

The order of this data package is as follows:

1. Chain-of-Custody/Lab Request
2. Copies of field COCs
3. ~~Validation Report~~
4. Laboratory analysis

Comments:

Validation report is unavailable.

[illegible]

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133298

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-07-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:40		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	BA	
LOCATION ID:	R-26 PZ-2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	125 mL 1 LITER POLY DIN 06-07-17	1	HNO3	Y	NA
	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	250 500 ML AMBER GLASS 06-07-17	1	H2SO4		

SAMPLE COMMENTS:

None

LOCATION COMMENTS:

None

FIELD PARAMETERS:

Sample Time	12:40	HH:MM	Dissolved Oxygen	7.56	Flow (in gpm)	NA
Oxidation-Reduction Potential	44.9		pH	6.95	Specific Conductance	228.0
Temperature	15.5		Turbidity	610.2		

COLLECTED BY (PRINT): D. Hughes, A. L. Gail, D. Jensen, H. O.

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 06-07-2017 15:30	RECEIVED BY (Printed Name) (Signature)	Date/Time 6/7/17 15:30
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133326

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-07-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:40		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	BA/PP	
LOCATION ID:	R-26 PZ-2		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO <input checked="" type="radio"/> NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	✓	NA
✓	WSP- GENINORG+PerChlorate	1 LITER POLY	1	ICE	✓	
✓	WSP- NH3+NO3/NO2	500 ML AMBER GLASS	1	H2SO4	✓	

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time _____ HH:MM _____ Dissolved Oxygen 06-07-2017 Flow (in gpm) _____
 Oxidation-Reduction Potential _____ pH _____ Specific Conductance _____
 Temperature _____ Turbidity _____

COLLECTED BY (PRINT): D. Hughes, A. Nigam, D. Jaramila

RELINQUISHED BY (Printed Name) Darren Hughes (Signature) <i>[Signature]</i>	Date/Time 06-07-2017 15:30	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>[Signature]</i>	Date/Time 6/7/17 15:30
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133343

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	06-07-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:40		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-26 PZ-2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:	1		SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	1	HCL 06-07-2017	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time _____ HH:MM _____ Dissolved Oxygen _____ Flow (in gpm) _____
 Oxidation-Reduction _____ pH _____ Specific _____
 Potential _____ Conductance _____
 Temperature _____ Turbidity _____

COLLECTED BY (PRINT):

D. Hughes, A. Nigal, P. Jaramillo

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 06-07-2017 15:30	RECEIVED BY (Printed Name) (Signature)	Date/Time 6/7/17 15:30
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133346

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-07-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	10:37		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-26 PZ-2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	EQB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time _____ HH:MM Dissolved Oxygen _____ Flow (in gpm) _____
Oxidation-Reduction _____ pH _____ Specific _____
Potential _____ Conductance _____
Temperature _____ Turbidity _____

COLLECTED BY (PRINT):

D. Hughes, A. V. 9, D. Jaramillo

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 06-07-2017 1530	RECEIVED BY (Printed Name) (Signature)	Date/Time 6/7/17 1530
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

June 30, 2017

Mr. Keith Greene
Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

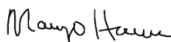
Re: LANL- WQH Water Samples
Work Order: 425115
SDG: 2017-1690

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 09, 2017, and analyzed for GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,


Margo Herron for
Valerie Davis
Project Manager

Chain of Custody: 2017-1690
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 425115
SDG: 2017-1690

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 425115
SDG # : 2017-1690**

June 30, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 09, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
425115001	CAWA-17-133298
425115002	CAWA-17-133326
425115003	CAWA-17-133343
425115004	CAWA-17-133346

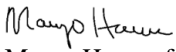
Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.


Margo Herron for
Valerie Davis
Project Manager

List of current GEL Certifications as of 30 June 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>ESH</u>		SDG/AR/COC/Work Order: <u>425115</u>		
Received By: <u>ZKW</u>		Date Received: <u>6/9/17</u>		
Carrier and Tracking Number		Circle Applicable: <input checked="" type="radio"/> FedEx Express <input type="radio"/> FedEx Ground <input type="radio"/> UPS <input type="radio"/> Field Services <input type="radio"/> Courier <input type="radio"/> Other		
		<u>5900 1782 1867</u> <u>5900 1782 1856</u>		
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM/mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?		<input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. <input checked="" type="checkbox"/> PCB's <input type="checkbox"/> Flammable <input type="checkbox"/> Foreign Soil <input type="checkbox"/> RCRA <input type="checkbox"/> Asbestos <input type="checkbox"/> Beryllium Other: _____	
Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs Dry ice None Other: _____ *all temperatures are recorded in Celsius TEMP: <u>2°C</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>IR3-16</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>			If Yes, Are Encores or Soil Kits present? Yes ___ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No ___ N/A ___ (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No ___ N/A ___ Sample ID's and containers affected: _____
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected: _____
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected: _____
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected: _____
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected: _____
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
Comments (Use Continuation Form if needed):				

PM (or PMA) review: Initials MMH Date 6/12/17 Page 1 of 1

GL-CHL-SR-001 Rev 5

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

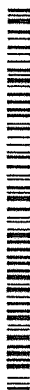
SHIP DATE: 08JUN17
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

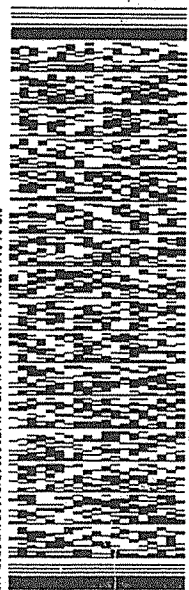
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: 21PD0ASRGW04BAGWEO



FedEx
Express

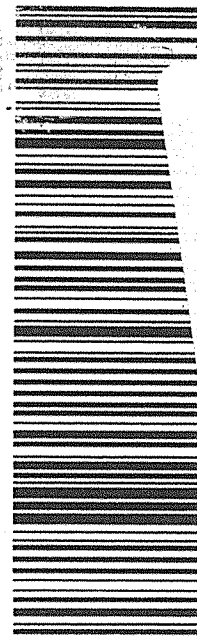


FRI - 09 JUN 10:30A
PRIORITY OVERNIGHT

MPS# 5908 1782 1867
Mstr# 5908 1782 1856

X7 RBWA

29407
SC-US CHS



Part # 156148V-A34 RIT2 06/15

RT 257 5 E 10:30

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

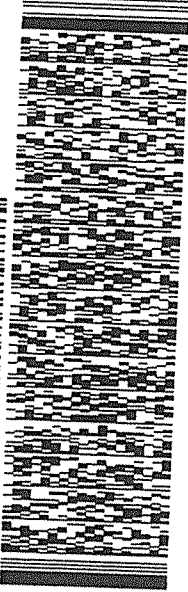
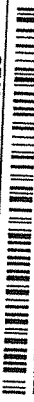
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CAD: 0014176/CAFE2916

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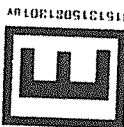
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: 21PD0ASRGW04BAGWEO



FedEx
Express

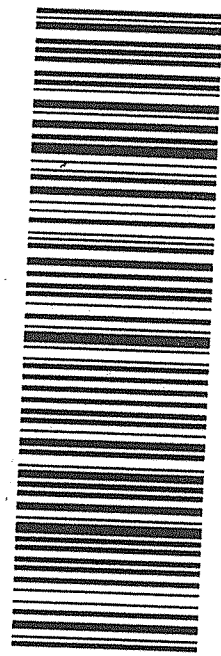


FRI - 09 JUN 10:30A
PRIORITY OVERNIGHT

1 of 2
TRK# 5908 1782 1856
0201
MASTER

X7 RBWA

29407
SC-US CHS



Part # 156148V-A34 RIT2 06/15

538C1/A502/329H

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

Qualifier Explanation

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

< Result is less than value reported

> Result is greater than value reported

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL

A The TIC is a suspected aldol-condensation product

B Target analyte was detected in the associated blank

B Metals-Either presence of analyte detected in the associated blank, or
MDL/IDL < sample value < PQL

BD Results are either below the MDC or tracer recovery is low

C Analyte has been confirmed by GC/MS analysis

D Results are reported from a diluted aliquot of the sample

d 5-day BOD-The 2:1 depletion requirement was not met for this sample

E Organics-Concentration of the target analyte exceeds the instrument calibration range

E Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria

H Analytical holding time was exceeded

h Preparation or preservation holding time was exceeded

J Value is estimated

N Metals-The Matrix spike sample recovery is not within specified control limits

N Organics-Presumptive evidence based on mass spectral library search to make a tentative
identification of the analyte (TIC). Quantitation is based on nearest internal standard
response factor

N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration
by 4X or more

ND Analyte concentration is not detected above the reporting limit

UI Gamma Spectroscopy-Uncertain identification

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Y QC Samples were not spiked with this compound

Z Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.
For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Volatile Analysis

Case Narrative

**GC/MS Volatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1690
Work Order #: 425115**

Method/Analysis Information

Procedure: Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

Analytical Method: SW-846:8260B

Analytical Batch
Number: 1676097

Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

Sample ID	Client ID
425115001	CAWA-17-133298
425115003	CAWA-17-133343
425115004	CAWA-17-133346
1203816298	Method Blank (MB)
1203816299	Laboratory Control Sample (LCS)
1203816300	Laboratory Control Sample (LCS)
1203816301	425329001(CAWA-17-133302) Post Spike (PS)
1203816302	425329001(CAWA-17-133302) Post Spike (PS)
1203816303	425329001(CAWA-17-133302) Post Spike Duplicate (PSD)
1203816304	425329001(CAWA-17-133302) Post Spike Duplicate (PSD)

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The data results reported met all SOP and method criteria, unless otherwise discussed below.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 26.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification Requirements

All associated calibration verification standard(s) (CCV) met the acceptance criteria.

Quality Control (QC) Information**Blank (MB) Statement**

The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

Surrogate recoveries in all client and quality control samples were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 425329001 (CAWA-17-133302) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement

Preservation by acidification causes 2-Chloroethylvinyl ether to degrade resulting in poor recoveries in samples (See Below).

Sample	Analyte	Value
1203816301 (CAWA-17-133302PS)	2-Chloroethylvinyl ether	0* (51%-118%)
1203816303 (CAWA-17-133302PSD)	2-Chloroethylvinyl ether	0* (51%-118%)

Relative Percent Difference (RPD) Statement

The RPD between the matrix spike pair (See Below) were not all within the acceptance limits. However, the spike recoveries passed. The unacceptable RPD may be attributed to matrix interference and/or sample non-homogeneity.

Sample	Analyte	Value
1203816301PS and 1203816303PSD (CAWA-17-133302)	Chloromethane	33* (0%-20%)
	Vinyl chloride	34* (0%-20%)

Internal Standard (ISTD) Acceptance

The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information**Holding Time Specifications**

All samples in this SDG met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-analyses were not required for samples in this SDG.

Miscellaneous Information**Data Exception (DER) Documentation**

A data exception report (DER) 1645783 was generated for samples in this SDG/batch.

Manual Integrations

Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment

Tentatively identified compounds (TIC) may be requested for samples in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, were included on the Sample Data Summary (Form 1) and included with the sample raw data.

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

Residual Chlorine was not detected in any of the samples in this SDG.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA4.I	Hewlett Packard 6890/5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-1690 GEL Work Order: 425115

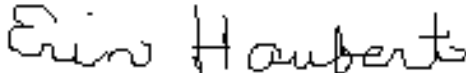
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Erin Haubert

Date: 29 JUN 2017

Title: Data Validator

Sample Data Summary

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1690
Lab Sample ID: 425115001

Client ID: CAWA-17-133298
Batch ID: 1676097
Run Date: 06/21/2017 13:31
Prep Date: 06/21/2017 13:31
Data File: 062117V4\4N310.D

Date Collected: 06/07/2017 12:40
Date Received: 06/09/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA4.I
Analyst: VXY1

Column: DB-624

Matrix: W

Project: ESHL00114
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
540-59-0	1,2-Dichloroethylene (total)	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
123-91-1	1,4-Dioxane	U	50.0	ug/L	15.0	50.0
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
110-75-8	2-Chloroethylvinyl ether	U	5.00	ug/L	1.50	5.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
79-46-9	2-Nitropropane	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690

Lab Sample ID: 425115001

Date Collected: 06/07/2017 12:40

Date Received: 06/09/2017 08:55

Matrix: W

Client ID: CAWA-17-133298

Batch ID: 1676097

Run Date: 06/21/2017 13:31

Prep Date: 06/21/2017 13:31

Data File: 062117V4\4N310.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
100-44-7	Benzyl chloride	U	5.00	ug/L	1.50	5.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
110-82-7	Cyclohexane	U	1.00	ug/L	0.300	1.00
108-94-1	Cyclohexanone	U	50.0	ug/L	15.0	50.0
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
141-78-6	Ethyl acetate	U	5.00	ug/L	1.50	5.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
79-20-9	Methyl acetate	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
108-87-2	Methylcyclohexane	U	1.00	ug/L	0.300	1.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
76-01-7	Pentachloroethane	U	5.00	ug/L	1.50	5.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		1.40	ug/L	0.300	1.00
109-99-9	Tetrahydrofuran	U	5.00	ug/L	1.50	5.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690

Lab Sample ID: 425115001

Date Collected: 06/07/2017 12:40

Date Received: 06/09/2017 08:55

Matrix: W

Client ID: CAWA-17-133298

Batch ID: 1676097

Run Date: 06/21/2017 13:31

Prep Date: 06/21/2017 13:31

Data File: 062117V4\4N310.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
1330-20-7	Xylenes (total)	U	1.00	ug/L	0.300	1.00
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	5.00	ug/L	1.50	5.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
1476-11-5	cis-1,4-Dichloro-2-butene	U	5.00	ug/L	1.50	5.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
110-57-6	trans-1,4-Dichloro-2-butene	U	5.00	ug/L	1.50	5.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	45.9	50.0	ug/L 92	(71%-134%)
Bromofluorobenzene	47.8	50.0	ug/L 96	(70%-131%)
Toluene-d8	48.8	50.0	ug/L 98	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690

Lab Sample ID: 425115003

Date Collected: 06/07/2017 12:40

Date Received: 06/09/2017 08:55

Matrix: W

Client ID: CAWA-17-133343

Batch ID: 1676097

Run Date: 06/21/2017 13:59

Prep Date: 06/21/2017 13:59

Data File: 062117V4\4N311.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1690

Lab Sample ID: 425115003

Date Collected: 06/07/2017 12:40

Date Received: 06/09/2017 08:55

Matrix: W

Client ID: CAWA-17-133343

Batch ID: 1676097

Run Date: 06/21/2017 13:59

Prep Date: 06/21/2017 13:59

Data File: 062117V4\4N311.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1690

Lab Sample ID: 425115003

Date Collected: 06/07/2017 12:40

Date Received: 06/09/2017 08:55

Matrix: W

Client ID: CAWA-17-133343

Batch ID: 1676097

Run Date: 06/21/2017 13:59

Prep Date: 06/21/2017 13:59

Data File: 062117V4\4N311.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	46.9	50.0	ug/L 94	(71%-134%)
Bromofluorobenzene	46.5	50.0	ug/L 93	(70%-131%)
Toluene-d8	47.4	50.0	ug/L 95	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.204	14.1	ug/L	0	J
	unknown siloxane	14.576	13.9	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1690

Lab Sample ID: 425115004

Date Collected: 06/07/2017 10:37

Date Received: 06/09/2017 08:55

Matrix: W

Client ID: CAWA-17-133346

Batch ID: 1676097

Run Date: 06/21/2017 14:28

Prep Date: 06/21/2017 14:28

Data File: 062117V4\4N312.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1690

Lab Sample ID: 425115004

Date Collected: 06/07/2017 10:37

Date Received: 06/09/2017 08:55

Matrix: W

Client ID: CAWA-17-133346

Batch ID: 1676097

Run Date: 06/21/2017 14:28

Prep Date: 06/21/2017 14:28

Data File: 062117V4\4N312.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number: 2017-1690

Lab Sample ID: 425115004

Date Collected: 06/07/2017 10:37

Date Received: 06/09/2017 08:55

Matrix: W

Client: ARSL004

Method: SW-846:8260B

Project: ESHL00114

Inst: VOA4.I

Analyst: VXY1

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Prep Date: 06/21/2017 14:28

Data File: 062117V4\4N312.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.5	50.0	ug/L 89	(71%-134%)
Bromofluorobenzene	46.4	50.0	ug/L 93	(70%-131%)
Toluene-d8	47.6	50.0	ug/L 95	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	12	ug/L	0	J
	unknown siloxane	14.576	16.6	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-1690**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203816299	LCS for batch 1676097	89	96	88
1203816300	LCS for batch 1676097	93	95	98
1203816298	MB for batch 1676097	91	98	89
425115001	CAWA-17-133298	92	98	96
425115003	CAWA-17-133343	94	95	93
425115004	CAWA-17-133346	89	95	93
1203816301	CAWA-17-133302PS	99	97	93
1203816303	CAWA-17-133302PSD	99	98	95
1203816302	CAWA-17-133302PS	97	97	101
1203816304	CAWA-17-133302PSD	102	97	101

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4

(71%-134%)

TOL = Toluene-d8

(74%-124%)

BFB = Bromofluorobenzene

(70%-131%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-1690

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	96.3	96	71-127
540-59-0	LCS 1,2-Dichloroethylene (total)	100	0.0	98.5	99	73-122
75-05-8	LCS Acetonitrile	1250	0.0	1140	91	61-125
1330-20-7	LCS Xylenes (total)	150	0.0	143	95	73-125
67-64-1	LCS Acetone	250	0.0	298	119	48-157
74-88-4	LCS Iodomethane	250	0.0	244	98	72-128
79-20-9	LCS Methyl acetate	250	0.0	262	105	69-136
75-15-0	LCS Carbon disulfide	250	0.0	234	94	69-138
108-05-4	LCS Vinyl acetate	250	0.0	213	85	67-125
78-93-3	LCS 2-Butanone	250	0.0	260	104	55-138
110-75-8	LCS 2-Chloroethylvinyl ether	250	0.0	191	77	58-115
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	223	89	66-124
591-78-6	LCS 2-Hexanone	250	0.0	264	106	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	30.0	60	40-160
74-87-3	LCS Chloromethane	50.0	0.0	41.8	84	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	41.8	84	65-137
74-83-9	LCS Bromomethane	50.0	0.0	42.2	84	63-137
75-00-3	LCS Chloroethane	50.0	0.0	44.5	89	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	42.4	85	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	48.7	97	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	47.1	94	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	44.2	88	68-119

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1690

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	46.1	92	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	48.6	97	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	47.8	96	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	49.9	100	75-123
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	46.4	93	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	51.4	103	76-125
67-66-3	LCS Chloroform	50.0	0.0	45.4	91	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	46.5	93	74-136
110-82-7	LCS Cyclohexane	50.0	0.0	47.4	95	67-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	45.5	91	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	49.3	99	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	44.4	89	74-122
71-43-2	LCS Benzene	50.0	0.0	45.4	91	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	48.2	96	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	46.9	94	73-121
108-87-2	LCS Methylcyclohexane	50.0	0.0	47.3	95	72-134
74-95-3	LCS Dibromomethane	50.0	0.0	47.7	95	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	48.4	97	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	48.2	96	78-131
108-88-3	LCS Toluene	50.0	0.0	44.6	89	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	48.2	96	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	46.2	92	74-118

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1690

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	44.3	89	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	47.7	95	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	45.7	91	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	47.5	95	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	46.9	94	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	45.5	91	73-125
95-47-6	LCS o-Xylene	50.0	0.0	46.6	93	74-126
100-42-5	LCS Styrene	50.0	0.0	51.3	103	72-130
75-25-2	LCS Bromoform	50.0	0.0	52.8	106	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	45.2	90	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	42.4	85	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	43.7	87	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	46.3	93	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	43.7	87	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	46.6	93	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	45.9	92	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	42.5	85	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	47.7	95	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	45.9	92	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	46.5	93	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	47.9	96	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	45.1	90	72-121

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1690

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	44.3	89	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	44.5	89	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	42.6	85	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	43.5	87	72-136
91-20-3	LCS Naphthalene	50.0	0.0	48.0	96	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	47.1	94	70-130
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	44.6	89	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	50.9	102	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	45.6	91	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5040	101	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1690

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816300

Instrument: VOA4.I

Analysis Date: 06/21/2017 11:05

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
108-94-1	LCS Cyclohexanone	1250	0.0	1210	97	56-138
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	250	0.0	225	90	53-127
107-02-8	LCS Acrolein	250	0.0	282	113	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	223	89	61-148
107-05-1	LCS Allyl chloride	250	0.0	237	95	59-125
107-13-1	LCS Acrylonitrile	250	0.0	222	89	65-122
141-78-6	LCS Ethyl acetate	250	0.0	226	91	64-120
107-12-0	LCS Propionitrile	250	0.0	216	86	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	229	91	64-126
109-99-9	LCS Tetrahydrofuran	250	0.0	212	85	62-122
80-62-6	LCS Methyl methacrylate	250	0.0	228	91	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	218	87	66-130
76-01-7	LCS Pentachloroethane	250	0.0	261	104	70-147
100-44-7	LCS Benzyl chloride	250	0.0	263	105	65-153
79-46-9	LCS 2-Nitropropane	250	0.0	227	91	59-144
1476-11-5	LCS cis-1,4-Dichloro-2-butene	250	0.0	238	95	64-139
110-57-6	LCS trans-1,4-Dichloro-2-butene	250	0.0	195	78	63-135
78-83-1	LCS Isobutyl alcohol	2500	0.0	2140	86	65-135
123-91-1	LCS 1,4-Dioxane	2500	0.0	2320	93	65-129
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	36.7	73	66-147

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1690

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	PS m,p-Xylenes	100	0.00 U	99.5	100	59-132
540-59-0	PS 1,2-Dichloroethylene (total)	100		106	106	66-128
75-05-8	PS Acetonitrile	1250	0.00 U	1350	108	56-131
1330-20-7	PS Xylenes (total)	150		149	99	60-131
67-64-1	PS Acetone	250	0.00 U	157	63	25-155
74-88-4	PS Iodomethane	250	0.00 U	264	105	66-133
79-20-9	PS Methyl acetate	250	0.00 U	295	118	61-141
75-15-0	PS Carbon disulfide	250	0.00 U	248	99	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	211	85	48-133
78-93-3	PS 2-Butanone	250	0.00 U	204	81	25-143
110-75-8	PS 2-Chloroethylvinyl ether	250	0.00 U	0.00	0 *	51-118
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	263	105	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	228	91	33-138
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	31.9	64	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	40.3	81	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	44.3	89	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	43.4	87	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	44.7	89	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	43.2	86	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	50.5	101	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	50.4	101	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	48.7	97	62-123

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-1690

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	53.8	108	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	52.6	105	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	52.3	105	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	53.5	107	69-127
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	50.3	101	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	56.3	113	71-130
67-66-3	PS Chloroform	50.0	0.00 U	50.7	101	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	50.8	102	69-139
110-82-7	PS Cyclohexane	50.0	0.00 U	49.3	99	58-138
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	49.1	98	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	52.6	105	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	52.6	105	69-130
71-43-2	PS Benzene	50.0	0.00 U	49.2	98	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	51.7	103	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	51.4	103	67-127
108-87-2	PS Methylcyclohexane	50.0	0.00 U	50.2	100	63-136
74-95-3	PS Dibromomethane	50.0	0.00 U	53.3	107	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	52.7	105	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	52.7	105	70-134
108-88-3	PS Toluene	50.0	0.00 U	47.1	94	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	53.7	107	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	51.1	102	66-125

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-1690

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	49.5	99	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	48.7	97	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	48.7	97	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	52.6	105	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	49.4	99	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	48.1	96	61-130
95-47-6	PS o-Xylene	50.0	0.00 U	49.4	99	62-131
100-42-5	PS Styrene	50.0	0.00 U	52.8	106	59-135
75-25-2	PS Bromoform	50.0	0.00 U	56.4	113	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	47.3	95	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	49.2	98	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	50.7	101	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	48.8	98	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	45.4	91	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	50.0	100	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	48.6	97	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	44.4	89	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	50.9	102	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	48.2	96	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	48.8	98	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	50.2	100	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	46.7	93	56-126

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-1690

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	45.5	91	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	46.4	93	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	52.0	104	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	47.9	96	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	56.5	113	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	50.3	101	52-135
120-82-1	PS 1,2,4-Trichlorobenzene	50.0	0.00 U	47.8	96	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	54.3	109	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	48.2	96	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	6270	125	60-140

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-1690

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	Acceptance RPD %	Acceptance Limits
179601-23-1	PSD m,p-Xylenes	100	0.00 U	97.6	98	59-132	2	0-20
540-59-0	PSD 1,2-Dichloroethylene (total)	100		107	107	66-128	0	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1370	109	56-131	1	0-20
1330-20-7	PSD Xylenes (total)	150		146	97	60-131	2	0-20
67-64-1	PSD Acetone	250	0.00 U	153	61	25-155	3	0-20
74-88-4	PSD Iodomethane	250	0.00 U	269	108	66-133	2	0-20
79-20-9	PSD Methyl acetate	250	0.00 U	276	111	61-141	6	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	242	97	61-141	3	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	200	80	48-133	6	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	199	80	25-143	2	0-20
110-75-8	PSD 2-Chloroethylvinyl ether	250	0.00 U	0.00	0 *	51-118	0	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	256	102	61-127	3	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	214	86	33-138	6	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	32.1	64	33-164	1	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	29.0	58	53-139	33 *	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	31.4	63	58-140	34 *	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	42.1	84	59-146	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	45.1	90	65-129	1	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	44.2	88	65-141	2	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	50.7	101	69-127	1	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	51.5	103	59-130	2	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	48.9	98	62-123	0	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-1690

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	55.2	110	69-132	3	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	52.7	105	65-127	0	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	52.3	105	67-127	0	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	53.9	108	69-127	1	0-20
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	52.2	104	66-137	4	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	57.0	114	71-130	1	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	51.4	103	71-129	1	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	52.8	106	69-139	4	0-20
110-82-7	PSD Cyclohexane	50.0	0.00 U	50.4	101	58-138	2	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	49.9	100	67-130	2	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	55.8	112	66-143	6	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	52.3	105	69-130	1	0-20
71-43-2	PSD Benzene	50.0	0.00 U	49.5	99	66-125	1	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	52.1	104	65-131	1	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	50.7	101	67-127	1	0-20
108-87-2	PSD Methylcyclohexane	50.0	0.00 U	51.3	103	63-136	2	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	53.9	108	72-129	1	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	53.9	108	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	53.2	106	70-134	1	0-20
108-88-3	PSD Toluene	50.0	0.00 U	47.7	95	60-126	1	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	54.1	108	69-135	1	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	51.3	103	66-125	0	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-1690

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	48.2	96	67-124	3	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	51.4	103	60-130	5	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	51.2	102	68-143	5	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	54.8	110	71-127	4	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	49.6	99	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	47.6	95	61-130	1	0-20
95-47-6	PSD o-Xylene	50.0	0.00 U	48.2	96	62-131	2	0-20
100-42-5	PSD Styrene	50.0	0.00 U	51.5	103	59-135	2	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	59.4	119	64-138	5	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	47.3	95	55-133	0	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	48.6	97	62-129	1	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	50.5	101	70-124	0	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	49.3	99	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	43.7	87	50-133	4	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	47.1	94	53-135	6	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	45.6	91	56-128	6	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	44.6	89	53-130	1	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	50.6	101	55-135	1	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	47.5	95	53-132	2	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	47.0	94	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	48.7	97	49-138	3	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	46.8	94	56-126	0	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-1690

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	45.8	92	55-125	1	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	43.7	87	43-142	6	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	52.5	105	62-141	1	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	47.7	95	40-147	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	55.1	110	62-134	2	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	50.7	101	52-135	1	0-20
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	48.5	97	50-133	1	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	55.2	110	71-133	2	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	48.3	97	60-125	0	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	6160	123	60-140	2	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-1690

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816302

Instrument: VOA4.I

Analysis Date: 06/21/2017 20:18

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
108-94-1	PS Cyclohexanone	1250	0.00 U	1120	90	47-144
108-60-1	PS bis(2-Chloro-1-methylethyl)et	250	0.00 U	212	85	46-134
107-02-8	PS Acrolein	250	0.00 U	262	105	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	209	84	57-149
107-05-1	PS Allyl chloride	250	0.00 U	227	91	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	218	87	59-129
141-78-6	PS Ethyl acetate	250	0.00 U	204	82	52-127
107-12-0	PS Propionitrile	250	0.00 U	215	86	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	222	89	59-134
109-99-9	PS Tetrahydrofuran	250	0.00 U	208	83	55-130
80-62-6	PS Methyl methacrylate	250	0.00 U	225	90	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	216	86	60-136
76-01-7	PS Pentachloroethane	250	0.00 U	260	104	36-172
100-44-7	PS Benzyl chloride	250	0.00 U	227	91	44-155
79-46-9	PS 2-Nitropropane	250	0.00 U	230	92	48-154
1476-11-5	PS cis-1,4-Dichloro-2-butene	250	0.00 U	215	86	56-146
110-57-6	PS trans-1,4-Dichloro-2-butene	250	0.00 U	181	73	56-140
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2120	85	60-143
123-91-1	PS 1,4-Dioxane	2500	0.00 U	2350	94	59-137
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	37.0	74	63-146

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-1690

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816304

Instrument: VOA4.I

Analysis Date: 06/21/2017 20:47

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
108-94-1	PSD Cyclohexanone	1250	0.00 U	1240	99	47-144	10	0-20
108-60-1	PSD bis(2-Chloro-1-methylethyl)et	250	0.00 U	228	91	46-134	7	0-20
107-02-8	PSD Acrolein	250	0.00 U	280	112	49-141	7	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00 U	231	92	57-149	10	0-20
107-05-1	PSD Allyl chloride	250	0.00 U	244	97	54-128	7	0-20
107-13-1	PSD Acrylonitrile	250	0.00 U	236	94	59-129	8	0-20
141-78-6	PSD Ethyl acetate	250	0.00 U	217	87	52-127	6	0-20
107-12-0	PSD Propionitrile	250	0.00 U	228	91	58-131	6	0-20
126-98-7	PSD Methacrylonitrile	250	0.00 U	241	96	59-134	8	0-20
109-99-9	PSD Tetrahydrofuran	250	0.00 U	220	88	55-130	5	0-20
80-62-6	PSD Methyl methacrylate	250	0.00 U	241	96	62-135	7	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00 U	231	92	60-136	7	0-20
76-01-7	PSD Pentachloroethane	250	0.00 U	273	109	36-172	5	0-20
100-44-7	PSD Benzyl chloride	250	0.00 U	239	96	44-155	5	0-20
79-46-9	PSD 2-Nitropropane	250	0.00 U	248	99	48-154	7	0-20
1476-11-5	PSD cis-1,4-Dichloro-2-butene	250	0.00 U	230	92	56-146	7	0-20
110-57-6	PSD trans-1,4-Dichloro-2-butene	250	0.00 U	193	77	56-140	6	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00 U	2250	90	60-143	6	0-20
123-91-1	PSD 1,4-Dioxane	2500	0.00 U	2570	103	59-137	9	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00 U	39.6	79	63-146	7	0-20

Method Blank Summary

Page 1 of 1

SDG Number:	2017-1690	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1676097	Instrument ID:	VOA4.I	Data File:	062117V4\4N306A.D
Lab Sample ID:	1203816298	Prep Date:	06/21/2017 11:34	Analyzed:	06/21/17 11:34
Column:	DB-624				

This method blank applies to the following samples and quality control samples:

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1676097	1203816299	062117V4\4N303A.D	06/21/17	1007
02 LCS for batch 1676097	1203816300	062117V4\4N305A.D	06/21/17	1105
03 CAWA-17-133298	425115001	062117V4\4N310.D	06/21/17	1331
04 CAWA-17-133343	425115003	062117V4\4N311.D	06/21/17	1359
05 CAWA-17-133346	425115004	062117V4\4N312.D	06/21/17	1428
06 CAWA-17-133302PS	1203816301	062117V4\4N322.D	06/21/17	1920
07 CAWA-17-133302PSD	1203816303	062117V4\4N323.D	06/21/17	1949
08 CAWA-17-133302PS	1203816302	062117V4\4N324.D	06/21/17	2018
09 CAWA-17-133302PSD	1203816304	062117V4\4N325.D	06/21/17	2047

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690

Lab Sample ID: 1203816298

Client Sample: QC for batch 1676097

Client ID: MB for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 11:34

Prep Date: 06/21/2017 11:34

Data File: 062117V4\4N306A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
540-59-0	1,2-Dichloroethylene (total)	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
123-91-1	1,4-Dioxane	U	50.0	ug/L	15.0	50.0
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
110-75-8	2-Chloroethylvinyl ether	U	5.00	ug/L	1.50	5.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
79-46-9	2-Nitropropane	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690

Matrix: WATER

Lab Sample ID: 1203816298

Client Sample: QC for batch 1676097

Client: ARSL004

Project: QC

Client ID: MB for batch 1676097

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1676097

Inst: VOA4.I

Dilution: 1

Run Date: 06/21/2017 11:34

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/21/2017 11:34

Data File: 062117V4\4N306A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
100-44-7	Benzyl chloride	U	5.00	ug/L	1.50	5.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
110-82-7	Cyclohexane	U	1.00	ug/L	0.300	1.00
108-94-1	Cyclohexanone	U	50.0	ug/L	15.0	50.0
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
141-78-6	Ethyl acetate	U	5.00	ug/L	1.50	5.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
79-20-9	Methyl acetate	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
108-87-2	Methylcyclohexane	U	1.00	ug/L	0.300	1.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
76-01-7	Pentachloroethane	U	5.00	ug/L	1.50	5.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
109-99-9	Tetrahydrofuran	U	5.00	ug/L	1.50	5.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1690

Lab Sample ID: 1203816298

Client Sample: QC for batch 1676097

Client ID: MB for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 11:34

Prep Date: 06/21/2017 11:34

Data File: 062117V4\4N306A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
1330-20-7	Xylenes (total)	U	1.00	ug/L	0.300	1.00
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	5.00	ug/L	1.50	5.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
1476-11-5	cis-1,4-Dichloro-2-butene	U	5.00	ug/L	1.50	5.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
110-57-6	trans-1,4-Dichloro-2-butene	U	5.00	ug/L	1.50	5.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	45.3	50.0	ug/L 91	(71%-134%)
Bromofluorobenzene	44.7	50.0	ug/L 89	(70%-131%)
Toluene-d8	48.9	50.0	ug/L 98	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
No Tentatively Identified Compounds Found				ug/L		

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690

Lab Sample ID: 1203816299

Client Sample: QC for batch 1676097

Client ID: LCS for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 10:07

Prep Date: 06/21/2017 10:07

Data File: 062117V4\4N303A.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		50.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		42.4	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		46.2	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		47.8	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		47.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		45.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		47.1	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		43.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		44.6	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		45.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		42.6	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		47.5	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		45.6	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		44.4	ug/L	0.300	1.00
540-59-0	1,2-Dichloroethylene (total)		98.5	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		46.9	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		46.6	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		45.1	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		44.3	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		44.3	ug/L	0.300	1.00
123-91-1	1,4-Dioxane	U	50.0	ug/L	15.0	50.0
594-20-7	2,2-Dichloropropane		46.4	ug/L	0.300	1.00
78-93-3	2-Butanone		260	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
110-75-8	2-Chloroethylvinyl ether		191	ug/L	1.50	5.00
95-49-8	2-Chlorotoluene		45.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		264	ug/L	1.50	5.00
79-46-9	2-Nitropropane	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		42.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.9	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		223	ug/L	1.50	5.00
67-64-1	Acetone		298	ug/L	1.50	10.0
75-05-8	Acetonitrile		1140	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		45.4	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690

Matrix: WATER

Lab Sample ID: 1203816299

Client Sample: QC for batch 1676097

Client: ARSL004

Project: QC

Client ID: LCS for batch 1676097

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1676097

Inst: VOA4.I

Dilution: 1

Run Date: 06/21/2017 10:07

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/21/2017 10:07

Data File: 062117V4\4N303A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
100-44-7	Benzyl chloride	U	5.00	ug/L	1.50	5.00
108-86-1	Bromobenzene		46.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		51.4	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		48.4	ug/L	0.300	1.00
75-25-2	Bromoform		52.8	ug/L	0.300	1.00
74-83-9	Bromomethane		42.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		234	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		49.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		46.9	ug/L	0.300	1.00
75-00-3	Chloroethane		44.5	ug/L	0.300	1.00
67-66-3	Chloroform		45.4	ug/L	0.300	1.00
74-87-3	Chloromethane		41.8	ug/L	0.300	1.00
110-82-7	Cyclohexane		47.4	ug/L	0.300	1.00
108-94-1	Cyclohexanone	U	50.0	ug/L	15.0	50.0
124-48-1	Dibromochloromethane		45.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		47.7	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		30.0	ug/L	0.300	1.00
141-78-6	Ethyl acetate	U	5.00	ug/L	1.50	5.00
60-29-7	Ethyl ether		48.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		45.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		43.5	ug/L	0.300	1.00
74-88-4	Iodomethane		244	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		45.2	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
79-20-9	Methyl acetate		262	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
108-87-2	Methylcyclohexane		47.3	ug/L	0.300	1.00
75-09-2	Methylene chloride		44.2	ug/L	1.00	10.0
91-20-3	Naphthalene		48.0	ug/L	0.300	1.00
76-01-7	Pentachloroethane	U	5.00	ug/L	1.50	5.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		51.3	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		47.7	ug/L	0.300	1.00
109-99-9	Tetrahydrofuran	U	5.00	ug/L	1.50	5.00
108-88-3	Toluene		44.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene		48.2	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1690

Lab Sample ID: 1203816299

Client Sample: QC for batch 1676097

Client ID: LCS for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 10:07

Prep Date: 06/21/2017 10:07

Data File: 062117V4\4N303A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-69-4	Trichlorofluoromethane		42.4	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		213	ug/L	1.50	5.00
75-01-4	Vinyl chloride		41.8	ug/L	0.300	1.00
1330-20-7	Xylenes (total)		143	ug/L	0.300	1.00
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	5.00	ug/L	1.50	5.00
156-59-2	cis-1,2-Dichloroethylene		49.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		48.2	ug/L	0.300	1.00
1476-11-5	cis-1,4-Dichloro-2-butene	U	5.00	ug/L	1.50	5.00
179601-23-1	m,p-Xylenes		96.3	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5040	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		44.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		43.7	ug/L	0.300	1.00
95-47-6	o-Xylene		46.6	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		46.5	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether		46.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		47.7	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		48.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		48.2	ug/L	0.300	1.00
110-57-6	trans-1,4-Dichloro-2-butene	U	5.00	ug/L	1.50	5.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.7	50.0	ug/L 89	(71%-134%)
Bromofluorobenzene	44.2	50.0	ug/L 88	(70%-131%)
Toluene-d8	48.2	50.0	ug/L 96	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690

Lab Sample ID: 1203816300

Client Sample: QC for batch 1676097

Client ID: LCS for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 11:05

Prep Date: 06/21/2017 11:05

Data File: 062117V4\4N305A.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
540-59-0	1,2-Dichloroethylene (total)	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
123-91-1	1,4-Dioxane		2320	ug/L	15.0	50.0
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		36.7	ug/L	0.300	1.00
110-75-8	2-Chloroethylvinyl ether	U	5.00	ug/L	1.50	5.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
79-46-9	2-Nitropropane		227	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		282	ug/L	1.50	5.00
107-13-1	Acrylonitrile		222	ug/L	1.50	5.00
107-05-1	Allyl chloride		237	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690

Matrix: WATER

Lab Sample ID: 1203816300

Client Sample: QC for batch 1676097

Client: ARSL004

Project: QC

Client ID: LCS for batch 1676097

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1676097

Inst: VOA4.I

Dilution: 1

Run Date: 06/21/2017 11:05

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/21/2017 11:05

Data File: 062117V4\4N305A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
100-44-7	Benzyl chloride		263	ug/L	1.50	5.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
110-82-7	Cyclohexane	U	1.00	ug/L	0.300	1.00
108-94-1	Cyclohexanone		1210	ug/L	15.0	50.0
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
141-78-6	Ethyl acetate		226	ug/L	1.50	5.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		218	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2140	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		229	ug/L	1.50	5.00
79-20-9	Methyl acetate	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		228	ug/L	1.50	5.00
108-87-2	Methylcyclohexane	U	1.00	ug/L	0.300	1.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
76-01-7	Pentachloroethane		261	ug/L	1.50	5.00
107-12-0	Propionitrile		216	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
109-99-9	Tetrahydrofuran		212	ug/L	1.50	5.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1690

Lab Sample ID: 1203816300

Client Sample: QC for batch 1676097

Client ID: LCS for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 11:05

Prep Date: 06/21/2017 11:05

Data File: 062117V4\4N305A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		223	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
1330-20-7	Xylenes (total)	U	1.00	ug/L	0.300	1.00
108-60-1	bis(2-Chloro-1-methylethyl)ether		225	ug/L	1.50	5.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
1476-11-5	cis-1,4-Dichloro-2-butene		238	ug/L	1.50	5.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
110-57-6	trans-1,4-Dichloro-2-butene		195	ug/L	1.50	5.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	46.4	50.0	ug/L	93	(71%-134%)
Bromofluorobenzene	48.9	50.0	ug/L	98	(70%-131%)
Toluene-d8	47.7	50.0	ug/L	95	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2017-1690	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816301	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 19:20	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 19:20				
Data File:	062117V4\4N322.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		54.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		50.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		49.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		51.1	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		50.4	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.1	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.3	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		47.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		48.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		52.0	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.6	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.2	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		52.6	ug/L	0.300	1.00
540-59-0	1,2-Dichloroethylene (total)		106	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		51.4	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		50.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.7	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		49.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		45.5	ug/L	0.300	1.00
123-91-1	1,4-Dioxane	U	50.0	ug/L	15.0	50.0
594-20-7	2,2-Dichloropropane		50.3	ug/L	0.300	1.00
78-93-3	2-Butanone		204	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
110-75-8	2-Chloroethylvinyl ether	U	5.00	ug/L	1.50	5.00
95-49-8	2-Chlorotoluene		48.6	ug/L	0.300	1.00
591-78-6	2-Hexanone		228	ug/L	1.50	5.00
79-46-9	2-Nitropropane	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.4	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		50.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		263	ug/L	1.50	5.00
67-64-1	Acetone		157	ug/L	1.50	10.0
75-05-8	Acetonitrile		1350	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		49.2	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816301	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 19:20	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 19:20		
Data File: 062117V4\4N322.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
100-44-7	Benzyl chloride	U	5.00	ug/L	1.50	5.00
108-86-1	Bromobenzene		48.8	ug/L	0.300	1.00
74-97-5	Bromochloromethane		56.3	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.7	ug/L	0.300	1.00
75-25-2	Bromoform		56.4	ug/L	0.300	1.00
74-83-9	Bromomethane		43.4	ug/L	0.300	1.00
75-15-0	Carbon disulfide		248	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		52.6	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.4	ug/L	0.300	1.00
75-00-3	Chloroethane		44.7	ug/L	0.300	1.00
67-66-3	Chloroform		50.7	ug/L	0.300	1.00
74-87-3	Chloromethane		40.3	ug/L	0.300	1.00
110-82-7	Cyclohexane		49.3	ug/L	0.300	1.00
108-94-1	Cyclohexanone	U	50.0	ug/L	15.0	50.0
124-48-1	Dibromochloromethane		48.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		53.3	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		31.9	ug/L	0.300	1.00
141-78-6	Ethyl acetate	U	5.00	ug/L	1.50	5.00
60-29-7	Ethyl ether		50.5	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		48.1	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		47.9	ug/L	0.300	1.00
74-88-4	Iodomethane		264	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.3	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
79-20-9	Methyl acetate		295	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
108-87-2	Methylcyclohexane		50.2	ug/L	0.300	1.00
75-09-2	Methylene chloride		48.7	ug/L	1.00	10.0
91-20-3	Naphthalene		56.5	ug/L	0.300	1.00
76-01-7	Pentachloroethane	U	5.00	ug/L	1.50	5.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		52.8	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		48.7	ug/L	0.300	1.00
109-99-9	Tetrahydrofuran	U	5.00	ug/L	1.50	5.00
108-88-3	Toluene		47.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		51.7	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816301	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 19:20	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 19:20		
Data File: 062117V4\4N322.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-69-4	Trichlorofluoromethane		43.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		211	ug/L	1.50	5.00
75-01-4	Vinyl chloride		44.3	ug/L	0.300	1.00
1330-20-7	Xylenes (total)		149	ug/L	0.300	1.00
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	5.00	ug/L	1.50	5.00
156-59-2	cis-1,2-Dichloroethylene		53.5	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		52.7	ug/L	0.300	1.00
1476-11-5	cis-1,4-Dichloro-2-butene	U	5.00	ug/L	1.50	5.00
179601-23-1	m,p-Xylenes		99.5	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6270	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		46.4	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		45.4	ug/L	0.300	1.00
95-47-6	o-Xylene		49.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		48.8	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether		53.8	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		50.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		52.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		53.7	ug/L	0.300	1.00
110-57-6	trans-1,4-Dichloro-2-butene	U	5.00	ug/L	1.50	5.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.3	50.0	99	(71%-134%)
Bromofluorobenzene	46.7	50.0	93	(70%-131%)
Toluene-d8	48.4	50.0	97	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816302	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 20:18	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 20:18		
Data File: 062117V4\4N324.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
540-59-0	1,2-Dichloroethylene (total)	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
123-91-1	1,4-Dioxane		2350	ug/L	15.0	50.0
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		37.0	ug/L	0.300	1.00
110-75-8	2-Chloroethylvinyl ether	U	5.00	ug/L	1.50	5.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
79-46-9	2-Nitropropane		230	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		262	ug/L	1.50	5.00
107-13-1	Acrylonitrile		218	ug/L	1.50	5.00
107-05-1	Allyl chloride		227	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1690	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816302	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:18	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:18				
Data File:	062117V4\4N324.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
100-44-7	Benzyl chloride		227	ug/L	1.50	5.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
110-82-7	Cyclohexane	U	1.00	ug/L	0.300	1.00
108-94-1	Cyclohexanone		1120	ug/L	15.0	50.0
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
141-78-6	Ethyl acetate		204	ug/L	1.50	5.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		216	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2120	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		222	ug/L	1.50	5.00
79-20-9	Methyl acetate	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		225	ug/L	1.50	5.00
108-87-2	Methylcyclohexane	U	1.00	ug/L	0.300	1.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
76-01-7	Pentachloroethane		260	ug/L	1.50	5.00
107-12-0	Propionitrile		215	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
109-99-9	Tetrahydrofuran		208	ug/L	1.50	5.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816302	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 20:18	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 20:18		
Data File: 062117V4\4N324.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		209	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
1330-20-7	Xylenes (total)	U	1.00	ug/L	0.300	1.00
108-60-1	bis(2-Chloro-1-methylethyl)ether		212	ug/L	1.50	5.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
1476-11-5	cis-1,4-Dichloro-2-butene		215	ug/L	1.50	5.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
110-57-6	trans-1,4-Dichloro-2-butene		181	ug/L	1.50	5.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.7	50.0	ug/L	97	(71%-134%)
Bromofluorobenzene	50.4	50.0	ug/L	101	(70%-131%)
Toluene-d8	48.5	50.0	ug/L	97	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816303	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 19:49	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 19:49		
Data File: 062117V4\4N323.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		55.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		52.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		48.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		51.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		51.5	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.9	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.5	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		48.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		47.5	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		52.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		54.8	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.3	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		52.3	ug/L	0.300	1.00
540-59-0	1,2-Dichloroethylene (total)		107	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		50.7	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		47.1	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		48.2	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		45.8	ug/L	0.300	1.00
123-91-1	1,4-Dioxane	U	50.0	ug/L	15.0	50.0
594-20-7	2,2-Dichloropropane		52.2	ug/L	0.300	1.00
78-93-3	2-Butanone		199	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
110-75-8	2-Chloroethylvinyl ether	U	5.00	ug/L	1.50	5.00
95-49-8	2-Chlorotoluene		45.6	ug/L	0.300	1.00
591-78-6	2-Hexanone		214	ug/L	1.50	5.00
79-46-9	2-Nitropropane	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		48.7	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		256	ug/L	1.50	5.00
67-64-1	Acetone		153	ug/L	1.50	10.0
75-05-8	Acetonitrile		1370	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		49.5	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816303	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 19:49	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 19:49		
Data File: 062117V4\4N323.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
100-44-7	Benzyl chloride	U	5.00	ug/L	1.50	5.00
108-86-1	Bromobenzene		49.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		57.0	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		53.9	ug/L	0.300	1.00
75-25-2	Bromoform		59.4	ug/L	0.300	1.00
74-83-9	Bromomethane		42.1	ug/L	0.300	1.00
75-15-0	Carbon disulfide		242	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		55.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.6	ug/L	0.300	1.00
75-00-3	Chloroethane		45.1	ug/L	0.300	1.00
67-66-3	Chloroform		51.4	ug/L	0.300	1.00
74-87-3	Chloromethane		29.0	ug/L	0.300	1.00
110-82-7	Cyclohexane		50.4	ug/L	0.300	1.00
108-94-1	Cyclohexanone	U	50.0	ug/L	15.0	50.0
124-48-1	Dibromochloromethane		51.2	ug/L	0.300	1.00
74-95-3	Dibromomethane		53.9	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		32.1	ug/L	0.300	1.00
141-78-6	Ethyl acetate	U	5.00	ug/L	1.50	5.00
60-29-7	Ethyl ether		50.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		47.7	ug/L	0.300	1.00
74-88-4	Iodomethane		269	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.3	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
79-20-9	Methyl acetate		276	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
108-87-2	Methylcyclohexane		51.3	ug/L	0.300	1.00
75-09-2	Methylene chloride		48.9	ug/L	1.00	10.0
91-20-3	Naphthalene		55.1	ug/L	0.300	1.00
76-01-7	Pentachloroethane	U	5.00	ug/L	1.50	5.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		51.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		51.4	ug/L	0.300	1.00
109-99-9	Tetrahydrofuran	U	5.00	ug/L	1.50	5.00
108-88-3	Toluene		47.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.1	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1690	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816303	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 19:49	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 19:49				
Data File:	062117V4\4N323.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-69-4	Trichlorofluoromethane		44.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		200	ug/L	1.50	5.00
75-01-4	Vinyl chloride		31.4	ug/L	0.300	1.00
1330-20-7	Xylenes (total)		146	ug/L	0.300	1.00
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	5.00	ug/L	1.50	5.00
156-59-2	cis-1,2-Dichloroethylene		53.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.2	ug/L	0.300	1.00
1476-11-5	cis-1,4-Dichloro-2-butene	U	5.00	ug/L	1.50	5.00
179601-23-1	m,p-Xylenes		97.6	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6160	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		43.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		43.7	ug/L	0.300	1.00
95-47-6	o-Xylene		48.2	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		47.0	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether		55.2	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		50.6	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		52.7	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		54.1	ug/L	0.300	1.00
110-57-6	trans-1,4-Dichloro-2-butene	U	5.00	ug/L	1.50	5.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.5	50.0	99	(71%-134%)
Bromofluorobenzene	47.6	50.0	95	(70%-131%)
Toluene-d8	48.9	50.0	98	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816304	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 20:47	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 20:47		
Data File: 062117V4\4N325.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
540-59-0	1,2-Dichloroethylene (total)	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
123-91-1	1,4-Dioxane		2570	ug/L	15.0	50.0
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		39.6	ug/L	0.300	1.00
110-75-8	2-Chloroethylvinyl ether	U	5.00	ug/L	1.50	5.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
79-46-9	2-Nitropropane		248	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		280	ug/L	1.50	5.00
107-13-1	Acrylonitrile		236	ug/L	1.50	5.00
107-05-1	Allyl chloride		244	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1690	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816304	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 20:47	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 20:47		
Data File: 062117V4\4N325.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
100-44-7	Benzyl chloride		239	ug/L	1.50	5.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
110-82-7	Cyclohexane	U	1.00	ug/L	0.300	1.00
108-94-1	Cyclohexanone		1240	ug/L	15.0	50.0
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
141-78-6	Ethyl acetate		217	ug/L	1.50	5.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		231	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2250	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		241	ug/L	1.50	5.00
79-20-9	Methyl acetate	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		241	ug/L	1.50	5.00
108-87-2	Methylcyclohexane	U	1.00	ug/L	0.300	1.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
76-01-7	Pentachloroethane		273	ug/L	1.50	5.00
107-12-0	Propionitrile		228	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
109-99-9	Tetrahydrofuran		220	ug/L	1.50	5.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1690	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816304	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:47	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:47				
Data File:	062117V4\4N325.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		231	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
1330-20-7	Xylenes (total)	U	1.00	ug/L	0.300	1.00
108-60-1	bis(2-Chloro-1-methylethyl)ether		228	ug/L	1.50	5.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
1476-11-5	cis-1,4-Dichloro-2-butene		230	ug/L	1.50	5.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
110-57-6	trans-1,4-Dichloro-2-butene		193	ug/L	1.50	5.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.8	50.0	ug/L	102	(71%-134%)
Bromofluorobenzene	50.6	50.0	ug/L	101	(70%-131%)
Toluene-d8	48.7	50.0	ug/L	97	(74%-124%)

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 26-JUN-17	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: VOA GC/MS	Test / Method: SW846 8260B DOE-AL	Matrix Type: Liquid	Client Code: ESHL, LANL
Batch ID: 1676097	Sample Numbers: See Below		
<p>Potentially affected work order(s)(SDG): 425115(2017-1690),425316(2017-1719),425324(2017-1717),425329(2017-1716),425331(2017-1714),425423(2017-1735),425520(2017-1749),425532(2017-1748)</p> <p>Application Issues:</p> <p>Failed Recovery for MS/MSD, or PS/PSD Failed RPD for MS/MSD, or PS/PSD Sample improperly preserved Failed Recovery for LCS/LCSD</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed RPD for MS/MSD, or PS/PSD:</p> <p>QC 1203816303PSD</p> <p>2. Failed Recovery for LCS/LCSD:</p> <p>QC 1203818957LCS</p> <p>3. Failed Recovery for MS/MSD, or PS/PSD:</p> <p>QC 1203816301PS, 1203816303PSD</p> <p>4. Samples 425316004, 425324001, and 425532008 were improperly preserved.</p>		<p>1. The RPD between the matrix spike pair (See Below) were not all within the acceptance limits. However, the spike recoveries passed. The unacceptable RPD may be attributed to matrix interference and/or sample non-homogeneity. 1203816301PS and 1203816303PSD (CAWA-17-133302) Chloromethane [33* (0%-20%)] and Vinyl chloride [34* (0%-20%)].</p> <p>2. The LCS/and or LCSD (See Below) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. 1203818957 (LCS) bis(2-Chloro-1-methylethyl)ether [133* (53%-127%)].</p> <p>3. Preservation by acidification causes 2-Chloroethylvinyl ether to degrade resulting in poor recoveries in samples (See Below). 1203816301 (CAWA-17-133302PS) 2-Chloroethylvinyl ether [0* (51%-118%)]. 1203816303 (CAWA-17-133302PSD) 2-Chloroethylvinyl ether [0* (51%-118%)].</p> <p>4. Samples 425324001 and 425532008 contained head-space greater than pea size. The Project Manager was notified and the results are reported.</p> <p>Preservation for sample 425316004 was indicated on the vial, however the sample pH value was above 2. The sample was analyzed beyond the 7th day from collection, consequently the holding time was exceeded for un-preserved Volatile analysis.</p>	

Originator's Name:

Vanny Yib 26-JUN-17

Data Validator/Group Leader:

Erin Haubert 26-JUN-17

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1690
Work Order #: 425115**

Method/Analysis Information

Procedure:	Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)
Analytical Method:	SW-846:6850
Prep Method:	SW-846:6850
Analytical Batch Number:	1675216
Prep Batch Number:	1675214

Sample Analysis

Sample ID	Client ID
425115002	425115002 (CAWA-17-133326)
1203814204	Interference Check Sample (ICS)
1203814194	Method Blank (MB)
1203814195	Laboratory Control Sample (LCS)
1203814196	425115002(CAWA-17-133326) Matrix Spike (MS)
1203814197	425115002(CAWA-17-133326) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial

Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 425115002 (CAWA-17-133326) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The recoveries of Perchlorate and Perchlorate-101 were not within the acceptance limits in 1203814196 (CAWA-17-133326MS) and 1203814197 (CAWA-17-133326MSD). This was due to the background concentration in the parent sample, 425115002 (CAWA-17-133326).

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information

Holding Time Specifications

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those

holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected for using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An

electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-1690 GEL Work Order: 425115

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Michael Penny

Date: 24 JUN 2017

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326Date Received: 09-JUN-17GEL Job No (SDG): 2017-1690GEL Sample ID: 425115002Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.05	ug/L		1	19-JUN-17 18:48	per0619016a
	Perchlorate Isotope Ratio			2.92			1	19-JUN-17 18:48	per0619016a
14797-73-0	Perchlorate-101	.05	.2	1.05	ug/L		1	19-JUN-17 18:48	per0619016a
	Perchlorate-O(18)			0.410	ug/L		1	19-JUN-17 18:48	per0619016a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 2017-1690

Extract Batch Code: 1675214

Date Filtered: 19-JUN-17

Matrix: WATER

Sample ID: 1203814195

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		85 - 115
Perchlorate Isotope Ratio		3.04				-
Perchlorate-101	0.200	.189	ug/L	95		85 - 115
Perchlorate-O(18)		.439	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 2017-1690

Extract Batch Code: 1675214

Date Extracted: 19-JUN-17

GEL MS/PS ID: 1203814196

Client ID: CAWA-17-133326

GEL MSD/PSD ID: 1203814197

QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	1.05	ug/L	1.12	34 *	1.16	53 *	3	30	75 - 125
Perchlorate Isotope Ratio	0	2.92		2.78		2.83		2		-
Perchlorate-101	0.200	1.05	ug/L	1.17	61 *	1.19	71 *	2	30	75 - 125
Perchlorate-O(18)	0	0.410	ug/L	0.415		.423		2		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 19-JUN-17GEL Job No (SDG): 2017-1690GEL Sample ID: 1203814194Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	19-JUN-17 18:15	per0619013a
	Perchlorate Isotope Ratio						1	19-JUN-17 18:15	per0619013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	19-JUN-17 18:15	per0619013a
	Perchlorate-O(18)			0.475	ug/L		1	19-JUN-17 18:15	per0619013a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 19-JUN-17GEL Job No (SDG): 2017-1690GEL Sample ID: 1203814195Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.197	ug/L	J	1	19-JUN-17 18:26	per0619014a
	Perchlorate Isotope Ratio			3.04			1	19-JUN-17 18:26	per0619014a
14797-73-0	Perchlorate-101	.05	.2	0.189	ug/L	J	1	19-JUN-17 18:26	per0619014a
	Perchlorate-O(18)			0.439	ug/L		1	19-JUN-17 18:26	per0619014a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1690GEL Sample ID: 1203814204Date Filtered: 19-JUN-17Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.186	ug/L	J	1	19-JUN-17 18:37	per0619015a
	Perchlorate Isotope Ratio			2.58			1	19-JUN-17 18:37	per0619015a
14797-73-0	Perchlorate-101	.05	.2	0.210	ug/L		1	19-JUN-17 18:37	per0619015a
	Perchlorate-O(18)			0.432	ug/L		1	19-JUN-17 18:37	per0619015a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326MSDate Received: 09-JUN-17GEL Job No (SDG): 2017-1690GEL Sample ID: 1203814196Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.12	ug/L		1	19-JUN-17 18:59	per0619017a
	Perchlorate Isotope Ratio			2.78			1	19-JUN-17 18:59	per0619017a
14797-73-0	Perchlorate-101	.05	.2	1.17	ug/L		1	19-JUN-17 18:59	per0619017a
	Perchlorate-O(18)			0.415	ug/L		1	19-JUN-17 18:59	per0619017a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326MSDDate Received: 09-JUN-17GEL Job No (SDG): 2017-1690GEL Sample ID: 1203814197Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.16	ug/L		1	19-JUN-17 19:10	per0619018a
	Perchlorate Isotope Ratio			2.83			1	19-JUN-17 19:10	per0619018a
14797-73-0	Perchlorate-101	.05	.2	1.19	ug/L		1	19-JUN-17 19:10	per0619018a
	Perchlorate-O(18)			0.423	ug/L		1	19-JUN-17 19:10	per0619018a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1690
Work Order #: 425115

Sample ID	Client ID
425115001	CAWA-17-133298
425115002	CAWA-17-133326
1203808401	Method Blank (MB) ICP
1203808402	Laboratory Control Sample (LCS)
1203808405	425079002(CAWA-17-133314L) Serial Dilution (SD)
1203808403	425079002(CAWA-17-133314D) Sample Duplicate (DUP)
1203808404	425079002(CAWA-17-133314S) Matrix Spike (MS)
1203808335	Method Blank (MB) ICP-MS
1203808336	Laboratory Control Sample (LCS)
1203808339	425079002(CAWA-17-133314L) Serial Dilution (SD)
1203808337	425079002(CAWA-17-133314D) Sample Duplicate (DUP)
1203808338	425079002(CAWA-17-133314S) Matrix Spike (MS)
1203811029	Method Blank (MB) CVAA
1203811030	Laboratory Control Sample (LCS)
1203811036	425079001(CAWA-17-133286L) Serial Dilution (SD)
1203811032	425079001(CAWA-17-133286D) Sample Duplicate (DUP)
1203811034	425079001(CAWA-17-133286S) Matrix Spike (MS)

Sample Analysis

Samples 425115001 and 002 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1672788, 1672758, 1673857 and 1678964
Prep Batch :	1672787, 1672757 and 1673856
Standard Operating Procedures:	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 30, GL-MA-E-010 REV# 34 and GL-GC-E-107 REV# 10
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Hardness as CaCO₃ is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 350X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL/PQL Requirements

The CRDL/PQL standard recoveries met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria. For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

Continuing Calibration Blanks (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 425079002 (CAWA-17-133314)-ICP and ICP-MS and 425079001 (CAWA-17-133286)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate

value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. The relative percent differences (RPD) between the sample and its duplicate (DUP) were within acceptable limits for all applicable analytes.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

Sample	Analyte	Value
1203808405 (CAWA-17-133314SDILT)	Potassium	11.9 *(0%-10%)

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

The samples in this SDG were not diluted and were prepared according to the cited SOP.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

A Data exception report (DER) was generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) 1646571 was generated for sample 1203808405 (CAWA-17-133314SDILT) in this SDG/batch.

Additional Comments

Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

Hardness = 2.497 (Ca) + 4.118 (Mg)

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-1690 GEL Work Order: 425115

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- E %difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Nik-Cole Elmore

Date: 03 JUL 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1690**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425115001**BASIS:** As Received**DATE COLLECTED** 07-JUN-17**CLIENT ID:** CAWA-17-133298**LEVEL:** Low**DATE RECEIVED** 09-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.110	ug/L	J	0.067	0.2	0.2	1	AV	MTM1	06/15/17 12:15	061517W1-3	1673857

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673857	1673856	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1690**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425115002**BASIS:** As Received**DATE COLLECTED** 07-JUN-17**CLIENT ID:** CAWA-17-133326**LEVEL:** Low**DATE RECEIVED** 09-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/15/17 12:17	061517W1-3	1673857

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1690

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425115002

BASIS: As Received

DATE COLLECTED 07-JUN-17

CLIENT ID: CAWA-17-133326

LEVEL: Low

DATE RECEIVED 09-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7440-39-3	Barium	33.4	ug/L		1	5	5	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7440-70-2	Calcium	24800	ug/L		50	200	200	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7440-48-4	Cobalt	8.89	ug/L		1	5	5	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7439-95-4	Magnesium	6110	ug/L		110	300	300	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7439-96-5	Manganese	54.8	ug/L		2	10	10	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7439-98-7	Molybdenum	3.06	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7440-02-0	Nickel	5.5	ug/L		0.6	2	2	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7440-09-7	Potassium	3070	ug/L		50	150	150	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7631-86-9	Silica	30500	ug/L		53	213	213	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7440-23-5	Sodium	10500	ug/L		100	300	300	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-24-6	Strontium	152	ug/L		1	5	5	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-61-1	Uranium	0.319	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/27/17 13:44	170627-2	1672758
7440-62-2	Vanadium	5	ug/L	U	1	5	5	1	P	JWJ	06/26/17 16:32	062617-1	1672788
7440-66-6	Zinc	130	ug/L		3.3	10	10	1	P	JWJ	06/26/17 16:32	062617-1	1672788

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1690**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425115002**BASIS:** As Received**DATE COLLECTED** 07-JUN-17**CLIENT ID:** CAWA-17-133326**LEVEL:** Low**DATE RECEIVED** 09-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	87.2	mg/L		0.453	1.24	1.24	1		TXT1	06/30/17 14:46		1678964

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1672758	1672757	SW846 3005A	50	mL	50	mL	06/19/17	CXW4
1672788	1672787	SW846 3005A	50	mL	50	mL	06/19/17	CXW4
1673857	1673856	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5

***Analytical Methods:**

P SW846 3005A/6010C
MS SW846 3005A/6020A
AV EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-1690

Contract: ESHL00114

Matrix: W

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Acceptance Window</u>	<u>Conc Qual</u>	<u>M*</u>	<u>MDL</u>	<u>RDL</u>
1203808335	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.231	ug/L	+/-0.5	J	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203808401	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203811029	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

*Analytical Methods:

P SW846 3005A/6010C
MS SW846 3005A/6020A
AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1690 Client ID CAWA-17-133314S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425079002 Spike ID: 1203808338

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	48.9		1	U	50	97.1		MS
Arsenic	ug/L	75-125	51.7		2.18	J	50	99.1		MS
Cadmium	ug/L	75-125	49.1		0.3	U	50	98.2		MS
Chromium	ug/L	75-125	50.1		3	U	50	99.4		MS
Molybdenum	ug/L	75-125	51.7		0.67		50	102		MS
Nickel	ug/L	75-125	52.9		1.37	J	50	103		MS
Selenium	ug/L	75-125	47.4		2	U	50	94.5		MS
Silver	ug/L	75-125	51.1		0.3	U	50	102		MS
Thallium	ug/L	75-125	47.2		0.6	U	50	94.3		MS
Uranium	ug/L	75-125	48.9		0.067	U	50	97.8		MS
Lead	ug/L	75-125	48.7		0.5	U	50	97.4		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1690 Client ID: CAWA-17-133314S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425079002 Spike ID: 1203808404

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Zinc	ug/L	75-125	482		3.3	U	500	96.4		P
Aluminum	ug/L	75-125	5110		73.3	J	5000	101		P
Barium	ug/L		7510		6810		500	141	N/A	P
Beryllium	ug/L	75-125	508		1	U	500	102		P
Boron	ug/L	75-125	538		30.2	J	500	102		P
Calcium	ug/L		26700		21600		5000	102	N/A	P
Cobalt	ug/L	75-125	511		5.85		500	101		P
Copper	ug/L	75-125	514		3	U	500	103		P
Iron	ug/L	75-125	6010		939		5000	101		P
Magnesium	ug/L	75-125	10600		5460		5000	102		P
Manganese	ug/L	75-125	741		238		500	101		P
Potassium	ug/L	75-125	8210		3150		5000	101		P
Silica	ug/L		58900		46600		10700	115	N/A	P
Sodium	ug/L	75-125	23100		17600		5000	110		P
Strontium	ug/L	75-125	685		193		500	98.4		P
Tin	ug/L	75-125	505		2.5	U	500	101		P
Vanadium	ug/L	75-125	515		1.94	J	500	103		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1690 **Client ID:** CAWA-17-133286S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 425079001 **Spike ID:** 1203811034

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.06		0.067	U	2	103		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
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Duplicate Sample Summary

SDG No.: 2017-1690

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133314D

Matrix: WATER

Level: Low

Sample ID: 425079002

Duplicate ID: 1203808337

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		2.18 J		2 U		200		MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.67		0.643		4.11		MS
Nickel	ug/L	+/- 2	1.37 J		1.23 J		10.5		MS
Selenium	ug/L		2 U		2 U				MS
Silver	ug/L		0.3 U		0.3 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L		0.067 U		0.067 U				MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1690

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133314D

Matrix: WATER

Level: Low

Sample ID: 425079002

Duplicate ID: 1203808403

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-200	73.3 J		82.8 J		12.1		P
Barium	ug/L	+/-20%	6810		6960		2.24		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	30.2 J		32.2 J		6.45		P
Calcium	ug/L	+/-20%	21600		22200		2.37		P
Cobalt	ug/L	+/-5	5.85		5.72		2.24		P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-20%	939		969		3.14		P
Magnesium	ug/L	+/-20%	5460		5580		2.24		P
Manganese	ug/L	+/-20%	238		244		2.2		P
Potassium	ug/L	+/-20%	3150		3300		4.54		P
Silica	ug/L	+/-20%	46600		47500		1.83		P
Sodium	ug/L	+/-20%	17600		18100		2.57		P
Strontium	ug/L	+/-20%	193		198		2.74		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	1.94 J		1.22 J		45.3		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
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Duplicate Sample Summary

SDG No.: 2017–1690**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA–17–133286D**Matrix:** WATER**Level:** Low**Sample ID:** 425079001**Duplicate ID:** 1203811032**Percent Solids for Dup:** N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Mercury	ug/L		0.067	U	0.067	U			AV

*Analytical Methods:
AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1690

Contract: ESHL00114

Aqueous LCS Source: O2Si

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203808336								
	Antimony	ug/L	50	50.1		100	80-120	MS
	Arsenic	ug/L	50	50.7		101	80-120	MS
	Cadmium	ug/L	50	51		102	80-120	MS
	Chromium	ug/L	50	51.7		103	80-120	MS
	Lead	ug/L	50	49.2		98.4	80-120	MS
	Molybdenum	ug/L	50	50.9		102	80-120	MS
	Nickel	ug/L	50	51.4		103	80-120	MS
	Selenium	ug/L	50	49.4		98.7	80-120	MS
	Silver	ug/L	50	51.5		103	80-120	MS
	Thallium	ug/L	50	47.7		95.4	80-120	MS
	Uranium	ug/L	50	47.5		95.1	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1690

Contract: ESHL00114

Aqueous LCS Source:OS2I

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203808402								
	Aluminum	ug/L	5000	5160		103	80-120	P
	Barium	ug/L	500	505		101	80-120	P
	Beryllium	ug/L	500	500		100	80-120	P
	Boron	ug/L	500	493		98.5	80-120	P
	Calcium	ug/L	5000	5140		103	80-120	P
	Cobalt	ug/L	500	514		103	80-120	P
	Copper	ug/L	500	506		101	80-120	P
	Iron	ug/L	5000	5110		102	80-120	P
	Magnesium	ug/L	5000	5210		104	80-120	P
	Manganese	ug/L	500	504		101	80-120	P
	Potassium	ug/L	5000	5250		105	80-120	P
	Silica	ug/L	10700	10500		98.3	80-120	P
	Sodium	ug/L	5000	5250		105	80-120	P
	Strontium	ug/L	500	501		100	80-120	P
	Tin	ug/L	500	509		102	80-120	P
	Vanadium	ug/L	500	507		101	80-120	P
	Zinc	ug/L	500	486		97.2	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1690

Contract: ESHL00114

Aqueous LCS Source: GEL

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203811030	Mercury	ug/L	2	2.08		104	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1690

Client ID: CAWA-17-133314L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425079002

Serial Dilution ID: 1203808339

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2.18	J	10	U	13.183			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	.67		1	U	14.925			MS
Nickel	1.37	J	3	U	4.745			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.067	U	.335	U				MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1690 Client ID: CAWA-17-133314L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 425079002 Serial Dilution ID: 1203808405

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	73.3	J	340	U	64.951			P
Barium	6810		7110		4.451		10	P
Beryllium	1	U	5	U				P
Boron	30.2	J	75	U	5.654			P
Calcium	21600		21300		1.585		10	P
Cobalt	5.85		5.27	J	9.82			P
Copper	3	U	15	U				P
Iron	939		920		1.99			P
Magnesium	5460		5570		2.107			P
Manganese	238		250		4.632		10	P
Potassium	3150		3530		11.944	E	10	P
Silica	46600		47100		1.064		10	P
Sodium	17600		18400		4.126		10	P
Strontium	193		195		.969		10	P
Tin	2.5	U	12.5	U				P
Vanadium	1.94	J	5	U	38.072			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1690 Client ID CAWA-17-133286L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 425079001 Serial Dilution ID: 1203811036

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Mercury	.067	U	.335	U				AV

*Analytical Methods:

AV EPA 245.1/245.2

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 27-JUN-17	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ICP	Test / Method: SW846 3005A/6010C	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1672788	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 425075(2017-1667),425079(2017-1664),425115(2017-1690),425121(2017-1689) Application Issues: Failed difference for SDILT			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Failed difference for SDILT: QC 1203808405SDILT		1. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified. 1203808405 (CAWA-17-133314SDILT) Potassium [11.9 *(0%-10%)].	

Originator's Name:
Jerry Wigfall 27-JUN-17

Data Validator/Group Leader:
Helen Camello 28-JUN-17

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1690
Work Order #: 425115**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1673634

Method: SW 9060 Total Organic Carbon

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW-846:9060:

Sample ID	Client ID
425115001	CAWA-17-133298
1203812102	Method Blank (MB)
1203812103	Laboratory Control Sample (LCS)
1203812277	Laboratory Control Sample Duplicate (LCSD)
1203812104	425075001(CAWA-17-133284) Sample Duplicate (DUP)
1203812106	425075001(CAWA-17-133284) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 15.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Carbon analysis was performed on a O-I Analytical 1030W Carbon Analyzer.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement

The RPD between the LCS and LCSD met the acceptance limits.

Quality Control (QC) Designation

Sample 425075001 (CAWA-17-133284) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1672526	Method:	WSP-CN(T)
Prep Batch :	1672525	Method:	EPA 335.4

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4 1993:

Sample ID	Client ID
425115001	CAWA-17-133298
1203807671	Method Blank (MB)
1203807672	Laboratory Control Sample (LCS)
1203808580	425115001(CAWA-17-133298) Sample Duplicate (DUP)
1203808581	425115001(CAWA-17-133298) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 19.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425115001 (CAWA-17-133298) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1672927

Method: WSP-ANIONS

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:300.0:

Sample ID	Client ID
425115002	CAWA-17-133326
1203808700	Method Blank (MB)
1203808701	Laboratory Control Sample (LCS)
1203808702	425075004(CAWA-17-133313) Sample Duplicate (DUP)
1203808703	425075004(CAWA-17-133313) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 25.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-1600 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425075004 (CAWA-17-133313) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following sample 425115002 (CAWA-17-133326) was diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	425115
	002
Chloride	2X

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integrations

Samples 1203808702 (CAWA-17-133313DUP), 1203808703 (CAWA-17-133313PS) and 425115002 (CAWA-17-133326) were manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product:	Ammonia Nitrogen		
Analytical Batch:	1672879	Method:	NH3
Prep Batch :	1672878	Method:	EPA 350.1 Prep

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:350.1:

Sample ID	Client ID
425115002	CAWA-17-133326
1203808632	Method Blank (MB)
1203808633	Laboratory Control Sample (LCS)
1203808634	425079004(CAWA-17-133315) Sample Duplicate (DUP)
1203808636	425079004(CAWA-17-133315) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425079004 (CAWA-17-133315) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recoveries for this sample set were within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1672891	Method:	TKN
Prep Batch :	1672890	Method:	EPA 351.2 Prep

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:351.2:

Sample ID	Client ID
425115001	CAWA-17-133298
1203808652	Method Blank (MB)
1203808653	Laboratory Control Sample (LCS)
1203808654	425121002(CAWA-17-133348) Sample Duplicate (DUP)
1203808656	425121002(CAWA-17-133348) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within

acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425121002 (CAWA-17-133348) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recoveries for this sample set were within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample:

Analyte	Sample	Value
Nitrogen, Total Kjeldahl	1203808654 (CAWA-17-133348DUP)	abs(.243 - .385)* (+/-1 mg/L)

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1641391 was generated for sample 1203808654 (CAWA-17-133348DUP) in this SDG/batch.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1673081

Method: NO3NO2

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:353.2:

Sample ID	Client ID
425115002	CAWA-17-133326
1203809086	Method Blank (MB)
1203809087	Laboratory Control Sample (LCS)
1203809089	425125001(CTUA-17-131775) Sample Duplicate (DUP)
1203809092	425125001(CTUA-17-131775) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425125001 (CTUA-17-131775) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recoveries for this sample set were within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The following samples 1203809089 (CTUA-17-131775DUP) and 1203809092 (CTUA-17-131775PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1672893	Method:	PO4
Prep Batch :	1672892	Method:	EPA 365.4 Prep

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4 1974:

Sample ID	Client ID
425115002	CAWA-17-133326
1203808658	Method Blank (MB)
1203808659	Laboratory Control Sample (LCS)
1203808660	425079004(CAWA-17-133315) Sample Duplicate (DUP)
1203808661	425079004(CAWA-17-133315) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425079004 (CAWA-17-133315) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1673668

Method: TDS

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:160.1:

Sample ID	Client ID
425115002	CAWA-17-133326
1203810561	Method Blank (MB)
1203810562	Laboratory Control Sample (LCS)
1203810564	425121001(CAWA-17-133347) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Consecutive Weight Checks

All consecutive weight checks were met.

Quality Control (QC) Designation

Sample 425121001 (CAWA-17-133347) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1678861

Method: EPA120.1 Specific Conductivity

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:120.1:

Sample ID	Client ID
425115002	CAWA-17-133326
1203822826	Laboratory Control Sample (LCS)
1203822828	425121001(CAWA-17-133347) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 14.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration and Ion analysis was performed on a Orion 160 Conductivity Meter.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425121001 (CAWA-17-133347) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: pH

Analytical Batch: 1673523 **Method:** PH

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1 1982:

Sample ID	Client ID
425115002	CAWA-17-133326
1203811672	Laboratory Control Sample (LCS)
1203810238	425121001(CAWA-17-133347) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 22.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration and Ion analysis was performed on a Thermo Orion Star A111. Immediates

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425121001 (CAWA-17-133347) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

Sample	Analyte	Value
1203810238 (CAWA-17-133347DUP)	pH	Received 09-JUN-17, out of holding 07-JUN-17
425115002 (CAWA-17-133326)	pH	Received 09-JUN-17, out of holding 07-JUN-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information**Data Exception (DER) Documentation**

A data exception report (DER) 1642299 was generated for samples 425115002 (CAWA-17-133326) and 1203810238 (CAWA-17-133347DUP) in this SDG/batch.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1673522 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA:310.1:

Sample ID	Client ID
425115002	CAWA-17-133326
1203810229	Laboratory Control Sample (LCS)
1203810232	425121001(CAWA-17-133347) Sample Duplicate (DUP)
1203810235	425121001(CAWA-17-133347) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 13.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration and Ion analysis was performed on a Electronic bottle-top buret.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425121001 (CAWA-17-133347) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-1690 GEL Work Order: 425115


The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Aubrey Kingsbury

Date: 30 JUN 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 30, 2017

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2017-1690

Client Sample ID: CAWA-17-133298
Sample ID: 425115001
Matrix: W
Collect Date: 07-JUN-17 12:40
Receive Date: 09-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		1.64	0.330	1.00	mg/L		1	TSM	06/21/17	2302	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/12/17	1208	1672526	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.675	0.033	0.100	mg/L	1.00	1	KLP1	06/13/17	1041	1672891	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/12/17	1104	1672525
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/12/17	1630	1672890

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW-846:9060	
2	EPA 335.4 1993	
3	EPA:351.2	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 30, 2017

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2017-1690

Client Sample ID: CAWA-17-133326
Sample ID: 425115002
Matrix: W
Collect Date: 07-JUN-17 12:40
Receive Date: 09-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.0972	0.067	0.200	mg/L		1	MXL2	06/10/17	0443	1672927	1
Fluoride	J	0.0832	0.033	0.100	mg/L		1					
Sulfate		4.39	0.133	0.400	mg/L		1					
Chloride		9.72	0.134	0.400	mg/L		2	MXL2	06/12/17	1718	1672927	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.105	0.017	0.050	mg/L	1.00	1	KLP1	06/13/17	1317	1672879	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.12	0.017	0.050	mg/L		1	AXH3	06/14/17	0709	1673081	4
PO4 "As Received"												
Phosphorus, Total as P		0.0801	0.020	0.050	mg/L	1.00	1	KLP1	06/13/17	1430	1672893	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		149	3.40	14.3	mg/L			KLP1	06/14/17	1056	1673668	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		95.0	1.45	4.00	mg/L			RXB5	06/14/17	1505	1673522	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		242	1.00	1.00	umhos/cm		1	RXB5	06/30/17	1337	1678861	8
PH "As Received"												
pH at Temp 21.0C	H	7.85	0.010	0.100	SU		1	RXB5	06/14/17	1503	1673523	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/13/17	0930	1672878
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/12/17	1630	1672892

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Certificate of Analysis

Report Date: June 30, 2017

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2017-1690

Client Sample ID: CAWA-17-133326
Sample ID: 425115002

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
The following Analytical Methods were performed:												
Method	Description					Analyst Comments						
1	EPA:300.0											
2	EPA:300.0											
3	EPA:350.1											
4	EPA:353.2											
5	EPA 365.4 1974											
6	EPA:160.1											
7	EPA:310.1											
8	EPA:120.1											
9	EPA 150.1 1982											

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

Quality Control Summary

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QC Summary

Report Date: June 30, 2017

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Los Alamos National Laboratory
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico

Contact: Mr. Keith Greene

Workorder: 425115

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1673634										
QC1203812104	425075001	DUP									
Total Organic Carbon Average	J	0.387	J	0.373	mg/L	3.68	^	(+/-1.00)	TSM	06/21/17	19:07
QC1203812103	LCS										
Total Organic Carbon Average	10.0			9.81	mg/L			98.1 (80%-120%)		06/21/17	17:57
QC1203812277	LCSD										
Total Organic Carbon Average	10.0			9.89	mg/L	0.873		98.9 (0%-20%)		06/21/17	18:09
QC1203812102	MB										
Total Organic Carbon Average			U	ND	mg/L					06/21/17	17:45
QC1203812106	425075001	PS									
Total Organic Carbon Average	10.0	J	0.387	11.0	mg/L			106 (75%-125%)		06/21/17	19:54
Flow Injection Analysis											
Batch	1672526										
QC1203808580	425115001	DUP									
Cyanide, Total	U	ND	U	ND	ug/L	N/A			AXH3	06/12/17	12:09
QC1203807672	LCS										
Cyanide, Total	50.0			51.6	ug/L			103 (90%-110%)		06/12/17	11:44
QC1203807671	MB										
Cyanide, Total			U	ND	ug/L					06/12/17	11:43
QC1203808581	425115001	MS									
Cyanide, Total	100	U	ND	108	ug/L			108 (90%-110%)		06/12/17	12:10

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QC Summary

Workorder: 425115

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1672927										
QC1203808702	425075004	DUP									
Bromide		J	0.0828	J	0.0829	mg/L	0.121 ^	(+/-0.200)	MXL2	06/10/17	01:49
Chloride			3.64		3.64	mg/L	0.0962	(0%-20%)			
Fluoride		J	0.0877	J	0.090	mg/L	2.59 ^	(+/-0.100)			
Sulfate			3.88		3.85	mg/L	0.787	(0%-20%)			
QC1203808701	LCS										
Bromide	1.25				1.31	mg/L		105	(80%-120%)	06/09/17	23:25
Chloride	5.00				4.93	mg/L		98.5	(80%-120%)		
Fluoride	2.50				2.57	mg/L		103	(80%-120%)		
Sulfate	10.0				10.2	mg/L		102	(80%-120%)		
QC1203808700	MB										
Bromide			U		ND	mg/L				06/09/17	22:56
Chloride			U		ND	mg/L					
Fluoride			U		ND	mg/L					
Sulfate			U		ND	mg/L					
QC1203808703	425075004	PS									
Bromide	1.25	J	0.0828		1.31	mg/L		98.5	(75%-125%)	06/10/17	02:18
Chloride	5.00		3.64		8.91	mg/L		105	(75%-125%)		

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QC Summary

Workorder: 425115

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1672927										
Fluoride	2.50	J	0.0877	2.54	mg/L		98.2	(75%-125%)	MXL2	06/10/17	02:18
Sulfate	10.0		3.88	14.0	mg/L		101	(75%-125%)			
Nutrient Analysis											
Batch	1672879										
QC1203808634	425079004	DUP									
Nitrogen, Ammonia			0.182	0.173	mg/L	5.07	^	(+/-0.050)	KLP1	06/13/17	13:10
QC1203808633	LCS										
Nitrogen, Ammonia	1.00			0.937	mg/L		93.7	(90%-110%)		06/13/17	12:52
QC1203808632	MB										
Nitrogen, Ammonia		J		0.0252	mg/L					06/13/17	12:51
QC1203808636	425079004	MS									
Nitrogen, Ammonia	1.00		0.182	1.13	mg/L		94.8	(90%-110%)		06/13/17	13:11
Batch	1672891										
QC1203808654	425121002	DUP									
Nitrogen, Total Kjeldahl			0.385	0.243	mg/L	45.2*	^	(+/-0.100)	KLP1	06/13/17	10:42
QC1203808653	LCS										
Nitrogen, Total Kjeldahl	1.00			0.979	mg/L		97.9	(90%-110%)		06/13/17	10:25
QC1203808652	MB										
Nitrogen, Total Kjeldahl		U		ND	mg/L					06/13/17	10:24
QC1203808656	425121002	MS									
Nitrogen, Total Kjeldahl	1.00		0.385	1.45	mg/L		107	(90%-110%)		06/13/17	10:43
Batch	1672893										
QC1203808660	425079004	DUP									
Phosphorus, Total as P			0.122	0.103	mg/L	16.9	^	(+/-0.050)	KLP1	06/13/17	14:28

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QC Summary

Workorder: 425115

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1672893										
QC1203808659	LCS										
Phosphorus, Total as P	1.00			0.982	mg/L		98.2	(80%-124%)	KLP1	06/13/17	14:24
QC1203808658	MB										
Phosphorus, Total as P			U	ND	mg/L					06/13/17	14:23
QC1203808661	425079004	MS									
Phosphorus, Total as P	1.00	0.122		1.22	mg/L		110	(63%-139%)		06/13/17	14:29
<hr/>											
Batch	1673081										
QC1203809089	425125001	DUP									
Nitrogen, Nitrate/Nitrite		3.01		3.00	mg/L	0.333		(0%-20%)	AXH3	06/14/17	07:31
QC1203809087	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.01	mg/L		101	(90%-110%)		06/14/17	06:34
QC1203809086	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					06/14/17	06:33
QC1203809092	425125001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.601		1.59	mg/L		98.9	(90%-110%)		06/14/17	07:32
<hr/>											
Solids Analysis											
Batch	1673668										
QC1203810564	425121001	DUP									
Total Dissolved Solids		139		143	mg/L	0		(0%-5%)	KLP1	06/14/17	10:56
QC1203810562	LCS										
Total Dissolved Solids	300			304	mg/L		101	(95%-105%)		06/14/17	10:56
QC1203810561	MB										
Total Dissolved Solids			U	ND	mg/L					06/14/17	10:56

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QC Summary

Workorder: 425115

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1673522										
QC1203810232	425121001	DUP									
Alkalinity, Total as CaCO3		62.0		61.8	mg/L	0.323		(0%-20%)	RXB5	06/14/17	15:10
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203810229	LCS										
Alkalinity, Total as CaCO3	100			105	mg/L		105	(90%-110%)		06/14/17	13:54
QC1203810235	425121001	MS									
Alkalinity, Total as CaCO3	100	62.0		166	mg/L		104	(80%-120%)		06/14/17	15:12
Batch	1673523										
QC1203810238	425121001	DUP									
pH	H	8.04	H	8.05	SU	0.124		(0%-5%)	RXB5	06/14/17	15:10
QC1203811672	LCS										
pH	7.00			7.00	SU		100	(99%-101%)		06/14/17	14:49
Batch	1678861										
QC1203822828	425121001	DUP									
Conductivity		190		197	umhos/cm	3.31		(0%-10%)	RXB5	06/30/17	13:39
QC1203822826	LCS										
Conductivity	1410			1410	umhos/cm		99.4	(95%-105%)		06/30/17	13:23

- Notes:**
- < Result is less than value reported
 - > Result is greater than value reported
 - B The target analyte was detected in the associated blank.
 - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
 - H Analytical holding time was exceeded
 - J Value is estimated
 - N/A RPD or %Recovery limits do not apply.
 - N1 See case narrative

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QC Summary

Workorder: 425115

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.										
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
d	5-day BOD--The 2:1 depletion requirement was not met for this sample										
e	5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes										
h	Preparation or preservation holding time was exceeded										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 13-JUN-17	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 351.2, EPA 351.2 SC	Matrix Type: Liquid	Client Code: BRKL, ESHL, NCSW
Batch ID: 1672891	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 424990(38945),425115(2017-1690),425121(2017-1689),425215 Application Issues: Failed Recovery for MS/MSD, or PS/PSD Failed RPD for DUP			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Failed RPD for DUP: QC 1203808654DUP 2. Failed Recovery for MS/MSD, or PS/PSD: QC 1203808657MS		1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: Nitrogen, Total Kjeldahl 1203808654 (CAWA-17-133348DUP) [abs(.243 - .385)* (+/-1 mg/L)]. 2. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity. Nitrogen, Total Kjeldahl 1203808657 (38945-002MS) [111* (90%-110%)].	

Originator's Name:

Kristen Mizzell 13-JUN-17

Data Validator/Group Leader:

Aubrey Kingsbury 13-JUN-17

DATA EXCEPTION REPORT

Mo.Day Yr. 15-JUN-17	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: EPA 150.1, SM 4500-H B, SW846 9040C	Matrix Type: Liquid	Client Code: BELI, ESHL, UCOR
Batch ID: 1673523	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 423944(2017-1573),423945(2017-1572),424030(2017-1589),424080,424916(2017-1657),424952,425075(2017-1667),425079(2017-1664),425115(2017-1690),425121(2017-1689) Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample received out of holding: 423944 001 423945 001 424030 001 424080 004 424916 002 424952 001,002,003 425075 002,004 425079 002,004 425115 002 425121 001 QC 1203810237DUP,1203810238DUP		1. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 1203810237 (EMWGW7913DUP) [Received 25-MAY-17, out of holding 24-MAY-17]. 1203810238 (CAWA-17-133347DUP) [Received 09-JUN-17, out of holding 07-JUN-17]. 423944001 (WST35-17-135774) [Received 24-MAY-17, out of holding 22-MAY-17]. 423945001 (WST35-17-135775) [Received 24-MAY-17, out of holding 22-MAY-17]. 424030001 (WST03-17-135771) [Received 25-MAY-17, out of holding 23-MAY-17]. 424080004 (EMWGW7913) [Received 25-MAY-17, out of holding 24-MAY-17]. 424916002 (CAWA-17-133329) [Received 07-JUN-17, out of holding 05-JUN-17]. 424952001 (1. Kaiser Capitol Hill - Cold Water) [Received 07-JUN-17, out of holding 06-JUN-17]. 424952002 (2. Kaiser Capitol Hill - Hot Water) [Received 07-JUN-17, out of holding 06-JUN-17]. 424952003 (3. Kaiser Capitol Hill - RO/DI) [Received 07-JUN-17, out of holding 06-JUN-17]. 425075002 (CAWA-17-133312) [Received 08-JUN-17, out of holding 06-JUN-17]. 425075004 (CAWA-17-133313) [Received 08-JUN-17, out of holding 06-JUN-17]. 425079002 (CAWA-17-133314) [Received 08-JUN-17, out of holding 06-JUN-17]. 425079004 (CAWA-17-133315) [Received 08-JUN-17, out of holding 06-JUN-17]. 425115002 (CAWA-17-133326) [Received 09-JUN-17, out of holding 07-JUN-17]. 425121001 (CAWA-17-133347) [Received 09-JUN-17, out of holding 07-JUN-17].	

Originator's Name:

Rachael Bell 15-JUN-17

Data Validator/Group Leader:

Elzbieta Szulc 15-JUN-17