vendor **
Final Volume (mls):	15	**Department:**	Inorganics
Vials:	1	**Last Edit:**	07/14/16 13:01 by SUL
Vendor:	Spex	**Lot Numbe**	P169-516

TOC = 36.0 mg/L (after dilution) therefore 36.0 x 200 = 7200 mg/L concentrated
AU002468 Standard recertified on 10/10/12 for 3 more years from expiration date.
Second and last recertification approved on 9/17/15 for 3 more years (until 7/31/18).

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	7200
Dissolved Organic Carbon	DOC	7200

Analytical Standard Record

EPA Region 9 Laboratory

1509014

Description:	Bromide Stock, 1000 mg/L	**Expires:**	12/03/17
Standard Type:	Analyte Spike	**Prepared:**	02/23/15
Solvent:	H2O	**Prepared By:**	** Vendor **
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	02/23/15 10:41 by SUL
Vendor:	Inorganic Ventures	**Lot Numbe**	H2-BR01103

Catalog #: ICBR1. Barcode AU006936

Analyte	CAS Number	Concentration (ppm)
Bromide	24959-67-9	1000

INORGANIC™ VENTURES
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Christiansburg, VA 24073 · USA
inorganicventures.com
tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (SAI Global File Number (010105).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Ion Chromatography Solution
Catalog Number:	ICBR1
Lot Number:	H2-BR01103
Matrix:	H2O
Value/Analyte(s):	1 000 µg/mL Bromide
Starting Material:	KBr
Starting Material Lot#:	09014BY
Starting Material Purity:	99.9000%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1003 ± 4 µg/mL

Certified Density: 0.999 g/mL (measured at 20 ± 1 °C)

Assay Information:

Assay Method #1 **1004 ± 1 µg/mL**
IC Assay NIST SRM 3184 Lot Number: 020701

Assay Method #2 **1002 ± 2 µg/mL**
Volhard NIST SRM 999b Lot Number: 999b

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$

X_a = mean of Assay Method A with standard uncertainty $u_{char\ a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char\ b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$w_a = (1/u_{char\ a})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

$w_b = (1/u_{char\ b})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a\&b} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a\&b} = [(w_a)^2 (u_{char\ a})^2 + (w_b)^2 (u_{char\ b})^2]^{1/2}$ where $u_{char\ a}$ and $u_{char\ b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM}$ = mean of Assay Method A with standard uncertainty $u_{char\ a}$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

No correction has been applied for transpiration that will occur after the CRM/RM bottle has been removed from the sealed aluminized bag. See Sec. 7.0 (Instructions for the Correct Use of this Reference Material) for more information.

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

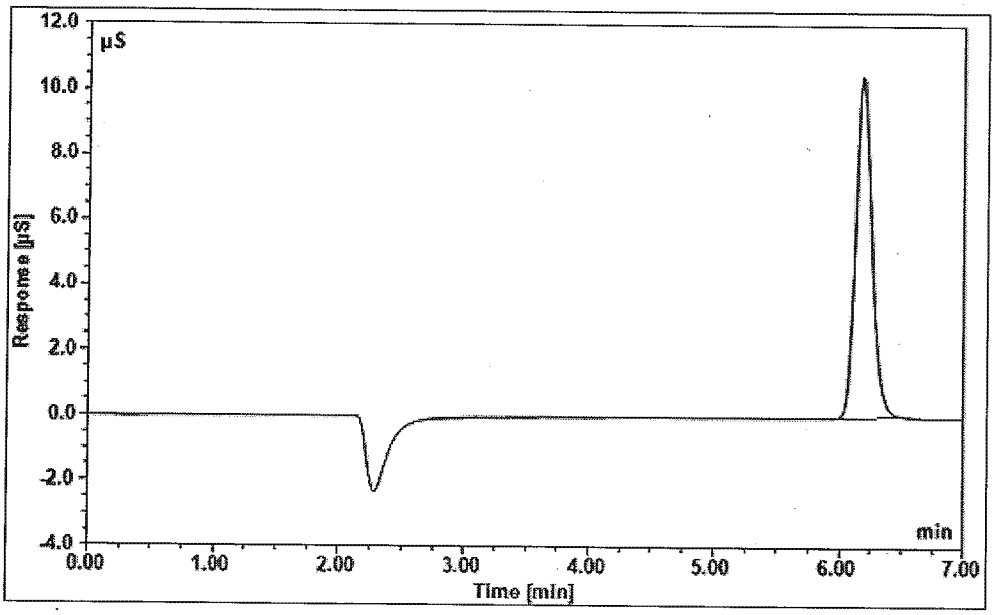
4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM



Dionex ICS-1000 Ion Chromatograph

Analytical Column:	IonPac AS22 4 x 250 mm	**Eluent:**	4.5/1.4 mM Na2CO3 / NaHCO3
Guard Column:	IonPac AG22 4 x 50 mm	**Eluent Flow Rate:**	1.2 mL/min
Anion Self-Regenerating Suppressor:	AERS 500 4 mm	**Column Temp:**	N/A
		Cell Temp:	35°C
Cation Self-Regenerating Suppressor:	N/A	**Scale X-Axis:**	minutes
		Scale Y-Axis:	12 µS
Suppressor Current:	31 mA	**Concentration:**	10 µg/g

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30°C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag keep cap tightly sealed when not in use. Store and use at 20° ± 4°C. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- SAI Global File Number 010105

10.4 ISO/IEC Guide 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

- December 03, 2014

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec. 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year from the date of opening the sealed TCT bag or after the date given in Sec. 11.3, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

11.3 Lot Expiration Date

- December 03, 2017

- The date after which this CRM/RM should not be used (See Sec. 11.2).

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Brenda Francis
Product Documentation Technician

Certificate Approved By:

Brian Alexander
PhD., Technical Process Director

Certifying Officer:

Paul Gaines
PhD., Senior Technical Director

Analytical Standard Record

EPA Region 9 Laboratory

1509016

Description:	Fluoride Stock, 1000 mg/L	**Expires:**	11/07/17
Standard Type:	Analyte Spike	**Prepared:**	02/23/15
Solvent:	Water	**Prepared By:**	** Vendor **
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	02/23/15 10:45 by SUL
Vendor:	Inorganic Ventures	**Lot Numbe**	H2-F01067

Catalog #: ICF1. Barcode AU006939

Analyte	CAS Number	Concentration (ppm)
Fluoride	16984-48-8	1000

INORGANIC VENTURES

300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (SAI Global File Number (010105).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Ion Chromatography Solution
Catalog Number:	ICF1
Lot Number:	H2-F01067
Matrix:	H2O
Value / Analyte(s):	1 000 µg/mL ea: Fluoride
Starting Material:	Sodium Fluoride
Starting Material Lot#:	1655
Starting Material Purity:	99.8000%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1000 ± 3 µg/mL - no weighted mean

Certified Density: 1.001 g/mL (measured at 20 ± 1 °C)

Assay Information:

Assay Method #1 **1000 ± 1 µg/mL**
IC Assay NIST SRM 3183 Lot Number: 050721

Assay Method #2 **1000 ± 5 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$

X_a = mean of Assay Method A with standard uncertainty $u_{char\ a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char\ b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$w_a = (1/u_{char\ a})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

$w_b = (1/u_{char\ b})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a\&b} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a\&b} = [(w_a)^2 (u_{char\ a})^2 + (w_b)^2 (u_{char\ b})^2]^{1/2}$ where $u_{char\ a}$ and $u_{char\ b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM}$ = mean of Assay Method A with standard uncertainty $u_{char\ a}$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

No correction has been applied for transpiration that will occur after the CRM/RM bottle has been removed from the sealed aluminized bag. See Sec. 7.0 (Instructions for the Correct Use of this Reference Material) for more information.

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

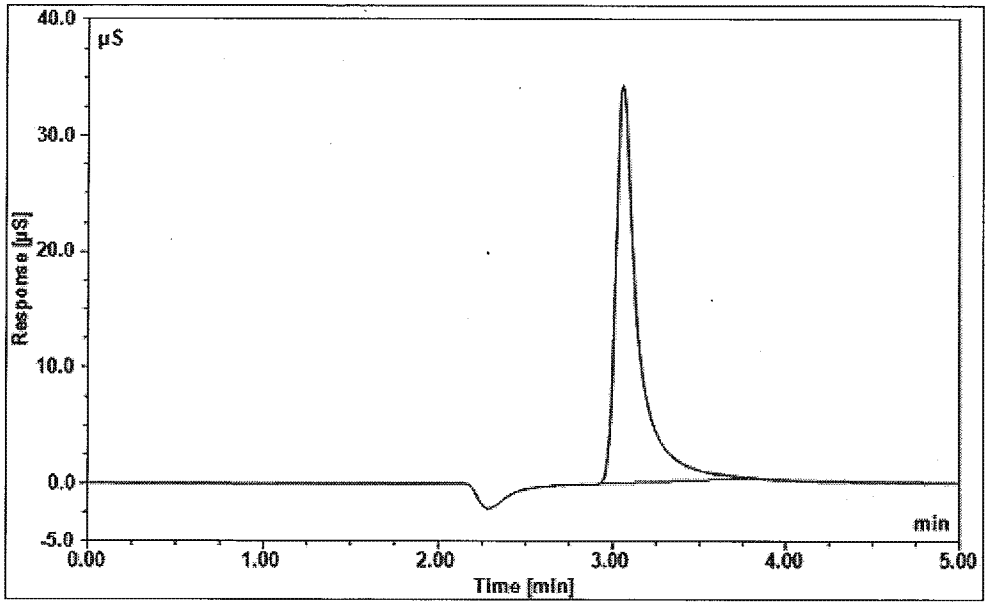
4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM



Dionex ICS-1000 Ion Chromatograph

Analytical Column:	IonPac AS22 4 x 250 mm	**Eluent:**	4.5/1.4 mM Na2CO3 / NaHCO3
Guard Column:	IonPac AG22 4 x 50 mm	**Eluent Flow Rate:**	1.2 mL/min
Anion Self-Regenerating Suppressor:	AERS 500 4 mm	**Column Temp:**	N/A
		Cell Temp:	35 °C
Cation Self-Regenerating Suppressor:	N/A	**Scale X-Axis:**	minutes
		Scale Y-Axis:	40 µS
Suppressor Current:	31 mA	**Concentration:**	10 µg/g

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30°C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag keep cap tightly sealed when not in use. Store and use at 20° ± 4°C. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- SAI Global File Number 010105

10.4 ISO/IEC Guide 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

- November 07, 2014

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec. 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year from the date of opening the sealed TCT bag or after the date given in Sec. 11.3, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

11.3 Lot Expiration Date

- November 07, 2017

- The date after which this CRM/RM should not be used (See Sec. 11.2).

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Zach Saunders
Product Documentation Technician

Certificate Approved By:

Brian Alexander
PhD., Technical Process Director

Certifying Officer:

Paul Gaines
PhD., Senior Technical Director

Analytical Standard Record

EPA Region 9 Laboratory

1509017

Description:	Nitrite-N Stock, 1000 mg/L	**Expires:**	03/24/17
Standard Type:	Analyte Spike	**Prepared:**	02/23/15
Solvent:	Water	**Prepared By:**	** Vendor **
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	02/23/15 10:47 by SUL
Vendor:	Inorganic Ventures	**Lot Numbe**	H2-NOX02113

Catalog #: ICNNO21. Barcode Au006917

Analyte	CAS Number	Concentration (ppm)
Nitrite as N	14797-65-0	1000
Nitrate+Nitrite as N	NA	1000

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CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (SAI Global File Number (010105).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Ion Chromatography Solution
Catalog Number:	ICNNO21
Lot Number:	H2-NOX02113
Matrix:	H2O
Value/Analyte(s):	1 000 µg/mL Nitrite as N
Starting Material:	NaNO2
Starting Material Lot#:	1574
Starting Material Purity:	99.5480%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1,007 ± 6 µg/mL no weighted mean

Certified Density: 1.001 g/mL (measured at 20 ± 1 °C)

Assay Information:

Assay Method #1 **1,007 ± 3 µg/mL**
IC Assay NIST SRM 8040 Lot Number: 8040

Assay Method #2 **1,007 ± 5 µg/mL**
Calculated NIST SRM 8040 Lot Number: 8040

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$

X_a = mean of Assay Method A with standard uncertainty $u_{char\ a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char\ b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$w_a = (1/u_{char\ a})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

$w_b = (1/u_{char\ b})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a\&b} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a\&b} = [(w_a)^2 (u_{char\ a})^2 + (w_b)^2 (u_{char\ b})^2]^{1/2}$ where $u_{char\ a}$ and $u_{char\ b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM}$ = mean of Assay Method A with standard uncertainty $u_{char\ a}$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

No correction has been applied for transpiration that will occur after the CRM/RM bottle has been removed from the sealed aluminized bag. See Sec. 7.0 (Instructions for the Correct Use of this Reference Material) for more information.

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

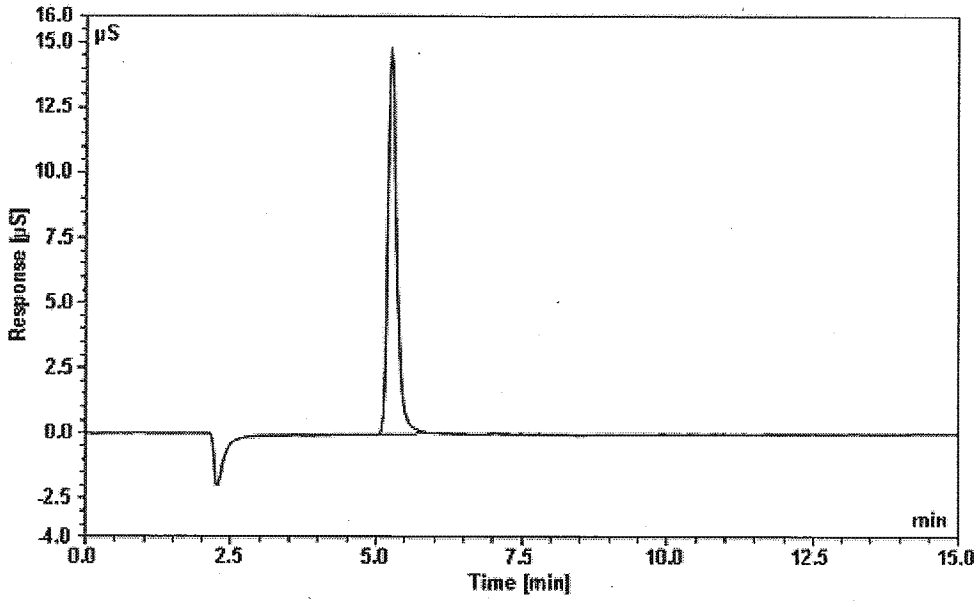
4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM



Dionex ICS-1000 Ion Chromatograph

Analytical Column:	IonPac AS22 4 x 250 mm	**Eluent:**	4.5mM Na2CO3 / 1.4mM NaHCO3
Guard Column:	IonPac AG22 4 x 50 mm	**Eluent Flow Rate:**	1.2mL/min
Anion Self-Regenerating Suppressor:	ASRS 300 4mm	**Column Temp:**	N/A
		Cell Temp:	35 °C
Cation Self-Regenerating Suppressor:	N/A	**Scale X-Axis:**	minutes
		Scale Y-Axis:	16µS scale
Suppressor Current:	31mA	**Concentration:**	approx. 20µg/g

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30°C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag keep cap tightly sealed when not in use. Store and use at 20° ± 4°C. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- SAI Global File Number 010105

10.4 ISO/IEC Guide 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

- March 24, 2014

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec. 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year from the date of opening the sealed TCT bag or after the date given in Sec. 11.3, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

11.3 Lot Expiration Date

- March 24, 2017

- The date after which this CRM/RM should not be used (See Sec. 11.2).

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Zach Saunders
Product Documentation Technician

Certificate Approved By:

Brian Alexander
PhD., Technical Process Director

Certifying Officer:

Paul Gaines
PhD., Senior Technical Director

Analytical Standard Record

EPA Region 9 Laboratory

1509018

Description:	Nitrate-N Stock, 1000 mg/L	**Expires:**	10/27/17
Standard Type:	Analyte Spike	**Prepared:**	02/23/15
Solvent:	Water	**Prepared By:**	** Vendor **
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	02/23/15 10:49 by SUL
Vendor:	Inorganic Ventures	**Lot Numbe**	H2-NOX02119

Catalog #: ICNNO31. Barcode AU006938

Analyte	CAS Number	Concentration (ppm)
Nitrate+Nitrite as N	NA	1000
Nitrate as N	14797-55-8	1000

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CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (SAI Global File Number (010105).

ACCREDITED Testing Laboratory Certificate 883 01
ACCREDITED Reference Material Producer Certificate 883 02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Ion Chromatography Solution
Catalog Number:	ICNNO31
Lot Number:	H2-NOX02119
Matrix:	H2O
Value / Analyte(s):	1 000 µg/mL ea: Nitrate_as_N
Starting Material:	NaNO3
Starting Material Lot#:	1571
Starting Material Purity:	99.0000%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 3 µg/mL - no weighted mean

Certified Density: 1.002 g/mL (measured at 20 ± 1 °C)

Assay Information:

Assay Method #1	**1001 ± 1 µg/mL** IC Assay NIST SRM 3185 Lot Number: 050517
Assay Method #2	**1000 ± 3 µg/mL** Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$

X_a = mean of Assay Method A with standard uncertainty $u_{char\ a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char\ b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$w_a = (1/u_{char\ a})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

$w_b = (1/u_{char\ b})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a\&b} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a\&b} = [(w_a)^2 (u_{char\ a})^2 + (w_b)^2 (u_{char\ b})^2]^{1/2}$ where $u_{char\ a}$ and $u_{char\ b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM}$ = mean of Assay Method A with standard uncertainty $u_{char\ a}$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

No correction has been applied for transpiration that will occur after the CRM/RM bottle has been removed from the sealed aluminized bag. See Sec. 7.0 (Instructions for the Correct Use of this Reference Material) for more information.

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

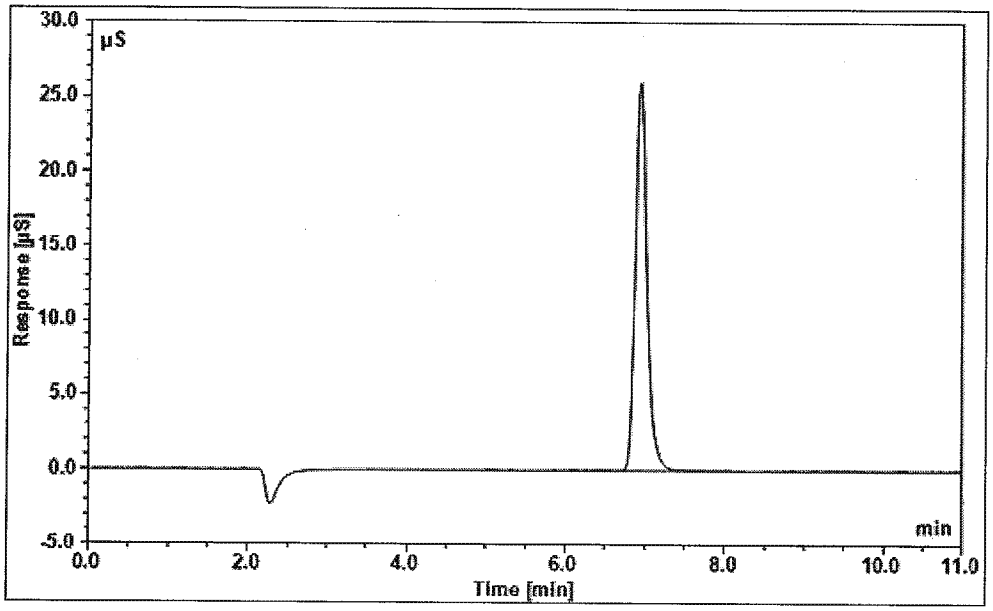
4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM



Dionex ICS-1000 Ion Chromatograph

Analytical Column:	IonPac AS22 4 x 250 mm	**Eluent:**	4.5/1.4 mM Na2CO3 / NaHCO3
Guard Column:	IonPac AG22 4 x 50 mm	**Eluent Flow Rate:**	1.2 mL/min
Anion Self-Regenerating Suppressor:	AERS 500 4 mm	**Column Temp:**	N/A
		Cell Temp:	35°C
Cation Self-Regenerating Suppressor:	N/A	**Scale X-Axis:**	minutes
		Scale Y-Axis:	30 µS
Suppressor Current:	31 mA	**Concentration:**	20 µg/g

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30°C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag keep cap tightly sealed when not in use. Store and use at 20° ± 4°C. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- SAI Global File Number 010105

10.4 ISO/IEC Guide 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

- October 27, 2014

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec. 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year from the date of opening the sealed TCT bag or after the date given in Sec. 11.3, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

11.3 Lot Expiration Date

- October 27, 2017

- The date after which this CRM/RM should not be used (See Sec. 11.2).

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Brenda Francis
Product Documentation Technician

Certificate Approved By:

Brian Alexander
PhD., Technical Process Director

Certifying Officer:

Paul Gaines
PhD., Senior Technical Director

Analytical Standard Record

EPA Region 9 Laboratory

1549007

Description:	O-Phosphate-P Stock, 1000 mg/L	**Expires:**	05/18/18
Standard Type:	Analyte Spike	**Prepared:**	11/30/15
Solvent:	Water	**Prepared By:**	** Vendor **
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	11/30/15 10:45 by SUL
Vendor:	Inorganic Ventures	**Lot Numbe**	J2-POX01109

Catalog #: ICPPO41. Barcode AU007636

Analyte	CAS Number	Concentration (ppm)
Phosphorus, Total	7723-14-0	1000
o-Phosphate, as P	o-PO4	1000

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CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (SAI Global File Number 010105).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Ion Chromatography Solution
Catalog Number:	ICPPO41
Lot Number:	J2-POX01109
Matrix:	H2O
Value / Analyte(s):	1 000 µg/mL ea: PPO4
Starting Material:	NH4H2PO4
Starting Material Lot#:	1670
Starting Material Purity:	99.3000%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 997 ± 3 µg/mL

Certified Density: 1.000 g/mL (measured at 20 ± 1 °C)

Assay Information:

Assay Method #1 **997 ± 1 µg/mL**
IC Assay NIST SRM 3186 Lot Number: 090723

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM by two independent methods

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$

X_a = mean of Assay Method A with standard uncertainty $u_{char\ a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char\ b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$w_a = (1/u_{char\ a})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

$w_b = (1/u_{char\ b})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a\&b} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a\&b} = [(w_a)^2 (u_{char\ a})^2 + (w_b)^2 (u_{char\ b})^2]^{1/2}$ where $u_{char\ a}$ and $u_{char\ b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

Characterization of CRM by one method

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM}$ = mean of Assay Method A with standard uncertainty $u_{char\ a}$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

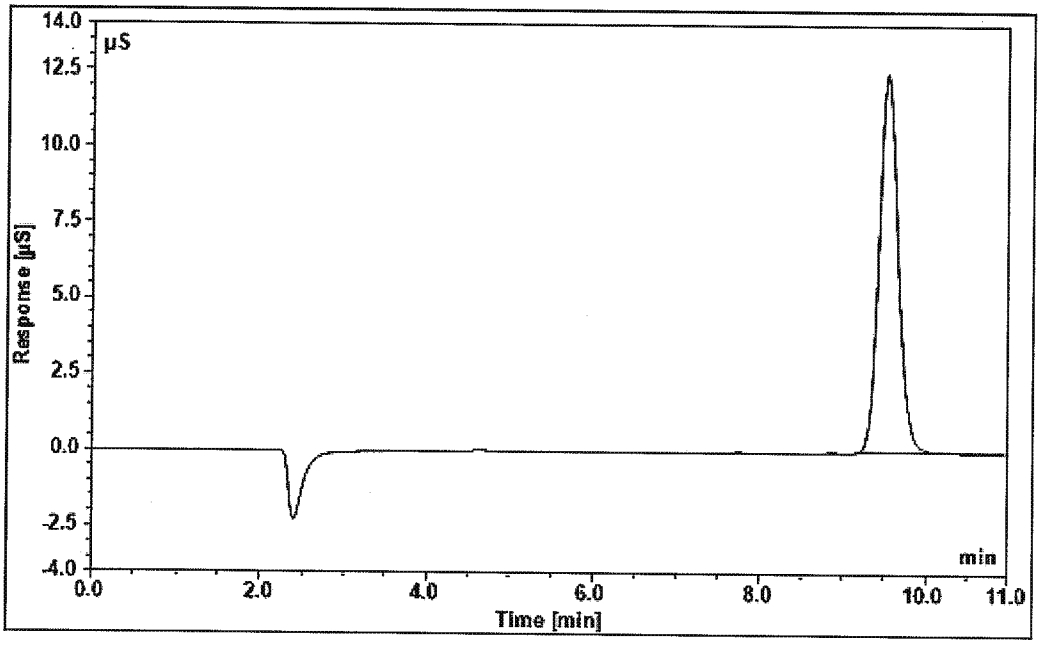
4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM



Dionex ICS-1000 Ion Chromatograph

Analytical Column:	IonPac AS22 4 x 250 mm	**Eluent:**	4.5/1.4 mM Na2CO3 / NaHCO3
Guard Column:	IonPac AG22 4 x 50 mm	**Eluent Flow Rate:**	1.2 mL/min
Anion Self-Regenerating Suppressor:	AERS 500 4 mm	**Column Temp:**	N/A
		Cell Temp:	35°C
Cation Self-Regenerating Suppressor:	N/A	**Scale X-Axis:**	minutes
		Scale Y-Axis:	14 µS
Suppressor Current:	31 mA	**Concentration:**	30 µg/g

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag keep cap tightly sealed when not in use. Store and use at 20° ± 4° C. Do not pippette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- SAI Global File Number 010105

10.4 ISO/IEC Guide 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

May 18, 2015

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **May 18, 2018**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year from the date of removal from the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being handled and stored in accordance with the instructions given in Sec 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Brenda Francis
Product Documentation Technician

Certificate Approved By:

Michael Booth
QC Supervisor

Certifying Officer:

Paul Gaines
PhD., Senior Technical Director

Analytical Standard Record

EPA Region 9 Laboratory

1549016

Description:	Sulfate Stock, 1000 mg/L	**Expires:**	08/12/18
Standard Type:	Analyte Spike	**Prepared:**	11/30/15
Solvent:	Water	**Prepared By:**	** Vendor **
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	11/30/15 10:48 by SUL
Vendor:	Inorganic Ventures	**Lot Numbe**	J2-SOX01108

Catalog #: ICS041. Barcode AU007635

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	1000

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (SAI Global File Number 010105).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Ion Chromatography Solution
Catalog Number:	ICSO41
Lot Number:	J2-SOX01108
Matrix:	H2O
Value / Analyte(s):	1 000 µg/mL ea: SO4
Starting Material:	K2SO4
Starting Material Lot#:	1637
Starting Material Purity:	99.9000%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 998 ± 4 µg/mL

Certified Density: 1.000 g/mL (measured at 20 ± 1 °C)

Assay Information:

Assay Method #1 **998 ± 1 µg/mL**
IC Assay NIST SRM 3181 Lot Number: 080603

Assay Method #2 **1000 ± 4 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM by two independent methods

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$

X_a = mean of Assay Method A with standard uncertainty $u_{char\ a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char\ b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$w_a = (1/u_{char\ a})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

$w_b = (1/u_{char\ b})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a\&b} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a\&b} = [(w_a)^2 (u_{char\ a})^2 + (w_b)^2 (u_{char\ b})^2]^{1/2}$ where $u_{char\ a}$ and $u_{char\ b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

Characterization of CRM by one method

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM}$ = mean of Assay Method A with standard uncertainty $u_{char\ a}$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

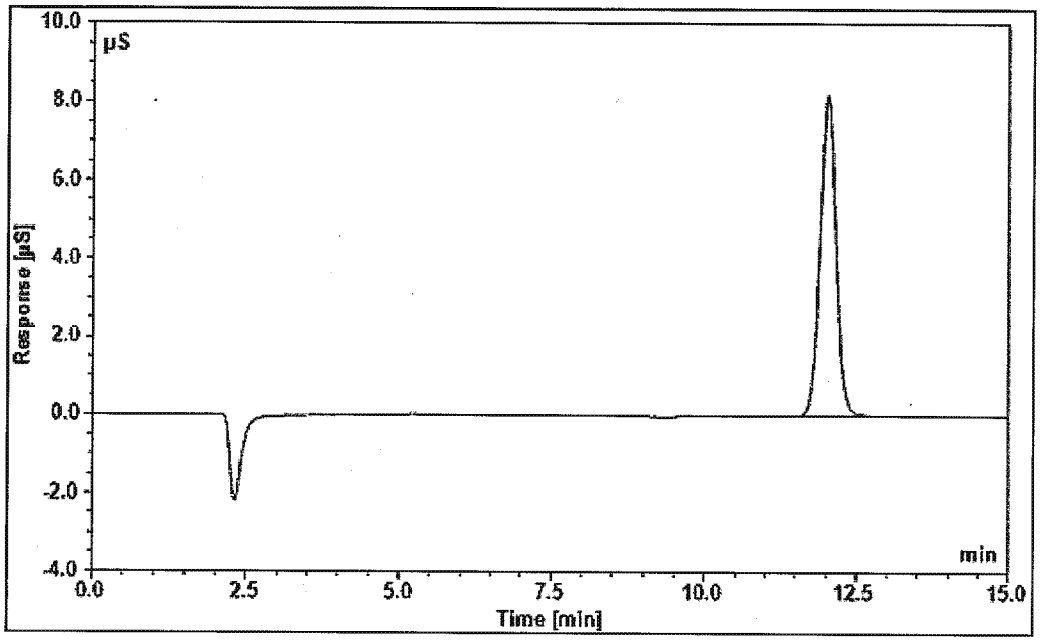
4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM



Dionex ICS-1000 Ion Chromatograph

Analytical Column:	IonPac AS22 4 x 250 mm	**Eluent:**	4.5/1.4 mM Na2CO3 / NaHCO3
Guard Column:	IonPac AG22 4 x 50 mm	**Eluent Flow Rate:**	1.2 mL/min
Anion Self-Regenerating Suppressor:	ASRS 300 4mm	**Column Temp:**	N/A
		Cell Temp:	35ºC
Cation Self-Regenerating Suppressor:	N/A	**Scale X-Axis:**	minutes
		Scale Y-Axis:	10 µS
Suppressor Current:	31 mA	**Concentration:**	10 µg/g

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag keep cap tightly sealed when not in use. Store and use at 20° ± 4° C. Do not pippette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- SAI Global File Number 010105

10.4 ISO/IEC Guide 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 12, 2015

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 12, 2018**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year from the date of removal from the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being handled and stored in accordance with the instructions given in Sec 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Brenda Francis
Product Documentation Technician

Certificate Approved By:

Michael Booth
QC Supervisor

Certifying Officer:

Paul Gaines
PhD., Senior Technical Director

Analytical Standard Record

EPA Region 9 Laboratory

1549018

Description:	Chloride Stock, 1000 mg/L	**Expires:**	07/23/18
Standard Type:	Analyte Spike	**Prepared:**	11/30/15
Solvent:	Water	**Prepared By:**	** Vendor **
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	11/30/15 10:50 by SUL
Vendor:	Inorganic Ventures	**Lot Numbe**	J2-CL01117

Catalog #: ICCL1. Barcode AU007637

Analyte	CAS Number	Concentration (ppm)
Chloride	16887-00-6	1000

INORGANIC VENTURES

CERTIFICATE OF ANALYSIS

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (SAI Global File Number 010105).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Ion Chromatography Solution
Catalog Number:	ICCL1
Lot Number:	J2-CL01117
Matrix:	H2O
Value / Analyte(s):	1 000 µg/mL ea: Cl-
Starting Material:	KCl
Starting Material Lot#:	1764
Starting Material Purity:	99.0000%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1000 ± 3 µg/mL

Certified Density: 1.000 g/mL (measured at 20 ± 1 °C)

Assay Information:

Assay Method #1 **1000 ± 1 µg/mL**
IC Assay NIST SRM 3182 Lot Number: 060925

Assay Method #2 **1001 ± 5 µg/mL**
Volhard NIST SRM 999b Lot Number: 999b

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM by two independent methods

Characterization of CRM/RM by Two Methods

Certified Value, $X_{CRM/RM}$, where two methods of characterization are used is the weighted mean of the two results:

$X_{CRM/RM} = [(w_a)(X_a) + (w_b)(X_b)]$

X_a = mean of Assay Method A with standard uncertainty $u_{char\ a}$

X_b = mean of Assay Method B with standard uncertainty $u_{char\ b}$

w_a and w_b = the weighting factors for each method calculated using the inverse square of the variance:

$w_a = (1/u_{char\ a})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

$w_b = (1/u_{char\ b})^2 / ((1/u_{char\ a})^2 + (1/u_{char\ b})^2))$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a\&b} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a\&b} = [(w_a)^2 (u_{char\ a})^2 + (w_b)^2 (u_{char\ b})^2]^{1/2}$ where $u_{char\ a}$ and $u_{char\ b}$ are the square root of the sum of the squares of errors from characterization which include instrument measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

Characterization of CRM by one method

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM}$ = mean of Assay Method A with standard uncertainty $u_{char\ a}$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{sts})^{1/2}$

k = coverage factor = 2 in all cases at Inorganic Ventures

$u_{char\ a}$ = square root of the sum of the squares of the errors from characterization which include instrumental measurement, density, NIST SRM uncertainty, weighing, and volume

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{sts} = short term stability standard uncertainty (transportation)

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

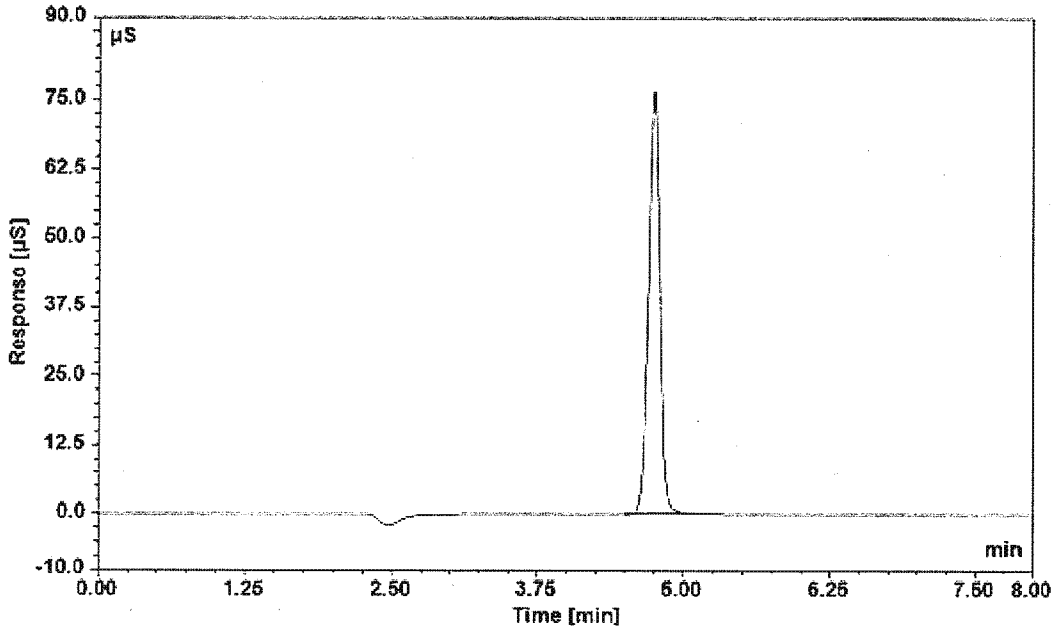
4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM



Dionex ICS-1000 Ion Chromatograph

Analytical Column:	IonPac AS22 4 x 250 mm	**Eluent:**	4.5/1.4 mM Na2CO3 / NaHCO3
Guard Column:	IonPac AG22 4 x 50 mm	**Eluent Flow Rate:**	1.2 mL/min
Anion Self-Regenerating Suppressor:	AERS 500 4 mm	**Column Temp:**	N/A
		Cell Temp:	35°C
Cation Self-Regenerating Suppressor:	N/A	**Scale X-Axis:**	minutes
		Scale Y-Axis:	90 µS
Suppressor Current:	31 mA	**Concentration:**	20 µg/g

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag keep cap tightly sealed when not in use. Store and use at 20° ± 4° C. Do not pippette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- SAI Global File Number 010105

10.4 ISO/IEC Guide 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

July 23, 2015

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- July 23, 2018

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year from the date of removal from the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being handled and stored in accordance with the instructions given in Sec 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Brenda Francis
Product Documentation Technician

Certificate Approved By:

Michael Booth
QC Supervisor

Certifying Officer:

Paul Gaines
PhD., Senior Technical Director

GRACE
Grace Materials Technologies • 2051 Waukegan Road • Deerfield, IL 60015
Phone: 847-948-8600 • Fax: 847-948-1078
Website: www.grace.com

Certificate of Analysis

1607101
1607102

1.0 ACCREDITATION / REGISTRATION

The certified reference material manufacturer is accredited to ISO Guide 34, "General Requirements for the Competence of Reference Material Producers" (A2LA certificate number 883.02) and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories" (A2LA certificate number 883.01) and it's also ISO 9001 registered (SAI Global File Number 010105).

2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Ion Chromatography Solution

Catalog Number: ANION MIX A - 26910200

$$oPO4P = 30.01mg/L\ PO4 \times \frac{30.97g/mole\ P}{94.97g/mole\ PO4} = 9.79mg/L$$

Lot Number: J2-MEB573021

Matrix: H2O

$$NO3N = 20.0mg/L\ NO3 \times \frac{14.01g/mole\ N}{62.01g/mole\ NO3} = 4.52mg/L$$

Value / Analyte(s): 30 µg/mL ea:
PO4, SO4,
20 µg/mL ea:
Br, Cl-, NO3-,
NO2-,
10 µg/mL ea:
F-

$$NO2N = 20.0mg/L\ NO2 \times \frac{14.01g/mole\ N}{46.01gmole\ NO2} = 6.09mg/L$$

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Bromide	20.01 ± 0.11 µg/mL	Chloride	20.01 ± 0.12 µg/mL	Fluoride	10.01 ± 0.05 µg/mL
Nitrate	20.01 ± 0.11 µg/mL	Nitrite	20.01 ± 0.15 µg/mL	o-Phosphate	30.01 ± 0.15 µg/mL
Sulfate	30.01 ± 0.17 µg/mL				

Certified Density: 0.998 g/mL (measured at 20 ± 1 °C)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Bromide	IC Assay	3184	020701
Bromide	Volhard	999b	999b
Chloride	IC Assay	3182	060925
Chloride	Volhard	999b	999b
Fluoride	IC Assay	3183	050721
Nitrate	IC Assay	3185	050517
Nitrite	Calculated	8040	8040
Nitrite	IC Assay	traceable to 8040	SRM 8040
oPhosphate	IC Assay	3186	090723
Sulfate	Calculated		See Sec. 4.2
Sulfate	IC Assay	3181	080603

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) = $2\,[\,\Sigma(s_i)^2\,]^{1/2}$

2 = the coverage factor.
$[\,\Sigma(s_i)^2\,]^{1/2}$ = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 CHROMATOGRAM

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Keep cap tightly sealed when not in use. Store and use at 20 ± 4° C. Do not pipette from the container. Do not return removed aliquots to container.

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.2 10CFR21 - Nuclear Regulatory Commission

- Reporting defects and Non-Compliance

10.3 ISO 9001 Quality Management System Registration

- SAI Global File Number 010105

10.4 ISO/IEC Guide 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.5 ISO/IEC Guide 34 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

May 21, 2015

11.2 Expiration Date

EXPIRES
1 MAR 2017

11.3 Period of Validity

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is handled and stored in accordance with instructions given in Sec 7.0 and used prior to the date given in Sec 11.2. This certification is nullified if the CRM/RM is damaged, contaminated, or otherwise modified.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:

Brenda Francis
Product Documentation Technician

Certificate Approved By:

Brian Alexander
PhD., Technical Process Director

Certifying Officer:

Paul Gaines
PhD., Senior Technical Director

Analytical Standard Record

EPA Region 9 Laboratory

1607102

Description:	Anions, Secondary Source Std. (SCV)	**Expires:**	03/01/17
Standard Type:	Analyte Spike	**Prepared:**	02/11/16
Solvent:	Solvent Lot #	**Prepared By:**	** Vendor **
Final Volume (mls):	125	**Department:**	Inorganics
Vials:	1	**Last Edit:**	06/03/16 13:19 by SUL
Vendor:	Alltech	**Lot Numbe**	J2-MEB573021

Grace, CAT.#26910200. The solution contains a mixture of all 7 anions (F, Br, Cl, NO2-N, NO3-N, OPO4-P, and SO4), Barcode AU007990

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	30
Phosphorus, Total	7723-14-0	9.79
o-Phosphate, as P	o-PO4	9.79
Nitrite as N	14797-65-0	6.09
Nitrate+Nitrite as N	NA	10.6
Nitrate as N	14797-55-8	4.52
Fluoride	16984-48-8	10
Chloride	16887-00-6	20
Bromide	24959-67-9	20

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 9 Laboratory
Science Services Branch
1337 S. 46th Street, Bldg 201, Richmond, CA 94804
Phone: (510)412-2382 Fax: (510)412-2302

ANALYTICAL STANDARD RECORD
1611083

Description:	Anions, 100mg/L Working Std (F, Br)	Expires:	03/10/17	Department:	Inorganics
Solvent:	Solvent Lot #	Prepared:	03/10/16	Vendor:	*Prepared*
Final Volume (mls):	500	Prepared By:	Susan Lepe	Lot#:	various
Vials:	1	Last Edit:	03/10/16 09:41 by SUL	Standard Type:	Analyte Spi

Comments: Multi anion working stock standard.

Parent Standards used in this standard:		Conc.	Prepared	Prepared By	Vendor	Expires	Last Edit	(mls)
1509016	Fluoride Stock, 1000 mg/L		02/23/15	** Vendor **	Inorganic Ventures	11/07/17	02/23/15 10:45 by SUL	50
1509014	Bromide Stock, 1000 mg/L		02/23/15	** Vendor **	Inorganic Ventures	12/03/17	02/23/15 10:41 by SUL	50

Analyte	CAS Number	Concentration	Units	Analyte	CAS Number	Concentration	Units
Bromide	24959-67-9	100	ppm				
Fluoride	16984-48-8	100	ppm				

Prepared By Date

Analytical Standard Record

EPA Region 9 Laboratory

1624046

Description:	Anions, 100mg/L Working Std (NO2-N, N	**Expires:**	03/24/17
Standard Type:	Analyte Spike	**Prepared:**	06/07/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	06/07/16 09:42 by SUL
Vendor:	*Prepared*	**Lot Numbe**	various

Analyte	CAS Number	Concentration (ppm)
Nitrite as N	14797-65-0	100
Nitrate+Nitrite as N	NA	200
Nitrate as N	14797-55-8	100

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1509017	Nitrite-N Stock, 1000 mg/L	02/23/15	** Vendor **	03/24/17	02/23/15 10:47 by SUL	50
1509018	Nitrate-N Stock, 1000 mg/L	02/23/15	** Vendor **	10/27/17	02/23/15 10:49 by SUL	50

Analytical Standard Record

EPA Region 9 Laboratory

1628053

Description:	Alkalinity, Inorganics Stock Standard	**Expires:**	01/31/19
Standard Type:	Analyte Spike	**Prepared:**	07/05/16
Solvent:	N/A	**Prepared By:**	** Vendor **
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	07/05/16 15:10 by SUL
Vendor:	ERA	**Lot Numbe**	S231-698

ERA Cat. No. 698. Bar code AU008230

Analyte	CAS Number	Concentration (ppm)
Total Dissolved Solids	TDS	565
Total Alkalinity	ALK-Total	101
Sulfate	14808-79-8	101
Specific Conductance (EC)	NA	745
Sodium	7440-23-5	153
Potassium	7440-09-7	21.9
Nitrate+Nitrite as N	NA	4.1
Nitrate as N	14797-55-8	4.1
Fluoride	16984-48-8	5.09
Chloride	16887-00-6	89.5

ERA
A Waters Company

Reference Materials

▪ Certificate of Analysis ▪

Product: WatR™ Supply Inorganics
Catalog Number: 698
Lot No. S231-698
Certificate Issue Date: February 19, 2016
Expiration Date: January 31, 2019
Revision Number: Original

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CERTIFICATION

Parameter	Certified Value[1]	Uncertainty[2]	QC Performance Acceptance Limits[3]	PT Performance Acceptance Limits[4]
	mg/L	%	mg/L	mg/L
Alkalinity as CaCO3	101	1.08	91.4 - 112	90.9 - 111
Chloride	89.5	4.55	78.8 - 101	76.1 - 103
Conductivity at 25°C (µmhos/cm)	745	0.413	692 - 805	671 - 820
Fluoride	5.09	2.70	4.39 - 5.70	4.58 - 5.60
Nitrate + Nitrite as N	4.10	1.83	3.62 - 4.47	3.48 - 4.72
Nitrate as N	4.10	1.83	3.56 - 4.55	3.69 - 4.51
Potassium	21.9	3.25	18.8 - 25.2	18.6 - 25.2
Sodium	153	2.85	133 - 173	137 - 167
Sulfate	101	2.29	84.1 - 115	85.8 - 116
Total Dissolved Solids at 180°C	565	2.89	476 - 627	452 - 678

ANALYTICAL VERIFICATION

Parameter	Certified Value[1]	Proficiency Testing Study			NIST Traceability	
		Mean	Recovery[5]	n	SRM Number	Recovery
	mg/L	mg/L	%			%
Alkalinity as CaCO3	101	100	99.1	71	187e	101
Chloride	89.5	88.2	98.6	95	3182	98.4
Conductivity at 25°C (µmhos/cm)	745	766	103	89	919b	100
Fluoride	5.09	4.97	97.6	106	3183	97.9
Nitrate + Nitrite as N	4.10	3.98	97.1	77	3185	97.9
Nitrate as N	4.10	3.98	97.1	116	3185	97.9
Potassium	21.9	21.5	98.2	59	3141a	97.3

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Reference Materials

▪ Certificate of Analysis ▪

Parameter	Certified Value[1]	Proficiency Testing Study			NIST Traceability	
		Mean	Recovery[5]	n	SRM Number	Recovery
	mg/L	mg/L	%			%
Sodium	153	-	-	-	3152a	98.2
Sulfate	101	99.3	98.4	86	3181	100
Total Dissolved Solids at 180°C	565	545	96.4	60	919b	98.9

1. The **Certified Values** are the actual "made-to" concentrations confirmed by ERA analytical verification. The certified values are monitored and purchasers will be notified of any significant changes resulting in recertification or withdrawal of this certified reference material during the period of validity of this certificate.

2. The **Uncertainty** is the total propagated uncertainty at the 95% confidence interval. The uncertainty is based on the preparation and internal analytical verification of the product by ERA, multiplied by a coverage factor. The uncertainty applies to the product as supplied and does not take into account any required or optional dilution and/or preparations the laboratory may perform while using this product.

3. The **QC Performance Acceptance Limits (QC PALs™)**are based on actual historical data collected in ERA's Proficiency Testing program. The QC PALs™ reflect any inherent biases in the methods used to establish the limits and closely approximate a 95% confidence interval of the performance that experienced laboratories should achieve using accepted environmental methods. Use the QC PALs™ to realistically evaluate your performance against your peers.

4. The **PT Performance Acceptance Limits (PT PALs™)** are calculated using the regression equations and fixed acceptance criteria specified in the NELAC proficiency testing requirements. Use the PT PALs™ when analyzing this QC standard alongside USEPA and NELAC compliant PT standards. Please note that many PT study acceptance limits are concentration dependent (some non-linearly) and, therefore, the acceptance limits of this QC standard and any PT standard may differ relative to their difference in concentrations.

5. The **PT Data/Traceability** data include the mean value, percent recovery and number of data points reported by the laboratories in our Proficiency Testing study compared to the Certified Values. In addition, where NIST Standard Reference Materials (SRMs) are available, each analyte has been analytically traced to the NIST SRM listed. This product is traceable to the lot numbers of its starting materials. All gravimetric and volumetric measurements related to its manufacture are traceable to NIST through an unbroken chain of comparisons.
Traceability Recovery (%) = [(% recovery certified standard)/(% recovery NIST SRM)]*100
The traceability data shown were compiled by analyzing the ERA standards or their associated stock solutions against the applicable NIST SRMs.

6. For additional information on this product such as intended use, instructions for use, level of homogeneity, and safety information, please refer to the provided Instruction Sheet

If you have any questions or need technical assistance, please call ERA technical assistance at 1-800-372-0122 or send an email to info@eraqc.com.

Certifying Officer

Brian Miller

Quality Officer

Patrick Larson

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Analytical Standard Record

EPA Region 9 Laboratory

1628055

Description:	Alkalinity, Inorganics Stock Standard	**Expires:**	01/31/19
Standard Type:	Analyte Spike	**Prepared:**	07/05/16
Solvent:	N/A	**Prepared By:**	** Vendor **
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	07/05/16 15:06 by SUL
Vendor:	ERA	**Lot Numbe**	S231-698

ERA Cat. No. 698. Bar code AU008232

Analyte	CAS Number	Concentration (ppm)
Total Dissolved Solids	TDS	565
Total Alkalinity	ALK-Total	101
Sulfate	14808-79-8	101
Specific Conductance (EC)	NA	745
Sodium	7440-23-5	153
Potassium	7440-09-7	21.9
Nitrate+Nitrite as N	NA	4.1
Nitrate as N	14797-55-8	4.1
Fluoride	16984-48-8	5.09
Chloride	16887-00-6	89.5

ERA
A Waters Company

Reference Materials

▪ Certificate of Analysis ▪

Product: WatR™ Supply Inorganics
Catalog Number: 698
Lot No. S231-698
Certificate Issue Date: February 19, 2016
Expiration Date: January 31, 2019
Revision Number: Original

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S5

CERTIFICATION

Parameter	Certified Value[1]	Uncertainty[2]	QC Performance Acceptance Limits[3]	PT Performance Acceptance Limits[4]
	mg/L	%	mg/L	mg/L
Alkalinity as CaCO3	101	1.08	91.4 - 112	90.9 - 111
Chloride	89.5	4.55	78.8 - 101	76.1 - 103
Conductivity at 25°C (µmhos/cm)	745	0.413	692 - 805	671 - 820
Fluoride	5.09	2.70	4.39 - 5.70	4.58 - 5.60
Nitrate + Nitrite as N	4.10	1.83	3.62 - 4.47	3.48 - 4.72
Nitrate as N	4.10	1.83	3.56 - 4.55	3.69 - 4.51
Potassium	21.9	3.25	18.8 - 25.2	18.6 - 25.2
Sodium	153	2.85	133 - 173	137 - 167
Sulfate	101	2.29	84.1 - 115	85.8 - 116
Total Dissolved Solids at 180°C	565	2.89	476 - 627	452 - 678

ANALYTICAL VERIFICATION

Parameter	Certified Value[1]	Proficiency Testing Study			NIST Traceability	
		Mean	Recovery[5]	n	SRM Number	Recovery
	mg/L	mg/L	%			%
Alkalinity as CaCO3	101	100	99.1	71	187e	101
Chloride	89.5	88.2	98.6	95	3182	98.4
Conductivity at 25°C (µmhos/cm)	745	766	103	89	919b	100
Fluoride	5.09	4.97	97.6	106	3183	97.9
Nitrate + Nitrite as N	4.10	3.98	97.1	77	3185	97.9
Nitrate as N	4.10	3.98	97.1	116	3185	97.9
Potassium	21.9	21.5	98.2	59	3141a	97.3

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Reference Materials

▪ Certificate of Analysis ▪

Parameter	Certified Value[1]	Proficiency Testing Study			NIST Traceability	
		Mean	Recovery[5]	n	SRM Number	Recovery
	mg/L	mg/L	%			%
Sodium	153	-	-	-	3152a	98.2
Sulfate	101	99.3	98.4	86	3181	100
Total Dissolved Solids at 180°C	565	545	96.4	60	919b	98.9

1. The **Certified Values** are the actual "made-to" concentrations confirmed by ERA analytical verification. The certified values are monitored and purchasers will be notified of any significant changes resulting in recertification or withdrawal of this certified reference material during the period of validity of this certificate.

2. The **Uncertainty** is the total propagated uncertainty at the 95% confidence interval. The uncertainty is based on the preparation and internal analytical verification of the product by ERA, multiplied by a coverage factor. The uncertainty applies to the product as supplied and does not take into account any required or optional dilution and/or preparations the laboratory may perform while using this product.

3. The **QC Performance Acceptance Limits (QC PALs™)**are based on actual historical data collected in ERA's Proficiency Testing program. The QC PALs™ reflect any inherent biases in the methods used to establish the limits and closely approximate a 95% confidence interval of the performance that experienced laboratories should achieve using accepted environmental methods. Use the QC PALs™ to realistically evaluate your performance against your peers.

4. The **PT Performance Acceptance Limits (PT PALs™)** are calculated using the regression equations and fixed acceptance criteria specified in the NELAC proficiency testing requirements. Use the PT PALs™ when analyzing this QC standard alongside USEPA and NELAC compliant PT standards. Please note that many PT study acceptance limits are concentration dependent (some non-linearly) and, therefore, the acceptance limits of this QC standard and any PT standard may differ relative to their difference in concentrations.

5. The **PT Data/Traceability** data include the mean value, percent recovery and number of data points reported by the laboratories in our Proficiency Testing study compared to the Certified Values. In addition, where NIST Standard Reference Materials (SRMs) are available, each analyte has been analytically traced to the NIST SRM listed. This product is traceable to the lot numbers of its starting materials. All gravimetric and volumetric measurements related to its manufacture are traceable to NIST through an unbroken chain of comparisons.
Traceability Recovery (%) = [(% recovery certified standard)/(% recovery NIST SRM)]*100
The traceability data shown were compiled by analyzing the ERA standards or their associated stock solutions against the applicable NIST SRMs.

6. For additional information on this product such as intended use, instructions for use, level of homogeneity, and safety information, please refer to the provided Instruction Sheet

If you have any questions or need technical assistance, please call ERA technical assistance at 1-800-372-0122 or send an email to info@eraqc.com.

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Quality Officer

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Analytical Standard Record

EPA Region 9 Laboratory

1631041

Description:	Phosphoric Acid	**Expires:**	10/24/20
Standard Type:	Other Solution	**Prepared:**	07/26/16
Solvent:	N/A	**Prepared By:**	** Vendor **
Final Volume (mls):	2500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	07/26/16 09:49 by WD
Vendor:	J.T. Baker	**Lot Numbe**	126538

J.T. Baker Cat # 0260-33 2.5L, CAS NO: 7664-38-2, Lot 126538 Barcode AU008026
Assay: 86%. FW=98g/mole

Analyte	CAS Number	Concentration (ppm)
Phosphoric Acid	7664-38-2	855000

Analytical Standard Record

EPA Region 9 Laboratory

1634043

Description:	Anions, 250mg/L Working Std (Cl, SO4, c	**Expires:**	05/18/18
Standard Type:	Analyte Spike	**Prepared:**	08/16/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	200	**Department:**	Inorganics
Vials:	1	**Last Edit:**	08/16/16 08:31 by SUL
Vendor:	*Prepared*	**Lot Numbe**	various

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	250
Phosphorus, Total	7723-14-0	250
o-Phosphate, as P	o-PO4	250
Chloride	16887-00-6	250

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1549018	Chloride Stock, 1000 mg/L	11/30/15	** Vendor **	07/23/18	11/30/15 10:50 by SUL	50
1549007	O-Phosphate-P Stock, 1000 mg/L	11/30/15	** Vendor **	05/18/18	11/30/15 10:45 by SUL	50
1549016	Sulfate Stock, 1000 mg/L	11/30/15	** Vendor **	08/12/18	11/30/15 10:48 by SUL	50

Analytical Standard Record

EPA Region 9 Laboratory

1634065

Description:	Anions, Cal Std1, 0.1/0.1/0.5 mg/L	**Expires:**	08/18/16
Standard Type:	Other Solution	**Prepared:**	08/17/16
Solvent:	Solvent	**Prepared By:**	Susan Lepe
Final Volume (mls):	50	**Department:**	Inorganics
Vials:	1	**Last Edit:**	08/17/16 10:32 by SUL
Vendor:	*Prepared*	**Lot Numbe**	various

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	0.5
Phosphorus, Total	7723-14-0	0.5
o-Phosphate, as P	o-PO4	0.5
Nitrite as N	14797-65-0	0.1
Nitrate+Nitrite as N	NA	0.2
Nitrate as N	14797-55-8	0.1
Fluoride	16984-48-8	0.1
Chloride	16887-00-6	0.5
Bromide	24959-67-9	0.1

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1611083	Anions, 100mg/L Working Std (F, Br)	03/10/16	Susan Lepe	03/10/17	03/10/16 09:41 by SUL	0.05
1624046	Anions, 100mg/L Working Std (NO2-N	06/07/16	Susan Lepe	03/24/17	06/07/16 09:42 by SUL	0.05
1634043	Anions, 250mg/L Working Std (Cl, SO4	08/16/16	Susan Lepe	05/18/18	08/16/16 08:31 by SUL	0.1

Analytical Standard Record

EPA Region 9 Laboratory

1634066

Description:	Anions, Cal Std2, 0.25/0.5/1.0 mg/L	**Expires:**	08/18/16
Standard Type:	Other Solution	**Prepared:**	08/17/16
Solvent:	Solvent	**Prepared By:**	Susan Lepe
Final Volume (mls):	50	**Department:**	Inorganics
Vials:	1	**Last Edit:**	08/17/16 10:33 by SUL
Vendor:	*Prepared*	**Lot Numbe**	various

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	1
Phosphorus, Total	7723-14-0	1
o-Phosphate, as P	o-PO4	1
Nitrite as N	14797-65-0	0.5
Nitrate+Nitrite as N	NA	1
Nitrate as N	14797-55-8	0.5
Fluoride	16984-48-8	0.25
Chloride	16887-00-6	1
Bromide	24959-67-9	0.25

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1611083	Anions, 100mg/L Working Std (F, Br)	03/10/16	Susan Lepe	03/10/17	03/10/16 09:41 by SUL	0.125
1624046	Anions, 100mg/L Working Std (NO2-N	06/07/16	Susan Lepe	03/24/17	06/07/16 09:42 by SUL	0.25
1634043	Anions, 250mg/L Working Std (Cl, SO4	08/16/16	Susan Lepe	05/18/18	08/16/16 08:31 by SUL	0.2

Analytical Standard Record

EPA Region 9 Laboratory

1634067

Description:	Anions, Cal Std3, 0.5/1.0/5.0 mg/L	**Expires:**	08/18/16
Standard Type:	Other Solution	**Prepared:**	08/17/16
Solvent:	Solvent	**Prepared By:**	Susan Lepe
Final Volume (mls):	50	**Department:**	Inorganics
Vials:	1	**Last Edit:**	08/17/16 10:33 by SUL
Vendor:	*Prepared*	**Lot Numbe**	various

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	5
Phosphorus, Total	7723-14-0	5
o-Phosphate, as P	o-PO4	5
Nitrite as N	14797-65-0	1
Nitrate+Nitrite as N	NA	2
Nitrate as N	14797-55-8	1
Fluoride	16984-48-8	0.5
Chloride	16887-00-6	5
Bromide	24959-67-9	0.5

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1624046	Anions, 100mg/L Working Std (NO2-N	06/07/16	Susan Lepe	03/24/17	06/07/16 09:42 by SUL	0.5
1611083	Anions, 100mg/L Working Std (F, Br)	03/10/16	Susan Lepe	03/10/17	03/10/16 09:41 by SUL	0.25
1634043	Anions, 250mg/L Working Std (Cl, SO	08/16/16	Susan Lepe	05/18/18	08/16/16 08:31 by SUL	1

Analytical Standard Record

EPA Region 9 Laboratory

1634068

Description:	Anions, Cal Std4, 1/5/10 mg/L	**Expires:**	08/18/16
Standard Type:	Other Solution	**Prepared:**	08/17/16
Solvent:	Solvent	**Prepared By:**	Susan Lepe
Final Volume (mls):	100	**Department:**	Inorganics
Vials:	1	**Last Edit:**	08/17/16 10:33 by SUL
Vendor:	*Prepared*	**Lot Numbe**	various

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	10
Phosphorus, Total	7723-14-0	10
o-Phosphate, as P	o-PO4	10
Nitrite as N	14797-65-0	5
Nitrate+Nitrite as N	NA	10
Nitrate as N	14797-55-8	5
Fluoride	16984-48-8	1
Chloride	16887-00-6	10
Bromide	24959-67-9	1

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1611083	Anions, 100mg/L Working Std (F, Br)	03/10/16	Susan Lepe	03/10/17	03/10/16 09:41 by SUL	1
1624046	Anions, 100mg/L Working Std (NO2-N	06/07/16	Susan Lepe	03/24/17	06/07/16 09:42 by SUL	5
1634043	Anions, 250mg/L Working Std (Cl, SO	08/16/16	Susan Lepe	05/18/18	08/16/16 08:31 by SUL	4

Analytical Standard Record

EPA Region 9 Laboratory

1634069

Description:	Anions, Cal Std5, 2.0/10.0/25.0 mg/L	**Expires:**	08/18/16
Standard Type:	Other Solution	**Prepared:**	08/17/16
Solvent:	Solvent	**Prepared By:**	Susan Lepe
Final Volume (mls):	50	**Department:**	Inorganics
Vials:	1	**Last Edit:**	08/17/16 10:33 by SUL
Vendor:	*Prepared*	**Lot Numbe**	various

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	25
Phosphorus, Total	7723-14-0	25
o-Phosphate, as P	o-PO4	25
Nitrite as N	14797-65-0	10
Nitrate+Nitrite as N	NA	20
Nitrate as N	14797-55-8	10
Fluoride	16984-48-8	2
Chloride	16887-00-6	25
Bromide	24959-67-9	2

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1611083	Anions, 100mg/L Working Std (F, Br)	03/10/16	Susan Lepe	03/10/17	03/10/16 09:41 by SUL	1
1624046	Anions, 100mg/L Working Std (NO2-N	06/07/16	Susan Lepe	03/24/17	06/07/16 09:42 by SUL	5
1634043	Anions, 250mg/L Working Std (Cl, SO4	08/16/16	Susan Lepe	05/18/18	08/16/16 08:31 by SUL	5

Analytical Standard Record

EPA Region 9 Laboratory

1634070

Description:	Anions, Cal Std6, 10.0/25.0/50.0 mg/L	**Expires:**	08/18/16
Standard Type:	Other Solution	**Prepared:**	08/17/16
Solvent:	Solvent	**Prepared By:**	Susan Lepe
Final Volume (mls):	50	**Department:**	Inorganics
Vials:	1	**Last Edit:**	08/17/16 10:34 by SUL
Vendor:	*Prepared*	**Lot Numbe**	various

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	50
Phosphorus, Total	7723-14-0	50
o-Phosphate, as P	o-PO4	50
Nitrite as N	14797-65-0	25
Nitrate+Nitrite as N	NA	50
Nitrate as N	14797-55-8	25
Fluoride	16984-48-8	10
Chloride	16887-00-6	50
Bromide	24959-67-9	10

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1611083	Anions, 100mg/L Working Std (F, Br)	03/10/16	Susan Lepe	03/10/17	03/10/16 09:41 by SUL	5
1624046	Anions, 100mg/L Working Std (NO2-N	06/07/16	Susan Lepe	03/24/17	06/07/16 09:42 by SUL	12.5
1634043	Anions, 250mg/L Working Std (Cl, SO4	08/16/16	Susan Lepe	05/18/18	08/16/16 08:31 by SUL	10

Analytical Standard Record

EPA Region 9 Laboratory

1634071

Description:	Anions, SCV	**Expires:**	08/18/16
Standard Type:	Other Solution	**Prepared:**	08/17/16
Solvent:	Solvent	**Prepared By:**	Susan Lepe
Final Volume (mls):	5	**Department:**	Inorganics
Vials:	1	**Last Edit:**	08/17/16 10:34 by SUL
Vendor:	*Prepared*	**Lot Numbe**	Prepared

Dilution of Anions Secondary Source Std. for calibration.

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	7.5
Phosphorus, Total	7723-14-0	2.45
o-Phosphate, as P	o-PO4	2.45
Nitrite as N	14797-65-0	1.52
Nitrate+Nitrite as N	NA	2.65
Nitrate as N	14797-55-8	1.13
Fluoride	16984-48-8	2.5
Chloride	16887-00-6	5
Bromide	24959-67-9	5

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1607102	Anions, Secondary Source Std. (SCV)	02/11/16	** Vendor **	03/01/17	06/03/16 13:19 by SUL	1.25

Analytical Standard Record

EPA Region 9 Laboratory

1637061

Description:	TOC, KHP Standard, 2000 mg/L	**Expires:**	09/09/17
Standard Type:	Analyte Spike	**Prepared:**	09/09/16
Solvent:	DI WATER	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/09/16 11:22 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	2000
Phosphoric Acid	7664-38-2	8550
Dissolved Organic Carbon	DOC	2000

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
6B17017	Potassium Biphthalate	02/17/06	** Vendor **	02/17/20	06/21/16 10:52 by RH	1.0625
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1637062

Description:	TOC, Cal Std 0.5/QLS	**Expires:**	10/09/16
Standard Type:	Other Solution	**Prepared:**	09/09/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/09/16 12:10 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	0.5
Phosphoric Acid	7664-38-2	8550
Dissolved Organic Carbon	DOC	0.5

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	0.0625

Analytical Standard Record

EPA Region 9 Laboratory

1637063

Description:	TOC, Cal Std 2.5/LCV	**Expires:**	10/09/16
Standard Type:	Other Solution	**Prepared:**	09/09/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/09/16 12:14 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	2.5
Phosphoric Acid	7664-38-2	8560
Dissolved Organic Carbon	DOC	2.5

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	0.3125
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1637064

Description:	TOC, Cal Std 25 mg/L CCV	**Expires:**	10/09/16
Standard Type:	Other Solution	**Prepared:**	09/09/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/09/16 12:18 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	25
Phosphoric Acid	7664-38-2	8660
Dissolved Organic Carbon	DOC	25

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	3.125

Analytical Standard Record

EPA Region 9 Laboratory

1638007

Description:	TOC, Cal Std 0/CB	**Expires:**	10/12/16
Standard Type:	Other Solution	**Prepared:**	09/12/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/12/16 09:11 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Phosphoric Acid	7664-38-2	8550

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1638008

Description:	TOC, Cal Std 2.0	**Expires:**	10/12/16
Standard Type:	Other Solution	**Prepared:**	09/12/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/12/16 09:12 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	2
Phosphoric Acid	7664-38-2	8560
Dissolved Organic Carbon	DOC	2

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	0.25
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1638009

Description:	TOC, Cal Std 5 mg/L	**Expires:**	10/12/16
Standard Type:	Other Solution	**Prepared:**	09/12/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/12/16 09:13 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	5
Phosphoric Acid	7664-38-2	8570
Dissolved Organic Carbon	DOC	5

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	0.625

Analytical Standard Record

EPA Region 9 Laboratory

1638010

Description:	TOC, Cal Std 10 mg/L	**Expires:**	10/12/16
Standard Type:	Other Solution	**Prepared:**	09/12/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/12/16 09:14 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	10
Phosphoric Acid	7664-38-2	8590
Dissolved Organic Carbon	DOC	10

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	1.25
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1638014

Description:	TOC, Cal Std 20 mg/L	**Expires:**	10/12/16
Standard Type:	Other Solution	**Prepared:**	09/12/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/12/16 09:14 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	20
Phosphoric Acid	7664-38-2	8640
Dissolved Organic Carbon	DOC	20

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	2.5
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1638018

Description:	TOC, Cal Std 50 mg/L	**Expires:**	10/12/16
Standard Type:	Other Solution	**Prepared:**	09/12/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/12/16 09:15 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	50
Phosphoric Acid	7664-38-2	8760
Dissolved Organic Carbon	DOC	50

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	6.25
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1638020

Description:	TOC, Cal Std 100 mg/L	**Expires:**	10/12/16
Standard Type:	Other Solution	**Prepared:**	09/12/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/12/16 09:16 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	100
Phosphoric Acid	7664-38-2	8980
Dissolved Organic Carbon	DOC	100

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	12.5
1631041	Phosphoric Acid	07/26/16	** Vendor **	10/24/20	07/26/16 09:49 by WD	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1638022

Description:	TOC, SCV, Secondary Source Std.	**Expires:**	10/12/16
Standard Type:	Other Solution	**Prepared:**	09/12/16
Solvent:	water	**Prepared By:**	Susan Lepe
Final Volume (mls):	100	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/12/16 09:35 by SUL
Vendor:	*Prepared*	**Lot Numbe**	prepared

TOC SCV standard made from Secondary Source Stock to 2.5ppm.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	2.5
Dissolved Organic Carbon	DOC	2.5

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
0E19012	TOC, Secondary Stock Standard	05/19/10	** Vendor **	07/31/18	07/14/16 13:01 by SUL	0.0347

Analytical Standard Record

EPA Region 9 Laboratory

1645025

Description:	Phosphoric Acid	**Expires:**	12/12/20
Standard Type:	Other Solution	**Prepared:**	12/14/15
Solvent:	N/A	**Prepared By:**	** Vendor **
Final Volume (mls):	2500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	11/02/16 08:59 by SUL
Vendor:	J.T. Baker	**Lot Numbe**	123693

J.T. Baker Cat # 0260-33 2.5L, CAS NO: 7664-38-2, Lot 126538 Barcode AU008193

Analyte	CAS Number	Concentration (ppm)
Phosphoric Acid	7664-38-2	855000

Analytical Standard Record

EPA Region 9 Laboratory

1647044

Description:	TOC, Inorganic Carbon Std	**Expires:**	12/15/16
Standard Type:	Other Solution	**Prepared:**	11/15/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	50	**Department:**	Inorganics
Vials:	1	**Last Edit:**	11/15/16 09:01 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Analyte	CAS Number	Concentration (ppm)
Sodium carbonate (as CO3)	497-19-8	5010
Sodium carbonate	497-19-8	8820
Carbon, Inorganic (Na2CO3)	497-19-8	1010

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1J19001	Sodium Bicarbonate, Powder	10/19/11	** Vendor **	10/19/21	10/19/11 10:06 by JM	0.3528
4I21061	Sodium Carbonate, Anhydrous	09/21/04	** Vendor **	09/21/18	08/30/14 12:13 by CND	0.441

Analytical Standard Record

EPA Region 9 Laboratory

1647126

Description:	TOC, Cal Std 2.5/LCV	**Expires:**	12/18/16
Standard Type:	Other Solution	**Prepared:**	11/18/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	11/18/16 10:29 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	2.5
Phosphoric Acid	7664-38-2	8560
Dissolved Organic Carbon	DOC	2.5

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	0.3125
1645025	Phosphoric Acid	12/14/15	** Vendor **	12/12/20	11/02/16 08:59 by SUL	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1649108

Description:	Anions, CCV/BS, 1/5/10 mg/L	**Expires:**	12/02/16
Standard Type:	Analyte Spike	**Prepared:**	12/01/16
Solvent:	Solvent	**Prepared By:**	Susan Lepe
Final Volume (mls):	100	**Department:**	Inorganics
Vials:	1	**Last Edit:**	12/01/16 06:44 by SUL
Vendor:	*Prepared*	**Lot Numbe**	various

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	10
Phosphorus, Total	7723-14-0	10
o-Phosphate, as P	o-PO4	10
Nitrite as N	14797-65-0	5
Nitrate+Nitrite as N	NA	10
Nitrate as N	14797-55-8	5
Fluoride	16984-48-8	1
Chloride	16887-00-6	10
Bromide	24959-67-9	1

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1624046	Anions, 100mg/L Working Std (NO2-N	06/07/16	Susan Lepe	03/24/17	06/07/16 09:42 by SUL	5
1611083	Anions, 100mg/L Working Std (F, Br)	03/10/16	Susan Lepe	03/10/17	03/10/16 09:41 by SUL	1
1634043	Anions, 250mg/L Working Std (Cl, SO4	08/16/16	Susan Lepe	05/18/18	08/16/16 08:31 by SUL	4

Analytical Standard Record

EPA Region 9 Laboratory

1649109

Description:	Anions, CRL/QLS, 0.1/0.5/1.0 mg/L	**Expires:**	12/02/16
Standard Type:	Analyte Spike	**Prepared:**	12/01/16
Solvent:	Solvent	**Prepared By:**	Susan Lepe
Final Volume (mls):	50	**Department:**	Inorganics
Vials:	1	**Last Edit:**	12/01/16 06:44 by SUL
Vendor:	*Prepared*	**Lot Numbe**	various

Analyte	CAS Number	Concentration (ppm)
Sulfate	14808-79-8	0.5
Phosphorus, Total	7723-14-0	1
o-Phosphate, as P	o-PO4	1
Nitrite as N	14797-65-0	0.1
Nitrate+Nitrite as N	NA	0.2
Nitrate as N	14797-55-8	0.1
Fluoride	16984-48-8	0.1
Chloride	16887-00-6	1
Bromide	24959-67-9	0.1

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1549016	Sulfate Stock, 1000 mg/L	11/30/15	** Vendor **	08/12/18	11/30/15 10:48 by SUL	0.025
1611083	Anions, 100mg/L Working Std (F, Br)	03/10/16	Susan Lepe	03/10/17	03/10/16 09:41 by SUL	0.05
1624046	Anions, 100mg/L Working Std (NO2-N	06/07/16	Susan Lepe	03/24/17	06/07/16 09:42 by SUL	0.05
1549018	Chloride Stock, 1000 mg/L	11/30/15	** Vendor **	07/23/18	11/30/15 10:50 by SUL	0.05
1549007	O-Phosphate-P Stock, 1000 mg/L	11/30/15	** Vendor **	05/18/18	11/30/15 10:45 by SUL	0.05

Analytical Standard Record

EPA Region 9 Laboratory

1650055

Description:	Alkalinity, MRL	**Expires:**	12/09/16
Standard Type:	Reference Material	**Prepared:**	12/08/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	100	**Department:**	Inorganics
Vials:	1	**Last Edit:**	12/08/16 06:21 by SUL
Vendor:	*Prepared*	**Lot Numbe**	see original

Analyte	CAS Number	Concentration (ppm)	SRM Control Limits
Total Dissolved Solids	TDS	55.9	0-200
Total Alkalinity	ALK-Total	10	0-200
Sulfate	14808-79-8	10	0-200
Specific Conductance (EC)	NA	73.8	0-200
Sodium	7440-23-5	15.1	0-200
Potassium	7440-09-7	2.17	0-200
Nitrate+Nitrite as N	NA	0.406	0-200
Nitrate as N	14797-55-8	0.406	0-200
Fluoride	16984-48-8	0.504	0-200
Chloride	16887-00-6	8.86	0-200

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1628053	Alkalinity, Inorganics Stock Standard	07/05/16	** Vendor **	01/31/19	07/05/16 15:10 by SUL	9.9

Analytical Standard Record

EPA Region 9 Laboratory

1650096

Description:	TOC, Cal Std 0/CB	**Expires:**	01/09/17
Standard Type:	Other Solution	**Prepared:**	12/09/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	12/09/16 09:33 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Phosphoric Acid	7664-38-2	8550

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1645025	Phosphoric Acid	12/14/15	** Vendor **	12/12/20	11/02/16 08:59 by SUL	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1650097

Description:	TOC, Cal Std 0.5/QLS	**Expires:**	01/09/17
Standard Type:	Other Solution	**Prepared:**	12/09/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	12/09/16 09:33 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	0.5
Phosphoric Acid	7664-38-2	8550
Dissolved Organic Carbon	DOC	0.5

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	0.0625
1645025	Phosphoric Acid	12/14/15	** Vendor **	12/12/20	11/02/16 08:59 by SUL	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1650098

Description:	TOC, Cal Std 2.5/LCV	**Expires:**	01/09/17
Standard Type:	Other Solution	**Prepared:**	12/09/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	12/09/16 09:33 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	2.5
Phosphoric Acid	7664-38-2	8560
Dissolved Organic Carbon	DOC	2.5

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	0.3125
1645025	Phosphoric Acid	12/14/15	** Vendor **	12/12/20	11/02/16 08:59 by SUL	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1650099

Description:	TOC, Cal Std 25 mg/L CCV	**Expires:**	01/09/17
Standard Type:	Other Solution	**Prepared:**	12/09/16
Solvent:	Solvent Lot #	**Prepared By:**	Susan Lepe
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	12/09/16 09:34 by SUL
Vendor:	*Prepared*	**Lot Numbe**	N/A

Prepare monthly, D.I. with acid.

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	25
Phosphoric Acid	7664-38-2	8660
Dissolved Organic Carbon	DOC	25

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	Last Edit	(mls)
1637061	TOC, KHP Standard, 2000 mg/L	09/09/16	Susan Lepe	09/09/17	09/09/16 11:22 by SUL	3.125
1645025	Phosphoric Acid	12/14/15	** Vendor **	12/12/20	11/02/16 08:59 by SUL	2.5

Analytical Standard Record

EPA Region 9 Laboratory

1J19001

Description:	Sodium Bicarbonate, Powder	**Expires:**	10/19/21
Standard Type:	Other Solution	**Prepared:**	10/19/11
Solvent:	Solvent Lot #	**Prepared By:**	** Vendor **
Final Volume (mls):	500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	10/19/11 10:06 by JM
Vendor:	J.T. Baker	**Lot Numbe**	K07583

JT Baker lOT#K07583, Cat. #3506-01 CAS# 144-55-8, FW = 84.01g/mole, Assay = 100.2%, barcode# AU004031.

Analyte	CAS Number	Concentration (ppm)
Carbon, Inorganic (Na2CO3)	497-19-8	143000

Certificate of Analysis

Best viewed in 800x600

Sodium Bicarbonate, Powder

`BAKER ANALYZED® A.C.S. Reagent

(sodium hydrogen carbonate)

Product No. 3506
Lot No. K07583
Release Date 02/23/2011

Certificate of Analysis

TEST	SPECIFICATION	RESULT
Meets A.C.S. Specifications		
Meets Reagent Specifications for testing USP/NF monographs		
Assay ($NaHCO_3$) (dried basis)	99.7 - 100.3 %	100.2 %
Insoluble Matter	0.015 % max.	< 0.002 %
Chloride (Cl)	0.003 % max.	< 0.003 %
Phosphate (PO_4)	0.001 % max.	< 0.001 %
Sulfur Compounds (as SO_4)	0.003 % max.	< 0.003 %
Calcium (Ca)	0.02 % max.	0.003 %
Iron (Fe)	0.001 % max.	< 0.001 %
Magnesium (Mg)	0.005 % max.	0.001 %
Potassium (K)	0.005 % max.	0.001 %
Trace Impurities (in ppm):		
Ammonium (NH_4)	5 max.	< 5
Heavy Metals (as Pb)	5 max.	< 5

For Laboratory, Research or Manufacturing Use

Country of Origin: USA

ISO
Phillipsburg, NJ 9001:2008 & 14001:2004
Paris, KY 9001:2008
Mexico City, Mexico 9001:2008
Deventer, Holland 9001:2008 & 14001:2004
Selangor, Malaysia 9001:2008

Mary M. Nutting

Mary M. Nutting
Director of Regulatory Affairs

For questions on this Certificate of Analysis please contact Technical Services at 1-800-582-2537 or 908-859-2151
Avantor ™ Performance Materials. Inc. (formerly Mallinckrodt Baker, Inc.)
222 Red School Lane • Phillipsburg, NJ 08865 • Phone: 908.859.2151 • Fax: 908.859.6905

Analytical Standard Record

EPA Region 9 Laboratory

4I21061

Description:	Sodium Carbonate, Anhydrous	**Expires:**	09/21/18
Standard Type:	Other Solution	**Prepared:**	09/21/04
Solvent:	Lot# D17192	**Prepared By:**	** Vendor **
Final Volume (mls):	2500	**Department:**	Inorganics
Vials:	1	**Last Edit:**	08/30/14 12:13 by CND
Vendor:	J.T. Baker	**Lot Numbe**	D17192

JTBaker Lot# D17192, Cat.# 3602-05 Na2CO3 FW = 105.99g/mol
Barcode# 00000000418
Expiration date extended - JM 03/04/14

Analyte	CAS Number	Concentration (ppm)
Sodium carbonate (as CO3)	497-19-8	567884
Sodium carbonate	497-19-8	1000000

Analytical Standard Record

EPA Region 9 Laboratory

6B17017

Description:	TOC Potassium Biphthalate Standard	**Expires:**	02/17/15
Standard Type:	Other Solution	**Prepared:**	02/17/06
Solvent:	N/A	**Prepared By:**	** Vendor **
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	01/20/10 15:40 by os
Vendor:	J.T. Baker	**Lot Numbe**	B21608

JT Baker, cas# 877-24-7, lot# B21608, 100.02% Potassium Biphthalate.
Barcode: 0000002741
FW = 204.22 g/mol C8H5KO4; Assay: 100.02%

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	471000

Analytical Standard Record

EPA Region 9 Laboratory

6B17017

Description:	TOC Potassium Biphthalate Standard	**Expires:**	02/17/15
Standard Type:	Other Solution	**Prepared:**	02/17/06
Solvent:	N/A	**Prepared By:**	** Vendor **
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	01/20/10 15:40 by os
Vendor:	J.T. Baker	**Lot Numbe**	B21608

JT Baker, cas# 877-24-7, lot# B21608, 100.02% Potassium Biphthalate.
Barcode: 0000002741
FW = 204.22 g/mol C8H5KO4; Assay: 100.02%

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	471000

Analytical Standard Record

EPA Region 9 Laboratory

6B17017

Description:	Potassium Biphthalate	**Expires:**	02/17/20
Standard Type:	Other Solution	**Prepared:**	02/17/06
Solvent:	N/A	**Prepared By:**	** Vendor **
Final Volume (mls):	250	**Department:**	Inorganics
Vials:	1	**Last Edit:**	09/22/14 08:08 by WD
Vendor:	J.T. Baker	**Lot Numbe**	B21608

100.02% Potassium Biphthalate.Barcode: 0000002741 FW = 204.22 g/mol C8H5KO4; Sample is neat powder form and expiration date was extended by approx. 5 years. W.D. 1/20/10. Expiration date extended five years to 2/17/20. SUL 9/22/14

Analyte	CAS Number	Concentration (ppm)
Total Organic Carbon	TOC	471000