The order of this data package is as follows:

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

Comments:

General Engineering

Charleston SC

Chain of Custody/Analysis Request

COC/Lab Request #: 2018-697

Page 1 of 1

Client Contact:

Lab Agreement #:

Project Number: ADEP

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐

7 Days - ☐

14 Days - ☐

21 Days - ☐

28 Days - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: LOCATION: 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-All Metals	WSP-CN(T)	WSP-GENINORG+PerChlorate	WSP-GrossA/B	WSP-NH3+NO3/NO2+PO4	WSP-RAD	WSP-TKN+TOC
CAPA-18-147556	Nov 2 2017	11:10	W				1		1		1		
CAPA-18-147582	Nov 2 2017	11:10	W	1	2			1					1
CAPA-18-147603	Nov 2 2017	11:10	W		~~2~~ 1	ME							
CAPA-18-147557	Nov 2 2017	12:53	W				1		1		1		
CAPA-18-147583	Nov 2 2017	12:53	W	1	2	2		1		1		1	1
CAPA-18-147609	Nov 2 2017	12:53	W		~~2~~ 1	ME							
CAPA-18-147627	Nov 2 2017	12:53	W		2	2							
CAPA-18-147629	Nov 2 2017	12:53	W				1		1		1		
CAPA-18-147631	Nov 2 2017	12:53	W	1	2	2		1		1		1	1

Sending WSP-8260B-VOAs (10 total) today 11/6/17 ship date

RO 11/6/17

Special Instructions:

Relinquished by: M EGLN	Print Name: MATT ENGLERT	Date/Time: 11-3-17 1506	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:

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147556

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYY):	11-2-17	OK	**FIELD MATRIX:**	WG	OK
TIME COLLECTED (HH:MM):	1110		**MEDIA:**		
PRS ID:	NA		**SAMPLE TECH CODE:**	RSP	
LOCATION ID:	R-40 S1		**FIELD PREP:**	F	
LOCATION TYPE:	NA		**FIELD QC TYPE:**	REG	
TOP DEPTH:			**SAMPLE USAGE:**	INV	
BOTTOM DEPTH:			**EXCAVATED:**		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
	WSP-GENINORG+PerChlorate	1 LITER POLY	1	ICE		
	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS: TV 11-2-17

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

COLLECTED BY (PRINT): D. Hughes, D. Jaramillo

RELINQUISHED BY (Printed Name) Tanya VanderVis **(Signature)** Tanya VanderVis	**Date/Time** 11-2-17 1350	**RECEIVED BY (Printed Name)** M. Martin **(Signature)**	**Date/Time** 11/2/17 1312
RELINQUISHED BY (Printed Name) **(Signature)**	**Date/Time**	**RECEIVED BY (Printed Name)** **(Signature)**	**Date/Time**

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147557

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYY):	11-2-17	OK	**FIELD MATRIX:**	WG	OK
TIME COLLECTED (HH:MM):	1253		**MEDIA:**		
PRS ID:	NA		**SAMPLE TECH CODE:**	GSP	
LOCATION ID:	R-40 S2		**FIELD PREP:**	F	
LOCATION TYPE:	NA		**FIELD QC TYPE:**	REG	
TOP DEPTH:			**SAMPLE USAGE:**	INV	
BOTTOM DEPTH:			**EXCAVATED:**		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
	WSP-GENINORG+PerChlorate	1 LITER POLY	1	ICE		
	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS: TV 11-2-17

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

COLLECTED BY (PRINT): D. Hughes, D. Jaramillo, K. Tow

RELINQUISHED BY (Printed Name) Tanya VanderVis **(Signature)** Tanya VanderVis	**Date/Time** 11-2-17 1350	**RECEIVED BY (Printed Name)** MATT ENGLERT **(Signature)** M Engler	**Date/Time** 11-2-17 1350
RELINQUISHED BY (Printed Name) **(Signature)**	**Date/Time**	**RECEIVED BY (Printed Name)** **(Signature)**	**Date/Time**

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147582

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYY):	11-2-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1110		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	RSP	
LOCATION ID:	R-40 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	500 ML POLY	1	HNO3	Y	NA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: Breezy

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	1110 HH:MM	Dissolved Oxygen	1.13 mg/L	Flow (in gpm)	0.53
Oxidation-Reduction Potential	176.5 mV	pH	9.01	Specific Conductance	160.8 µS/cm
Temperature	16.9 °C	Turbidity	0.23 NTU		

COLLECTED BY (PRINT): D. Hughes, D. Jaramillo

RELINQUISHED BY (Printed Name) TanyaVanderVis (Signature) Tanya VanderVis	**Date/Time** 11-2-17 1350	**RECEIVED BY** (Printed Name) (Signature)	**Date/Time** 11/2/17 1350
RELINQUISHED BY (Printed Name) (Signature)	**Date/Time**	**RECEIVED BY** (Printed Name) (Signature)	**Date/Time**

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147583

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYY):	11-2-17	OK	FIELD MATRIX:	WG	TV 11-2-17 ~~N~~ OK
TIME COLLECTED (HH:MM):	1253		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-40 S2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	500 ML POLY	1	HNO3	Y	NA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-RAD	1 GAL POLY	1	HNO3		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: Samped with running diesel generator w45ft. away.

LOCATION COMMENTS: Breezy while sampling

FIELD PARAMETERS:

Sample Time	1253 HH:MM	Dissolved Oxygen	6.63 mg/L	Flow (in gpm)	2.11
Oxidation-Reduction Potential	247.6 mV	pH	8.13	Specific Conductance	127.1 µS/cm
Temperature	20.7°C	Turbidity	0.39 NTU		

COLLECTED BY (PRINT): D. Hughes, D. Jaramillo, K. Tow

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147583

WORK ORDER:

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) Tanya VanderVis	**Date/Time** 11-2-17 1350	**RECEIVED BY** (Printed Name) MATT ENGLERT (Signature) M—Egler	**Date/Time** 11-2-17 1350
RELINQUISHED BY (Printed Name) (Signature)	**Date/Time**	**RECEIVED BY** (Printed Name) (Signature)	**Date/Time**

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147603

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYY):	11-2-17	OK	**FIELD MATRIX:**	WG	OK
TIME COLLECTED (HH:MM):	1110		**MEDIA:**		
PRS ID:	NA		**SAMPLE TECH CODE:**	DC	
LOCATION ID:	R-40 S1		**FIELD PREP:**	UF	
LOCATION TYPE:	NA		**FIELD QC TYPE:**	FTB	
TOP DEPTH:			**SAMPLE USAGE:**	QC	
BOTTOM DEPTH:			**EXCAVATED:**		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	1 2 DUP	HCL	Y	NA

SAMPLE COMMENTS: 11-02-17

LOCATION COMMENTS:

FIELD PARAMETERS: JV 11-2-17

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

COLLECTED BY (PRINT): D. Hughes, D. Jaramillo

RELINQUISHED BY (Printed Name) Tanya VanderVis **(Signature)** Tanya VanderVis	**Date/Time** 11-2-17 1350	**RECEIVED BY (Printed Name)** M. Martin **(Signature)**	**Date/Time** 11/2/17 1350
RELINQUISHED BY (Printed Name) **(Signature)**	**Date/Time**	**RECEIVED BY (Printed Name)** **(Signature)**	**Date/Time**

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147609

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYY):	11-2-17	NA	**FIELD MATRIX:**	WG	GK
TIME COLLECTED (HH:MM):	1253		**MEDIA:**		
PRS ID:	NA		**SAMPLE TECH CODE:**	DC	
LOCATION ID:	R-40 S2		**FIELD PREP:**	UF	
LOCATION TYPE:	NA		**FIELD QC TYPE:**	FTB	
TOP DEPTH:			**SAMPLE USAGE:**	QC	
BOTTOM DEPTH:			**EXCAVATED:**		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	1/2	KT 11/2/17 HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS: TV 11-2-17

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

COLLECTED BY (PRINT): D. Hughes, D Jaramillo

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) Tanya VanderVis	**Date/Time** 11-2-17 1350	**RECEIVED BY** (Printed Name) MATT ENGLERT (Signature) M ESLV	**Date/Time** 11-2-17 1350
RELINQUISHED BY (Printed Name) (Signature)	**Date/Time**	**RECEIVED BY** (Printed Name) (Signature)	**Date/Time**

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147627

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYY):	11-2-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1253		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-40 S2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE	↓	↓

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS: TV 11-2-17

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

COLLECTED BY (PRINT): K. Tow

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) Tanya VanderVis	**Date/Time** 11-2-17 1350	**RECEIVED BY** (Printed Name) MATT ENGLERT (Signature) M—Egler	**Date/Time** 11-2-17 1350
RELINQUISHED BY (Printed Name) (Signature)	**Date/Time**	**RECEIVED BY** (Printed Name) (Signature)	**Date/Time**

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147629

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYY):	11-2-17	OK	**FIELD MATRIX:**	WG	OK
TIME COLLECTED (HH:MM):	1253		**MEDIA:**		
PRS ID:	NA		**SAMPLE TECH CODE:**	GSP	
LOCATION ID:	R-40 S2		**FIELD PREP:**	F	
LOCATION TYPE:	NA		**FIELD QC TYPE:**	FD	
TOP DEPTH:			**SAMPLE USAGE:**	QC	
BOTTOM DEPTH:			**EXCAVATED:**		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
	WSP-GENINORG+PerChlorate	1 LITER POLY	1	ICE		
	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS: IV 11-2-17

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

COLLECTED BY (PRINT): D. Hughes, D. Jaramillo

RELINQUISHED BY (Printed Name) Tanya VanderVis **(Signature)** Tanya VanderVis	**Date/Time** 11-2-17 1350	**RECEIVED BY (Printed Name)** MATT ENGLERT **(Signature)**	**Date/Time** 11-2-17 1350
RELINQUISHED BY (Printed Name) **(Signature)**	**Date/Time**	**RECEIVED BY (Printed Name)** **(Signature)**	**Date/Time**

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147631

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYY):	11-2-17	OK	**FIELD MATRIX:**	WG	OK
TIME COLLECTED (HH:MM):	1253		**MEDIA:**		
PRS ID:	NA		**SAMPLE TECH CODE:**	GSP	
LOCATION ID:	R-40 S2		**FIELD PREP:**	UF	
LOCATION TYPE:	NA		**FIELD QC TYPE:**	FD	
TOP DEPTH:			**SAMPLE USAGE:**	QC	
BOTTOM DEPTH:			**EXCAVATED:**		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	500 ML POLY	1	HNO3	Y	NA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-RAD	1 GAL POLY	1	HNO3		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS: TV 11-2-17

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

COLLECTED BY (PRINT): D. Hughes, D. Jaramillo

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147631

WORK ORDER:

RELINQUISHED BY **(Printed Name)** Tanya VanderVis **(Signature)** Tanya VanderVis	**Date/Time** 11-2-17 1350	**RECEIVED BY** MATT ENGLERT **(Printed Name)** **(Signature)**	**Date/Time** 11-2-17 1350
RELINQUISHED BY **(Printed Name)** **(Signature)**	**Date/Time**	**RECEIVED BY** **(Printed Name)** **(Signature)**	**Date/Time**

Report Date: 10/05/2017

COC: 2018-697 TEST – Explosives	YES	NO
Samples collected from a WFO area?		✓

Field Test for Explosives Results	YES	NO	NA
Spot test shows presence of explosives residues. If YES - Do not ship.			✓

TEST – Chemical Preservation	YES	NO
Samples are chemically preserved?	X	

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.		X	

TEST – Field Screen	YES	NO
The sample has field screening measurements of alpha activity and beta activity?		✓

Sample Activity (dpm/100cm²)	Shipment Activity (dpm*g/100cm²)	Sampled Location	YES	NO	NA
Alpha detectable	Alpha >160,000	TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49			✓
Alpha > 125	Alpha >1,250,000	other locations			✓
Beta > 1,500	Beta >15,000,000	any location			✓
The sample Alpha >16,000,000 dpm*g/100cm² or Beta > 160,000,000 dpm*g/100cm². If YES – Do not ship.					✓
On the external surface of the sample container, alpha activity ≥ 24 dpm/cm², beta activity ≥ 240 dpm/cm², or surface activity ≥ 0.5 mR/hr. If YES – Do not ship.					✓
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package – Limited Quantity of Material – UN2910, based on field screening measurements of alpha and beta activity.					✓

TEST - Location	YES	NO
Prior analytical measurements of radioactive isotopes are available?	X	

Sample Activity (pCi/g)	Shipment Activity (pCi)	YES	NO	NA
• Am-241 > 27	• Am-241 > 270,000			
• Cs-137 > 270	• Cs-137 > 270,000			
• Pu-238 > 27	• Pu-238 > 270,000			
• Pu-239/240 > 27	• Pu-239/240 > 270,000			
• Th-228 > 27	• Th-228 > 270,000			
• U-234 > 270	• U-234 > 1,600,000,000			
• U-238 > 270	• U-238 > unlimited		X	
• H-3 > 27,000,000	• H-3 > 27,000,000,000			
Am-241, Pu-238, Pu-239/240, or Th 228 > 27,000,000 pCi; or Cs-137 > 270,000,000 pCi or U-234 ≥ 160,000,000 pCi; or H-3 ≥ 1 Ci. If YES – Do not ship.			X	
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package – Limited Quantity of Material – UN2910, based on prior analytical measurements of radioactive isotopes.			(X)	

TEST – AK	YES	NO	NA
The shippers documented knowledge of the sample positively identifies appropriate labeling.			✓
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled *Radioactive Material, Excepted Package – Limited Quantity of Material – UN2910*, and the sample is submitted to ARS or RP for hazard classification analysis.			✓

HOLD SAMPLES FOR ANALYSIS
The samples are held per ER-SOP-10094, Rev. 1, 5.2.2 [7]

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 By:	Date/Time
(Printed Name) MATT ENGLERT	11-3-17
(Signature) M ENGLERT	1500

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) Renee Onstott	11/3/17
(Signature) Renee Onstott	1500

DATA VALIDATION REPORT

Chain Of Custody No. 2018-697

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
437078	EPA:120.1	2	1			
437078	EPA:150.1	2	1			
437078	EPA:160.1	2	1			
437078	EPA:170.0	4	2	2	1	
437078	EPA:245.2	4	2			
437078	EPA:300.0	2	1			
437078	EPA:310.1	2	1			
437078	EPA:335.4	2	1			
437078	EPA:350.1	2	1			
437078	EPA:351.2	2	1			
437078	EPA:353.2	2	1			
437078	EPA:365.4	2	1			
437078	EPA:900	1	1			
437078	EPA:901.1	1	1			
437078	EPA:905.0	1	1			
437078	HASL-300:AM-241	1	1			
437078	HASL-300:ISOPU	1	1			
437078	HASL-300:ISOU	1	1			
437078	SM:A2340B	2	1			
437078	SW-846:6010C	2	1			
437078	SW-846:6020	2	1			
437078	SW-846:8260B	2	1	2	1	
437078	SW-846:8270D	1	1		1	
437078	SW-846:9060	2	1			

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

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
437078	EPA:120.1	1717163	1717163	2	1									1				1			
437078	EPA:150.1	1717129	1717129	2	1									1				1			
437078	EPA:160.1	1717340	1717340	2	1				1					1				1			
437078	EPA:170.0	NA	NA	4	2	2	1														
437078	EPA:245.2	1721328	1721327	4	2				1	1				1				1			
437078	EPA:300.0	1716510	1716510	2	1				1					1				1			
437078	EPA:310.1	1717125	1717125	2	1					1				1				1			
437078	EPA:335.4	1715405	1715404	2	1				1	1	1			1				1			
437078	EPA:350.1	1716959	1716958	2	1				1	1				1				1			
437078	EPA:351.2	1716949	1716948	2	1				1	1				1				1			
437078	EPA:353.2	1716170	1716170	2	1				1					1				1			
437078	EPA:365.4	1716179	1716177	2	1				1	1				1				1			
437078	EPA:900	1716449	1716449	1	1				1	1	1			1				1			
437078	EPA:901.1	1716271	1716271	1	1				1					1				1			
437078	EPA:905.0	1717217	1717217	1	1				1	1				1				1			
437078	HASL-300:AM-241	1718541	1718541	1	1				1					1				1			
437078	HASL-300:ISOPU	1718543	1718543	1	1				1					1				1			
437078	HASL-300:ISOU	1718546	1718546	1	1				1					1				1			
437078	SM:A2340B	1723242	1723242	2	1																
437078	SW-846:6010C	1716049	1716048	2	1				1	1				1				1			
437078	SW-846:6020	1716045	1716044	2	1				1	1				1				1			
437078	SW-846:8260B	1717151	1717151	2	1	2	1		3					6							
437078	SW-846:8270D	1716878	1716877	1	1		1		1	1	1			1							
437078	SW-846:9060	1716073	1716073	2	1				1					1				1			

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	CAPA-18-147556	1203915376	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-147556	437078001	REG	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-147557	437078004	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-147629	437078008	FD	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203915374	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-147556	1203915278	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-147556	437078001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-147557	437078004	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-147629	437078008	FD	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203915277	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-147556	437078001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-147557	1203915791	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-147557	437078004	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-147629	437078008	FD	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203915788	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203915787	MB	1	0	0	0
EPA:170.0	VOC	CAPA-18-147556	437078001	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147557	437078004	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147582	437078002	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147583	437078005	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147603	437078003	FTB	1	0	0	0
EPA:170.0	VOC	CAPA-18-147609	437078006	FTB	1	0	0	0
EPA:170.0	VOC	CAPA-18-147627	437078007	FB	1	0	0	0
EPA:170.0	VOC	CAPA-18-147629	437078008	FD	1	0	0	0
EPA:170.0	VOC	CAPA-18-147631	437078009	FD	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147556	1203926013	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147556	1203926015	MS	0	0	1	0
EPA:245.2	INORGANIC	CAPA-18-147556	437078001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147557	437078004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147582	437078002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147583	437078005	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147629	437078008	FD	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147631	437078009	FD	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203926012	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203926011	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-147556	437078001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-147557	437078004	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-147629	437078008	FD	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CrIN6-18-148624	1203913870	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203913869	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203913868	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147556	437078001	REG	2	0	0	0

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Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147557	437078004	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147629	437078008	FD	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-18-147992	1203915266	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-18-147992	1203915268	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203915264	LCS	0	0	1	0
EPA:335.4	INORGANIC	CAMO-18-147655	1203911003	DUP	1	0	0	0
EPA:335.4	INORGANIC	CAMO-18-147655	1203911004	MS	0	0	1	0
EPA:335.4	INORGANIC	CAMO-18-147655	1203914659	MSD	0	0	1	0
EPA:335.4	INORGANIC	CAPA-18-147582	437078002	REG	1	0	0	0
EPA:335.4	INORGANIC	CAPA-18-147583	437078005	REG	1	0	0	0
EPA:335.4	INORGANIC	CAPA-18-147631	437078009	FD	1	0	0	0
EPA:335.4	INORGANIC	LCS	1203911002	LCS	0	0	1	0
EPA:335.4	INORGANIC	MB	1203911001	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147556	1203914836	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147556	1203914837	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147556	437078001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147557	437078004	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147629	437078008	FD	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203914835	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203914834	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-147582	437078002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-147583	437078005	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-147631	437078009	FD	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CrIN6-18-148623	1203914815	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CrIN6-18-148623	1203914816	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203914814	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203914813	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-18-147640	1203912903	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-147556	437078001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-147557	437078004	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-147629	437078008	FD	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203912902	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203912901	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147556	437078001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147557	437078004	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147629	437078008	FD	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CrIN6-18-148623	1203912932	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CrIN6-18-148623	1203912933	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203912931	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203912930	MB	1	0	0	0

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Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:900	RAD	CAPA-18-147583	437078005	REG	2	0	0	0
EPA:900	RAD	CAPA-18-147631	1203913665	DUP	2	0	0	0
EPA:900	RAD	CAPA-18-147631	1203913666	MS	0	0	2	0
EPA:900	RAD	CAPA-18-147631	1203913667	MSD	0	0	2	0
EPA:900	RAD	CAPA-18-147631	437078009	FD	2	0	0	0
EPA:900	RAD	LCS	1203913668	LCS	0	0	2	0
EPA:900	RAD	MB	1203913664	MB	2	0	0	0
EPA:901.1	RAD	CAPA-18-147576	1203913159	DUP	5	0	0	0
EPA:901.1	RAD	CAPA-18-147583	437078005	REG	5	0	0	0
EPA:901.1	RAD	CAPA-18-147631	437078009	FD	5	0	0	0
EPA:901.1	RAD	LCS	1203913160	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203913158	MB	5	0	0	0
EPA:905.0	RAD	CAPA-18-147583	437078005	REG	1	0	0	0
EPA:905.0	RAD	CAPA-18-147593	1203915511	DUP	1	0	0	0
EPA:905.0	RAD	CAPA-18-147593	1203915512	MS	0	0	1	0
EPA:905.0	RAD	CAPA-18-147631	437078009	FD	1	0	0	0
EPA:905.0	RAD	LCS	1203915513	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203915510	MB	1	0	0	0
HASL-300:AM-241	RAD	CAMO-18-148111	1203918916	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-147583	437078005	REG	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-147631	437078009	FD	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203918917	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203918915	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAMO-18-148111	1203918922	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-147583	437078005	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-147631	437078009	FD	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203918923	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203918921	MB	2	0	0	0
HASL-300:ISOU	RAD	CAMO-18-148111	1203918933	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAPA-18-147583	437078005	REG	3	0	0	0
HASL-300:ISOU	RAD	CAPA-18-147631	437078009	FD	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203918934	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203918932	MB	3	0	0	0
SM:A2340B	INORGANIC	CAPA-18-147556	437078001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAPA-18-147557	437078004	REG	1	0	0	0
SM:A2340B	INORGANIC	CAPA-18-147629	437078008	FD	1	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-147556	1203912592	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-147556	1203912593	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAPA-18-147556	437078001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-147557	437078004	REG	17	0	0	0

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	CAPA-18-147629	437078008	FD	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203912591	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203912590	MB	17	0	0	0
SW-846:6020	INORGANIC	CAPA-18-147556	1203912582	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-147556	1203912583	MS	0	0	11	0
SW-846:6020	INORGANIC	CAPA-18-147556	437078001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-147557	437078004	REG	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-147629	437078008	FD	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203912581	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203912580	MB	11	0	0	0
SW-846:8260B	VOC	CAPA-18-147582	437078002	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147583	437078005	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147603	437078003	FTB	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147609	437078006	FTB	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147627	437078007	FB	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147631	437078009	FD	80	3	0	0
SW-846:8260B	VOC	LCS	1203915328	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203915329	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203919292	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203919293	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203919294	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203919295	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203915326	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203919290	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203919291	MB	80	3	0	0
SW-846:8270D	SVOC	CAPA-18-147583	1203914621	MS	0	6	76	0
SW-846:8270D	SVOC	CAPA-18-147583	1203914622	MSD	0	6	76	0
SW-846:8270D	SVOC	CAPA-18-147583	437078005	REG	80	6	0	0
SW-846:8270D	SVOC	CAPA-18-147627	437078007	FB	80	6	0	0
SW-846:8270D	SVOC	CAPA-18-147631	437078009	FD	80	6	0	0
SW-846:8270D	SVOC	LCS	1203914620	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203914619	MB	80	6	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-147582	437078002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-147583	437078005	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-147631	437078009	FD	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CrIN6-18-148623	1203912658	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203912656	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203912655	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	1203912580	METHOD BLANK	SW-846:6020	W	Molybdenum	0.302	J	ug/L	0.500
MB	1203912590	METHOD BLANK	SW-846:6010C	W	Zinc	4.95	J	ug/L	10.0
MB	1203914813	METHOD BLANK	EPA:351.2	W	Total Kjeldahl Nitrogen	0.0999	J	mg/L	0.100
MB	1203915326	METHOD BLANK	SW-846:8260B	W	Hexachlorobutadiene	0.41	J	ug/L	1.00
CAPA-18-147603	437078003	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	
CAPA-18-147609	437078006	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	
CAPA-18-147627	437078007	FIELD BLANK	EPA:170.0	W	Temperature	2		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
CAPA-18-147582	1203914813	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	0.0999	mg/L	0.137		0.100	Y	5	100	Y
CAPA-18-147583	1203914813	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	0.0999	mg/L	0.0716	J	0.100	Y	5	100	Y
CAPA-18-147631	1203914813	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	0.0999	mg/L	0.0352	J	0.100	Y	5	100	Y
CAPA-18-147556	1203912580	METHOD BLANK	SW-846:6020	Molybdenum	0.302	ug/L	2.89		0.500	Y	5	100	Y
CAPA-18-147557	1203912580	METHOD BLANK	SW-846:6020	Molybdenum	0.302	ug/L	1.57		0.500	Y	5	100	Y
CAPA-18-147629	1203912580	METHOD BLANK	SW-846:6020	Molybdenum	0.302	ug/L	1.57		0.500	Y	5	100	Y

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
CAPA-18-147603	1203915326	METHOD BLANK	SW-846:8260B	Hexachlorobutadiene	0.41	ug/L	0.3	BJ	1.00	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

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

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
CAPA-18-147583	1203914621	1203914622	SW-846:8270D	Benzidine	1716877	11-09-2017	W	76	49	130	15		42	30
CAPA-18-147583	1203914621	1203914622	SW-846:8270D	Hexachlorocyclopentadiene	1716877	11-09-2017	W	25	25	79	26		3	30

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

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
1203918934		HASL-300:ISOU	Uranium-232	1718546	11-26-2017	W	43.6		105	50		10		
1203919292		SW-846:8260B	Hexachlorobutadiene	1717151	11-13-2017	W	70		136	72		10		

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
1203914620		SW-846:8270D	Hexachlorocyclopentadiene	1716877	11-09-2017	W	29		89	34				

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

Field Sample ID	Lab Sample ID	LD Lab Sample ID	Analytical Method	Parameter Name	Sample Matrix	Lab Result	LD Lab Result	Lab Units	Detect Flag	LD Detect Flag	RPD	RPD Limit
CAPA-18-147557	437078004	1203915791	EPA:160.1	Total Dissolved	W	116	110	mg/L	Y	Y	5.06	5

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	Paramter 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-40 S1	2018-697	CAPA-18-147556	REG	INIT	INORGANIC	SW-846:6020	Molybdenum		J+	I4a	Y	2.89	ug/L	2.89	ug/L			W	11/02/2017		1716045	VAL	Y
R-40 S2	2018-697	CAPA-18-147557	REG	INIT	INORGANIC	SW-846:6020	Molybdenum		J+	I4a	Y	1.57	ug/L	1.57	ug/L			W	11/02/2017		1716045	VAL	Y
R-40 S1	2018-697	CAPA-18-147582	REG	INIT	VOC	SW-846:8260B	Hexachlorobutadiene	U	UJ	V12a	N	0.300	ug/L	0.300	ug/L			W	11/02/2017		1717151	VAL	Y
R-40 S1	2018-697	CAPA-18-147582	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen		U	I4	N	0.137	mg/L	0.137	mg/L			W	11/02/2017		1716949	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.0124	pCi/L	0.0124	pCi/L	0.0366	0.00651	W	11/02/2017		1718541	VAL	Y

DATA VALIDATION REPORT

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Paramter 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-40 S2	2018-697	CAPA-18-147583	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	2.29	pCi/L	2.29	pCi/L	6.51	3.86	W	11/02/2017		1716271	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	-2.39	pCi/L	-2.39	pCi/L	6.40	1.75	W	11/02/2017		1716271	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	0.946	pCi/L	0.946	pCi/L	2.25	0.663	W	11/02/2017		1716449	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	VOC	SW-846:8260B	Hexachlorobutadiene	U	UJ	V12a	N	0.300	ug/L	0.300	ug/L			W	11/02/2017		1717151	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	SVOC	SW-846:8270D	Hexachlorocyclopentadiene	U	UJ	SV12a	N	3.00	ug/L	3.00	ug/L			W	11/02/2017		1716878	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	5.83	pCi/L	5.83	pCi/L	11.4	2.95	W	11/02/2017		1716271	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.0126	pCi/L	0.0126	pCi/L	0.0466	0.011	W	11/02/2017		1718543	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.00316	pCi/L	0.00316	pCi/L	0.0666	0.0122	W	11/02/2017		1718543	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	17.9	pCi/L	17.9	pCi/L	73.2	29.1	W	11/02/2017		1716271	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	3.23	pCi/L	3.23	pCi/L	6.57	1.24	W	11/02/2017		1716271	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.0764	pCi/L	-0.0764	pCi/L	0.194	0.0535	W	11/02/2017		1717217	VAL	Y
R-40 S2	2018-697	CAPA-18-147583	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	J	U	I4	N	0.0716	mg/L	0.0716	mg/L			W	11/02/2017		1716949	VAL	Y
R-40 S1	2018-697	CAPA-18-147603	FTB	INIT	VOC	SW-846:8260B	Hexachlorobutadiene	BJ	U	V4	N	0.3	ug/L	0.3	ug/L			W	11/02/2017		1717151	VAL	Y
R-40 S2	2018-697	CAPA-18-147609	FTB	INIT	VOC	SW-846:8260B	Hexachlorobutadiene	U	UJ	V12a	N	0.300	ug/L	0.300	ug/L			W	11/02/2017		1717151	VAL	Y
R-40 S2	2018-697	CAPA-18-147627	FB	INIT	VOC	SW-846:8260B	Hexachlorobutadiene	U	UJ	V12a	N	0.300	ug/L	0.300	ug/L			W	11/02/2017		1717151	VAL	Y
R-40 S2	2018-697	CAPA-18-147627	FB	INIT	SVOC	SW-846:8270D	Hexachlorocyclopentadiene	U	UJ	SV12a	N	3.13	ug/L	3.13	ug/L			W	11/02/2017		1716878	VAL	Y
R-40 S2	2018-697	CAPA-18-147629	FD	INIT	INORGANIC	SW-846:6020	Molybdenum		J+	I4a	Y	1.57	ug/L	1.57	ug/L			W	11/02/2017		1716045	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00932	pCi/L	0.00932	pCi/L	0.0332	0.00559	W	11/02/2017		1718541	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.254	pCi/L	0.254	pCi/L	4.36	1.16	W	11/02/2017		1716271	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	-0.56	pCi/L	-0.56	pCi/L	4.59	1.22	W	11/02/2017		1716271	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	2.54	pCi/L	2.54	pCi/L	2.97	0.959	W	11/02/2017		1716449	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	VOC	SW-846:8260B	Hexachlorobutadiene	U	UJ	V12a	N	0.300	ug/L	0.300	ug/L			W	11/02/2017		1717151	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	SVOC	SW-846:8270D	Hexachlorocyclopentadiene	U	UJ	SV12a	N	3.16	ug/L	3.16	ug/L			W	11/02/2017		1716878	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	0.672	pCi/L	0.672	pCi/L	9.45	2.56	W	11/02/2017		1716271	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00717	pCi/L	0.00717	pCi/L	0.0528	0.0113	W	11/02/2017		1718543	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.00716	pCi/L	0.00716	pCi/L	0.0755	0.00877	W	11/02/2017		1718543	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	15	pCi/L	15	pCi/L	74.9	17.7	W	11/02/2017		1716271	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	-0.471	pCi/L	-0.471	pCi/L	4.80	1.27	W	11/02/2017		1716271	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.00882	pCi/L	-0.00882	pCi/L	0.494	0.131	W	11/02/2017		1717217	VAL	Y
R-40 S2	2018-697	CAPA-18-147631	FD	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	J	U	I4	N	0.0352	mg/L	0.0352	mg/L			W	11/02/2017		1716949	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 qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample.
R5	Analyte is not detected because the amount reported is less than the MDC.
SV12a	The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package.
U_LAB	The analytical laboratory qualified the analyte as not detected.
V12a	The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package.
V4	The sample result is less than or equal to 5 times (10 times for acetone, methylene chloride, and 2-butanone) the concentration of the related analyte in the method blank, which indicates the reported detection is considered indistinguishable from contamination in the blank.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-18-147556	R-40 S1	REG	EPA:120.1	0	1
CAPA-18-147556	R-40 S1	REG	EPA:150.1	0	1
CAPA-18-147556	R-40 S1	REG	EPA:160.1	0	1
CAPA-18-147556	R-40 S1	REG	EPA:170.0	0	1
CAPA-18-147556	R-40 S1	REG	EPA:245.2	0	1
CAPA-18-147556	R-40 S1	REG	EPA:300.0	0	4
CAPA-18-147556	R-40 S1	REG	EPA:310.1	0	2
CAPA-18-147556	R-40 S1	REG	EPA:350.1	0	1
CAPA-18-147556	R-40 S1	REG	EPA:353.2	0	1
CAPA-18-147556	R-40 S1	REG	EPA:365.4	0	1
CAPA-18-147556	R-40 S1	REG	SM:A2340B	0	1
CAPA-18-147556	R-40 S1	REG	SW-846:6010C	0	17
CAPA-18-147556	R-40 S1	REG	SW-846:6020	0	11
CAPA-18-147557	R-40 S2	REG	EPA:120.1	0	1
CAPA-18-147557	R-40 S2	REG	EPA:150.1	0	1
CAPA-18-147557	R-40 S2	REG	EPA:160.1	0	1
CAPA-18-147557	R-40 S2	REG	EPA:170.0	0	1
CAPA-18-147557	R-40 S2	REG	EPA:245.2	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-18-147557	R-40 S2	REG	EPA:300.0	0	4
CAPA-18-147557	R-40 S2	REG	EPA:310.1	0	2
CAPA-18-147557	R-40 S2	REG	EPA:350.1	0	1
CAPA-18-147557	R-40 S2	REG	EPA:353.2	0	1
CAPA-18-147557	R-40 S2	REG	EPA:365.4	0	1
CAPA-18-147557	R-40 S2	REG	SM:A2340B	0	1
CAPA-18-147557	R-40 S2	REG	SW-846:6010C	0	17
CAPA-18-147557	R-40 S2	REG	SW-846:6020	0	11
CAPA-18-147582	R-40 S1	REG	EPA:170.0	0	1
CAPA-18-147582	R-40 S1	REG	EPA:245.2	0	1
CAPA-18-147582	R-40 S1	REG	EPA:335.4	0	1
CAPA-18-147582	R-40 S1	REG	EPA:351.2	0	1
CAPA-18-147582	R-40 S1	REG	SW-846:8260B	0	80
CAPA-18-147582	R-40 S1	REG	SW-846:9060	0	1
CAPA-18-147583	R-40 S2	REG	EPA:170.0	0	1
CAPA-18-147583	R-40 S2	REG	EPA:245.2	0	1
CAPA-18-147583	R-40 S2	REG	EPA:335.4	0	1
CAPA-18-147583	R-40 S2	REG	EPA:351.2	0	1
CAPA-18-147583	R-40 S2	REG	EPA:900	0	2
CAPA-18-147583	R-40 S2	REG	EPA:901.1	0	5
CAPA-18-147583	R-40 S2	REG	EPA:905.0	0	1
CAPA-18-147583	R-40 S2	REG	HASL-300:AM-241	0	1
CAPA-18-147583	R-40 S2	REG	HASL-300:ISOPU	0	2
CAPA-18-147583	R-40 S2	REG	HASL-300:ISOU	0	3
CAPA-18-147583	R-40 S2	REG	SW-846:8260B	0	80
CAPA-18-147583	R-40 S2	REG	SW-846:8270D	0	80
CAPA-18-147583	R-40 S2	REG	SW-846:9060	0	1
CAPA-18-147603	R-40 S1	FTB	EPA:170.0	0	1
CAPA-18-147603	R-40 S1	FTB	SW-846:8260B	0	80
CAPA-18-147609	R-40 S2	FTB	EPA:170.0	0	1
CAPA-18-147609	R-40 S2	FTB	SW-846:8260B	0	80
CAPA-18-147627	R-40 S2	FB	EPA:170.0	0	1
CAPA-18-147627	R-40 S2	FB	SW-846:8260B	0	80
CAPA-18-147627	R-40 S2	FB	SW-846:8270D	0	80
CAPA-18-147629	R-40 S2	FD	EPA:120.1	0	1
CAPA-18-147629	R-40 S2	FD	EPA:150.1	0	1
CAPA-18-147629	R-40 S2	FD	EPA:160.1	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-18-147629	R-40 S2	FD	EPA:170.0	0	1
CAPA-18-147629	R-40 S2	FD	EPA:245.2	0	1
CAPA-18-147629	R-40 S2	FD	EPA:300.0	0	4
CAPA-18-147629	R-40 S2	FD	EPA:310.1	0	2
CAPA-18-147629	R-40 S2	FD	EPA:350.1	0	1
CAPA-18-147629	R-40 S2	FD	EPA:353.2	0	1
CAPA-18-147629	R-40 S2	FD	EPA:365.4	0	1
CAPA-18-147629	R-40 S2	FD	SM:A2340B	0	1
CAPA-18-147629	R-40 S2	FD	SW-846:6010C	0	17
CAPA-18-147629	R-40 S2	FD	SW-846:6020	0	11
CAPA-18-147631	R-40 S2	FD	EPA:170.0	0	1
CAPA-18-147631	R-40 S2	FD	EPA:245.2	0	1
CAPA-18-147631	R-40 S2	FD	EPA:335.4	0	1
CAPA-18-147631	R-40 S2	FD	EPA:351.2	0	1
CAPA-18-147631	R-40 S2	FD	EPA:900	0	2
CAPA-18-147631	R-40 S2	FD	EPA:901.1	0	5
CAPA-18-147631	R-40 S2	FD	EPA:905.0	0	1
CAPA-18-147631	R-40 S2	FD	HASL-300:AM-241	0	1
CAPA-18-147631	R-40 S2	FD	HASL-300:ISOPU	0	2
CAPA-18-147631	R-40 S2	FD	HASL-300:ISOU	0	3
CAPA-18-147631	R-40 S2	FD	SW-846:8260B	0	80
CAPA-18-147631	R-40 S2	FD	SW-846:8270D	0	80
CAPA-18-147631	R-40 S2	FD	SW-846:9060	0	1

GEL Laboratories LLC
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November 28, 2017

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

Re: LANL- WQH Water Samples
Work Order: 437078
SDG: 2018-697

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on November 04, 2017, and analyzed for GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals 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,

Katrina Hiott for
Valerie Davis
Project Manager

Chain of Custody: 2018-697
Enclosures

ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 437078
SDG: 2018-697

Table of Contents

Case Narrative

Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 437078
SDG # : 2018-697

November 28, 2017

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on November 04, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperatures were checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). We did not receive the following -147556- metals & perchlorate -147582- hg & VOA -147603- VOA -147557- metals & Perchlorate -147583- hg, VOA, SVOA -147609-VOA -147627-VOA -147629-Metals & Perchlorate -147631-Hg, VOA, CN.

Sample Identification The laboratory received the following samples:

Laboratory ID	Client ID
437078001	CAPA-18-147556
437078002	CAPA-18-147582
437078003	CAPA-18-147603
437078004	CAPA-18-147557
437078005	CAPA-18-147583
437078006	CAPA-18-147609
437078007	CAPA-18-147627
437078008	CAPA-18-147629
437078009	CAPA-18-147631

Case Narrative

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

Data Package

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

Katrina Hiott for
Valerie Davis
Project Manager

List of current GEL Certifications as of 28 November 2017

State	Certification
Alaska	UST−0110
Arkansas	88−0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−15−00283, P330−15−00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE−OS−26−13
Nevada	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	T104704235−17−12
Utah NELAP	SC000122017−24
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

General Engineering
Charleston SC

Chain of Custody/Analysis Request 437098

COC/Lab Request #: 2018-697
Page 1 of 1

Client Contact:

Lab Agreement #:

Project Number: ADEP

Analysis Turnaround Time:
24 Hour - ☐ Other - ☐
7 Days - ☐
14 Days - ☐
21 Days - ☐
28 Days - ☒

Site Name: Los Alamos National Laboratory

Rad Screening Info: LOCATION: 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-All Metals	WSP-CN(T)	WSP-GENINORG+PerChlorate	WSP-GrossA/B	WSP-NH3+NO3/NO2+PO4	WSP-RAD	WSP-TKN+TOC
CAPA-18-147556	Nov 2 2017	11:10	W				1		1		1		
CAPA-18-147582	Nov 2 2017	11:10	W	1	2			1					1
CAPA-18-147603	Nov 2 2017	11:10	W		2 1 ME								
CAPA-18-147557	Nov 2 2017	12:53	W				1		1		1		
CAPA-18-147583	Nov 2 2017	12:53	W	1	2	2		1		1		1	1
CAPA-18-147609	Nov 2 2017	12:53	W		2 1 ME								
CAPA-18-147627	Nov 2 2017	12:53	W		2	2							
CAPA-18-147629	Nov 2 2017	12:53	W				1		1		1		
CAPA-18-147631	Nov 2 2017	12:53	W	1	2	2		1		1		1	1

Special Instructions:

Relinquished by: EBEN	Print Name: MATT ENGLERT	Date/Time: 11-3-17 1508	Received by:	Print Name: Zac Worsham	Date/Time: 11/4/17 9:15
Relinquished by:	Print Name:	Date/Time:	Received by:	Print Name:	Date/Time:
Relinquished by:	Print Name:	Date/Time:	Received by:	Print Name:	Date/Time:

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: ESHL	**SDG/AR/COC/Work Order:** U37078
Received By: ZKW	**Date Received:** 11/4/17
Carrier and Tracking Number	Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other 5908 1783 1206-19°C (Frozen) 5908 1783 1217-2°C 5908 1783 1239-2°C 5908 1783 1240-2°C

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
COC/Samples marked or classified as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 (CPM) / mR/Hr **Classified as: Rad 1 Rad 2 Rad 3**
Is package, COC, and/or Samples marked HAZ?		✓	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?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	✓			
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: Wet Ice Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: See Above
4	Daily check performed and passed on IR temperature gun?	✓			**Temperature Device Serial #:** IR3-16 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	✓			Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?	✓			If Yes, Are Encores or Soil Kits present? Yes___ No✓ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes___ No___ N/A✓ (If unknown, select No) VOA vials free of headspace? Yes___ No___ N/A✓ Sample ID's and containers affected:
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?			✓	Sample ID's affected: See Attached
12	Are sample containers identifiable as GEL provided?			✓	
13	COC form is properly signed in relinquished/received sections?	✓			

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials KHoth Date 11/6/17 Page 1 of 1

GL-CHL-SR-001 Rev 5

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: ESHL	SDG/AR/COC/Work Order: Additional Samples 437078
Received By: ZKW	Date Received: 11/6/17
Carrier and Tracking Number	Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other 5908 1783 1228

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
COC/Samples marked or classified as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3
Is package, COC, and/or Samples marked HAZ?		✓	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?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	✓			
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*			✓	Preservation Method: Wet Ice Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: 12c
4	Daily check performed and passed on IR temperature gun?	✓			**Temperature Device Serial #:** IR3-16 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	✓			Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?			✓	If Yes, Are Encores or Soil Kits present? Yes___ No___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes___ No___ N/A___ (If unknown, select No) VOA vials free of headspace? Yes___ No___ N/A___ Sample ID's and containers affected:
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?			✓	Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			✓	
13	COC form is properly signed in relinquished/received sections?	✓			

Comments (Use Continuation Form if needed):

* We received all the missing samples from 11/4/17 except all the VOA vials

PM (or PMA) review: Initials VSD Date 11/6/17 Page 1 of 1

GL-CHL-SR-001 Rev 5

CHEMS | Laboratories LLC SAMPLE RECEIPT & REVIEW CONTINUATION FORM

Client: ESHL Received By: ZKW Date Received: 11/4/17 SDG/AR/COC/Work Order: 437078

We did not receive the following:

- 147556: Metals & Perchlorate
- 147582: Hg & VOA
- 147603: VOA
- 147557: Metals & Perchlorate
- 147583: Hg, VOA, SVOA (1 Container)
- 147609: VOA
- 147627: VOA
- 147629: Metals & Perchorate
- 147631: Hg, VOA, CN
- 1486608: Metals
- 1486624: Perchlorate
- 1488312: Tal Metals
- 1488313: Tal Metals
- 1488314: Tal Metals
- 1488380: 8270 & Tal Metals
- 1488381: Tal Metals
- 1488411: Metals

PM (or PMA) review: Initials KMH Date 11/6/17 Page 1 of 1

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: 03NOV17
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: 8A030AWEGL11551000

12c

FedEx
Express

1 of 2

TRK# 0201 5908 1783 1228

SATURDAY 12:00
PRIORITY OVERNIGHT

MASTER

XO RBWA

29407
SC-US CHS

Part # 1561489Y-434 RIT2 06/15

KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 03NOV17
ACTWGT: 40.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: 8A030AWEGL11551000

2c

FedEx Express

2 of 2
MPS# 0263 5908 1783 1239
Mstr# 5908 1783 1228
0201

SATURDAY 12:00
PRIORITY OVERNIGH

XO RBWA

29407
SC-US CHS

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: 03NOV17
ACTWGT: 31.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: 3N030ATT47100TMANT

2c

FedEx Expr

TRK# 0201 5908 1783 1240

SATURDAY 12:0
PRIORITY OVERNIGH

XO RBWA

2940
SC-US CHS

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: 03NOV17
ACTWGT: 42.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: 21PD0AWE991316W200

19c

FedEx Express

1 of 2
TRK# 0201 5908 1783 1206
MASTER

SATURDAY 12:00
PRIORITY OVERNIGHT

XO RBWA

29407
SC-US CHS

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: 03NOV17
ACTWGT: 34.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: 21PD0AWE991316W200

2c

FedEx Expres

2 of 2
MPS# 0263 5908 1783 1217
Mstr# 5908 1783 1206
0201

SATURDAY 12:00
PRIORITY OVERNIGH

XO RBWA

29407
SC-US CHS

Subject: FW: Sample Receipt Issues for 11/4/17
From: "Patel, Nita" <npatel@lanl.gov>
Date: 11/6/2017 3:04 PM
To: Valerie Davis <vsd@gel.com>

Cancel perchlorate and voa.

Keep rest and have lab apply H qual?

Let me know what you think?

We will have to do FV on this set of samples to compare to historical again.

Thank you!

Nita

From: Valerie Davis <vsd@gel.com>
Sent: Monday, November 6, 2017 9:19:09 AM
To: Patel, Nita
Cc: team.DAVIS@GEL.COM
Subject: Sample Receipt Issues for 11/4/17

Nita,

The containers listed below did not arrive on Saturday as scheduled. The missing cooler was delivered this morning at 12C. Please let me know if we should proceed with the analysis.

2018-697
CAPA-18-147556- metals, perchlorate
CAPA-18-147582- Hg
CAPA-18-147557- metals, perchlorate
CAPA-18-147583- Hg, SVOA (1 bottle)
CAPA-18-147629-Metals & Perchlorate
CAPA-18-147631-Hg, CN

2018-700
CrIN6-18-148608- metals
CrIN6-18-148624- Perchlorate

2018-698
CALA-18-148312 - metals
CALA-18-148313 - metals
CALA-18-148314 - metals
CASA-18-148380 - 8270, metals
CASA-18-148381 - metals
CASA-18-148411 - metals

NOTE...The VOA vials listed below for RN 2018-697 were not included in the shipment. Please let me know if we should expect to receive them.

CAPA-18-147582
CAPA-18-147603
CAPA-18-147583
CAPA-18-147609
CAPA-18-147627

CAPA-18-147631

Thanks,

Valerie

--

Valerie S. Davis
Project Manager

2040 Savage Road, Charleston, SC 29407 | PO Box 30712, Charleston, SC 29417
Office Direct: 843.769.7391 | Office Main: 843.556.8171 | Fax: 843.766.1178
E-Mail: vsd@gel.com | Website: www.gel.com
Environmental | Engineering | Surveying | Analytical Testing

Subject: FW: COC 2018-697 VOAs
From: "Patel, Nita" <npatel@lanl.gov>
Date: 11/6/2017 2:17 PM
To: Valerie Davis <vsd@gel.com>

From: Onstott, Ranee N
Sent: Monday, November 06, 2017 10:49 AM
To: Patel, Nita <npatel@lanl.gov>
Cc: Mark, Paul <paulmark@lanl.gov>
Subject: Re: COC 2018-697 VOAs

Actually make that 2 for CAPA-18-147631 making a total of 10. They were sampled on 11/2. We will ship them today to meet the 7 day hold time.

From: Onstott, Ranee N
Sent: Monday, November 6, 2017 10:39 AM
To: Patel, Nita
Subject: COC 2018-697 VOAs

VOAs from COC 2018-697

CAPA-18-147582 - 2 count
CAPA-18-147603 -1
CAPA-18-147583 - 2
CAPA-18-147609 - 1
CAPA-18-147627 - 2
CAPA-18-147631- 1

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 #: 2018-697
Work Order #: 437078

Method/Analysis Information

Procedure:	**Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method:	SW-846:8260B
Analytical Batch Number:	1717151

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
437078002	CAPA-18-147582
437078003	CAPA-18-147603
437078005	CAPA-18-147583
437078006	CAPA-18-147609
437078007	CAPA-18-147627
437078009	CAPA-18-147631
1203915326	Method Blank (MB)
1203915328	Laboratory Control Sample (LCS)
1203915329	Laboratory Control Sample (LCS)
1203915332	436504006(CAPA-18-147596) Post Spike (PS)
1203915333	436504006(CAPA-18-147596) Post Spike (PS)
1203915334	436504006(CAPA-18-147596) Post Spike Duplicate (PSD)
1203915335	436504006(CAPA-18-147596) Post Spike Duplicate (PSD)
1203919290	Method Blank (MB)
1203919291	Method Blank (MB)
1203919292	Laboratory Control Sample (LCS)
1203919293	Laboratory Control Sample (LCS)
1203919294	Laboratory Control Sample (LCS)
1203919295	Laboratory Control Sample (LCS)

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
Target analytes were detected in the blanks 1203915326 (MB), 1203919290 (MB) and 1203919291 (MB) below the reporting limit.

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

Laboratory Control Sample (LCS) Recovery
The LCS/and or LCSD (See Below) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported.

Sample	Analyte	Value
1203919292 (LCS)	Hexachlorobutadiene	70* (72%-136%)

QC Sample Designation
Spike analyses were not required for this SDG.

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
All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-analyses were not required for samples in this SDG.

Miscellaneous Information

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

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

Additional Comments
Additional comments were not required for this SDG.

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

Electronic Package Comment

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA6.I	Agilent 6890N/5975 GC/MS w/ OI 4560/Archon Autosampler	HP6890N/HP5975	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: 2018-697 GEL Work Order: 437078

The Qualifiers in this report are defined as follows:

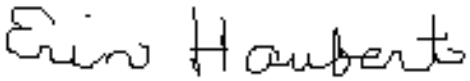
* A quality control analyte recovery is outside of specified acceptance criteria
** Analyte is a surrogate compound
B The target analyte was detected in the associated blank.
J Value is estimated
U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

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: 29 NOV 2017 **Title: Data Validator**

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 11:10**	**Matrix:**	**W**
Lab Sample ID:	**437078002**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147582**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/14/2017 03:41**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/14/2017 03:41**				
Data File:	**111317V6\6H139.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 11:10**	**Matrix:**	**W**
Lab Sample ID:	**437078002**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147582**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/14/2017 03:41**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/14/2017 03:41**				
Data File:	**111317V6\6H139.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 11:10**	**Matrix:**	**W**
Lab Sample ID:	**437078002**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147582**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/14/2017 03:41**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/14/2017 03:41**				
Data File:	**111317V6\6H139.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	53.0	50.0	ug/L	106	(71%-134%)
Bromofluorobenzene	51.4	50.0	ug/L	103	(70%-131%)
Toluene-d8	50.1	50.0	ug/L	100	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	13.75	7.94	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 11:10**	**Matrix:**	**W**
Lab Sample ID:	**437078003**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147603**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 01:04**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 01:04**				
Data File:	**111517V6\6H333.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 11:10**	**Matrix:**	**W**
Lab Sample ID:	**437078003**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147603**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 01:04**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 01:04**				
Data File:	**111517V6\6H333.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	BJ	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:	**2018-697**	**Date Collected:**	**11/02/2017 11:10**	**Matrix:**	**W**
Lab Sample ID:	**437078003**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147603**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 01:04**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 01:04**				
Data File:	**111517V6\6H333.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	50.7	50.0	ug/L	101	(71%-134%)
Bromofluorobenzene	50.0	50.0	ug/L	100	(70%-131%)
Toluene-d8	49.6	50.0	ug/L	99	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	13.75	23.5	ug/L	0	J
	unknown siloxane	15.671	6.72	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078005**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147583**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 01:32**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 01:32**				
Data File:	**111517V6\6H334.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078005**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147583**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 01:32**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 01:32**				
Data File:	**111517V6\6H334.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078005**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147583**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 01:32**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 01:32**				
Data File:	**111517V6\6H334.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	50.3	50.0	ug/L	101	(71%-134%)
Bromofluorobenzene	50.9	50.0	ug/L	102	(70%-131%)
Toluene-d8	48.9	50.0	ug/L	98	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown hydrocarbon	3.592	5.78	ug/L	0	J
	unknown siloxane	11.348	5.25	ug/L	0	J
	unknown siloxane	13.75	33.6	ug/L	0	J
	unknown siloxane	15.671	7.25	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078006**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147609**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 02:00**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 02:00**				
Data File:	**111517V6\6H335.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078006**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147609**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 02:00**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 02:00**				
Data File:	**111517V6\6H335.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078006**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147609**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 02:00**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 02:00**				
Data File:	**111517V6\6H335.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	51.5	50.0	ug/L	103	(71%-134%)
Bromofluorobenzene	50.0	50.0	ug/L	100	(70%-131%)
Toluene-d8	48.9	50.0	ug/L	98	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	13.75	6.28	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078007**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147627**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 02:29**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 02:29**				
Data File:	**111517V6\6H336.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078007**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147627**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 02:29**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 02:29**				
Data File:	**111517V6\6H336.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078007**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147627**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 02:29**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 02:29**				
Data File:	**111517V6\6H336.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	50.5	50.0	ug/L	101	(71%-134%)
Bromofluorobenzene	50.8	50.0	ug/L	102	(70%-131%)
Toluene-d8	49.1	50.0	ug/L	98	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	11.348	9.26	ug/L	0	J
	unknown siloxane	13.75	32.7	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078009**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147631**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 02:57**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 02:57**				
Data File:	**111517V6\6H337.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078009**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147631**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 02:57**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 02:57**				
Data File:	**111517V6\6H337.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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078009**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147631**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 02:57**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 02:57**				
Data File:	**111517V6\6H337.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	51.5	50.0	ug/L	103	(71%-134%)
Bromofluorobenzene	50.3	50.0	ug/L	101	(70%-131%)
Toluene-d8	48.8	50.0	ug/L	98	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown hydrocarbon	3.592	5.25	ug/L	0	J
	unknown siloxane	13.75	19.1	ug/L	0	J

Quality Control Summary

Volatile

Surrogate Recovery Report

SDG Number: 2018-697

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203915328	LCS for batch 1717151	100	100	101
1203915329	LCS for batch 1717151	101	98	101
1203915326	MB for batch 1717151	101	100	102
1203915332	CAPA-18-147596PS	101	100	100
1203915334	CAPA-18-147596PSD	100	100	99
1203915333	CAPA-18-147596PS	100	99	101
1203915335	CAPA-18-147596PSD	100	98	101
1203919292	LCS for batch 1717151	96	97	96
1203919293	LCS for batch 1717151	98	95	98
1203919290	MB for batch 1717151	104	99	102
437078002	CAPA-18-147582	106	100	103
1203919294	LCS for batch 1717151	100	98	96
1203919295	LCS for batch 1717151	102	98	101
1203919291	MB for batch 1717151	101	97	99
437078003	CAPA-18-147603	101	99	100
437078005	CAPA-18-147583	101	98	102
437078006	CAPA-18-147609	103	98	100
437078007	CAPA-18-147627	101	98	102
437078009	CAPA-18-147631	103	98	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

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203915328
Instrument: VOA6.I
Analysis Date: 11/08/2017 10:38
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	102	102	71-127
75-05-8	LCS	Acetonitrile	1250	0.0	1280	102	61-125
67-64-1	LCS	Acetone	250	0.0	246	99	48-157
74-88-4	LCS	Iodomethane	250	0.0	248	99	72-128
75-15-0	LCS	Carbon disulfide	250	0.0	248	99	69-138
108-05-4	LCS	Vinyl acetate	250	0.0	247	99	67-125
78-93-3	LCS	2-Butanone	250	0.0	262	105	55-138
108-10-1	LCS	4-Methyl-2-pentanone	250	0.0	253	101	66-124
591-78-6	LCS	2-Hexanone	250	0.0	257	103	56-140
75-71-8	LCS	Dichlorodifluoromethane	50.0	0.0	57.5	115	40-160
74-87-3	LCS	Chloromethane	50.0	0.0	52.6	105	58-135
75-01-4	LCS	Vinyl chloride	50.0	0.0	50.7	101	65-137
74-83-9	LCS	Bromomethane	50.0	0.0	52.0	104	63-137
75-00-3	LCS	Chloroethane	50.0	0.0	50.1	100	69-129
75-69-4	LCS	Trichlorofluoromethane	50.0	0.0	51.3	103	69-138
60-29-7	LCS	Ethyl ether	50.0	0.0	49.2	98	72-125
75-35-4	LCS	1,1-Dichloroethylene	50.0	0.0	51.9	104	66-126
75-09-2	LCS	Methylene chloride	50.0	0.0	48.3	97	68-119
1634-04-4	LCS	tert-Butyl methyl ether	50.0	0.0	52.0	104	76-128
156-60-5	LCS	trans-1,2-Dichloroethylene	50.0	0.0	53.0	106	71-124
75-34-3	LCS	1,1-Dichloroethane	50.0	0.0	52.7	105	73-123
156-59-2	LCS	cis-1,2-Dichloroethylene	50.0	0.0	52.7	105	75-123

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203915328
Instrument: VOA6.I
Analysis Date: 11/08/2017 10:38
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	51.0	102	72-138
74-97-5	LCS	Bromochloromethane	50.0	0.0	52.8	106	76-125
67-66-3	LCS	Chloroform	50.0	0.0	51.4	103	76-123
71-55-6	LCS	1,1,1-Trichloroethane	50.0	0.0	50.7	101	74-136
563-58-6	LCS	1,1-Dichloropropene	50.0	0.0	49.1	98	72-129
56-23-5	LCS	Carbon tetrachloride	50.0	0.0	52.4	105	72-140
107-06-2	LCS	1,2-Dichloroethane	50.0	0.0	52.1	104	74-122
71-43-2	LCS	Benzene	50.0	0.0	50.5	101	72-121
79-01-6	LCS	Trichloroethylene	50.0	0.0	52.3	105	74-125
78-87-5	LCS	1,2-Dichloropropane	50.0	0.0	51.6	103	73-121
74-95-3	LCS	Dibromomethane	50.0	0.0	51.7	103	78-123
75-27-4	LCS	Bromodichloromethane	50.0	0.0	54.1	108	77-131
10061-01-5	LCS	cis-1,3-Dichloropropylene	50.0	0.0	52.6	105	78-131
108-88-3	LCS	Toluene	50.0	0.0	51.0	102	71-121
10061-02-6	LCS	trans-1,3-Dichloropropylene	50.0	0.0	54.6	109	78-131
79-00-5	LCS	1,1,2-Trichloroethane	50.0	0.0	52.6	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	50.6	101	69-129
124-48-1	LCS	Dibromochloromethane	50.0	0.0	58.5	117	76-137
106-93-4	LCS	1,2-Dibromoethane	50.0	0.0	54.9	110	78-122
108-90-7	LCS	Chlorobenzene	50.0	0.0	51.1	102	74-120
100-41-4	LCS	Ethylbenzene	50.0	0.0	50.9	102	73-125

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203915328
Instrument: VOA6.I
Analysis Date: 11/08/2017 10:38
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	50.3	101	74-126
100-42-5	LCS	Styrene	50.0	0.0	52.6	105	72-130
75-25-2	LCS	Bromoform	50.0	0.0	60.0	120	72-136
98-82-8	LCS	Isopropylbenzene	50.0	0.0	50.4	101	70-130
79-34-5	LCS	1,1,2,2-Tetrachloroethane	50.0	0.0	52.5	105	70-126
96-18-4	LCS	1,2,3-Trichloropropane	50.0	0.0	53.6	107	74-122
108-86-1	LCS	Bromobenzene	50.0	0.0	51.5	103	74-120
103-65-1	LCS	n-Propylbenzene	50.0	0.0	49.4	99	67-128
108-67-8	LCS	1,3,5-Trimethylbenzene	50.0	0.0	51.0	102	70-129
95-49-8	LCS	2-Chlorotoluene	50.0	0.0	50.9	102	71-124
106-43-4	LCS	4-Chlorotoluene	50.0	0.0	50.2	100	69-125
98-06-6	LCS	tert-Butylbenzene	50.0	0.0	52.1	104	72-130
95-63-6	LCS	1,2,4-Trimethylbenzene	50.0	0.0	51.2	102	70-126
135-98-8	LCS	sec-Butylbenzene	50.0	0.0	50.6	101	70-131
99-87-6	LCS	4-Isopropyltoluene	50.0	0.0	50.8	102	71-131
541-73-1	LCS	1,3-Dichlorobenzene	50.0	0.0	50.6	101	72-121
106-46-7	LCS	1,4-Dichlorobenzene	50.0	0.0	50.3	101	71-120
104-51-8	LCS	n-Butylbenzene	50.0	0.0	49.7	99	68-134
96-12-8	LCS	1,2-Dibromo-3-chloropropane	50.0	0.0	58.3	117	68-141
87-68-3	LCS	Hexachlorobutadiene	50.0	0.0	50.4	101	72-136
91-20-3	LCS	Naphthalene	50.0	0.0	54.0	108	72-132
87-61-6	LCS	1,2,3-Trichlorobenzene	50.0	0.0	51.5	103	70-130

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203915328
Instrument: VOA6.I
Analysis Date: 11/08/2017 10:38
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	50.1	100	71-129
630-20-6	LCS	1,1,1,2-Tetrachloroethane	50.0	0.0	54.7	109	79-127
95-50-1	LCS	1,2-Dichlorobenzene	50.0	0.0	51.2	102	74-120
71-36-3	LCS	n-Butyl alcohol	5000	0.0	5380	108	63-138

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203915329
Instrument: VOA6.I
Analysis Date: 11/08/2017 12:31
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	221	88	60-140
76-13-1	LCS	Trichlorotrifluoroethane	250	0.0	220	88	61-148
107-05-1	LCS	Allyl chloride	250	0.0	225	90	59-125
107-13-1	LCS	Acrylonitrile	250	0.0	242	97	65-122
107-12-0	LCS	Propionitrile	250	0.0	238	95	64-124
126-98-7	LCS	Methacrylonitrile	250	0.0	243	97	64-126
80-62-6	LCS	Methyl methacrylate	250	0.0	243	97	69-127
97-63-2	LCS	Ethyl methacrylate	250	0.0	235	94	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	41.1	82	66-147

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697 **Sample Type:** Post Spike

Client ID: CAPA-18-147596PS **Matrix:** W

Lab Sample ID 1203915332

Instrument: VOA6.I **Analysis Date:** 11/08/2017 19:06 **Dilution:** 1

Analyst: JP1

Purge Vol: 5 mL **Batch ID:** 1717151

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	91.3	91	59-132
75-05-8	PS	Acetonitrile	1250	0.00	U	1160	93	56-131
67-64-1	PS	Acetone	250	0.00	U	137	55	25-155
74-88-4	PS	Iodomethane	250	0.00	U	221	89	66-133
75-15-0	PS	Carbon disulfide	250	0.00	U	220	88	61-141
108-05-4	PS	Vinyl acetate	250	0.00	U	214	85	48-133
78-93-3	PS	2-Butanone	250	0.00	U	168	67	25-143
108-10-1	PS	4-Methyl-2-pentanone	250	0.00	U	225	90	61-127
591-78-6	PS	2-Hexanone	250	0.00	U	167	67	33-138
87-68-3	PS	Hexachlorobutadiene	50.0	0.970	BJ	44.6	87	40-147
87-61-6	PS	1,2,3-Trichlorobenzene	50.0	0.930	BJ	45.7	90	52-135
104-51-8	PS	n-Butylbenzene	50.0	0.320	J	43.5	86	43-142
91-20-3	PS	Naphthalene	50.0	0.740	J	48.4	95	62-134
120-82-1	PS	1,2,4-Trichlorobenzene	50.0	0.740	J	44.2	87	50-133
75-71-8	PS	Dichlorodifluoromethane	50.0	0.00	U	49.5	99	33-164
74-87-3	PS	Chloromethane	50.0	0.00	U	45.6	91	53-139
75-01-4	PS	Vinyl chloride	50.0	0.00	U	44.0	88	58-140
74-83-9	PS	Bromomethane	50.0	0.00	U	48.3	97	59-146
75-00-3	PS	Chloroethane	50.0	0.00	U	44.0	88	65-129
75-69-4	PS	Trichlorofluoromethane	50.0	0.00	U	45.3	91	65-141
60-29-7	PS	Ethyl ether	50.0	0.00	U	44.7	89	69-127
75-35-4	PS	1,1-Dichloroethylene	50.0	0.00	U	45.4	91	59-130

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697 **Sample Type:** Post Spike

Client ID: CAPA-18-147596PS **Matrix:** W

Lab Sample ID 1203915332

Instrument: VOA6.I **Analysis Date:** 11/08/2017 19:06 **Dilution:** 1

Analyst: JP1

Purge Vol: 5 mL **Batch ID:** 1717151

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
75-09-2	PS	Methylene chloride	50.0	0.00	U	43.4	87	62-123
1634-04-4	PS	tert-Butyl methyl ether	50.0	0.00	U	47.1	94	69-132
156-60-5	PS	trans-1,2-Dichloroethylene	50.0	0.00	U	47.5	95	65-127
75-34-3	PS	1,1-Dichloroethane	50.0	0.00	U	47.4	95	67-127
156-59-2	PS	cis-1,2-Dichloroethylene	50.0	0.00	U	47.4	95	69-127
594-20-7	PS	2,2-Dichloropropane	50.0	0.00	U	44.6	89	66-137
74-97-5	PS	Bromochloromethane	50.0	0.00	U	48.3	97	71-130
67-66-3	PS	Chloroform	50.0	0.00	U	47.0	94	71-129
71-55-6	PS	1,1,1-Trichloroethane	50.0	0.00	U	45.5	91	69-139
563-58-6	PS	1,1-Dichloropropene	50.0	0.00	U	43.8	88	67-130
56-23-5	PS	Carbon tetrachloride	50.0	0.00	U	46.6	93	66-143
107-06-2	PS	1,2-Dichloroethane	50.0	0.00	U	48.3	97	69-130
71-43-2	PS	Benzene	50.0	0.00	U	45.5	91	66-125
79-01-6	PS	Trichloroethylene	50.0	0.00	U	46.5	93	65-131
78-87-5	PS	1,2-Dichloropropane	50.0	0.00	U	47.2	94	67-127
74-95-3	PS	Dibromomethane	50.0	0.00	U	46.9	94	72-129
75-27-4	PS	Bromodichloromethane	50.0	0.00	U	48.8	98	70-138
10061-01-5	PS	cis-1,3-Dichloropropylene	50.0	0.00	U	46.9	94	70-134
108-88-3	PS	Toluene	50.0	0.00	U	45.9	92	60-126
10061-02-6	PS	trans-1,3-Dichloropropylene	50.0	0.00	U	49.3	99	69-135
79-00-5	PS	1,1,2-Trichloroethane	50.0	0.00	U	48.1	96	66-125
142-28-9	PS	1,3-Dichloropropane	50.0	0.00	U	47.7	95	67-124

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697 **Sample Type:** Post Spike

Client ID: CAPA-18-147596PS **Matrix:** W

Lab Sample ID 1203915332

Instrument: VOA6.I **Analysis Date:** 11/08/2017 19:06 **Dilution:** 1

Analyst: JP1

Purge Vol: 5 mL **Batch ID:** 1717151

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
127-18-4	PS	Tetrachloroethylene	50.0	0.00	U	45.7	91	60-130
124-48-1	PS	Dibromochloromethane	50.0	0.00	U	52.6	105	68-143
106-93-4	PS	1,2-Dibromoethane	50.0	0.00	U	50.1	100	71-127
108-90-7	PS	Chlorobenzene	50.0	0.00	U	46.2	92	64-124
100-41-4	PS	Ethylbenzene	50.0	0.00	U	45.6	91	61-130
95-47-6	PS	o-Xylene	50.0	0.00	U	45.8	92	62-131
100-42-5	PS	Styrene	50.0	0.00	U	47.3	95	59-135
75-25-2	PS	Bromoform	50.0	0.00	U	51.7	103	64-138
98-82-8	PS	Isopropylbenzene	50.0	0.00	U	45.2	90	55-133
79-34-5	PS	1,1,2,2-Tetrachloroethane	50.0	0.00	U	47.6	95	62-129
96-18-4	PS	1,2,3-Trichloropropane	50.0	0.00	U	48.1	96	70-124
108-86-1	PS	Bromobenzene	50.0	0.00	U	46.0	92	62-124
103-65-1	PS	n-Propylbenzene	50.0	0.00	U	44.0	88	50-133
108-67-8	PS	1,3,5-Trimethylbenzene	50.0	0.00	U	45.8	92	53-135
95-49-8	PS	2-Chlorotoluene	50.0	0.00	U	45.4	91	56-128
106-43-4	PS	4-Chlorotoluene	50.0	0.00	U	44.6	89	53-130
98-06-6	PS	tert-Butylbenzene	50.0	0.00	U	46.2	92	55-135
95-63-6	PS	1,2,4-Trimethylbenzene	50.0	0.00	U	45.7	91	53-132
135-98-8	PS	sec-Butylbenzene	50.0	0.00	U	45.5	91	50-138
99-87-6	PS	4-Isopropyltoluene	50.0	0.00	U	45.8	92	49-138
541-73-1	PS	1,3-Dichlorobenzene	50.0	0.00	U	45.1	90	56-126
106-46-7	PS	1,4-Dichlorobenzene	50.0	0.00	U	44.9	90	55-125

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697 **Sample Type:** Post Spike

Client ID: CAPA-18-147596PS **Matrix:** W

Lab Sample ID 1203915332

Instrument: VOA6.I **Analysis Date:** 11/08/2017 19:06 **Dilution:** 1

Analyst: JP1

Purge Vol: 5 mL **Batch ID:** 1717151

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
96-12-8	PS	1,2-Dibromo-3-chloropropane	50.0	0.00	U	50.4	101	62-141
630-20-6	PS	1,1,1,2-Tetrachloroethane	50.0	0.00	U	49.9	100	71-133
95-50-1	PS	1,2-Dichlorobenzene	50.0	0.00	U	45.8	92	60-125
71-36-3	PS	n-Butyl alcohol	5000	0.00	U	4820	96	60-140

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697 **Sample Type:** Post Spike Duplicate

Client ID: CAPA-18-147596PSD **Matrix:** W

Lab Sample ID 1203915334

Instrument: VOA6.I **Analysis Date:** 11/08/2017 19:35 **Dilution:** 1

Analyst: JP1

Purge Vol: 5 mL **Batch ID:** 1717151

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
179601-23-1	PSD	m,p-Xylenes	100	0.00	U	92.7	93	59-132	2	0-20
75-05-8	PSD	Acetonitrile	1250	0.00	U	1110	88	56-131	5	0-20
67-64-1	PSD	Acetone	250	0.00	U	128	51	25-155	7	0-20
74-88-4	PSD	Iodomethane	250	0.00	U	225	90	66-133	2	0-20
75-15-0	PSD	Carbon disulfide	250	0.00	U	225	90	61-141	3	0-20
108-05-4	PSD	Vinyl acetate	250	0.00	U	207	83	48-133	3	0-20
78-93-3	PSD	2-Butanone	250	0.00	U	156	62	25-143	8	0-20
108-10-1	PSD	4-Methyl-2-pentanone	250	0.00	U	209	83	61-127	7	0-20
591-78-6	PSD	2-Hexanone	250	0.00	U	153	61	33-138	9	0-20
87-68-3	PSD	Hexachlorobutadiene	50.0	0.970	BJ	46.0	90	40-147	3	0-20
87-61-6	PSD	1,2,3-Trichlorobenzene	50.0	0.930	BJ	46.4	91	52-135	2	0-20
104-51-8	PSD	n-Butylbenzene	50.0	0.320	J	44.9	89	43-142	3	0-20
91-20-3	PSD	Naphthalene	50.0	0.740	J	47.2	93	62-134	3	0-20
120-82-1	PSD	1,2,4-Trichlorobenzene	50.0	0.740	J	44.8	88	50-133	1	0-20
75-71-8	PSD	Dichlorodifluoromethane	50.0	0.00	U	50.7	101	33-164	2	0-20
74-87-3	PSD	Chloromethane	50.0	0.00	U	48.1	96	53-139	5	0-20
75-01-4	PSD	Vinyl chloride	50.0	0.00	U	46.3	93	58-140	5	0-20
74-83-9	PSD	Bromomethane	50.0	0.00	U	50.0	100	59-146	3	0-20
75-00-3	PSD	Chloroethane	50.0	0.00	U	45.2	90	65-129	3	0-20
75-69-4	PSD	Trichlorofluoromethane	50.0	0.00	U	46.4	93	65-141	2	0-20
60-29-7	PSD	Ethyl ether	50.0	0.00	U	43.7	87	69-127	2	0-20
75-35-4	PSD	1,1-Dichloroethylene	50.0	0.00	U	46.6	93	59-130	3	0-20

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697 **Sample Type:** Post Spike Duplicate

Client ID: CAPA-18-147596PSD **Matrix:** W

Lab Sample ID 1203915334

Instrument: VOA6.I **Analysis Date:** 11/08/2017 19:35 **Dilution:** 1

Analyst: JP1

Purge Vol: 5 mL **Batch ID:** 1717151

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
75-09-2	PSD	Methylene chloride	50.0	0.00	U	43.6	87	62-123	1	0-20
1634-04-4	PSD	tert-Butyl methyl ether	50.0	0.00	U	46.0	92	69-132	2	0-20
156-60-5	PSD	trans-1,2-Dichloroethylene	50.0	0.00	U	48.2	96	65-127	2	0-20
75-34-3	PSD	1,1-Dichloroethane	50.0	0.00	U	48.0	96	67-127	1	0-20
156-59-2	PSD	cis-1,2-Dichloroethylene	50.0	0.00	U	47.6	95	69-127	0	0-20
594-20-7	PSD	2,2-Dichloropropane	50.0	0.00	U	46.1	92	66-137	3	0-20
74-97-5	PSD	Bromochloromethane	50.0	0.00	U	47.9	96	71-130	1	0-20
67-66-3	PSD	Chloroform	50.0	0.00	U	46.9	94	71-129	0	0-20
71-55-6	PSD	1,1,1-Trichloroethane	50.0	0.00	U	46.6	93	69-139	2	0-20
563-58-6	PSD	1,1-Dichloropropene	50.0	0.00	U	44.7	89	67-130	2	0-20
56-23-5	PSD	Carbon tetrachloride	50.0	0.00	U	47.7	95	66-143	2	0-20
107-06-2	PSD	1,2-Dichloroethane	50.0	0.00	U	47.8	96	69-130	1	0-20
71-43-2	PSD	Benzene	50.0	0.00	U	46.2	92	66-125	1	0-20
79-01-6	PSD	Trichloroethylene	50.0	0.00	U	47.0	94	65-131	1	0-20
78-87-5	PSD	1,2-Dichloropropane	50.0	0.00	U	47.2	94	67-127	0	0-20
74-95-3	PSD	Dibromomethane	50.0	0.00	U	46.8	94	72-129	0	0-20
75-27-4	PSD	Bromodichloromethane	50.0	0.00	U	48.6	97	70-138	0	0-20
10061-01-5	PSD	cis-1,3-Dichloropropylene	50.0	0.00	U	46.9	94	70-134	0	0-20
108-88-3	PSD	Toluene	50.0	0.00	U	46.1	92	60-126	0	0-20
10061-02-6	PSD	trans-1,3-Dichloropropylene	50.0	0.00	U	48.2	96	69-135	2	0-20
79-00-5	PSD	1,1,2-Trichloroethane	50.0	0.00	U	46.3	93	66-125	4	0-20
142-28-9	PSD	1,3-Dichloropropane	50.0	0.00	U	46.7	93	67-124	2	0-20

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Post Spike Duplicate
Client ID: CAPA-18-147596PSD
Matrix: W
Lab Sample ID 1203915334
Instrument: VOA6.I
Analysis Date: 11/08/2017 19:35
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
127-18-4	PSD	Tetrachloroethylene	50.0	0.00	U	46.6	93	60-130	2	0-20
124-48-1	PSD	Dibromochloromethane	50.0	0.00	U	51.1	102	68-143	3	0-20
106-93-4	PSD	1,2-Dibromoethane	50.0	0.00	U	48.0	96	71-127	4	0-20
108-90-7	PSD	Chlorobenzene	50.0	0.00	U	46.5	93	64-124	1	0-20
100-41-4	PSD	Ethylbenzene	50.0	0.00	U	46.3	93	61-130	1	0-20
95-47-6	PSD	o-Xylene	50.0	0.00	U	45.9	92	62-131	0	0-20
100-42-5	PSD	Styrene	50.0	0.00	U	47.1	94	59-135	0	0-20
75-25-2	PSD	Bromoform	50.0	0.00	U	50.5	101	64-138	2	0-20
98-82-8	PSD	Isopropylbenzene	50.0	0.00	U	45.9	92	55-133	1	0-20
79-34-5	PSD	1,1,2,2-Tetrachloroethane	50.0	0.00	U	45.7	91	62-129	4	0-20
96-18-4	PSD	1,2,3-Trichloropropane	50.0	0.00	U	46.4	93	70-124	4	0-20
108-86-1	PSD	Bromobenzene	50.0	0.00	U	46.0	92	62-124	0	0-20
103-65-1	PSD	n-Propylbenzene	50.0	0.00	U	45.0	90	50-133	2	0-20
108-67-8	PSD	1,3,5-Trimethylbenzene	50.0	0.00	U	46.8	94	53-135	2	0-20
95-49-8	PSD	2-Chlorotoluene	50.0	0.00	U	45.6	91	56-128	1	0-20
106-43-4	PSD	4-Chlorotoluene	50.0	0.00	U	45.4	91	53-130	2	0-20
98-06-6	PSD	tert-Butylbenzene	50.0	0.00	U	46.9	94	55-135	2	0-20
95-63-6	PSD	1,2,4-Trimethylbenzene	50.0	0.00	U	46.4	93	53-132	2	0-20
135-98-8	PSD	sec-Butylbenzene	50.0	0.00	U	46.5	93	50-138	2	0-20
99-87-6	PSD	4-Isopropyltoluene	50.0	0.00	U	47.0	94	49-138	3	0-20
541-73-1	PSD	1,3-Dichlorobenzene	50.0	0.00	U	45.4	91	56-126	1	0-20
106-46-7	PSD	1,4-Dichlorobenzene	50.0	0.00	U	45.1	90	55-125	0	0-20

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697 **Sample Type:** Post Spike Duplicate

Client ID: CAPA-18-147596PSD **Matrix:** W

Lab Sample ID 1203915334

Instrument: VOA6.I **Analysis Date:** 11/08/2017 19:35 **Dilution:** 1

Analyst: JP1

Purge Vol: 5 mL **Batch ID:** 1717151

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
96-12-8	PSD	1,2-Dibromo-3-chloropropane	50.0	0.00	U	46.9	94	62-141	7	0-20
630-20-6	PSD	1,1,1,2-Tetrachloroethane	50.0	0.00	U	49.3	99	71-133	1	0-20
95-50-1	PSD	1,2-Dichlorobenzene	50.0	0.00	U	45.9	92	60-125	0	0-20
71-36-3	PSD	n-Butyl alcohol	5000	0.00	U	4410	88	60-140	9	0-20

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697 **Sample Type:** Post Spike

Client ID: CAPA-18-147596PS **Matrix:** W

Lab Sample ID 1203915333

Instrument: VOA6.I **Analysis Date:** 11/08/2017 20:59 **Dilution:** 1

Analyst: JP1

Purge Vol: 5 mL **Batch ID:** 1717151

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	200	80	49-141
76-13-1	PS	Trichlorotrifluoroethane	250	0.00	U	207	83	57-149
107-05-1	PS	Allyl chloride	250	0.00	U	213	85	54-128
107-13-1	PS	Acrylonitrile	250	0.00	U	227	91	59-129
107-12-0	PS	Propionitrile	250	0.00	U	223	89	58-131
126-98-7	PS	Methacrylonitrile	250	0.00	U	228	91	59-134
80-62-6	PS	Methyl methacrylate	250	0.00	U	228	91	62-135
97-63-2	PS	Ethyl methacrylate	250	0.00	U	221	89	60-136
78-83-1	PS	Isobutyl alcohol	2500	0.00	U	2340	93	60-143
126-99-8	PS	2-Chloro-1,3-butadiene	50.0	0.00	U	38.2	76	63-146

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Post Spike Duplicate
Client ID: CAPA-18-147596PSD
Matrix: W
Lab Sample ID 1203915335
Instrument: VOA6.I
Analysis Date: 11/08/2017 21:27
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD	Acrolein	250	0.00	U	203	81	49-141	2	0-20
76-13-1	PSD	Trichlorotrifluoroethane	250	0.00	U	211	84	57-149	2	0-20
107-05-1	PSD	Allyl chloride	250	0.00	U	215	86	54-128	1	0-20
107-13-1	PSD	Acrylonitrile	250	0.00	U	232	93	59-129	2	0-20
107-12-0	PSD	Propionitrile	250	0.00	U	230	92	58-131	3	0-20
126-98-7	PSD	Methacrylonitrile	250	0.00	U	232	93	59-134	1	0-20
80-62-6	PSD	Methyl methacrylate	250	0.00	U	231	92	62-135	1	0-20
97-63-2	PSD	Ethyl methacrylate	250	0.00	U	224	90	60-136	1	0-20
78-83-1	PSD	Isobutyl alcohol	2500	0.00	U	2380	95	60-143	2	0-20
126-99-8	PSD	2-Chloro-1,3-butadiene	50.0	0.00	U	39.0	78	63-146	2	0-20

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203919292
Instrument: VOA6.I
Analysis Date: 11/13/2017 22:59
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	85.8	86	71-127
75-05-8	LCS	Acetonitrile	1250	0.0	1230	98	61-125
67-64-1	LCS	Acetone	250	0.0	219	88	48-157
74-88-4	LCS	Iodomethane	250	0.0	232	93	72-128
75-15-0	LCS	Carbon disulfide	250	0.0	228	91	69-138
108-05-4	LCS	Vinyl acetate	250	0.0	220	88	67-125
78-93-3	LCS	2-Butanone	250	0.0	228	91	55-138
108-10-1	LCS	4-Methyl-2-pentanone	250	0.0	230	92	66-124
591-78-6	LCS	2-Hexanone	250	0.0	199	80	56-140
75-71-8	LCS	Dichlorodifluoromethane	50.0	0.0	43.5	87	40-160
74-87-3	LCS	Chloromethane	50.0	0.0	40.7	81	58-135
75-01-4	LCS	Vinyl chloride	50.0	0.0	39.5	79	65-137
74-83-9	LCS	Bromomethane	50.0	0.0	43.7	87	63-137
75-00-3	LCS	Chloroethane	50.0	0.0	41.8	84	69-129
75-69-4	LCS	Trichlorofluoromethane	50.0	0.0	41.7	83	69-138
60-29-7	LCS	Ethyl ether	50.0	0.0	43.9	88	72-125
75-35-4	LCS	1,1-Dichloroethylene	50.0	0.0	46.9	94	66-126
75-09-2	LCS	Methylene chloride	50.0	0.0	45.9	92	68-119
1634-04-4	LCS	tert-Butyl methyl ether	50.0	0.0	49.8	100	76-128
156-60-5	LCS	trans-1,2-Dichloroethylene	50.0	0.0	48.8	98	71-124
75-34-3	LCS	1,1-Dichloroethane	50.0	0.0	49.1	98	73-123
156-59-2	LCS	cis-1,2-Dichloroethylene	50.0	0.0	48.9	98	75-123

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203919292
Instrument: VOA6.I
Analysis Date: 11/13/2017 22:59
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	45.9	92	72-138
74-97-5	LCS	Bromochloromethane	50.0	0.0	49.2	98	76-125
67-66-3	LCS	Chloroform	50.0	0.0	48.6	97	76-123
71-55-6	LCS	1,1,1-Trichloroethane	50.0	0.0	46.2	92	74-136
563-58-6	LCS	1,1-Dichloropropene	50.0	0.0	43.7	87	72-129
56-23-5	LCS	Carbon tetrachloride	50.0	0.0	46.0	92	72-140
107-06-2	LCS	1,2-Dichloroethane	50.0	0.0	50.0	100	74-122
71-43-2	LCS	Benzene	50.0	0.0	46.5	93	72-121
79-01-6	LCS	Trichloroethylene	50.0	0.0	47.0	94	74-125
78-87-5	LCS	1,2-Dichloropropane	50.0	0.0	48.6	97	73-121
74-95-3	LCS	Dibromomethane	50.0	0.0	48.6	97	78-123
75-27-4	LCS	Bromodichloromethane	50.0	0.0	49.9	100	77-131
10061-01-5	LCS	cis-1,3-Dichloropropylene	50.0	0.0	47.9	96	78-131
108-88-3	LCS	Toluene	50.0	0.0	45.4	91	71-121
10061-02-6	LCS	trans-1,3-Dichloropropylene	50.0	0.0	49.2	98	78-131
79-00-5	LCS	1,1,2-Trichloroethane	50.0	0.0	49.5	99	74-118
142-28-9	LCS	1,3-Dichloropropane	50.0	0.0	48.8	98	74-118
127-18-4	LCS	Tetrachloroethylene	50.0	0.0	43.4	87	69-129
124-48-1	LCS	Dibromochloromethane	50.0	0.0	52.2	104	76-137
106-93-4	LCS	1,2-Dibromoethane	50.0	0.0	50.6	101	78-122
108-90-7	LCS	Chlorobenzene	50.0	0.0	45.2	90	74-120
100-41-4	LCS	Ethylbenzene	50.0	0.0	43.8	88	73-125

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203919292
Instrument: VOA6.I
Analysis Date: 11/13/2017 22:59
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	44.1	88	74-126
100-42-5	LCS	Styrene	50.0	0.0	45.3	91	72-130
75-25-2	LCS	Bromoform	50.0	0.0	51.0	102	72-136
98-82-8	LCS	Isopropylbenzene	50.0	0.0	41.9	84	70-130
79-34-5	LCS	1,1,2,2-Tetrachloroethane	50.0	0.0	48.2	96	70-126
96-18-4	LCS	1,2,3-Trichloropropane	50.0	0.0	49.5	99	74-122
108-86-1	LCS	Bromobenzene	50.0	0.0	44.5	89	74-120
103-65-1	LCS	n-Propylbenzene	50.0	0.0	39.9	80	67-128
108-67-8	LCS	1,3,5-Trimethylbenzene	50.0	0.0	42.1	84	70-129
95-49-8	LCS	2-Chlorotoluene	50.0	0.0	42.0	84	71-124
106-43-4	LCS	4-Chlorotoluene	50.0	0.0	41.4	83	69-125
98-06-6	LCS	tert-Butylbenzene	50.0	0.0	41.6	83	72-130
95-63-6	LCS	1,2,4-Trimethylbenzene	50.0	0.0	42.0	84	70-126
135-98-8	LCS	sec-Butylbenzene	50.0	0.0	40.3	81	70-131
99-87-6	LCS	4-Isopropyltoluene	50.0	0.0	41.7	83	71-131
541-73-1	LCS	1,3-Dichlorobenzene	50.0	0.0	41.8	84	72-121
106-46-7	LCS	1,4-Dichlorobenzene	50.0	0.0	41.3	83	71-120
104-51-8	LCS	n-Butylbenzene	50.0	0.0	36.7	73	68-134
96-12-8	LCS	1,2-Dibromo-3-chloropropane	50.0	0.0	47.9	96	68-141
87-68-3	LCS	Hexachlorobutadiene	50.0	0.0	35.1	70 *	72-136
91-20-3	LCS	Naphthalene	50.0	0.0	49.0	98	72-132
87-61-6	LCS	1,2,3-Trichlorobenzene	50.0	0.0	43.8	88	70-130

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203919292
Instrument: VOA6.I
Analysis Date: 11/13/2017 22:59
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	41.5	83	71-129
630-20-6	LCS	1,1,1,2-Tetrachloroethane	50.0	0.0	49.1	98	79-127
95-50-1	LCS	1,2-Dichlorobenzene	50.0	0.0	43.6	87	74-120
71-36-3	LCS	n-Butyl alcohol	5000	0.0	4910	98	63-138

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203919293
Instrument: VOA6.I
Analysis Date: 11/13/2017 23:56
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	212	85	60-140
76-13-1	LCS	Trichlorotrifluoroethane	250	0.0	220	88	61-148
107-05-1	LCS	Allyl chloride	250	0.0	226	90	59-125
107-13-1	LCS	Acrylonitrile	250	0.0	265	106	65-122
107-12-0	LCS	Propionitrile	250	0.0	262	105	64-124
126-98-7	LCS	Methacrylonitrile	250	0.0	262	105	64-126
80-62-6	LCS	Methyl methacrylate	250	0.0	258	103	69-127
97-63-2	LCS	Ethyl methacrylate	250	0.0	249	100	66-130
78-83-1	LCS	Isobutyl alcohol	2500	0.0	2690	108	65-135
126-99-8	LCS	2-Chloro-1,3-butadiene	50.0	0.0	40.8	82	66-147

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203919294
Instrument: VOA6.I
Analysis Date: 11/15/2017 23:12
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	84.6	85	71-127
75-05-8	LCS	Acetonitrile	1250	0.0	1170	94	61-125
67-64-1	LCS	Acetone	250	0.0	189	76	48-157
74-88-4	LCS	Iodomethane	250	0.0	209	84	72-128
75-15-0	LCS	Carbon disulfide	250	0.0	207	83	69-138
108-05-4	LCS	Vinyl acetate	250	0.0	242	97	67-125
78-93-3	LCS	2-Butanone	250	0.0	202	81	55-138
108-10-1	LCS	4-Methyl-2-pentanone	250	0.0	220	88	66-124
591-78-6	LCS	2-Hexanone	250	0.0	174	70	56-140
75-71-8	LCS	Dichlorodifluoromethane	50.0	0.0	46.9	94	40-160
74-87-3	LCS	Chloromethane	50.0	0.0	44.9	90	58-135
75-01-4	LCS	Vinyl chloride	50.0	0.0	43.4	87	65-137
74-83-9	LCS	Bromomethane	50.0	0.0	47.3	95	63-137
75-00-3	LCS	Chloroethane	50.0	0.0	45.0	90	69-129
75-69-4	LCS	Trichlorofluoromethane	50.0	0.0	45.6	91	69-138
60-29-7	LCS	Ethyl ether	50.0	0.0	48.5	97	72-125
75-35-4	LCS	1,1-Dichloroethylene	50.0	0.0	42.3	85	66-126
75-09-2	LCS	Methylene chloride	50.0	0.0	41.4	83	68-119
1634-04-4	LCS	tert-Butyl methyl ether	50.0	0.0	45.1	90	76-128
156-60-5	LCS	trans-1,2-Dichloroethylene	50.0	0.0	44.2	88	71-124
75-34-3	LCS	1,1-Dichloroethane	50.0	0.0	44.5	89	73-123
156-59-2	LCS	cis-1,2-Dichloroethylene	50.0	0.0	44.1	88	75-123

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203919294
Instrument: VOA6.I
Analysis Date: 11/15/2017 23:12
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	39.1	78	72-138
74-97-5	LCS	Bromochloromethane	50.0	0.0	45.2	90	76-125
67-66-3	LCS	Chloroform	50.0	0.0	44.4	89	76-123
71-55-6	LCS	1,1,1-Trichloroethane	50.0	0.0	41.8	84	74-136
563-58-6	LCS	1,1-Dichloropropene	50.0	0.0	40.3	81	72-129
56-23-5	LCS	Carbon tetrachloride	50.0	0.0	42.3	85	72-140
107-06-2	LCS	1,2-Dichloroethane	50.0	0.0	46.7	93	74-122
71-43-2	LCS	Benzene	50.0	0.0	42.5	85	72-121
79-01-6	LCS	Trichloroethylene	50.0	0.0	43.7	87	74-125
78-87-5	LCS	1,2-Dichloropropane	50.0	0.0	44.4	89	73-121
74-95-3	LCS	Dibromomethane	50.0	0.0	45.3	91	78-123
75-27-4	LCS	Bromodichloromethane	50.0	0.0	45.5	91	77-131
10061-01-5	LCS	cis-1,3-Dichloropropylene	50.0	0.0	43.1	86	78-131
108-88-3	LCS	Toluene	50.0	0.0	42.8	86	71-121
10061-02-6	LCS	trans-1,3-Dichloropropylene	50.0	0.0	44.5	89	78-131
79-00-5	LCS	1,1,2-Trichloroethane	50.0	0.0	45.2	90	74-118
142-28-9	LCS	1,3-Dichloropropane	50.0	0.0	45.7	91	74-118
127-18-4	LCS	Tetrachloroethylene	50.0	0.0	41.8	84	69-129
124-48-1	LCS	Dibromochloromethane	50.0	0.0	47.9	96	76-137
106-93-4	LCS	1,2-Dibromoethane	50.0	0.0	47.2	94	78-122
108-90-7	LCS	Chlorobenzene	50.0	0.0	42.9	86	74-120
100-41-4	LCS	Ethylbenzene	50.0	0.0	42.5	85	73-125

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203919294
Instrument: VOA6.I
Analysis Date: 11/15/2017 23:12
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	42.7	85	74-126
100-42-5	LCS	Styrene	50.0	0.0	43.7	87	72-130
75-25-2	LCS	Bromoform	50.0	0.0	45.6	91	72-136
98-82-8	LCS	Isopropylbenzene	50.0	0.0	40.9	82	70-130
79-34-5	LCS	1,1,2,2-Tetrachloroethane	50.0	0.0	44.6	89	70-126
96-18-4	LCS	1,2,3-Trichloropropane	50.0	0.0	45.4	91	74-122
108-86-1	LCS	Bromobenzene	50.0	0.0	42.4	85	74-120
103-65-1	LCS	n-Propylbenzene	50.0	0.0	40.4	81	67-128
108-67-8	LCS	1,3,5-Trimethylbenzene	50.0	0.0	42.0	84	70-129
95-49-8	LCS	2-Chlorotoluene	50.0	0.0	41.2	82	71-124
106-43-4	LCS	4-Chlorotoluene	50.0	0.0	41.1	82	69-125
98-06-6	LCS	tert-Butylbenzene	50.0	0.0	41.9	84	72-130
95-63-6	LCS	1,2,4-Trimethylbenzene	50.0	0.0	42.2	84	70-126
135-98-8	LCS	sec-Butylbenzene	50.0	0.0	41.6	83	70-131
99-87-6	LCS	4-Isopropyltoluene	50.0	0.0	41.7	83	71-131
541-73-1	LCS	1,3-Dichlorobenzene	50.0	0.0	41.5	83	72-121
106-46-7	LCS	1,4-Dichlorobenzene	50.0	0.0	41.2	82	71-120
104-51-8	LCS	n-Butylbenzene	50.0	0.0	39.8	80	68-134
96-12-8	LCS	1,2-Dibromo-3-chloropropane	50.0	0.0	44.3	89	68-141
87-68-3	LCS	Hexachlorobutadiene	50.0	0.0	41.7	83	72-136
91-20-3	LCS	Naphthalene	50.0	0.0	46.7	93	72-132
87-61-6	LCS	1,2,3-Trichlorobenzene	50.0	0.0	43.7	87	70-130

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203919294
Instrument: VOA6.I
Analysis Date: 11/15/2017 23:12
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	41.3	83	71-129
630-20-6	LCS	1,1,1,2-Tetrachloroethane	50.0	0.0	45.6	91	79-127
95-50-1	LCS	1,2-Dichlorobenzene	50.0	0.0	42.9	86	74-120
71-36-3	LCS	n-Butyl alcohol	5000	0.0	4760	95	63-138

Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1717151
Matrix: WATER
Lab Sample ID 1203919295
Instrument: VOA6.I
Analysis Date: 11/16/2017 00:08
Dilution: 1
Analyst: JP1
Purge Vol: 5 mL
Batch ID: 1717151

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	192	77	60-140
76-13-1	LCS	Trichlorotrifluoroethane	250	0.0	188	75	61-148
107-05-1	LCS	Allyl chloride	250	0.0	199	80	59-125
107-13-1	LCS	Acrylonitrile	250	0.0	243	97	65-122
107-12-0	LCS	Propionitrile	250	0.0	240	96	64-124
126-98-7	LCS	Methacrylonitrile	250	0.0	240	96	64-126
80-62-6	LCS	Methyl methacrylate	250	0.0	233	93	69-127
97-63-2	LCS	Ethyl methacrylate	250	0.0	228	91	66-130
78-83-1	LCS	Isobutyl alcohol	2500	0.0	2570	103	65-135
126-99-8	LCS	2-Chloro-1,3-butadiene	50.0	0.0	36.2	72	66-147

Method Blank Summary

SDG Number:	**2018-697**	**Client:**	**ARSL004**	**Matrix:**	**WATER**
Client ID:	**MB for batch 1717151**	**Instrument ID:**	**VOA6.I**	**Data File:**	**110817V6\6G308BA.D**
Lab Sample ID:	**1203915326**	**Prep Date:**	**11/08/2017 12:59**	**Analyzed:**	**11/08/17 12:59**
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 1717151	1203915328	110817V6\6G303LA.D	11/08/17	1038
02	LCS for batch 1717151	1203915329	110817V6\6G307LA.D	11/08/17	1231
03	CAPA-18-147596PS	1203915332	110817V6\6G321.D	11/08/17	1906
04	CAPA-18-147596PSD	1203915334	110817V6\6G322.D	11/08/17	1935
05	CAPA-18-147596PS	1203915333	110817V6\6G325.D	11/08/17	2059
06	CAPA-18-147596PSD	1203915335	110817V6\6G326.D	11/08/17	2127

Method Blank Summary

SDG Number:	**2018-697**	**Client:**	**ARSL004**	**Matrix:**	**WATER**
Client ID:	**MB for batch 1717151**	**Instrument ID:**	**VOA6.I**	**Data File:**	**111317V6\6H132BA.D**
Lab Sample ID:	**1203919290**	**Prep Date:**	**11/14/2017 00:24**	**Analyzed:**	**11/14/17 00:24**
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
08	**LCS for batch 1717151**	**1203919292**	**111317V6\6H129LA.D**	**11/13/17**	**2259**
09	**LCS for batch 1717151**	**1203919293**	**111317V6\6H131LA.D**	**11/13/17**	**2356**
10	**CAPA-18-147582**	**437078002**	**111317V6\6H139.D**	**11/14/17**	**0341**

Method Blank Summary

SDG Number:	**2018-697**	**Client:**	**ARSL004**	**Matrix:**	**WATER**
Client ID:	**MB for batch 1717151**	**Instrument ID:**	**VOA6.I**	**Data File:**	**111517V6\6H332BA.D**
Lab Sample ID:	**1203919291**	**Prep Date:**	**11/16/2017 00:36**	**Analyzed:**	**11/16/17 00:36**
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
12	LCS for batch 1717151	1203919294	111517V6\6H329LA.D	11/15/17	2312
13	LCS for batch 1717151	1203919295	111517V6\6H331LA.D	11/16/17	0008
14	CAPA-18-147603	437078003	111517V6\6H333.D	11/16/17	0104
15	CAPA-18-147583	437078005	111517V6\6H334.D	11/16/17	0132
16	CAPA-18-147609	437078006	111517V6\6H335.D	11/16/17	0200
17	CAPA-18-147627	437078007	111517V6\6H336.D	11/16/17	0229
18	CAPA-18-147631	437078009	111517V6\6H337.D	11/16/17	0257

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203915326**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 12:59**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 12:59**				
Data File:	**110817V6\6G308BA.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	J	0.330	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

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203915326**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 12:59**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 12:59**				
Data File:	**110817V6\6G308BA.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	J	0.410	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:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203915326**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 12:59**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 12:59**				
Data File:	**110817V6\6G308BA.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	50.7	50.0	ug/L	101	(71%-134%)
Bromofluorobenzene	51.0	50.0	ug/L	102	(70%-131%)
Toluene-d8	49.9	50.0	ug/L	100	(74%-124%)

Tentatively Identified Compound Summary

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203915328**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 10:38**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 10:38**				
Data File:	**110817V6\6G303LA.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		54.7	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		50.7	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		52.5	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		52.6	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.7	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		51.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.1	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	51.5	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		53.6	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		50.1	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		51.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		58.3	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		54.9	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		52.1	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		51.6	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		51.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		50.6	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		50.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		51.0	ug/L	0.300	1.00
78-93-3	2-Butanone		262	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		50.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		257	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		50.2	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		50.8	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		253	ug/L	1.50	5.00
67-64-1	Acetone		246	ug/L	1.50	10.0
75-05-8	Acetonitrile		1280	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		50.5	ug/L	0.300	1.00
108-86-1	Bromobenzene		51.5	ug/L	0.300	1.00
74-97-5	Bromochloromethane		52.8	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		54.1	ug/L	0.300	1.00
75-25-2	Bromoform		60.0	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203915328**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 10:38**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 10:38**				
Data File:	**110817V6\6G303LA.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		52.0	ug/L	0.300	1.00
75-15-0	Carbon disulfide		248	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		52.4	ug/L	0.300	1.00
108-90-7	Chlorobenzene		51.1	ug/L	0.300	1.00
75-00-3	Chloroethane		50.1	ug/L	0.300	1.00
67-66-3	Chloroform		51.4	ug/L	0.300	1.00
74-87-3	Chloromethane		52.6	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		58.5	ug/L	0.300	1.00
74-95-3	Dibromomethane		51.7	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		57.5	ug/L	0.300	1.00
60-29-7	Ethyl ether		49.2	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		50.9	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	50.4	ug/L	0.300	1.00
74-88-4	Iodomethane		248	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		50.4	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		48.3	ug/L	1.00	10.0
91-20-3	Naphthalene		54.0	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		52.6	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		50.6	ug/L	0.300	1.00
108-88-3	Toluene		51.0	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.3	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		51.3	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		247	ug/L	1.50	5.00
75-01-4	Vinyl chloride		50.7	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		52.7	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		52.6	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		102	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5380	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		49.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		49.4	ug/L	0.300	1.00
95-47-6	o-Xylene		50.3	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		50.6	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203915328**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 10:38**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 10:38**				
Data File:	**110817V6\6G303LA.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		52.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		52.1	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		53.0	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		54.6	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.1	50.0	ug/L	100	(71%-134%)
Bromofluorobenzene	50.4	50.0	ug/L	101	(70%-131%)
Toluene-d8	50.2	50.0	ug/L	100	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203915329**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 12:31**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 12:31**				
Data File:	**110817V6\6G307LA.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		41.1	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		221	ug/L	1.50	5.00
107-13-1	Acrylonitrile		242	ug/L	1.50	5.00
107-05-1	Allyl chloride		225	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

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203915329**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 12:31**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 12:31**				
Data File:	**110817V6\6G307LA.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		235	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		243	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		243	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		238	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		220	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:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203915329**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 12:31**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 12:31**				
Data File:	**110817V6\6G307LA.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	50.3	50.0	ug/L	101	(71%-134%)
Bromofluorobenzene	50.5	50.0	ug/L	101	(70%-131%)
Toluene-d8	48.9	50.0	ug/L	98	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915332**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PS**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 19:06**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 19:06**				
Data File:	**110817V6\6G321.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		49.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		45.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		47.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		48.1	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		47.4	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		45.4	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		43.8	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	45.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		48.1	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		44.2	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		45.7	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		50.4	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		50.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		45.8	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		48.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		47.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		45.8	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		45.1	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		47.7	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		44.9	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		44.6	ug/L	0.300	1.00
78-93-3	2-Butanone		168	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		45.4	ug/L	0.300	1.00
591-78-6	2-Hexanone		167	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		45.8	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		225	ug/L	1.50	5.00
67-64-1	Acetone		137	ug/L	1.50	10.0
75-05-8	Acetonitrile		1160	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		45.5	ug/L	0.300	1.00
108-86-1	Bromobenzene		46.0	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.3	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		48.8	ug/L	0.300	1.00
75-25-2	Bromoform		51.7	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915332**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PS**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 19:06**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 19:06**				
Data File:	**110817V6\6G321.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		48.3	ug/L	0.300	1.00
75-15-0	Carbon disulfide		220	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		46.6	ug/L	0.300	1.00
108-90-7	Chlorobenzene		46.2	ug/L	0.300	1.00
75-00-3	Chloroethane		44.0	ug/L	0.300	1.00
67-66-3	Chloroform		47.0	ug/L	0.300	1.00
74-87-3	Chloromethane		45.6	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.6	ug/L	0.300	1.00
74-95-3	Dibromomethane		46.9	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		49.5	ug/L	0.300	1.00
60-29-7	Ethyl ether		44.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		45.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	44.6	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		45.2	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		43.4	ug/L	1.00	10.0
91-20-3	Naphthalene		48.4	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		47.3	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		45.7	ug/L	0.300	1.00
108-88-3	Toluene		45.9	ug/L	0.300	1.00
79-01-6	Trichloroethylene		46.5	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		45.3	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		214	ug/L	1.50	5.00
75-01-4	Vinyl chloride		44.0	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		47.4	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		46.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		91.3	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4820	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		43.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		44.0	ug/L	0.300	1.00
95-47-6	o-Xylene		45.8	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		45.5	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915332**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PS**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 19:06**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 19:06**				
Data File:	**110817V6\6G321.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		47.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		46.2	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		47.5	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		49.3	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.7	50.0	ug/L	101	(71%-134%)
Bromofluorobenzene	49.9	50.0	ug/L	100	(70%-131%)
Toluene-d8	49.9	50.0	ug/L	100	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915333**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PS**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 20:59**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 20:59**				
Data File:	**110817V6\6G325.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		38.2	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		200	ug/L	1.50	5.00
107-13-1	Acrylonitrile		227	ug/L	1.50	5.00
107-05-1	Allyl chloride		213	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

SDG Number:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915333**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PS**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 20:59**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 20:59**				
Data File:	**110817V6\6G325.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		221	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		2340	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		228	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		228	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		223	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		207	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:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915333**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PS**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 20:59**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 20:59**				
Data File:	**110817V6\6G325.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	50.2	50.0	ug/L	100	(71%-134%)
Bromofluorobenzene	50.6	50.0	ug/L	101	(70%-131%)
Toluene-d8	49.3	50.0	ug/L	99	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915334**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PSD**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 19:35**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 19:35**				
Data File:	**110817V6\6G322.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		49.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.6	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		45.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		46.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		48.0	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		46.6	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		44.7	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	46.4	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		46.4	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		44.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		46.4	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		46.9	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		48.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		45.9	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		47.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		47.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		46.8	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		45.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		46.7	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		45.1	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		46.1	ug/L	0.300	1.00
78-93-3	2-Butanone		156	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		45.6	ug/L	0.300	1.00
591-78-6	2-Hexanone		153	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		45.4	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.0	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		209	ug/L	1.50	5.00
67-64-1	Acetone		128	ug/L	1.50	10.0
75-05-8	Acetonitrile		1110	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		46.2	ug/L	0.300	1.00
108-86-1	Bromobenzene		46.0	ug/L	0.300	1.00
74-97-5	Bromochloromethane		47.9	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		48.6	ug/L	0.300	1.00
75-25-2	Bromoform		50.5	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915334**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PSD**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 19:35**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 19:35**				
Data File:	**110817V6\6G322.D**	**Column:**	**DB-624**		

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		225	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		47.7	ug/L	0.300	1.00
108-90-7	Chlorobenzene		46.5	ug/L	0.300	1.00
75-00-3	Chloroethane		45.2	ug/L	0.300	1.00
67-66-3	Chloroform		46.9	ug/L	0.300	1.00
74-87-3	Chloromethane		48.1	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		51.1	ug/L	0.300	1.00
74-95-3	Dibromomethane		46.8	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		50.7	ug/L	0.300	1.00
60-29-7	Ethyl ether		43.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		46.3	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	46.0	ug/L	0.300	1.00
74-88-4	Iodomethane		225	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		45.9	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		43.6	ug/L	1.00	10.0
91-20-3	Naphthalene		47.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		47.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		46.6	ug/L	0.300	1.00
108-88-3	Toluene		46.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		47.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		46.4	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		207	ug/L	1.50	5.00
75-01-4	Vinyl chloride		46.3	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		47.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		46.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		92.7	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4410	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		44.9	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		45.0	ug/L	0.300	1.00
95-47-6	o-Xylene		45.9	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		46.5	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915334**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PSD**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 19:35**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 19:35**				
Data File:	**110817V6\6G322.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		46.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		46.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		48.2	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		48.2	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.8	50.0	ug/L	100	(71%-134%)
Bromofluorobenzene	49.4	50.0	ug/L	99	(70%-131%)
Toluene-d8	49.9	50.0	ug/L	100	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915335**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PSD**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 21:27**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 21:27**				
Data File:	**110817V6\6G326.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		39.0	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		203	ug/L	1.50	5.00
107-13-1	Acrylonitrile		232	ug/L	1.50	5.00
107-05-1	Allyl chloride		215	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

SDG Number:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915335**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PSD**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 21:27**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 21:27**				
Data File:	**110817V6\6G326.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		224	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		2380	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		232	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		231	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		230	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		211	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:	**2018-697**	**Date Collected:**	**10/26/2017 10:38**	**Matrix:**	**W**
Lab Sample ID:	**1203915335**	**Date Received:**	**10/28/2017 08:50**		
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147596PSD**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/08/2017 21:27**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/08/2017 21:27**				
Data File:	**110817V6\6G326.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	50.2	50.0	ug/L	100	(71%-134%)
Bromofluorobenzene	50.4	50.0	ug/L	101	(70%-131%)
Toluene-d8	49.2	50.0	ug/L	98	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919290**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/14/2017 00:24**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/14/2017 00:24**				
Data File:	**111317V6\6H132BA.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	J	0.490	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	J	0.370	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

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919290**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/14/2017 00:24**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/14/2017 00:24**				
Data File:	**111317V6\6H132BA.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	J	0.500	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:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919290**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/14/2017 00:24**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/14/2017 00:24**				
Data File:	**111317V6\6H132BA.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	51.9	50.0	ug/L	104	(71%-134%)
Bromofluorobenzene	51.2	50.0	ug/L	102	(70%-131%)
Toluene-d8	49.7	50.0	ug/L	99	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown hydrocarbon	16.506	11.6	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919291**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 00:36**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 00:36**				
Data File:	**111517V6\6H332BA.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	J	0.420	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

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919291**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 00:36**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 00:36**				
Data File:	**111517V6\6H332BA.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	J	0.520	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:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919291**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 00:36**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 00:36**				
Data File:	**111517V6\6H332BA.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	50.6	50.0	ug/L	101	(71%-134%)
Bromofluorobenzene	49.7	50.0	ug/L	99	(70%-131%)
Toluene-d8	48.5	50.0	ug/L	97	(74%-124%)

Tentatively Identified Compound Summary

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919292**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/13/2017 22:59**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/13/2017 22:59**				
Data File:	**111317V6\6H129LA.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		49.1	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.2	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		48.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		49.5	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		49.1	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		46.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		43.7	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	43.8	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		49.5	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	B	41.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		42.0	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		47.9	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		50.6	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		43.6	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		50.0	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		48.6	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		42.1	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		41.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		48.8	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		41.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		45.9	ug/L	0.300	1.00
78-93-3	2-Butanone		228	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		42.0	ug/L	0.300	1.00
591-78-6	2-Hexanone		199	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		41.4	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		41.7	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		230	ug/L	1.50	5.00
67-64-1	Acetone		219	ug/L	1.50	10.0
75-05-8	Acetonitrile		1230	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		46.5	ug/L	0.300	1.00
108-86-1	Bromobenzene		44.5	ug/L	0.300	1.00
74-97-5	Bromochloromethane		49.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		49.9	ug/L	0.300	1.00
75-25-2	Bromoform		51.0	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919292**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/13/2017 22:59**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/13/2017 22:59**				
Data File:	**111317V6\6H129LA.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		43.7	ug/L	0.300	1.00
75-15-0	Carbon disulfide		228	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		46.0	ug/L	0.300	1.00
108-90-7	Chlorobenzene		45.2	ug/L	0.300	1.00
75-00-3	Chloroethane		41.8	ug/L	0.300	1.00
67-66-3	Chloroform		48.6	ug/L	0.300	1.00
74-87-3	Chloromethane		40.7	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.2	ug/L	0.300	1.00
74-95-3	Dibromomethane		48.6	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		43.5	ug/L	0.300	1.00
60-29-7	Ethyl ether		43.9	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		43.8	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	35.1	ug/L	0.300	1.00
74-88-4	Iodomethane		232	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		41.9	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		45.9	ug/L	1.00	10.0
91-20-3	Naphthalene		49.0	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		45.3	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		43.4	ug/L	0.300	1.00
108-88-3	Toluene		45.4	ug/L	0.300	1.00
79-01-6	Trichloroethylene		47.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		41.7	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		220	ug/L	1.50	5.00
75-01-4	Vinyl chloride		39.5	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		48.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		47.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		85.8	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4910	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		36.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		39.9	ug/L	0.300	1.00
95-47-6	o-Xylene		44.1	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		40.3	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919292**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/13/2017 22:59**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/13/2017 22:59**				
Data File:	**111317V6\6H129LA.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		49.8	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		41.6	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		48.8	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		49.2	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.2	50.0	ug/L	96	(71%-134%)
Bromofluorobenzene	47.8	50.0	ug/L	96	(70%-131%)
Toluene-d8	48.5	50.0	ug/L	97	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919293**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/13/2017 23:56**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/13/2017 23:56**				
Data File:	**111317V6\6H131LA.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		40.8	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		212	ug/L	1.50	5.00
107-13-1	Acrylonitrile		265	ug/L	1.50	5.00
107-05-1	Allyl chloride		226	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

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919293**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/13/2017 23:56**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/13/2017 23:56**				
Data File:	**111317V6\6H131LA.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		249	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		2690	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		262	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		258	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		262	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		220	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:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919293**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/13/2017 23:56**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/13/2017 23:56**				
Data File:	**111317V6\6H131LA.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	48.9	50.0	ug/L	98	(71%-134%)
Bromofluorobenzene	49.1	50.0	ug/L	98	(70%-131%)
Toluene-d8	47.5	50.0	ug/L	95	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919294**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/15/2017 23:12**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/15/2017 23:12**				
Data File:	**111517V6\6H329LA.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		45.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		41.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		44.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		45.2	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		44.5	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		42.3	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		40.3	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	43.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		45.4	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		41.3	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		42.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		44.3	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		47.2	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		42.9	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		46.7	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		44.4	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		42.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		41.5	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		45.7	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		41.2	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		39.1	ug/L	0.300	1.00
78-93-3	2-Butanone		202	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		41.2	ug/L	0.300	1.00
591-78-6	2-Hexanone		174	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		41.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		41.7	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		220	ug/L	1.50	5.00
67-64-1	Acetone		189	ug/L	1.50	10.0
75-05-8	Acetonitrile		1170	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		42.5	ug/L	0.300	1.00
108-86-1	Bromobenzene		42.4	ug/L	0.300	1.00
74-97-5	Bromochloromethane		45.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		45.5	ug/L	0.300	1.00
75-25-2	Bromoform		45.6	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919294**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/15/2017 23:12**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/15/2017 23:12**				
Data File:	**111517V6\6H329LA.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		47.3	ug/L	0.300	1.00
75-15-0	Carbon disulfide		207	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		42.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		42.9	ug/L	0.300	1.00
75-00-3	Chloroethane		45.0	ug/L	0.300	1.00
67-66-3	Chloroform		44.4	ug/L	0.300	1.00
74-87-3	Chloromethane		44.9	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		47.9	ug/L	0.300	1.00
74-95-3	Dibromomethane		45.3	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		46.9	ug/L	0.300	1.00
60-29-7	Ethyl ether		48.5	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		42.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	41.7	ug/L	0.300	1.00
74-88-4	Iodomethane		209	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		40.9	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		41.4	ug/L	1.00	10.0
91-20-3	Naphthalene		46.7	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		43.7	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		41.8	ug/L	0.300	1.00
108-88-3	Toluene		42.8	ug/L	0.300	1.00
79-01-6	Trichloroethylene		43.7	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		45.6	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		242	ug/L	1.50	5.00
75-01-4	Vinyl chloride		43.4	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		44.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		43.1	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		84.6	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4760	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		39.8	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		40.4	ug/L	0.300	1.00
95-47-6	o-Xylene		42.7	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		41.6	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919294**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/15/2017 23:12**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/15/2017 23:12**				
Data File:	**111517V6\6H329LA.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		45.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		41.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		44.2	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		44.5	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.2	50.0	ug/L	100	(71%-134%)
Bromofluorobenzene	47.9	50.0	ug/L	96	(70%-131%)
Toluene-d8	49.2	50.0	ug/L	98	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919295**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 00:08**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 00:08**				
Data File:	**111517V6\6H331LA.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		36.2	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		192	ug/L	1.50	5.00
107-13-1	Acrylonitrile		243	ug/L	1.50	5.00
107-05-1	Allyl chloride		199	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

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919295**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 00:08**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 00:08**				
Data File:	**111517V6\6H331LA.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		228	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		2570	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		240	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		233	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		240	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		188	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:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203919295**				
Client Sample:	**QC for batch 1717151**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1717151**	**Method:**	**SW-846:8260B**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1717151**	**Inst:**	**VOA6.I**	**Dilution:**	**1**
Run Date:	**11/16/2017 00:08**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**11/16/2017 00:08**				
Data File:	**111517V6\6H331LA.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	50.9	50.0	ug/L	102	(71%-134%)
Bromofluorobenzene	50.3	50.0	ug/L	101	(70%-131%)
Toluene-d8	49.0	50.0	ug/L	98	(74%-124%)

Semi-Volatile Analysis

Case Narrative

GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-697
Work Order #: 437078

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:	1716878
Prep Batch Number:	1716877

Sample Analysis

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

Sample ID	Client ID
437078005	CAPA-18-147583
437078007	CAPA-18-147627
437078009	CAPA-18-147631
1203914619	Method Blank (MB)
1203914620	Laboratory Control Sample (LCS)
1203914621	437078005(CAPA-18-147583) Matrix Spike (MS)
1203914622	437078005(CAPA-18-147583) 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# 39.

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 437078005 (CAPA-18-147583), 437078007 (CAPA-18-147627) and 437078009 (CAPA-18-147631) 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 and/or LCSD (See Below) did not meet spike recovery acceptance criteria. The failures are known to be poor responding analytes as stated per the Method. This may account for the low recoveries and the data were reported.

Sample	Analyte	Value
1203914620 (LCS)	Hexachlorocyclopentadiene	29* (34%-89%)

QC Sample Designation
Sample 437078005 (CAPA-18-147583) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement
The MS and MSD (See Below) did not meet spike recovery acceptance criteria. The failures are known to be poor responding analytes as stated per the Method. This may account for the low recoveries and the data were reported.

Sample	Analyte	Value
1203914621 (CAPA-18-147583MS)	Hexachlorocyclopentadiene	25* (26%-79%)
1203914622 (CAPA-18-147583MSD)	Hexachlorocyclopentadiene	25* (26%-79%)

MS/MSD Relative Percent Difference (RPD) Statement
The relative percent difference (RPD) between the MS and MSD (See Below) did not meet acceptance limits. As the individual MS and MSD recoveries were within the acceptance limits, the failures had no adverse impact on the reported sample data.

Sample	Analyte	Value
1203914621MS and 1203914622MSD (CAPA-18-147583)	Benzidine	RPD 42* (0%-30%)

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
Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

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 437078005 (CAPA-18-147583), 437078007 (CAPA-18-147627) and 437078009 (CAPA-18-147631) 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
MSD5.I	Agilent 6890/5973 GC/MS w/ 7683 Autosampler	HP6890/HP5973	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: 2018-697 GEL Work Order: 437078

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: Barbara Bailey **Name: Barbara Bailey**

Date: 28 NOV 2017 **Title: Data Validator**

Sample Data Summary

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078005**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147583**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 12:18**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0915.D**	**Column:**	**DB-5ms**		

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
	1,2-Diphenylhydrazine					
541-73-1	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
	4-Chloro-3-methylphenol					
106-47-8	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

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078005**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147583**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 12:18**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0915.D**	**Column:**	**DB-5ms**		

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 *N-Nitrosodipropylamine*	U	3.00	ug/L	3.00	10.0
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	10.0

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078005**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147583**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 12:18**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0915.D**	**Column:**	**DB-5ms**		

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 *m-Nitroaniline*	U	3.00	ug/L	3.00	10.0
95-48-7	o-Cresol	U	3.00	ug/L	3.00	10.0
88-74-4	2-Nitroaniline *o-Nitroaniline*	U	3.00	ug/L	3.00	10.0
100-01-6	4-Nitroaniline *p-Nitroaniline*	U	3.00	ug/L	3.00	10.0

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	63.5	100	ug/L	64	(32%-124%)
2-Fluorobiphenyl	34.0	50.0	ug/L	68	(32%-112%)
2-Fluorophenol	46.6	100	ug/L	47	(15%-88%)
Nitrobenzene-d5	38.5	50.0	ug/L	77	(36%-115%)
Phenol-d5	32.6	100	ug/L	33	(15%-91%)
p-Terphenyl-d14	39.5	50.0	ug/L	79	(36%-121%)

Tentatively Identified Compound Summary

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

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078007**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147627**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 15:52**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**960 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0922.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.13	ug/L	3.13	10.4
120-82-1	1,2,4-Trichlorobenzene	U	3.13	ug/L	3.13	10.4
95-50-1	1,2-Dichlorobenzene	U	3.13	ug/L	3.13	10.4
122-66-7	Azobenzene	U	3.13	ug/L	3.13	10.4
	1,2-Diphenylhydrazine					
541-73-1	1,3-Dichlorobenzene	U	3.13	ug/L	3.13	10.4
106-46-7	1,4-Dichlorobenzene	U	3.13	ug/L	3.13	10.4
123-91-1	1,4-Dioxane	U	3.13	ug/L	3.13	10.4
90-12-0	1-Methylnaphthalene	U	0.313	ug/L	0.313	1.04
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.13	ug/L	3.13	10.4
95-95-4	2,4,5-Trichlorophenol	U	3.13	ug/L	3.13	10.4
88-06-2	2,4,6-Trichlorophenol	U	3.13	ug/L	3.13	10.4
120-83-2	2,4-Dichlorophenol	U	3.13	ug/L	3.13	10.4
105-67-9	2,4-Dimethylphenol	U	3.13	ug/L	3.13	10.4
51-28-5	2,4-Dinitrophenol	U	5.21	ug/L	5.21	20.8
121-14-2	2,4-Dinitrotoluene	U	3.13	ug/L	3.13	10.4
606-20-2	2,6-Dinitrotoluene	U	3.13	ug/L	3.13	10.4
91-58-7	2-Chloronaphthalene	U	0.427	ug/L	0.427	1.04
95-57-8	2-Chlorophenol	U	3.13	ug/L	3.13	10.4
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.13	ug/L	3.13	10.4
91-57-6	2-Methylnaphthalene	U	0.313	ug/L	0.313	1.04
88-75-5	2-Nitrophenol	U	3.13	ug/L	3.13	10.4
91-94-1	3,3'-Dichlorobenzidine	U	3.13	ug/L	3.13	10.4
101-55-3	4-Bromophenylphenylether	U	3.13	ug/L	3.13	10.4
59-50-7	Parachlorometa cresol	U	3.13	ug/L	3.13	10.4
	4-Chloro-3-methylphenol					
106-47-8	4-Chloroaniline	U	3.44	ug/L	3.44	10.4
7005-72-3	4-Chlorophenylphenylether	U	3.13	ug/L	3.13	10.4
100-02-7	4-Nitrophenol	U	3.13	ug/L	3.13	10.4
83-32-9	Acenaphthene	U	0.313	ug/L	0.313	1.04
208-96-8	Acenaphthylene	U	0.313	ug/L	0.313	1.04
62-53-3	Aniline	U	4.38	ug/L	4.38	10.4
120-12-7	Anthracene	U	0.313	ug/L	0.313	1.04
1912-24-9	Atrazine	U	3.13	ug/L	3.13	10.4
92-87-5	Benzidine	U	4.06	ug/L	4.06	10.4
56-55-3	Benzo(a)anthracene	U	0.313	ug/L	0.313	1.04
50-32-8	Benzo(a)pyrene	U	0.313	ug/L	0.313	1.04
205-99-2	Benzo(b)fluoranthene	U	0.313	ug/L	0.313	1.04
191-24-2	Benzo(ghi)perylene	U	0.313	ug/L	0.313	1.04

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078007**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147627**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 15:52**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**960 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0922.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.313	ug/L	0.313	1.04
65-85-0	Benzoic acid	U	6.25	ug/L	6.25	20.8
100-51-6	Benzyl alcohol	U	3.13	ug/L	3.13	10.4
85-68-7	Butylbenzylphthalate	U	3.13	ug/L	3.13	10.4
218-01-9	Chrysene	U	0.313	ug/L	0.313	1.04
84-74-2	Di-n-butylphthalate	U	3.13	ug/L	3.13	10.4
117-84-0	Di-n-octylphthalate	U	3.13	ug/L	3.13	10.4
53-70-3	Dibenzo(a,h)anthracene	U	0.313	ug/L	0.313	1.04
132-64-9	Dibenzofuran	U	3.13	ug/L	3.13	10.4
84-66-2	Diethylphthalate	U	3.13	ug/L	3.13	10.4
131-11-3	Dimethylphthalate	U	3.13	ug/L	3.13	10.4
88-85-7	Dinoseb	U	3.13	ug/L	3.13	10.4
122-39-4	Diphenylamine	U	3.13	ug/L	3.13	10.4
206-44-0	Fluoranthene	U	0.313	ug/L	0.313	1.04
86-73-7	Fluorene	U	0.313	ug/L	0.313	1.04
118-74-1	Hexachlorobenzene	U	3.13	ug/L	3.13	10.4
87-68-3	Hexachlorobutadiene	U	3.13	ug/L	3.13	10.4
77-47-4	Hexachlorocyclopentadiene	U	3.13	ug/L	3.13	10.4
67-72-1	Hexachloroethane	U	3.13	ug/L	3.13	10.4
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.313	ug/L	0.313	1.04
78-59-1	Isophorone	U	3.65	ug/L	3.65	10.4
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.13	ug/L	3.13	10.4
924-16-3	N-Nitrosodi-n-butylamine	U	3.13	ug/L	3.13	10.4
55-18-5	N-Nitrosodiethylamine	U	3.13	ug/L	3.13	10.4
621-64-7	N-Nitrosodi--n-propylamine *N-Nitrosodipropylamine*	U	3.13	ug/L	3.13	10.4
930-55-2	N-Nitrosopyrrolidine	U	3.13	ug/L	3.13	10.4
91-20-3	Naphthalene	U	0.313	ug/L	0.313	1.04
98-95-3	Nitrobenzene	U	3.13	ug/L	3.13	10.4
608-93-5	Pentachlorobenzene	U	3.13	ug/L	3.13	10.4
87-86-5	Pentachlorophenol	U	3.13	ug/L	3.13	10.4
85-01-8	Phenanthrene	U	0.313	ug/L	0.313	1.04
108-95-2	Phenol	U	3.13	ug/L	3.13	10.4
129-00-0	Pyrene	U	0.313	ug/L	0.313	1.04
110-86-1	Pyridine	U	3.13	ug/L	3.13	10.4
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.13	ug/L	3.13	10.4
111-91-1	bis(2-Chloroethoxy)methane	U	3.13	ug/L	3.13	10.4
111-44-4	bis(2-Chloroethyl) ether	U	3.13	ug/L	3.13	10.4
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.13	ug/L	3.13	10.4

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078007**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147627**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 15:52**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**960 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0922.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.85	ug/L	3.85	10.4
99-09-2	3-Nitroaniline *m-Nitroaniline*	U	3.13	ug/L	3.13	10.4
95-48-7	o-Cresol	U	3.13	ug/L	3.13	10.4
88-74-4	2-Nitroaniline *o-Nitroaniline*	U	3.13	ug/L	3.13	10.4
100-01-6	4-Nitroaniline *p-Nitroaniline*	U	3.13	ug/L	3.13	10.4

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	67.1	104	ug/L	64	(32%-124%)
2-Fluorobiphenyl	34.8	52.1	ug/L	67	(32%-112%)
2-Fluorophenol	49.5	104	ug/L	48	(15%-88%)
Nitrobenzene-d5	39.4	52.1	ug/L	76	(36%-115%)
Phenol-d5	35.4	104	ug/L	34	(15%-91%)
p-Terphenyl-d14	39.3	52.1	ug/L	75	(36%-121%)

Tentatively Identified Compound Summary

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

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078009**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147631**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 16:22**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**950 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0923.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.16	ug/L	3.16	10.5
120-82-1	1,2,4-Trichlorobenzene	U	3.16	ug/L	3.16	10.5
95-50-1	1,2-Dichlorobenzene	U	3.16	ug/L	3.16	10.5
122-66-7	Azobenzene	U	3.16	ug/L	3.16	10.5
	1,2-Diphenylhydrazine					
541-73-1	1,3-Dichlorobenzene	U	3.16	ug/L	3.16	10.5
106-46-7	1,4-Dichlorobenzene	U	3.16	ug/L	3.16	10.5
123-91-1	1,4-Dioxane	U	3.16	ug/L	3.16	10.5
90-12-0	1-Methylnaphthalene	U	0.316	ug/L	0.316	1.05
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.16	ug/L	3.16	10.5
95-95-4	2,4,5-Trichlorophenol	U	3.16	ug/L	3.16	10.5
88-06-2	2,4,6-Trichlorophenol	U	3.16	ug/L	3.16	10.5
120-83-2	2,4-Dichlorophenol	U	3.16	ug/L	3.16	10.5
105-67-9	2,4-Dimethylphenol	U	3.16	ug/L	3.16	10.5
51-28-5	2,4-Dinitrophenol	U	5.26	ug/L	5.26	21.1
121-14-2	2,4-Dinitrotoluene	U	3.16	ug/L	3.16	10.5
606-20-2	2,6-Dinitrotoluene	U	3.16	ug/L	3.16	10.5
91-58-7	2-Chloronaphthalene	U	0.432	ug/L	0.432	1.05
95-57-8	2-Chlorophenol	U	3.16	ug/L	3.16	10.5
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.16	ug/L	3.16	10.5
91-57-6	2-Methylnaphthalene	U	0.316	ug/L	0.316	1.05
88-75-5	2-Nitrophenol	U	3.16	ug/L	3.16	10.5
91-94-1	3,3'-Dichlorobenzidine	U	3.16	ug/L	3.16	10.5
101-55-3	4-Bromophenylphenylether	U	3.16	ug/L	3.16	10.5
59-50-7	Parachlorometa cresol	U	3.16	ug/L	3.16	10.5
	4-Chloro-3-methylphenol					
106-47-8	4-Chloroaniline	U	3.47	ug/L	3.47	10.5
7005-72-3	4-Chlorophenylphenylether	U	3.16	ug/L	3.16	10.5
100-02-7	4-Nitrophenol	U	3.16	ug/L	3.16	10.5
83-32-9	Acenaphthene	U	0.316	ug/L	0.316	1.05
208-96-8	Acenaphthylene	U	0.316	ug/L	0.316	1.05
62-53-3	Aniline	U	4.42	ug/L	4.42	10.5
120-12-7	Anthracene	U	0.316	ug/L	0.316	1.05
1912-24-9	Atrazine	U	3.16	ug/L	3.16	10.5
92-87-5	Benzidine	U	4.11	ug/L	4.11	10.5
56-55-3	Benzo(a)anthracene	U	0.316	ug/L	0.316	1.05
50-32-8	Benzo(a)pyrene	U	0.316	ug/L	0.316	1.05
205-99-2	Benzo(b)fluoranthene	U	0.316	ug/L	0.316	1.05
191-24-2	Benzo(ghi)perylene	U	0.316	ug/L	0.316	1.05

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078009**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147631**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 16:22**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**950 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0923.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.316	ug/L	0.316	1.05
65-85-0	Benzoic acid	U	6.32	ug/L	6.32	21.1
100-51-6	Benzyl alcohol	U	3.16	ug/L	3.16	10.5
85-68-7	Butylbenzylphthalate	U	3.16	ug/L	3.16	10.5
218-01-9	Chrysene	U	0.316	ug/L	0.316	1.05
84-74-2	Di-n-butylphthalate	U	3.16	ug/L	3.16	10.5
117-84-0	Di-n-octylphthalate	U	3.16	ug/L	3.16	10.5
53-70-3	Dibenzo(a,h)anthracene	U	0.316	ug/L	0.316	1.05
132-64-9	Dibenzofuran	U	3.16	ug/L	3.16	10.5
84-66-2	Diethylphthalate	U	3.16	ug/L	3.16	10.5
131-11-3	Dimethylphthalate	U	3.16	ug/L	3.16	10.5
88-85-7	Dinoseb	U	3.16	ug/L	3.16	10.5
122-39-4	Diphenylamine	U	3.16	ug/L	3.16	10.5
206-44-0	Fluoranthene	U	0.316	ug/L	0.316	1.05
86-73-7	Fluorene	U	0.316	ug/L	0.316	1.05
118-74-1	Hexachlorobenzene	U	3.16	ug/L	3.16	10.5
87-68-3	Hexachlorobutadiene	U	3.16	ug/L	3.16	10.5
77-47-4	Hexachlorocyclopentadiene	U	3.16	ug/L	3.16	10.5
67-72-1	Hexachloroethane	U	3.16	ug/L	3.16	10.5
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.316	ug/L	0.316	1.05
78-59-1	Isophorone	U	3.68	ug/L	3.68	10.5
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.16	ug/L	3.16	10.5
924-16-3	N-Nitrosodi-n-butylamine	U	3.16	ug/L	3.16	10.5
55-18-5	N-Nitrosodiethylamine	U	3.16	ug/L	3.16	10.5
621-64-7	N-Nitrosodi--n-propylamine *N-Nitrosodipropylamine*	U	3.16	ug/L	3.16	10.5
930-55-2	N-Nitrosopyrrolidine	U	3.16	ug/L	3.16	10.5
91-20-3	Naphthalene	U	0.316	ug/L	0.316	1.05
98-95-3	Nitrobenzene	U	3.16	ug/L	3.16	10.5
608-93-5	Pentachlorobenzene	U	3.16	ug/L	3.16	10.5
87-86-5	Pentachlorophenol	U	3.16	ug/L	3.16	10.5
85-01-8	Phenanthrene	U	0.316	ug/L	0.316	1.05
108-95-2	Phenol	U	3.16	ug/L	3.16	10.5
129-00-0	Pyrene	U	0.316	ug/L	0.316	1.05
110-86-1	Pyridine	U	3.16	ug/L	3.16	10.5
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.16	ug/L	3.16	10.5
111-91-1	bis(2-Chloroethoxy)methane	U	3.16	ug/L	3.16	10.5
111-44-4	bis(2-Chloroethyl) ether	U	3.16	ug/L	3.16	10.5
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.16	ug/L	3.16	10.5

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**437078009**	**Date Received:**	**11/04/2017 09:15**		
		Client:	**ARSL004**	**Project:**	**ESHL00114**
Client ID:	**CAPA-18-147631**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 16:22**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**950 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0923.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.89	ug/L	3.89	10.5
99-09-2	3-Nitroaniline *m-Nitroaniline*	U	3.16	ug/L	3.16	10.5
95-48-7	o-Cresol	U	3.16	ug/L	3.16	10.5
88-74-4	2-Nitroaniline *o-Nitroaniline*	U	3.16	ug/L	3.16	10.5
100-01-6	4-Nitroaniline *p-Nitroaniline*	U	3.16	ug/L	3.16	10.5

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	67.5	105	ug/L	64	(32%-124%)
2-Fluorobiphenyl	34.9	52.6	ug/L	66	(32%-112%)
2-Fluorophenol	50.6	105	ug/L	48	(15%-88%)
Nitrobenzene-d5	40.0	52.6	ug/L	76	(36%-115%)
Phenol-d5	36.6	105	ug/L	35	(15%-91%)
p-Terphenyl-d14	45.3	52.6	ug/L	86	(36%-121%)

Tentatively Identified Compound Summary

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

Quality Control Summary

Surrogate Recovery Report

SDG Number: 2018-697

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203914619	MB for batch 1716877	43	30	74	60	60	70
1203914620	LCS for batch 1716877	39	25	62	55	55	74
437078005	CAPA-18-147583	47	33	77	68	64	79
1203914621	CAPA-18-147583MS	65	54	79	74	71	82
1203914622	CAPA-18-147583MSD	66	54	78	74	74	86
437078007	CAPA-18-147627	48	34	76	67	64	75
437078009	CAPA-18-147631	48	35	76	66	64	86

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

SDG Number: 2018-697
Client ID: LCS for batch 1716877
Lab Sample ID 1203914620
Instrument: MSD5.I
Analvst: JMB3
Inj. Vol: 1 uL

Sample Type: Laboratory Control Sample
Matrix: WATER
Analvsis Date: 11/09/2017 11:47
Dilution: 1
Prep Batch ID: 1716877
Batch ID: 1716878

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	20.5	41	30-88
110-86-1	LCS	Pyridine	50.0	0.0	22.1	44	27-89
62-53-3	LCS	Aniline	50.0	0.0	33.2	66	49-112
108-95-2	LCS	Phenol	50.0	0.0	13.9	28	16-82
111-44-4	LCS	bis(2-Chloroethyl) ether	50.0	0.0	35.8	72	51-111
95-57-8	LCS	2-Chlorophenol	50.0	0.0	31.1	62	49-105
541-73-1	LCS	1,3-Dichlorobenzene	50.0	0.0	26.0	52	37-95
106-46-7	LCS	1,4-Dichlorobenzene	50.0	0.0	25.1	50	38-96
95-50-1	LCS	1,2-Dichlorobenzene	50.0	0.0	26.4	53	39-97
108-60-1	LCS	bis(2-Chloro-1-methylethyl)ether	50.0	0.0	32.1	64	44-123
100-51-6	LCS	Benzyl alcohol	50.0	0.0	30.3	61	44-102
95-48-7	LCS	o-Cresol	50.0	0.0	29.7	59	41-101
65794-96-9	LCS	m,p-Cresols	50.0	0.0	28.2	56	43-102
621-64-7	LCS	N-Nitrosodi--n-propylamine *N-Nitrosodipropylamine*	50.0	0.0	29.9	60	54-115
67-72-1	LCS	Hexachloroethane	50.0	0.0	25.1	50	36-96
98-95-3	LCS	Nitrobenzene	50.0	0.0	31.6	63	53-115
78-59-1	LCS	Isophorone	50.0	0.0	32.5	65	56-117
88-75-5	LCS	2-Nitrophenol	50.0	0.0	32.2	64	51-113
105-67-9	LCS	2,4-Dimethylphenol	50.0	0.0	28.5	57	51-104
111-91-1	LCS	bis(2-Chloroethoxy)methane	50.0	0.0	35.2	70	55-114
120-83-2	LCS	2,4-Dichlorophenol	50.0	0.0	32.9	66	53-109
65-85-0	LCS	Benzoic acid	100	0.0	29.6	30	21-74

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1716877
Matrix: WATER
Lab Sample ID 1203914620
Instrument: MSD5.I
Analysis Date: 11/09/2017 11:47
Dilution: 1
Analyst: JMB3
Prep Batch ID: 1716877
Inj. Vol: 1 uL
Batch ID: 1716878

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	39.2	78	65-136
87-68-3	LCS	Hexachlorobutadiene	50.0	0.0	22.2	44	35-98
59-50-7	LCS	Parachlorometa cresol *4-Chloro-3-methylphenol*	50.0	0.0	33.6	67	55-115
91-57-6	LCS	2-Methylnaphthalene	50.0	0.0	27.2	54	42-103
91-20-3	LCS	Naphthalene	50.0	0.0	27.4	55	44-102
90-12-0	LCS	1-Methylnaphthalene	50.0	0.0	27.7	55	45-108
77-47-4	LCS	Hexachlorocyclopentadiene	50.0	0.0	14.7	29 *	34-89
88-06-2	LCS	2,4,6-Trichlorophenol	50.0	0.0	30.5	61	55-120
95-95-4	LCS	2,4,5-Trichlorophenol	50.0	0.0	30.5	61	55-116
91-58-7	LCS	2-Chloronaphthalene	50.0	0.0	26.4	53	44-107
88-74-4	LCS	2-Nitroaniline *o-Nitroaniline*	50.0	0.0	31.8	64	53-121
99-09-2	LCS	3-Nitroaniline *m-Nitroaniline*	50.0	0.0	41.3	83	61-139
131-11-3	LCS	Dimethylphthalate	50.0	0.0	34.5	69	60-122
606-20-2	LCS	2,6-Dinitrotoluene	50.0	0.0	35.6	71	59-122
121-14-2	LCS	2,4-Dinitrotoluene	50.0	0.0	34.6	69	57-124
208-96-8	LCS	Acenaphthylene	50.0	0.0	31.2	62	50-113
83-32-9	LCS	Acenaphthene	50.0	0.0	32.1	64	49-112
51-28-5	LCS	2,4-Dinitrophenol	50.0	0.0	19.6	39	34-122
132-64-9	LCS	Dibenzofuran	50.0	0.0	30.9	62	50-111
58-90-2	LCS	2,3,4,6-Tetrachlorophenol	50.0	0.0	31.2	62	54-122
84-66-2	LCS	Diethylphthalate	50.0	0.0	33.2	66	57-122
100-02-7	LCS	4-Nitrophenol	50.0	0.0	12.8	26	15-137

Semi-Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1716877
Matrix: WATER
Lab Sample ID 1203914620
Instrument: MSD5.I
Analysis Date: 11/09/2017 11:47
Dilution: 1
Analyst: JMB3
Prep Batch ID: 1716877
Inj. Vol: 1 uL
Batch ID: 1716878

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	29.8	60	52-114
7005-72-3	LCS	4-Chlorophenylphenylether	50.0	0.0	30.1	60	52-121
100-01-6	LCS	4-Nitroaniline *p-Nitroaniline*	50.0	0.0	32.8	66	44-137
534-52-1	LCS	2-Methyl-4,6-dinitrophenol	50.0	0.0	29.3	59	45-124
122-39-4	LCS	Diphenylamine	50.0	0.0	28.1	56	55-113
122-66-7	LCS	Azobenzene *1,2-Diphenylhydrazine*	50.0	0.0	31.2	62	53-115
101-55-3	LCS	4-Bromophenylphenylether	50.0	0.0	30.2	60	54-116
118-74-1	LCS	Hexachlorobenzene	50.0	0.0	28.8	58	54-115
87-86-5	LCS	Pentachlorophenol	50.0	0.0	32.4	65	41-116
85-01-8	LCS	Phenanthrene	50.0	0.0	31.8	64	55-110
120-12-7	LCS	Anthracene	50.0	0.0	31.4	63	56-112
84-74-2	LCS	Di-n-butylphthalate	50.0	0.0	33.2	66	57-123
206-44-0	LCS	Fluoranthene	50.0	0.0	32.7	65	54-118
129-00-0	LCS	Pyrene	50.0	0.0	34.4	69	49-121
85-68-7	LCS	Butylbenzylphthalate	50.0	0.0	34.8	70	52-125
117-81-7	LCS	bis(2-Ethylhexyl)phthalate	50.0	0.0	33.1	66	52-125
56-55-3	LCS	Benzo(a)anthracene	50.0	0.0	34.1	68	57-112
218-01-9	LCS	Chrysene	50.0	0.0	33.7	67	58-117
117-84-0	LCS	Di-n-octylphthalate	50.0	0.0	30.7	61	50-129
205-99-2	LCS	Benzo(b)fluoranthene	50.0	0.0	33.0	66	41-118
207-08-9	LCS	Benzo(k)fluoranthene	50.0	0.0	31.9	64	42-121
50-32-8	LCS	Benzo(a)pyrene	50.0	0.0	31.9	64	40-118

Semi-Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Laboratory Control Sample
Client ID: LCS for batch 1716877
Matrix: WATER
Lab Sample ID 1203914620
Instrument: MSD5.I
Analysis Date: 11/09/2017 11:47
Dilution: 1
Analyst: JMB3
Prep Batch ID: 1716877
Inj. Vol: 1 uL
Batch ID: 1716878

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	33.4	67	34-125
53-70-3	LCS	Dibenzo(a,h)anthracene	50.0	0.0	31.2	62	38-129
191-24-2	LCS	Benzo(ghi)perylene	50.0	0.0	32.2	64	33-131
123-91-1	LCS	1,4-Dioxane	50.0	0.0	25.6	51	38-78
930-55-2	LCS	N-Nitrosopyrrolidine	50.0	0.0	36.3	73	54-113
95-94-3	LCS	1,2,4,5-Tetrachlorobenzene	50.0	0.0	25.4	51	44-102
1912-24-9	LCS	Atrazine	50.0	0.0	35.8	72	60-131
92-87-5	LCS	Benzidine	100	0.0	36.6	37	20-144
91-94-1	LCS	3,3'-Dichlorobenzidine	50.0	0.0	31.6	63	43-127
120-82-1	LCS	1,2,4-Trichlorobenzene	50.0	0.0	26.4	53	39-99

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Client ID: CAPA-18-147583MS
Lab Sample ID 1203914621
Instrument: MSD5.I
Analvst: JMB3
Inj. Vol: 1 uL

Sample Type: Matrix Spike
Matrix: W
Analvsis Date: 11/09/2017 12:48
Prep Batch ID: 1716877
Batch ID: 1716878
Dilution: 1

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	125	0.00	U	84.2	67	25-106
110-86-1	MS	Pyridine	125	0.00	U	78.0	62	24-93
62-53-3	MS	Aniline	125	0.00	U	103	83	37-113
108-95-2	MS	Phenol	125	0.00	U	70.4	56	23-82
111-44-4	MS	bis(2-Chloroethyl) ether	125	0.00	U	109	87	39-114
95-57-8	MS	2-Chlorophenol	125	0.00	U	96.3	77	37-108
541-73-1	MS	1,3-Dichlorobenzene	125	0.00	U	80.9	65	27-97
106-46-7	MS	1,4-Dichlorobenzene	125	0.00	U	78.2	63	28-97
95-50-1	MS	1,2-Dichlorobenzene	125	0.00	U	81.7	65	28-99
108-60-1	MS	bis(2-Chloro-1-methylethyl)ether	125	0.00	U	98.1	78	32-127
100-51-6	MS	Benzyl alcohol	125	0.00	U	104	83	37-116
95-48-7	MS	o-Cresol	125	0.00	U	103	82	34-109
65794-96-9	MS	m,p-Cresols	125	0.00	U	106	85	36-120
621-64-7	MS	N-Nitrosodi--n-propylamine *N-Nitrosodipropylamine*	125	0.00	U	91.6	73	42-118
67-72-1	MS	Hexachloroethane	125	0.00	U	79.1	63	29-94
98-95-3	MS	Nitrobenzene	125	0.00	U	98.3	79	38-123
78-59-1	MS	Isophorone	125	0.00	U	102	81	43-120
88-75-5	MS	2-Nitrophenol	125	0.00	U	103	82	39-115
105-67-9	MS	2,4-Dimethylphenol	125	0.00	U	90.2	72	39-107
111-91-1	MS	bis(2-Chloroethoxy)methane	125	0.00	U	111	89	42-118
120-83-2	MS	2,4-Dichlorophenol	125	0.00	U	100	80	40-111
65-85-0	MS	Benzoic acid	250	0.00	U	159	63	17-95

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Client ID: CAPA-18-147583MS
Lab Sample ID 1203914621
Instrument: MSD5.I
Analvst: JMB3
Inj. Vol: 1 uL

Sample Type: Matrix Spike
Matrix: W
Analvsis Date: 11/09/2017 12:48
Prep Batch ID: 1716877
Batch ID: 1716878
Dilution: 1

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	125	0.00	U	123	99	44-138
87-68-3	MS	Hexachlorobutadiene	125	0.00	U	70.4	56	26-98
59-50-7	MS	Parachlorometa cresol *4-Chloro-3-methylphenol*	125	0.00	U	104	83	41-122
91-57-6	MS	2-Methylnaphthalene	125	0.00	U	84.8	68	29-109
91-20-3	MS	Naphthalene	125	0.00	U	87.1	70	31-108
90-12-0	MS	1-Methylnaphthalene	125	0.00	U	87.1	70	33-112
77-47-4	MS	Hexachlorocyclopentadiene	125	0.00	U	30.7	25 *	26-79
88-06-2	MS	2,4,6-Trichlorophenol	125	0.00	U	94.0	75	39-124
95-95-4	MS	2,4,5-Trichlorophenol	125	0.00	U	99.7	80	42-120
91-58-7	MS	2-Chloronaphthalene	125	0.00	U	84.9	68	29-113
88-74-4	MS	2-Nitroaniline *o-Nitroaniline*	125	0.00	U	99.8	80	41-121
99-09-2	MS	3-Nitroaniline *m-Nitroaniline*	125	0.00	U	137	109	42-144
131-11-3	MS	Dimethylphthalate	125	0.00	U	109	87	45-128
606-20-2	MS	2,6-Dinitrotoluene	125	0.00	U	112	90	46-124
121-14-2	MS	2,4-Dinitrotoluene	125	0.00	U	111	89	45-125
208-96-8	MS	Acenaphthylene	125	0.00	U	97.7	78	35-120
83-32-9	MS	Acenaphthene	125	0.00	U	103	83	35-117
51-28-5	MS	2,4-Dinitrophenol	125	0.00	U	77.2	62	27-122
132-64-9	MS	Dibenzofuran	125	0.00	U	98.2	79	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	125	0.00	U	101	81	40-128
84-66-2	MS	Diethylphthalate	125	0.00	U	105	84	43-127
100-02-7	MS	4-Nitrophenol	125	0.00	U	86.1	69	17-85

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Matrix Spike
Client ID: CAPA-18-147583MS
Matrix: W
Lab Sample ID 1203914621
Instrument: MSD5.I
Analysis Date: 11/09/2017 12:48
Dilution: 1
Analyst: JMB3
Prep Batch ID: 1716877
Inj. Vol: 1 uL
Batch ID: 1716878

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	125	0.00	U	93.8	75	39-117
7005-72-3	MS	4-Chlorophenylphenylether	125	0.00	U	97.7	78	39-121
100-01-6	MS	4-Nitroaniline *p-Nitroaniline*	125	0.00	U	125	100	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	125	0.00	U	103	82	32-126
122-39-4	MS	Diphenylamine	125	0.00	U	88.7	71	37-118
122-66-7	MS	Azobenzene *1,2-Diphenylhydrazine*	125	0.00	U	96.0	77	38-120
101-55-3	MS	4-Bromophenylphenylether	125	0.00	U	95.4	76	39-121
118-74-1	MS	Hexachlorobenzene	125	0.00	U	90.2	72	40-118
87-86-5	MS	Pentachlorophenol	125	0.00	U	108	87	35-121
85-01-8	MS	Phenanthrene	125	0.00	U	101	81	40-115
120-12-7	MS	Anthracene	125	0.00	U	98.8	79	38-120
84-74-2	MS	Di-n-butylphthalate	125	0.00	U	103	82	41-128
206-44-0	MS	Fluoranthene	125	0.00	U	106	85	41-119
129-00-0	MS	Pyrene	125	0.00	U	99.3	79	35-128
85-68-7	MS	Butylbenzylphthalate	125	0.00	U	106	85	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	125	0.00	U	101	81	38-131
56-55-3	MS	Benzo(a)anthracene	125	0.00	U	108	87	39-120
218-01-9	MS	Chrysene	125	0.00	U	109	87	41-124
117-84-0	MS	Di-n-octylphthalate	125	0.00	U	103	83	37-134
205-99-2	MS	Benzo(b)fluoranthene	125	0.00	U	108	86	31-122
207-08-9	MS	Benzo(k)fluoranthene	125	0.00	U	102	82	33-123
50-32-8	MS	Benzo(a)pyrene	125	0.00	U	99.4	80	32-118

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Client ID: CAPA-18-147583MS
Lab Sample ID 1203914621
Instrument: MSD5.I
Analvst: JMB3
Inj. Vol: 1 uL

Sample Type: Matrix Spike
Matrix: W
Analvsis Date: 11/09/2017 12:48
Prep Batch ID: 1716877
Batch ID: 1716878
Dilution: 1

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	125	0.00	U	97.4	78	27-121
53-70-3	MS	Dibenzo(a,h)anthracene	125	0.00	U	95.1	76	30-125
191-24-2	MS	Benzo(ghi)perylene	125	0.00	U	91.3	73	24-126
123-91-1	MS	1,4-Dioxane	125	0.00	U	100	80	24-110
930-55-2	MS	N-Nitrosopyrrolidine	125	0.00	U	116	93	47-119
95-94-3	MS	1,2,4,5-Tetrachlorobenzene	125	0.00	U	81.4	65	32-101
1912-24-9	MS	Atrazine	125	0.00	U	111	89	42-129
92-87-5	MS	Benzidine	250	0.00	U	189	76	15-130
91-94-1	MS	3,3'-Dichlorobenzidine	125	0.00	U	122	98	34-124
120-82-1	MS	1,2,4-Trichlorobenzene	125	0.00	U	78.8	63	26-102

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Client ID: CAPA-18-147583MSD
Lab Sample ID 1203914622
Instrument: MSD5.I
Analyst: JMB3
Inj. Vol: 1 uL

Sample Type: Matrix Spike Duplicate
Matrix: W
Analysis Date: 11/09/2017 13:19
Dilution: 1
Prep Batch ID: 1716877
Batch ID: 1716878

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	125	0.00	U	84.1	67	25-106	0	0-30
110-86-1	MSD	Pyridine	125	0.00	U	68.9	55	24-93	12	0-30
62-53-3	MSD	Aniline	125	0.00	U	101	81	37-113	2	0-30
108-95-2	MSD	Phenol	125	0.00	U	70.5	56	23-82	0	0-30
111-44-4	MSD	bis(2-Chloroethyl) ether	125	0.00	U	110	88	39-114	1	0-30
95-57-8	MSD	2-Chlorophenol	125	0.00	U	98.8	79	37-108	3	0-30
541-73-1	MSD	1,3-Dichlorobenzene	125	0.00	U	79.4	64	27-97	2	0-30
106-46-7	MSD	1,4-Dichlorobenzene	125	0.00	U	77.0	62	28-97	2	0-30
95-50-1	MSD	1,2-Dichlorobenzene	125	0.00	U	82.1	66	28-99	0	0-30
108-60-1	MSD	bis(2-Chloro-1-methylethyl)ether	125	0.00	U	99.9	80	32-127	2	0-30
100-51-6	MSD	Benzyl alcohol	125	0.00	U	108	87	37-116	4	0-30
95-48-7	MSD	o-Cresol	125	0.00	U	101	81	34-109	1	0-30
65794-96-9	MSD	m,p-Cresols	125	0.00	U	107	85	36-120	0	0-30
621-64-7	MSD	N-Nitrosodi--n-propylamine *N-Nitrosodipropylamine*	125	0.00	U	92.3	74	42-118	1	0-30
67-72-1	MSD	Hexachloroethane	125	0.00	U	78.4	63	29-94	1	0-30
98-95-3	MSD	Nitrobenzene	125	0.00	U	98.8	79	38-123	0	0-30
78-59-1	MSD	Isophorone	125	0.00	U	104	83	43-120	2	0-30
88-75-5	MSD	2-Nitrophenol	125	0.00	U	104	83	39-115	1	0-30
105-67-9	MSD	2,4-Dimethylphenol	125	0.00	U	90.2	72	39-107	0	0-30
111-91-1	MSD	bis(2-Chloroethoxy)methane	125	0.00	U	111	89	42-118	0	0-30
120-83-2	MSD	2,4-Dichlorophenol	125	0.00	U	102	81	40-111	1	0-30
65-85-0	MSD	Benzoic acid	250	0.00	U	170	68	17-95	7	0-30

Semi-Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Client ID: CAPA-18-147583MSD
Lab Sample ID 1203914622
Instrument: MSD5.I
Analyst: JMB3
Inj. Vol: 1 uL

Sample Type: Matrix Spike Duplicate
Matrix: W
Analysis Date: 11/09/2017 13:19
Dilution: 1
Prep Batch ID: 1716877
Batch ID: 1716878

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	125	0.00	U	121	97	44-138	2	0-30
87-68-3	MSD	Hexachlorobutadiene	125	0.00	U	67.9	54	26-98	4	0-30
59-50-7	MSD	Parachlorometa cresol *4-Chloro-3-methylphenol*	125	0.00	U	110	88	41-122	5	0-30
91-57-6	MSD	2-Methylnaphthalene	125	0.00	U	87.7	70	29-109	3	0-30
91-20-3	MSD	Naphthalene	125	0.00	U	87.5	70	31-108	0	0-30
90-12-0	MSD	1-Methylnaphthalene	125	0.00	U	89.9	72	33-112	3	0-30
77-47-4	MSD	Hexachlorocyclopentadiene	125	0.00	U	31.6	25 *	26-79	3	0-30
88-06-2	MSD	2,4,6-Trichlorophenol	125	0.00	U	94.3	75	39-124	0	0-30
95-95-4	MSD	2,4,5-Trichlorophenol	125	0.00	U	103	82	42-120	3	0-30
91-58-7	MSD	2-Chloronaphthalene	125	0.00	U	84.6	68	29-113	0	0-30
88-74-4	MSD	2-Nitroaniline *o-Nitroaniline*	125	0.00	U	104	83	41-121	4	0-30
99-09-2	MSD	3-Nitroaniline *m-Nitroaniline*	125	0.00	U	142	114	42-144	4	0-30
131-11-3	MSD	Dimethylphthalate	125	0.00	U	113	91	45-128	4	0-30
606-20-2	MSD	2,6-Dinitrotoluene	125	0.00	U	118	94	46-124	5	0-30
121-14-2	MSD	2,4-Dinitrotoluene	125	0.00	U	116	92	45-125	4	0-30
208-96-8	MSD	Acenaphthylene	125	0.00	U	99.6	80	35-120	2	0-30
83-32-9	MSD	Acenaphthene	125	0.00	U	105	84	35-117	2	0-30
51-28-5	MSD	2,4-Dinitrophenol	125	0.00	U	81.0	65	27-122	5	0-30
132-64-9	MSD	Dibenzofuran	125	0.00	U	101	81	38-113	3	0-30
58-90-2	MSD	2,3,4,6-Tetrachlorophenol	125	0.00	U	106	85	40-128	5	0-30
84-66-2	MSD	Diethylphthalate	125	0.00	U	109	87	43-127	4	0-30
100-02-7	MSD	4-Nitrophenol	125	0.00	U	69.3	55	17-85	22	0-30

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Sample Type: Matrix Spike Duplicate
Client ID: CAPA-18-147583MSD
Matrix: W
Lab Sample ID 1203914622
Instrument: MSD5.I
Analysis Date: 11/09/2017 13:19
Dilution: 1
Analyst: JMB3
Prep Batch ID: 1716877
Inj. Vol: 1 uL
Batch ID: 1716878

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	125	0.00	U	95.3	76	39-117	2	0-30
7005-72-3	MSD	4-Chlorophenylphenylether	125	0.00	U	99.4	80	39-121	2	0-30
100-01-6	MSD	4-Nitroaniline *p-Nitroaniline*	125	0.00	U	127	102	30-133	2	0-30
534-52-1	MSD	2-Methyl-4,6-dinitrophenol	125	0.00	U	106	85	32-126	3	0-30
122-39-4	MSD	Diphenylamine	125	0.00	U	93.1	74	37-118	5	0-30
122-66-7	MSD	Azobenzene *1,2-Diphenylhydrazine*	125	0.00	U	99.7	80	38-120	4	0-30
101-55-3	MSD	4-Bromophenylphenylether	125	0.00	U	99.3	79	39-121	4	0-30
118-74-1	MSD	Hexachlorobenzene	125	0.00	U	96.4	77	40-118	7	0-30
87-86-5	MSD	Pentachlorophenol	125	0.00	U	114	91	35-121	5	0-30
85-01-8	MSD	Phenanthrene	125	0.00	U	105	84	40-115	4	0-30
120-12-7	MSD	Anthracene	125	0.00	U	103	83	38-120	5	0-30
84-74-2	MSD	Di-n-butylphthalate	125	0.00	U	107	86	41-128	4	0-30
206-44-0	MSD	Fluoranthene	125	0.00	U	110	88	41-119	4	0-30
129-00-0	MSD	Pyrene	125	0.00	U	102	82	35-128	3	0-30
85-68-7	MSD	Butylbenzylphthalate	125	0.00	U	109	87	40-129	3	0-30
117-81-7	MSD	bis(2-Ethylhexyl)phthalate	125	0.00	U	104	83	38-131	3	0-30
56-55-3	MSD	Benzo(a)anthracene	125	0.00	U	113	90	39-120	4	0-30
218-01-9	MSD	Chrysene	125	0.00	U	114	91	41-124	5	0-30
117-84-0	MSD	Di-n-octylphthalate	125	0.00	U	110	88	37-134	6	0-30
205-99-2	MSD	Benzo(b)fluoranthene	125	0.00	U	111	89	31-122	2	0-30
207-08-9	MSD	Benzo(k)fluoranthene	125	0.00	U	110	88	33-123	7	0-30
50-32-8	MSD	Benzo(a)pyrene	125	0.00	U	106	85	32-118	7	0-30

Semi-Volatile

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-697
Client ID: CAPA-18-147583MSD
Lab Sample ID 1203914622
Instrument: MSD5.I
Analvst: JMB3
Inj. Vol: 1 uL

Sample Type: Matrix Spike Duplicate
Matrix: W
Analvsis Date: 11/09/2017 13:19
Prep Batch ID: 1716877
Batch ID: 1716878
Dilution: 1

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	MSD	Indeno(1,2,3-cd)pyrene	125	0.00	U	104	83	27-121	6	0-30
53-70-3	MSD	Dibenzo(a,h)anthracene	125	0.00	U	104	83	30-125	9	0-30
191-24-2	MSD	Benzo(ghi)perylene	125	0.00	U	102	82	24-126	11	0-30
123-91-1	MSD	1,4-Dioxane	125	0.00	U	101	81	24-110	1	0-30
930-55-2	MSD	N-Nitrosopyrrolidine	125	0.00	U	121	97	47-119	4	0-30
95-94-3	MSD	1,2,4,5-Tetrachlorobenzene	125	0.00	U	81.9	66	32-101	1	0-30
1912-24-9	MSD	Atrazine	125	0.00	U	118	95	42-129	6	0-30
92-87-5	MSD	Benzidine	250	0.00	U	124	49	15-130	42 *	0-30
91-94-1	MSD	3,3'-Dichlorobenzidine	125	0.00	U	127	101	34-124	4	0-30
120-82-1	MSD	1,2,4-Trichlorobenzene	125	0.00	U	78.9	63	26-102	0	0-30

Method Blank Summary

SDG Number:	**2018-697**	**Client:**	**ARSL004**	**Matrix:**	**WATER**
Client ID:	**MB for batch 1716877**	**Instrument ID:**	**MSD5.I**	**Data File:**	**s110917.B\s5k0913.D**
Lab Sample ID:	**1203914619**	**Prep Date:**	**11/08/2017 18:23**	**Analyzed:**	**11/09/17 11:12**
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 1716877	1203914620	s110917.B\s5k0914.D	11/09/17	1147
02	CAPA-18-147583	437078005	s110917.B\s5k0915.D	11/09/17	1218
03	CAPA-18-147583MS	1203914621	s110917.B\s5k0916.D	11/09/17	1248
04	CAPA-18-147583MSD	1203914622	s110917.B\s5k0917.D	11/09/17	1319
05	CAPA-18-147627	437078007	s110917.B\s5k0922.D	11/09/17	1552
06	CAPA-18-147631	437078009	s110917.B\s5k0923.D	11/09/17	1622

Quality Control Data

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203914619**				
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1716877**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 11:12**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0913.D**	**Column:**	**DB-5ms**		

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
	1,2-Diphenylhydrazine					
541-73-1	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
	4-Chloro-3-methylphenol					
106-47-8	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

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203914619**				
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1716877**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 11:12**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0913.D**	**Column:**	**DB-5ms**		

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 *N-Nitrosodipropylamine*	U	3.00	ug/L	3.00	10.0
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	10.0

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203914619**				
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**MB for batch 1716877**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 11:12**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0913.D**	**Column:**	**DB-5ms**		

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 *m-Nitroaniline*	U	3.00	ug/L	3.00	10.0
95-48-7	o-Cresol	U	3.00	ug/L	3.00	10.0
88-74-4	2-Nitroaniline *o-Nitroaniline*	U	3.00	ug/L	3.00	10.0
100-01-6	4-Nitroaniline *p-Nitroaniline*	U	3.00	ug/L	3.00	10.0

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	59.9	100	ug/L	60	(32%-124%)
2-Fluorobiphenyl	30.1	50.0	ug/L	60	(32%-112%)
2-Fluorophenol	42.7	100	ug/L	43	(15%-88%)
Nitrobenzene-d5	37.0	50.0	ug/L	74	(36%-115%)
Phenol-d5	29.9	100	ug/L	30	(15%-91%)
p-Terphenyl-d14	35.0	50.0	ug/L	70	(36%-121%)

Tentatively Identified Compound Summary

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

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203914620**				
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1716877**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 11:47**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0914.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		25.4	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		26.4	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		26.4	ug/L	3.00	10.0
122-66-7	Azobenzene		31.2	ug/L	3.00	10.0
	1,2-Diphenylhydrazine					
541-73-1	1,3-Dichlorobenzene		26.0	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		25.1	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		25.6	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		27.7	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		31.2	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		30.5	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		30.5	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		32.9	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		28.5	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol	J	19.6	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		34.6	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		35.6	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		26.4	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		31.1	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		29.3	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		27.2	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		32.2	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		31.6	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		30.2	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		33.6	ug/L	3.00	10.0
	4-Chloro-3-methylphenol					
106-47-8	4-Chloroaniline		39.2	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		30.1	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		12.8	ug/L	3.00	10.0
83-32-9	Acenaphthene		32.1	ug/L	0.300	1.00
208-96-8	Acenaphthylene		31.2	ug/L	0.300	1.00
62-53-3	Aniline		33.2	ug/L	4.20	10.0
120-12-7	Anthracene		31.4	ug/L	0.300	1.00
1912-24-9	Atrazine		35.8	ug/L	3.00	10.0
92-87-5	Benzidine		36.6	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		34.1	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		31.9	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		33.0	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		32.2	ug/L	0.300	1.00

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203914620**				
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1716877**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 11:47**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0914.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		31.9	ug/L	0.300	1.00
65-85-0	Benzoic acid		29.6	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		30.3	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		34.8	ug/L	3.00	10.0
218-01-9	Chrysene		33.7	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		33.2	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		30.7	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		31.2	ug/L	0.300	1.00
132-64-9	Dibenzofuran		30.9	ug/L	3.00	10.0
84-66-2	Diethylphthalate		33.2	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		34.5	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		28.1	ug/L	3.00	10.0
206-44-0	Fluoranthene		32.7	ug/L	0.300	1.00
86-73-7	Fluorene		29.8	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		28.8	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		22.2	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		14.7	ug/L	3.00	10.0
67-72-1	Hexachloroethane		25.1	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		33.4	ug/L	0.300	1.00
78-59-1	Isophorone		32.5	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		20.5	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 *N-Nitrosodipropylamine*		29.9	ug/L	3.00	10.0
930-55-2	N-Nitrosopyrrolidine		36.3	ug/L	3.00	10.0
91-20-3	Naphthalene		27.4	ug/L	0.300	1.00
98-95-3	Nitrobenzene		31.6	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		32.4	ug/L	3.00	10.0
85-01-8	Phenanthrene		31.8	ug/L	0.300	1.00
108-95-2	Phenol		13.9	ug/L	3.00	10.0
129-00-0	Pyrene		34.4	ug/L	0.300	1.00
110-86-1	Pyridine		22.1	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		32.1	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		35.2	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		35.8	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		33.1	ug/L	3.00	10.0

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**			**Matrix:**	**WATER**
Lab Sample ID:	**1203914620**				
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**LCS for batch 1716877**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 11:47**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0914.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		28.2	ug/L	3.70	10.0
99-09-2	3-Nitroaniline *m-Nitroaniline*		41.3	ug/L	3.00	10.0
95-48-7	o-Cresol		29.7	ug/L	3.00	10.0
88-74-4	2-Nitroaniline *o-Nitroaniline*		31.8	ug/L	3.00	10.0
100-01-6	4-Nitroaniline *p-Nitroaniline*		32.8	ug/L	3.00	10.0

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	55.4	100	ug/L	55	(32%-124%)
2-Fluorobiphenyl	27.3	50.0	ug/L	55	(32%-112%)
2-Fluorophenol	39.1	100	ug/L	39	(15%-88%)
Nitrobenzene-d5	31.2	50.0	ug/L	62	(36%-115%)
Phenol-d5	25.0	100	ug/L	25	(15%-91%)
p-Terphenyl-d14	36.8	50.0	ug/L	74	(36%-121%)

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**1203914621**	**Date Received:**	**11/04/2017 09:15**		
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147583MS**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 12:48**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**400 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0916.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		81.4	ug/L	7.50	25.0
120-82-1	1,2,4-Trichlorobenzene		78.8	ug/L	7.50	25.0
95-50-1	1,2-Dichlorobenzene		81.7	ug/L	7.50	25.0
122-66-7	Azobenzene		96.0	ug/L	7.50	25.0
	1,2-Diphenylhydrazine					
541-73-1	1,3-Dichlorobenzene		80.9	ug/L	7.50	25.0
106-46-7	1,4-Dichlorobenzene		78.2	ug/L	7.50	25.0
123-91-1	1,4-Dioxane		100	ug/L	7.50	25.0
90-12-0	1-Methylnaphthalene		87.1	ug/L	0.750	2.50
58-90-2	2,3,4,6-Tetrachlorophenol		101	ug/L	7.50	25.0
95-95-4	2,4,5-Trichlorophenol		99.7	ug/L	7.50	25.0
88-06-2	2,4,6-Trichlorophenol		94.0	ug/L	7.50	25.0
120-83-2	2,4-Dichlorophenol		100	ug/L	7.50	25.0
105-67-9	2,4-Dimethylphenol		90.2	ug/L	7.50	25.0
51-28-5	2,4-Dinitrophenol		77.2	ug/L	12.5	50.0
121-14-2	2,4-Dinitrotoluene		111	ug/L	7.50	25.0
606-20-2	2,6-Dinitrotoluene		112	ug/L	7.50	25.0
91-58-7	2-Chloronaphthalene		84.9	ug/L	1.03	2.50
95-57-8	2-Chlorophenol		96.3	ug/L	7.50	25.0
534-52-1	2-Methyl-4,6-dinitrophenol		103	ug/L	7.50	25.0
91-57-6	2-Methylnaphthalene		84.8	ug/L	0.750	2.50
88-75-5	2-Nitrophenol		103	ug/L	7.50	25.0
91-94-1	3,3'-Dichlorobenzidine		122	ug/L	7.50	25.0
101-55-3	4-Bromophenylphenylether		95.4	ug/L	7.50	25.0
59-50-7	Parachlorometa cresol		104	ug/L	7.50	25.0
	4-Chloro-3-methylphenol					
106-47-8	4-Chloroaniline		123	ug/L	8.25	25.0
7005-72-3	4-Chlorophenylphenylether		97.7	ug/L	7.50	25.0
100-02-7	4-Nitrophenol		86.1	ug/L	7.50	25.0
83-32-9	Acenaphthene		103	ug/L	0.750	2.50
208-96-8	Acenaphthylene		97.7	ug/L	0.750	2.50
62-53-3	Aniline		103	ug/L	10.5	25.0
120-12-7	Anthracene		98.8	ug/L	0.750	2.50
1912-24-9	Atrazine		111	ug/L	7.50	25.0
92-87-5	Benzidine		189	ug/L	9.75	25.0
56-55-3	Benzo(a)anthracene		108	ug/L	0.750	2.50
50-32-8	Benzo(a)pyrene		99.4	ug/L	0.750	2.50
205-99-2	Benzo(b)fluoranthene		108	ug/L	0.750	2.50
191-24-2	Benzo(ghi)perylene		91.3	ug/L	0.750	2.50

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**1203914621**	**Date Received:**	**11/04/2017 09:15**		
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147583MS**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 12:48**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**400 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0916.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		102	ug/L	0.750	2.50
65-85-0	Benzoic acid		159	ug/L	15.0	50.0
100-51-6	Benzyl alcohol		104	ug/L	7.50	25.0
85-68-7	Butylbenzylphthalate		106	ug/L	7.50	25.0
218-01-9	Chrysene		109	ug/L	0.750	2.50
84-74-2	Di-n-butylphthalate		103	ug/L	7.50	25.0
117-84-0	Di-n-octylphthalate		103	ug/L	7.50	25.0
53-70-3	Dibenzo(a,h)anthracene		95.1	ug/L	0.750	2.50
132-64-9	Dibenzofuran		98.2	ug/L	7.50	25.0
84-66-2	Diethylphthalate		105	ug/L	7.50	25.0
131-11-3	Dimethylphthalate		109	ug/L	7.50	25.0
88-85-7	Dinoseb	U	7.50	ug/L	7.50	25.0
122-39-4	Diphenylamine		88.7	ug/L	7.50	25.0
206-44-0	Fluoranthene		106	ug/L	0.750	2.50
86-73-7	Fluorene		93.8	ug/L	0.750	2.50
118-74-1	Hexachlorobenzene		90.2	ug/L	7.50	25.0
87-68-3	Hexachlorobutadiene		70.4	ug/L	7.50	25.0
77-47-4	Hexachlorocyclopentadiene		30.7	ug/L	7.50	25.0
67-72-1	Hexachloroethane		79.1	ug/L	7.50	25.0
193-39-5	Indeno(1,2,3-cd)pyrene		97.4	ug/L	0.750	2.50
78-59-1	Isophorone		102	ug/L	8.75	25.0
62-75-9	N-Methyl-N-nitrosomethylamine		84.2	ug/L	7.50	25.0
924-16-3	N-Nitrosodi-n-butylamine	U	7.50	ug/L	7.50	25.0
55-18-5	N-Nitrosodiethylamine	U	7.50	ug/L	7.50	25.0
621-64-7	N-Nitrosodi--n-propylamine *N-Nitrosodipropylamine*		91.6	ug/L	7.50	25.0
930-55-2	N-Nitrosopyrrolidine		116	ug/L	7.50	25.0
91-20-3	Naphthalene		87.1	ug/L	0.750	2.50
98-95-3	Nitrobenzene		98.3	ug/L	7.50	25.0
608-93-5	Pentachlorobenzene	U	7.50	ug/L	7.50	25.0
87-86-5	Pentachlorophenol		108	ug/L	7.50	25.0
85-01-8	Phenanthrene		101	ug/L	0.750	2.50
108-95-2	Phenol		70.4	ug/L	7.50	25.0
129-00-0	Pyrene		99.3	ug/L	0.750	2.50
110-86-1	Pyridine		78.0	ug/L	7.50	25.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		98.1	ug/L	7.50	25.0
111-91-1	bis(2-Chloroethoxy)methane		111	ug/L	7.50	25.0
111-44-4	bis(2-Chloroethyl) ether		109	ug/L	7.50	25.0
117-81-7	bis(2-Ethylhexyl)phthalate		101	ug/L	7.50	25.0

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**1203914621**	**Date Received:**	**11/04/2017 09:15**		
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147583MS**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 12:48**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**400 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0916.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		106	ug/L	9.25	25.0
99-09-2	3-Nitroaniline *m-Nitroaniline*		137	ug/L	7.50	25.0
95-48-7	o-Cresol		103	ug/L	7.50	25.0
88-74-4	2-Nitroaniline *o-Nitroaniline*		99.8	ug/L	7.50	25.0
100-01-6	4-Nitroaniline *p-Nitroaniline*		125	ug/L	7.50	25.0

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	178	250	ug/L	71	(32%-124%)
2-Fluorobiphenyl	92.0	125	ug/L	74	(32%-112%)
2-Fluorophenol	162	250	ug/L	65	(15%-88%)
Nitrobenzene-d5	98.3	125	ug/L	79	(36%-115%)
Phenol-d5	135	250	ug/L	54	(15%-91%)
p-Terphenyl-d14	103	125	ug/L	82	(36%-121%)

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**1203914622**	**Date Received:**	**11/04/2017 09:15**		
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147583MSD**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 13:19**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**400 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0917.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		81.9	ug/L	7.50	25.0
120-82-1	1,2,4-Trichlorobenzene		78.9	ug/L	7.50	25.0
95-50-1	1,2-Dichlorobenzene		82.1	ug/L	7.50	25.0
122-66-7	Azobenzene		99.7	ug/L	7.50	25.0
	1,2-Diphenylhydrazine					
541-73-1	1,3-Dichlorobenzene		79.4	ug/L	7.50	25.0
106-46-7	1,4-Dichlorobenzene		77.0	ug/L	7.50	25.0
123-91-1	1,4-Dioxane		101	ug/L	7.50	25.0
90-12-0	1-Methylnaphthalene		89.9	ug/L	0.750	2.50
58-90-2	2,3,4,6-Tetrachlorophenol		106	ug/L	7.50	25.0
95-95-4	2,4,5-Trichlorophenol		103	ug/L	7.50	25.0
88-06-2	2,4,6-Trichlorophenol		94.3	ug/L	7.50	25.0
120-83-2	2,4-Dichlorophenol		102	ug/L	7.50	25.0
105-67-9	2,4-Dimethylphenol		90.2	ug/L	7.50	25.0
51-28-5	2,4-Dinitrophenol		81.0	ug/L	12.5	50.0
121-14-2	2,4-Dinitrotoluene		116	ug/L	7.50	25.0
606-20-2	2,6-Dinitrotoluene		118	ug/L	7.50	25.0
91-58-7	2-Chloronaphthalene		84.6	ug/L	1.03	2.50
95-57-8	2-Chlorophenol		98.8	ug/L	7.50	25.0
534-52-1	2-Methyl-4,6-dinitrophenol		106	ug/L	7.50	25.0
91-57-6	2-Methylnaphthalene		87.7	ug/L	0.750	2.50
88-75-5	2-Nitrophenol		104	ug/L	7.50	25.0
91-94-1	3,3'-Dichlorobenzidine		127	ug/L	7.50	25.0
101-55-3	4-Bromophenylphenylether		99.3	ug/L	7.50	25.0
59-50-7	Parachlorometa cresol		110	ug/L	7.50	25.0
	4-Chloro-3-methylphenol					
106-47-8	4-Chloroaniline		121	ug/L	8.25	25.0
7005-72-3	4-Chlorophenylphenylether		99.4	ug/L	7.50	25.0
100-02-7	4-Nitrophenol		69.3	ug/L	7.50	25.0
83-32-9	Acenaphthene		105	ug/L	0.750	2.50
208-96-8	Acenaphthylene		99.6	ug/L	0.750	2.50
62-53-3	Aniline		101	ug/L	10.5	25.0
120-12-7	Anthracene		103	ug/L	0.750	2.50
1912-24-9	Atrazine		118	ug/L	7.50	25.0
92-87-5	Benzidine		124	ug/L	9.75	25.0
56-55-3	Benzo(a)anthracene		113	ug/L	0.750	2.50
50-32-8	Benzo(a)pyrene		106	ug/L	0.750	2.50
205-99-2	Benzo(b)fluoranthene		111	ug/L	0.750	2.50
191-24-2	Benzo(ghi)perylene		102	ug/L	0.750	2.50

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**1203914622**	**Date Received:**	**11/04/2017 09:15**		
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147583MSD**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 13:19**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**400 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0917.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		110	ug/L	0.750	2.50
65-85-0	Benzoic acid		170	ug/L	15.0	50.0
100-51-6	Benzyl alcohol		108	ug/L	7.50	25.0
85-68-7	Butylbenzylphthalate		109	ug/L	7.50	25.0
218-01-9	Chrysene		114	ug/L	0.750	2.50
84-74-2	Di-n-butylphthalate		107	ug/L	7.50	25.0
117-84-0	Di-n-octylphthalate		110	ug/L	7.50	25.0
53-70-3	Dibenzo(a,h)anthracene		104	ug/L	0.750	2.50
132-64-9	Dibenzofuran		101	ug/L	7.50	25.0
84-66-2	Diethylphthalate		109	ug/L	7.50	25.0
131-11-3	Dimethylphthalate		113	ug/L	7.50	25.0
88-85-7	Dinoseb	U	7.50	ug/L	7.50	25.0
122-39-4	Diphenylamine		93.1	ug/L	7.50	25.0
206-44-0	Fluoranthene		110	ug/L	0.750	2.50
86-73-7	Fluorene		95.3	ug/L	0.750	2.50
118-74-1	Hexachlorobenzene		96.4	ug/L	7.50	25.0
87-68-3	Hexachlorobutadiene		67.9	ug/L	7.50	25.0
77-47-4	Hexachlorocyclopentadiene		31.6	ug/L	7.50	25.0
67-72-1	Hexachloroethane		78.4	ug/L	7.50	25.0
193-39-5	Indeno(1,2,3-cd)pyrene		104	ug/L	0.750	2.50
78-59-1	Isophorone		104	ug/L	8.75	25.0
62-75-9	N-Methyl-N-nitrosomethylamine		84.1	ug/L	7.50	25.0
924-16-3	N-Nitrosodi-n-butylamine	U	7.50	ug/L	7.50	25.0
55-18-5	N-Nitrosodiethylamine	U	7.50	ug/L	7.50	25.0
621-64-7	N-Nitrosodi--n-propylamine *N-Nitrosodipropylamine*		92.3	ug/L	7.50	25.0
930-55-2	N-Nitrosopyrrolidine		121	ug/L	7.50	25.0
91-20-3	Naphthalene		87.5	ug/L	0.750	2.50
98-95-3	Nitrobenzene		98.8	ug/L	7.50	25.0
608-93-5	Pentachlorobenzene	U	7.50	ug/L	7.50	25.0
87-86-5	Pentachlorophenol		114	ug/L	7.50	25.0
85-01-8	Phenanthrene		105	ug/L	0.750	2.50
108-95-2	Phenol		70.5	ug/L	7.50	25.0
129-00-0	Pyrene		102	ug/L	0.750	2.50
110-86-1	Pyridine		68.9	ug/L	7.50	25.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		99.9	ug/L	7.50	25.0
111-91-1	bis(2-Chloroethoxy)methane		111	ug/L	7.50	25.0
111-44-4	bis(2-Chloroethyl) ether		110	ug/L	7.50	25.0
117-81-7	bis(2-Ethylhexyl)phthalate		104	ug/L	7.50	25.0

Semi-Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**2018-697**	**Date Collected:**	**11/02/2017 12:53**	**Matrix:**	**W**
Lab Sample ID:	**1203914622**	**Date Received:**	**11/04/2017 09:15**		
Client Sample:	**QC for batch 1716877**	**Client:**	**ARSL004**	**Project:**	**QC**
Client ID:	**CAPA-18-147583MSD**	**Method:**	**SW846 3510C/8270D**	**SOP Ref:**	**GL-OA-E-009**
Batch ID:	**1716878**	**Inst:**	**MSD5.I**	**Dilution:**	**1**
Run Date:	**11/09/2017 13:19**	**Analyst:**	**JMB3**	**Inj. Vol:**	**1 uL**
Prep Date:	**11/08/2017 18:23**	**Aliquot:**	**400 mL**	**Final Volume:**	**1 mL**
Data File:	**s110917.B\s5k0917.D**	**Column:**	**DB-5ms**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		107	ug/L	9.25	25.0
99-09-2	3-Nitroaniline *m-Nitroaniline*		142	ug/L	7.50	25.0
95-48-7	o-Cresol		101	ug/L	7.50	25.0
88-74-4	2-Nitroaniline *o-Nitroaniline*		104	ug/L	7.50	25.0
100-01-6	4-Nitroaniline *p-Nitroaniline*		127	ug/L	7.50	25.0

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	185	250	ug/L	74	(32%-124%)
2-Fluorobiphenyl	92.4	125	ug/L	74	(32%-112%)
2-Fluorophenol	164	250	ug/L	66	(15%-88%)
Nitrobenzene-d5	97.1	125	ug/L	78	(36%-115%)
Phenol-d5	136	250	ug/L	54	(15%-91%)
p-Terphenyl-d14	107	125	ug/L	86	(36%-121%)

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-697
Work Order #: 437078

Sample ID	Client ID
437078001	CAPA-18-147556
437078002	CAPA-18-147582
437078004	CAPA-18-147557
437078005	CAPA-18-147583
437078008	CAPA-18-147629
437078009	CAPA-18-147631
1203912590	Method Blank (MB)**ICP**
1203912591	Laboratory Control Sample (LCS)
1203912594	437078001(CAPA-18-147556L) Serial Dilution (SD)
1203912592	437078001(CAPA-18-147556D) Sample Duplicate (DUP)
1203912593	437078001(CAPA-18-147556S) Matrix Spike (MS)
1203912580	Method Blank (MB)**ICP-MS**
1203912581	Laboratory Control Sample (LCS)
1203912584	437078001(CAPA-18-147556L) Serial Dilution (SD)
1203912582	437078001(CAPA-18-147556D) Sample Duplicate (DUP)
1203912583	437078001(CAPA-18-147556S) Matrix Spike (MS)
1203926011	Method Blank (MB)**CVAA**
1203926012	Laboratory Control Sample (LCS)
1203926017	437078001(CAPA-18-147556L) Serial Dilution (SD)
1203926013	437078001(CAPA-18-147556D) Sample Duplicate (DUP)
1203926015	437078001(CAPA-18-147556S) Matrix Spike (MS)

Sample Analysis

Samples 437078001,002,004,005,008 and 009 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1716049, 1716045, 1721328 and 1723242
Prep Batch :	1716048, 1716044 and 1721327
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-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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

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

Calibration Information

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

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

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

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

Continuing Calibration Verification (CCV) Requirements
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement
The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)
An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement
The following samples were selected as the quality control (QC) samples for this SDG: 437078001 (CAPA-18-147556)-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
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

Analyte	Sample	Value
Magnesium	1203912594 (CAPA-18-147556SDILT)	12 *(0%-10%)
Sodium	1203912594 (CAPA-18-147556SDILT)	11.9 *(0%-10%)
Strontium	1203912594 (CAPA-18-147556SDILT)	11 *(0%-10%)

Post Spike (PS) Recovery Statement
The PS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the absence of matrix interferences in the post-digested sample.

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.

Hardness = 2.497 (Ca) + 4.118 (Mg)

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

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

Client SDG: 2018-697 GEL Work Order: 437078

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:  **Name: Jamie Johnson**

Date: 02 DEC 2017 **Title: Group Leader**

Sample Data Summary

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

SAMPLE ID: 437078001 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147556 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

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	11/27/17 11:09	112717W1−4	1721328

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:** SW846

SAMPLE ID: 437078001 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147556 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

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	JWJ	11/30/17 19:14	113017A−2	1716049
7440−36−0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7440−38−2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7440−39−3	Barium	23.8	ug/L		1	5	5	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7440−41−7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7440−42−8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7440−43−9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7440−70−2	Calcium	12500	ug/L		50	200	200	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7440−47−3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7440−48−4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7440−50−8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7439−89−6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7439−92−1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7439−95−4	Magnesium	5650	ug/L	E	110	300	300	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7439−96−5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7439−98−7	Molybdenum	2.89	ug/L		0.2	0.5	0.5	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7440−02−0	Nickel	1.05	ug/L	J	0.6	2	2	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7440−09−7	Potassium	2040	ug/L		50	150	150	1	P	JWJ	12/01/17 19:07	120117A−1	1716049
7782−49−2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7631−86−9	Silica	52100	ug/L		53	213	213	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7440−22−4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7440−23−5	Sodium	14100	ug/L	E	100	300	300	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7440−24−6	Strontium	129	ug/L	E	1	5	5	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7440−28−0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7440−31−5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7440−61−1	Uranium	0.430	ug/L		0.067	0.2	0.2	1	MS	BAJ	11/08/17 16:51	171108−3	1716045
7440−62−2	Vanadium	3.35	ug/L	J	1	5	5	1	P	JWJ	11/30/17 19:14	113017A−2	1716049
7440−66−6	Zinc	4.84	ug/L	J	3.3	10	10	1	P	JWJ	11/30/17 19:14	113017A−2	1716049

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:**

SAMPLE ID: 437078001 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147556 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

MATRIX: W **%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	54.4	mg/L		0.453	1.24	1.24	1		JJ2	12/02/17 11:55		1723242

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1716045	1716044	SW846 3005A	50	mL	50	mL	11/07/17	SXW1
1716049	1716048	SW846 3005A	50	mL	50	mL	11/07/17	SXW1
1721328	1721327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/22/17	AXS5

***Analytical Methods:**

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

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

SAMPLE ID: 437078002 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147582 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

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	11/27/17 11:21	112717W1−4	1721328

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1721328	1721327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/22/17	AXS5

***Analytical Methods:**

AV **EPA 245.2 1974**

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

SAMPLE ID: 437078004 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147557 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

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	11/27/17 11:23	112717W1−4	1721328

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:** SW846

SAMPLE ID: 437078004 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147557 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

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	JWJ	11/30/17 19:24	113017A−2	1716049
7440−36−0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7440−38−2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7440−39−3	Barium	28.1	ug/L		1	5	5	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7440−41−7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7440−42−8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7440−43−9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7440−70−2	Calcium	12100	ug/L		50	200	200	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7440−47−3	Chromium	3.05	ug/L	J	3	10	10	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7440−48−4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7440−50−8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7439−89−6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7439−92−1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7439−95−4	Magnesium	2950	ug/L	E	110	300	300	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7439−96−5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7439−98−7	Molybdenum	1.57	ug/L		0.2	0.5	0.5	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7440−02−0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7440−09−7	Potassium	1440	ug/L		50	150	150	1	P	JWJ	12/01/17 19:20	120117A−1	1716049
7782−49−2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7631−86−9	Silica	67500	ug/L		53	213	213	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7440−22−4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7440−23−5	Sodium	9320	ug/L	E	100	300	300	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7440−24−6	Strontium	48.9	ug/L	E	1	5	5	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7440−28−0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7440−31−5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7440−61−1	Uranium	0.303	ug/L		0.067	0.2	0.2	1	MS	BAJ	11/08/17 17:08	171108−3	1716045
7440−62−2	Vanadium	4.54	ug/L	J	1	5	5	1	P	JWJ	11/30/17 19:24	113017A−2	1716049
7440−66−6	Zinc	6.74	ug/L	J	3.3	10	10	1	P	JWJ	11/30/17 19:24	113017A−2	1716049

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:**

SAMPLE ID: 437078004 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147557 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

MATRIX: W **%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	42.5	mg/L		0.453	1.24	1.24	1		JJ2	12/02/17 11:55		1723242

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1716045	1716044	SW846 3005A	50	mL	50	mL	11/07/17	SXW1
1716049	1716048	SW846 3005A	50	mL	50	mL	11/07/17	SXW1
1721328	1721327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/22/17	AXS5

***Analytical Methods:**

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

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

SAMPLE ID: 437078005 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147583 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

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	11/27/17 11:24	112717W1−4	1721328

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1721328	1721327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/22/17	AXS5

***Analytical Methods:**

AV **EPA 245.2 1974**

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

SAMPLE ID: 437078008 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147629 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

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	11/27/17 11:26	112717W1−4	1721328

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:** SW846

SAMPLE ID: 437078008 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147629 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

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	JWJ	11/30/17 19:27	113017A−2	1716049
7440−36−0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7440−38−2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7440−39−3	Barium	27.9	ug/L		1	5	5	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7440−41−7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7440−42−8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7440−43−9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7440−70−2	Calcium	12300	ug/L		50	200	200	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7440−47−3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7440−48−4	Cobalt	1.22	ug/L	J	1	5	5	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7440−50−8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7439−89−6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7439−92−1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7439−95−4	Magnesium	3010	ug/L	E	110	300	300	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7439−96−5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7439−98−7	Molybdenum	1.57	ug/L		0.2	0.5	0.5	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7440−02−0	Nickel	0.627	ug/L	J	0.6	2	2	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7440−09−7	Potassium	1480	ug/L		50	150	150	1	P	JWJ	12/01/17 19:23	120117A−1	1716049
7782−49−2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7631−86−9	Silica	67600	ug/L		53	213	213	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7440−22−4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7440−23−5	Sodium	9530	ug/L	E	100	300	300	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7440−24−6	Strontium	49.7	ug/L	E	1	5	5	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7440−28−0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7440−31−5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7440−61−1	Uranium	0.30	ug/L		0.067	0.2	0.2	1	MS	BAJ	11/08/17 17:11	171108−3	1716045
7440−62−2	Vanadium	4.51	ug/L	J	1	5	5	1	P	JWJ	11/30/17 19:27	113017A−2	1716049
7440−66−6	Zinc	7.5	ug/L	J	3.3	10	10	1	P	JWJ	11/30/17 19:27	113017A−2	1716049

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:**

SAMPLE ID: 437078008 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147629 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

MATRIX: W **%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	43.1	mg/L		0.453	1.24	1.24	1		JJ2	12/02/17 11:55		1723242

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1716045	1716044	SW846 3005A	50	mL	50	mL	11/07/17	SXW1
1716049	1716048	SW846 3005A	50	mL	50	mL	11/07/17	SXW1
1721328	1721327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/22/17	AXS5

***Analytical Methods:**

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

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018−697 **CONTRACT:** ESHL00114 **METHOD TYPE:** EPA

SAMPLE ID: 437078009 **BASIS:** As Received **DATE COLLECTED** 02−NOV−17

CLIENT ID: CAPA−18−147631 **LEVEL:** Low **DATE RECEIVED** 04−NOV−17

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	11/27/17 11:28	112717W1−4	1721328

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1721328	1721327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/22/17	AXS5

***Analytical Methods:**

AV **EPA 245.2 1974**

Quality Control Summary

METALS
−3b−
PREPARATION BLANK SUMMARY

SDG NO. 2018−697
Contract: ESHL00114
Matrix: W

Sample ID	Analyte	Result	Units	Acceptance Window	Conc Qual	M*	MDL	RDL
1203912580								
	Antimony	1	ug/L	+/−3	U	MS	1	3
	Arsenic	2	ug/L	+/−5	U	MS	2	5
	Cadmium	0.3	ug/L	+/−1	U	MS	0.3	1
	Chromium	3	ug/L	+/−10	U	MS	3	10
	Lead	0.5	ug/L	+/−2	U	MS	0.5	2
	Molybdenum	0.302	ug/L	+/−0.5	J	MS	0.2	0.5
	Nickel	0.6	ug/L	+/−2	U	MS	0.6	2
	Selenium	2	ug/L	+/−5	U	MS	2	5
	Silver	0.3	ug/L	+/−1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/−2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/−0.2	U	MS	0.067	0.2
1203912590								
	Aluminum	68	ug/L	+/−200	U	P	68	200
	Barium	1	ug/L	+/−5	U	P	1	5
	Beryllium	1	ug/L	+/−5	U	P	1	5
	Boron	15	ug/L	+/−50	U	P	15	50
	Calcium	50	ug/L	+/−200	U	P	50	200
	Cobalt	1	ug/L	+/−5	U	P	1	5
	Copper	3	ug/L	+/−10	U	P	3	10
	Iron	30	ug/L	+/−100	U	P	30	100
	Magnesium	110	ug/L	+/−300	U	P	110	300
	Manganese	2	ug/L	+/−10	U	P	2	10
	Potassium	50	ug/L	+/−150	U	P	50	150
	Silica	53	ug/L	+/−213	U	P	53	213
	Sodium	100	ug/L	+/−300	U	P	100	300
	Strontium	1	ug/L	+/−5	U	P	1	5
	Tin	2.5	ug/L	+/−10	U	P	2.5	10
	Vanadium	1	ug/L	+/−5	U	P	1	5
	Zinc	4.95	ug/L	+/−10	J	P	3.3	10
1203926011								
	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. 2018−697 **Client ID** CAPA−18−147556S

Contract: ESHL00114 **Level:** Low

Matrix: WATER **% Solids:**

Sample ID: 437078001 **Spike ID:** 1203912583

Analyte	Units	Acceptance Limit	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M*
Selenium	ug/L	75−125	50.3		2	U	50	100		MS
Silver	ug/L	75−125	51.4		0.3	U	50	103		MS
Thallium	ug/L	75−125	49.1		0.6	U	50	98.2		MS
Uranium	ug/L	75−125	51.5		0.43		50	102		MS
Antimony	ug/L	75−125	50.9		1	U	50	99.9		MS
Arsenic	ug/L	75−125	51.5		2	U	50	100		MS
Cadmium	ug/L	75−125	52.2		0.3	U	50	104		MS
Chromium	ug/L	75−125	51.6		3	U	50	99.4		MS
Lead	ug/L	75−125	50.8		0.5	U	50	102		MS
Molybdenum	ug/L	75−125	56.9		2.89		50	108		MS
Nickel	ug/L	75−125	50.3		1.05	J	50	98.4		MS

***Analytical Methods:**

MS SW846 3005A/6020A

METALS
−5a−

Matrix Spike Summary

SDG NO. 2018−697 **Client ID** CAPA−18−147556S

Contract: ESHL00114 **Level:** Low

Matrix: WATER **% Solids:**

Sample ID: 437078001 **Spike ID:** 1203912593

Analyte	Units	Acceptance Limit	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M*
Aluminum	ug/L	75−125	5070		68	U	5000	101		P
Barium	ug/L	75−125	521		23.8		500	99.4		P
Beryllium	ug/L	75−125	502		1	U	500	100		P
Boron	ug/L	75−125	529		15	U	500	103		P
Calcium	ug/L	75−125	17300		12500		5000	96.8		P
Cobalt	ug/L	75−125	503		1	U	500	100		P
Copper	ug/L	75−125	507		3	U	500	101		P
Iron	ug/L	75−125	5120		30	U	5000	102		P
Magnesium	ug/L	75−125	10900		5650		5000	105		P
Manganese	ug/L	75−125	496		2	U	500	99.1		P
Potassium	ug/L	75−125	6840		2040		5000	96.1		P
Silica	ug/L		61900		52100		10700	90.9	N/A	P
Sodium	ug/L	75−125	18400		14100		5000	86.2		P
Strontium	ug/L	75−125	612		129		500	96.6		P
Tin	ug/L	75−125	516		2.5	U	500	103		P
Vanadium	ug/L	75−125	508		3.35	J	500	101		P
Zinc	ug/L	75−125	517		4.84	J	500	102		P

***Analytical Methods:**

P **SW846 3005A/6010C**

METALS
−5a−

Matrix Spike Summary

SDG NO. 2018−697 **Client ID** CAPA−18−147556S

Contract: ESHL00114 **Level:** Low

Matrix: WATER **% Solids:**

Sample ID: 437078001 **Spike ID:** 1203926015

Analyte	Units	Acceptance Limit	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M*
Mercury	ug/L	75−125	2.02		0.067	U	2	101		AV

***Analytical Methods:**

AV **EPA 245.1/245.2**

METALS
−5a−

Spike Summary

SDG NO. 2018−697 **Client ID** CAPA−18−147556PS

Contract: ESHL00114 **Level:** Low

Matrix: WATER **% Solids:**

Sample ID: 437078001 **Spike ID:** 1203926025

Analyte	Units	Acceptance Limit	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M*

***Analytical Methods:**

Metals
−6−
Duplicate Sample Summary

SDG No.: 2018−697 **Lab Code:** GEL

Contract: ESHL00114 **Client ID:** CAPA−18−147556D

Matrix: WATER **Level:** Low

Sample ID: 437078001 **Duplicate ID:** 1203912582 **Percent Solids for Dup:** N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1	U	1	U			MS
Arsenic	ug/L		2	U	2	U			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%	2.89		2.75		5.07		MS
Nickel	ug/L		1.05	J	0.6	U	200		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	0.43		0.41		4.76		MS

***Analytical Methods:**
MS SW846 3005A/6020A

Metals
−6−
Duplicate Sample Summary

SDG No.: 2018−697 **Lab Code:** GEL

Contract: ESHL00114 **Client ID:** CAPA−18−147556D

Matrix: WATER **Level:** Low

Sample ID: 437078001 **Duplicate ID:** 1203912592 **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	23.8		24		.611		P
Beryllium	ug/L		1	U	1	U			P
Boron	ug/L		15	U	15	U			P
Calcium	ug/L	+/−20%	12500		12400		.394		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%	5650		5560		1.47		P
Manganese	ug/L		2	U	2	U			P
Potassium	ug/L	+/−20%	2040		2040		.0344		P
Silica	ug/L	+/−20%	52100		52100		.113		P
Sodium	ug/L	+/−20%	14100		14100		.305		P
Strontium	ug/L	+/−20%	129		128		.194		P
Tin	ug/L		2.5	U	2.5	U			P
Vanadium	ug/L	+/−5	3.35	J	3.58	J	6.54		P
Zinc	ug/L	+/−10	4.84	J	3.68	J	27.2		P

***Analytical Methods:**
P SW846 3005A/6010C

Metals
−6−
Duplicate Sample Summary

SDG No.: 2018−697 **Lab Code:** GEL

Contract: ESHL00114 **Client ID:** CAPA−18−147556D

Matrix: WATER **Level:** Low

Sample ID: 437078001 **Duplicate ID:** 1203926013 **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. 2018−697

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limit	M*
1203912581								
	Antimony	ug/L	50	50.9		102	80−120	MS
	Arsenic	ug/L	50	53.4		107	80−120	MS
	Cadmium	ug/L	50	53.8		108	80−120	MS
	Chromium	ug/L	50	54.4		109	80−120	MS
	Lead	ug/L	50	51.8		104	80−120	MS
	Molybdenum	ug/L	50	55.6		111	80−120	MS
	Nickel	ug/L	50	55.6		111	80−120	MS
	Selenium	ug/L	50	52.6		105	80−120	MS
	Silver	ug/L	50	53.3		107	80−120	MS
	Thallium	ug/L	50	49.5		99.1	80−120	MS
	Uranium	ug/L	50	50.9		102	80−120	MS

***Analytical Methods:**

MS **SW846 3005A/6020A**

METALS
−7−
Laboratory Control Sample Summary

SDG NO. 2018−697

Contract: ESHL00114

Aqueous LCS Source: OS2I **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limit	M*
1203912591								
	Cobalt	ug/L	500	518		104	80−120	P
	Copper	ug/L	500	513		103	80−120	P
	Iron	ug/L	5000	5200		104	80−120	P
	Magnesium	ug/L	5000	5480		110	80−120	P
	Manganese	ug/L	500	512		102	80−120	P
	Potassium	ug/L	5000	5150		103	80−120	P
	Silica	ug/L	10700	10400		97.4	80−120	P
	Sodium	ug/L	5000	4840		96.9	80−120	P
	Strontium	ug/L	500	497		99.3	80−120	P
	Tin	ug/L	500	519		104	80−120	P
	Vanadium	ug/L	500	508		102	80−120	P
	Zinc	ug/L	500	524		105	80−120	P
	Aluminum	ug/L	5000	5240		105	80−120	P
	Barium	ug/L	500	508		102	80−120	P
	Beryllium	ug/L	500	506		101	80−120	P
	Boron	ug/L	500	519		104	80−120	P
	Calcium	ug/L	5000	5310		106	80−120	P

***Analytical Methods:**

P **SW846 3005A/6010C**

METALS
−7−
Laboratory Control Sample Summary

SDG NO. 2018−697

Contract: ESHL00114

Aqueous LCS Source: GEL **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limit	M*
1203926012								
	Mercury	ug/L	2	2.05		102	85−115	AV

***Analytical Methods:**

AV **EPA 245.1/245.2**

METALS
−9−
Serial Dilution Sample Summary

SDG NO. 2018−697 **Client ID** CAPA−18−147556L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 437078001 **Serial Dilution ID:** 1203912584

Analyte	Initial Value ug/L	C	Serial Value ug/L	C	% Difference	Qual	Acceptance Limit	M*
Antimony	1	U	5	U				MS
Arsenic	2	U	10	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	2.89		2.77		4.391			MS
Nickel	1.05	J	3	U	114.013			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.43		.465	J	8.14			MS

***Analytical Methods:**

MS **SW846 3005A/6020A**

METALS
−9−
Serial Dilution Sample Summary

SDG NO. 2018−697 **Client ID** CAPA−18−147556L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 437078001 **Serial Dilution ID:** 1203912594

Analyte	Initial Value ug/L	C	Serial Value ug/L	C	% Difference	Qual	Acceptance Limit	M*
Aluminum	68	U	340	U				P
Barium	23.8		26.5		11.213			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	12500		13600		9.375		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	5650		6320		11.986	E	10	P
Manganese	2	U	10	U				P
Potassium	2040		2100		3.28			P
Silica	52100		56100		7.577		10	P
Sodium	14100		15800		11.939	E	10	P
Strontium	129		143		11.023	E	10	P
Tin	2.5	U	12.5	U				P
Vanadium	3.35	J	5	U	5.71			P
Zinc	4.84	J	16.5	U	133.167			P

***Analytical Methods:**

P **SW846 3005A/6010C**

METALS
−9−
Serial Dilution Sample Summary

SDG NO. 2018−697 **Client ID** CAPA−18−147556L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 437078001 **Serial Dilution ID:** 1203926017

Analyte	Initial Value ug/L	C	Serial Value ug/L	C	% Difference	Qual	Acceptance Limit	M*
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 #: 2018-697
Work Order #: 437078

Method/Analysis Information

Product:	**Carbon and Total Organic**		
Analytical Batch:	1716073	**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
437078002	CAPA-18-147582
437078005	CAPA-18-147583
437078009	CAPA-18-147631
1203912655	Method Blank (MB)
1203912656	Laboratory Control Sample (LCS)
1203912658	436983003(CrIN6-18-148623) Sample Duplicate (DUP)
1203912660	436983003(CrIN6-18-148623) 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 436983003 (CrIN6-18-148623) 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:	**Cyanide and Total**		
Analytical Batch:	1715405	**Method:**	WSP-CN(T)
Prep Batch :	1715404	**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
437078002	CAPA-18-147582
437078005	CAPA-18-147583
437078009	CAPA-18-147631
1203911001	Method Blank (MB)
1203911002	Laboratory Control Sample (LCS)
1203911003	436850002(CAMO-18-147655) Sample Duplicate (DUP)
1203911004	436850002(CAMO-18-147655) Matrix Spike (MS)
1203914659	436850002(CAMO-18-147655) 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-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
Sample 436850002 (CAMO-18-147655) 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.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the spike and spike duplicate met the acceptance limits.

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
Sample437078005 (CAPA-18-147583) 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:	**Ion Chromatography**		
Analytical Batch:	1716510	**Method:**	WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
437078001	CAPA-18-147556
437078004	CAPA-18-147557
437078008	CAPA-18-147629
1203913868	Method Blank (MB)
1203913869	Laboratory Control Sample (LCS)
1203913870	437081002(CrIN6-18-148624) Sample Duplicate (DUP)
1203913871	437081002(CrIN6-18-148624) 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-3000 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 437081002 (CrIN6-18-148624) 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 Dilutions
The following samples 1203913870 (CrIN6-18-148624DUP) and 1203913871 (CrIN6-18-148624PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.
Sample Re-analysis
The samples in this SDG did not require re-analysis.

Miscellaneous Information

Manual Integrations
Samples 1203913870 (CrIN6-18-148624DUP), 437078001 (CAPA-18-147556), 437078004 (CAPA-18-147557) and 437078008 (CAPA-18-147629) 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:	1716959	**Method:**	NH3
Prep Batch :	1716958	**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
437078001	CAPA-18-147556
437078004	CAPA-18-147557
437078008	CAPA-18-147629
1203914834	Method Blank (MB)
1203914835	Laboratory Control Sample (LCS)
1203914836	437078001(CAPA-18-147556) Sample Duplicate (DUP)
1203914837	437078001(CAPA-18-147556) 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 437078001 (CAPA-18-147556) 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:
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Method/Analysis Information

Product:	**Total Kjeldahl Nitrogen**		
Analytical Batch:	1716949	**Method:**	TKN
Prep Batch :	1716948	**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
437078002	CAPA-18-147582
437078005	CAPA-18-147583
437078009	CAPA-18-147631
1203914813	Method Blank (MB)
1203914814	Laboratory Control Sample (LCS)
1203914815	436983003(CrIN6-18-148623) Sample Duplicate (DUP)
1203914816	436983003(CrIN6-18-148623) 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 436983003 (CrIN6-18-148623) 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
Samples1203914813 (MB) and 1203914815 (CrIN6-18-148623DUP) were 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:	**Nitrate Nitrite by Cadmium Reduction**		
Analytical Batch:	1716170	**Method:**	NO3NO2

Sample Analysis

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

Sample ID	Client ID
437078001	CAPA-18-147556
437078004	CAPA-18-147557
437078008	CAPA-18-147629
1203912901	Method Blank (MB)
1203912902	Laboratory Control Sample (LCS)
1203912903	436850001(CAMO-18-147640) Sample Duplicate (DUP)
1203912905	436850001(CAMO-18-147640) 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# 9.

Preparation/Analytical Method Verification

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

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 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 436850001 (CAMO-18-147640) 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 following samples 1203912903 (CAMO-18-147640DUP) and 1203912905 (CAMO-18-147640PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.
Sample Re-analysis
The samples in this SDG did not require re-analysis.

Miscellaneous Information

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:
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Method/Analysis Information

Product:	**Total Phosphorus**		
Analytical Batch:	1716179	**Method:**	PO4
Prep Batch :	1716177	**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
437078001	CAPA-18-147556
437078004	CAPA-18-147557
437078008	CAPA-18-147629
1203912930	Method Blank (MB)
1203912931	Laboratory Control Sample (LCS)
1203912932	436983003(CrIN6-18-148623) Sample Duplicate (DUP)
1203912933	436983003(CrIN6-18-148623) Matrix Spike (MS)

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

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration
All initial calibration requirements have been met for this SDG.

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

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

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

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)
An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery
The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation
Sample 436983003 (CrIN6-18-148623) 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:	1717340	**Method:**	TDS

Sample Analysis

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

Sample ID	Client ID
437078001	CAPA-18-147556
437078004	CAPA-18-147557
437078008	CAPA-18-147629
1203915787	Method Blank (MB)
1203915788	Laboratory Control Sample (LCS)
1203915791	437078004(CAPA-18-147557) 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 437078004 (CAPA-18-147557) was selected for QC analysis.

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

Analyte	Sample	Value
Total Dissolved Solids	1203915791 (CAPA-18-147557DUP)	5.06* (0%-5%)

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:	1717163	**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
437078001	CAPA-18-147556
437078004	CAPA-18-147557
437078008	CAPA-18-147629
1203915374	Laboratory Control Sample (LCS)
1203915376	437078001(CAPA-18-147556) 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# 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 Titration and Ion analysis was performed on a Orion 160 Conductivity Meter.

Initial Calibration
All initial calibration requirements have been met for this SDG.

Initial Standardization
The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)
An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery
The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation
Sample 437078001 (CAPA-18-147556) 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: 1717129 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
437078001	CAPA-18-147556
437078004	CAPA-18-147557
437078008	CAPA-18-147629
1203915277	Laboratory Control Sample (LCS)
1203915278	437078001(CAPA-18-147556) Sample Duplicate (DUP)

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

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration
All initial calibration requirements have been met for this SDG.

Initial Standardization
The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)
An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery
The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation
Sample 437078001 (CAPA-18-147556) 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
1203915278 (CAPA-18-147556DUP)	pH	Received 04-NOV-17, out of holding 02-NOV-17
437078001 (CAPA-18-147556)	pH	Received 04-NOV-17, out of holding 02-NOV-17
437078004 (CAPA-18-147557)	pH	Received 04-NOV-17, out of holding 02-NOV-17
437078008 (CAPA-18-147629)	pH	Received 04-NOV-17, out of holding 02-NOV-17

Sample Dilutions
The samples in this SDG did not require dilutions.

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

Miscellaneous Information

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:	1717125	**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
437078001	CAPA-18-147556
437078004	CAPA-18-147557
437078008	CAPA-18-147629
1203915264	Laboratory Control Sample (LCS)
1203915266	437322007(CASA-18-147992) Sample Duplicate (DUP)
1203915268	437322007(CASA-18-147992) 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 437322007 (CASA-18-147992) 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: 2018-697 GEL Work Order: 437078

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:  **Name: Aubrey Kingsbury**

Date: 22 NOV 2017 **Title: Analyst I**

Sample Data Summary

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

Certificate of Analysis

Report Date: November 22, 2017

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: 2018-697

Client Sample ID: CAPA-18-147556
Sample ID: 437078001
Matrix: W
Collect Date: 02-NOV-17 11:10
Receive Date: 04-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	11/09/17	2351	1716510	1
Chloride		1.88	0.067	0.200	mg/L		1					
Fluoride		0.213	0.033	0.100	mg/L		1					
Sulfate		5.10	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0188	0.017	0.050	mg/L	1.00	1	KLP1	11/09/17	1458	1716959	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.556	0.017	0.050	mg/L		1	AXH3	11/07/17	0654	1716170	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.046	0.020	0.050	mg/L	1.00	1	KLP1	11/07/17	1500	1716179	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		110	3.40	14.3	mg/L			KLP1	11/09/17	1449	1717340	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		83.1	1.45	4.00	mg/L			RXB5	11/11/17	1214	1717125	6
Carbonate alkalinity (CaCO3)		18.1	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		194	1.00	1.00	umhos/cm		1	VH1	11/14/17	1348	1717163	7
PH "As Received"												
pH at Temp 16.2C	H	8.98	0.010	0.100	SU		1	RXB5	11/11/17	1213	1717129	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	11/09/17	1049	1716958
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/06/17	1700	1716177

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Report Date: November 22, 2017

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: 2018-697

Client Sample ID:	CAPA-18-147556	Project:	ESHL00114
Sample ID:	437078001	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

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Certificate of Analysis

Report Date: November 22, 2017

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: 2018-697

Client Sample ID: CAPA-18-147582
Sample ID: 437078002
Matrix: W
Collect Date: 02-NOV-17 11:10
Receive Date: 04-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.337	0.330	1.00	mg/L		1	TSM	11/08/17	0704	1716073	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	11/08/17	0718	1715405	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.137	0.033	0.100	mg/L	1.00	1	KLP1	11/09/17	1240	1716949	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	11/08/17	0634	1715404
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/08/17	1700	1716948

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
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

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Report Date: November 22, 2017

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: 2018-697

Client Sample ID: CAPA-18-147557
Sample ID: 437078004
Matrix: W
Collect Date: 02-NOV-17 12:53
Receive Date: 04-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	11/10/17	0020	1716510	1
Chloride		2.03	0.067	0.200	mg/L		1					
Fluoride		0.222	0.033	0.100	mg/L		1					
Sulfate		2.15	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0394	0.017	0.050	mg/L	1.00	1	KLP1	11/09/17	1501	1716959	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.506	0.017	0.050	mg/L		1	AXH3	11/07/17	0655	1716170	3
PO4 "As Received"												
Phosphorus, Total as P		0.0579	0.020	0.050	mg/L	1.00	1	KLP1	11/07/17	1501	1716179	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		116	3.40	14.3	mg/L			KLP1	11/09/17	1449	1717340	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		60.7	1.45	4.00	mg/L			RXB5	11/11/17	1220	1717125	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		146	1.00	1.00	umhos/cm		1	VH1	11/14/17	1350	1717163	7
PH "As Received"												
pH at Temp 16.4C	H	8.04	0.010	0.100	SU		1	RXB5	11/11/17	1217	1717129	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	11/09/17	1049	1716958
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/06/17	1700	1716177

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Report Date: November 22, 2017

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: 2018-697

Client Sample ID:	CAPA-18-147557	Project:	ESHL00114
Sample ID:	437078004	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

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Report Date: November 22, 2017

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

Client SDG: 2018-697

Client Sample ID: CAPA-18-147583
Sample ID: 437078005
Matrix: W
Collect Date: 02-NOV-17 12:53
Receive Date: 04-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	11/08/17	0751	1716073	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	11/08/17	0731	1715405	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0716	0.033	0.100	mg/L	1.00	1	KLP1	11/09/17	1241	1716949	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	11/08/17	0634	1715404
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/08/17	1700	1716948

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
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

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Report Date: November 22, 2017

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

Client SDG: 2018-697

Client Sample ID: CAPA-18-147629
Sample ID: 437078008
Matrix: W
Collect Date: 02-NOV-17 12:53
Receive Date: 04-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	11/10/17	0048	1716510	1
Chloride		2.04	0.067	0.200	mg/L		1					
Fluoride		0.186	0.033	0.100	mg/L		1					
Sulfate		2.15	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0389	0.017	0.050	mg/L	1.00	1	KLP1	11/09/17	1502	1716959	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.537	0.017	0.050	mg/L		1	AXH3	11/07/17	0656	1716170	3
PO4 "As Received"												
Phosphorus, Total as P		0.0594	0.020	0.050	mg/L	1.00	1	KLP1	11/07/17	1502	1716179	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		113	3.40	14.3	mg/L			KLP1	11/09/17	1449	1717340	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		60.9	1.45	4.00	mg/L			RXB5	11/11/17	1220	1717125	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		144	1.00	1.00	umhos/cm		1	VH1	11/14/17	1350	1717163	7
PH "As Received"												
pH at Temp 16.2C	H	8.03	0.010	0.100	SU		1	RXB5	11/11/17	1219	1717129	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	11/09/17	1049	1716958
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/06/17	1700	1716177

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Report Date: November 22, 2017

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: 2018-697

Client Sample ID:	CAPA-18-147629	Project:	ESHL00114
Sample ID:	437078008	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

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Report Date: November 22, 2017

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: 2018-697

Client Sample ID: CAPA-18-147631
Sample ID: 437078009
Matrix: W
Collect Date: 02-NOV-17 12:53
Receive Date: 04-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	11/08/17	0838	1716073	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	11/08/17	0720	1715405	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0352	0.033	0.100	mg/L	1.00	1	KLP1	11/09/17	1241	1716949	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	11/08/17	0634	1715404
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/08/17	1700	1716948

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

Quality Control Summary

QC Summary

Report Date: November 22, 2017

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

Contact: **Ms. Nita Patel**

Workorder: **437078**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Carbon Analysis										
Batch 1716073										
QC1203912658 436983003 DUP										
Total Organic Carbon Average	J	0.944		1.02	mg/L	7.93 ^		(+/-1.00)	TSM	11/08/17 04:43
QC1203912656 LCS										
Total Organic Carbon Average	10.0			9.81	mg/L		98.1	(80%-120%)		11/07/17 17:35
QC1203912655 MB										
Total Organic Carbon Average			U	ND	mg/L					11/07/17 17:24
QC1203912660 436983003 PS										
Total Organic Carbon Average	10.0 J	0.944		11.7	mg/L		108	(75%-125%)		11/08/17 05:30
Flow Injection Analysis										
Batch 1715405										
QC1203911003 436850002 DUP										
Cyanide, Total	U	ND	U	ND	ug/L	N/A			AXH3	11/08/17 07:00
QC1203911002 LCS										
Cyanide, Total	50.0			51.3	ug/L		103	(90%-110%)		11/08/17 06:53
QC1203911001 MB										
Cyanide, Total			U	ND	ug/L					11/08/17 06:52
QC1203911004 436850002 MS										
Cyanide, Total	100 U	ND		98.9	ug/L		98.9	(90%-110%)		11/08/17 07:01
QC1203914659 436850002 MSD										
Cyanide, Total	100 U	ND		103	ug/L	4.06	103	(0%-20%)		11/08/17 07:02

QC Summary

Workorder: **437078**

Parmname	NOM		Sample	Qual	QC	Units	RPD%		REC%	Range	Anlst	Date Time
Ion Chromatography												
Batch 1716510												
QC1203913870 437081002 DUP												
Bromide		J	0.154	J	0.158	mg/L	2.38	^		(+/-0.200)	MAR1	11/10/17 02:44
Chloride			23.0		22.9	mg/L	0.15			(0%-20%)		11/10/17 18:00
Fluoride			0.255		0.260	mg/L	2.14	^		(+/-0.100)		11/10/17 02:44
Sulfate			35.1		35.1	mg/L	0.0627			(0%-20%)		11/10/17 18:00
QC1203913869 LCS												
Bromide	1.25				1.19	mg/L			94.9	(80%-120%)		11/09/17 20:57
Chloride	5.00				4.87	mg/L			97.3	(80%-120%)		
Fluoride	2.50				2.57	mg/L			103	(80%-120%)		
Sulfate	10.0				9.91	mg/L			99.1	(80%-120%)		
QC1203913868 MB												
Bromide				U	ND	mg/L						11/09/17 20:29
Chloride				U	ND	mg/L						
Fluoride				U	ND	mg/L						
Sulfate				U	ND	mg/L						
QC1203913871 437081002 PS												
Bromide	1.25	J	0.154		1.35	mg/L			95.5	(75%-125%)		11/10/17 03:13
Chloride	5.00		4.59		10.3	mg/L			114	(75%-125%)		11/10/17 18:29

QC Summary

Workorder: **437078**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Ion Chromatography										
Batch 1716510										
Fluoride	2.50	0.255		2.99	mg/L		109	(75%-125%)	MAR1	11/10/17 03:13
Sulfate	10.0	7.01		17.9	mg/L		109	(75%-125%)		11/10/17 18:29
Nutrient Analysis										
Batch 1716170										
QC1203912903 436850001 DUP										
Nitrogen, Nitrate/Nitrite		3.15		3.06	mg/L	2.9		(0%-20%)	AXH3	11/07/17 06:31
QC1203912902 LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.05	mg/L		105	(90%-110%)		11/07/17 06:20
QC1203912901 MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					11/07/17 06:19
QC1203912905 436850001 PS										
Nitrogen, Nitrate/Nitrite	1.00	0.629		1.63	mg/L		100	(90%-110%)		11/07/17 06:32
Batch 1716179										
QC1203912932 436983003 DUP										
Phosphorus, Total as P		0.0737		0.0698	mg/L	5.44 ^		(+/-0.050)	KLP1	11/07/17 14:57
QC1203912931 LCS										
Phosphorus, Total as P	1.00			1.05	mg/L		105	(80%-124%)		11/07/17 14:51
QC1203912930 MB										
Phosphorus, Total as P			U	ND	mg/L					11/07/17 14:50
QC1203912933 436983003 MS										
Phosphorus, Total as P	1.00	0.0737		1.03	mg/L		95.6	(63%-139%)		11/07/17 14:58
Batch 1716949										
QC1203914815 436983003 DUP										
Nitrogen, Total Kjeldahl	U	ND	J	0.0397	mg/L	200			KLP1	11/09/17 12:36

QC Summary

Workorder: **437078**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Nutrient Analysis											
Batch 1716949											
QC1203914814 LCS											
Nitrogen, Total Kjeldahl	1.00				1.03	mg/L		103	(90%-110%)	KLP1	11/09/17 12:17
QC1203914813 MB											
Nitrogen, Total Kjeldahl				J	0.0999	mg/L					11/09/17 12:24
QC1203914816 436983003 MS											
Nitrogen, Total Kjeldahl	1.00	U	ND		0.963	mg/L		96.3	(90%-110%)		11/09/17 12:30
Batch 1716959											
QC1203914836 437078001 DUP											
Nitrogen, Ammonia		J	0.0188	J	0.0352	mg/L	60.7 ^		(+/-0.050)	KLP1	11/09/17 14:59
QC1203914835 LCS											
Nitrogen, Ammonia	1.00				1.05	mg/L		105	(90%-110%)		11/09/17 14:58
QC1203914834 MB											
Nitrogen, Ammonia				U	ND	mg/L					11/09/17 14:57
QC1203914837 437078001 MS											
Nitrogen, Ammonia	1.00	J	0.0188		1.04	mg/L		102	(90%-110%)		11/09/17 15:00
Solids Analysis											
Batch 1717340											
QC1203915791 437078004 DUP											
Total Dissolved Solids			116		110	mg/L	5.06*		(0%-5%)	KLP1	11/09/17 14:49
QC1203915788 LCS											
Total Dissolved Solids	300				289	mg/L		96.2	(95%-105%)		11/09/17 14:49
QC1203915787 MB											
Total Dissolved Solids				U	ND	mg/L					11/09/17 14:49

QC Summary

Workorder: **437078**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis												
Batch 1717125												
QC1203915266 437322007 DUP												
Alkalinity, Total as CaCO3			70.8		70.6	mg/L	0.285		(0%-20%)	RXB5	11/11/17	12:56
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A					
QC1203915264 LCS												
Alkalinity, Total as CaCO3	100				108	mg/L		108	(90%-110%)		11/11/17	11:49
QC1203915268 437322007 MS												
Alkalinity, Total as CaCO3	100		70.8		176	mg/L		105	(80%-120%)		11/11/17	12:59
Batch 1717129												
QC1203915278 437078001 DUP												
pH		H	8.98	H	8.99	SU	0.111		(0%-5%)	RXB5	11/11/17	12:14
QC1203915277 LCS												
pH	7.00				7.00	SU		100	(99%-101%)		11/11/17	11:46
Batch 1717163												
QC1203915376 437078001 DUP												
Conductivity			194		191	umhos/cm	1.35		(0%-10%)	VH1	11/14/17	13:49
QC1203915374 LCS												
Conductivity	1410				1390	umhos/cm		98.5	(95%-105%)		11/14/17	13:29

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

QC Summary

Workorder: **437078**

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 #: 2018-697
Work Order #: 437078

Method/Analysis Information

Product:	**Alphaspec Am241 Liquid**
Analytical Method:	HASL-300:AM-241
Analytical Batch Number:	1718541

Sample ID	Client ID
437078005	CAPA-18-147583
437078009	CAPA-18-147631
1203918915	Method Blank (MB)
1203918917	Laboratory Control Sample (LCS)
1203918916	437632010(CAMO-18-148111) 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 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
Aliquots for samples 1203918915 (MB) and 1203918917 (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: 437632010 (CAMO-18-148111). The QC was from ARSL work order 437632.

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 1203918917 (LCS) was recounted due to a peak shift. The recount is reported. Sample 437078005 (CAPA-18-147583) was recounted due to a suspected false positive. 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:	**ISOPU**
Analytical Method:	HASL-300:ISOPU
Analytical Batch Number:	1718543

Sample ID	Client ID
437078005	CAPA-18-147583
437078009	CAPA-18-147631
1203918921	Method Blank (MB)
1203918923	Laboratory Control Sample (LCS)
1203918922	437632010(CAMO-18-148111) 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 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
Aliquots for samples 1203918921 (MB) and 1203918923 (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: 437632010 (CAMO-18-148111). The QC was from ARSL work order 437632.

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

RDL Met
Samples (See Below) did not meet the detection limits due to the high standard deviation. When a blank population is performed the MDC is greater than the RDL due to the high standard deviation. The samples were counted the maximum count time of in order to achieve the lowest possible MDAs.

Sample	Analyte	Value
1203918921 (MB)	Plutonium-239/240	Result 0.00818 < MDA 0.0575 > RDL 0.05 pCi/L
1203918922 (CAMO-18-148111DUP)	Plutonium-238	Result -0.00868 < MDA 0.064 > RDL 0.05 pCi/L
	Plutonium-239/240	Result -0.00434 < MDA 0.0914 > RDL 0.05 pCi/L
437078005 (CAPA-18-147583)	Plutonium-239/240	Result 0.00316 < MDA 0.0666 > RDL 0.05 pCi/L
437078009 (CAPA-18-147631)	Plutonium-239/240	Result 0.00716 < MDA 0.0755 > RDL 0.05 pCi/L

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 1203918922 (CAMO-18-148111DUP) 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
Sample 437078009 (CAPA-18-147631) did not meet the resolution requirement of having a full width half maximum of 100 keV or less for the tracer; however, the tracer yield requirement was met and the tracer peak is within the tracer region of interest.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	**IsoU**
Analytical Method:	HASL-300:ISOU
Analytical Batch Number:	1718546

Sample ID	Client ID
437078005	CAPA-18-147583
437078009	CAPA-18-147631
1203918932	Method Blank (MB)
1203918934	Laboratory Control Sample (LCS)
1203918933	437632010(CAMO-18-148111) 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 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
Aliquots for samples 1203918932 (MB) and 1203918934 (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
1203918932 (MB)	Uranium-233/234, Uranium-235/236 and Uranium-238	Blank result > 1.65 CSU

Blank Decision Level
The blank result is less than the decision level.

Tracer/Carrier Yield
Sample (See Below) did not meet the client's yield requirement. However, there are 400 tracer counts, GEL's standard tracer yield requirements are met, and the client's detection limits are met.

Sample	Analyte	Value
1203918934 (LCS)	Uranium-232 Tracer	43.6* (50%-105%)

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Designated QC
The following sample was used for QC: 437632010 (CAMO-18-148111). The QC was from ARSL work order 437632.

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:	**Gammaspec**
Analytical Method:	EPA:901.1
Analytical Batch Number:	1716271

Sample ID	Client ID
437078005	CAPA-18-147583
437078009	CAPA-18-147631
1203913158	Method Blank (MB)
1203913160	Laboratory Control Sample (LCS)
1203913159	436463002(CAPA-18-147576) 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 January 2017, July 2017, March 2017, October 2017 and September 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 result is less than 1.65 times the CSU.

Blank Decision Level
The blank result is less than the decision level.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Designated QC
The following sample was used for QC: 436463002 (CAPA-18-147576). The QC was from ARSL work order 436463.

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.

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:	**WSP-GrossA/B**
Analytical Method:	EPA 900.0/SW846 9310
Analytical Batch Number:	1716449

Sample ID	Client ID
437078005	CAPA-18-147583
437078009	CAPA-18-147631
1203913664	Method Blank (MB)

1203913668	Laboratory Control Sample (LCS)
1203913665	437078009(CAPA-18-147631) Sample Duplicate (DUP)
1203913666	437078009(CAPA-18-147631) Matrix Spike (MS)
1203913667	437078009(CAPA-18-147631) 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 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 1203913664 (MB) and 1203913668 (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
1203913664 (MB)	ALPHA and 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
1203913664 (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: 437078009 (CAPA-18-147631). The QC was from ARSL work order 437078.

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 1203913666 (CAPA-18-147631MS) was recounted due to low recovery. The recount 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, 1203913666 (CAPA-18-147631MS) and 1203913667 (CAPA-18-147631MSD), aliquots were reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: **GFPC, Sr90, liquid**

Analytical Method: EPA:905.0

Analytical Batch Number: 1717217

Sample ID	Client ID
437078005	CAPA-18-147583
437078009	CAPA-18-147631
1203915510	Method Blank (MB)
1203915513	Laboratory Control Sample (LCS)
1203915511	436615005(CAPA-18-147593) Sample Duplicate (DUP)
1203915512	436615005(CAPA-18-147593) 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 1203915510 (MB) and 1203915513 (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: 436615005 (CAPA-18-147593). The QC was from ARSL work order 436615.

Matrix Spike (MS) Recovery
The MS spike recoveries met acceptance limits.

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 437078009 (CAPA-18-147631) was recounted due to a suspected false positive. The recount 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, 1203915512 (CAPA-18-147593MS), aliquot was 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: 2018-697 GEL Work Order: 437078

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: Heather McCarty **Name: Heather McCarty**

Date: 01 DEC 2017 **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
Report Date: December 1, 2017
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147583
Sample ID: 437078005
Matrix: W
Collect Date: 02-NOV-17
Receive Date: 04-NOV-17
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	0.0124	+/-0.00651	0.0366	0.0155	+/-0.00653	0.050	pCi/L			BXA4	11/28/17	1814	1718541	1
ISOPU "As Received"															
Plutonium-238	U	0.0126	+/-0.011	0.0466	0.019	+/-0.011	0.050	pCi/L			BXA4	11/25/17	1131	1718543	2
Plutonium-239/240	U	0.00316	+/-0.0122	0.0666	0.029	+/-0.0122	0.050	pCi/L							
IsoU "As Received"															
Uranium-234		0.343	+/-0.0304	0.125	0.0589	+/-0.0346	1.00	pCi/L			BXA4	11/26/17	1118	1718546	3
Uranium-235/236		0.0774	+/-0.0167	0.0539	0.0228	+/-0.0171	1.00	pCi/L							
Uranium-238		0.193	+/-0.0231	0.073	0.0331	+/-0.0249	0.500	pCi/L							
Rad Gamma Spec Analysis															
Gammaspec "As Received"															
Cesium-137	U	2.29	+/-3.86	6.51	2.90	+/-3.87	8.00	pCi/L			BSW1	11/16/17	0913	1716271	4
Cobalt-60	U	-2.39	+/-1.75	6.40	2.66	+/-1.84	8.00	pCi/L							
Neptunium-237	U	5.83	+/-2.95	11.4	5.30	+/-3.25		pCi/L							
Potassium-40	U	17.9	+/-29.1	73.2	31.1	+/-29.1		pCi/L							
Sodium-22	U	3.23	+/-1.24	6.57	2.76	+/-1.45		pCi/L							
Rad Gas Flow Proportional Counting															
GFPC, Sr90, liquid "As Received"															
Strontium-90	U	-0.0764	+/-0.0535	0.194	0.0918	+/-0.0535	0.500	pCi/L			KSD1	11/16/17	1856	1717217	5
WSP-GrossA/B "As Received"															
Beta		6.61	+/-0.977	2.42	1.09	+/-1.12	3.00	pCi/L			AXH4	11/15/17	1141	1716449	6
Alpha	U	0.946	+/-0.663	2.25	0.866	+/-0.668	3.00	pCi/L			AXH4	11/15/17	1654	1716449	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"	1718541	80.8	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1718543	72.1	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1718546	85.2	(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
Report Date: December 1, 2017
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147583
Sample ID: 437078005
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**	
Strontium Carrier		GFPC, Sr90, liquid "As Received"									1717217	94.3		(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

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Certificate of Analysis

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

Los Alamos, New Mexico 87545

Report Date: December 1, 2017

Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147631
Sample ID: 437078009
Matrix: W
Collect Date: 02-NOV-17
Receive Date: 04-NOV-17
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	0.00932	+/-0.00559	0.0332	0.0141	+/-0.00561	0.050	pCi/L			BXA4	11/25/17	1129	1718541	1
ISOPU "As Received"															
Plutonium-238	U	0.00717	+/-0.0113	0.0528	0.0216	+/-0.0113	0.050	pCi/L			BXA4	11/25/17	1131	1718543	2
Plutonium-239/240	U	0.00716	+/-0.00877	0.0755	0.0329	+/-0.00878	0.050	pCi/L							
IsoU "As Received"															
Uranium-234		0.312	+/-0.030	0.136	0.0644	+/-0.0338	1.00	pCi/L			BXA4	11/26/17	1118	1718546	3
Uranium-235/236		0.0846	+/-0.0188	0.0589	0.0249	+/-0.0193	1.00	pCi/L							
Uranium-238		0.129	+/-0.0234	0.0798	0.0362	+/-0.0243	0.500	pCi/L							
Rad Gamma Spec Analysis															
Gammaspec "As Received"															
Cesium-137	U	0.254	+/-1.16	4.36	1.88	+/-1.16	8.00	pCi/L			BSW1	11/16/17	0956	1716271	4
Cobalt-60	U	-0.56	+/-1.22	4.59	1.84	+/-1.23	8.00	pCi/L							
Neptunium-237	U	0.672	+/-2.56	9.45	4.33	+/-2.57		pCi/L							
Potassium-40	U	15.0	+/-17.7	74.9	33.0	+/-18.1		pCi/L							
Sodium-22	U	-0.471	+/-1.27	4.80	1.97	+/-1.27		pCi/L							
Rad Gas Flow Proportional Counting															
GFPC, Sr90, liquid "As Received"															
Strontium-90	U	-0.00882	+/-0.131	0.494	0.217	+/-0.131	0.500	pCi/L			KSD1	11/17/17	0756	1717217	5
WSP-GrossA/B "As Received"															
Beta	U	2.54	+/-0.959	2.97	1.33	+/-0.982	3.00	pCi/L			AXH4	11/15/17	1142	1716449	6
Alpha		2.35	+/-0.879	2.22	0.746	+/-0.901	3.00	pCi/L			AXH4	11/15/17	1648	1716449	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"	1718541	94.1	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1718543	70.1	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1718546	76.2	(50%-105%)
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1717217	102	(50%-105%)

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C
Los Alamos, New Mexico 87545
Report Date: December 1, 2017
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147631
Sample ID: 437078009
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

Client : **Los Alamos National Laboratory**
TA-00, SM1237, Rm104C
Los Alamos, New Mexico
Contact: **Ms. Nita Patel**
Workorder: **437078**

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date Time
Rad Alpha Spec										
Batch 1718541										
QC1203918916 437632010 DUP										
Americium-241	U	0.00457	U	0.0127	pCi/L	0.34		(0-1)	BXA4	11/25/17 11:32
	Uncert:	+/-0.00457		+/-0.00732						
	TPU:	+/-0.00457		+/-0.00734						
**Americium-243 Tracer	2.62	2.62		2.69	pCi/L		102	(50%-105%)		
	Uncert:	+/-0.077		+/-0.0744						
	TPU:	+/-0.140		+/-0.137						
QC1203918917 LCS										
Americium-241	1.97			1.85	pCi/L		93.9	(80%-120%)	BXA4	11/28/17 18:14
	Uncert:			+/-0.0513						
	TPU:			+/-0.0937						
**Americium-243 Tracer	2.10			2.17	pCi/L		103	(50%-105%)		
	Uncert:			+/-0.0543						
	TPU:			+/-0.104						
QC1203918915 MB										
Americium-241			U	0.00	pCi/L				BXA4	11/25/17 11:32
	Uncert:			+/-0.00481						
	TPU:			+/-0.00481						
**Americium-243 Tracer	2.10			1.90	pCi/L		90.8	(50%-105%)		
	Uncert:			+/-0.0641						
	TPU:			+/-0.115						
Batch 1718543										
QC1203918922 437632010 DUP										
Plutonium-238	U	0.00552	U	-0.00868	pCi/L	0.385		(0-1)	BXA4	11/28/17 14:21
	Uncert:	+/-0.00781		+/-0.0106						
	TPU:	+/-0.00781		+/-0.0106						
Plutonium-239/240	U	0.00828	U	-0.00434	pCi/L	0.24		(0-1)		
	Uncert:	+/-0.0107		+/-0.0156						
	TPU:	+/-0.0107		+/-0.0156						
**Plutonium-242 Tracer	2.47	1.96		1.29	pCi/L		52.5	(50%-105%)		
	Uncert:	+/-0.0831		+/-0.105						
	TPU:	+/-0.137		+/-0.164						
QC1203918923 LCS										
Plutonium-238			U	0.0151	pCi/L			(80%-120%)	BXA4	11/25/17 11:32
	Uncert:			+/-0.0094						
	TPU:			+/-0.00942						
Plutonium-239/240	1.98			2.07	pCi/L		105	(80%-120%)		
	Uncert:			+/-0.0723						
	TPU:			+/-0.119						
**Plutonium-242 Tracer	1.97			1.35	pCi/L		68.2	(50%-105%)		
	Uncert:			+/-0.0707						
	TPU:			+/-0.114						

QC Summary

Workorder: **437078**

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date Time
Rad Alpha Spec										
Batch 1718543										
QC1203918921 MB										
Plutonium-238			U	0.00545	pCi/L				BXA4	11/25/17 11:31
Uncert:				+/-0.00771						
TPU:				+/-0.00772						
Plutonium-239/240			U	0.00818	pCi/L					
Uncert:				+/-0.00818						
TPU:				+/-0.00819						
**Plutonium-242 Tracer	1.97			1.30	pCi/L		65.7	(50%-105%)		
Uncert:				+/-0.0742						
TPU:				+/-0.119						
Batch 1718546										
QC1203918933 437632010 DUP										
Uranium-234		0.275		0.364	pCi/L	0.687		(0-1)	BXA4	11/26/17 11:19
Uncert:		+/-0.0272		+/-0.0298						
TPU:		+/-0.0303		+/-0.0345						
Uranium-235/236	U	0.0271		0.0725	pCi/L	0.891		(0-1)		
Uncert:		+/-0.00997		+/-0.0151						
TPU:		+/-0.0101		+/-0.0155						
Uranium-238		0.114		0.183	pCi/L	0.823		(0-1)		
Uncert:		+/-0.0177		+/-0.0215						
TPU:		+/-0.0186		+/-0.0232						
**Uranium-232 Tracer	2.62	2.16		2.12	pCi/L		80.8	(50%-105%)		
Uncert:		+/-0.0807		+/-0.0795						
TPU:		+/-0.150		+/-0.149						
QC1203918934 LCS										
Uranium-234				2.65	pCi/L				BXA4	11/26/17 11:19
Uncert:				+/-0.0957						
TPU:				+/-0.175						
Uranium-235/236				0.218	pCi/L					
Uncert:				+/-0.0314						
TPU:				+/-0.0336						
Uranium-238	2.70			3.00	pCi/L		111	(80%-120%)		
Uncert:				+/-0.101						
TPU:				+/-0.195						
**Uranium-232 Tracer	2.09			0.912	pCi/L		43.6 *	(50%-105%)		
Uncert:				+/-0.0858						
TPU:				+/-0.144						
QC1203918932 MB										
Uranium-234			U	0.0463	pCi/L				BXA4	11/26/17 11:19
Uncert:				+/-0.0131						
TPU:				+/-0.0133						
Uranium-235/236			U	0.0143	pCi/L					
Uncert:				+/-0.00757						
TPU:				+/-0.0076						
Uranium-238			U	0.0185	pCi/L					
Uncert:				+/-0.00982						
TPU:				+/-0.00986						

QC Summary

Workorder: **437078**

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date Time
Rad Alpha Spec										
Batch 1718546										
**Uranium-232 Tracer	2.09			1.21	pCi/L		57.7	(50%-105%)		
	Uncert:			+/-0.0709						
	TPU:			+/-0.127						
Rad Gamma Spec										
Batch 1716271										
QC1203913159 436463002 DUP										
Cesium-137	U	-0.569	U	-0.885	pCi/L	0.0607		(0-1)	BSW1	11/16/17 11:06
	Uncert:	+/-1.26		+/-1.32						
	TPU:	+/-1.27		+/-1.33						
Cobalt-60	U	-0.55	U	0.470	pCi/L	0.179		(0-1)		
	Uncert:	+/-1.57		+/-1.27						
	TPU:	+/-1.58		+/-1.27						
Neptunium-237	U	-0.691	U	6.70	pCi/L	0.536		(0-1)		
	Uncert:	+/-2.90		+/-3.98						
	TPU:	+/-2.90		+/-3.99						
Potassium-40	U	6.14	U	-10.4	pCi/L	0.183		(0-1)		
	Uncert:	+/-24.3		+/-20.7						
	TPU:	+/-24.3		+/-20.9						
Sodium-22	U	1.59	U	0.0529	pCi/L	0.299		(0-1)		
	Uncert:	+/-1.26		+/-1.26						
	TPU:	+/-1.31		+/-1.26						
QC1203913160 LCS										
Americium-241	34300			34900	pCi/L		102	(80%-120%)	BSW1	11/16/17 09:58
	Uncert:			+/-878						
	TPU:			+/-3420						
Cesium-137	13000			13700	pCi/L		105	(80%-120%)		
	Uncert:			+/-180						
	TPU:			+/-915						
Cobalt-60	11300			11100	pCi/L		98.4	(80%-120%)		
	Uncert:			+/-173						
	TPU:			+/-497						
Neptunium-237			U	43.2	pCi/L					
	Uncert:			+/-60.5						
	TPU:			+/-61.4						
Potassium-40			U	36.1	pCi/L					
	Uncert:			+/-96.2						
	TPU:			+/-96.6						
Sodium-22			U	-22.8	pCi/L					
	Uncert:			+/-19.0						
	TPU:			+/-19.7						
QC1203913158 MB										
Cesium-137			U	0.201	pCi/L				BSW1	11/16/17 09:57
	Uncert:			+/-1.21						
	TPU:			+/-1.21						
Cobalt-60			U	0.757	pCi/L					
	Uncert:			+/-1.26						

QC Summary

Workorder: **437078**

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date Time
Rad Gamma Spec										
Batch 1716271										
	TPU:			+/-1.27						
Neptunium-237			U	-0.0134	pCi/L					
	Uncert:			+/-1.88						
	TPU:			+/-1.88						
Potassium-40			U	15.3	pCi/L					
	Uncert:			+/-12.7						
	TPU:			+/-13.2						
Sodium-22			U	0.346	pCi/L					
	Uncert:			+/-1.15						
	TPU:			+/-1.16						
Rad Gas Flow										
Batch 1716449										
QC1203913665 437078009 DUP										
Alpha		2.35	U	1.11	pCi/L	0.36		(0-1)	AXH4	11/15/17 16:48
	Uncert:	+/-0.879		+/-0.802						
	TPU:	+/-0.901		+/-0.808						
Beta	U	2.54		4.00	pCi/L	0.363		(0-1)		11/15/17 11:42
	Uncert:	+/-0.959		+/-0.980						
	TPU:	+/-0.982		+/-1.04						
QC1203913668 LCS										
Alpha	12.1			11.6	pCi/L		95.6	(80%-120%)	AXH4	11/15/17 16:50
	Uncert:			+/-0.557						
	TPU:			+/-1.12						
Beta	47.4			49.7	pCi/L		105	(80%-120%)		11/15/17 12:09
	Uncert:			+/-0.878						
	TPU:			+/-4.21						
QC1203913664 MB										
Alpha			U	0.235	pCi/L				AXH4	11/15/17 16:48
	Uncert:			+/-0.124						
	TPU:			+/-0.125						
Beta			U	0.276	pCi/L					11/15/17 12:08
	Uncert:			+/-0.130						
	TPU:			+/-0.132						
QC1203913666 437078009 MS										
Alpha	483	2.35		371	pCi/L		76.3	(75%-125%)	AXH4	11/16/17 10:18
	Uncert:	+/-0.879		+/-20.9						
	TPU:	+/-0.901		+/-39.2						
Beta	1900 U	2.54		2020	pCi/L		107	(75%-125%)		11/15/17 12:08
	Uncert:	+/-0.959		+/-35.6						
	TPU:	+/-0.982		+/-172						
QC1203913667 437078009 MSD										
Alpha	483	2.35		453	pCi/L	0.494	93.3	(0-1)	AXH4	11/15/17 16:50
	Uncert:	+/-0.879		+/-21.9						
	TPU:	+/-0.901		+/-43.6						
Beta	1900 U	2.54		1790	pCi/L	0.364	94.2	(0-1)		11/15/17 12:08
	Uncert:	+/-0.959		+/-33.2						

QC Summary

Workorder: 437078

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date Time
Rad Gas Flow										
Batch 1716449										
	TPU:	+/-0.982		+/-152						
Batch 1717217										
QC1203915511 436615005 DUP										
Strontium-90	U	0.110	U	0.0423	pCi/L	0.262		(0-1)	KSD1	11/16/17 18:56
	Uncert:	+/-0.0726		+/-0.0553						
	TPU:	+/-0.0731		+/-0.0554						
**Strontium Carrier	7.85	6.30		7.50	mg		95.5	(50%-105%)		
QC1203915513 LCS										
Strontium-90	23.7			22.5	pCi/L		95.1	(80%-120%)	KSD1	11/16/17 18:56
	Uncert:			+/-0.646						
	TPU:			+/-1.93						
**Strontium Carrier	7.85			7.90	mg		101	(50%-105%)		
QC1203915510 MB										
Strontium-90			U	-0.689	pCi/L				KSD1	11/16/17 18:56
	Uncert:			+/-0.0522						
	TPU:			+/-0.0522						
**Strontium Carrier	7.85			6.70	mg		85.4	(50%-105%)		
QC1203915512 436615005 MS										
Strontium-90	237 U	0.110		210	pCi/L		88.4	(75%-125%)	KSD1	11/16/17 18:56
	Uncert:	+/-0.0726		+/-6.05						
	TPU:	+/-0.0731		+/-17.9						
**Strontium Carrier	7.85	6.30		7.50	mg		95.5	(50%-105%)		

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	REMP 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.
R	Sample results are rejected

QC Summary

Workorder: **437078**

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time

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 acceptence 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.