

The order of this data package is as follows:

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

Comments:

[illegible]

General Engineering

Charleston SC

Chain of Custody/Analysis Request

COC/Lab Request #:

2018-1639

Page 1 of 1

Client Contact:

Lab Agreement #:

Site Name:

Los Alamos National Laboratory

Project Number: ADEP

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐7 Days - ☐14 Days - ☐21 Days - ☐28 Days - ☒

Rad Screening Info:

Lead - no

Lab Reporting Limit Type:

Method Detection Limit

Field Sample ID

Sample Date

Sample Time

Sample Matrix

MSGP-Hg

WSP-8260B-VOA

WSP-8270C-SVOA

WSP-8330B-NMED HEXMOD

WSP-All Metals

WSP-CN(T)

WSP-GENINORG+PerChlorate

WSP-GrossA/B

WSP-NH3+NO3/NO2+PO4

WSP-RAD

WSP-TKN+TOC

CAWA-18-71

Feb 7 2018

11:37

W

1

1

1

CAWA-18-72

Feb 7 2018

11:37

W

1

2

2

3

1

1

1

1

1

CAWA-18-116

Feb 7 2018

11:37

W

2

CAWA-18-74

Feb 7 2018

11:32

W

1

1

1

CAWA-18-75

Feb 7 2018

11:32

W

1

2

2

3

1

1

1

1

1

CAWA-18-117

Feb 7 2018

11:32

W

2

CAWA-18-77

Feb 7 2018

13:16

W

1

1

1

CAWA-18-78

Feb 7 2018

13:16

W

1

2

2

3

1

1

1

1

1

CAWA-18-118

Feb 7 2018

13:16

W

2

Special Instructions:

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

LANL SMO

Los Alamos NM

Chain of Custody/Analysis Request

COC/Lab Request #:

2018-1635

Page 1 of 1

Client Contact:

Lab Agreement #:

Site Name:

Los Alamos National Laboratory

Project Number:

Analysis Turnaround Time:

24 Hour - ☐ Other - ☒7 Days - ☐14 Days - ☐21 Days - ☐28 Days - ☐

Rad Screening Info:

location; no

Lab Reporting Limit Type:

Method Detection Limit

Field Sample ID

Sample
DateSample
TimeSample
Matrix

MSGP-Hg

WSP-8260B-VOA

WSP-8270C-SVOA

WSP-8290-D/F

WSP-8330B-NMED HEXMOD

WSP-All Metals

WSP-CN(T)

WSP-EES-Br

WSP-EES-Tracers

WSP-GENINORG+PerChlorate

WSP-GrossA/B

WSP-LL-H-3

WSP-NH3+NO3/NO2+PO4

WSP-RAD

WSP-TKN+TOC

CAWA-18-77

Feb 7 2018

13:16

W

1

1

1

CAWA-18-118

Feb 7 2018

13:16

W

2

2

2

3

1

1

1

1

1

1

1

1

CAWA-18-129

Feb 7 2018

13:16

W

2

2

2

3

1

1

1

1

1

1

1

1

CAWA-18-78

Feb 7 2018

13:16

W

1

2

2

3

1

1

1

1

1

CAWA-18-79

Feb 7 2018

13:16

W

1

2

Special Instructions:

Relinquished by:

Print Name: Allsyn Stanfield

Date/Time: 2/7/18

Received by:

Print Name: Rance Orsatt

Date/Time: 2/13/18

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

[illegible]

Shipping Classification Determination Checklist

Page 6 of 6

Sampling Plan ID/Name: R-48, R-58, R-63 11669COC: 2018-1639

TEST - Explosives		YES	NO
Samples collected from a WFO area? (TAs -8, 9, 11, 16, 37, 14, 15, 36, 22, 39, 40, and 49)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> 2/7/18
Field Test for Explosives Results		YES	NO NA
HE SPOT test result positive. If YES - Do not transport.		<input checked="" type="checkbox"/>	

TEST - Chemical Preservation		YES	NO
Samples are chemically preserved?		<input checked="" type="checkbox"/>	
Field Team Member Statement		YES	NO NA
Chemical preservation exceeds limits given 40 CFR 136, Table II - Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship.		<input checked="" type="checkbox"/>	

TEST - Field Screen			YES	NO
The sample has field screening measurements of alpha and beta activity?			<input checked="" type="checkbox"/>	
Sample Activity (dpm/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO NA
Alpha detectable	AND Alpha \geq 160,000	AT TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49		<input checked="" type="checkbox"/>
Alpha \geq 125	AND Alpha \geq 1,250,000	AT other locations		<input checked="" type="checkbox"/>
Beta \geq 1,500	AND Beta \geq 15,000,000	AT any location		<input checked="" type="checkbox"/>
The sample Alpha \geq 16,000,000 dpm*g/100cm ² or Beta \geq 160,000,000 dpm*g/100cm ² . If YES - Do not ship.				<input checked="" type="checkbox"/>
On the external surface of the sample container, alpha activity \geq 24 dpm/cm ² , beta activity \geq 240 dpm/cm ² , or surface activity \geq 0.5 mR/hr. If YES - Do not ship.				<input checked="" type="checkbox"/>
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity Material - UN2910</i> , based on field screening measurements of alpha and beta activity.				<input checked="" type="checkbox"/>

TEST - Location		YES	NO
Prior analytical measurements of radioactive isotopes are available?		<input checked="" type="checkbox"/>	
Sample Activity (pCi/g)	Shipment Activity (pCi)	YES	NO NA
Am-241 \geq 27 pCi/g	AND Am-241 \geq 270,000 pCi Total		<input checked="" type="checkbox"/>
Cs-137 \geq 270 pCi/g	AND Cs-137 \geq 270,000 pCi Total		<input checked="" type="checkbox"/>
Pu-238 \geq 27 pCi/g	AND Pu-238 \geq 270,000 pCi Total		<input checked="" type="checkbox"/>
Pu-239/240 \geq 27 pCi/g	AND Pu-239/240 \geq 270,000 pCi Total		<input checked="" type="checkbox"/>
Th-228 \geq 27 pCi/g	AND Th-228 \geq 270,000 pCi Total		<input checked="" type="checkbox"/>
U-234 \geq 270 pCi/g	AND U-234 \geq 1,600,000,000 pCi Total		<input checked="" type="checkbox"/>
U-238 \geq 270 pCi/g	AND U-238 \geq unlimited		<input checked="" type="checkbox"/>
H-3 \geq 27,000,000 pCi/g	AND H-3 \geq 27,000,000,000 pCi Total		<input checked="" type="checkbox"/>
Am-241, Pu-238, Pu-239/240, or Th 228 \geq 27,000,000 pCi; or Cs-137 \geq 270,000,000 pCi or U-234 \geq 160,000,000 pCi; or H-3 \geq 1 Ci. If YES - Do not ship.			<input checked="" type="checkbox"/>
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , based on prior analytical measurements of radioactive isotopes.			<input checked="" type="checkbox"/>

TEST - AK		YES	NO	NA
The shippers documented knowledge of the sample positively identifies appropriate labeling.				<input checked="" type="checkbox"/>
Documented Field Team Member Statement		YES	NO	NA
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , and the sample is submitted to ARS or RP for hazard classification analysis.				<input checked="" type="checkbox"/>

These samples do not meet the criteria for classification in any hazard class according to regulation OSHA 29 CFR 1910.1200. The sample(s) contained in this shipment have been assigned a tentative proper DOT shipping name, hazard class, identification number, and packing group, based on the shipper's knowledge of the sample:

Hazard Assessment Completed	Date/Time
(Printed Name) <u>Allison Stanfield</u> (Signature) <u>[Signature]</u>	<u>2/7/18</u> <u>1440</u>

Hazard Assessment Reviewed	Date/Time
(Printed Name) <u>Renee Da Silva</u> (Signature) <u>[Signature]</u>	<u>2/7/18</u> <u>1440</u>

ER-SOP-10094, R1, Attachment 1

DATA VALIDATION REPORT

Chain Of Custody No. 2018-1639

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
443438	EPA:120.1	3				
443438	EPA:150.1	3				
443438	EPA:160.1	3				
443438	EPA:170.0	6		3		
443438	EPA:245.2	6				
443438	EPA:300.0	3				
443438	EPA:310.1	3				
443438	EPA:335.4	3				
443438	EPA:350.1	3				
443438	EPA:351.2	3				
443438	EPA:353.2	3				
443438	EPA:365.4	3				
443438	EPA:900	3				
443438	EPA:901.1	3				
443438	EPA:905.0	3				
443438	HASL-300:AM-241	3				
443438	HASL-300:ISOPU	3				
443438	HASL-300:ISOU	3				
443438	SM:A2340B	3				
443438	SW-846:6010C	3				
443438	SW-846:6020	3				
443438	SW-846:6850	3				
443438	SW-846:8260B	3		3		
443438	SW-846:8270D	3				
443438	SW-846:8330B	3				
443438	SW-846:9060	3				

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
443438	EPA:120.1	1738543	1738543	3										1			1				
443438	EPA:150.1	1737969	1737969	3										1			1				
443438	EPA:160.1	1738394	1738394	3					1					1			1				
443438	EPA:170.0	NA	NA	6		3															
443438	EPA:245.2	1739145	1739143	6					1	1				1			1				
443438	EPA:300.0	1738628	1738628	3					1					1			1				
443438	EPA:310.1	1737964	1737964	3						1				1			1				
443438	EPA:335.4	1737905	1737904	3					1	2				1			2				
443438	EPA:350.1	1738770	1738769	3					1	1				1			1				
443438	EPA:351.2	1738774	1738773	3					1	1				1			1				
443438	EPA:353.2	1738768	1738768	3					1					1			1				
443438	EPA:365.4	1738772	1738771	3					1	1				1			1				
443438	EPA:900	1738567	1738567	3					1	1	1			1			1				
443438	EPA:901.1	1738441	1738441	3					1					1			1				
443438	EPA:905.0	1738564	1738564	3					1	1				1			1				
443438	HASL-300:AM-241	1738205	1738205	3					1					1			1				
443438	HASL-300:AM-241	1738650	1738650						1					1			1				
443438	HASL-300:ISOPU	1738208	1738208	3					1					1			1				
443438	HASL-300:ISOPU	1738651	1738651						1					1			1				
443438	HASL-300:ISOU	1738211	1738211	3					1					1			1				
443438	HASL-300:ISOU	1738652	1738652						1					1			1				
443438	SM:A2340B	1745508	1745508	3																	
443438	SW-846:6010C	1738231	1738230	3					1	1				1			1				
443438	SW-846:6020	1738183	1738182	3					1	1				1			1				
443438	SW-846:6850	1738590	1738588	3					1	1	1			1							
443438	SW-846:8260B	1740473	1740473	3		3			2					4							
443438	SW-846:8270D	1738268	1738267	3					1	1	1			1							
443438	SW-846:8330B	1738503	1738498	3					1	1	1			1							
443438	SW-846:9060	1738436	1738436	3					1					1			1				

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-129	443438013	PEB	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-71	443438001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-74	443438005	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-77	443438009	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CrPZ-2-18-151284	1203969858	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203970773	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-129	443438013	PEB	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-71	443438001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-74	443438005	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-77	443438009	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-80	1203968361	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203968359	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-129	443438013	PEB	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-33	1203969495	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-71	443438001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-74	443438005	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-77	443438009	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203969494	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203969493	MB	1	0	0	0
EPA:170.0	VOC	CAWA-18-116	443438004	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-18-117	443438008	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-18-118	443438012	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-18-129	443438014	PEB	1	0	0	0
EPA:170.0	VOC	CAWA-18-71	443438001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-18-72	443438002	REG	1	0	0	0
EPA:170.0	VOC	CAWA-18-74	443438005	REG	1	0	0	0
EPA:170.0	VOC	CAWA-18-75	443438006	REG	1	0	0	0
EPA:170.0	VOC	CAWA-18-77	443438009	REG	1	0	0	0
EPA:170.0	VOC	CAWA-18-78	443438010	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-129	443438013	PEB	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-71	1203971527	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-71	1203971529	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-18-71	443438001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-72	443438002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-74	443438005	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-75	443438006	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-77	443438009	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-78	443438010	REG	1	0	0	0

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:245.2	INORGANIC	LCS	1203971526	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203971525	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-129	443438013	PEB	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-71	443438001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-74	443438005	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-77	443438009	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-80	1203970120	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203970119	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203970118	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-129	443438013	PEB	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-71	443438001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-74	443438005	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-77	443438009	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-80	1203968352	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-80	1203968356	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203968350	LCS	0	0	1	0
EPA:335.4	INORGANIC	CAWA-18-129	443438013	PEB	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-34	1203968145	DUP	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-34	1203968146	MS	0	0	1	0
EPA:335.4	INORGANIC	CAWA-18-72	443438002	REG	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-75	443438006	REG	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-78	443438010	REG	1	0	0	0
EPA:335.4	INORGANIC	LCS	1203968144	LCS	0	0	1	0
EPA:335.4	INORGANIC	MB	1203968143	MB	1	0	0	0
EPA:335.4	INORGANIC	NP160-18-150759	1203968934	DUP	1	0	0	0
EPA:335.4	INORGANIC	NP160-18-150759	1203968935	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-129	443438013	PEB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-71	1203970531	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-71	1203970532	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-71	443438001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-74	443438005	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-77	443438009	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203970530	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203970529	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-129	443438013	PEB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-72	1203970543	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-72	1203970544	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-72	443438002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-75	443438006	REG	1	0	0	0

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-78	443438010	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203970542	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203970541	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-129	443438013	PEB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-71	1203970527	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-71	443438001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-74	443438005	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-77	443438009	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203970526	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203970525	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-129	443438013	PEB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-71	1203970537	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-71	1203970539	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-71	443438001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-74	443438005	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-77	443438009	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203970536	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203970535	MB	1	0	0	0
EPA:900	RAD	CAWA-18-129	443438013	PEB	2	0	0	0
EPA:900	RAD	CAWA-18-4	1203969943	DUP	2	0	0	0
EPA:900	RAD	CAWA-18-4	1203969944	MS	0	0	2	0
EPA:900	RAD	CAWA-18-4	1203969945	MSD	0	0	2	0
EPA:900	RAD	CAWA-18-72	443438002	REG	2	0	0	0
EPA:900	RAD	CAWA-18-75	443438006	REG	2	0	0	0
EPA:900	RAD	CAWA-18-78	443438010	REG	2	0	0	0
EPA:900	RAD	LCS	1203969946	LCS	0	0	2	0
EPA:900	RAD	MB	1203969942	MB	2	0	0	0
EPA:901.1	RAD	CAWA-18-129	443438013	PEB	5	0	0	0
EPA:901.1	RAD	CAWA-18-72	1203969651	DUP	5	0	0	0
EPA:901.1	RAD	CAWA-18-72	443438002	REG	5	0	0	0
EPA:901.1	RAD	CAWA-18-75	443438006	REG	5	0	0	0
EPA:901.1	RAD	CAWA-18-78	443438010	REG	5	0	0	0
EPA:901.1	RAD	LCS	1203969652	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203969650	MB	5	0	0	0
EPA:905.0	RAD	CAWA-18-129	443438013	PEB	1	0	0	0
EPA:905.0	RAD	CAWA-18-34	1203969933	DUP	1	0	0	0
EPA:905.0	RAD	CAWA-18-34	1203969934	MS	0	0	1	0
EPA:905.0	RAD	CAWA-18-72	443438002	REG	1	0	0	0
EPA:905.0	RAD	CAWA-18-75	443438006	REG	1	0	0	0

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:905.0	RAD	CAWA-18-78	443438010	REG	1	0	0	0
EPA:905.0	RAD	LCS	1203969935	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203969932	MB	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-129	1203970191	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-129	443438013	PEB	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-72	1203969025	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-72	443438002	REG	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-75	443438006	REG	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-78	443438010	REG	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203969026	LCS	0	0	1	0
HASL-300:AM-241	RAD	LCS	1203970192	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203969024	MB	1	0	0	0
HASL-300:AM-241	RAD	MB	1203970190	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-129	1203970194	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-129	443438013	PEB	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-72	1203969033	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-72	443438002	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-75	443438006	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-78	443438010	REG	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203969034	LCS	0	0	1	0
HASL-300:ISOPU	RAD	LCS	1203970195	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203969032	MB	2	0	0	0
HASL-300:ISOPU	RAD	MB	1203970193	MB	2	0	0	0
HASL-300:ISOU	RAD	CAWA-18-129	1203970197	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-129	443438013	PEB	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-72	1203969041	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-72	443438002	REG	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-75	443438006	REG	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-78	443438010	REG	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203969042	LCS	0	0	1	0
HASL-300:ISOU	RAD	LCS	1203970198	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203969040	MB	3	0	0	0
HASL-300:ISOU	RAD	MB	1203970196	MB	3	0	0	0
SM:A2340B	INORGANIC	CAWA-18-129	443438013	PEB	1	0	0	0
SM:A2340B	INORGANIC	CAWA-18-71	443438001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-18-74	443438005	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-18-77	443438009	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-129	443438013	PEB	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-71	1203969081	DUP	17	0	0	0

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:6010C	INORGANIC	CAWA-18-71	1203969082	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-18-71	443438001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-74	443438005	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-77	443438009	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203969080	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203969079	MB	17	0	0	0
SW-846:6020	INORGANIC	CAWA-18-129	443438013	PEB	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-71	1203968960	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-71	1203968961	MS	0	0	11	0
SW-846:6020	INORGANIC	CAWA-18-71	443438001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-74	443438005	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-77	443438009	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203968959	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203968958	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-129	443438013	PEB	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-71	443438001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-74	443438005	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-77	443438009	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CrPZ-1-18-151275	1203970020	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CrPZ-1-18-151275	1203970021	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203970019	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203970018	MB	1	0	0	0
SW-846:8260B	VOC	CAWA-18-116	443438004	FTB	80	3	0	0
SW-846:8260B	VOC	CAWA-18-117	443438008	FTB	80	3	0	0
SW-846:8260B	VOC	CAWA-18-118	443438012	FTB	80	3	0	0
SW-846:8260B	VOC	CAWA-18-129	443438013	PEB	80	3	0	0
SW-846:8260B	VOC	CAWA-18-72	443438002	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-18-75	443438006	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-18-78	443438010	REG	80	3	0	0
SW-846:8260B	VOC	LCS	1203975096	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203975097	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203975098	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203975099	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203975094	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203975095	MB	80	3	0	0
SW-846:8270D	SVOC	CAWA-18-129	443438013	PEB	80	6	0	0
SW-846:8270D	SVOC	CAWA-18-72	443438002	REG	80	6	0	0
SW-846:8270D	SVOC	CAWA-18-75	443438006	REG	80	6	0	0
SW-846:8270D	SVOC	CAWA-18-78	443438010	REG	80	6	0	0

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8270D	SVOC	CAWA-18-81	1203969167	MS	0	6	76	0
SW-846:8270D	SVOC	CAWA-18-81	1203969168	MSD	0	6	76	0
SW-846:8270D	SVOC	LCS	1203969166	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203969165	MB	80	6	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-129	443438014	PEB	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-72	1203969748	MS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-72	1203969749	MSD	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-72	443438003	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-75	443438007	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-78	443438011	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203969747	LCS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	MB	1203969746	MB	23	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-129	443438013	PEB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-34	1203969630	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-72	443438002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-75	443438006	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-78	443438010	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203969628	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203969627	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203969079	METHOD BLANK	SW-846:6010C	W	Potassium	75.3	J	ug/L	150

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203970529	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0178	J	mg/L	0.050
CAWA-18-116	443438004	TRIP BLANK	EPA:170.0	W	Temperature	3		Deg C	
CAWA-18-117	443438008	TRIP BLANK	EPA:170.0	W	Temperature	3		Deg C	
CAWA-18-118	443438012	TRIP BLANK	EPA:170.0	W	Temperature	3		Deg C	

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAWA-18-71	1203970529	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0178	mg/L	0.0172	J	0.050	Y	5	100	Y
CAWA-18-74	1203970529	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0178	mg/L	0.037	J	0.050	Y	5	100	Y
CAWA-18-77	1203970529	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0178	mg/L	0.0767		0.050	Y	5	100	Y
CAWA-18-71	1203969079	METHOD BLANK	SW-846:6010C	Potassium	75.3	ug/L	1290		150	Y	5	100	Y
CAWA-18-74	1203969079	METHOD BLANK	SW-846:6010C	Potassium	75.3	ug/L	1370		150	Y	5	100	Y
CAWA-18-77	1203969079	METHOD BLANK	SW-846:6010C	Potassium	75.3	ug/L	703		150	Y	5	100	Y
CAWA-18-129	1203969079	METHOD BLANK	SW-846:6010C	Potassium	75.3	ug/L	97.8	J	150	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.0147	pCi/L	0.0147	pCi/L	0.0354	0.00755	W	02/07/2018		1738650	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.769	pCi/L	0.769	pCi/L	3.15	0.787	W	02/07/2018		1738441	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	-1.03	pCi/L	-1.03	pCi/L	3.44	0.979	W	02/07/2018		1738441	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	0.154	pCi/L	0.154	pCi/L	1.87	0.440	W	02/07/2018		1738567	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	2.36	pCi/L	2.36	pCi/L	2.61	0.858	W	02/07/2018		1738567	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-0.602	pCi/L	-0.602	pCi/L	6.11	1.68	W	02/07/2018		1738441	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00773	pCi/L	0.00773	pCi/L	0.0336	0.00947	W	02/07/2018		1738651	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.00193	pCi/L	0.00193	pCi/L	0.027	0.00842	W	02/07/2018		1738651	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	INORGANIC	SW-846:6010C	Potassium	J	U	I4	N	97.8	ug/L	0.0978	mg/L			W	02/07/2018		1738231	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-17.8	pCi/L	-17.8	pCi/L	44.4	13.2	W	02/07/2018		1738441	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	1.28	pCi/L	1.28	pCi/L	4.19	0.983	W	02/07/2018		1738441	VAL	Y

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.358	pCi/L	0.358	pCi/L	0.490	0.157	W	02/07/2018		1738564	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	HASL-300:ISOU	Uranium-234	U	U	R5	N	0.093	pCi/L	0.093	pCi/L	0.243	0.0295	W	02/07/2018		1738652	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0739	pCi/L	0.0739	pCi/L	0.137	0.0248	W	02/07/2018		1738652	VAL	Y
R-63	2018-1639	CAWA-18-129	PEB	INIT	RAD	HASL-300:ISOU	Uranium-238	U	U	R5	N	0.0208	pCi/L	0.0208	pCi/L	0.124	0.0158	W	02/07/2018		1738652	VAL	Y
R-48	2018-1639	CAWA-18-71	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	J	U	I4	N	0.0172	mg/L	0.0172	mg/L			W	02/07/2018		1738770	VAL	Y
R-48	2018-1639	CAWA-18-71	REG	INIT	INORGANIC	SW-846:6010C	Potassium		J+	I4a	Y	1290	ug/L	1.29	mg/L			W	02/07/2018		1738231	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.013	pCi/L	0.013	pCi/L	0.0438	0.0086	W	02/07/2018		1738205	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-1.61	pCi/L	-1.61	pCi/L	2.77	0.856	W	02/07/2018		1738441	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	0.543	pCi/L	0.543	pCi/L	3.27	0.780	W	02/07/2018		1738441	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	0.299	pCi/L	0.299	pCi/L	1.80	0.425	W	02/07/2018		1738567	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	0.874	pCi/L	0.874	pCi/L	2.94	0.870	W	02/07/2018		1738567	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	1.97	pCi/L	1.97	pCi/L	6.63	1.74	W	02/07/2018		1738441	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.0142	pCi/L	0.0142	pCi/L	0.0353	0.00837	W	02/07/2018		1738208	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00609	pCi/L	-0.00609	pCi/L	0.0284	0.00609	W	02/07/2018		1738208	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-9.37	pCi/L	-9.37	pCi/L	43.4	11.9	W	02/07/2018		1738441	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.154	pCi/L	0.154	pCi/L	3.37	1.02	W	02/07/2018		1738441	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.224	pCi/L	0.224	pCi/L	0.311	0.0954	W	02/07/2018		1738564	VAL	Y
R-48	2018-1639	CAWA-18-72	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0322	pCi/L	0.0322	pCi/L	0.075	0.0139	W	02/07/2018		1738211	VAL	Y
R-58	2018-1639	CAWA-18-74	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	J	U	I4	N	0.037	mg/L	0.037	mg/L			W	02/07/2018		1738770	VAL	Y
R-58	2018-1639	CAWA-18-74	REG	INIT	INORGANIC	SW-846:6010C	Potassium		J+	I4a	Y	1370	ug/L	1.37	mg/L			W	02/07/2018		1738231	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00198	pCi/L	0.00198	pCi/L	0.0335	0.00443	W	02/07/2018		1738205	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.00275	pCi/L	0.00275	pCi/L	3.29	0.899	W	02/07/2018		1738441	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	-0.356	pCi/L	-0.356	pCi/L	3.43	0.908	W	02/07/2018		1738441	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	0.707	pCi/L	0.707	pCi/L	1.73	0.517	W	02/07/2018		1738567	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	0.471	pCi/L	0.471	pCi/L	1.79	0.516	W	02/07/2018		1738567	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	2.34	pCi/L	2.34	pCi/L	5.69	1.55	W	02/07/2018		1738441	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.0164	pCi/L	0.0164	pCi/L	0.0316	0.00603	W	02/07/2018		1738208	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00000000	pCi/L	-0.000000001	pCi/L	0.0254	0.0068	W	02/07/2018		1738208	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-20.5	pCi/L	-20.5	pCi/L	43.1	12.9	W	02/07/2018		1738441	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.357	pCi/L	0.357	pCi/L	2.92	0.766	W	02/07/2018		1738441	VAL	Y
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.24	pCi/L	-0.24	pCi/L	0.489	0.120	W	02/07/2018		1738564	VAL	Y

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-58	2018-1639	CAWA-18-75	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0211	pCi/L	0.0211	pCi/L	0.0881	0.0163	W	02/07/2018		1738211	VAL	Y
R-63	2018-1639	CAWA-18-77	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N	0.0767	mg/L	0.0767	mg/L			W	02/07/2018		1738770	VAL	Y
R-63	2018-1639	CAWA-18-77	REG	INIT	INORGANIC	SW-846:6010C	Potassium		J+	I4a	Y	703	ug/L	0.703	mg/L			W	02/07/2018		1738231	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00716	pCi/L	0.00716	pCi/L	0.0303	0.00566	W	02/07/2018		1738205	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.266	pCi/L	0.266	pCi/L	3.43	0.917	W	02/07/2018		1738441	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	1.59	pCi/L	1.59	pCi/L	4.08	0.891	W	02/07/2018		1738441	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	-0.173	pCi/L	-0.173	pCi/L	2.29	0.437	W	02/07/2018		1738567	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	0.818	pCi/L	0.818	pCi/L	1.80	0.543	W	02/07/2018		1738567	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-1.46	pCi/L	-1.46	pCi/L	6.65	2.10	W	02/07/2018		1738441	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00714	pCi/L	0.00714	pCi/L	0.031	0.00619	W	02/07/2018		1738208	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00179	pCi/L	-0.00179	pCi/L	0.025	0.00692	W	02/07/2018		1738208	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-33.8	pCi/L	-33.8	pCi/L	45.5	13.9	W	02/07/2018		1738441	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.12	pCi/L	0.12	pCi/L	2.64	0.681	W	02/07/2018		1738441	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.151	pCi/L	0.151	pCi/L	0.405	0.122	W	02/07/2018		1738564	VAL	Y
R-63	2018-1639	CAWA-18-78	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0288	pCi/L	0.0288	pCi/L	0.100	0.0152	W	02/07/2018		1738211	VAL	Y

Reason Code

Description

I4	the sample result is =<5x the concentration of related analyte in the method blank.
I4a	The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x
J_LAB	The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL
NQ	The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualfire. The analyte is detected in the sample.
R5	Analyte is not detected because the amount reported is less than the MDC.
U_LAB	The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-116	R-48	FTB	EPA:170.0	0	1

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-116	R-48	FTB	SW-846:8260B	0	80
CAWA-18-117	R-58	FTB	EPA:170.0	0	1
CAWA-18-117	R-58	FTB	SW-846:8260B	0	80
CAWA-18-118	R-63	FTB	EPA:170.0	0	1
CAWA-18-118	R-63	FTB	SW-846:8260B	0	80
CAWA-18-129	R-63	PEB	EPA:120.1	0	1
CAWA-18-129	R-63	PEB	EPA:150.1	0	1
CAWA-18-129	R-63	PEB	EPA:160.1	0	1
CAWA-18-129	R-63	PEB	EPA:170.0	0	1
CAWA-18-129	R-63	PEB	EPA:245.2	0	1
CAWA-18-129	R-63	PEB	EPA:300.0	0	4
CAWA-18-129	R-63	PEB	EPA:310.1	0	2
CAWA-18-129	R-63	PEB	EPA:335.4	0	1
CAWA-18-129	R-63	PEB	EPA:350.1	0	1
CAWA-18-129	R-63	PEB	EPA:351.2	0	1
CAWA-18-129	R-63	PEB	EPA:353.2	0	1
CAWA-18-129	R-63	PEB	EPA:365.4	0	1
CAWA-18-129	R-63	PEB	EPA:900	0	2
CAWA-18-129	R-63	PEB	EPA:901.1	0	5
CAWA-18-129	R-63	PEB	EPA:905.0	0	1
CAWA-18-129	R-63	PEB	HASL-300:AM-241	0	1
CAWA-18-129	R-63	PEB	HASL-300:ISOPU	0	2
CAWA-18-129	R-63	PEB	HASL-300:ISOU	0	3
CAWA-18-129	R-63	PEB	SM:A2340B	0	1
CAWA-18-129	R-63	PEB	SW-846:6010C	0	17
CAWA-18-129	R-63	PEB	SW-846:6020	0	11
CAWA-18-129	R-63	PEB	SW-846:6850	0	1
CAWA-18-129	R-63	PEB	SW-846:8260B	0	80
CAWA-18-129	R-63	PEB	SW-846:8270D	0	80
CAWA-18-129	R-63	PEB	SW-846:8330B	0	23
CAWA-18-129	R-63	PEB	SW-846:9060	0	1
CAWA-18-71	R-48	REG	EPA:120.1	0	1
CAWA-18-71	R-48	REG	EPA:150.1	0	1
CAWA-18-71	R-48	REG	EPA:160.1	0	1
CAWA-18-71	R-48	REG	EPA:170.0	0	1
CAWA-18-71	R-48	REG	EPA:245.2	0	1

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-71	R-48	REG	EPA:300.0	0	4
CAWA-18-71	R-48	REG	EPA:310.1	0	2
CAWA-18-71	R-48	REG	EPA:350.1	0	1
CAWA-18-71	R-48	REG	EPA:353.2	0	1
CAWA-18-71	R-48	REG	EPA:365.4	0	1
CAWA-18-71	R-48	REG	SM:A2340B	0	1
CAWA-18-71	R-48	REG	SW-846:6010C	0	17
CAWA-18-71	R-48	REG	SW-846:6020	0	11
CAWA-18-71	R-48	REG	SW-846:6850	0	1
CAWA-18-72	R-48	REG	EPA:170.0	0	1
CAWA-18-72	R-48	REG	EPA:245.2	0	1
CAWA-18-72	R-48	REG	EPA:335.4	0	1
CAWA-18-72	R-48	REG	EPA:351.2	0	1
CAWA-18-72	R-48	REG	EPA:900	0	2
CAWA-18-72	R-48	REG	EPA:901.1	0	5
CAWA-18-72	R-48	REG	EPA:905.0	0	1
CAWA-18-72	R-48	REG	HASL-300:AM-241	0	1
CAWA-18-72	R-48	REG	HASL-300:ISOPU	0	2
CAWA-18-72	R-48	REG	HASL-300:ISOU	0	3
CAWA-18-72	R-48	REG	SW-846:8260B	0	80
CAWA-18-72	R-48	REG	SW-846:8270D	0	80
CAWA-18-72	R-48	REG	SW-846:8330B	0	23
CAWA-18-72	R-48	REG	SW-846:9060	0	1
CAWA-18-74	R-58	REG	EPA:120.1	0	1
CAWA-18-74	R-58	REG	EPA:150.1	0	1
CAWA-18-74	R-58	REG	EPA:160.1	0	1
CAWA-18-74	R-58	REG	EPA:170.0	0	1
CAWA-18-74	R-58	REG	EPA:245.2	0	1
CAWA-18-74	R-58	REG	EPA:300.0	0	4
CAWA-18-74	R-58	REG	EPA:310.1	0	2
CAWA-18-74	R-58	REG	EPA:350.1	0	1
CAWA-18-74	R-58	REG	EPA:353.2	0	1
CAWA-18-74	R-58	REG	EPA:365.4	0	1
CAWA-18-74	R-58	REG	SM:A2340B	0	1
CAWA-18-74	R-58	REG	SW-846:6010C	0	17
CAWA-18-74	R-58	REG	SW-846:6020	0	11

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-74	R-58	REG	SW-846:6850	0	1
CAWA-18-75	R-58	REG	EPA:170.0	0	1
CAWA-18-75	R-58	REG	EPA:245.2	0	1
CAWA-18-75	R-58	REG	EPA:335.4	0	1
CAWA-18-75	R-58	REG	EPA:351.2	0	1
CAWA-18-75	R-58	REG	EPA:900	0	2
CAWA-18-75	R-58	REG	EPA:901.1	0	5
CAWA-18-75	R-58	REG	EPA:905.0	0	1
CAWA-18-75	R-58	REG	HASL-300:AM-241	0	1
CAWA-18-75	R-58	REG	HASL-300:ISOPU	0	2
CAWA-18-75	R-58	REG	HASL-300:ISOU	0	3
CAWA-18-75	R-58	REG	SW-846:8260B	0	80
CAWA-18-75	R-58	REG	SW-846:8270D	0	80
CAWA-18-75	R-58	REG	SW-846:8330B	0	23
CAWA-18-75	R-58	REG	SW-846:9060	0	1
CAWA-18-77	R-63	REG	EPA:120.1	0	1
CAWA-18-77	R-63	REG	EPA:150.1	0	1
CAWA-18-77	R-63	REG	EPA:160.1	0	1
CAWA-18-77	R-63	REG	EPA:170.0	0	1
CAWA-18-77	R-63	REG	EPA:245.2	0	1
CAWA-18-77	R-63	REG	EPA:300.0	0	4
CAWA-18-77	R-63	REG	EPA:310.1	0	2
CAWA-18-77	R-63	REG	EPA:350.1	0	1
CAWA-18-77	R-63	REG	EPA:353.2	0	1
CAWA-18-77	R-63	REG	EPA:365.4	0	1
CAWA-18-77	R-63	REG	SM:A2340B	0	1
CAWA-18-77	R-63	REG	SW-846:6010C	0	17
CAWA-18-77	R-63	REG	SW-846:6020	0	11
CAWA-18-77	R-63	REG	SW-846:6850	0	1
CAWA-18-78	R-63	REG	EPA:170.0	0	1
CAWA-18-78	R-63	REG	EPA:245.2	0	1
CAWA-18-78	R-63	REG	EPA:335.4	0	1
CAWA-18-78	R-63	REG	EPA:351.2	0	1
CAWA-18-78	R-63	REG	EPA:900	0	2
CAWA-18-78	R-63	REG	EPA:901.1	0	5
CAWA-18-78	R-63	REG	EPA:905.0	0	1

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-78	R-63	REG	HASL-300:AM-241	0	1
CAWA-18-78	R-63	REG	HASL-300:ISOPU	0	2
CAWA-18-78	R-63	REG	HASL-300:ISOU	0	3
CAWA-18-78	R-63	REG	SW-846:8260B	0	80
CAWA-18-78	R-63	REG	SW-846:8270D	0	80
CAWA-18-78	R-63	REG	SW-846:8330B	0	23
CAWA-18-78	R-63	REG	SW-846:9060	0	1

March 08, 2018

Ms. Nita Patel
Los Alamos National Laboratory
TA-00, SM1237, Rm104C
Los Alamos, New Mexico 87545

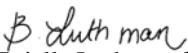
Re: LANL- WQH Water Samples
Work Order: 443438
SDG: 2018-1639

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on February 09, 2018, and analyzed for Explosives by LCMSMS, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. 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,


Brielle Luthman for
Valerie Davis
Project Manager

Chain of Custody: 2018-1639
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 443438
SDG: 2018-1639

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	5
Data Review Qualifier Flag Definition Sheet.....	11
Volatile Analysis.....	14
Case Narrative.....	15
Sample Data Summary.....	20
Quality Control Summary.....	42
Quality Control Data.....	66
Semi-Volatile Analysis.....	97
Case Narrative.....	98
Sample Data Summary.....	104
Quality Control Summary.....	117
Quality Control Data.....	132
Perchlorates by LCMSMS Analysis.....	145
Case Narrative.....	146
Sample Data Summary.....	152
Quality Control Summary.....	157
Quality Control Data.....	160
Explosives by LCMSMS Analysis.....	166
Case Narrative.....	167

Sample Data Summary.....	172
Quality Control Summary.....	181
Quality Control Data.....	185
Metals Analysis.....	208
Case Narrative.....	209
Sample Data Summary.....	215
Quality Control Summary.....	231
General Chem Analysis.....	245
Case Narrative.....	246
Sample Data Summary.....	277
Quality Control Summary.....	289
Radiological Analysis.....	296
Case Narrative.....	297
Sample Data Summary.....	317
Quality Control Summary.....	326

Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 443438
SDG # : 2018-1639**

March 08, 2018

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 February 09, 2018 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 temperatures were checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
443438001	CAWA-18-71
443438002	CAWA-18-72
443438003	CAWA-18-72
443438004	CAWA-18-116
443438005	CAWA-18-74
443438006	CAWA-18-75
443438007	CAWA-18-75
443438008	CAWA-18-117
443438009	CAWA-18-77
443438010	CAWA-18-78
443438011	CAWA-18-78
443438012	CAWA-18-118
443438013	CAWA-18-129
443438014	CAWA-18-129

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: Explosives by LCMSMS, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry.

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.


Brielle Luthman for
Valerie Davis
Project Manager

List of current GEL Certifications as of 08 March 2018

State	Certification
Alaska	17-018
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	LA180011
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
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
Puerto Rico	SC00012
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-18-13
Utah NELAP	SC000122017-25
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>443438</u>	
Received By: <u>ZKW</u>		Date Received: <u>2/9/10</u>	
Carrier and Tracking Number		Circle Applicable: FedEx Express <u>5908 1783</u> FedEx Ground <u>4012-3c</u> UPS <u>4023-2c</u> Field Services <u>4797-2c</u> Courier <u>4801-3c</u> Other <u>4786-15c</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> <u>CPM</u> mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos 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 ≤ deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Wet ice <u>Ice Packs</u> Dry ice <u>None</u> Other: _____ *all temperatures are recorded in Celsius TEMP: <u>See Above</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 ___ No <input checked="" type="checkbox"/> N/A ___ Sample ID's and containers affected: <u>Both Vials for -18-72 rec'd w/headspace</u>
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: <u>See Below</u>
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):
We rec'd CWA-18-129 collected 2/7 @ 0900 not on any COC for:
CN, NH₃+NO₃/NO₂+PO₄, TKW+TDC, Perchlorate, Metals, GAB, RAD,
HEX, SVOA, 1/2 VOA

PM (or PMA) review: Initials TMC Date 2/12/18 Page 1 of 1

GL-CHL-SR-001 Rev 5

A
4823
02.09

SHIP DATE: 08FEB18
ACTWGT: 43.0 LB. MAN
CAD: 0014178/CAFE2916

ORIGIN ID: SAFA (505) 865-9966

KEITH GREENE
LOS ALAMOS NATL LAB,
1800 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

BILL SENDER

TO
VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

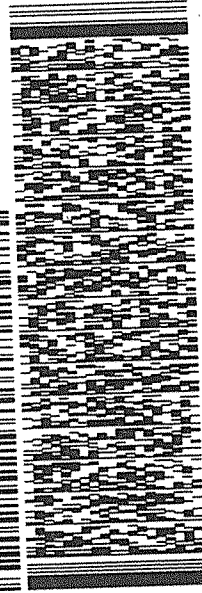
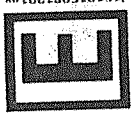
2c

CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO

FedEx
Express



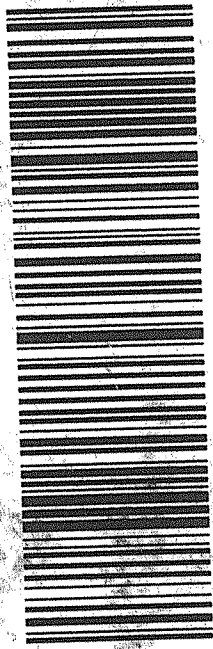
FRI - 09 FEB 10:30A
PRIORITY OVERNIGHT

2 of 2
MPS# **5908 1783 4823**
Mstr# **5908 1783 4812**

0201

X7 RBWA

29407
SC-US CHS

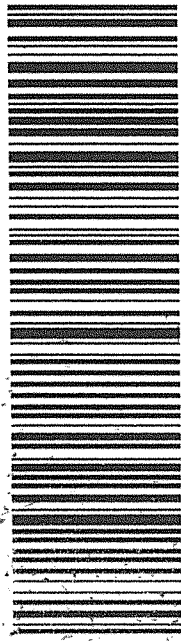


171

FRI - 09 FEB 10:30A
5908 1783 4812 PRIORITY OVERNIGHT

THK#
0201

X7 RBWA
3c
29407
SC-US CHS



567853 09Feb 00:18 MEMH 547C1/122D/A17C

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

SHIP DATE: 08FEB18
 ACTWGT: 47.0 LB MAN
 CAD: 0014176/CAFE2916

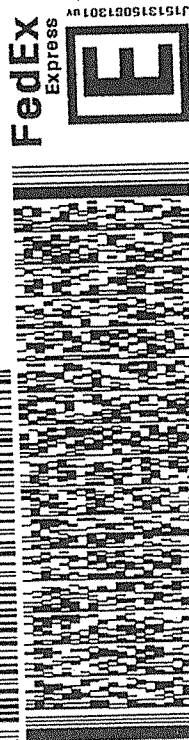
BILL SENDER

TO VALERIE DAVIS
 GENERAL ENGINEERING LAB
 2040 SAVAGE RD
 CHARLESTON SC 29407

(843) 556-8171
 REF: 21PDOASRGW04BAGWEO

538C1/122D/3298

20c



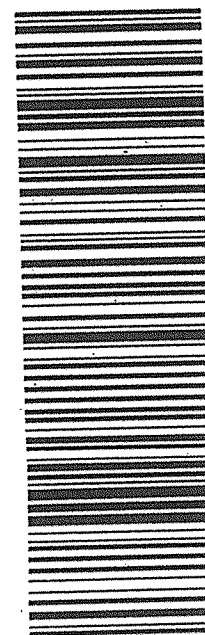
2 of 3
 FRI - 09 FEB 10:30A
 PRIORITY OVERNIGHT

MPS# 5908 1783 4797
 Mstr# 5908 1783 4786

0201

X7 RBWA

29407
 CHS
 SC-US



Part # 156148V-434 R1T2 EXP 02/18

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

SHIP DATE: 08FEB18
 ACTWGT: 48.0 LB MAN
 CAD: 0014176/CAFE2916

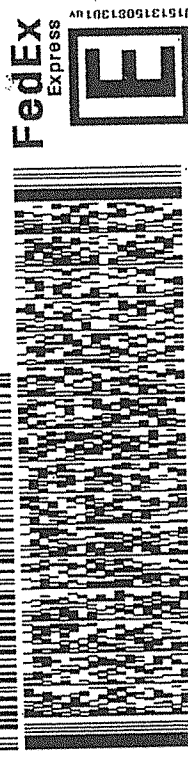
BILL SENDER

TO VALERIE DAVIS
 GENERAL ENGINEERING LAB
 2040 SAVAGE RD
 CHARLESTON SC 29407

(843) 556-8171
 REF: 21PDOASRGW04BAGWEO

538C1/122D/3298

15c

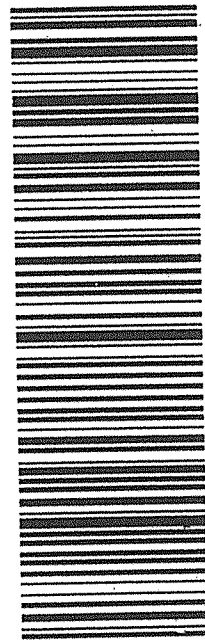


1 of 3
 FRI - 09 FEB 10:30A
 PRIORITY OVERNIGHT

TRK# 5908 1783 4786
 0201
 ## MASTER ##

X7 RBWA

29407
 CHS
 SC-US



Part # 156148V-434 R1T2 EXP 02/18

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: 08FEB18
ACTWGT: 46.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

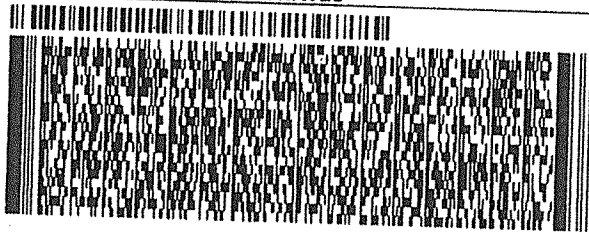
CHARLESTON SC 29407

(843) 668-8171

REF: 21PD0ASRGW04BAGWE0

3c

538C1/122D/3298



FedEx
Express



J151315061201W

3 of 3

MPS# 5908 1783 4801
0263

Mstr# 5908 1783 4786

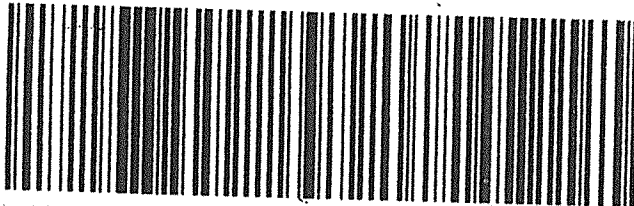
0201

FRI - 09 FEB 10:30A
PRIORITY OVERNIGHT

29407

SC-US CHS

X7 RBWA



Part # 156148V-434 Rnt2 EXP 02/18

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 #: 2018-1639
Work Order #: 443438**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch Number: 1740473

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
443438002	CAWA-18-72
443438004	CAWA-18-116
443438006	CAWA-18-75
443438008	CAWA-18-117
443438010	CAWA-18-78
443438012	CAWA-18-118
443438013	CAWA-18-129
1203975094	Method Blank (MB)
1203975095	Method Blank (MB)
1203975096	Laboratory Control Sample (LCS)
1203975097	Laboratory Control Sample (LCS)
1203975098	Laboratory Control Sample (LCS)
1203975099	Laboratory Control Sample (LCS)
1203975100	443794006(CAWA-18-51) Post Spike (PS)
1203975101	443794006(CAWA-18-51) Post Spike (PS)
1203975102	443794006(CAWA-18-51) Post Spike Duplicate (PSD)
1203975103	443794006(CAWA-18-51) 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 blanks 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 443794006 (CAWA-18-51) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the required acceptance limits.

Relative Percent Difference (RPD) Statement

The RPDs between the matrix spike pair met the acceptance limits.

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

Sample 443438002 (CAWA-18-72) contained head-space greater than pea size. The Project Manager was notified and the results are reported.

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

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 443438002 (CAWA-18-72), 443438004 (CAWA-18-116), 443438006 (CAWA-18-75), 443438008 (CAWA-18-117), 443438010 (CAWA-18-78), 443438012 (CAWA-18-118) and 443438013 (CAWA-18-129) 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
VOA9.I	Agilent 6890/5973 GC/MS w/ OI Eclipse/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: 2018-1639 GEL Work Order: 443438

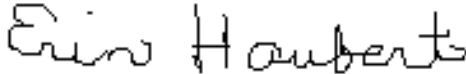
The Qualifiers in this report are defined as follows:

- * 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: Erin Haubert

Date: 07 MAR 2018

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438002

Date Collected: 02/07/2018 11:37

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-72

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 21:32

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 21:32

Column: DB-624

Data File: 021918V9\9G126.D

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438002

Date Collected: 02/07/2018 11:37

Date Received: 02/09/2018 08:55

Matrix: W

Client ID: CAWA-18-72

Batch ID: 1740473

Run Date: 02/19/2018 21:32

Prep Date: 02/19/2018 21:32

Data File: 021918V9\9G126.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438002

Date Collected: 02/07/2018 11:37

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 21:32

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 21:32

Data File: 021918V9\9G126.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	55.8	50.0	ug/L 112	(71%-134%)
Bromofluorobenzene	52.6	50.0	ug/L 105	(70%-131%)
Toluene-d8	54.4	50.0	ug/L 109	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	5.52	ug/L	0	J
	unknown siloxane	14.651	16.1	ug/L	0	J
	unknown siloxane	16.62	5.9	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438004

Date Collected: 02/07/2018 11:37

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-116

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 20:35

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 20:35

Data File: 021918V9\9G124.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438004

Date Collected: 02/07/2018 11:37

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 20:35

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 20:35

Data File: 021918V9\9G124.D

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438004

Date Collected: 02/07/2018 11:37

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 20:35

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 20:35

Data File: 021918V9\9G124.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	54.6	50.0	ug/L 109	(71%-134%)
Bromofluorobenzene	51.1	50.0	ug/L 102	(70%-131%)
Toluene-d8	52.7	50.0	ug/L 105	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	10.3	ug/L	0	J
	unknown siloxane	14.652	29.7	ug/L	0	J
	unknown siloxane	16.62	9.03	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438006

Date Collected: 02/07/2018 11:32

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-75

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 22:00

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 22:00

Column: DB-624

Data File: 021918V9\9G127.D

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438006

Date Collected: 02/07/2018 11:32

Date Received: 02/09/2018 08:55

Matrix: W

Client ID: CAWA-18-75

Batch ID: 1740473

Run Date: 02/19/2018 22:00

Prep Date: 02/19/2018 22:00

Data File: 021918V9\9G127.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1639

Lab Sample ID: 443438006

Date Collected: 02/07/2018 11:32

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 22:00

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 22:00

Data File: 021918V9\9G127.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.9	50.0	ug/L 108	(71%-134%)
Bromofluorobenzene	51.8	50.0	ug/L 104	(70%-131%)
Toluene-d8	53.1	50.0	ug/L 106	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.291	12.1	ug/L	0	J
	unknown siloxane	14.651	23.1	ug/L	0	J
	unknown siloxane	16.62	7.71	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438008

Date Collected: 02/07/2018 11:32

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-117

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 21:03

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 21:03

Column: DB-624

Data File: 021918V9\9G125.D

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438008

Date Collected: 02/07/2018 11:32

Date Received: 02/09/2018 08:55

Matrix: W

Client ID: CAWA-18-117

Batch ID: 1740473

Run Date: 02/19/2018 21:03

Prep Date: 02/19/2018 21:03

Data File: 021918V9\9G125.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1639

Lab Sample ID: 443438008

Date Collected: 02/07/2018 11:32

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 21:03

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 21:03

Data File: 021918V9\9G125.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	55.2	50.0	ug/L 110	(71%-134%)
Bromofluorobenzene	52.0	50.0	ug/L 104	(70%-131%)
Toluene-d8	53.8	50.0	ug/L 108	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.291	11.8	ug/L	0	J
	unknown siloxane	14.651	38.7	ug/L	0	J
	unknown siloxane	16.62	10.8	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438010

Date Collected: 02/07/2018 13:16

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-78

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 22:29

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 22:29

Column: DB-624

Data File: 021918V9\9G128.D

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438010

Date Collected: 02/07/2018 13:16

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 22:29

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 22:29

Data File: 021918V9\9G128.D

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438010

Date Collected: 02/07/2018 13:16

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/19/2018 22:29

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/19/2018 22:29

Data File: 021918V9\9G128.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	56.9	50.0	ug/L 114	(71%-134%)
Bromofluorobenzene	52.6	50.0	ug/L 105	(70%-131%)
Toluene-d8	53.8	50.0	ug/L 108	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.291	6.3	ug/L	0	J
	unknown siloxane	14.651	16.8	ug/L	0	J
	unknown siloxane	16.62	6.93	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438012

Date Collected: 02/07/2018 13:16

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-118

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/20/2018 13:48

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/20/2018 13:48

Data File: 022018V9\9G208.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438012

Date Collected: 02/07/2018 13:16

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/20/2018 13:48

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/20/2018 13:48

Data File: 022018V9\9G208.D

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438012

Date Collected: 02/07/2018 13:16

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-118

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/20/2018 13:48

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/20/2018 13:48

Column: DB-624

Data File: 022018V9\9G208.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.8	50.0	ug/L 108	(71%-134%)
Bromofluorobenzene	51.4	50.0	ug/L 103	(70%-131%)
Toluene-d8	53.2	50.0	ug/L 106	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.291	8.89	ug/L	0	J
	unknown siloxane	14.651	14.7	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438013

Date Collected: 02/07/2018 09:00

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Batch ID: 1740473

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Run Date: 02/20/2018 15:44

Inst: VOA9.I

Dilution: 1

Prep Date: 02/20/2018 15:44

Analyst: RXY1

Purge Vol: 5 mL

Data File: 022018V9\9G212.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	J	3.25	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438013

Date Collected: 02/07/2018 09:00

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Method: SW-846:8260B

Project: ESHL00114

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/20/2018 15:44

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/20/2018 15:44

Data File: 022018V9\9G212.D

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438013

Date Collected: 02/07/2018 09:00

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-129

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/20/2018 15:44

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/20/2018 15:44

Column: DB-624

Data File: 022018V9\9G212.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	55.2	50.0	ug/L 110	(71%-134%)
Bromofluorobenzene	51.9	50.0	ug/L 104	(70%-131%)
Toluene-d8	54.0	50.0	ug/L 108	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	7.69	ug/L	0	J
	unknown siloxane	14.651	8.53	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-1639**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203975096	LCS for batch 1740473	105	106	101
1203975097	LCS for batch 1740473	105	108	102
1203975094	MB for batch 1740473	106	105	103
443438004	CAWA-18-116	109	105	102
443438008	CAWA-18-117	110	108	104
443438002	CAWA-18-72	112	109	105
443438006	CAWA-18-75	108	106	104
443438010	CAWA-18-78	114	108	105
1203975098	LCS for batch 1740473	103	106	105
1203975099	LCS for batch 1740473	105	105	101
1203975095	MB for batch 1740473	108	106	104
443438012	CAWA-18-118	108	106	103
443438013	CAWA-18-129	110	108	104
1203975100	CAWA-18-51PS	109	107	105
1203975102	CAWA-18-51PSD	107	107	104
1203975101	CAWA-18-51PS	107	106	103
1203975103	CAWA-18-51PSD	107	107	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: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975096

Instrument: VOA9.I

Analysis Date: 02/19/2018 12:55

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

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	107	107	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1310	105	61-125
67-64-1	LCS Acetone	250	0.0	343	137	48-157
74-88-4	LCS Iodomethane	250	0.0	222	89	72-128
75-15-0	LCS Carbon disulfide	250	0.0	248	99	69-138
108-05-4	LCS Vinyl acetate	250	0.0	282	113	67-125
78-93-3	LCS 2-Butanone	250	0.0	311	124	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	280	112	66-124
591-78-6	LCS 2-Hexanone	250	0.0	330	132	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	49.5	99	40-160
74-87-3	LCS Chloromethane	50.0	0.0	57.6	115	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	58.8	118	65-137
74-83-9	LCS Bromomethane	50.0	0.0	50.0	100	63-137
75-00-3	LCS Chloroethane	50.0	0.0	53.2	106	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	51.6	103	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	52.3	105	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	53.7	107	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	47.9	96	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	50.1	100	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	53.9	108	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	53.2	106	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	53.4	107	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975096

Instrument: VOA9.I

Analysis Date: 02/19/2018 12:55

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	54.2	108	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	47.6	95	76-125
67-66-3	LCS Chloroform	50.0	0.0	50.8	102	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	50.9	102	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	52.3	105	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	51.6	103	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	52.4	105	74-122
71-43-2	LCS Benzene	50.0	0.0	51.2	102	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	51.8	104	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	52.0	104	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	50.1	100	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	53.2	106	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	52.9	106	78-131
108-88-3	LCS Toluene	50.0	0.0	52.9	106	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	59.0	118	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	54.4	109	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	52.7	105	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	50.6	101	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	55.1	110	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	53.0	106	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	50.7	101	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	52.6	105	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975096

Instrument: VOA9.I

Analysis Date: 02/19/2018 12:55

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	LCS o-Xylene	50.0	0.0	52.4	105	74-126
100-42-5	LCS Styrene	50.0	0.0	51.7	103	72-130
75-25-2	LCS Bromoform	50.0	0.0	47.2	94	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	53.0	106	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	54.4	109	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	53.2	106	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	49.1	98	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	52.9	106	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	53.4	107	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	51.8	104	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	52.1	104	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	54.1	108	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	52.6	105	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	54.0	108	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	53.2	106	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	48.5	97	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	49.6	99	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	53.7	107	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	46.5	93	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	54.9	110	72-136
91-20-3	LCS Naphthalene	50.0	0.0	55.5	111	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	55.1	110	70-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975096

Instrument: VOA9.I

Analysis Date: 02/19/2018 12:55

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	54.3	109	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	56.3	113	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	48.3	97	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5780	116	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975097

Instrument: VOA9.I

Analysis Date: 02/19/2018 13:53

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS	Acrolein	250	0.0	275	110	60-140
76-13-1	LCS	Trichlorotrifluoroethane	250	0.0	260	104	61-148
107-05-1	LCS	Allyl chloride	250	0.0	267	107	59-125
107-13-1	LCS	Acrylonitrile	250	0.0	267	107	65-122
107-12-0	LCS	Propionitrile	250	0.0	260	104	64-124
126-98-7	LCS	Methacrylonitrile	250	0.0	268	107	64-126
80-62-6	LCS	Methyl methacrylate	250	0.0	250	100	69-127
97-63-2	LCS	Ethyl methacrylate	250	0.0	262	105	66-130
78-83-1	LCS	Isobutyl alcohol	2500	0.0	2540	102	65-135
126-99-8	LCS	2-Chloro-1,3-butadiene	50.0	0.0	52.0	104	66-147

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975098

Instrument: VOA9.I

Analysis Date: 02/20/2018 11:53

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

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	107	107	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1250	100	61-125
67-64-1	LCS Acetone	250	0.0	326	130	48-157
74-88-4	LCS Iodomethane	250	0.0	223	89	72-128
75-15-0	LCS Carbon disulfide	250	0.0	245	98	69-138
108-05-4	LCS Vinyl acetate	250	0.0	275	110	67-125
78-93-3	LCS 2-Butanone	250	0.0	299	120	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	271	108	66-124
591-78-6	LCS 2-Hexanone	250	0.0	320	128	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	49.2	98	40-160
74-87-3	LCS Chloromethane	50.0	0.0	56.5	113	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	57.6	115	65-137
74-83-9	LCS Bromomethane	50.0	0.0	49.9	100	63-137
75-00-3	LCS Chloroethane	50.0	0.0	53.5	107	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	52.0	104	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.7	103	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	52.9	106	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	46.9	94	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	50.0	100	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	53.8	108	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	52.9	106	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	53.3	107	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975098

Instrument: VOA9.I

Analysis Date: 02/20/2018 11:53

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	54.2	108	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	47.6	95	76-125
67-66-3	LCS Chloroform	50.0	0.0	50.3	101	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	51.0	102	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	52.1	104	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	51.2	102	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	51.5	103	74-122
71-43-2	LCS Benzene	50.0	0.0	51.0	102	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	51.8	104	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	51.8	104	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	49.2	98	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	53.1	106	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	53.2	106	78-131
108-88-3	LCS Toluene	50.0	0.0	52.4	105	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	57.9	116	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	52.7	105	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	51.4	103	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	50.5	101	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	54.3	109	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	52.3	105	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	50.3	101	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	51.5	103	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975098

Instrument: VOA9.I

Analysis Date: 02/20/2018 11:53

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	LCS o-Xylene	50.0	0.0	51.8	104	74-126
100-42-5	LCS Styrene	50.0	0.0	51.5	103	72-130
75-25-2	LCS Bromoform	50.0	0.0	48.3	97	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	53.6	107	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	55.9	112	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	53.8	108	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	50.3	101	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	54.0	108	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	55.0	110	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	52.8	106	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	53.1	106	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	54.4	109	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	53.5	107	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	54.4	109	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	53.8	108	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	49.4	99	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	50.7	101	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	54.7	109	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	47.5	95	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	55.1	110	72-136
91-20-3	LCS Naphthalene	50.0	0.0	56.1	112	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	55.9	112	70-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975098

Instrument: VOA9.I

Analysis Date: 02/20/2018 11:53

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	55.5	111	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	54.9	110	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	49.1	98	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5550	111	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975099

Instrument: VOA9.I

Analysis Date: 02/20/2018 12:51

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS	Acrolein	250	0.0	291	116	60-140
76-13-1	LCS	Trichlorotrifluoroethane	250	0.0	259	104	61-148
107-05-1	LCS	Allyl chloride	250	0.0	272	109	59-125
107-13-1	LCS	Acrylonitrile	250	0.0	285	114	65-122
107-12-0	LCS	Propionitrile	250	0.0	279	112	64-124
126-98-7	LCS	Methacrylonitrile	250	0.0	283	113	64-126
80-62-6	LCS	Methyl methacrylate	250	0.0	269	108	69-127
97-63-2	LCS	Ethyl methacrylate	250	0.0	275	110	66-130
78-83-1	LCS	Isobutyl alcohol	2500	0.0	2810	112	65-135
126-99-8	LCS	2-Chloro-1,3-butadiene	50.0	0.0	53.2	106	66-147

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-1639

Sample Type: Post Spike

Client ID: CAWA-18-51PS

Matrix: W

Lab Sample ID 1203975100

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:00

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

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	109	109	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1400	112	56-131
67-64-1	PS Acetone	250	0.00 U	221	88	25-155
74-88-4	PS Iodomethane	250	0.00 U	221	88	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	251	100	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	270	108	48-133
78-93-3	PS 2-Butanone	250	0.00 U	266	106	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	284	114	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	283	113	33-138
67-66-3	PS Chloroform	50.0	0.540 J	52.7	104	71-129
75-27-4	PS Bromodichloromethane	50.0	0.410 J	56.2	112	70-138
124-48-1	PS Dibromochloromethane	50.0	0.560 J	56.9	113	68-143
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	44.2	88	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	54.6	109	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	56.1	112	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	45.6	91	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	49.5	99	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	47.6	95	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	51.0	102	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	54.1	108	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	48.1	96	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	51.3	103	69-132

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-1639

Sample Type: Post Spike

Client ID: CAWA-18-51PS

Matrix: W

Lab Sample ID 1203975100

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:00

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	55.2	110	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	55.2	110	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	55.1	110	69-127
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	52.1	104	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	48.3	97	71-130
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	51.7	103	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	52.1	104	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	51.6	103	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	56.1	112	69-130
71-43-2	PS Benzene	50.0	0.00 U	52.3	105	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	52.4	105	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	55.7	111	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	52.4	105	72-129
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	55.2	110	70-134
108-88-3	PS Toluene	50.0	0.00 U	53.1	106	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	59.3	119	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	56.2	112	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	55.9	112	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	49.5	99	60-130
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	54.4	109	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	51.8	104	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	53.2	106	61-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2018-1639

Sample Type: Post Spike

Client ID: CAWA-18-51PS

Matrix: W

Lab Sample ID 1203975100

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:00

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	PS o-Xylene	50.0	0.00 U	52.6	105	62-131
100-42-5	PS Styrene	50.0	0.00 U	53.1	106	59-135
75-25-2	PS Bromoform	50.0	0.00 U	49.1	98	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	53.8	108	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	59.2	118	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	57.9	116	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	50.8	102	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	54.8	110	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	55.1	110	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	53.5	107	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	53.9	108	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	53.9	108	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	53.9	108	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	55.0	110	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	54.0	108	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	49.1	98	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	50.4	101	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	54.7	109	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	47.3	95	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	53.3	107	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	54.3	109	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	51.5	103	52-135

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2018-1639

Sample Type: Post Spike

Client ID: CAWA-18-51PS

Matrix: W

Lab Sample ID 1203975100

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:00

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	PS	1,2,4-Trichlorobenzene	50.0	0.00	U	51.1	102	50-133
630-20-6	PS	1,1,1,2-Tetrachloroethane	50.0	0.00	U	56.0	112	71-133
95-50-1	PS	1,2-Dichlorobenzene	50.0	0.00	U	49.6	99	60-125
71-36-3	PS	n-Butyl alcohol	5000	0.00	U	6520	130	60-140

Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2018-1639

Sample Type: Post Spike Duplicate

Client ID: CAWA-18-51PSD

Matrix: W

Lab Sample ID 1203975102

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:29

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

			Amount	Sample	Spike	Acceptance		Acceptance		
CAS No	Parmname		Added	Conc.	Conc.	Recovery	Limits	RPD	Limits	
			ug/L	ug/L	ug/L	%		%		
179601-23-1	PSD	m,p-Xylenes	100	0.00	U	112	112	59-132	3	0-20
75-05-8	PSD	Acetonitrile	1250	0.00	U	1380	110	56-131	2	0-20
67-64-1	PSD	Acetone	250	0.00	U	217	87	25-155	2	0-20
74-88-4	PSD	Iodomethane	250	0.00	U	233	93	66-133	6	0-20
75-15-0	PSD	Carbon disulfide	250	0.00	U	260	104	61-141	4	0-20
108-05-4	PSD	Vinyl acetate	250	0.00	U	282	113	48-133	4	0-20
78-93-3	PSD	2-Butanone	250	0.00	U	259	104	25-143	2	0-20
108-10-1	PSD	4-Methyl-2-pentanone	250	0.00	U	290	116	61-127	2	0-20
591-78-6	PSD	2-Hexanone	250	0.00	U	276	110	33-138	2	0-20
67-66-3	PSD	Chloroform	50.0	0.540	J	54.2	107	71-129	3	0-20
75-27-4	PSD	Bromodichloromethane	50.0	0.410	J	57.5	114	70-138	2	0-20
124-48-1	PSD	Dibromochloromethane	50.0	0.560	J	58.7	116	68-143	3	0-20
75-71-8	PSD	Dichlorodifluoromethane	50.0	0.00	U	49.4	99	33-164	11	0-20
74-87-3	PSD	Chloromethane	50.0	0.00	U	61.3	123	53-139	12	0-20
75-01-4	PSD	Vinyl chloride	50.0	0.00	U	63.5	127	58-140	12	0-20
74-83-9	PSD	Bromomethane	50.0	0.00	U	52.9	106	59-146	15	0-20
75-00-3	PSD	Chloroethane	50.0	0.00	U	56.9	114	65-129	14	0-20
75-69-4	PSD	Trichlorofluoromethane	50.0	0.00	U	53.9	108	65-141	12	0-20
60-29-7	PSD	Ethyl ether	50.0	0.00	U	56.1	112	69-127	9	0-20
75-35-4	PSD	1,1-Dichloroethylene	50.0	0.00	U	56.5	113	59-130	4	0-20
75-09-2	PSD	Methylene chloride	50.0	0.00	U	50.3	101	62-123	4	0-20
1634-04-4	PSD	tert-Butyl methyl ether	50.0	0.00	U	53.2	106	69-132	4	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2018-1639

Sample Type: Post Spike Duplicate

Client ID: CAWA-18-51PSD

Matrix: W

Lab Sample ID 1203975102

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:29

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00	U 56.6	113	65-127	3	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00	U 56.9	114	67-127	3	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00	U 57.0	114	69-127	3	0-20
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00	U 54.6	109	66-137	5	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00	U 50.0	100	71-130	3	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00	U 54.5	109	69-139	5	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00	U 54.5	109	67-130	5	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	U 54.5	109	66-143	6	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	U 56.5	113	69-130	1	0-20
71-43-2	PSD Benzene	50.0	0.00	U 54.1	108	66-125	3	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00	U 54.1	108	65-131	3	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	U 56.2	112	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	U 52.9	106	72-129	1	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	U 55.9	112	70-134	1	0-20
108-88-3	PSD Toluene	50.0	0.00	U 55.6	111	60-126	5	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	U 60.8	122	69-135	2	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	U 57.7	115	66-125	3	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	U 56.7	113	67-124	1	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00	U 52.2	104	60-130	5	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00	U 55.7	111	71-127	2	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	U 53.3	107	64-124	3	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	U 54.6	109	61-130	3	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2018-1639

Sample Type: Post Spike Duplicate

Client ID: CAWA-18-51PSD

Matrix: W

Lab Sample ID 1203975102

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:29

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-47-6	PSD o-Xylene	50.0	0.00 U	55.3	111	62-131	5	0-20
100-42-5	PSD Styrene	50.0	0.00 U	54.5	109	59-135	3	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	50.2	100	64-138	2	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	56.1	112	55-133	4	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	59.3	119	62-129	0	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	56.8	114	70-124	2	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	52.1	104	62-124	2	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	56.1	112	50-133	2	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	56.8	114	53-135	3	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	54.9	110	56-128	2	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	54.9	110	53-130	2	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	57.7	115	55-135	7	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	55.9	112	53-132	4	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	57.3	115	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	56.1	112	49-138	4	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	50.8	102	56-126	3	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	52.2	104	55-125	3	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	56.5	113	43-142	3	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	48.8	98	62-141	3	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	57.0	114	40-147	7	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	58.0	116	62-134	6	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	56.3	113	52-135	9	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2018-1639

Sample Type: Post Spike Duplicate

Client ID: CAWA-18-51PSD

Matrix: W

Lab Sample ID 1203975102

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:29

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No			Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
120-82-1	PSD	1,2,4-Trichlorobenzene		50.0	0.00	U	55.1	110	50-133	7	0-20
630-20-6	PSD	1,1,1,2-Tetrachloroethane		50.0	0.00	U	59.8	120	71-133	7	0-20
95-50-1	PSD	1,2-Dichlorobenzene		50.0	0.00	U	51.2	102	60-125	3	0-20
71-36-3	PSD	n-Butyl alcohol		5000	0.00	U	5890	118	60-140	10	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2018-1639

Sample Type: Post Spike

Client ID: CAWA-18-51PS

Matrix: W

Lab Sample ID 1203975101

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:59

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	PS	Acrolein	250	0.00	U	272	109	49-141
76-13-1	PS	Trichlorotrifluoroethane	250	0.00	U	273	109	57-149
107-05-1	PS	Allyl chloride	250	0.00	U	280	112	54-128
107-13-1	PS	Acrylonitrile	250	0.00	U	279	111	59-129
107-12-0	PS	Propionitrile	250	0.00	U	267	107	58-131
126-98-7	PS	Methacrylonitrile	250	0.00	U	281	112	59-134
80-62-6	PS	Methyl methacrylate	250	0.00	U	263	105	62-135
97-63-2	PS	Ethyl methacrylate	250	0.00	U	271	109	60-136
78-83-1	PS	Isobutyl alcohol	2500	0.00	U	2650	106	60-143
126-99-8	PS	2-Chloro-1,3-butadiene	50.0	0.00	U	53.7	107	63-146

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 2

SDG Number: 2018-1639

Sample Type: Post Spike Duplicate

Client ID: CAWA-18-51PSD

Matrix: W

Lab Sample ID 1203975103

Instrument: VOA9.I

Analysis Date: 02/20/2018 22:28

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD	Acrolein	250	0.00	U	300	120	49-141	10	0-20
76-13-1	PSD	Trichlorotrifluoroethane	250	0.00	U	293	117	57-149	7	0-20
107-05-1	PSD	Allyl chloride	250	0.00	U	296	118	54-128	6	0-20
107-13-1	PSD	Acrylonitrile	250	0.00	U	309	124	59-129	10	0-20
107-12-0	PSD	Propionitrile	250	0.00	U	297	119	58-131	11	0-20
126-98-7	PSD	Methacrylonitrile	250	0.00	U	306	122	59-134	9	0-20
80-62-6	PSD	Methyl methacrylate	250	0.00	U	279	112	62-135	6	0-20
97-63-2	PSD	Ethyl methacrylate	250	0.00	U	290	116	60-136	7	0-20
78-83-1	PSD	Isobutyl alcohol	2500	0.00	U	2910	116	60-143	9	0-20
126-99-8	PSD	2-Chloro-1,3-butadiene	50.0	0.00	U	57.7	115	63-146	7	0-20

Method Blank Summary

Page 1 of 1

SDG Number: 2018-1639

Client: ARSL004

Matrix: WATER

Client ID: MB for batch 1740473

Instrument ID: VOA9.I

Data File: 021918V9\9G111B1.D

Lab Sample ID: 1203975094

Prep Date: 02/19/2018 14:22

Analyzed: 02/19/18 14:22

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 1740473	1203975096	021918V9\9G108L1.D	02/19/18	1255
02 LCS for batch 1740473	1203975097	021918V9\9G110L1.D	02/19/18	1353
03 CAWA-18-116	443438004	021918V9\9G124.D	02/19/18	2035
04 CAWA-18-117	443438008	021918V9\9G125.D	02/19/18	2103
05 CAWA-18-72	443438002	021918V9\9G126.D	02/19/18	2132
06 CAWA-18-75	443438006	021918V9\9G127.D	02/19/18	2200
07 CAWA-18-78	443438010	021918V9\9G128.D	02/19/18	2229

Method Blank Summary

Page 1 of 1

SDG Number:	2018-1639	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1740473	Instrument ID:	VOA9.I	Data File:	022018V9\9G207B.D
Lab Sample ID:	1203975095	Prep Date:	02/20/2018 13:20	Analyzed:	02/20/18 13:20
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
09 LCS for batch 1740473	1203975098	022018V9\9G204L.D	02/20/18	1153
10 LCS for batch 1740473	1203975099	022018V9\9G206L.D	02/20/18	1251
11 CAWA-18-118	443438012	022018V9\9G208.D	02/20/18	1348
12 CAWA-18-129	443438013	022018V9\9G212.D	02/20/18	1544
13 CAWA-18-51PS	1203975100	022018V9\9G223.D	02/20/18	2100
14 CAWA-18-51PSD	1203975102	022018V9\9G224.D	02/20/18	2129
15 CAWA-18-51PS	1203975101	022018V9\9G225.D	02/20/18	2159
16 CAWA-18-51PSD	1203975103	022018V9\9G226.D	02/20/18	2228

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975094

Client Sample: QC for batch 1740473

Client ID: MB for batch 1740473

Batch ID: 1740473

Run Date: 02/19/2018 14:22

Prep Date: 02/19/2018 14:22

Data File: 021918V9\9G111B1.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: QC

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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975094

Client Sample: QC for batch 1740473

Client ID: MB for batch 1740473

Batch ID: 1740473

Run Date: 02/19/2018 14:22

Prep Date: 02/19/2018 14:22

Data File: 021918V9\9G111B1.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975094

Client Sample: QC for batch 1740473

Client ID: MB for batch 1740473

Batch ID: 1740473

Run Date: 02/19/2018 14:22

Prep Date: 02/19/2018 14:22

Data File: 021918V9\9G111B1.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.8	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	51.6	50.0	ug/L 103	(70%-131%)
Toluene-d8	52.6	50.0	ug/L 105	(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**

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975095

Client Sample: QC for batch 1740473

Client ID: MB for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 13:20

Prep Date: 02/20/2018 13:20

Data File: 022018V9\9G207B.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: QC

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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975095

Client Sample: QC for batch 1740473

Client ID: MB for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 13:20

Prep Date: 02/20/2018 13:20

Data File: 022018V9\9G207B.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975095

Client Sample: QC for batch 1740473

Client ID: MB for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 13:20

Prep Date: 02/20/2018 13:20

Data File: 022018V9\9G207B.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: QC

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	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	54.2	50.0	ug/L 108	(71%-134%)
Bromofluorobenzene	52.1	50.0	ug/L 104	(70%-131%)
Toluene-d8	53.1	50.0	ug/L 106	(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

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975096

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/19/2018 12:55

Prep Date: 02/19/2018 12:55

Data File: 021918V9\9G108L1.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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		56.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		50.9	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		54.4	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		54.4	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		53.2	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		53.7	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		52.3	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		55.1	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		53.2	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		54.3	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		52.6	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		46.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		53.0	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		52.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		52.0	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		53.4	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		48.5	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		52.7	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		49.6	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		54.2	ug/L	0.300	1.00
78-93-3	2-Butanone		311	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		51.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		330	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		52.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		53.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		280	ug/L	1.50	5.00
67-64-1	Acetone		343	ug/L	1.50	10.0
75-05-8	Acetonitrile		1310	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		51.2	ug/L	0.300	1.00
108-86-1	Bromobenzene		49.1	ug/L	0.300	1.00
74-97-5	Bromochloromethane		47.6	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		53.2	ug/L	0.300	1.00
75-25-2	Bromoform		47.2	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1639
Lab Sample ID: 1203975096
Client Sample: QC for batch 1740473
Client ID: LCS for batch 1740473
Batch ID: 1740473
Run Date: 02/19/2018 12:55
Prep Date: 02/19/2018 12:55
Data File: 021918V9\9G108L1.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

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
74-83-9	Bromomethane		50.0	ug/L	0.300	1.00
75-15-0	Carbon disulfide		248	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		51.6	ug/L	0.300	1.00
108-90-7	Chlorobenzene		50.7	ug/L	0.300	1.00
75-00-3	Chloroethane		53.2	ug/L	0.300	1.00
67-66-3	Chloroform		50.8	ug/L	0.300	1.00
74-87-3	Chloromethane		57.6	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		55.1	ug/L	0.300	1.00
74-95-3	Dibromomethane		50.1	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		49.5	ug/L	0.300	1.00
60-29-7	Ethyl ether		52.3	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		52.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		54.9	ug/L	0.300	1.00
74-88-4	Iodomethane		222	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		53.0	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		47.9	ug/L	1.00	10.0
91-20-3	Naphthalene		55.5	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		51.7	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		50.6	ug/L	0.300	1.00
108-88-3	Toluene		52.9	ug/L	0.300	1.00
79-01-6	Trichloroethylene		51.8	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		51.6	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		282	ug/L	1.50	5.00
75-01-4	Vinyl chloride		58.8	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.4	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		52.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		107	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5780	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		53.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		52.9	ug/L	0.300	1.00
95-47-6	o-Xylene		52.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		54.0	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1639	Matrix:	WATER
Lab Sample ID:	1203975096		
Client Sample:	QC for batch 1740473	Client:	ARSL004
Client ID:	LCS for batch 1740473	Method:	SW-846:8260B
Batch ID:	1740473	Inst:	VOA9.I
Run Date:	02/19/2018 12:55	Analyst:	RXY1
Prep Date:	02/19/2018 12:55		
Data File:	021918V9\9G108L1.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		50.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		54.1	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		53.9	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		59.0	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.6	50.0	ug/L	105	(71%-134%)
Bromofluorobenzene	50.6	50.0	ug/L	101	(70%-131%)
Toluene-d8	53.2	50.0	ug/L	106	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975097

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/19/2018 13:53

Prep Date: 02/19/2018 13:53

Data File: 021918V9\9G110L1.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		52.0	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		275	ug/L	1.50	5.00
107-13-1	Acrylonitrile		267	ug/L	1.50	5.00
107-05-1	Allyl chloride		267	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975097

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/19/2018 13:53

Prep Date: 02/19/2018 13:53

Data File: 021918V9\9G110L1.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: QC

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	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		262	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2540	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		268	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		250	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		260	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		260	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1639	Matrix:	WATER
Lab Sample ID:	1203975097		
Client Sample:	QC for batch 1740473	Client:	ARSL004
Client ID:	LCS for batch 1740473	Method:	SW-846:8260B
Batch ID:	1740473	Inst:	VOA9.I
Run Date:	02/19/2018 13:53	Analyst:	RXY1
Prep Date:	02/19/2018 13:53	Purge Vol:	5 mL
Data File:	021918V9\9G110L1.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.7	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	51.0	50.0	ug/L 102	(70%-131%)
Toluene-d8	54.0	50.0	ug/L 108	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975098

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 11:53

Prep Date: 02/20/2018 11:53

Data File: 022018V9\9G204L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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		54.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		51.0	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		55.9	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		52.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		52.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		52.1	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		55.9	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		53.8	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		55.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		53.5	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		47.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.3	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.1	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		51.5	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		51.8	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		55.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		49.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		51.4	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		50.7	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		54.2	ug/L	0.300	1.00
78-93-3	2-Butanone		299	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		52.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		320	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		53.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		53.8	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		271	ug/L	1.50	5.00
67-64-1	Acetone		326	ug/L	1.50	10.0
75-05-8	Acetonitrile		1250	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		51.0	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		47.6	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		53.1	ug/L	0.300	1.00
75-25-2	Bromoform		48.3	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975098

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 11:53

Prep Date: 02/20/2018 11:53

Data File: 022018V9\9G204L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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
74-83-9	Bromomethane		49.9	ug/L	0.300	1.00
75-15-0	Carbon disulfide		245	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		51.2	ug/L	0.300	1.00
108-90-7	Chlorobenzene		50.3	ug/L	0.300	1.00
75-00-3	Chloroethane		53.5	ug/L	0.300	1.00
67-66-3	Chloroform		50.3	ug/L	0.300	1.00
74-87-3	Chloromethane		56.5	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		54.3	ug/L	0.300	1.00
74-95-3	Dibromomethane		49.2	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		49.2	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		51.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		55.1	ug/L	0.300	1.00
74-88-4	Iodomethane		223	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		53.6	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		46.9	ug/L	1.00	10.0
91-20-3	Naphthalene		56.1	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		51.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		50.5	ug/L	0.300	1.00
108-88-3	Toluene		52.4	ug/L	0.300	1.00
79-01-6	Trichloroethylene		51.8	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		52.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		275	ug/L	1.50	5.00
75-01-4	Vinyl chloride		57.6	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.3	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		107	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5550	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		54.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		54.0	ug/L	0.300	1.00
95-47-6	o-Xylene		51.8	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		54.4	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1639	Matrix:	WATER
Lab Sample ID:	1203975098		
Client Sample:	QC for batch 1740473	Client:	ARSL004
Client ID:	LCS for batch 1740473	Method:	SW-846:8260B
Batch ID:	1740473	Inst:	VOA9.I
Run Date:	02/20/2018 11:53	Analyst:	RXY1
Prep Date:	02/20/2018 11:53	Purge Vol:	5 mL
Data File:	022018V9\9G204L.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		50.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		54.4	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		53.8	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		57.9	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.5	50.0	ug/L	103	(71%-134%)
Bromofluorobenzene	52.3	50.0	ug/L	105	(70%-131%)
Toluene-d8	52.8	50.0	ug/L	106	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975099

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 12:51

Prep Date: 02/20/2018 12:51

Data File: 022018V9\9G206L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		53.2	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		291	ug/L	1.50	5.00
107-13-1	Acrylonitrile		285	ug/L	1.50	5.00
107-05-1	Allyl chloride		272	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975099

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 12:51

Prep Date: 02/20/2018 12:51

Data File: 022018V9\9G206L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

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
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		275	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2810	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		283	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		269	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		279	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		259	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203975099

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 12:51

Prep Date: 02/20/2018 12:51

Data File: 022018V9\9G206L.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.4	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	50.3	50.0	ug/L 101	(70%-131%)
Toluene-d8	52.6	50.0	ug/L 105	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203975100
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PS
Batch ID: 1740473
Run Date: 02/20/2018 21:00
Prep Date: 02/20/2018 21:00
Data File: 022018V9\9G223.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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		56.0	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		51.7	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		59.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		56.2	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		55.2	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		54.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		52.1	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		51.5	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		57.9	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		51.1	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		53.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		47.3	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		54.4	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.6	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		56.1	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		55.7	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		55.1	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		49.1	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		55.9	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		50.4	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		52.1	ug/L	0.300	1.00
78-93-3	2-Butanone		266	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		53.5	ug/L	0.300	1.00
591-78-6	2-Hexanone		283	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		53.9	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		54.0	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		284	ug/L	1.50	5.00
67-64-1	Acetone		221	ug/L	1.50	10.0
75-05-8	Acetonitrile		1400	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		52.3	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.8	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.3	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		56.2	ug/L	0.300	1.00
75-25-2	Bromoform		49.1	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203975100
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PS
Batch ID: 1740473
Run Date: 02/20/2018 21:00
Prep Date: 02/20/2018 21:00
Data File: 022018V9\9G223.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		45.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		251	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		51.6	ug/L	0.300	1.00
108-90-7	Chlorobenzene		51.8	ug/L	0.300	1.00
75-00-3	Chloroethane		49.5	ug/L	0.300	1.00
67-66-3	Chloroform		52.7	ug/L	0.300	1.00
74-87-3	Chloromethane		54.6	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		56.9	ug/L	0.300	1.00
74-95-3	Dibromomethane		52.4	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		44.2	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.0	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		53.2	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		53.3	ug/L	0.300	1.00
74-88-4	Iodomethane		221	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		53.8	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.1	ug/L	1.00	10.0
91-20-3	Naphthalene		54.3	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		53.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		49.5	ug/L	0.300	1.00
108-88-3	Toluene		53.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.4	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		47.6	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		270	ug/L	1.50	5.00
75-01-4	Vinyl chloride		56.1	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		55.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		55.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		109	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6520	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		54.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		54.8	ug/L	0.300	1.00
95-47-6	o-Xylene		52.6	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		55.0	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1639	Date Collected:	02/09/2018 14:36	Matrix:	W
Lab Sample ID:	1203975100	Date Received:	02/14/2018 09:30		
Client Sample:	QC for batch 1740473	Client:	ARSL004	Project:	QC
Client ID:	CAWA-18-51PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1740473	Inst:	VOA9.I	Dilution:	1
Run Date:	02/20/2018 21:00	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/20/2018 21:00				
Data File:	022018V9\9G223.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		51.3	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		53.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		55.2	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		59.3	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	54.6	50.0	ug/L	109	(71%-134%)
Bromofluorobenzene	52.5	50.0	ug/L	105	(70%-131%)
Toluene-d8	53.3	50.0	ug/L	107	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203975101
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PS
Batch ID: 1740473
Run Date: 02/20/2018 21:59
Prep Date: 02/20/2018 21:59
Data File: 022018V9\9G225.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		53.7	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		272	ug/L	1.50	5.00
107-13-1	Acrylonitrile		279	ug/L	1.50	5.00
107-05-1	Allyl chloride		280	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203975101
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PS
Batch ID: 1740473
Run Date: 02/20/2018 21:59
Prep Date: 02/20/2018 21:59
Data File: 022018V9\9G225.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		271	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2650	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		281	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		263	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		267	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		273	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1639	Date Collected:	02/09/2018 14:36	Matrix:	W
Lab Sample ID:	1203975101	Date Received:	02/14/2018 09:30		
Client Sample:	QC for batch 1740473	Client:	ARSL004	Project:	QC
Client ID:	CAWA-18-51PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1740473	Inst:	VOA9.I	Dilution:	1
Run Date:	02/20/2018 21:59	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/20/2018 21:59				
Data File:	022018V9\9G225.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.4	50.0	ug/L	107	(71%-134%)
Bromofluorobenzene	51.4	50.0	ug/L	103	(70%-131%)
Toluene-d8	53.2	50.0	ug/L	106	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203975102
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PSD
Batch ID: 1740473
Run Date: 02/20/2018 21:29
Prep Date: 02/20/2018 21:29
Data File: 022018V9\9G224.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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		59.8	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		54.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		59.3	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		57.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		56.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		56.5	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		54.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		56.3	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		56.8	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		55.1	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		55.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		48.8	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		55.7	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		51.2	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		56.5	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		56.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		56.8	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		50.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		56.7	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		52.2	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		54.6	ug/L	0.300	1.00
78-93-3	2-Butanone		259	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		54.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		276	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		54.9	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		56.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		290	ug/L	1.50	5.00
67-64-1	Acetone		217	ug/L	1.50	10.0
75-05-8	Acetonitrile		1380	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		54.1	ug/L	0.300	1.00
108-86-1	Bromobenzene		52.1	ug/L	0.300	1.00
74-97-5	Bromochloromethane		50.0	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		57.5	ug/L	0.300	1.00
75-25-2	Bromoform		50.2	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639	Date Collected: 02/09/2018 14:36	Matrix: W
Lab Sample ID: 1203975102	Date Received: 02/14/2018 09:30	
Client Sample: QC for batch 1740473	Client: ARSL004	Project: QC
Client ID: CAWA-18-51PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1740473	Inst: VOA9.I	Dilution: 1
Run Date: 02/20/2018 21:29	Analyst: RXY1	Purge Vol: 5 mL
Prep Date: 02/20/2018 21:29		
Data File: 022018V9\9G224.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		52.9	ug/L	0.300	1.00
75-15-0	Carbon disulfide		260	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		54.5	ug/L	0.300	1.00
108-90-7	Chlorobenzene		53.3	ug/L	0.300	1.00
75-00-3	Chloroethane		56.9	ug/L	0.300	1.00
67-66-3	Chloroform		54.2	ug/L	0.300	1.00
74-87-3	Chloromethane		61.3	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		58.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		52.9	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		49.4	ug/L	0.300	1.00
60-29-7	Ethyl ether		56.1	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		54.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		57.0	ug/L	0.300	1.00
74-88-4	Iodomethane		233	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		56.1	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		50.3	ug/L	1.00	10.0
91-20-3	Naphthalene		58.0	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		54.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		52.2	ug/L	0.300	1.00
108-88-3	Toluene		55.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene		54.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		53.9	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		282	ug/L	1.50	5.00
75-01-4	Vinyl chloride		63.5	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		57.0	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		55.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		112	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5890	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		56.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		56.1	ug/L	0.300	1.00
95-47-6	o-Xylene		55.3	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		57.3	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1639	Date Collected:	02/09/2018 14:36	Matrix:	W
Lab Sample ID:	1203975102	Date Received:	02/14/2018 09:30		
Client Sample:	QC for batch 1740473	Client:	ARSL004	Project:	QC
Client ID:	CAWA-18-51PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1740473	Inst:	VOA9.I	Dilution:	1
Run Date:	02/20/2018 21:29	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/20/2018 21:29				
Data File:	022018V9\9G224.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		53.2	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		57.7	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		56.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		60.8	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.5	50.0	ug/L	107	(71%-134%)
Bromofluorobenzene	51.9	50.0	ug/L	104	(70%-131%)
Toluene-d8	53.6	50.0	ug/L	107	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203975103
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PSD
Batch ID: 1740473
Run Date: 02/20/2018 22:28
Prep Date: 02/20/2018 22:28
Data File: 022018V9\9G226.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		57.7	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		300	ug/L	1.50	5.00
107-13-1	Acrylonitrile		309	ug/L	1.50	5.00
107-05-1	Allyl chloride		296	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203975103
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PSD
Batch ID: 1740473
Run Date: 02/20/2018 22:28
Prep Date: 02/20/2018 22:28
Data File: 022018V9\9G226.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		290	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2910	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		306	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		279	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		297	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		293	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1639	Date Collected:	02/09/2018 14:36	Matrix:	W
Lab Sample ID:	1203975103	Date Received:	02/14/2018 09:30		
Client Sample:	QC for batch 1740473	Client:	ARSL004	Project:	QC
Client ID:	CAWA-18-51PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1740473	Inst:	VOA9.I	Dilution:	1
Run Date:	02/20/2018 22:28	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/20/2018 22:28				
Data File:	022018V9\9G226.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.3	50.0	ug/L 107	(71%-134%)
Bromofluorobenzene	50.6	50.0	ug/L 101	(70%-131%)
Toluene-d8	53.5	50.0	ug/L 107	(74%-124%)

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1639
Work Order #: 443438**

Method/Analysis Information

Procedure:	Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
Analytical Method:	SW846 3510C/8270D
Prep Method:	SW846 3510C
Analytical Batch Number:	1738268
Prep Batch Number:	1738267

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

Sample ID	Client ID
443438002	CAWA-18-72
443438006	CAWA-18-75
443438010	CAWA-18-78
443438013	CAWA-18-129
1203969165	Method Blank (MB)
1203969166	Laboratory Control Sample (LCS)
1203969167	443360003(CAWA-18-81) Matrix Spike (MS)
1203969168	443360003(CAWA-18-81) 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-009 REV# 40.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

CCV Requirements

All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D for samples 443438002 (CAWA-18-72), 443438006 (CAWA-18-75), 443438010 (CAWA-18-78) and 443438013 (CAWA-18-129) and the associated QC. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. If required, a CRDL was analyzed after the CCVs to demonstrate that there is adequate sensitivity to detect the failed compounds at the applicable lower quantitation limit.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG in this batch met the acceptance criteria.

Surrogate Recoveries

All the surrogate recoveries were within the established acceptance criteria for this SDG in this batch.

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.

QC Sample Designation

Sample 443360003 (CAWA-18-81) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

The MS or MSD (See Below) recovered spiked analytes outside of the established acceptance limits. As similar recoveries were displayed in the MS and MSD, the failures were attributed to sample matrix interference and the data were reported.

Sample	Analyte	Value
1203969167 (CAWA-18-81MS)	Hexachlorocyclopentadiene	22* (26%-79%)
1203969168 (CAWA-18-81MSD)	Hexachlorocyclopentadiene	19* (26%-79%)

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses used to quantitate the requested target analytes were within the required acceptance criteria for the SDG associated samples in this batch.

Technical Information:**Holding Time Specifications**

All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that 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.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

Sample Dilutions

The samples in this SDG in this batch did not require dilutions.

Sample Re-extraction/Re-analysis

Samples 443438006 (CAWA-18-75) and 443438013 (CAWA-18-129) were re-analyzed for ISTD failure. Samples 443438006 (CAWA-18-75), 443438010 (CAWA-18-78) and 443438013 (CAWA-18-129) were re-analyzed due to an injection error. The re-analysis data were reported.

Miscellaneous Information:**Manual Integrations**

Manual integrations were not required on samples in this batch in this SDG for detected target analytes or surrogates.

TIC Comment

Tentatively identified compounds (TIC) were requested for samples 443438002 (CAWA-18-72), 443438006 (CAWA-18-75), 443438010 (CAWA-18-78) and 443438013 (CAWA-18-129) in this SDG in this batch.

Additional Comments

Additional comments were not required for the SDG associated samples in this batch.

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
MSD3.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP7890A/HP5975C	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)

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: 2018-1639 GEL Work Order: 443438

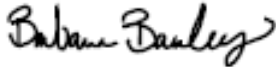
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- E Concentration of the target analyte exceeds the instrument calibration range
- 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: Barbara Bailey

Date: 07 MAR 2018

Title: Data Validator

Sample Data Summary

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438002

Date Collected: 02/07/2018 11:37

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1738268

Run Date: 02/12/2018 20:46

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/12/2018 09:00

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s021218.s\3b1219.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.09	ug/L	3.09	10.3
120-82-1	1,2,4-Trichlorobenzene	U	3.09	ug/L	3.09	10.3
95-50-1	1,2-Dichlorobenzene	U	3.09	ug/L	3.09	10.3
122-66-7	Azobenzene	U	3.09	ug/L	3.09	10.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.09	ug/L	3.09	10.3
106-46-7	1,4-Dichlorobenzene	U	3.09	ug/L	3.09	10.3
123-91-1	1,4-Dioxane	U	3.09	ug/L	3.09	10.3
90-12-0	1-Methylnaphthalene	U	0.309	ug/L	0.309	1.03
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.09	ug/L	3.09	10.3
95-95-4	2,4,5-Trichlorophenol	U	3.09	ug/L	3.09	10.3
88-06-2	2,4,6-Trichlorophenol	U	3.09	ug/L	3.09	10.3
120-83-2	2,4-Dichlorophenol	U	3.09	ug/L	3.09	10.3
105-67-9	2,4-Dimethylphenol	U	3.09	ug/L	3.09	10.3
51-28-5	2,4-Dinitrophenol	U	5.15	ug/L	5.15	20.6
121-14-2	2,4-Dinitrotoluene	U	3.09	ug/L	3.09	10.3
606-20-2	2,6-Dinitrotoluene	U	3.09	ug/L	3.09	10.3
91-58-7	2-Chloronaphthalene	U	0.423	ug/L	0.423	1.03
95-57-8	2-Chlorophenol	U	3.09	ug/L	3.09	10.3
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.09	ug/L	3.09	10.3
91-57-6	2-Methylnaphthalene	U	0.309	ug/L	0.309	1.03
88-75-5	2-Nitrophenol	U	3.09	ug/L	3.09	10.3
91-94-1	3,3'-Dichlorobenzidine	U	3.09	ug/L	3.09	10.3
101-55-3	4-Bromophenylphenylether	U	3.09	ug/L	3.09	10.3
59-50-7	Parachlorometa cresol	U	3.09	ug/L	3.09	10.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.40	ug/L	3.40	10.3
7005-72-3	4-Chlorophenylphenylether	U	3.09	ug/L	3.09	10.3
100-02-7	4-Nitrophenol	U	3.09	ug/L	3.09	10.3
83-32-9	Acenaphthene	U	0.309	ug/L	0.309	1.03
208-96-8	Acenaphthylene	U	0.309	ug/L	0.309	1.03
62-53-3	Aniline	U	4.33	ug/L	4.33	10.3
120-12-7	Anthracene	U	0.309	ug/L	0.309	1.03
1912-24-9	Atrazine	U	3.09	ug/L	3.09	10.3
92-87-5	Benzidine	U	4.02	ug/L	4.02	10.3
56-55-3	Benzo(a)anthracene	U	0.309	ug/L	0.309	1.03
50-32-8	Benzo(a)pyrene	U	0.309	ug/L	0.309	1.03
205-99-2	Benzo(b)fluoranthene	U	0.309	ug/L	0.309	1.03
191-24-2	Benzo(ghi)perylene	U	0.309	ug/L	0.309	1.03

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438002

Date Collected: 02/07/2018 11:37

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1738268

Analyst: JLD1

Inj. Vol: 1 uL

Run Date: 02/12/2018 20:46

Prep Date: 02/12/2018 09:00

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s021218.s\3b1219.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.309	ug/L	0.309	1.03
65-85-0	Benzoic acid	U	6.19	ug/L	6.19	20.6
100-51-6	Benzyl alcohol	U	3.09	ug/L	3.09	10.3
85-68-7	Butylbenzylphthalate	U	3.09	ug/L	3.09	10.3
218-01-9	Chrysene	U	0.309	ug/L	0.309	1.03
84-74-2	Di-n-butylphthalate	U	3.09	ug/L	3.09	10.3
117-84-0	Di-n-octylphthalate	U	3.09	ug/L	3.09	10.3
53-70-3	Dibenzo(a,h)anthracene	U	0.309	ug/L	0.309	1.03
132-64-9	Dibenzofuran	U	3.09	ug/L	3.09	10.3
84-66-2	Diethylphthalate	U	3.09	ug/L	3.09	10.3
131-11-3	Dimethylphthalate	U	3.09	ug/L	3.09	10.3
88-85-7	Dinoseb	U	3.09	ug/L	3.09	10.3
122-39-4	Diphenylamine	U	3.09	ug/L	3.09	10.3
206-44-0	Fluoranthene	U	0.309	ug/L	0.309	1.03
86-73-7	Fluorene	U	0.309	ug/L	0.309	1.03
118-74-1	Hexachlorobenzene	U	3.09	ug/L	3.09	10.3
87-68-3	Hexachlorobutadiene	U	3.09	ug/L	3.09	10.3
77-47-4	Hexachlorocyclopentadiene	U	3.09	ug/L	3.09	10.3
67-72-1	Hexachloroethane	U	3.09	ug/L	3.09	10.3
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.309	ug/L	0.309	1.03
78-59-1	Isophorone	U	3.61	ug/L	3.61	10.3
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.09	ug/L	3.09	10.3
924-16-3	N-Nitrosodi-n-butylamine	U	3.09	ug/L	3.09	10.3
55-18-5	N-Nitrosodiethylamine	U	3.09	ug/L	3.09	10.3
621-64-7	N-Nitrosodi-n-propylamine	U	3.09	ug/L	3.09	10.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.09	ug/L	3.09	10.3
91-20-3	Naphthalene	U	0.309	ug/L	0.309	1.03
98-95-3	Nitrobenzene	U	3.09	ug/L	3.09	10.3
608-93-5	Pentachlorobenzene	U	3.09	ug/L	3.09	10.3
87-86-5	Pentachlorophenol	U	3.09	ug/L	3.09	10.3
85-01-8	Phenanthrene	U	0.309	ug/L	0.309	1.03
108-95-2	Phenol	U	3.09	ug/L	3.09	10.3
129-00-0	Pyrene	U	0.309	ug/L	0.309	1.03
110-86-1	Pyridine	U	3.09	ug/L	3.09	10.3
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.09	ug/L	3.09	10.3
111-91-1	bis(2-Chloroethoxy)methane	U	3.09	ug/L	3.09	10.3
111-44-4	bis(2-Chloroethyl) ether	U	3.09	ug/L	3.09	10.3
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.09	ug/L	3.09	1.03

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639
Lab Sample ID: 443438002

Client ID: CAWA-18-72
Batch ID: 1738268
Run Date: 02/12/2018 20:46
Prep Date: 02/12/2018 09:00
Data File: s021218.s\s3b1219.D

Date Collected: 02/07/2018 11:37
Date Received: 02/09/2018 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 970 mL
Column: DB-5ms

Matrix: W

Project: ESHL00114
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.81	ug/L	3.81	10.3
99-09-2	3-Nitroaniline	U	3.09	ug/L	3.09	10.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	3.09	ug/L	3.09	10.3
88-74-4	2-Nitroaniline	U	3.09	ug/L	3.09	10.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	3.09	ug/L	3.09	10.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	34.1	103	ug/L	33	(32%-124%)
2-Fluorobiphenyl	29.3	51.5	ug/L	57	(32%-112%)
2-Fluorophenol	33.9	103	ug/L	33	(15%-88%)
Nitrobenzene-d5	29.7	51.5	ug/L	58	(36%-115%)
Phenol-d5	21.4	103	ug/L	21	(15%-91%)
p-Terphenyl-d14	38.4	51.5	ug/L	75	(36%-121%)

Tentatively Identified Compound Summary

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

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438006

Date Collected: 02/07/2018 11:32

Date Received: 02/09/2018 08:55

Matrix: W

Client ID: CAWA-18-75

Batch ID: 1738268

Run Date: 02/13/2018 17:16

Prep Date: 02/12/2018 09:00

Data File: s021318.s\3b1316.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 910 mL

Column: DB-5ms

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.30	ug/L	3.30	11.0
120-82-1	1,2,4-Trichlorobenzene	U	3.30	ug/L	3.30	11.0
95-50-1	1,2-Dichlorobenzene	U	3.30	ug/L	3.30	11.0
122-66-7	Azobenzene	U	3.30	ug/L	3.30	11.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.30	ug/L	3.30	11.0
106-46-7	1,4-Dichlorobenzene	U	3.30	ug/L	3.30	11.0
123-91-1	1,4-Dioxane	U	3.30	ug/L	3.30	11.0
90-12-0	1-Methylnaphthalene	U	0.330	ug/L	0.330	1.10
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.30	ug/L	3.30	11.0
95-95-4	2,4,5-Trichlorophenol	U	3.30	ug/L	3.30	11.0
88-06-2	2,4,6-Trichlorophenol	U	3.30	ug/L	3.30	11.0
120-83-2	2,4-Dichlorophenol	U	3.30	ug/L	3.30	11.0
105-67-9	2,4-Dimethylphenol	U	3.30	ug/L	3.30	11.0
51-28-5	2,4-Dinitrophenol	U	5.49	ug/L	5.49	22.0
121-14-2	2,4-Dinitrotoluene	U	3.30	ug/L	3.30	11.0
606-20-2	2,6-Dinitrotoluene	U	3.30	ug/L	3.30	11.0
91-58-7	2-Chloronaphthalene	U	0.451	ug/L	0.451	1.10
95-57-8	2-Chlorophenol	U	3.30	ug/L	3.30	11.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.30	ug/L	3.30	11.0
91-57-6	2-Methylnaphthalene	U	0.330	ug/L	0.330	1.10
88-75-5	2-Nitrophenol	U	3.30	ug/L	3.30	11.0
91-94-1	3,3'-Dichlorobenzidine	U	3.30	ug/L	3.30	11.0
101-55-3	4-Bromophenylphenylether	U	3.30	ug/L	3.30	11.0
59-50-7	Parachlorometa cresol	U	3.30	ug/L	3.30	11.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.63	ug/L	3.63	11.0
7005-72-3	4-Chlorophenylphenylether	U	3.30	ug/L	3.30	11.0
100-02-7	4-Nitrophenol	U	3.30	ug/L	3.30	11.0
83-32-9	Acenaphthene	U	0.330	ug/L	0.330	1.10
208-96-8	Acenaphthylene	U	0.330	ug/L	0.330	1.10
62-53-3	Aniline	U	4.62	ug/L	4.62	11.0
120-12-7	Anthracene	U	0.330	ug/L	0.330	1.10
1912-24-9	Atrazine	U	3.30	ug/L	3.30	11.0
92-87-5	Benzidine	U	4.29	ug/L	4.29	11.0
56-55-3	Benzo(a)anthracene	U	0.330	ug/L	0.330	1.10
50-32-8	Benzo(a)pyrene	U	0.330	ug/L	0.330	1.10
205-99-2	Benzo(b)fluoranthene	U	0.330	ug/L	0.330	1.10
191-24-2	Benzo(ghi)perylene	U	0.330	ug/L	0.330	1.10

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438006

Date Collected: 02/07/2018 11:32

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1738268

Run Date: 02/13/2018 17:16

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/12/2018 09:00

Aliquot: 910 mL

Final Volume: 1 mL

Data File: s021318.s\s3b1316.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.330	ug/L	0.330	1.10
65-85-0	Benzoic acid	U	6.59	ug/L	6.59	22.0
100-51-6	Benzyl alcohol	U	3.30	ug/L	3.30	11.0
85-68-7	Butylbenzylphthalate	U	3.30	ug/L	3.30	11.0
218-01-9	Chrysene	U	0.330	ug/L	0.330	1.10
84-74-2	Di-n-butylphthalate	U	3.30	ug/L	3.30	11.0
117-84-0	Di-n-octylphthalate	U	3.30	ug/L	3.30	11.0
53-70-3	Dibenzo(a,h)anthracene	U	0.330	ug/L	0.330	1.10
132-64-9	Dibenzofuran	U	3.30	ug/L	3.30	11.0
84-66-2	Diethylphthalate	U	3.30	ug/L	3.30	11.0
131-11-3	Dimethylphthalate	U	3.30	ug/L	3.30	11.0
88-85-7	Dinoseb	U	3.30	ug/L	3.30	11.0
122-39-4	Diphenylamine	U	3.30	ug/L	3.30	11.0
206-44-0	Fluoranthene	U	0.330	ug/L	0.330	1.10
86-73-7	Fluorene	U	0.330	ug/L	0.330	1.10
118-74-1	Hexachlorobenzene	U	3.30	ug/L	3.30	11.0
87-68-3	Hexachlorobutadiene	U	3.30	ug/L	3.30	11.0
77-47-4	Hexachlorocyclopentadiene	U	3.30	ug/L	3.30	11.0
67-72-1	Hexachloroethane	U	3.30	ug/L	3.30	11.0
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.330	ug/L	0.330	1.10
78-59-1	Isophorone	U	3.85	ug/L	3.85	11.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.30	ug/L	3.30	11.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.30	ug/L	3.30	11.0
55-18-5	N-Nitrosodiethylamine	U	3.30	ug/L	3.30	11.0
621-64-7	N-Nitrosodi-n-propylamine	U	3.30	ug/L	3.30	11.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.30	ug/L	3.30	11.0
91-20-3	Naphthalene	U	0.330	ug/L	0.330	1.10
98-95-3	Nitrobenzene	U	3.30	ug/L	3.30	11.0
608-93-5	Pentachlorobenzene	U	3.30	ug/L	3.30	11.0
87-86-5	Pentachlorophenol	U	3.30	ug/L	3.30	11.0
85-01-8	Phenanthrene	U	0.330	ug/L	0.330	1.10
108-95-2	Phenol	U	3.30	ug/L	3.30	11.0
129-00-0	Pyrene	U	0.330	ug/L	0.330	1.10
110-86-1	Pyridine	U	3.30	ug/L	3.30	11.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.30	ug/L	3.30	11.0
111-91-1	bis(2-Chloroethoxy)methane	U	3.30	ug/L	3.30	11.0
111-44-4	bis(2-Chloroethyl) ether	U	3.30	ug/L	3.30	11.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.30	ug/L	3.30	1.10

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438006

Date Collected: 02/07/2018 11:32

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-75

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1738268

Inst: MSD3.I

Dilution: 1

Run Date: 02/13/2018 17:16

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/12/2018 09:00

Aliquot: 910 mL

Final Volume: 1 mL

Data File: s021318.s\s3b1316.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	4.07	ug/L	4.07	11.0
99-09-2	3-Nitroaniline	U	3.30	ug/L	3.30	11.0
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.30	ug/L	3.30	11.0
88-74-4	2-Nitroaniline	U	3.30	ug/L	3.30	11.0
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.30	ug/L	3.30	11.0
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	60.8	110	ug/L	55	(32%-124%)
2-Fluorobiphenyl	28.5	54.9	ug/L	52	(32%-112%)
2-Fluorophenol	43.3	110	ug/L	39	(15%-88%)
Nitrobenzene-d5	35.7	54.9	ug/L	65	(36%-115%)
Phenol-d5	28.2	110	ug/L	26	(15%-91%)
p-Terphenyl-d14	33.3	54.9	ug/L	61	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	2.286	5.21	ug/L	98	NJ

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438010

Date Collected: 02/07/2018 13:16

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1738268

Run Date: 02/13/2018 17:45

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/12/2018 09:00

Aliquot: 940 mL

Final Volume: 1 mL

Data File: s021318.s\3b1317.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.19	ug/L	3.19	10.6
120-82-1	1,2,4-Trichlorobenzene	U	3.19	ug/L	3.19	10.6
95-50-1	1,2-Dichlorobenzene	U	3.19	ug/L	3.19	10.6
122-66-7	Azobenzene	U	3.19	ug/L	3.19	10.6
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.19	ug/L	3.19	10.6
106-46-7	1,4-Dichlorobenzene	U	3.19	ug/L	3.19	10.6
123-91-1	1,4-Dioxane	U	3.19	ug/L	3.19	10.6
90-12-0	1-Methylnaphthalene	U	0.319	ug/L	0.319	1.06
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.19	ug/L	3.19	10.6
95-95-4	2,4,5-Trichlorophenol	U	3.19	ug/L	3.19	10.6
88-06-2	2,4,6-Trichlorophenol	U	3.19	ug/L	3.19	10.6
120-83-2	2,4-Dichlorophenol	U	3.19	ug/L	3.19	10.6
105-67-9	2,4-Dimethylphenol	U	3.19	ug/L	3.19	10.6
51-28-5	2,4-Dinitrophenol	U	5.32	ug/L	5.32	21.3
121-14-2	2,4-Dinitrotoluene	U	3.19	ug/L	3.19	10.6
606-20-2	2,6-Dinitrotoluene	U	3.19	ug/L	3.19	10.6
91-58-7	2-Chloronaphthalene	U	0.436	ug/L	0.436	1.06
95-57-8	2-Chlorophenol	U	3.19	ug/L	3.19	10.6
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.19	ug/L	3.19	10.6
91-57-6	2-Methylnaphthalene	U	0.319	ug/L	0.319	1.06
88-75-5	2-Nitrophenol	U	3.19	ug/L	3.19	10.6
91-94-1	3,3'-Dichlorobenzidine	U	3.19	ug/L	3.19	10.6
101-55-3	4-Bromophenylphenylether	U	3.19	ug/L	3.19	10.6
59-50-7	Parachlorometa cresol	U	3.19	ug/L	3.19	10.6
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.51	ug/L	3.51	10.6
7005-72-3	4-Chlorophenylphenylether	U	3.19	ug/L	3.19	10.6
100-02-7	4-Nitrophenol	U	3.19	ug/L	3.19	10.6
83-32-9	Acenaphthene	U	0.319	ug/L	0.319	1.06
208-96-8	Acenaphthylene	U	0.319	ug/L	0.319	1.06
62-53-3	Aniline	U	4.47	ug/L	4.47	10.6
120-12-7	Anthracene	U	0.319	ug/L	0.319	1.06
1912-24-9	Atrazine	U	3.19	ug/L	3.19	10.6
92-87-5	Benzidine	U	4.15	ug/L	4.15	10.6
56-55-3	Benzo(a)anthracene	U	0.319	ug/L	0.319	1.06
50-32-8	Benzo(a)pyrene	U	0.319	ug/L	0.319	1.06
205-99-2	Benzo(b)fluoranthene	U	0.319	ug/L	0.319	1.06
191-24-2	Benzo(ghi)perylene	U	0.319	ug/L	0.319	1.06

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438010

Date Collected: 02/07/2018 13:16

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1738268

Analyst: JLD1

Inj. Vol: 1 uL

Run Date: 02/13/2018 17:45

Aliquot: 940 mL

Final Volume: 1 mL

Prep Date: 02/12/2018 09:00

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.319	ug/L	0.319	1.06
65-85-0	Benzoic acid	U	6.38	ug/L	6.38	21.3
100-51-6	Benzyl alcohol	U	3.19	ug/L	3.19	10.6
85-68-7	Butylbenzylphthalate	U	3.19	ug/L	3.19	10.6
218-01-9	Chrysene	U	0.319	ug/L	0.319	1.06
84-74-2	Di-n-butylphthalate	U	3.19	ug/L	3.19	10.6
117-84-0	Di-n-octylphthalate	U	3.19	ug/L	3.19	10.6
53-70-3	Dibenzo(a,h)anthracene	U	0.319	ug/L	0.319	1.06
132-64-9	Dibenzofuran	U	3.19	ug/L	3.19	10.6
84-66-2	Diethylphthalate	U	3.19	ug/L	3.19	10.6
131-11-3	Dimethylphthalate	U	3.19	ug/L	3.19	10.6
88-85-7	Dinoseb	U	3.19	ug/L	3.19	10.6
122-39-4	Diphenylamine	U	3.19	ug/L	3.19	10.6
206-44-0	Fluoranthene	U	0.319	ug/L	0.319	1.06
86-73-7	Fluorene	U	0.319	ug/L	0.319	1.06
118-74-1	Hexachlorobenzene	U	3.19	ug/L	3.19	10.6
87-68-3	Hexachlorobutadiene	U	3.19	ug/L	3.19	10.6
77-47-4	Hexachlorocyclopentadiene	U	3.19	ug/L	3.19	10.6
67-72-1	Hexachloroethane	U	3.19	ug/L	3.19	10.6
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.319	ug/L	0.319	1.06
78-59-1	Isophorone	U	3.72	ug/L	3.72	10.6
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.19	ug/L	3.19	10.6
924-16-3	N-Nitrosodi-n-butylamine	U	3.19	ug/L	3.19	10.6
55-18-5	N-Nitrosodiethylamine	U	3.19	ug/L	3.19	10.6
621-64-7	N-Nitrosodi-n-propylamine	U	3.19	ug/L	3.19	10.6
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.19	ug/L	3.19	10.6
91-20-3	Naphthalene	U	0.319	ug/L	0.319	1.06
98-95-3	Nitrobenzene	U	3.19	ug/L	3.19	10.6
608-93-5	Pentachlorobenzene	U	3.19	ug/L	3.19	10.6
87-86-5	Pentachlorophenol	U	3.19	ug/L	3.19	10.6
85-01-8	Phenanthrene	U	0.319	ug/L	0.319	1.06
108-95-2	Phenol	U	3.19	ug/L	3.19	10.6
129-00-0	Pyrene	U	0.319	ug/L	0.319	1.06
110-86-1	Pyridine	U	3.19	ug/L	3.19	10.6
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.19	ug/L	3.19	10.6
111-91-1	bis(2-Chloroethoxy)methane	U	3.19	ug/L	3.19	10.6
111-44-4	bis(2-Chloroethyl) ether	U	3.19	ug/L	3.19	10.6
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.19	ug/L	3.19	1.06

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438010

Date Collected: 02/07/2018 13:16

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-78

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1738268

Inst: MSD3.I

Dilution: 1

Run Date: 02/13/2018 17:45

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/12/2018 09:00

Aliquot: 940 mL

Final Volume: 1 mL

Data File: s021318.s\s3b1317.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.94	ug/L	3.94	10.6
99-09-2	3-Nitroaniline	U	3.19	ug/L	3.19	10.6
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.19	ug/L	3.19	10.6
88-74-4	2-Nitroaniline	U	3.19	ug/L	3.19	10.6
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.19	ug/L	3.19	10.6
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	48.1	106	ug/L	45	(32%-124%)
2-Fluorobiphenyl	20.8	53.2	ug/L	39	(32%-112%)
2-Fluorophenol	31.6	106	ug/L	30	(15%-88%)
Nitrobenzene-d5	26.3	53.2	ug/L	50	(36%-115%)
Phenol-d5	20.4	106	ug/L	19	(15%-91%)
p-Terphenyl-d14	28.3	53.2	ug/L	53	(36%-121%)

Tentatively Identified Compound Summary

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

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438013

Date Collected: 02/07/2018 09:00

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1738268

Run Date: 02/14/2018 13:16

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/12/2018 09:00

Aliquot: 980 mL

Final Volume: 1 mL

Data File: s021418.s\3b1406.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.06	ug/L	3.06	10.2
120-82-1	1,2,4-Trichlorobenzene	U	3.06	ug/L	3.06	10.2
95-50-1	1,2-Dichlorobenzene	U	3.06	ug/L	3.06	10.2
122-66-7	Azobenzene	U	3.06	ug/L	3.06	10.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.06	ug/L	3.06	10.2
106-46-7	1,4-Dichlorobenzene	U	3.06	ug/L	3.06	10.2
123-91-1	1,4-Dioxane	U	3.06	ug/L	3.06	10.2
90-12-0	1-Methylnaphthalene	U	0.306	ug/L	0.306	1.02
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.06	ug/L	3.06	10.2
95-95-4	2,4,5-Trichlorophenol	U	3.06	ug/L	3.06	10.2
88-06-2	2,4,6-Trichlorophenol	U	3.06	ug/L	3.06	10.2
120-83-2	2,4-Dichlorophenol	U	3.06	ug/L	3.06	10.2
105-67-9	2,4-Dimethylphenol	U	3.06	ug/L	3.06	10.2
51-28-5	2,4-Dinitrophenol	U	5.10	ug/L	5.10	20.4
121-14-2	2,4-Dinitrotoluene	U	3.06	ug/L	3.06	10.2
606-20-2	2,6-Dinitrotoluene	U	3.06	ug/L	3.06	10.2
91-58-7	2-Chloronaphthalene	U	0.418	ug/L	0.418	1.02
95-57-8	2-Chlorophenol	U	3.06	ug/L	3.06	10.2
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.06	ug/L	3.06	10.2
91-57-6	2-Methylnaphthalene	U	0.306	ug/L	0.306	1.02
88-75-5	2-Nitrophenol	U	3.06	ug/L	3.06	10.2
91-94-1	3,3'-Dichlorobenzidine	U	3.06	ug/L	3.06	10.2
101-55-3	4-Bromophenylphenylether	U	3.06	ug/L	3.06	10.2
59-50-7	Parachlorometa cresol	U	3.06	ug/L	3.06	10.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.37	ug/L	3.37	10.2
7005-72-3	4-Chlorophenylphenylether	U	3.06	ug/L	3.06	10.2
100-02-7	4-Nitrophenol	U	3.06	ug/L	3.06	10.2
83-32-9	Acenaphthene	U	0.306	ug/L	0.306	1.02
208-96-8	Acenaphthylene	U	0.306	ug/L	0.306	1.02
62-53-3	Aniline	U	4.29	ug/L	4.29	10.2
120-12-7	Anthracene	U	0.306	ug/L	0.306	1.02
1912-24-9	Atrazine	U	3.06	ug/L	3.06	10.2
92-87-5	Benzidine	U	3.98	ug/L	3.98	10.2
56-55-3	Benzo(a)anthracene	U	0.306	ug/L	0.306	1.02
50-32-8	Benzo(a)pyrene	U	0.306	ug/L	0.306	1.02
205-99-2	Benzo(b)fluoranthene	U	0.306	ug/L	0.306	1.02
191-24-2	Benzo(ghi)perylene	U	0.306	ug/L	0.306	1.02

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438013

Date Collected: 02/07/2018 09:00

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1738268

Run Date: 02/14/2018 13:16

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/12/2018 09:00

Aliquot: 980 mL

Final Volume: 1 mL

Data File: s021418.s\s3b1406.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.306	ug/L	0.306	1.02
65-85-0	Benzoic acid	U	6.12	ug/L	6.12	20.4
100-51-6	Benzyl alcohol	U	3.06	ug/L	3.06	10.2
85-68-7	Butylbenzylphthalate	U	3.06	ug/L	3.06	10.2
218-01-9	Chrysene	U	0.306	ug/L	0.306	1.02
84-74-2	Di-n-butylphthalate	U	3.06	ug/L	3.06	10.2
117-84-0	Di-n-octylphthalate	U	3.06	ug/L	3.06	10.2
53-70-3	Dibenzo(a,h)anthracene	U	0.306	ug/L	0.306	1.02
132-64-9	Dibenzofuran	U	3.06	ug/L	3.06	10.2
84-66-2	Diethylphthalate	U	3.06	ug/L	3.06	10.2
131-11-3	Dimethylphthalate	U	3.06	ug/L	3.06	10.2
88-85-7	Dinoseb	U	3.06	ug/L	3.06	10.2
122-39-4	Diphenylamine	U	3.06	ug/L	3.06	10.2
206-44-0	Fluoranthene	U	0.306	ug/L	0.306	1.02
86-73-7	Fluorene	U	0.306	ug/L	0.306	1.02
118-74-1	Hexachlorobenzene	U	3.06	ug/L	3.06	10.2
87-68-3	Hexachlorobutadiene	U	3.06	ug/L	3.06	10.2
77-47-4	Hexachlorocyclopentadiene	U	3.06	ug/L	3.06	10.2
67-72-1	Hexachloroethane	U	3.06	ug/L	3.06	10.2
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.306	ug/L	0.306	1.02
78-59-1	Isophorone	U	3.57	ug/L	3.57	10.2
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.06	ug/L	3.06	10.2
924-16-3	N-Nitrosodi-n-butylamine	U	3.06	ug/L	3.06	10.2
55-18-5	N-Nitrosodiethylamine	U	3.06	ug/L	3.06	10.2
621-64-7	N-Nitrosodi-n-propylamine	U	3.06	ug/L	3.06	10.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.06	ug/L	3.06	10.2
91-20-3	Naphthalene	U	0.306	ug/L	0.306	1.02
98-95-3	Nitrobenzene	U	3.06	ug/L	3.06	10.2
608-93-5	Pentachlorobenzene	U	3.06	ug/L	3.06	10.2
87-86-5	Pentachlorophenol	U	3.06	ug/L	3.06	10.2
85-01-8	Phenanthrene	U	0.306	ug/L	0.306	1.02
108-95-2	Phenol	U	3.06	ug/L	3.06	10.2
129-00-0	Pyrene	U	0.306	ug/L	0.306	1.02
110-86-1	Pyridine	U	3.06	ug/L	3.06	10.2
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.06	ug/L	3.06	10.2
111-91-1	bis(2-Chloroethoxy)methane	U	3.06	ug/L	3.06	10.2
111-44-4	bis(2-Chloroethyl) ether	U	3.06	ug/L	3.06	10.2
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.06	ug/L	3.06	1.02

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639

Lab Sample ID: 443438013

Date Collected: 02/07/2018 09:00

Date Received: 02/09/2018 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1738268

Inst: MSD3.I

Dilution: 1

Run Date: 02/14/2018 13:16

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/12/2018 09:00

Aliquot: 980 mL

Final Volume: 1 mL

Data File: s021418.s\s3b1406.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.78	ug/L	3.78	10.2
99-09-2	3-Nitroaniline	U	3.06	ug/L	3.06	10.2
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.06	ug/L	3.06	10.2
88-74-4	2-Nitroaniline	U	3.06	ug/L	3.06	10.2
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.06	ug/L	3.06	10.2
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	81.0	102	ug/L	79	(32%-124%)
2-Fluorobiphenyl	37.6	51.0	ug/L	74	(32%-112%)
2-Fluorophenol	46.6	102	ug/L	46	(15%-88%)
Nitrobenzene-d5	40.1	51.0	ug/L	79	(36%-115%)
Phenol-d5	29.5	102	ug/L	29	(15%-91%)
p-Terphenyl-d14	43.5	51.0	ug/L	85	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	2.296	5.14	ug/L	99	NJ

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-1639

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203969165	MB for batch 1738267	50	31	80	75	89	103
1203969166	LCS for batch 1738267	48	29	76	67	89	85
1203969167	CAWA-18-81MS	63	49	74	72	74	86
1203969168	CAWA-18-81MSD	55	42	66	68	67	80
443438002	CAWA-18-72	33	21	58	57	33	75
443438006	CAWA-18-75	39	26	65	52	55	61
443438010	CAWA-18-78	30	19	50	39	45	53
443438013	CAWA-18-129	46	29	79	74	79	85

Surrogate**Acceptance Limits**

2FP	= 2-Fluorophenol	(15%-88%)
PHL	= Phenol-d5	(15%-91%)
NBZ	= Nitrobenzene-d5	(36%-115%)
FBP	= 2-Fluorobiphenyl	(32%-112%)
TBP	= 2,4,6-Tribromophenol	(32%-124%)
TPH	= p-Terphenyl-d14	(36%-121%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1738267

Matrix: WATER

Lab Sample ID 1203969166

Instrument: MSD3.I

Analysis Date: 02/12/2018 16:20

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	LCS N-Methyl-N-nitrosomethylamine	50.0	0.0	24.0	48	30-88
110-86-1	LCS Pyridine	50.0	0.0	27.5	55	27-89
62-53-3	LCS Aniline	50.0	0.0	36.7	73	49-112
108-95-2	LCS Phenol	50.0	0.0	14.8	30	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	40.5	81	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	37.2	74	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	30.0	60	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	29.8	60	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	30.8	62	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)ether	50.0	0.0	39.7	79	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	33.3	67	44-102
95-48-7	LCS o-Cresol	50.0	0.0	31.9	64	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	32.6	65	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	40.7	81	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	27.0	54	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	38.9	78	53-115
78-59-1	LCS Isophorone	50.0	0.0	39.1	78	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	40.4	81	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	33.2	66	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	40.9	82	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	40.7	81	53-109
65-85-0	LCS Benzoic acid	100	0.0	29.1	29	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1738267

Matrix: WATER

Lab Sample ID 1203969166

Instrument: MSD3.I

Analysis Date: 02/12/2018 16:20

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	LCS 4-Chloroaniline	50.0	0.0	49.3	99	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	31.1	62	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	38.1	76	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	32.3	65	42-103
91-20-3	LCS Naphthalene	50.0	0.0	32.9	66	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	34.0	68	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	19.5	39	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	42.0	84	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	40.7	81	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	37.9	76	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	39.6	79	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	47.3	95	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	43.9	88	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	40.8	82	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	39.9	80	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	39.4	79	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	43.4	87	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	35.8	72	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	40.9	82	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	39.9	80	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	45.2	90	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	16.9	34	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1738267

Matrix: WATER

Lab Sample ID 1203969166

Instrument: MSD3.I

Analysis Date: 02/12/2018 16:20

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	LCS Fluorene	50.0	0.0	40.7	81	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	44.6	89	52-121
100-01-6	LCS 4-Nitroaniline	50.0	0.0	42.6	85	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	38.7	77	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	41.5	83	55-113
122-66-7	LCS Azobenzene	50.0	0.0	40.8	82	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	44.6	89	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	43.6	87	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	46.6	93	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	42.6	85	55-110
120-12-7	LCS Anthracene	50.0	0.0	43.1	86	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	49.9	100	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	49.0	98	54-118
129-00-0	LCS Pyrene	50.0	0.0	37.3	75	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	40.7	81	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	40.6	81	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	42.0	84	57-112
218-01-9	LCS Chrysene	50.0	0.0	42.1	84	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	37.4	75	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	41.0	82	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	41.9	84	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	42.4	85	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-1639

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1738267

Matrix: WATER

Lab Sample ID 1203969166

Instrument: MSD3.I

Analysis Date: 02/12/2018 16:20

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	LCS Indeno(1,2,3-cd)pyrene	50.0	0.0	44.4	89	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	45.0	90	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	44.4	89	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	26.2	52	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	37.9	76	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	39.2	78	44-102
1912-24-9	LCS Atrazine	50.0	0.0	48.7	97	60-131
92-87-5	LCS Benzidine	100	0.0	128	128	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	50.2	100	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	32.7	65	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-1639

Sample Type: Matrix Spike

Client ID: CAWA-18-81MS

Matrix: W

Lab Sample ID 1203969167

Instrument: MSD3.I

Analysis Date: 02/12/2018 19:47

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	MS N-Methyl-N-nitrosomethylamine	111	0.00 U	68.6	62	25-106
110-86-1	MS Pyridine	111	0.00 U	73.2	66	24-93
62-53-3	MS Aniline	111	0.00 U	84.6	76	37-113
108-95-2	MS Phenol	111	0.00 U	55.4	50	23-82
111-44-4	MS bis(2-Chloroethyl) ether	111	0.00 U	89.0	80	39-114
95-57-8	MS 2-Chlorophenol	111	0.00 U	84.5	76	37-108
541-73-1	MS 1,3-Dichlorobenzene	111	0.00 U	69.4	62	27-97
106-46-7	MS 1,4-Dichlorobenzene	111	0.00 U	69.4	62	28-97
95-50-1	MS 1,2-Dichlorobenzene	111	0.00 U	70.8	64	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)ether	111	0.00 U	88.5	80	32-127
100-51-6	MS Benzyl alcohol	111	0.00 U	86.5	78	37-116
95-48-7	MS o-Cresol	111	0.00 U	81.6	73	34-109
65794-96-9	MS m,p-Cresols	111	0.00 U	88.7	80	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	111	0.00 U	92.3	83	42-118
67-72-1	MS Hexachloroethane	111	0.00 U	63.2	57	29-94
98-95-3	MS Nitrobenzene	111	0.00 U	84.5	76	38-123
78-59-1	MS Isophorone	111	0.00 U	83.7	75	43-120
88-75-5	MS 2-Nitrophenol	111	0.00 U	86.8	78	39-115
105-67-9	MS 2,4-Dimethylphenol	111	0.00 U	71.0	64	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	111	0.00 U	87.5	79	42-118
120-83-2	MS 2,4-Dichlorophenol	111	0.00 U	86.4	78	40-111
65-85-0	MS Benzoic acid	222	0.00 U	94.8	43	17-95

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-1639

Sample Type: Matrix Spike

Client ID: CAWA-18-81MS

Matrix: W

Lab Sample ID 1203969167

Instrument: MSD3.I

Analysis Date: 02/12/2018 19:47

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS 4-Chloroaniline	111	0.00 U	110	99	44-138
87-68-3	MS Hexachlorobutadiene	111	0.00 U	69.5	63	26-98
59-50-7	MS Parachlorometa cresol 4-Chloro-3-methylphenol	111	0.00 U	84.8	76	41-122
91-57-6	MS 2-Methylnaphthalene	111	0.00 U	71.4	64	29-109
91-20-3	MS Naphthalene	111	0.00 U	73.7	66	31-108
90-12-0	MS 1-Methylnaphthalene	111	0.00 U	74.2	67	33-112
77-47-4	MS Hexachlorocyclopentadiene	111	0.00 U	24.5	22 *	26-79
88-06-2	MS 2,4,6-Trichlorophenol	111	0.00 U	81.6	73	39-124
95-95-4	MS 2,4,5-Trichlorophenol	111	0.00 U	78.2	70	42-120
91-58-7	MS 2-Chloronaphthalene	111	0.00 U	78.6	71	29-113
88-74-4	MS 2-Nitroaniline o-Nitroaniline	111	0.00 U	86.6	78	41-121
99-09-2	MS 3-Nitroaniline m-Nitroaniline	111	0.00 U	103	93	42-144
131-11-3	MS Dimethylphthalate	111	0.00 U	93.2	84	45-128
606-20-2	MS 2,6-Dinitrotoluene	111	0.00 U	88.1	79	46-124
121-14-2	MS 2,4-Dinitrotoluene	111	0.00 U	88.2	79	45-125
208-96-8	MS Acenaphthylene	111	0.00 U	83.2	75	35-120
83-32-9	MS Acenaphthene	111	0.00 U	90.8	82	35-117
51-28-5	MS 2,4-Dinitrophenol	111	0.00 U	51.3	46	27-122
132-64-9	MS Dibenzofuran	111	0.00 U	89.4	80	38-113
58-90-2	MS 2,3,4,6-Tetrachlorophenol	111	0.00 U	67.6	61	40-128
84-66-2	MS Diethylphthalate	111	0.00 U	96.0	86	43-127
100-02-7	MS 4-Nitrophenol	111	0.00 U	40.8	37	17-85

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2018-1639

Sample Type: Matrix Spike

Client ID: CAWA-18-81MS

Matrix: W

Lab Sample ID 1203969167

Instrument: MSD3.I

Analysis Date: 02/12/2018 19:47

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS Fluorene	111	0.00 U	89.8	81	39-117
7005-72-3	MS 4-Chlorophenylphenylether	111	0.00 U	95.7	86	39-121
100-01-6	MS 4-Nitroaniline	111	0.00 U	85.9	77	30-133
534-52-1	MS 2-Methyl-4,6-dinitrophenol	111	0.00 U	48.5	44	32-126
122-39-4	MS Diphenylamine	111	0.00 U	88.3	79	37-118
122-66-7	MS Azobenzene	111	0.00 U	85.8	77	38-120
101-55-3	MS 4-Bromophenylphenylether	111	0.00 U	94.4	85	39-121
118-74-1	MS Hexachlorobenzene	111	0.00 U	94.5	85	40-118
87-86-5	MS Pentachlorophenol	111	0.00 U	59.6	54	35-121
85-01-8	MS Phenanthrene	111	0.00 U	91.3	82	40-115
120-12-7	MS Anthracene	111	0.00 U	91.7	83	38-120
84-74-2	MS Di-n-butylphthalate	111	0.00 U	103	93	41-128
206-44-0	MS Fluoranthene	111	0.00 U	101	91	41-119
129-00-0	MS Pyrene	111	0.00 U	85.7	77	35-128
85-68-7	MS Butylbenzylphthalate	111	0.00 U	94.8	85	40-129
117-81-7	MS bis(2-Ethylhexyl)phthalate	111	0.00 U	102	92	38-131
56-55-3	MS Benzo(a)anthracene	111	0.00 U	91.4	82	39-120
218-01-9	MS Chrysene	111	0.00 U	92.2	83	41-124
117-84-0	MS Di-n-octylphthalate	111	0.00 U	95.3	86	37-134
205-99-2	MS Benzo(b)fluoranthene	111	0.00 U	93.4	84	31-122
207-08-9	MS Benzo(k)fluoranthene	111	0.00 U	96.6	87	33-123
50-32-8	MS Benzo(a)pyrene	111	0.00 U	94.7	85	32-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2018-1639

Sample Type: Matrix Spike

Client ID: CAWA-18-81MS

Matrix: W

Lab Sample ID 1203969167

Instrument: MSD3.I

Analysis Date: 02/12/2018 19:47

Dilution: 1

Analyst: JLD1

Prep Batch ID:1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	MS Indeno(1,2,3-cd)pyrene	111	0.00 U	87.0	78	27-121
53-70-3	MS Dibenzo(a,h)anthracene	111	0.00 U	85.0	76	30-125
191-24-2	MS Benzo(ghi)perylene	111	0.00 U	81.9	74	24-126
123-91-1	MS 1,4-Dioxane	111	0.00 U	72.5	65	24-110
930-55-2	MS N-Nitrosopyrrolidine	111	0.00 U	93.2	84	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	111	0.00 U	78.9	71	32-101
1912-24-9	MS Atrazine	111	0.00 U	99.2	89	42-129
92-87-5	MS Benzidine	222	0.00 U	217	98	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	111	0.00 U	92.2	83	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	111	0.00 U	71.4	64	26-102

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2018-1639

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-18-81MSD

Matrix: W

Lab Sample ID 1203969168

Instrument: MSD3.I

Analysis Date: 02/12/2018 20:16

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	MSD N-Methyl-N-nitrosomethylamine	111	0.00	U 58.9	53	25-106	15	0-30
110-86-1	MSD Pyridine	111	0.00	U 58.8	53	24-93	22	0-30
62-53-3	MSD Aniline	111	0.00	U 73.3	66	37-113	14	0-30
108-95-2	MSD Phenol	111	0.00	U 47.7	43	23-82	15	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	111	0.00	U 76.7	69	39-114	15	0-30
95-57-8	MSD 2-Chlorophenol	111	0.00	U 73.5	66	37-108	14	0-30
541-73-1	MSD 1,3-Dichlorobenzene	111	0.00	U 60.2	54	27-97	14	0-30
106-46-7	MSD 1,4-Dichlorobenzene	111	0.00	U 60.2	54	28-97	14	0-30
95-50-1	MSD 1,2-Dichlorobenzene	111	0.00	U 61.2	55	28-99	15	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)ether	111	0.00	U 75.7	68	32-127	16	0-30
100-51-6	MSD Benzyl alcohol	111	0.00	U 74.7	67	37-116	15	0-30
95-48-7	MSD o-Cresol	111	0.00	U 71.0	64	34-109	14	0-30
65794-96-9	MSD m,p-Cresols	111	0.00	U 77.7	70	36-120	13	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	111	0.00	U 80.1	72	42-118	14	0-30
67-72-1	MSD Hexachloroethane	111	0.00	U 54.1	49	29-94	16	0-30
98-95-3	MSD Nitrobenzene	111	0.00	U 73.6	66	38-123	14	0-30
78-59-1	MSD Isophorone	111	0.00	U 74.1	67	43-120	12	0-30
88-75-5	MSD 2-Nitrophenol	111	0.00	U 77.3	70	39-115	12	0-30
105-67-9	MSD 2,4-Dimethylphenol	111	0.00	U 62.4	56	39-107	13	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	111	0.00	U 77.6	70	42-118	12	0-30
120-83-2	MSD 2,4-Dichlorophenol	111	0.00	U 77.1	69	40-111	11	0-30
65-85-0	MSD Benzoic acid	222	0.00	U 92.2	41	17-95	3	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2018-1639

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-18-81MSD

Matrix: W

Lab Sample ID 1203969168

Instrument: MSD3.I

Analysis Date: 02/12/2018 20:16

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	MSD 4-Chloroaniline	111	0.00	U 98.3	89	44-138	11	0-30
87-68-3	MSD Hexachlorobutadiene	111	0.00	U 60.2	54	26-98	14	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	111	0.00	U 75.0	68	41-122	12	0-30
91-57-6	MSD 2-Methylnaphthalene	111	0.00	U 63.6	57	29-109	11	0-30
91-20-3	MSD Naphthalene	111	0.00	U 65.0	58	31-108	13	0-30
90-12-0	MSD 1-Methylnaphthalene	111	0.00	U 66.4	60	33-112	11	0-30
77-47-4	MSD Hexachlorocyclopentadiene	111	0.00	U 20.6	19 *	26-79	18	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	111	0.00	U 74.2	67	39-124	10	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	111	0.00	U 70.0	63	42-120	11	0-30
91-58-7	MSD 2-Chloronaphthalene	111	0.00	U 71.4	64	29-113	10	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	111	0.00	U 77.3	70	41-121	11	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	111	0.00	U 90.6	82	42-144	13	0-30
131-11-3	MSD Dimethylphthalate	111	0.00	U 83.3	75	45-128	11	0-30
606-20-2	MSD 2,6-Dinitrotoluene	111	0.00	U 78.6	71	46-124	11	0-30
121-14-2	MSD 2,4-Dinitrotoluene	111	0.00	U 78.0	70	45-125	12	0-30
208-96-8	MSD Acenaphthylene	111	0.00	U 75.0	68	35-120	10	0-30
83-32-9	MSD Acenaphthene	111	0.00	U 82.0	74	35-117	10	0-30
51-28-5	MSD 2,4-Dinitrophenol	111	0.00	U 49.2	44	27-122	4	0-30
132-64-9	MSD Dibenzofuran	111	0.00	U 79.8	72	38-113	11	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	111	0.00	U 61.5	55	40-128	10	0-30
84-66-2	MSD Diethylphthalate	111	0.00	U 85.2	77	43-127	12	0-30
100-02-7	MSD 4-Nitrophenol	111	0.00	U 38.2	34	17-85	7	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2018-1639

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-18-81MSD

Matrix: W

Lab Sample ID 1203969168

Instrument: MSD3.I

Analysis Date: 02/12/2018 20:16

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	MSD Fluorene	111	0.00	U 79.2	71	39-117	13	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	111	0.00	U 84.4	76	39-121	13	0-30
100-01-6	MSD 4-Nitroaniline <i>p-Nitroaniline</i>	111	0.00	U 74.4	67	30-133	14	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	111	0.00	U 47.2	43	32-126	3	0-30
122-39-4	MSD Diphenylamine	111	0.00	U 79.0	71	37-118	11	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	111	0.00	U 77.8	70	38-120	10	0-30
101-55-3	MSD 4-Bromophenylphenylether	111	0.00	U 83.7	75	39-121	12	0-30
118-74-1	MSD Hexachlorobenzene	111	0.00	U 84.5	76	40-118	11	0-30
87-86-5	MSD Pentachlorophenol	111	0.00	U 54.4	49	35-121	9	0-30
85-01-8	MSD Phenanthrene	111	0.00	U 80.9	73	40-115	12	0-30
120-12-7	MSD Anthracene	111	0.00	U 81.9	74	38-120	11	0-30
84-74-2	MSD Di-n-butylphthalate	111	0.00	U 92.1	83	41-128	12	0-30
206-44-0	MSD Fluoranthene	111	0.00	U 89.3	80	41-119	12	0-30
129-00-0	MSD Pyrene	111	0.00	U 77.7	70	35-128	10	0-30
85-68-7	MSD Butylbenzylphthalate	111	0.00	U 85.0	77	40-129	11	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	111	0.00	U 91.1	82	38-131	11	0-30
56-55-3	MSD Benzo(a)anthracene	111	0.00	U 82.8	74	39-120	10	0-30
218-01-9	MSD Chrysene	111	0.00	U 83.7	75	41-124	10	0-30
117-84-0	MSD Di-n-octylphthalate	111	0.00	U 84.9	76	37-134	12	0-30
205-99-2	MSD Benzo(b)fluoranthene	111	0.00	U 80.8	73	31-122	15	0-30
207-08-9	MSD Benzo(k)fluoranthene	111	0.00	U 82.9	75	33-123	15	0-30
50-32-8	MSD Benzo(a)pyrene	111	0.00	U 82.3	74	32-118	14	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2018-1639

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-18-81MSD

Matrix: W

Lab Sample ID 1203969168

Instrument: MSD3.I

Analysis Date: 02/12/2018 20:16

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1738267

Inj. Vol: 1 uL

Batch ID: 1738268

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	Acceptance RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	111	0.00	U	85.9	77	27-121	1 0-30
53-70-3	MSD Dibenzo(a,h)anthracene	111	0.00	U	84.2	76	30-125	1 0-30
191-24-2	MSD Benzo(ghi)perylene	111	0.00	U	82.8	75	24-126	1 0-30
123-91-1	MSD 1,4-Dioxane	111	0.00	U	63.3	57	24-110	14 0-30
930-55-2	MSD N-Nitrosopyrrolidine	111	0.00	U	82.3	74	47-119	12 0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	111	0.00	U	72.7	65	32-101	8 0-30
1912-24-9	MSD Atrazine	111	0.00	U	88.6	80	42-129	11 0-30
92-87-5	MSD Benzidine	222	0.00	U	164	74	15-130	28 0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	111	0.00	U	84.5	76	34-124	9 0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	111	0.00	U	63.2	57	26-102	12 0-30

Method Blank Summary

Page 1 of 1

SDG Number:	2018-1639	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1738267	Instrument ID:	MSD3.I	Data File:	s021218.s\s3b1209.D
Lab Sample ID:	1203969165	Prep Date:	02/12/2018 09:00	Analyzed:	02/12/18 15:51
Column:	DB-5ms				

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 1738267	1203969166	s021218.s\s3b1210.D	02/12/18	1620
02 CAWA-18-81MS	1203969167	s021218.s\s3b1217.D	02/12/18	1947
03 CAWA-18-81MSD	1203969168	s021218.s\s3b1218.D	02/12/18	2016
04 CAWA-18-72	443438002	s021218.s\s3b1219.D	02/12/18	2046
05 CAWA-18-75	443438006	s021318.s\s3b1316.D	02/13/18	1716
06 CAWA-18-78	443438010	s021318.s\s3b1317.D	02/13/18	1745
07 CAWA-18-129	443438013	s021418.s\s3b1406.D	02/14/18	1316

Quality Control Data

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203969165
Client Sample: QC for batch 1738267
Client ID: MB for batch 1738267
Batch ID: 1738268
Run Date: 02/12/2018 15:51
Prep Date: 02/12/2018 09:00
Data File: s021218.s\3b1209.D

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.00	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene	U	3.00	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
122-66-7	Azobenzene	U	3.00	ug/L	3.00	10.0
541-73-1	<i>1,2-Diphenylhydrazine</i> 1,3-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
123-91-1	1,4-Dioxane	U	3.00	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.00	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol	U	3.00	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol	U	3.00	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol	U	3.00	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol	U	3.00	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol	U	5.00	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene	U	3.00	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene	U	3.00	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene	U	0.410	ug/L	0.410	1.00
95-57-8	2-Chlorophenol	U	3.00	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.00	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
88-75-5	2-Nitrophenol	U	3.00	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine	U	3.00	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether	U	3.00	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol	U	3.00	ug/L	3.00	10.0
106-47-8	<i>4-Chloro-3-methylphenol</i> 4-Chloroaniline	U	3.30	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether	U	3.00	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	U	3.00	ug/L	3.00	10.0
83-32-9	Acenaphthene	U	0.300	ug/L	0.300	1.00
208-96-8	Acenaphthylene	U	0.300	ug/L	0.300	1.00
62-53-3	Aniline	U	4.20	ug/L	4.20	10.0
120-12-7	Anthracene	U	0.300	ug/L	0.300	1.00
1912-24-9	Atrazine	U	3.00	ug/L	3.00	10.0
92-87-5	Benzidine	U	3.90	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene	U	0.300	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene	U	0.300	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene	U	0.300	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene	U	0.300	ug/L	0.300	1.00

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1639

Lab Sample ID: 1203969165

Client Sample: QC for batch 1738267

Client ID: MB for batch 1738267

Batch ID: 1738268

Run Date: 02/12/2018 15:51

Prep Date: 02/12/2018 09:00

Data File: s021218.s\sb1209.D

Matrix: WATER

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.300	ug/L	0.300	1.00
65-85-0	Benzoic acid	U	6.00	ug/L	6.00	20.0
100-51-6	Benzyl alcohol	U	3.00	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate	U	3.00	ug/L	3.00	10.0
218-01-9	Chrysene	U	0.300	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate	U	3.00	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate	U	3.00	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene	U	0.300	ug/L	0.300	1.00
132-64-9	Dibenzofuran	U	3.00	ug/L	3.00	10.0
84-66-2	Diethylphthalate	U	3.00	ug/L	3.00	10.0
131-11-3	Dimethylphthalate	U	3.00	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine	U	3.00	ug/L	3.00	10.0
206-44-0	Fluoranthene	U	0.300	ug/L	0.300	1.00
86-73-7	Fluorene	U	0.300	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene	U	3.00	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene	U	3.00	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene	U	3.00	ug/L	3.00	10.0
67-72-1	Hexachloroethane	U	3.00	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.300	ug/L	0.300	1.00
78-59-1	Isophorone	U	3.50	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.00	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi-n-propylamine	U	3.00	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.00	ug/L	3.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
98-95-3	Nitrobenzene	U	3.00	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol	U	3.00	ug/L	3.00	10.0
85-01-8	Phenanthrene	U	0.300	ug/L	0.300	1.00
108-95-2	Phenol	U	3.00	ug/L	3.00	10.0
129-00-0	Pyrene	U	0.300	ug/L	0.300	1.00
110-86-1	Pyridine	U	3.00	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.00	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane	U	3.00	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether	U	3.00	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.00	ug/L	3.00	1.00

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203969165
Client Sample: QC for batch 1738267
Client ID: MB for batch 1738267
Batch ID: 1738268
Run Date: 02/12/2018 15:51
Prep Date: 02/12/2018 09:00
Data File: s021218.s\3b1209.D

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.70	ug/L	3.70	10.0
99-09-2	3-Nitroaniline	U	3.00	ug/L	3.00	10.0
95-48-7	<i>m</i> -Nitroaniline o-Cresol	U	3.00	ug/L	3.00	10.0
88-74-4	2-Nitroaniline	U	3.00	ug/L	3.00	10.0
100-01-6	<i>o</i> -Nitroaniline 4-Nitroaniline <i>p</i> -Nitroaniline	U	3.00	ug/L	3.00	10.0

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	88.9	100	ug/L	89	(32%-124%)
2-Fluorobiphenyl	37.3	50.0	ug/L	75	(32%-112%)
2-Fluorophenol	49.6	100	ug/L	50	(15%-88%)
Nitrobenzene-d5	40.1	50.0	ug/L	80	(36%-115%)
Phenol-d5	30.7	100	ug/L	31	(15%-91%)
p-Terphenyl-d14	51.7	50.0	ug/L	103	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	2.425	5.61	ug/L	99	NJ

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203969166
Client Sample: QC for batch 1738267
Client ID: LCS for batch 1738267
Batch ID: 1738268
Run Date: 02/12/2018 16:20
Prep Date: 02/12/2018 09:00
Data File: s021218.s\3b1210.D

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		39.2	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		32.7	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		30.8	ug/L	3.00	10.0
122-66-7	Azobenzene		40.8	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		30.0	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		29.8	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		26.2	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		34.0	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		39.9	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		40.7	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		42.0	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		40.7	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		33.2	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		35.8	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		39.9	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		40.8	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		37.9	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		37.2	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		38.7	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		32.3	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		40.4	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		50.2	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		44.6	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		38.1	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		49.3	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		44.6	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		16.9	ug/L	3.00	10.0
83-32-9	Acenaphthene		43.4	ug/L	0.300	1.00
208-96-8	Acenaphthylene		39.4	ug/L	0.300	1.00
62-53-3	Aniline		36.7	ug/L	4.20	10.0
120-12-7	Anthracene		43.1	ug/L	0.300	1.00
1912-24-9	Atrazine		48.7	ug/L	3.00	10.0
92-87-5	Benzidine	E	128	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		42.0	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		42.4	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		41.0	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		44.4	ug/L	0.300	1.00

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203969166
Client Sample: QC for batch 1738267
Client ID: LCS for batch 1738267
Batch ID: 1738268
Run Date: 02/12/2018 16:20
Prep Date: 02/12/2018 09:00
Data File: s021218.s\3b1210.D

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		41.9	ug/L	0.300	1.00
65-85-0	Benzoic acid		29.1	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		33.3	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		40.7	ug/L	3.00	10.0
218-01-9	Chrysene		42.1	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		49.9	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		37.4	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		45.0	ug/L	0.300	1.00
132-64-9	Dibenzofuran		40.9	ug/L	3.00	10.0
84-66-2	Diethylphthalate		45.2	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		43.9	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		41.5	ug/L	3.00	10.0
206-44-0	Fluoranthene		49.0	ug/L	0.300	1.00
86-73-7	Fluorene		40.7	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		43.6	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		31.1	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		19.5	ug/L	3.00	10.0
67-72-1	Hexachloroethane		27.0	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		44.4	ug/L	0.300	1.00
78-59-1	Isophorone		39.1	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		24.0	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi-n-propylamine		40.7	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		37.9	ug/L	3.00	10.0
91-20-3	Naphthalene		32.9	ug/L	0.300	1.00
98-95-3	Nitrobenzene		38.9	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		46.6	ug/L	3.00	10.0
85-01-8	Phenanthrene		42.6	ug/L	0.300	1.00
108-95-2	Phenol		14.8	ug/L	3.00	10.0
129-00-0	Pyrene		37.3	ug/L	0.300	1.00
110-86-1	Pyridine		27.5	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		39.7	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		40.9	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		40.5	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		40.6	ug/L	3.00	1.00

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203969166
Client Sample: QC for batch 1738267
Client ID: LCS for batch 1738267
Batch ID: 1738268
Run Date: 02/12/2018 16:20
Prep Date: 02/12/2018 09:00
Data File: s021218.s\s3b1210.D

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		32.6	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		47.3	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		31.9	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		39.6	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		42.6	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	88.8	100	ug/L	89	(32%-124%)
2-Fluorobiphenyl	33.7	50.0	ug/L	67	(32%-112%)
2-Fluorophenol	47.9	100	ug/L	48	(15%-88%)
Nitrobenzene-d5	38.1	50.0	ug/L	76	(36%-115%)
Phenol-d5	28.9	100	ug/L	29	(15%-91%)
p-Terphenyl-d14	42.5	50.0	ug/L	85	(36%-121%)

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203969167
Client Sample: QC for batch 1738267
Client ID: CAWA-18-81MS
Batch ID: 1738268
Run Date: 02/12/2018 19:47
Prep Date: 02/12/2018 09:00
Data File: s021218.s\3b1217.D

Date Collected: 02/06/2018 11:24
Date Received: 02/08/2018 08:45
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 450 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		78.9	ug/L	6.67	22.2
120-82-1	1,2,4-Trichlorobenzene		71.4	ug/L	6.67	22.2
95-50-1	1,2-Dichlorobenzene		70.8	ug/L	6.67	22.2
122-66-7	Azobenzene		85.8	ug/L	6.67	22.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		69.4	ug/L	6.67	22.2
106-46-7	1,4-Dichlorobenzene		69.4	ug/L	6.67	22.2
123-91-1	1,4-Dioxane		72.5	ug/L	6.67	22.2
90-12-0	1-Methylnaphthalene		74.2	ug/L	0.667	2.22
58-90-2	2,3,4,6-Tetrachlorophenol		67.6	ug/L	6.67	22.2
95-95-4	2,4,5-Trichlorophenol		78.2	ug/L	6.67	22.2
88-06-2	2,4,6-Trichlorophenol		81.6	ug/L	6.67	22.2
120-83-2	2,4-Dichlorophenol		86.4	ug/L	6.67	22.2
105-67-9	2,4-Dimethylphenol		71.0	ug/L	6.67	22.2
51-28-5	2,4-Dinitrophenol		51.3	ug/L	11.1	44.4
121-14-2	2,4-Dinitrotoluene		88.2	ug/L	6.67	22.2
606-20-2	2,6-Dinitrotoluene		88.1	ug/L	6.67	22.2
91-58-7	2-Chloronaphthalene		78.6	ug/L	0.911	2.22
95-57-8	2-Chlorophenol		84.5	ug/L	6.67	22.2
534-52-1	2-Methyl-4,6-dinitrophenol		48.5	ug/L	6.67	22.2
91-57-6	2-Methylnaphthalene		71.4	ug/L	0.667	2.22
88-75-5	2-Nitrophenol		86.8	ug/L	6.67	22.2
91-94-1	3,3'-Dichlorobenzidine		92.2	ug/L	6.67	22.2
101-55-3	4-Bromophenylphenylether		94.4	ug/L	6.67	22.2
59-50-7	Parachlorometa cresol		84.8	ug/L	6.67	22.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		110	ug/L	7.33	22.2
7005-72-3	4-Chlorophenylphenylether		95.7	ug/L	6.67	22.2
100-02-7	4-Nitrophenol		40.8	ug/L	6.67	22.2
83-32-9	Acenaphthene		90.8	ug/L	0.667	2.22
208-96-8	Acenaphthylene		83.2	ug/L	0.667	2.22
62-53-3	Aniline		84.6	ug/L	9.33	22.2
120-12-7	Anthracene		91.7	ug/L	0.667	2.22
1912-24-9	Atrazine		99.2	ug/L	6.67	22.2
92-87-5	Benzidine		217	ug/L	8.67	22.2
56-55-3	Benzo(a)anthracene		91.4	ug/L	0.667	2.22
50-32-8	Benzo(a)pyrene		94.7	ug/L	0.667	2.22
205-99-2	Benzo(b)fluoranthene		93.4	ug/L	0.667	2.22
191-24-2	Benzo(ghi)perylene		81.9	ug/L	0.667	2.22

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203969167
Client Sample: QC for batch 1738267
Client ID: CAWA-18-81MS
Batch ID: 1738268
Run Date: 02/12/2018 19:47
Prep Date: 02/12/2018 09:00
Data File: s021218.s\3b1217.D

Date Collected: 02/06/2018 11:24
Date Received: 02/08/2018 08:45
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 450 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		96.6	ug/L	0.667	2.22
65-85-0	Benzoic acid		94.8	ug/L	13.3	44.4
100-51-6	Benzyl alcohol		86.5	ug/L	6.67	22.2
85-68-7	Butylbenzylphthalate		94.8	ug/L	6.67	22.2
218-01-9	Chrysene		92.2	ug/L	0.667	2.22
84-74-2	Di-n-butylphthalate		103	ug/L	6.67	22.2
117-84-0	Di-n-octylphthalate		95.3	ug/L	6.67	22.2
53-70-3	Dibenzo(a,h)anthracene		85.0	ug/L	0.667	2.22
132-64-9	Dibenzofuran		89.4	ug/L	6.67	22.2
84-66-2	Diethylphthalate		96.0	ug/L	6.67	22.2
131-11-3	Dimethylphthalate		93.2	ug/L	6.67	22.2
88-85-7	Dinoseb	U	6.67	ug/L	6.67	22.2
122-39-4	Diphenylamine		88.3	ug/L	6.67	22.2
206-44-0	Fluoranthene		101	ug/L	0.667	2.22
86-73-7	Fluorene		89.8	ug/L	0.667	2.22
118-74-1	Hexachlorobenzene		94.5	ug/L	6.67	22.2
87-68-3	Hexachlorobutadiene		69.5	ug/L	6.67	22.2
77-47-4	Hexachlorocyclopentadiene		24.5	ug/L	6.67	22.2
67-72-1	Hexachloroethane		63.2	ug/L	6.67	22.2
193-39-5	Indeno(1,2,3-cd)pyrene		87.0	ug/L	0.667	2.22
78-59-1	Isophorone		83.7	ug/L	7.78	22.2
62-75-9	N-Methyl-N-nitrosomethylamine		68.6	ug/L	6.67	22.2
924-16-3	N-Nitrosodi-n-butylamine	U	6.67	ug/L	6.67	22.2
55-18-5	N-Nitrosodiethylamine	U	6.67	ug/L	6.67	22.2
621-64-7	N-Nitrosodi-n-propylamine		92.3	ug/L	6.67	22.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		93.2	ug/L	6.67	22.2
91-20-3	Naphthalene		73.7	ug/L	0.667	2.22
98-95-3	Nitrobenzene		84.5	ug/L	6.67	22.2
608-93-5	Pentachlorobenzene	U	6.67	ug/L	6.67	22.2
87-86-5	Pentachlorophenol		59.6	ug/L	6.67	22.2
85-01-8	Phenanthrene		91.3	ug/L	0.667	2.22
108-95-2	Phenol		55.4	ug/L	6.67	22.2
129-00-0	Pyrene		85.7	ug/L	0.667	2.22
110-86-1	Pyridine		73.2	ug/L	6.67	22.2
108-60-1	bis(2-Chloro-1-methylethyl)ether		88.5	ug/L	6.67	22.2
111-91-1	bis(2-Chloroethoxy)methane		87.5	ug/L	6.67	22.2
111-44-4	bis(2-Chloroethyl) ether		89.0	ug/L	6.67	22.2
117-81-7	bis(2-Ethylhexyl)phthalate		102	ug/L	6.67	2.22

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639	Date Collected: 02/06/2018 11:24	Matrix: W
Lab Sample ID: 1203969167	Date Received: 02/08/2018 08:45	
Client Sample: QC for batch 1738267	Client: ARSL004	Project: QC
Client ID: CAWA-18-81MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1738268	Inst: MSD3.I	Dilution: 1
Run Date: 02/12/2018 19:47	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 02/12/2018 09:00	Aliquot: 450 mL	Final Volume: 1 mL
Data File: s021218.s\s3b1217.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		88.7	ug/L	8.22	22.2
99-09-2	3-Nitroaniline		103	ug/L	6.67	22.2
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		81.6	ug/L	6.67	22.2
88-74-4	2-Nitroaniline		86.6	ug/L	6.67	22.2
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		85.9	ug/L	6.67	22.2
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	164	222	ug/L	74	(32%-124%)
2-Fluorobiphenyl	79.6	111	ug/L	72	(32%-112%)
2-Fluorophenol	140	222	ug/L	63	(15%-88%)
Nitrobenzene-d5	82.3	111	ug/L	74	(36%-115%)
Phenol-d5	109	222	ug/L	49	(15%-91%)
p-Terphenyl-d14	95.8	111	ug/L	86	(36%-121%)

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203969168
Client Sample: QC for batch 1738267
Client ID: CAWA-18-81MSD
Batch ID: 1738268
Run Date: 02/12/2018 20:16
Prep Date: 02/12/2018 09:00
Data File: s021218.s\3b1218.D

Date Collected: 02/06/2018 11:24
Date Received: 02/08/2018 08:45
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 450 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		72.7	ug/L	6.67	22.2
120-82-1	1,2,4-Trichlorobenzene		63.2	ug/L	6.67	22.2
95-50-1	1,2-Dichlorobenzene		61.2	ug/L	6.67	22.2
122-66-7	Azobenzene		77.8	ug/L	6.67	22.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		60.2	ug/L	6.67	22.2
106-46-7	1,4-Dichlorobenzene		60.2	ug/L	6.67	22.2
123-91-1	1,4-Dioxane		63.3	ug/L	6.67	22.2
90-12-0	1-Methylnaphthalene		66.4	ug/L	0.667	2.22
58-90-2	2,3,4,6-Tetrachlorophenol		61.5	ug/L	6.67	22.2
95-95-4	2,4,5-Trichlorophenol		70.0	ug/L	6.67	22.2
88-06-2	2,4,6-Trichlorophenol		74.2	ug/L	6.67	22.2
120-83-2	2,4-Dichlorophenol		77.1	ug/L	6.67	22.2
105-67-9	2,4-Dimethylphenol		62.4	ug/L	6.67	22.2
51-28-5	2,4-Dinitrophenol		49.2	ug/L	11.1	44.4
121-14-2	2,4-Dinitrotoluene		78.0	ug/L	6.67	22.2
606-20-2	2,6-Dinitrotoluene		78.6	ug/L	6.67	22.2
91-58-7	2-Chloronaphthalene		71.4	ug/L	0.911	2.22
95-57-8	2-Chlorophenol		73.5	ug/L	6.67	22.2
534-52-1	2-Methyl-4,6-dinitrophenol		47.2	ug/L	6.67	22.2
91-57-6	2-Methylnaphthalene		63.6	ug/L	0.667	2.22
88-75-5	2-Nitrophenol		77.3	ug/L	6.67	22.2
91-94-1	3,3'-Dichlorobenzidine		84.5	ug/L	6.67	22.2
101-55-3	4-Bromophenylphenylether		83.7	ug/L	6.67	22.2
59-50-7	Parachlorometa cresol		75.0	ug/L	6.67	22.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		98.3	ug/L	7.33	22.2
7005-72-3	4-Chlorophenylphenylether		84.4	ug/L	6.67	22.2
100-02-7	4-Nitrophenol		38.2	ug/L	6.67	22.2
83-32-9	Acenaphthene		82.0	ug/L	0.667	2.22
208-96-8	Acenaphthylene		75.0	ug/L	0.667	2.22
62-53-3	Aniline		73.3	ug/L	9.33	22.2
120-12-7	Anthracene		81.9	ug/L	0.667	2.22
1912-24-9	Atrazine		88.6	ug/L	6.67	22.2
92-87-5	Benzidine		164	ug/L	8.67	22.2
56-55-3	Benzo(a)anthracene		82.8	ug/L	0.667	2.22
50-32-8	Benzo(a)pyrene		82.3	ug/L	0.667	2.22
205-99-2	Benzo(b)fluoranthene		80.8	ug/L	0.667	2.22
191-24-2	Benzo(ghi)perylene		82.8	ug/L	0.667	2.22

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1639
Lab Sample ID: 1203969168
Client Sample: QC for batch 1738267
Client ID: CAWA-18-81MSD
Batch ID: 1738268
Run Date: 02/12/2018 20:16
Prep Date: 02/12/2018 09:00
Data File: s021218.s\3b1218.D

Date Collected: 02/06/2018 11:24
Date Received: 02/08/2018 08:45
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 450 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		82.9	ug/L	0.667	2.22
65-85-0	Benzoic acid		92.2	ug/L	13.3	44.4
100-51-6	Benzyl alcohol		74.7	ug/L	6.67	22.2
85-68-7	Butylbenzylphthalate		85.0	ug/L	6.67	22.2
218-01-9	Chrysene		83.7	ug/L	0.667	2.22
84-74-2	Di-n-butylphthalate		92.1	ug/L	6.67	22.2
117-84-0	Di-n-octylphthalate		84.9	ug/L	6.67	22.2
53-70-3	Dibenzo(a,h)anthracene		84.2	ug/L	0.667	2.22
132-64-9	Dibenzofuran		79.8	ug/L	6.67	22.2
84-66-2	Diethylphthalate		85.2	ug/L	6.67	22.2
131-11-3	Dimethylphthalate		83.3	ug/L	6.67	22.2
88-85-7	Dinoseb	U	6.67	ug/L	6.67	22.2
122-39-4	Diphenylamine		79.0	ug/L	6.67	22.2
206-44-0	Fluoranthene		89.3	ug/L	0.667	2.22
86-73-7	Fluorene		79.2	ug/L	0.667	2.22
118-74-1	Hexachlorobenzene		84.5	ug/L	6.67	22.2
87-68-3	Hexachlorobutadiene		60.2	ug/L	6.67	22.2
77-47-4	Hexachlorocyclopentadiene	J	20.6	ug/L	6.67	22.2
67-72-1	Hexachloroethane		54.1	ug/L	6.67	22.2
193-39-5	Indeno(1,2,3-cd)pyrene		85.9	ug/L	0.667	2.22
78-59-1	Isophorone		74.1	ug/L	7.78	22.2
62-75-9	N-Methyl-N-nitrosomethylamine		58.9	ug/L	6.67	22.2
924-16-3	N-Nitrosodi-n-butylamine	U	6.67	ug/L	6.67	22.2
55-18-5	N-Nitrosodiethylamine	U	6.67	ug/L	6.67	22.2
621-64-7	N-Nitrosodi-n-propylamine		80.1	ug/L	6.67	22.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		82.3	ug/L	6.67	22.2
91-20-3	Naphthalene		65.0	ug/L	0.667	2.22
98-95-3	Nitrobenzene		73.6	ug/L	6.67	22.2
608-93-5	Pentachlorobenzene	U	6.67	ug/L	6.67	22.2
87-86-5	Pentachlorophenol		54.4	ug/L	6.67	22.2
85-01-8	Phenanthrene		80.9	ug/L	0.667	2.22
108-95-2	Phenol		47.7	ug/L	6.67	22.2
129-00-0	Pyrene		77.7	ug/L	0.667	2.22
110-86-1	Pyridine		58.8	ug/L	6.67	22.2
108-60-1	bis(2-Chloro-1-methylethyl)ether		75.7	ug/L	6.67	22.2
111-91-1	bis(2-Chloroethoxy)methane		77.6	ug/L	6.67	22.2
111-44-4	bis(2-Chloroethyl) ether		76.7	ug/L	6.67	22.2
117-81-7	bis(2-Ethylhexyl)phthalate		91.1	ug/L	6.67	2.22

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1639	Date Collected: 02/06/2018 11:24	Matrix: W
Lab Sample ID: 1203969168	Date Received: 02/08/2018 08:45	
Client Sample: QC for batch 1738267	Client: ARSL004	Project: QC
Client ID: CAWA-18-81MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1738268	Inst: MSD3.I	Dilution: 1
Run Date: 02/12/2018 20:16	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 02/12/2018 09:00	Aliquot: 450 mL	Final Volume: 1 mL
Data File: s021218.s\s3b1218.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		77.7	ug/L	8.22	22.2
99-09-2	3-Nitroaniline		90.6	ug/L	6.67	22.2
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		71.0	ug/L	6.67	22.2
88-74-4	2-Nitroaniline		77.3	ug/L	6.67	22.2
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		74.4	ug/L	6.67	22.2
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	150	222	ug/L	67	(32%-124%)
2-Fluorobiphenyl	75.3	111	ug/L	68	(32%-112%)
2-Fluorophenol	123	222	ug/L	55	(15%-88%)
Nitrobenzene-d5	73.6	111	ug/L	66	(36%-115%)
Phenol-d5	93.9	222	ug/L	42	(15%-91%)
p-Terphenyl-d14	88.9	111	ug/L	80	(36%-121%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1639
Work Order #: 443438**

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: 1738590

Prep Batch Number: 1738588

Sample Analysis

Sample ID	Client ID
443438001	443438001 (CAWA-18-71)
443438005	443438005 (CAWA-18-74)
443438009	443438009 (CAWA-18-77)
443438013	443438013 (CAWA-18-129)
1203970044	Interference Check Sample (ICS)
1203970018	Method Blank (MB)
1203970019	Laboratory Control Sample (LCS)
1203970020	442852002(CrPZ-1-18-151275) Matrix Spike (MS)
1203970021	442852002(CrPZ-1-18-151275) 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.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

QC Sample Designation

Client sample 442852002 (CrPZ-1-18-151275) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

One or more of the required spiking analytes were not within the acceptance limits in 1203970020 (CrPZ-1-18-151275MS) and 1203970021 (CrPZ-1-18-151275MSD). The non-conforming recoveries are attributed to the background concentration of Perchlorate in the parent sample, 2018-1588 (CrPZ-1-18-151275), and the need to dilute the samples at a 1:10 ratio.

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

Samples 1203970020 (CrPZ-1-18-151275MS) and 1203970021 (CrPZ-1-18-151275MSD) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

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: 2018-1639 GEL Work Order: 443438

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: 21 FEB 2018

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1738588Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-71Date Received: 09-FEB-18GEL Job No (SDG): 2018-1639GEL Sample ID: 443438001Date Filtered: 12-FEB-18Injection 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	0.364	ug/L		1	13-FEB-18 19:14	per0213037a
	Perchlorate Isotope Ratio			3.34			1	13-FEB-18 19:14	per0213037a
14797-73-0	Perchlorate-101	.05	.2	0.339	ug/L		1	13-FEB-18 19:14	per0213037a
	Perchlorate-O(18)			0.502	ug/L		1	13-FEB-18 19:14	per0213037a

^ 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: 1738588Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-74Date Received: 09-FEB-18GEL Job No (SDG): 2018-1639GEL Sample ID: 443438005Date Filtered: 12-FEB-18Injection 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	0.290	ug/L		1	13-FEB-18 19:22	per0213038a
	Perchlorate Isotope Ratio			3.21			1	13-FEB-18 19:22	per0213038a
14797-73-0	Perchlorate-101	.05	.2	0.281	ug/L		1	13-FEB-18 19:22	per0213038a
	Perchlorate-O(18)			0.492	ug/L		1	13-FEB-18 19:22	per0213038a

^ 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: 1738588Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-77Date Received: 09-FEB-18GEL Job No (SDG): 2018-1639GEL Sample ID: 443438009Date Filtered: 12-FEB-18Injection 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	0.235	ug/L		1	13-FEB-18 19:30	per0213039a
	Perchlorate Isotope Ratio			2.96			1	13-FEB-18 19:30	per0213039a
14797-73-0	Perchlorate-101	.05	.2	0.246	ug/L		1	13-FEB-18 19:30	per0213039a
	Perchlorate-O(18)			0.507	ug/L		1	13-FEB-18 19:30	per0213039a

^ 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: 1738588Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-129Date Received: 09-FEB-18GEL Job No (SDG): 2018-1639GEL Sample ID: 443438013Date Filtered: 12-FEB-18Injection 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	0.050	ug/L	U	1	13-FEB-18 19:38	per0213040a
	Perchlorate Isotope Ratio						1	13-FEB-18 19:38	per0213040a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	13-FEB-18 19:38	per0213040a
	Perchlorate-O(18)			0.497	ug/L		1	13-FEB-18 19:38	per0213040a

^ 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): 2018-1639

Extract Batch Code: 1738588

Date Filtered: 12-FEB-18

Matrix: WATER

Sample ID: 1203970019

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.201	ug/L	101		85 - 115
Perchlorate Isotope Ratio		3.47				-
Perchlorate-101	0.200	.18	ug/L	90		85 - 115
Perchlorate-O(18)		.555	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): 2018-1639

Extract Batch Code: 1738588

Date Extracted: 12-FEB-18

GEL MS/PS ID: 1203970020

Client ID: CrPZ-1-18-151275

GEL MSD/PSD ID: 1203970021

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	10.4	ug/L	10.1	0 *	10.6	103	5	30	75 - 125
Perchlorate Isotope Ratio	0	3.04		3		2.99		0		-
Perchlorate-101	0.200	10.1	ug/L	9.88	0 *	10.4	174 *	5	30	75 - 125
Perchlorate-O(18)	0	4.64	ug/L	4.73		4.62		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: 1738588Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 12-FEB-18GEL Job No (SDG): 2018-1639GEL Sample ID: 1203970018Date Filtered: 12-FEB-18Injection 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	0.050	ug/L	U	1	13-FEB-18 17:14	per0213022a
	Perchlorate Isotope Ratio						1	13-FEB-18 17:14	per0213022a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	13-FEB-18 17:14	per0213022a
	Perchlorate-O(18)			0.536	ug/L		1	13-FEB-18 17:14	per0213022a

^ 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: 1738588Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 12-FEB-18GEL Job No (SDG): 2018-1639GEL Sample ID: 1203970019Date Filtered: 12-FEB-18Injection 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	0.201	ug/L		1	13-FEB-18 17:22	per0213023a
	Perchlorate Isotope Ratio			3.47			1	13-FEB-18 17:22	per0213023a
14797-73-0	Perchlorate-101	.05	.2	0.180	ug/L	J	1	13-FEB-18 17:22	per0213023a
	Perchlorate-O(18)			0.555	ug/L		1	13-FEB-18 17:22	per0213023a

^ 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: 1738588Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2018-1639GEL Sample ID: 1203970044Date Filtered: 12-FEB-18Injection 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	0.228	ug/L		1	13-FEB-18 17:30	per0213024a
	Perchlorate Isotope Ratio			3.2			1	13-FEB-18 17:30	per0213024a
14797-73-0	Perchlorate-101	.05	.2	0.221	ug/L		1	13-FEB-18 17:30	per0213024a
	Perchlorate-O(18)			0.529	ug/L		1	13-FEB-18 17:30	per0213024a

^ 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: 1738588Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CrPZ-1-18-151275MSDate Received: 01-FEB-18GEL Job No (SDG): 2018-1639GEL Sample ID: 1203970020Date Filtered: 12-FEB-18Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.5	2	10.1	ug/L		10	16-FEB-18 18:06	per0216014a
	Perchlorate Isotope Ratio			3			10	16-FEB-18 18:06	per0216014a
14797-73-0	Perchlorate-101	.5	2	9.88	ug/L		10	16-FEB-18 18:06	per0216014a
	Perchlorate-O(18)			4.73	ug/L		10	16-FEB-18 18:06	per0216014a

^ 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: 1738588Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CrPZ-1-18-151275MSDDate Received: 01-FEB-18GEL Job No (SDG): 2018-1639GEL Sample ID: 1203970021Date Filtered: 12-FEB-18Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.5	2	10.6	ug/L		10	16-FEB-18 18:14	per0216015a
	Perchlorate Isotope Ratio			2.99			10	16-FEB-18 18:14	per0216015a
14797-73-0	Perchlorate-101	.5	2	10.4	ug/L		10	16-FEB-18 18:14	per0216015a
	Perchlorate-O(18)			4.62	ug/L		10	16-FEB-18 18:14	per0216015a

^ 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 =

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

Explosives by LCMSMS Analysis

Case Narrative

**Explosives by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1639
Work Order #: 443438**

Method/Analysis Information

Procedure: The Processing, Extraction, and Analysis of Nitroaromatics, Nitroamines, and Nitrate Esters by SW-846 8330B

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch Number: 1738503

Prep Batch Number: 1738498

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8330B:

Sample ID	Client ID
443438003	CAWA-18-72
443438007	CAWA-18-75
443438011	CAWA-18-78
443438014	CAWA-18-129
1203969746	Method Blank (MB)
1203969747	Laboratory Control Sample (LCS)
1203969748	443438003(CAWA-18-72) Matrix Spike (MS)
1203969749	443438003(CAWA-18-72) Matrix Spike Duplicate (MSD)

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-068 REV# 7.

Calibration Information

Initial Calibration

All initial calibration requirements for this analysis have been met for this SDG.

Calibration Verification Standard Requirements

All continuing calibration verification standards (CCV) have not met requirements of 80-120% for samples 1203969748 (CAWA-18-72MS), 1203969749 (CAWA-18-72MSD), 443438003 (CAWA-18-72), 443438007 (CAWA-18-75), 443438011 (CAWA-18-78) and 443438014 (CAWA-18-129) in this SDG. Please refer to Form 7 of the data package for a list of recoveries. A LLOQ level standard was analyzed following the biased low

CCV with all target analytes meeting acceptance limits. Since the target analytes were not detected in the associated samples, the data are reported.

Calibration Blank Requirements

All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria. Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

CRI Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG for this analysis met the acceptance criteria.

Surrogate Recoveries

All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 443438003 (CAWA-18-72) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS spike recoveries were within the established acceptance limits for this analysis.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD (See Below) were not within the acceptance limits. Since all other RPD values met acceptance criteria, the noted exceptions are attributed to vagaries in the extraction process. The data are reported.

Sample	Analyte	Value
1203969748MS and 1203969749MSD (CAWA-18-72)	2, 6-Diamino-4-nitrotoluene	RPD 38* (0%-30%)

Internal Standard (ISTD) Acceptance

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

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. 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

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water. The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

Miscellaneous Information

Manual Integrations

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

Additional Comments

Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct. Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data. Relative Retention Time (RRT) is used by the laboratory to establish peak identity. The RRT of each target analyte is calculated using the retention time of the corresponding internal standard. The RRT of each analyte in a sample must be within 2.0 of the analyte's calculated RRT in the ICV.

System Configuration

The laboratory utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC/MS/MS #3 or LC/MS/MS #4. The laboratory also utilizes a Shimadzu Nexera XC liquid chromatography instrument for Primary and/or Secondary analyte analysis. It is coupled with an Applied Biosystems 5500 Mass Spectrometer/ Mass Spectrometer, designated as LC/MS/MS #5. All are fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte 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 Explosives analysis was performed on a ABSciex 5500 Qtrap LC/MS/MS.

The detection of the Primary and Secondary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

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: 2018-1639 GEL Work Order: 443438

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: Michael Penny

Date: 22 FEB 2018

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-72

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 443438003

Sample Amount 940 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215046.wiff

Date Analyzed: 17-FEB-18 06:19

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0851	U	0.0851	0.266
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.0851	U	0.0851	0.266
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.0851	U	0.0851	0.266
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.0851	U	0.0851	0.266
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.0851	U	0.0851	0.266
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.0851	U	0.0851	0.266
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0851	U	0.0851	0.266
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.0851	U	0.0851	0.532
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.0851	U	0.0851	0.266
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.0851	U	0.0851	0.266
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.0851	U	0.0851	0.266
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.0851	U	0.0851	0.266
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0851	U	0.0851	0.266
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-72

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 443438003

Sample Amount 940 mL

Date Received: 09-FEB-18

Moisture:

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.0851	U	0.0851	0.266
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.0851	U	0.0851	0.266
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.0872	U	0.0872	0.266
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.106	U	0.106	0.532
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.16	U	0.160	0.532
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.319	U	0.319	1.06
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.319	U	0.319	1.06
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.319	U	0.319	1.06
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.532	U	0.532	2.66
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.532	U	0.532	2.66
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-75

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 443438007

Sample Amount 890 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215049.wiff

Date Analyzed: 17-FEB-18 08:06

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0899	U	0.0899	0.281
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.0899	U	0.0899	0.281
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.0899	U	0.0899	0.281
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.0899	U	0.0899	0.281
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.0899	U	0.0899	0.281
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.0899	U	0.0899	0.281
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0899	U	0.0899	0.281
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.0899	U	0.0899	0.562
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.0899	U	0.0899	0.281
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.0899	U	0.0899	0.281
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.0899	U	0.0899	0.281
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.0899	U	0.0899	0.281
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0899	U	0.0899	0.281
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-75

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 443438007

Sample Amount 890 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.0899	U	0.0899	0.281
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.0899	U	0.0899	0.281
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.0921	U	0.0921	0.281
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.112	U	0.112	0.562
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.169	U	0.169	0.562
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.337	U	0.337	1.12
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.337	U	0.337	1.12
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.337	U	0.337	1.12
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.562	U	0.562	2.81
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.562	U	0.562	2.81
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-78

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 443438011

Sample Amount 900 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215050.wiff

Date Analyzed: 17-FEB-18 08:41

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0889	U	0.0889	0.278
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.0889	U	0.0889	0.278
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.0889	U	0.0889	0.278
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.0889	U	0.0889	0.278
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.0889	U	0.0889	0.278
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0889	U	0.0889	0.278
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.0889	U	0.0889	0.556
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.0889	U	0.0889	0.278
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.0889	U	0.0889	0.278
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.0889	U	0.0889	0.278
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.0889	U	0.0889	0.278
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0889	U	0.0889	0.278
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.0889	U	0.0889	0.278
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-78

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 443438011

Sample Amount 900 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	.0889	U	0.0889	0.278
99-65-0	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.0911	U	0.0911	0.278
88-72-2	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.111	U	0.111	0.556
78-11-5	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.167	U	0.167	0.556
99-99-0	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	.333	U	0.333	1.11
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.333	U	0.333	1.11
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.333	U	0.333	1.11
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.556	U	0.556	2.78
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.556	U	0.556	2.78
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	1.46		0.0889	0.278
121-82-4	<i>RDX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-129

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 443438014

Sample Amount 960 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215051.wiff

Date Analyzed: 17-FEB-18 09:17

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0833	U	0.0833	0.260
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.0833	U	0.0833	0.260
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.0833	U	0.0833	0.260
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.0833	U	0.0833	0.260
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.0833	U	0.0833	0.260
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.0833	U	0.0833	0.260
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0833	U	0.0833	0.260
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.0833	U	0.0833	0.521
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.0833	U	0.0833	0.260
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.0833	U	0.0833	0.260
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.0833	U	0.0833	0.260
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.0833	U	0.0833	0.260
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0833	U	0.0833	0.260
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-129

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 443438014

Sample Amount 960 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.0833	U	0.0833	0.260
99-35-4	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.0833	U	0.0833	0.260
99-65-0	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.0854	U	0.0854	0.260
88-72-2	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.104	U	0.104	0.521
78-11-5	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.156	U	0.156	0.521
99-99-0	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	.313	U	0.313	1.04
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.313	U	0.313	1.04
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.313	U	0.313	1.04
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.521	U	0.521	2.60
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.521	U	0.521	2.60
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2018-1639**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
443438003	CAWA-18-72	88	55 - 115	
443438007	CAWA-18-75	87	55 - 115	
443438011	CAWA-18-78	87	55 - 115	
443438014	CAWA-18-129	91	55 - 115	
1203969746	MB for batch 1738498	95	55 - 115	
1203969747	LCS for batch 1738498	88	55 - 115	
1203969748	CAWA-18-72MS	87	55 - 115	
1203969749	CAWA-18-72MSD	88	55 - 115	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Extract Batch Code: 1738498

Date Extracted: 12-FEB-18

GEL LCS ID: 1203969747

GEL LCSDUP ID: .

Analysis Date/Time: 17-FEB-18 02:10

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
1,3,5-Trinitrobenzene	5	4.83	97					70 - 110
2,4,6-Trinitrotoluene	5	4.9	98					69 - 113
2,4-Diamino-6-nitrotoluene	5	5.58	112					50 - 121
2,4-Dinitrotoluene	5	4.99	100					71 - 110
2,6-Diamino-4-nitrotoluene	5	3.73	75					53 - 127
2,6-Dinitrotoluene	5	4.84	97					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.91	98					70 - 112
3,5-Dinitroaniline	5	4.56	91					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.93	99					74 - 116
DNX	5	3.4	68					65 - 113
HMX	5	4	80					58 - 113
MNX	5	3.78	76					66 - 114
Nitrobenzene	5	4.46	89					64 - 115
PETN	5	4.69	94					57 - 126
RDX	5	3.85	77					64 - 117
TATB	3	2.52	84					47 - 135
TNX	5	3.71	74					51 - 110
Tetryl	5	4.26	85					55 - 122
m-Dinitrobenzene	5	4.96	99					74 - 117
m-Nitrotoluene	5	4.7	94					66 - 114
o-Nitrotoluene	5	4.63	93					64 - 115
p-Nitrotoluene	5	5.33	107					66 - 127
tris(o-cresyl) phosphate	5	2.91	58					43 - 104

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-18-72

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Extract Batch Code: 1738498

Date Extracted: 12-FEB-18

GEL Spike ID: 1203969748

GEL SpikeDup ID: 1203969749

Analysis Date/Time: 17-FEB-18 06:55

MSD Analysis Date/Time: 17-FEB-18 07:30

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
o-Nitrotoluene	5.49451	0	4.7	86	4.48	85	5	30	56 - 119
p-Nitrotoluene	5.49451	0	5.22	95	5.34	101	2	30	61 - 129
tris(o-cresyl) phosphate	5.49451	0	4.51	82	3.87	73	15	30	38 - 105
1,3,5-Trinitrobenzene	5.49451	0	5.48	100	4.78	91	14	30	67 - 111
2,4,6-Trinitrotoluene	5.49451	0	4.75	87	4.48	85	6	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.49451	0	6.47	118	4.98	95	26	30	50 - 121
2,4-Dinitrotoluene	5.49451	0	5.28	96	5.03	96	5	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.49451	0	5.33	97	3.62	69	38 *	30	53 - 127
2,6-Dinitrotoluene	5.49451	0	5.32	97	4.64	88	14	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.49451	0	5.14	94	5.02	95	2	30	67 - 115
3,5-Dinitroaniline	5.49451	0	4.85	88	4.62	88	5	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.49451	0	4.96	90	4.84	92	3	30	65 - 120
DNX	5.49451	0	4.56	83	3.82	73	18	30	53 - 124
HMX	5.49451	0	4.85	88	3.84	73	23	30	44 - 128
MNX	5.49451	0	4.69	85	3.82	73	20	30	60 - 121
Nitrobenzene	5.49451	0	5.24	95	4.97	94	5	30	62 - 116
PETN	5.49451	0	4.6	84	4.1	78	11	30	51 - 131
RDX	5.49451	0	4.81	87	4.27	81	12	30	57 - 125
TATB	3.2967	0	3.36	102	3.03	96	10	30	38 - 149
TNX	5.49451	0	4.6	84	3.52	67	27	30	46 - 120
Tetryl	5.49451	0	4.45	81	3.69	70	19	30	50 - 126
m-Dinitrobenzene	5.49451	0	5.51	100	5.4	103	2	30	74 - 117
m-Nitrotoluene	5.49451	0	5.01	91	4.5	85	11	30	59 - 120

#Column to be used to flag recovery and RPD values with an asterisk

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1738498

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 1203969746

Sample Amount 1000 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215038.wiff

Date Analyzed: 17-FEB-18 01:35

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.08	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.08	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.08	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.08	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.08	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.08	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.08	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.08	U	0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.08	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.08	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.08	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.08	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.08	U	0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1738498

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 1203969746

Sample Amount 1000 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.08	U	0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.08	U	0.080	0.250
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.082	U	0.082	0.250
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.1	U	0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.15	U	0.150	0.500
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.3	U	0.300	1.00
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.3	U	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.3	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.5	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.5	U	0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1738498

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 1203969747

Sample Amount 1000 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215039.wiff

Date Analyzed: 17-FEB-18 02:10

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.52		0.300	1.00
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	2.91		0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
80251-29-2	DNX	3.4		0.080	0.250
80251-29-2	DNX				
13980-04-6	TNX	3.71		0.080	0.250
13980-04-6	TNX				
59229-75-3	2,6-Diamino-4-nitrotoluene	3.73		0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
5755-27-1	MNX	3.78		0.080	0.250
5755-27-1	MNX				
121-82-4	RDX	3.85		0.080	0.250
121-82-4	RDX				
2691-41-0	HMX	4		0.080	0.250
2691-41-0	HMX				
479-45-8	Tetryl	4.26		0.080	0.500
479-45-8	Tetryl				
98-95-3	Nitrobenzene	4.46		0.080	0.250
98-95-3	Nitrobenzene				
618-87-1	3,5-Dinitroaniline	4.56		0.300	1.00
618-87-1	3,5-Dinitroaniline				
88-72-2	o-Nitrotoluene	4.63		0.082	0.250
88-72-2	o-Nitrotoluene				
78-11-5	PETN	4.69		0.100	0.500
78-11-5	PETN				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1738498

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 1203969747

Sample Amount 1000 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-08-1	m-Nitrotoluene	4.7		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.83		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
606-20-2	2,6-Dinitrotoluene	4.84		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.9		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.91		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.93		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.96		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	4.99		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	5.33		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.58		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-72(443438003MS)MS

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 1203969748

Sample Amount 910 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215047.wiff

Date Analyzed: 17-FEB-18 06:55

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	3.36		0.330	1.10
<i>3058-38-6</i>	<i>TATB</i>				
479-45-8	Tetryl	4.45		0.0879	0.549
<i>479-45-8</i>	<i>Tetryl</i>				
78-30-8	tris(o-cresyl) phosphate	4.51		0.330	1.10
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
80251-29-2	DNX	4.56		0.0879	0.275
<i>80251-29-2</i>	<i>DNX</i>				
13980-04-6	TNX	4.6		0.0879	0.275
<i>13980-04-6</i>	<i>TNX</i>				
78-11-5	PETN	4.6		0.110	0.549
<i>78-11-5</i>	<i>PETN</i>				
5755-27-1	MNX	4.69		0.0879	0.275
<i>5755-27-1</i>	<i>MNX</i>				
88-72-2	o-Nitrotoluene	4.7		0.0901	0.275
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.75		0.0879	0.275
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-82-4	RDX	4.81		0.0879	0.275
<i>121-82-4</i>	<i>RDX</i>				
2691-41-0	HMX	4.85		0.0879	0.275
<i>2691-41-0</i>	<i>HMX</i>				
618-87-1	3,5-Dinitroaniline	4.85		0.330	1.10
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.96		0.0879	0.275
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-72(443438003MS)MS

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 1203969748

Sample Amount 910 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-08-1	m-Nitrotoluene	5.01		0.0879	0.275
99-08-1	m-Nitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.14		0.0879	0.275
35572-78-2	2-Amino-4,6-dinitrotoluene				
99-99-0	p-Nitrotoluene	5.22		0.165	0.549
99-99-0	p-Nitrotoluene				
98-95-3	Nitrobenzene	5.24		0.0879	0.275
98-95-3	Nitrobenzene				
121-14-2	2,4-Dinitrotoluene	5.28		0.0879	0.275
121-14-2	2,4-Dinitrotoluene				
606-20-2	2,6-Dinitrotoluene	5.32		0.0879	0.275
606-20-2	2,6-Dinitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.33		0.549	2.75
59229-75-3	2,6-Diamino-4-nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	5.48		0.0879	0.275
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	5.51		0.0879	0.275
99-65-0	m-Dinitrobenzene				
6629-29-4	2,4-Diamino-6-nitrotoluene	6.47		0.549	2.75
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-72(443438003MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 1203969749

Sample Amount 950 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215048.wiff

Date Analyzed: 17-FEB-18 07:30

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	3.03		0.316	1.05
<i>3058-38-6</i>	<i>TATB</i>				
13980-04-6	TNX	3.52		0.0842	0.263
<i>13980-04-6</i>	<i>TNX</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	3.62		0.526	2.63
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
479-45-8	Tetryl	3.69		0.0842	0.526
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MXN	3.82		0.0842	0.263
<i>5755-27-1</i>	<i>MXN</i>				
80251-29-2	DNX	3.82		0.0842	0.263
<i>80251-29-2</i>	<i>DNX</i>				
2691-41-0	HMX	3.84		0.0842	0.263
<i>2691-41-0</i>	<i>HMX</i>				
78-30-8	tris(o-cresyl) phosphate	3.87		0.316	1.05
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
78-11-5	PETN	4.1		0.105	0.526
<i>78-11-5</i>	<i>PETN</i>				
121-82-4	RDX	4.27		0.0842	0.263
<i>121-82-4</i>	<i>RDX</i>				
118-96-7	2,4,6-Trinitrotoluene	4.48		0.0842	0.263
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.48		0.0863	0.263
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
99-08-1	m-Nitrotoluene	4.5		0.0842	0.263
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-72(443438003MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2018-1639

Matrix: WATER

GEL Sample ID: 1203969749

Sample Amount 950 mL

Date Received: 09-FEB-18

Moisture: .

Extraction Batch ID: 1738498

Extraction Type Sol Exchange

Date Extracted: 12-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
618-87-1	3,5-Dinitroaniline	4.62		0.316	1.05
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
606-20-2	2,6-Dinitrotoluene	4.64		0.0842	0.263
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.78		0.0842	0.263
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.84		0.0842	0.263
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
98-95-3	Nitrobenzene	4.97		0.0842	0.263
<i>98-95-3</i>	<i>Nitrobenzene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.98		0.526	2.63
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.02		0.0842	0.263
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5.03		0.0842	0.263
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	5.34		0.158	0.526
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.4		0.0842	0.263
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-1639Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 15-FEB-18 18:40GEL Data File: EXP0215001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MXN	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-1639Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 15-FEB-18 19:15GEL Data File: EXP0215002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 16-FEB-18 00:00

GEL Data File: EXP0215010.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 16-FEB-18 02:22

GEL Data File: EXP0215014.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 16-FEB-18 12:33

GEL Data File: EXP0215016.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 16-FEB-18 13:09

GEL Data File: EXP0215017.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 16-FEB-18 14:20

GEL Data File: EXP0215019.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 16-FEB-18 20:51

GEL Data File: EXP0215030.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 16-FEB-18 22:02

GEL Data File: EXP0215032.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 17-FEB-18 00:59

GEL Data File: EXP0215037.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 17-FEB-18 03:57

GEL Data File: EXP0215042.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK11

Analysis Date: 17-FEB-18 05:08

GEL Data File: EXP0215044.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 17-FEB-18 11:03

GEL Data File: EXP0215054.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1639

Lab Code: GEL

Lab Sample ID: XIBLK13

Analysis Date: 17-FEB-18 12:14

GEL Data File: EXP0215056.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1639
Work Order #: 443438

Sample ID	Client ID
443438001	CAWA-18-71
443438002	CAWA-18-72
443438005	CAWA-18-74
443438006	CAWA-18-75
443438009	CAWA-18-77
443438010	CAWA-18-78
443438013	CAWA-18-129
1203969079	Method Blank (MB) ICP
1203969080	Laboratory Control Sample (LCS)
1203969083	443438001(CAWA-18-71L) Serial Dilution (SD)
1203969081	443438001(CAWA-18-71D) Sample Duplicate (DUP)
1203969082	443438001(CAWA-18-71S) Matrix Spike (MS)
1203968958	Method Blank (MB) ICP-MS
1203968959	Laboratory Control Sample (LCS)
1203968962	443438001(CAWA-18-71L) Serial Dilution (SD)
1203968960	443438001(CAWA-18-71D) Sample Duplicate (DUP)
1203968961	443438001(CAWA-18-71S) Matrix Spike (MS)
1203971525	Method Blank (MB) CVAA
1203971526	Laboratory Control Sample (LCS)
1203971531	443438001(CAWA-18-71L) Serial Dilution (SD)
1203971527	443438001(CAWA-18-71D) Sample Duplicate (DUP)
1203971529	443438001(CAWA-18-71S) Matrix Spike (MS)

Sample Analysis

Samples 443438001,002,005,006,009,010 and 013 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1738231, 1738183, 1739145 and 1745508
Prep Batch :	1738230, 1738182 and 1739143
Standard Operating Procedures:	GL-MA-E-013 REV# 30, GL-MA-E-006 REV# 14, GL-MA-E-014 REV# 32, GL-MA-E-010 REV# 36 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 P E 5300 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 PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of sodium and potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 443438001 (CAWA-18-71), 443438005 (CAWA-18-74), 443438009 (CAWA-18-77) and 443438013 (CAWA-18-129)-ICP.

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: 443438001 (CAWA-18-71)-ICP, ICP-MS and 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

All applicable analytes in the serial dilution (SDILT) demonstrated acceptable correlation to its associated sample and met the established acceptance percent difference criteria.

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.

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.

$$\text{Hardness} = 2.497 (\text{Ca}) + 4.118 (\text{Mg})$$

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: 2018-1639 GEL Work Order: 443438

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance 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: 08 MAR 2018

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443438001**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-71**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/15/18 10:54	021418W2-5	1739145

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443438001

BASIS: As Received

DATE COLLECTED 07-FEB-18

CLIENT ID: CAWA-18-71

LEVEL: Low

DATE RECEIVED 09-FEB-18

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7440-38-2	Arsenic	2.7	ug/L	J	2	5	5	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7440-39-3	Barium	7.48	ug/L		1	5	5	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7440-70-2	Calcium	9610	ug/L		50	200	200	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/02/18 13:15	030218-1	1738231
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/02/18 13:15	030218-1	1738231
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7439-95-4	Magnesium	3240	ug/L		110	300	300	1	P	HSC	03/02/18 13:15	030218-1	1738231
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	03/02/18 13:15	030218-1	1738231
7439-98-7	Molybdenum	2.57	ug/L		0.2	0.5	0.5	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7440-02-0	Nickel	1.19	ug/L	J	0.6	2	2	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7440-09-7	Potassium	1290	ug/L		50	150	150	1	P	HSC	03/06/18 11:45	030618-2	1738231
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7631-86-9	Silica	53700	ug/L		53	213	213	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7440-23-5	Sodium	11700	ug/L		100	300	300	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-24-6	Strontium	52.5	ug/L		1	5	5	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-61-1	Uranium	0.515	ug/L		0.067	0.2	0.2	1	MS	BAJ	02/26/18 17:42	180226-4	1738183
7440-62-2	Vanadium	12.1	ug/L		1	5	5	1	P	HSC	03/02/18 13:15	030218-1	1738231
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	03/02/18 13:15	030218-1	1738231

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443438001**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-71**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	37.3	mg/L		0.453	1.24	1.24	1		TXT1	03/08/18 12:35		1745508

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1738183	1738182	SW846 3005A	50	mL	50	mL	02/12/18	SXW1
1738231	1738230	SW846 3005A	50	mL	50	mL	02/12/18	SXW1
1739145	1739143	EPA 245.1/245.2 Prep	20	mL	20	mL	02/14/18	AXS5

Analytical Methods:*P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443438002**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-72**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/15/18 11:03	021418W2-5	1739145

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739145	1739143	EPA 245.1/245.2 Prep	20	mL	20	mL	02/14/18	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443438005**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-74**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/15/18 11:04	021418W2-5	1739145

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443438005

BASIS: As Received

DATE COLLECTED 07-FEB-18

CLIENT ID: CAWA-18-74

LEVEL: Low

DATE RECEIVED 09-FEB-18

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7440-38-2	Arsenic	2.97	ug/L	J	2	5	5	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7440-39-3	Barium	10.9	ug/L		1	5	5	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7440-70-2	Calcium	8760	ug/L		50	200	200	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/02/18 13:06	030218-1	1738231
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/02/18 13:06	030218-1	1738231
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7439-95-4	Magnesium	2650	ug/L		110	300	300	1	P	HSC	03/02/18 13:06	030218-1	1738231
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	03/02/18 13:06	030218-1	1738231
7439-98-7	Molybdenum	2.24	ug/L		0.2	0.5	0.5	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7440-09-7	Potassium	1370	ug/L		50	150	150	1	P	HSC	03/06/18 11:36	030618-2	1738231
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7631-86-9	Silica	56400	ug/L		53	213	213	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7440-23-5	Sodium	12100	ug/L		100	300	300	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-24-6	Strontium	61	ug/L		1	5	5	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7440-31-5	Tin	2.57	ug/L	J	2.5	10	10	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-61-1	Uranium	0.851	ug/L		0.067	0.2	0.2	1	MS	BAJ	02/26/18 17:58	180226-4	1738183
7440-62-2	Vanadium	8.15	ug/L		1	5	5	1	P	HSC	03/02/18 13:06	030218-1	1738231
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	03/02/18 13:06	030218-1	1738231

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443438005**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-74**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	32.8	mg/L		0.453	1.24	1.24	1		TXT1	03/08/18 12:35		1745508

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1738183	1738182	SW846 3005A	50	mL	50	mL	02/12/18	SXW1
1738231	1738230	SW846 3005A	50	mL	50	mL	02/12/18	SXW1
1739145	1739143	EPA 245.1/245.2 Prep	20	mL	20	mL	02/14/18	AXS5

Analytical Methods:*P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443438006**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-75**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/15/18 11:06	021418W2-5	1739145

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739145	1739143	EPA 245.1/245.2 Prep	20	mL	20	mL	02/14/18	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443438009**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-77**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/15/18 11:11	021418W2-5	1739145

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443438009

BASIS: As Received

DATE COLLECTED 07-FEB-18

CLIENT ID: CAWA-18-77

LEVEL: Low

DATE RECEIVED 09-FEB-18

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7440-39-3	Barium	12.2	ug/L		1	5	5	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7440-70-2	Calcium	9500	ug/L		50	200	200	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/02/18 13:09	030218-1	1738231
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/02/18 13:09	030218-1	1738231
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7439-95-4	Magnesium	3030	ug/L		110	300	300	1	P	HSC	03/02/18 13:09	030218-1	1738231
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	03/02/18 13:09	030218-1	1738231
7439-98-7	Molybdenum	0.593	ug/L		0.2	0.5	0.5	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7440-09-7	Potassium	703	ug/L		50	150	150	1	P	HSC	03/06/18 11:39	030618-2	1738231
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7631-86-9	Silica	58400	ug/L		53	213	213	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7440-23-5	Sodium	7910	ug/L		100	300	300	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-24-6	Strontium	51.3	ug/L		1	5	5	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-61-1	Uranium	0.346	ug/L		0.067	0.2	0.2	1	MS	BAJ	02/26/18 18:02	180226-4	1738183
7440-62-2	Vanadium	2.38	ug/L	J	1	5	5	1	P	HSC	03/02/18 13:09	030218-1	1738231
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	03/02/18 13:09	030218-1	1738231

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443438009**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-77**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	36.2	mg/L		0.453	1.24	1.24	1		TXT1	03/08/18 12:35		1745508

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1738183	1738182	SW846 3005A	50	mL	50	mL	02/12/18	SXW1
1738231	1738230	SW846 3005A	50	mL	50	mL	02/12/18	SXW1
1739145	1739143	EPA 245.1/245.2 Prep	20	mL	20	mL	02/14/18	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443438010**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-78**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/15/18 11:13	021418W2-5	1739145

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739145	1739143	EPA 245.1/245.2 Prep	20	mL	20	mL	02/14/18	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443438013**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-129**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/15/18 11:15	021418W2-5	1739145

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443438013

BASIS: As Received

DATE COLLECTED 07-FEB-18

CLIENT ID: CAWA-18-129

LEVEL: Low

DATE RECEIVED 09-FEB-18

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7440-39-3	Barium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7440-70-2	Calcium	50	ug/L	U	50	200	200	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7440-48-4	Cobalt	1	ug/L	J	1	5	5	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/02/18 13:12	030218-1	1738231
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	03/02/18 13:12	030218-1	1738231
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7439-95-4	Magnesium	110	ug/L	U	110	300	300	1	P	HSC	03/02/18 13:12	030218-1	1738231
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	03/02/18 13:12	030218-1	1738231
7439-98-7	Molybdenum	0.20	ug/L	U	0.2	0.5	0.5	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7440-09-7	Potassium	97.8	ug/L	J	50	150	150	1	P	HSC	03/07/18 07:42	030718-3	1738231
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7631-86-9	Silica	53	ug/L	U	53	213	213	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7440-23-5	Sodium	100	ug/L	U	100	300	300	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-24-6	Strontium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-61-1	Uranium	0.067	ug/L	U	0.067	0.2	0.2	1	MS	BAJ	02/26/18 18:05	180226-4	1738183
7440-62-2	Vanadium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 13:12	030218-1	1738231
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	03/02/18 13:12	030218-1	1738231

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1639**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443438013**BASIS:** As Received**DATE COLLECTED** 07-FEB-18**CLIENT ID:** CAWA-18-129**LEVEL:** Low**DATE RECEIVED** 09-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	0.453	mg/L	U	0.453	1.24	1.24	1		TXT1	03/08/18 12:35		1745508

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1738183	1738182	SW846 3005A	50	mL	50	mL	02/12/18	SXW1
1738231	1738230	SW846 3005A	50	mL	50	mL	02/12/18	SXW1
1739145	1739143	EPA 245.1/245.2 Prep	20	mL	20	mL	02/14/18	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. 2018-1639

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>
1203968958	Antimony	1.38	ug/L	+/-3	J	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	0.2	ug/L	+/-0.5	U	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
1203969079	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	75.3	ug/L	+/-150	J	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
1203971525	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. 2018-1639 Client ID: CAWA-18-71S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 443438001 Spike ID: 1203968961

<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	49.3		1	U	50	96.8		MS
Arsenic	ug/L	75-125	51.9		2.7	J	50	98.5		MS
Cadmium	ug/L	75-125	51.8		0.3	U	50	104		MS
Chromium	ug/L	75-125	53.7		3	U	50	103		MS
Lead	ug/L	75-125	50.5		0.5	U	50	101		MS
Molybdenum	ug/L	75-125	55.5		2.57		50	106		MS
Nickel	ug/L	75-125	54.3		1.19	J	50	106		MS
Selenium	ug/L	75-125	51.2		2	U	50	101		MS
Silver	ug/L	75-125	52.2		0.3	U	50	104		MS
Thallium	ug/L	75-125	46.4		0.6	U	50	92.8		MS
Uranium	ug/L	75-125	49.9		0.515		50	98.9		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-1639 Client ID: CAWA-18-71S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 443438001 Spike ID: 1203969082

<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>
Aluminum	ug/L	75-125	4660		68	U	5000	93.2		P
Barium	ug/L	75-125	486		7.48		500	95.8		P
Beryllium	ug/L	75-125	482		1	U	500	96.3		P
Boron	ug/L	75-125	516		15	U	500	101		P
Calcium	ug/L	75-125	14300		9610		5000	94.6		P
Cobalt	ug/L	75-125	478		1	U	500	95.4		P
Copper	ug/L	75-125	498		3	U	500	99.6		P
Iron	ug/L	75-125	5100		30	U	5000	102		P
Magnesium	ug/L	75-125	8170		3240		5000	98.8		P
Manganese	ug/L	75-125	482		2	U	500	96.4		P
Potassium	ug/L	75-125	6180		1290		5000	98		P
Silica	ug/L		62600		53700		10700	83.1	N/A	P
Sodium	ug/L	75-125	16300		11700		5000	91.7		P
Strontium	ug/L	75-125	544		52.5		500	98.3		P
Tin	ug/L	75-125	475		2.5	U	500	94.6		P
Vanadium	ug/L	75-125	503		12.1		500	98.3		P
Zinc	ug/L	75-125	440		3.3	U	500	87.8		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-1639 Client ID CAWA-18-71S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 443438001 Spike ID: 1203971529

<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	1.95		0.067	U	2	97.7		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-1639

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-18-71D

Matrix: WATER

Level: Low

Sample ID: 443438001

Duplicate ID: 1203968960

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	+/-5	2.7 J		2.47 J		9.03		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	+/-20%	2.57		2.5		2.92		MS
Nickel	ug/L	+/-2	1.19 J		1.16 J		2.65		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	+/-2	0.515		0.46		11.3		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-1639

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-18-71D

Matrix: WATER

Level: Low

Sample ID: 443438001

Duplicate ID: 1203969081

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-5	7.48		7.13		4.87		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	9610		9460		1.62		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	3240		3110		3.94		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1290		1240		3.92		P
Silica	ug/L	+/-20%	53700		52700		1.85		P
Sodium	ug/L	+/-20%	11700		11100		5.23		P
Strontium	ug/L	+/-20%	52.5		50.3		4.2		P
Tin	ug/L		2.5 U		3.15 J		200		P
Vanadium	ug/L	+/-5	12.1		12.1		.347		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
–6–
Duplicate Sample Summary

SDG No.: 2018–1639**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA–18–71D**Matrix:** WATER**Level:** Low**Sample ID:** 443438001**Duplicate ID:** 1203971527**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

-7-

Laboratory Control Sample Summary

SDG NO. 2018-1639

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures

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>
1203968959								
	Antimony	ug/L	50	51.3		103	80-120	MS
	Arsenic	ug/L	50	52.9		106	80-120	MS
	Cadmium	ug/L	50	53		106	80-120	MS
	Chromium	ug/L	50	54.1		108	80-120	MS
	Lead	ug/L	50	52.2		104	80-120	MS
	Molybdenum	ug/L	50	51.5		103	80-120	MS
	Nickel	ug/L	50	55.8		112	80-120	MS
	Selenium	ug/L	50	53.6		107	80-120	MS
	Silver	ug/L	50	54.2		108	80-120	MS
	Thallium	ug/L	50	49.1		98.3	80-120	MS
	Uranium	ug/L	50	50.2		100	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2018-1639

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>
1203969080								
	Strontium	ug/L	500	502		100	80-120	P
	Tin	ug/L	500	478		95.6	80-120	P
	Vanadium	ug/L	500	489		97.8	80-120	P
	Zinc	ug/L	500	444		88.7	80-120	P
	Sodium	ug/L	5000	5010		100	80-120	P
	Aluminum	ug/L	5000	4650		92.9	80-120	P
	Barium	ug/L	500	484		96.9	80-120	P
	Beryllium	ug/L	500	480		95.9	80-120	P
	Boron	ug/L	500	501		100	80-120	P
	Calcium	ug/L	5000	4880		97.7	80-120	P
	Cobalt	ug/L	500	488		97.6	80-120	P
	Copper	ug/L	500	489		97.8	80-120	P
	Iron	ug/L	5000	4960		99.2	80-120	P
	Magnesium	ug/L	5000	5030		101	80-120	P
	Manganese	ug/L	500	488		97.7	80-120	P
	Potassium	ug/L	5000	4840		96.8	80-120	P
	Silica	ug/L	10700	9980		93.2	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2018-1639

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>
1203971526	Mercury	ug/L	2	2.04		102	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1639

Client ID: CAWA-18-71L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 443438001

Serial Dilution ID: 1203968962

<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	2.7	J	10	U	15.493			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	2.57		2.45	J	4.864			MS
Nickel	1.19	J	3	U	22.072			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.515		.495	J	3.883			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1639

Client ID: CAWA-18-71L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 443438001

Serial Dilution ID: 1203969083

<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>
Aluminum	68	U	340	U				P
Barium	7.48		7.77	J	3.922			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	9610		9580		.286		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	3240		3340		3.193			P
Manganese	2	U	10	U				P
Potassium	1290		978		23.979			P
Silica	53700		53100		1.094		10	P
Sodium	11700		12800		9.549		10	P
Strontium	52.5		51.7		1.433		10	P
Tin	2.5	U	12.5	U				P
Vanadium	12.1		12.5	J	3.281			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1639 **Client ID:** CAWA-18-71L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 443438001 **Serial Dilution ID:** 1203971531

<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

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1639
Work Order #: 443438**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1738436

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
443438002	CAWA-18-72
443438006	CAWA-18-75
443438010	CAWA-18-78
443438013	CAWA-18-129
1203969627	Method Blank (MB)
1203969628	Laboratory Control Sample (LCS)
1203969630	443345003(CAWA-18-34) Sample Duplicate (DUP)
1203969633	443345003(CAWA-18-34) 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.

Quality Control (QC) Designation

Sample 443345003 (CAWA-18-34) 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**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:	1737905	Method:	WSP-CN(T)
Prep Batch :	1737904	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
443438002	CAWA-18-72
443438006	CAWA-18-75
443438010	CAWA-18-78
443438013	CAWA-18-129
1203968143	Method Blank (MB)
1203968144	Laboratory Control Sample (LCS)
1203968145	443345003(CAWA-18-34) Sample Duplicate (DUP)
1203968934	443434001(NonSDG) Sample Duplicate (DUP)
1203968146	443345003(CAWA-18-34) Matrix Spike (MS)
1203968935	443434001(NonSDG) 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# 21.

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

Samples 443345003 (CAWA-18-34) and 443434001 (NonSDG) were 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**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: 1738628

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
443438001	CAWA-18-71
443438005	CAWA-18-74
443438009	CAWA-18-77
443438013	CAWA-18-129
1203970118	Method Blank (MB)
1203970119	Laboratory Control Sample (LCS)
1203970120	443360002(CAWA-18-80) Sample Duplicate (DUP)
1203970121	443360002(CAWA-18-80) 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-5000 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 443360002 (CAWA-18-80) was selected for QC analysis.

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

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

Analyte	Sample	Value
Fluoride	1203970121 (CAWA-18-80PS)	126* (75%-125%)
Sulfate	1203970121 (CAWA-18-80PS)	146* (75%-125%)

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**Manual Integrations**

Samples 1203970120 (CAWA-18-80DUP), 1203970121 (CAWA-18-80PS), 443438001 (CAWA-18-71), 443438005 (CAWA-18-74), 443438009 (CAWA-18-77) and 443438013 (CAWA-18-129) 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: 1738770 **Method:** NH3
Prep Batch : 1738769 **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
443438001	CAWA-18-71
443438005	CAWA-18-74
443438009	CAWA-18-77
443438013	CAWA-18-129
1203970529	Method Blank (MB)
1203970530	Laboratory Control Sample (LCS)
1203970531	443438001(CAWA-18-71) Sample Duplicate (DUP)
1203970532	443438001(CAWA-18-71) 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# 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.

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 443438001 (CAWA-18-71) 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**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:	1738774	Method:	TKN
Prep Batch :	1738773	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
443438002	CAWA-18-72
443438006	CAWA-18-75
443438010	CAWA-18-78
443438013	CAWA-18-129
1203970541	Method Blank (MB)
1203970542	Laboratory Control Sample (LCS)
1203970543	443438002(CAWA-18-72) Sample Duplicate (DUP)
1203970544	443438002(CAWA-18-72) 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# 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 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 443438002 (CAWA-18-72) was selected for QC analysis.

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

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

Analyte	Sample	Value
Nitrogen, Total Kjeldahl	1203970544 (CAWA-18-72MS)	112* (90%-110%)

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

Samples 1203970541 (MB) and 1203970542 (LCS) were re-analyzed due to instrument failure. The results from the

reanalysis are reported. Sample1203970541 (MB) was re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was reported.

Miscellaneous Information

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: 1738768

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
443438001	CAWA-18-71
443438005	CAWA-18-74
443438009	CAWA-18-77
443438013	CAWA-18-129
1203970525	Method Blank (MB)
1203970526	Laboratory Control Sample (LCS)
1203970527	443438001(CAWA-18-71) Sample Duplicate (DUP)
1203970528	443438001(CAWA-18-71) 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# 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+ 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 443438001 (CAWA-18-71) was selected for QC analysis.

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

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.

Analyte	Sample	Value
Nitrogen, Nitrate/Nitrite	1203970528 (CAWA-18-71PS)	111* (90%-110%)

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

Sample1203970526 (LCS) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

Miscellaneous Information

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:	1738772	Method:	PO4
Prep Batch :	1738771	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
443438001	CAWA-18-71
443438005	CAWA-18-74
443438009	CAWA-18-77
443438013	CAWA-18-129
1203970535	Method Blank (MB)
1203970536	Laboratory Control Sample (LCS)
1203970537	443438001(CAWA-18-71) Sample Duplicate (DUP)
1203970539	443438001(CAWA-18-71) 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# 11.

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 443438001 (CAWA-18-71) 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**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: 1738394

Method: TDS

Sample Analysis

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

Sample ID	Client ID
443438001	CAWA-18-71
443438005	CAWA-18-74
443438009	CAWA-18-77
443438013	CAWA-18-129
1203969493	Method Blank (MB)
1203969494	Laboratory Control Sample (LCS)
1203969495	443345002(CAWA-18-33) 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 443345002 (CAWA-18-33) 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

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: 1738543

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
443438001	CAWA-18-71
443438005	CAWA-18-74
443438009	CAWA-18-77
443438013	CAWA-18-129
1203970773	Laboratory Control Sample (LCS)
1203969858	443105002(CrPZ-2-18-151284) 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# 16.

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 Scientific Orion Star A212 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 443105002 (CrPZ-2-18-151284) 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**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: 1737969 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
443438001	CAWA-18-71
443438005	CAWA-18-74
443438009	CAWA-18-77
443438013	CAWA-18-129
1203968359	Laboratory Control Sample (LCS)
1203968361	443360002(CAWA-18-80) 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# 23.

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 443360002 (CAWA-18-80) 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
1203968361 (CAWA-18-80DUP)	pH	Received 08-FEB-18, out of holding 06-FEB-18
443438001 (CAWA-18-71)	pH	Received 09-FEB-18, out of holding 07-FEB-18
443438005 (CAWA-18-74)	pH	Received 09-FEB-18, out of holding 07-FEB-18
443438009 (CAWA-18-77)	pH	Received 09-FEB-18, out of holding 07-FEB-18
443438013 (CAWA-18-129)	pH	Received 09-FEB-18, out of holding 07-FEB-18

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**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: 1737964 **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
443438001	CAWA-18-71
443438005	CAWA-18-74
443438009	CAWA-18-77
443438013	CAWA-18-129
1203968350	Laboratory Control Sample (LCS)
1203968352	443360002(CAWA-18-80) Sample Duplicate (DUP)
1203968356	443360002(CAWA-18-80) 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 443360002 (CAWA-18-80) 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

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: 2018-1639 GEL Work Order: 443438

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: Kristen Mizzell

Date: 01 MAR 2018

Title: Team Leader

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1639

Client Sample ID: CAWA-18-71
Sample ID: 443438001
Matrix: W
Collect Date: 07-FEB-18 11:37
Receive Date: 09-FEB-18
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	U	ND	0.067	0.200	mg/L		1	MAR1	02/12/18	2028	1738628	1
Chloride		2.45	0.067	0.200	mg/L		1					
Fluoride		0.200	0.033	0.100	mg/L		1					
Sulfate		2.21	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0172	0.017	0.050	mg/L	1.00	1	KLP1	02/15/18	1357	1738770	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.304	0.017	0.050	mg/L		1	KLP1	02/15/18	1156	1738768	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0245	0.020	0.050	mg/L	1.00	1	KLP1	02/15/18	1141	1738772	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		100	3.40	14.3	mg/L			KLP1	02/13/18	1227	1738394	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		58.6	1.45	4.00	mg/L			RXB5	02/10/18	1244	1737964	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		126	1.00	1.00	umhos/cm		1	VH1	02/13/18	1033	1738543	7
PH "As Received"												
pH at Temp 18.4C	H	8.23	0.010	0.100	SU		1	RXB5	02/10/18	1243	1737969	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	02/15/18	1104	1738769
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	02/14/18	1500	1738771

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1639

Client Sample ID: CAWA-18-71
Sample ID: 443438001

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:350.1											
3	EPA:353.2											
4	EPA 365.4 1974											
5	EPA:160.1											
6	EPA:310.1											
7	EPA:120.1											
8	EPA 150.1 1982											

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

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1639

Client Sample ID: CAWA-18-72
Sample ID: 443438002
Matrix: W
Collect Date: 07-FEB-18 11:37
Receive Date: 09-FEB-18
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	J	0.382	0.330	1.00	mg/L		1	TSM	02/20/18	2229	1738436	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/12/18	0735	1737905	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	02/15/18	1535	1738774	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/12/18	0712	1737904
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	02/14/18	1500	1738773

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

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1639

Client Sample ID: CAWA-18-74
Sample ID: 443438005
Matrix: W
Collect Date: 07-FEB-18 11:32
Receive Date: 09-FEB-18
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	U	ND	0.067	0.200	mg/L		1	MAR1	02/12/18	2059	1738628	1
Chloride		1.64	0.067	0.200	mg/L		1					
Fluoride		0.216	0.033	0.100	mg/L		1					
Sulfate		3.72	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.037	0.017	0.050	mg/L	1.00	1	KLP1	02/15/18	1400	1738770	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.408	0.017	0.050	mg/L		1	KLP1	02/15/18	1159	1738768	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0331	0.020	0.050	mg/L	1.00	1	KLP1	02/15/18	1143	1738772	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		107	3.40	14.3	mg/L			KLP1	02/13/18	1227	1738394	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		58.2	1.45	4.00	mg/L			RXB5	02/10/18	1247	1737964	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		126	1.00	1.00	umhos/cm		1	VH1	02/13/18	1034	1738543	7
PH "As Received"												
pH at Temp 18.2C	H	8.21	0.010	0.100	SU		1	RXB5	02/10/18	1245	1737969	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	02/15/18	1104	1738769
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	02/14/18	1500	1738771

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1639

Client Sample ID: CAWA-18-74
Sample ID: 443438005

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:350.1											
3	EPA:353.2											
4	EPA 365.4 1974											
5	EPA:160.1											
6	EPA:310.1											
7	EPA:120.1											
8	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

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-1639

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-75

Project: ESHL00114

Sample ID: 443438006

Client ID: ARSL004

Matrix: W

Collect Date: 07-FEB-18 11:32

Receive Date: 09-FEB-18

Collector: Client

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	U	ND	0.330	1.00	mg/L		1	TSM	02/20/18	2308	1738436	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/12/18	0736	1737905	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	02/15/18	1538	1738774	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/12/18	0712	1737904
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	02/14/18	1500	1738773

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

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1639

Client Sample ID: CAWA-18-77
Sample ID: 443438009
Matrix: W
Collect Date: 07-FEB-18 13:16
Receive Date: 09-FEB-18
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	U	ND	0.067	0.200	mg/L		1	MAR1	02/12/18	2130	1738628	1
Chloride		1.13	0.067	0.200	mg/L		1					
Fluoride		0.108	0.033	0.100	mg/L		1					
Sulfate		2.27	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0767	0.017	0.050	mg/L	1.00	1	KLP1	02/15/18	1401	1738770	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.488	0.017	0.050	mg/L		1	KLP1	02/15/18	1200	1738768	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0287	0.020	0.050	mg/L	1.00	1	KLP1	02/15/18	1144	1738772	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		97.1	3.40	14.3	mg/L			KLP1	02/13/18	1227	1738394	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		51.4	1.45	4.00	mg/L			RXB5	02/10/18	1249	1737964	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		107	1.00	1.00	umhos/cm		1	VH1	02/13/18	1035	1738543	7
PH "As Received"												
pH at Temp 18.4C	H	7.66	0.010	0.100	SU		1	RXB5	02/10/18	1247	1737969	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	02/15/18	1104	1738769
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	02/14/18	1500	1738771

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1639

Client Sample ID: CAWA-18-77
Sample ID: 443438009

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:350.1											
3	EPA:353.2											
4	EPA 365.4 1974											
5	EPA:160.1											
6	EPA:310.1											
7	EPA:120.1											
8	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

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1639

Client Sample ID: CAWA-18-78
Sample ID: 443438010
Matrix: W
Collect Date: 07-FEB-18 13:16
Receive Date: 09-FEB-18
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	J	0.423	0.330	1.00	mg/L		1	TSM	02/20/18	2348	1738436	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/12/18	0737	1737905	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	02/15/18	1538	1738774	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/12/18	0712	1737904
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	02/14/18	1500	1738773

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

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1639

Client Sample ID: CAWA-18-129
Sample ID: 443438013
Matrix: W
Collect Date: 07-FEB-18 09:00
Receive Date: 09-FEB-18
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	U	ND	0.330	1.00	mg/L		1	TSM	02/21/18	0027	1738436	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/12/18	0738	1737905	2
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	02/12/18	2201	1738628	3
Chloride	J	0.082	0.067	0.200	mg/L		1					
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate	U	ND	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	U	ND	0.017	0.050	mg/L	1.00	1	KLP1	02/15/18	1402	1738770	4
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite	U	ND	0.017	0.050	mg/L		1	KLP1	02/15/18	1202	1738768	5
PO4 "As Received"												
Phosphorus, Total as P	U	ND	0.020	0.050	mg/L	1.00	1	KLP1	02/15/18	1145	1738772	6
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	02/15/18	1539	1738774	7
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids	U	ND	3.40	14.3	mg/L			KLP1	02/13/18	1227	1738394	8
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3	U	ND	1.45	4.00	mg/L			RXB5	02/10/18	1253	1737964	9
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		1.10	1.00	1.00	umhos/cm		1	VH1	02/13/18	1036	1738543	10
PH "As Received"												
pH at Temp 19.2C	H	5.89	0.010	0.100	SU		1	RXB5	02/10/18	1250	1737969	11

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
--------	-------------	---------	------	------	------------

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 1, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1639

Client Sample ID: CAWA-18-129
Sample ID: 443438013

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
EPA 335.4	EPA 335.4	Total Cyanide		AXH3	02/12/18		0712		1737904			
EPA 350.1 Prep	EPA 350.1	Ammonia Nitrogen Prep		KLP1	02/15/18		1104		1738769			
EPA 351.2 Prep	EPA 351.2	Total Kjeldahl Nitrogen Prep		KLP1	02/14/18		1500		1738773			
EPA 365.4 Prep	EPA 365.4	Phosphorus, Total in liquid PR		KLP1	02/14/18		1500		1738771			

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW-846:9060	
2	EPA 335.4 1993	
3	EPA:300.0	
4	EPA:350.1	
5	EPA:353.2	
6	EPA 365.4 1974	
7	EPA:351.2	
8	EPA:160.1	
9	EPA:310.1	
10	EPA:120.1	
11	EPA 150.1 1982	

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: March 1, 2018

Page 1 of 6

Los Alamos National Laboratory
TA-00, SM1237, Rm104C
Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 443438

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1738436										
QC1203969630	443345003	DUP									
Total Organic Carbon Average	J	0.842	J	0.803	mg/L	4.74	^	(+/-1.00)	TSM	02/20/18	20:11
QC1203969628	LCS										
Total Organic Carbon Average	10.0			10.7	mg/L			(80%-120%)		02/20/18	17:32
QC1203969627	MB										
Total Organic Carbon Average			U	ND	mg/L					02/20/18	17:22
QC1203969633	443345003	PS									
Total Organic Carbon Average	10.0	J	0.842	13.3	mg/L			(75%-125%)		02/20/18	20:50
Flow Injection Analysis											
Batch	1737905										
QC1203968145	443345003	DUP									
Cyanide, Total	U	ND	U	ND	ug/L	N/A			AXH3	02/12/18	07:19
QC1203968934	443434001	DUP									
Cyanide, Total	U	ND	U	ND	ug/L	N/A				02/12/18	07:33
QC1203968144	LCS										
Cyanide, Total	50.0			49.9	ug/L			(90%-110%)		02/12/18	07:17
QC1203968143	MB										
Cyanide, Total			U	ND	ug/L					02/12/18	07:16
QC1203968146	443345003	MS									
Cyanide, Total	100	U	ND	107	ug/L			(90%-110%)		02/12/18	07:20
QC1203968935	443434001	MS									
Cyanide, Total	100	U	ND	105	ug/L			(90%-110%)		02/12/18	07:34

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1738628										
QC1203970120	443360002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	02/12/18	19:26
Chloride			1.43		1.43	mg/L	0.112	(0%-20%)			
Fluoride			0.133		0.146	mg/L	9.9 ^	(+/-0.100)			
Sulfate			2.74		2.75	mg/L	0.35	(0%-20%)			
QC1203970119	LCS										
Bromide	1.25				1.28	mg/L	102	(80%-120%)		02/12/18	17:53
Chloride	5.00				4.53	mg/L	90.6	(80%-120%)			
Fluoride	2.50				2.35	mg/L	94.1	(80%-120%)			
Sulfate	10.0				9.39	mg/L	93.9	(80%-120%)			
QC1203970118	MB										
Bromide			U		ND	mg/L				02/12/18	17:22
Chloride			U		ND	mg/L					
Fluoride			U		ND	mg/L					
Sulfate			U		ND	mg/L					
QC1203970121	443360002	PS									
Bromide	1.25	U	ND		1.51	mg/L	117	(75%-125%)		02/12/18	19:57
Chloride	5.00		1.43		7.29	mg/L	117	(75%-125%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1738628										
Fluoride	2.50	0.133		3.27	mg/L		126*	(75%-125%)	MAR1	02/12/18	19:57
Sulfate	10.0	2.74		17.4	mg/L		146*	(75%-125%)			
Nutrient Analysis											
Batch	1738768										
QC1203970527	443438001	DUP									
Nitrogen, Nitrate/Nitrite		0.304		0.302	mg/L	0.66		(0%-20%)	KLP1	02/15/18	11:57
QC1203970526	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.985	mg/L		98.5	(90%-110%)		02/15/18	12:10
QC1203970525	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					02/15/18	11:53
QC1203970528	443438001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.304		1.41	mg/L		111*	(90%-110%)		02/15/18	11:58
Batch	1738770										
QC1203970531	443438001	DUP									
Nitrogen, Ammonia		J	0.0172	U	ND	mg/L	200	^	KLP1	02/15/18	13:58
QC1203970530	LCS										
Nitrogen, Ammonia	1.00			0.952	mg/L		95.2	(90%-110%)		02/15/18	13:56
QC1203970529	MB										
Nitrogen, Ammonia			J	0.0178	mg/L					02/15/18	13:55
QC1203970532	443438001	MS									
Nitrogen, Ammonia	1.00	J	0.0172	0.992	mg/L		97.5	(90%-110%)		02/15/18	13:59
Batch	1738772										
QC1203970537	443438001	DUP									
Phosphorus, Total as P		J	0.0245	J	0.032	mg/L	26.5	^	(+/-0.050)	KLP1	02/15/18 11:41

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1738772										
QC1203970536	LCS										
Phosphorus, Total as P	1.00			0.969	mg/L		96.9	(80%-124%)	KLP1	02/15/18	11:38
QC1203970535	MB										
Phosphorus, Total as P			U	ND	mg/L					02/15/18	11:37
QC1203970539	443438001	MS									
Phosphorus, Total as P	1.00	J	0.0245	1.01	mg/L		98.6	(63%-139%)		02/15/18	11:42
<hr/>											
Batch	1738774										
QC1203970543	443438002	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	02/15/18	15:36
QC1203970542	LCS										
Nitrogen, Total Kjeldahl	1.00			1.08	mg/L		108	(90%-110%)		02/15/18	15:49
QC1203970541	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					02/15/18	16:38
QC1203970544	443438002	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	1.12	mg/L		112 *	(90%-110%)		02/15/18	15:37
<hr/>											
Solids Analysis											
Batch	1738394										
QC1203969495	443345002	DUP									
Total Dissolved Solids			147	150	mg/L	1.92		(0%-5%)	KLP1	02/13/18	12:27
QC1203969494	LCS										
Total Dissolved Solids	300			293	mg/L		97.6	(95%-105%)		02/13/18	12:27
QC1203969493	MB										
Total Dissolved Solids			U	ND	mg/L					02/13/18	12:27

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1737964										
QC1203968352	443360002	DUP									
Alkalinity, Total as CaCO3		52.6		53.4	mg/L	1.51		(0%-20%)	RXB5	02/10/18	12:23
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203968350	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)		02/10/18	11:26
QC1203968356	443360002	MS									
Alkalinity, Total as CaCO3	100	52.6		158	mg/L		106	(80%-120%)		02/10/18	12:23
Batch	1737969										
QC1203968361	443360002	DUP									
pH	H	7.74	H	7.79	SU	0.644		(0%-5%)	RXB5	02/10/18	12:18
QC1203968359	LCS										
pH	7.00			7.04	SU		101	(99%-101%)		02/10/18	11:17
Batch	1738543										
QC1203969858	443105002	DUP									
Conductivity		594		593	umhos/cm	0.185		(0%-10%)	VH1	02/13/18	10:26
QC1203970773	LCS										
Conductivity	1410			1420	umhos/cm		101	(95%-105%)		02/13/18	10:24

- 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

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 6 of 6

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.

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1639
Work Order #: 443438**

Method/Analysis Information

Product: Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1738205

Sample ID	Client ID
443438002	CAWA-18-72
443438006	CAWA-18-75
443438010	CAWA-18-78
1203969024	Method Blank (MB)
1203969026	Laboratory Control Sample (LCS)
1203969025	443438002(CAWA-18-72) 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-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibrations were performed in February 2018 and January 2018.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203969024 (MB) and 1203969026 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443438002 (CAWA-18-72). The QC was from ARSL work order 443438.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Samples 1203969025 (CAWA-18-72DUP) and 443438002 (CAWA-18-72) were recounted due to results more negative than the three sigma TPU. The second counts are reported.

Miscellaneous Information:**Manual Integration**

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: ISOPU
Analytical Method: HASL-300:ISOPU
Analytical Batch Number: 1738208

Sample ID	Client ID
443438002	CAWA-18-72
443438006	CAWA-18-75
443438010	CAWA-18-78
1203969032	Method Blank (MB)
1203969034	Laboratory Control Sample (LCS)
1203969033	443438002(CAWA-18-72) 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-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibrations were performed in February 2018 and January 2018.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203969032 (MB) and 1203969034 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443438002 (CAWA-18-72). The QC was from ARSL work order 443438.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Manual Integration**

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	IsoU
Analytical Method:	HASL-300:ISOU
Analytical Batch Number:	1738211

Sample ID	Client ID
443438002	CAWA-18-72
443438006	CAWA-18-75
443438010	CAWA-18-78
1203969040	Method Blank (MB)
1203969042	Laboratory Control Sample (LCS)
1203969041	443438002(CAWA-18-72) 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-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in February 2018.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203969040 (MB) and 1203969042 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443438002 (CAWA-18-72). The QC was from ARSL work order 443438.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Sample 1203969041 (CAWA-18-72DUP) was recounted due to a peak shift. The recount is reported.

Miscellaneous Information:**Manual Integration**

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1738650

Sample ID	Client ID
443438013	CAWA-18-129
1203970190	Method Blank (MB)
1203970192	Laboratory Control Sample (LCS)
1203970191	443438013(CAWA-18-129) 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-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in February 2018.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203970190 (MB) and 1203970192 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443438013 (CAWA-18-129). The QC was from ARSL work order 443438.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Sample result are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	ISOPU
Analytical Method:	HASL-300:ISOPU
Analytical Batch Number:	1738651

Sample ID	Client ID
443438013	CAWA-18-129
1203970193	Method Blank (MB)
1203970195	Laboratory Control Sample (LCS)
1203970194	443438013(CAWA-18-129) 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-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in February 2018.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203970193 (MB) and 1203970195 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443438013 (CAWA-18-129). The QC was from ARSL work order 443438.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Sample result are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Manual Integration**

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: IsoU

Analytical Method: HASL-300:ISOU

Analytical Batch Number: 1738652

Sample ID	Client ID
443438013	CAWA-18-129
1203970196	Method Blank (MB)
1203970198	Laboratory Control Sample (LCS)
1203970197	443438013(CAWA-18-129) 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-RAD-A-011 REV# 26.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in February 2018.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203970196 (MB) and 1203970198 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

Sample	Analyte	Value
1203970196 (MB)	Uranium-233/234, Uranium-235/236 and Uranium-238	Blank result > 1.65 CSU

Blank Decision Level

The blank (See Below) result is greater than the decision level but less than the MDC.

Sample	Analyte	Value
1203970196 (MB)	Uranium-235/236	Blank result > DL

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443438013 (CAWA-18-129). The QC was from ARSL work order 443438.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Sample result are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Manual Integration**

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: **GammaSpec**

Analytical Method: EPA:901.1

Analytical Batch Number: 1738441

Sample ID	Client ID
443438002	CAWA-18-72
443438006	CAWA-18-75
443438010	CAWA-18-78
443438013	CAWA-18-129
1203969650	Method Blank (MB)
1203969652	Laboratory Control Sample (LCS)
1203969651	443438002(CAWA-18-72) 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-RAD-A-013 REV# 27.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in August 2017, December 2017, January 2018, June 2017 and November 2017.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

Sample	Analyte	Value
1203969650 (MB)	Sodium-22	Blank result > 1.65 CSU

Blank Decision Level

The blank (See Below) result is greater than the decision level but less than the MDC.

Sample	Analyte	Value
1203969650 (MB)	Sodium-22	Blank result > DL

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443438002 (CAWA-18-72). The QC was from ARSL work order 443438.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Additional Identified Radionuclides

No additional radionuclides were added.

Miscellaneous Information:

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr90, liquid

Analytical Method: EPA:905.0

Analytical Batch Number: 1738564

Sample ID	Client ID
443438002	CAWA-18-72
443438006	CAWA-18-75
443438010	CAWA-18-78
443438013	CAWA-18-129
1203969932	Method Blank (MB)
1203969935	Laboratory Control Sample (LCS)
1203969933	443345003(CAWA-18-34) Sample Duplicate (DUP)
1203969934	443345003(CAWA-18-34) 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-RAD-A-004 REV# 19.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibration was performed in April 2016.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203969932 (MB) and 1203969935 (LCS) were changed to 1.0 per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443345003 (CAWA-18-34). The QC was from ARSL work order 443345.

Matrix Spike (MS) Recovery

The MS spike recoveries met acceptance limits.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and the Duplicate, (See Below), did not meet the relative error ratio requirement; however, both sample and duplicate results are less than the minimum detectable concentration.

Sample	Analyte	Value
1203969933 (CAWA-18-34DUP)	Strontium-90	RPD 0 N/A RER 1.39* (0-1)

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Samples 443438006 (CAWA-18-75) and 443438013 (CAWA-18-129) were recounted due to results more negative than the three sigma TPU. The second counts are reported.

Miscellaneous Information:**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

The matrix spike, 1203969934 (CAWA-18-34MS), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: WSP-GrossA/B
Analytical Method: EPA 900.0/SW846 9310
Analytical Batch Number: 1738567

Sample ID	Client ID
443438002	CAWA-18-72
443438006	CAWA-18-75
443438010	CAWA-18-78
443438013	CAWA-18-129
1203969942	Method Blank (MB)
1203969946	Laboratory Control Sample (LCS)
1203969943	443549002(CAWA-18-4) Sample Duplicate (DUP)
1203969944	443549002(CAWA-18-4) Matrix Spike (MS)
1203969945	443549002(CAWA-18-4) Matrix Spike Duplicate (MSD)

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-RAD-A-001 REV# 19.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in December 2017.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203969942 (MB) and 1203969946 (LCS) were changed to 1.0 per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

Sample	Analyte	Value
1203969942 (MB)	BETA	Blank result > 1.65 CSU

Blank Decision Level

The blank (See Below) result is greater than the decision level but less than the MDC.

Sample	Analyte	Value
1203969942 (MB)	ALPHA and BETA	Blank result > DL

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443549002 (CAWA-18-4). The QC was from ARSL work order 443549.

Matrix Spike (MS) Recovery

The MS spike recoveries met acceptance limits.

Duplication Criteria between MS and MSD

The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) met the duplication acceptance criteria.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating, especially to a dull red heat. For this sample set, the prepared planchet was counted for beta activity before being flamed. After flaming, the planchet was counted for alpha activity.

Recounts

Sample 443438002 (CAWA-18-72) was recounted due to results more negative than the three sigma TPU. The second count is reported.

Miscellaneous Information:**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

The matrix spike and matrix spike duplicate, 1203969944 (CAWA-18-4MS) and 1203969945 (CAWA-18-4MSD), aliquots were reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

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: 2018-1639 GEL Work Order: 443438

The Qualifiers in this report are defined as follows:

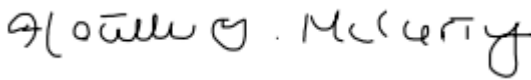
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

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: Heather McCarty

Date: 01 MAR 2018

Title: Analyst II

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Report Date: March 1, 2018

Client Sample ID: CAWA-18-72
Sample ID: 443438002
Matrix: W
Collect Date: 07-FEB-18
Receive Date: 09-FEB-18
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
-----------	-----------	--------	-------------	-----	----	-----	----	-------	----	----	---------	------	------	-------	------

Rad Alpha Spec Analysis

Alphaspec Am241 Liquid "As Received"

Americium-241	U	0.013	+/-0.0086	0.0438	0.0184	+/-0.00862	0.050	pCi/L			EXC2	02/22/18	1352	1738205	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.0142	+/-0.00837	0.0353	0.0149	+/-0.00839	0.050	pCi/L			EXC2	02/13/18	1404	1738208	2
Plutonium-239/240	U	-0.00609	+/-0.00609	0.0284	0.0115	+/-0.00609	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.325	+/-0.0319	0.135	0.0634	+/-0.036	1.00	pCi/L			EXC2	02/13/18	1332	1738211	3
Uranium-235/236	U	0.0322	+/-0.0139	0.075	0.0326	+/-0.014	1.00	pCi/L							
Uranium-238		0.226	+/-0.0275	0.068	0.0301	+/-0.0297	0.500	pCi/L							

Rad Gamma Spec Analysis

Gammasespec "As Received"

Cesium-137	U	-1.61	+/-0.856	2.77	1.23	+/-0.935	8.00	pCi/L			BSW1	02/12/18	0920	1738441	4
Cobalt-60	U	0.543	+/-0.780	3.27	1.41	+/-0.790	8.00	pCi/L							
Neptunium-237	U	1.97	+/-1.74	6.63	3.11	+/-1.80		pCi/L							
Potassium-40	U	-9.37	+/-11.9	43.4	19.4	+/-12.1		pCi/L							
Sodium-22	U	0.154	+/-1.02	3.37	1.47	+/-1.02		pCi/L							

Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	0.224	+/-0.0954	0.311	0.151	+/-0.0973	0.500	pCi/L			LXB3	02/19/18	1619	1738564	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	0.874	+/-0.870	2.94	1.37	+/-0.873	3.00	pCi/L			BXG2	02/23/18	0805	1738567	6
Alpha	U	0.299	+/-0.425	1.80	0.539	+/-0.426	3.00	pCi/L			BXG2	02/23/18	1107	1738567	7

The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241 Liquid "As Received"	1738205	86.3	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1738208	87.7	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1738211	74.2	(50%-105%)

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-72

Sample ID: 443438002

Project: ESHL00114

Client ID: ARSL004

Report Date: March 1, 2018

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test								Batch ID	Recovery%	Acceptable Limits				
Strontium Carrier		GFPC, Sr90, liquid "As Received"							1738564	102	(50%-105%)				

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-75

Sample ID: 443438006

Matrix: W

Collect Date: 07-FEB-18

Receive Date: 09-FEB-18

Collector: Client

Report Date: March 1, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis															
<i>Alphaspec Am241 Liquid "As Received"</i>															
Americium-241	U	0.00198	+/-0.00443	0.0335	0.0141	+/-0.00443	0.050	pCi/L			EXC2	02/13/18	1404	1738205	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.0164	+/-0.00603	0.0316	0.0133	+/-0.00607	0.050	pCi/L			EXC2	02/13/18	1404	1738208	2
Plutonium-239/240	U	-1.82E-09	+/-0.0068	0.0254	0.0103	+/-0.0068	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.458	+/-0.0407	0.158	0.0745	+/-0.0476	1.00	pCi/L			EXC2	02/13/18	1332	1738211	3
Uranium-235/236	U	0.0211	+/-0.0163	0.0881	0.0383	+/-0.0163	1.00	pCi/L							
Uranium-238		0.249	+/-0.0299	0.080	0.0354	+/-0.0326	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	0.00275	+/-0.899	3.29	1.48	+/-0.899	8.00	pCi/L			BSW1	02/12/18	0921	1738441	4
Cobalt-60	U	-0.356	+/-0.908	3.43	1.47	+/-0.911	8.00	pCi/L							
Neptunium-237	U	2.34	+/-1.55	5.69	2.63	+/-1.64		pCi/L							
Potassium-40	U	-20.5	+/-12.9	43.1	19.2	+/-13.8		pCi/L							
Sodium-22	U	0.357	+/-0.766	2.92	1.23	+/-0.770		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	-0.24	+/-0.120	0.489	0.221	+/-0.120	0.500	pCi/L			LXB3	02/20/18	1141	1738564	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	0.471	+/-0.516	1.79	0.776	+/-0.518	3.00	pCi/L			BXG2	02/22/18	1644	1738567	6
Alpha	U	0.707	+/-0.517	1.73	0.484	+/-0.520	3.00	pCi/L			BXG2	02/23/18	1107	1738567	7

The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer		Alphaspec Am241 Liquid "As Received"	1738205	94.9	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1738208	95.8	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1738211	74.1	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1738564	100	(50%-105%)

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-75

Sample ID: 443438006

Report Date: March 1, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test								Batch ID	Recovery%	Acceptable Limits				

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-78

Sample ID: 443438010

Matrix: W

Collect Date: 07-FEB-18

Receive Date: 09-FEB-18

Collector: Client

Report Date: March 1, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis															
<i>Alphaspec Am241 Liquid "As Received"</i>															
Americium-241	U	0.00716	+/-0.00566	0.0303	0.0127	+/-0.00567	0.050	pCi/L			EXC2	02/13/18	1404	1738205	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.00714	+/-0.00619	0.031	0.0131	+/-0.00619	0.050	pCi/L			EXC2	02/13/18	1404	1738208	2
Plutonium-239/240	U	-0.00179	+/-0.00692	0.025	0.0101	+/-0.00692	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.240	+/-0.0343	0.180	0.0849	+/-0.0368	1.00	pCi/L			EXC2	02/13/18	1332	1738211	3
Uranium-235/236	U	0.0288	+/-0.0152	0.100	0.0437	+/-0.0152	1.00	pCi/L							
Uranium-238		0.120	+/-0.0249	0.0911	0.0403	+/-0.0257	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	0.266	+/-0.917	3.43	1.53	+/-0.919	8.00	pCi/L			BSW1	02/12/18	0922	1738441	4
Cobalt-60	U	1.59	+/-0.891	4.08	1.76	+/-0.967	8.00	pCi/L							
Neptunium-237	U	-1.46	+/-2.10	6.65	3.08	+/-2.13		pCi/L							
Potassium-40	U	-33.8	+/-13.9	45.5	20.0	+/-16.0		pCi/L							
Sodium-22	U	0.120	+/-0.681	2.64	1.05	+/-0.681		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	0.151	+/-0.122	0.405	0.197	+/-0.123	0.500	pCi/L			LXB3	02/19/18	1619	1738564	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	0.818	+/-0.543	1.80	0.767	+/-0.548	3.00	pCi/L			BXG2	02/22/18	1644	1738567	6
Alpha	U	-0.173	+/-0.437	2.29	0.790	+/-0.437	3.00	pCi/L			BXG2	02/23/18	1108	1738567	7

The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer		Alphaspec Am241 Liquid "As Received"	1738205	92.2	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1738208	89.2	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1738211	66.7	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1738564	93	(50%-105%)

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-78

Sample ID: 443438010

Report Date: March 1, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test											Batch ID	Recovery%	Acceptable Limits	

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-129

Sample ID: 443438013

Matrix: W

Collect Date: 07-FEB-18

Receive Date: 09-FEB-18

Collector: Client

Report Date: March 1, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis															
<i>Alphaspec Am241 Liquid "As Received"</i>															
Americium-241	U	0.0147	+/-0.00755	0.0354	0.0149	+/-0.00757	0.050	pCi/L			EXC2	02/17/18	1609	1738650	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.00773	+/-0.00947	0.0336	0.0142	+/-0.00947	0.050	pCi/L			EXC2	02/17/18	1609	1738651	2
Plutonium-239/240	U	0.00193	+/-0.00842	0.027	0.0109	+/-0.00842	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234	U	0.093	+/-0.0295	0.243	0.113	+/-0.0301	1.00	pCi/L			EXC2	02/15/18	1704	1738652	3
Uranium-235/236	U	0.0739	+/-0.0248	0.137	0.0584	+/-0.0252	1.00	pCi/L							
Uranium-238	U	0.0208	+/-0.0158	0.124	0.0538	+/-0.0159	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	0.769	+/-0.787	3.15	1.39	+/-0.808	8.00	pCi/L			BSW1	02/12/18	0923	1738441	4
Cobalt-60	U	-1.03	+/-0.979	3.44	1.45	+/-1.01	8.00	pCi/L							
Neptunium-237	U	-0.602	+/-1.68	6.11	2.80	+/-1.68		pCi/L							
Potassium-40	U	-17.8	+/-13.2	44.4	19.5	+/-13.9		pCi/L							
Sodium-22	U	1.28	+/-0.983	4.19	1.83	+/-1.03		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	0.358	+/-0.157	0.490	0.212	+/-0.159	0.500	pCi/L			LXB3	02/20/18	1141	1738564	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	2.36	+/-0.858	2.61	1.16	+/-0.882	3.00	pCi/L			BXG2	02/22/18	1644	1738567	6
Alpha	U	0.154	+/-0.440	1.87	0.670	+/-0.440	3.00	pCi/L			BXG2	02/23/18	1108	1738567	7

The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer		Alphaspec Am241 Liquid "As Received"	1738650	81.8	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1738651	83.8	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1738652	75.7	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1738564	88.4	(50%-105%)

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-129

Sample ID: 443438013

Report Date: March 1, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test											Batch ID	Recovery%	Acceptable Limits	

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: March 1, 2018

Page 1 of 8

Client : Los Alamos National Laboratory
TA-00, SM1237, Rm104C

Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 443438

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1738205										
QC1203969025	443438002	DUP									
Americium-241	U	0.013	U	-0.00239	pCi/L	0.338		(0-1)	EXC2	02/22/18	13:52
	Uncert:	+/-0.0086		+/-0.0141							
	TPU:	+/-0.00862		+/-0.0141							
**Americium-243 Tracer	2.62	2.26		2.25	pCi/L		85.8	(50%-105%)			
	Uncert:	+/-0.0825		+/-0.0792							
	TPU:	+/-0.146		+/-0.143							
QC1203969026	LCS										
Americium-241	1.97			1.78	pCi/L		90.4	(80%-120%)	EXC2	02/13/18	14:04
	Uncert:			+/-0.0597							
	TPU:			+/-0.101							
**Americium-243 Tracer	2.10			2.13	pCi/L		102	(50%-105%)			
	Uncert:			+/-0.0644							
	TPU:			+/-0.115							
QC1203969024	MB										
Americium-241			U	0.00139	pCi/L				EXC2	02/13/18	14:04
	Uncert:			+/-0.00501							
	TPU:			+/-0.00501							
**Americium-243 Tracer	2.10			1.88	pCi/L		89.9	(50%-105%)			
	Uncert:			+/-0.0537							
	TPU:			+/-0.103							
Batch	1738208										
QC1203969033	443438002	DUP									
Plutonium-238	U	0.0142	U	0.00614	pCi/L	0.227		(0-1)	EXC2	02/13/18	14:04
	Uncert:	+/-0.00837		+/-0.00938							
	TPU:	+/-0.00839		+/-0.00938							
Plutonium-239/240	U	-0.00609	U	-0.00205	pCi/L	0.127		(0-1)			
	Uncert:	+/-0.00609		+/-0.00981							
	TPU:	+/-0.00609		+/-0.00981							
**Plutonium-242 Tracer	2.47	2.16		1.95	pCi/L		79.2	(50%-105%)			
	Uncert:	+/-0.0714		+/-0.0722							
	TPU:	+/-0.122		+/-0.123							
QC1203969034	LCS										
Plutonium-238			U	0.0162	pCi/L			(80%-120%)	EXC2	02/13/18	14:04
	Uncert:			+/-0.00897							
	TPU:			+/-0.009							
Plutonium-239/240	1.98			2.03	pCi/L		102	(80%-120%)			
	Uncert:			+/-0.0686							
	TPU:			+/-0.114							
**Plutonium-242 Tracer	1.97			1.83	pCi/L		92.9	(50%-105%)			
	Uncert:			+/-0.0682							
	TPU:			+/-0.112							

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 2 of 8

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1738208										
QC1203969032	MB										
Plutonium-238			U	0.00411	pCi/L				EXC2	02/13/18	14:04
				Uncert: +/-0.0065							
				TPU: +/-0.00651							
Plutonium-239/240			U	-0.00206	pCi/L						
				Uncert: +/-0.00682							
				TPU: +/-0.00682							
**Plutonium-242 Tracer	1.97			1.41	pCi/L		71.4	(50%-105%)			
				Uncert: +/-0.064							
				TPU: +/-0.106							
Batch	1738211										
QC1203969041	443438002	DUP									
Uranium-234		0.325		0.318	pCi/L	0.0464		(0-1)	EXC2	02/22/18	13:52
		Uncert: +/-0.0319		+/-0.0308							
		TPU: +/-0.036		+/-0.0348							
Uranium-235/236		U	0.0322	U	0.0258	pCi/L	0.115	(0-1)			
		Uncert: +/-0.0139		+/-0.0137							
		TPU: +/-0.014		+/-0.0138							
Uranium-238		0.226		0.196	pCi/L	0.271		(0-1)			
		Uncert: +/-0.0275		+/-0.0238							
		TPU: +/-0.0297		+/-0.0257							
**Uranium-232 Tracer	2.61	1.93		1.87	pCi/L		71.4	(50%-105%)			
		Uncert: +/-0.0878		+/-0.0845							
		TPU: +/-0.158		+/-0.154							
QC1203969042	LCS										
Uranium-234				2.46	pCi/L				EXC2	02/13/18	13:32
		Uncert: +/-0.0753		+/-0.0753							
		TPU: +/-0.144		+/-0.144							
Uranium-235/236				0.210	pCi/L						
		Uncert: +/-0.0252		+/-0.0252							
		TPU: +/-0.0273		+/-0.0273							
Uranium-238	2.70			2.64	pCi/L		97.6	(80%-120%)			
		Uncert: +/-0.0775		+/-0.0775							
		TPU: +/-0.153		+/-0.153							
**Uranium-232 Tracer	2.09			1.61	pCi/L		77.3	(50%-105%)			
		Uncert: +/-0.0693		+/-0.0693							
		TPU: +/-0.125		+/-0.125							
QC1203969040	MB										
Uranium-234			U	-0.0169	pCi/L				EXC2	02/13/18	13:32
		Uncert: +/-0.0181		+/-0.0181							
		TPU: +/-0.0181		+/-0.0181							
Uranium-235/236			U	0.00632	pCi/L						
		Uncert: +/-0.0109		+/-0.0109							
		TPU: +/-0.0109		+/-0.0109							
Uranium-238			U	-0.0204	pCi/L						
		Uncert: +/-0.0149		+/-0.0149							
		TPU: +/-0.0149		+/-0.0149							

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 3 of 8

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1738211										
**Uranium-232 Tracer	2.09			1.47	pCi/L		70.5	(50%-105%)			
	Uncert:			+/-0.074							
	TPU:			+/-0.130							
Batch	1738650										
QC1203970191	443438013	DUP									
Americium-241	U	0.0147	U	0.00373	pCi/L	0.449		(0-1)	EXC2	02/17/18	16:09
	Uncert:	+/-0.00755		+/-0.00457							
	TPU:	+/-0.00757		+/-0.00458							
**Americium-243 Tracer	2.62	2.14		2.61	pCi/L		99.7	(50%-105%)			
	Uncert:	+/-0.0738		+/-0.070							
	TPU:	+/-0.136		+/-0.132							
QC1203970192	LCS										
Americium-241	1.97			1.79	pCi/L		90.7	(80%-120%)	EXC2	02/17/18	16:08
	Uncert:			+/-0.0578							
	TPU:			+/-0.0987							
**Americium-243 Tracer	2.10			1.97	pCi/L		93.7	(50%-105%)			
	Uncert:			+/-0.0622							
	TPU:			+/-0.113							
QC1203970190	MB										
Americium-241			U	0.00	pCi/L				EXC2	02/17/18	16:09
	Uncert:			+/-0.00461							
	TPU:			+/-0.00461							
**Americium-243 Tracer	2.10			1.86	pCi/L		88.6	(50%-105%)			
	Uncert:			+/-0.0553							
	TPU:			+/-0.105							
Batch	1738651										
QC1203970194	443438013	DUP									
Plutonium-238	U	0.00773	U	0.00627	pCi/L	0.0462		(0-1)	EXC2	02/17/18	16:09
	Uncert:	+/-0.00947		+/-0.00627							
	TPU:	+/-0.00947		+/-0.00628							
Plutonium-239/240	U	0.00193	U	-0.00418	pCi/L	0.177		(0-1)			
	Uncert:	+/-0.00842		+/-0.00887							
	TPU:	+/-0.00842		+/-0.00887							
**Plutonium-242 Tracer	2.47	2.07		1.96	pCi/L		79.6	(50%-105%)			
	Uncert:	+/-0.070		+/-0.0728							
	TPU:	+/-0.121		+/-0.124							
QC1203970195	LCS										
Plutonium-238			U	0.0157	pCi/L			(80%-120%)	EXC2	02/17/18	16:08
	Uncert:			+/-0.0092							
	TPU:			+/-0.00923							
Plutonium-239/240	1.98			2.01	pCi/L		102	(80%-120%)			
	Uncert:			+/-0.0629							
	TPU:			+/-0.106							
**Plutonium-242 Tracer	1.97			1.69	pCi/L		85.9	(50%-105%)			
	Uncert:			+/-0.0625							
	TPU:			+/-0.105							

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 4 of 8

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1738651										
QC1203970193	MB										
Plutonium-238			U	0.0067	pCi/L				EXC2	02/17/18	16:09
				Uncert:							
				TPU:							
Plutonium-239/240			U	-0.0167	pCi/L						
				Uncert:							
				TPU:							
**Plutonium-242 Tracer	1.97			1.64	pCi/L		83.4	(50%-105%)			
				Uncert:							
				TPU:							
Batch	1738652										
QC1203970197	443438013	DUP									
Uranium-234		U	0.093	U	0.131	pCi/L	0.285	(0-1)	EXC2	02/15/18	17:04
				Uncert:							
				TPU:							
Uranium-235/236		U	0.0739	U	0.0709	pCi/L	0.0296	(0-1)			
				Uncert:							
				TPU:							
Uranium-238		U	0.0208	U	0.0158	pCi/L	0.0792	(0-1)			
				Uncert:							
				TPU:							
**Uranium-232 Tracer	2.61		1.98		1.99	pCi/L	76.3	(50%-105%)			
				Uncert:							
				TPU:							
QC1203970198	LCS										
Uranium-234				2.97	pCi/L				EXC2	02/15/18	17:04
				Uncert:							
				TPU:							
Uranium-235/236				0.344	pCi/L						
				Uncert:							
				TPU:							
Uranium-238	2.70			3.02	pCi/L		112	(80%-120%)			
				Uncert:							
				TPU:							
**Uranium-232 Tracer	2.09			1.55	pCi/L		74.2	(50%-105%)			
				Uncert:							
				TPU:							
QC1203970196	MB										
Uranium-234			U	0.0608	pCi/L				EXC2	02/15/18	17:04
				Uncert:							
				TPU:							
Uranium-235/236			U	0.0674	pCi/L						
				Uncert:							
				TPU:							
Uranium-238			U	0.0363	pCi/L						
				Uncert:							
				TPU:							

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 5 of 8

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1738652										
**Uranium-232 Tracer	2.09			1.37	pCi/L		65.4	(50%-105%)			
	Uncert:			+/-0.105							
	TPU:			+/-0.168							
Rad Gamma Spec											
Batch	1738441										
QC1203969651	443438002	DUP									
Cesium-137	U	-1.61	U	0.556	pCi/L	0.439		(0-1)	BSW1	02/12/18	15:33
	Uncert:	+/-0.856		+/-1.53							
	TPU:	+/-0.935		+/-1.53							
Cobalt-60	U	0.543	U	0.534	pCi/L	0.00261		(0-1)			
	Uncert:	+/-0.780		+/-0.967							
	TPU:	+/-0.790		+/-0.975							
Neptunium-237	U	1.97	U	2.58	pCi/L	0.0834		(0-1)			
	Uncert:	+/-1.74		+/-1.78							
	TPU:	+/-1.80		+/-1.88							
Potassium-40	U	-9.37	U	34.8	pCi/L	0.806		(0-1)			
	Uncert:	+/-11.9		+/-15.2							
	TPU:	+/-12.1		+/-15.3							
Sodium-22	U	0.154	U	-1.72	pCi/L	0.465		(0-1)			
	Uncert:	+/-1.02		+/-0.913							
	TPU:	+/-1.02		+/-0.998							
QC1203969652	LCS										
Americium-241	34300			35900	pCi/L		105	(80%-120%)	BSW1	02/12/18	09:31
	Uncert:			+/-318							
	TPU:			+/-1410							
Cesium-137	12900			13600	pCi/L		105	(80%-120%)			
	Uncert:			+/-175							
	TPU:			+/-595							
Cobalt-60	10900			11300	pCi/L		104	(80%-120%)			
	Uncert:			+/-176							
	TPU:			+/-495							
Neptunium-237			U	-56.6	pCi/L						
	Uncert:			+/-58.7							
	TPU:			+/-60.2							
Potassium-40			U	-234	pCi/L						
	Uncert:			+/-110							
	TPU:			+/-123							
Sodium-22			U	23.5	pCi/L						
	Uncert:			+/-19.9							
	TPU:			+/-20.6							
QC1203969650	MB										
Cesium-137			U	-1.72	pCi/L				BSW1	02/12/18	09:24
	Uncert:			+/-1.22							
	TPU:			+/-1.29							
Cobalt-60			U	-1.09	pCi/L						
	Uncert:			+/-1.03							

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 6 of 8

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1738441										
Neptunium-237	TPU:			+/-1.06							
			U	0.640	pCi/L						
	Uncert:			+/-1.83							
Potassium-40	TPU:			+/-1.84							
			U	-13.2	pCi/L						
	Uncert:			+/-15.8							
Sodium-22	TPU:			+/-16.1							
			U	2.44	pCi/L						
	Uncert:			+/-1.14							
	TPU:			+/-1.27							
Rad Gas Flow											
Batch	1738564										
QC1203969933	443345003	DUP									
Strontium-90	U	-0.326	U	0.216	pCi/L	1.39		(0-1)	LXB3	02/19/18	16:18
	Uncert:	+/-0.118		+/-0.0751							
	TPU:	+/-0.118		+/-0.0771							
**Strontium Carrier	4.30	4.50		4.50	mg		105	(50%-105%)			
QC1203969935	LCS										
Strontium-90	23.5			25.6	pCi/L		109	(80%-120%)	LXB3	02/19/18	16:18
	Uncert:			+/-0.703							
	TPU:			+/-2.16							
**Strontium Carrier	4.30			4.10	mg		95.3	(50%-105%)			
QC1203969932	MB										
Strontium-90			U	-0.00829	pCi/L				LXB3	02/19/18	16:18
	Uncert:			+/-0.0368							
	TPU:			+/-0.0368							
**Strontium Carrier	4.30			4.10	mg		95.3	(50%-105%)			
QC1203969934	443345003	MS									
Strontium-90	471	U	-0.326	463	pCi/L		98.3	(75%-125%)	LXB3	02/19/18	16:18
	Uncert:		+/-0.118	+/-12.8							
	TPU:		+/-0.118	+/-39.2							
**Strontium Carrier	4.30	4.50		4.30	mg		100	(50%-105%)			
Batch	1738567										
QC1203969943	443549002	DUP									
Alpha	U	0.239	U	0.451	pCi/L	0.104		(0-1)	BXG2	02/23/18	11:08
	Uncert:	+/-0.511		+/-0.508							
	TPU:	+/-0.511		+/-0.509							
Beta	U	0.190	U	2.00	pCi/L	0.616		(0-1)		02/22/18	16:44
	Uncert:	+/-0.574		+/-0.882							
	TPU:	+/-0.574		+/-0.899							
QC1203969946	LCS										
Alpha	12.1			11.0	pCi/L		91.4	(80%-120%)	BXG2	02/23/18	11:08
	Uncert:			+/-0.552							
	TPU:			+/-1.10							
Beta	47.1			51.1	pCi/L		109	(80%-120%)		02/22/18	18:27

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 7 of 8

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1738567										
				Uncert:							
				TPU:							
QC1203969942	MB										
Alpha			U	0.133	pCi/L				BXG2	02/23/18	11:08
				Uncert:							
				TPU:							
Beta			U	0.346	pCi/L					02/22/18	16:44
				Uncert:							
				TPU:							
QC1203969944	443549002	MS									
Alpha	483	U	0.239	471	pCi/L		97.4	(75%-125%)	BXG2	02/23/18	11:08
				Uncert:							
				TPU:							
Beta	1880	U	0.190	1970	pCi/L		105	(75%-125%)		02/22/18	18:27
				Uncert:							
				TPU:							
QC1203969945	443549002	MSD									
Alpha	483	U	0.239	439	pCi/L	0.175	90.8	(0-1)	BXG2	02/23/18	11:08
				Uncert:							
				TPU:							
Beta	1880	U	0.190	1850	pCi/L	0.181	98.4	(0-1)		02/22/18	18:27
				Uncert:							
				TPU:							

Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMF Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- 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.

GEL LABORATORIES LLC

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

QC Summary

Workorder: 443438

Page 8 of 8

Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
R	Sample results are rejected									
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.									
UI	Gamma Spectroscopy--Uncertain identification									
UJ	Gamma Spectroscopy--Uncertain identification									
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.									
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.									
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.									
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.

** Indicates analyte is a surrogate/tracer compound.

^ 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.

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.