

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:

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

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

SAMPLE ID: CAPA-18-147597

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10-26-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1231		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-56 S2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

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: Sampled with running generator ~30 ft away.

LOCATION COMMENTS: None

FIELD PARAMETERS:

Sample Time	1231	HH:MM	Dissolved Oxygen	5.19 mg/L	Flow (in gpm)	4.29
Oxidation-Reduction Potential	265.3 mV		pH	8.59	Specific Conductance	131.4 μ S/cm
Temperature	21.2 °C		Turbidity	0.25 NTU		

COLLECTED BY (PRINT): A. Vigil, 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-18-147597**WORK ORDER:**

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) <i>Tanya VanderVis</i>	Date/Time 10-26-17 1345	RECEIVED BY (Printed Name) <i>M. Martin</i> (Signature) <i>M. Martin</i>	Date/Time 10/26/17 1345
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-18-147620

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10-26-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1038		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	TV 10-26-17 GSP DC	
LOCATION ID:	R-56 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	2 AM 10/29/17	HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	HH:MM	TV 10-26-17 Dissolved Oxygen		Flow (in gpm)	
Oxidation-Reduction Potential		pH		Specific Conductance	
Temperature		Turbidity			

COLLECTED BY (PRINT): A. Vigil, D. Jaramillo

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) Tanya VanderVis	Date/Time 10-26-17 1345	RECEIVED BY (Printed Name) M. Monte (Signature) M. Monte	Date/Time 10/26/17 1345
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-18-147621

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10-26-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1231		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-56 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	7 10/26/17	HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): A. Vigil, D. Jaramillo

RELINQUISHED BY (Printed Name) Tanya VanderV... (Signature) Tanya VanderV...	Date/Time 10-26-17 1345	RECEIVED BY (Printed Name) M. Montoya (Signature) M. Montoya	Date/Time 10/26/17 1345
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: CAMO-18-147642

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10/26/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1059		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-50 S1		FIELD PREP:	F	
LOCATION TYPE:	OK		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+PerChlorat e	1 LITER POLY	1	ICE	↓	↓
↓	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) Allisun Stayfield (Signature) <i>[Signature]</i>	Date/Time 10/26/17 1515	RECEIVED BY (Printed Name) S Sherwood (Signature) <i>[Signature]</i>	Date/Time 10/26/17 1515
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: CAMO-18-147643

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10/26/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1413		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-50 S2		FIELD PREP:	F	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / <u>NA</u>

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) Allison Standfield (Signature) <i>[Signature]</i>	Date/Time 10/26/17 1515	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>[Signature]</i>	Date/Time 10/26/17 1515
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: CAMO-18-147657

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10/26/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1059		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-50 S1		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	500 ML POLY	1	HNO3	Y	NA
↓	WSP-CN(T)	250 ML POLY	1	NAOH	↓	
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) Allison Stanfield (Signature) <i>[Signature]</i>	Date/Time 10/26/17 1515	RECEIVED BY (Printed Name) S Sherwood (Signature) <i>[Signature]</i>	Date/Time 10/26/17 1515
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: CAMO-18-147658

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10/26/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1413		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-50 S2		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	500 ML POLY	1	HNO3	Y	NA
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: Sampled about 40 ft. from running diesel generator

LOCATION COMMENTS: Breezy while sampling

FIELD PARAMETERS:

Sample Time	1413	HH:MM	Dissolved Oxygen	7.51	Flow (in gpm)	2.63
Oxidation-Reduction Potential	237.5		pH	8.06	Specific Conductance	135.4
Temperature	21.1		Turbidity	0.66		

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) Allison Starfield (Signature) <i>[Signature]</i>	Date/Time 10/26/17 1515	RECEIVED BY (Printed Name) S Sherwood (Signature) <i>[Signature]</i>	Date/Time 10/26/17 1515
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-18-147570

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10-26-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1038		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-56 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+PerChlorat e	1 LITER POLY	1	ICE		
	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): A. Vigil, D. Jaramillo

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) <i>Tanya VanderVis</i>	Date/Time 10-26-17 1345	RECEIVED BY (Printed Name) <i>A. Vigil</i> (Signature) <i>A. Vigil</i>	Date/Time 10/26/17 1345
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-18-147571

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10-26-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1231		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-56 S2		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

TV 10-26-17

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

COLLECTED BY (PRINT): A. Vigil, D. Jaramillo

RELINQUISHED BY (Printed Name) Tanya VanderNis (Signature) <i>Tanya VanderNis</i>	Date/Time 10-26-17 1345	RECEIVED BY (Printed Name) <i>M. Montoya</i> (Signature) <i>[Signature]</i>	Date/Time 10/26/17 1345
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-18-147596

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10-26-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1038		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-56 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-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: Sampled with running diesel generator ~30ft away.

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	1038	HH:MM	Dissolved Oxygen	6.68 mg/L	Flow (in' gpm)	4.17
Oxidation-Reduction Potential	262.8 mV		pH	8.08	Specific Conductance	148.5 μ S/cm
Temperature	20.7°C		Turbidity	0.11 NTU		

COLLECTED BY (PRINT): A. Vigil, 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-18-147596**WORK ORDER:**

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) <i>Tanya VanderVis</i>	Date/Time 10-26-17 1345	RECEIVED BY (Printed Name) <i>M. Montoya</i> (Signature) <i>[Signature]</i>	Date/Time 10/26/17 1345
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

COC: 2018-594		TEST - Explosives		YES	NO
Samples collected from a WFO area?					
Field Test for Explosives Results				YES	NO
Spot test shows presence of explosives residues. If YES - Do not ship.					NA

TEST - Chemical Preservation		YES	NO
Samples are chemically preserved?		X	
Field Team Member Statement		YES	NO
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/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO
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/100cm ² or Beta > 160,000,000 dpm*g/100cm ² . If YES - Do not ship.				
On the external surface of the sample container, alpha activity ≥ 24 dpm/cm ² , beta activity ≥ 240 dpm/cm ² , 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
<ul style="list-style-type: none"> Am-241 > 27 Cs-137 > 270 Pu-238 > 27 Pu-239/240 > 27 Th-228 > 27 U-234 > 270 U-238 > 270 H-3 > 27,000,000 	<ul style="list-style-type: none"> Am-241 > 270,000 Cs-137 > 270,000 Pu-238 > 270,000 Pu-239/240 > 270,000 Th-228 > 270,000 U-234 > 1,600,000,000 U-238 > unlimited H-3 > 27,000,000,000 		X
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	10-27-17
(Signature) <i>[Signature]</i>	1500

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) S. Sherwood	10/27/17
(Signature) <i>[Signature]</i>	15:00

DATA VALIDATION REPORT

Chain Of Custody No. 2018-594

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
436504	EPA:120.1	4				
436504	EPA:150.1	4				
436504	EPA:160.1	4				
436504	EPA:170.0	8		2		
436504	EPA:245.2	8				
436504	EPA:300.0	4				
436504	EPA:310.1	4				
436504	EPA:335.4	4				
436504	EPA:350.1	4				
436504	EPA:351.2	4				
436504	EPA:353.2	4				
436504	EPA:365.4	4				
436504	EPA:900	2				
436504	EPA:901.1	2				
436504	EPA:905.0	2				
436504	HASL-300:AM-241	2				
436504	HASL-300:ISOPU	2				
436504	HASL-300:ISOU	2				
436504	SM:A2340B	4				
436504	SW-846:6010C	4				
436504	SW-846:6020	4				
436504	SW-846:6850	4				
436504	SW-846:8260B	2		2		
436504	SW-846:8270D	2				
436504	SW-846:9060	4				

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
436504	EPA:120.1	1714428	1714428	3										1			1				
436504	EPA:120.1	1717163	1717163	1										1			1				
436504	EPA:150.1	1715386	1715386	4										1			2				
436504	EPA:160.1	1714366	1714366	4					1					1			1				
436504	EPA:170.0	NA	NA	8		2															
436504	EPA:245.2	1719070	1719065	8					1	1				1			1				
436504	EPA:300.0	1715567	1715567	3					1					1			1				
436504	EPA:300.0	1715632	1715632	1					1					1			1				
436504	EPA:310.1	1715371	1715371	4						1				1			1				
436504	EPA:335.4	1713610	1713609	4					1	1				1			1				
436504	EPA:350.1	1715525	1715524	4					1	1				1			1				
436504	EPA:351.2	1715519	1715516	4					1	2				1			2				
436504	EPA:353.2	1714065	1714065	4					1					1			1				
436504	EPA:365.4	1715514	1715513	4					1	2				1			2				
436504	EPA:900	1716449	1716449	2					1	1	1			1			1				
436504	EPA:901.1	1716271	1716271	2					1					1			1				
436504	EPA:905.0	1714184	1714184	2					1	1				1			1				
436504	HASL-300:AM-241	1715443	1715443	2					1					1			1				
436504	HASL-300:ISOPU	1715444	1715444	2					1					1			1				
436504	HASL-300:ISOU	1715445	1715445	2					1					1			1				
436504	SM:A2340B	1721461	1721461	4																	
436504	SW-846:6010C	1714025	1714024	4					1	1				1			1				
436504	SW-846:6020	1714033	1714032	4					1	1				1			1				
436504	SW-846:6850	1714762	1714758	4					1	1	1			1							
436504	SW-846:8260B	1717151	1717151	2		2			1					2							
436504	SW-846:8270D	1715004	1715003	2					1	1	1			1							
436504	SW-846:9060	1714357	1714357	4					1					1			1				

2. Distribution Of Analytes In EDD.

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	CAMO-18-147642	436504001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-18-147643	436504003	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-147558	1203908703	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-147570	436504005	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-147571	1203915375	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-147571	436504008	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203908702	LCS	0	0	1	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203915374	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-18-147642	436504001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-18-147643	436504003	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-147567	1203910984	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-147570	436504005	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-147571	436504008	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203910983	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	WT_SIP-17-148289	1203911838	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-18-147642	436504001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-18-147643	436504003	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-147550	1203910423	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-147570	436504005	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-147571	436504008	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203908512	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203908511	MB	1	0	0	0
EPA:170.0	VOC	CAMO-18-147642	436504001	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-147643	436504003	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-147657	436504002	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-147658	436504004	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147570	436504005	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147571	436504008	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147596	436504006	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147597	436504009	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147620	436504007	FTB	1	0	0	0
EPA:170.0	VOC	CAPA-18-147621	436504010	FTB	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-147642	1203920277	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-147642	1203920279	MS	0	0	1	0
EPA:245.2	INORGANIC	CAMO-18-147642	436504001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-147643	436504003	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-147657	436504002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-147658	436504004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147570	436504005	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147571	436504008	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:245.2	INORGANIC	CAPA-18-147596	436504006	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147597	436504009	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203920276	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203920275	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-147642	436504001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-147643	436504003	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-147648	1203911578	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-147570	1203911415	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-147570	436504005	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-147571	436504008	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203911414	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203911577	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203911413	MB	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203911576	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-18-147642	436504001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-18-147643	436504003	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147567	1203910953	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147567	1203910955	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147570	436504005	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147571	436504008	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203910950	LCS	0	0	1	0
EPA:335.4	INORGANIC	CAMO-18-147657	436504002	REG	1	0	0	0
EPA:335.4	INORGANIC	CAMO-18-147658	436504004	REG	1	0	0	0
EPA:335.4	INORGANIC	CAPA-18-147576	1203906461	DUP	1	0	0	0
EPA:335.4	INORGANIC	CAPA-18-147576	1203906463	MS	0	0	1	0
EPA:335.4	INORGANIC	CAPA-18-147596	436504006	REG	1	0	0	0
EPA:335.4	INORGANIC	CAPA-18-147597	436504009	REG	1	0	0	0
EPA:335.4	INORGANIC	LCS	1203906459	LCS	0	0	1	0
EPA:335.4	INORGANIC	MB	1203906458	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-147642	1203911275	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-147642	1203911276	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-147642	436504001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-147643	436504003	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147570	436504005	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147571	436504008	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203911274	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203911273	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-147657	1203911263	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-147657	1203911265	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-147657	436504002	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:351.2	GENERAL CHEMISTRY	CAMO-18-147658	1203911264	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-147658	1203911266	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-147658	436504004	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-147596	436504006	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-147597	436504009	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203911262	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203911261	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-18-147642	436504001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-18-147643	436504003	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-147551	1203907656	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-147570	436504005	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-147571	436504008	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203907655	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203907654	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-147642	1203911259	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-147642	1203911260	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-147642	436504001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-147643	436504003	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147554	1203911257	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147554	1203911258	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147570	436504005	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147571	436504008	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203911256	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203911255	MB	1	0	0	0
EPA:900	RAD	CAPA-18-147596	436504006	REG	2	0	0	0
EPA:900	RAD	CAPA-18-147597	436504009	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	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-18-147596	436504006	REG	5	0	0	0
EPA:901.1	RAD	CAPA-18-147597	436504009	REG	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-18-147574	1203907995	DUP	1	0	0	0
EPA:905.0	RAD	CAPA-18-147574	1203907996	MS	0	0	1	0
EPA:905.0	RAD	CAPA-18-147596	436504006	REG	1	0	0	0
EPA:905.0	RAD	CAPA-18-147597	436504009	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:905.0	RAD	LCS	1203907997	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203907994	MB	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-147576	1203911097	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-147596	436504006	REG	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-147597	436504009	REG	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203911098	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203911096	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-147576	1203911100	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-147596	436504006	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-147597	436504009	REG	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203911101	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203911099	MB	2	0	0	0
HASL-300:ISOU	RAD	CAPA-18-147576	1203911104	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAPA-18-147596	436504006	REG	3	0	0	0
HASL-300:ISOU	RAD	CAPA-18-147597	436504009	REG	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203911105	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203911103	MB	3	0	0	0
SM:A2340B	INORGANIC	CAMO-18-147642	436504001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-18-147643	436504003	REG	1	0	0	0
SM:A2340B	INORGANIC	CAPA-18-147570	436504005	REG	1	0	0	0
SM:A2340B	INORGANIC	CAPA-18-147571	436504008	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-147642	1203907534	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-147642	1203907535	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAMO-18-147642	436504001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-147643	436504003	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-147570	436504005	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-147571	436504008	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203907533	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203907532	MB	17	0	0	0
SW-846:6020	INORGANIC	CAMO-18-147642	1203907554	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAMO-18-147642	1203907555	MS	0	0	11	0
SW-846:6020	INORGANIC	CAMO-18-147642	436504001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-18-147643	436504003	REG	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-147570	436504005	REG	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-147571	436504008	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203907553	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203907552	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-18-147642	436504001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-18-147643	436504003	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-18-147551	1203909515	MS	0	0	1	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-18-147551	1203909516	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-18-147570	436504005	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-18-147571	436504008	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203909514	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203909513	MB	1	0	0	0
SW-846:8260B	VOC	CAPA-18-147596	436504006	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147597	436504009	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147620	436504007	FTB	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147621	436504010	FTB	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	MB	1203915326	MB	80	3	0	0
SW-846:8270D	SVOC	CAPA-18-147596	1203910075	MS	0	6	76	0
SW-846:8270D	SVOC	CAPA-18-147596	1203910076	MSD	0	6	76	0
SW-846:8270D	SVOC	CAPA-18-147596	436504006	REG	80	6	0	0
SW-846:8270D	SVOC	CAPA-18-147597	436504009	REG	80	6	0	0
SW-846:8270D	SVOC	LCS	1203910074	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203910073	MB	80	6	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-18-147657	436504002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-18-147658	436504004	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-147578	1203908474	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-147596	436504006	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-147597	436504009	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203908473	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203908472	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

DATA VALIDATION REPORT

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203907532	METHOD BLANK	SW-846:6010C	W	Potassium	-108	J	ug/L	150
MB	1203911255	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.0231	J	mg/L	0.050
MB	1203915326	METHOD BLANK	SW-846:8260B	W	Hexachlorobutadiene	0.41	J	ug/L	1.00
MB	1203915326	METHOD BLANK	SW-846:8260B	W	Trichlorobenzene[1,2,3-]	0.33	J	ug/L	1.00
MB	1203920275	METHOD BLANK	EPA:245.2	W	Mercury	-0.131	J	ug/L	0.200
CAPA-18-147620	436504007	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	
CAPA-18-147620	436504007	TRIP BLANK	SW-846:8260B	W	Hexachlorobutadiene	0.61	BJ	ug/L	1.00
CAPA-18-147620	436504007	TRIP BLANK	SW-846:8260B	W	Trichlorobenzene[1,2,3-]	0.45	BJ	ug/L	1.00
CAPA-18-147620	436504007	TRIP BLANK	SW-846:8260B	W	Trichlorobenzene[1,2,4-]	0.4	J	ug/L	1.00
CAPA-18-147621	436504010	TRIP 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
CAMO-18-147642	1203920275	METHOD BLANK	EPA:245.2	Mercury	-0.131	ug/L	0.067	U	0.200	N	5	100	Y
CAMO-18-147657	1203920275	METHOD BLANK	EPA:245.2	Mercury	-0.131	ug/L	0.067	U	0.200	N	5	100	Y
CAMO-18-147643	1203920275	METHOD BLANK	EPA:245.2	Mercury	-0.131	ug/L	0.067	U	0.200	N	5	100	Y
CAMO-18-147658	1203920275	METHOD BLANK	EPA:245.2	Mercury	-0.131	ug/L	0.067	U	0.200	N	5	100	Y
CAPA-18-147570	1203920275	METHOD BLANK	EPA:245.2	Mercury	-0.131	ug/L	0.067	U	0.200	N	5	100	Y
CAPA-18-147596	1203920275	METHOD BLANK	EPA:245.2	Mercury	-0.131	ug/L	0.067	U	0.200	N	5	100	Y
CAPA-18-147571	1203920275	METHOD BLANK	EPA:245.2	Mercury	-0.131	ug/L	0.067	U	0.200	N	5	100	Y
CAPA-18-147597	1203920275	METHOD BLANK	EPA:245.2	Mercury	-0.131	ug/L	0.067	U	0.200	N	5	100	Y
CAMO-18-147642	1203911255	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0231	mg/L	0.0278	J	0.050	Y	5	100	Y
CAMO-18-147643	1203911255	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0231	mg/L	0.0583		0.050	Y	5	100	Y
CAPA-18-147570	1203911255	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0231	mg/L	0.0652		0.050	Y	5	100	Y
CAPA-18-147571	1203911255	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0231	mg/L	0.0649		0.050	Y	5	100	Y
CAMO-18-147642	1203907532	METHOD BLANK	SW-846:6010C	Potassium	-108	ug/L	1180		150	Y			

DATA VALIDATION REPORT

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
CAMO-18-147643	1203907532	METHOD BLANK	SW-846:6010C	Potassium	-108	ug/L	1180		150	Y			
CAPA-18-147570	1203907532	METHOD BLANK	SW-846:6010C	Potassium	-108	ug/L	1580		150	Y			
CAPA-18-147571	1203907532	METHOD BLANK	SW-846:6010C	Potassium	-108	ug/L	1540		150	Y			
CAPA-18-147596	436504007	TRIP BLANK	SW-846:8260B	Hexachlorobutadiene	0.61	ug/L	0.97	BJ	1.00	Y	5	100	Y
CAPA-18-147596	1203915326	METHOD BLANK	SW-846:8260B	Hexachlorobutadiene	0.41	ug/L	0.97	BJ	1.00	Y	5	100	Y
CAPA-18-147620	1203915326	METHOD BLANK	SW-846:8260B	Hexachlorobutadiene	0.41	ug/L	0.61	BJ	1.00	Y	5	100	Y
CAPA-18-147597	1203915326	METHOD BLANK	SW-846:8260B	Hexachlorobutadiene	0.41	ug/L	0.4	BJ	1.00	Y	5	100	Y
CAPA-18-147596	436504007	TRIP BLANK	SW-846:8260B	Trichlorobenzene[1,2,3-]	0.45	ug/L	0.93	BJ	1.00	Y	5	100	Y
CAPA-18-147596	1203915326	METHOD BLANK	SW-846:8260B	Trichlorobenzene[1,2,3-]	0.33	ug/L	0.93	BJ	1.00	Y	5	100	Y
CAPA-18-147620	1203915326	METHOD BLANK	SW-846:8260B	Trichlorobenzene[1,2,3-]	0.33	ug/L	0.45	BJ	1.00	Y	5	100	Y
CAPA-18-147596	436504007	TRIP BLANK	SW-846:8260B	Trichlorobenzene[1,2,4-]	0.4	ug/L	0.74	J	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
CAMO-18-147657	1203911265		EPA:351.2	Total Kjeldahl Nitrogen	1715516	11-07-2017	W	116		110	90	10		
CAMO-18-147657	1203911265		EPA:351.2	Total Kjeldahl Nitrogen	1715516	11-07-2017	W	116		110	90	10		
CAMO-18-147658	1203911266		EPA:351.2	Total Kjeldahl Nitrogen	1715516	11-07-2017	W	115		110	90	10		
CAMO-18-147658	1203911266		EPA:351.2	Total Kjeldahl Nitrogen	1715516	11-07-2017	W	115		110	90	10		

DATA VALIDATION REPORT

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-50 S1	2018-594	CAMO-18-147642	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	J	U	I4	N	0.0278	mg/L	0.0278	mg/L			W	10/26/2017		1715514	VAL	Y
R-50 S2	2018-594	CAMO-18-147643	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0583	mg/L	0.0583	mg/L			W	10/26/2017		1715514	VAL	Y
R-50 S1	2018-594	CAMO-18-147657	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	U	UJ	I6b	N	0.033	mg/L	0.033	mg/L			W	10/26/2017		1715519	VAL	Y
R-50 S2	2018-594	CAMO-18-147658	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	U	UJ	I6b	N	0.033	mg/L	0.033	mg/L			W	10/26/2017		1715519	VAL	Y
R-56 S1	2018-594	CAPA-18-147570	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0652	mg/L	0.0652	mg/L			W	10/26/2017		1715514	VAL	Y
R-56 S2	2018-594	CAPA-18-147571	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0649	mg/L	0.0649	mg/L			W	10/26/2017		1715514	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.0094	pCi/L	0.0094	pCi/L	0.0549	0.00701	W	10/26/2017		1715443	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	VOC	SW-846:8260B	Butylbenzene[n-]	J	U	V4	N	0.32	ug/L	0.32	ug/L			W	10/26/2017		1717151	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	1.08	pCi/L	1.08	pCi/L	4.45	1.15	W	10/26/2017		1716271	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	1.82	pCi/L	1.82	pCi/L	4.47	0.921	W	10/26/2017		1716271	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	VOC	SW-846:8260B	Hexachlorobutadiene	BJ	U	V4d	N	0.97	ug/L	0.97	ug/L			W	10/26/2017		1717151	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	VOC	SW-846:8260B	Naphthalene	J	U	V4	N	0.74	ug/L	0.74	ug/L			W	10/26/2017		1717151	VAL	Y

DATA VALIDATION REPORT

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-1.1	pCi/L	-1.1	pCi/L	7.12	1.98	W	10/26/2017		1716271	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00887	pCi/L	0.00887	pCi/L	0.0436	0.00782	W	10/26/2017		1715444	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.00295	pCi/L	0.00295	pCi/L	0.0623	0.00661	W	10/26/2017		1715444	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-2.3	pCi/L	-2.3	pCi/L	54.9	14.9	W	10/26/2017		1716271	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	1.46	pCi/L	1.46	pCi/L	5.40	1.30	W	10/26/2017		1716271	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.107	pCi/L	0.107	pCi/L	0.450	0.128	W	10/26/2017		1714184	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	VOC	SW-846:8260B	Trichlorobenzene[1,2,3-BJ	U	U	V4d	N	0.93	ug/L	0.93	ug/L			W	10/26/2017		1717151	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	VOC	SW-846:8260B	Trichlorobenzene[1,2,4-U	U	U	V4d	N	0.74	ug/L	0.74	ug/L			W	10/26/2017		1717151	VAL	Y
R-56 S1	2018-594	CAPA-18-147596	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.00924	pCi/L	0.00924	pCi/L	0.0999	0.0116	W	10/26/2017		1715445	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.0104	pCi/L	0.0104	pCi/L	0.0456	0.00638	W	10/26/2017		1715443	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.131	pCi/L	0.131	pCi/L	4.93	1.35	W	10/26/2017		1716271	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	1.77	pCi/L	1.77	pCi/L	6.22	1.45	W	10/26/2017		1716271	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	0.973	pCi/L	0.973	pCi/L	1.94	0.596	W	10/26/2017		1716449	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	VOC	SW-846:8260B	Hexachlorobutadiene	BJ	U	V4	N	0.4	ug/L	0.4	ug/L			W	10/26/2017		1717151	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	2.21	pCi/L	2.21	pCi/L	9.58	2.51	W	10/26/2017		1716271	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.0096	pCi/L	0.0096	pCi/L	0.0472	0.00847	W	10/26/2017		1715444	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.0256	pCi/L	-0.0256	pCi/L	0.0674	0.012	W	10/26/2017		1715444	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-7.26	pCi/L	-7.26	pCi/L	77.9	20.1	W	10/26/2017		1716271	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	-0.843	pCi/L	-0.843	pCi/L	4.56	1.27	W	10/26/2017		1716271	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.103	pCi/L	0.103	pCi/L	0.453	0.129	W	10/26/2017		1714184	VAL	Y
R-56 S2	2018-594	CAPA-18-147597	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0168	pCi/L	0.0168	pCi/L	0.0908	0.0135	W	10/26/2017		1715445	VAL	Y
R-56 S1	2018-594	CAPA-18-147620	FTB	INIT	VOC	SW-846:8260B	Hexachlorobutadiene	BJ	U	V4	N	0.61	ug/L	0.61	ug/L			W	10/26/2017		1717151	VAL	Y
R-56 S1	2018-594	CAPA-18-147620	FTB	INIT	VOC	SW-846:8260B	Trichlorobenzene[1,2,3-BJ	U	U	V4	N	0.45	ug/L	0.45	ug/L			W	10/26/2017		1717151	VAL	Y

Reason Code

Description

I4

the sample result is =<5x the concentration of related analyte in the method blank.

I6b

The associated matrix spike recovery was above the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package.

J_LAB

The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL

NQ

The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample.

DATA VALIDATION REPORT

Reason Code

Description

R5

Analyte is not detected because the amount reported is less than the MDC.

U_LAB

The analytical laboratory qualified the analyte as not detected.

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.

V4d

The samples result is $\leq 5x$ the concentration of the related analyte in the trip, rinsate and/or equipment blank.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-18-147642	R-50 S1	REG	EPA:120.1	0	1
CAMO-18-147642	R-50 S1	REG	EPA:150.1	0	1
CAMO-18-147642	R-50 S1	REG	EPA:160.1	0	1
CAMO-18-147642	R-50 S1	REG	EPA:170.0	0	1
CAMO-18-147642	R-50 S1	REG	EPA:245.2	0	1
CAMO-18-147642	R-50 S1	REG	EPA:300.0	0	4
CAMO-18-147642	R-50 S1	REG	EPA:310.1	0	2
CAMO-18-147642	R-50 S1	REG	EPA:350.1	0	1
CAMO-18-147642	R-50 S1	REG	EPA:353.2	0	1
CAMO-18-147642	R-50 S1	REG	EPA:365.4	0	1
CAMO-18-147642	R-50 S1	REG	SM:A2340B	0	1
CAMO-18-147642	R-50 S1	REG	SW-846:6010C	0	17
CAMO-18-147642	R-50 S1	REG	SW-846:6020	0	11
CAMO-18-147642	R-50 S1	REG	SW-846:6850	0	1
CAMO-18-147643	R-50 S2	REG	EPA:120.1	0	1
CAMO-18-147643	R-50 S2	REG	EPA:150.1	0	1
CAMO-18-147643	R-50 S2	REG	EPA:160.1	0	1
CAMO-18-147643	R-50 S2	REG	EPA:170.0	0	1
CAMO-18-147643	R-50 S2	REG	EPA:245.2	0	1
CAMO-18-147643	R-50 S2	REG	EPA:300.0	0	4
CAMO-18-147643	R-50 S2	REG	EPA:310.1	0	2
CAMO-18-147643	R-50 S2	REG	EPA:350.1	0	1
CAMO-18-147643	R-50 S2	REG	EPA:353.2	0	1
CAMO-18-147643	R-50 S2	REG	EPA:365.4	0	1
CAMO-18-147643	R-50 S2	REG	SM:A2340B	0	1
CAMO-18-147643	R-50 S2	REG	SW-846:6010C	0	17

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-18-147643	R-50 S2	REG	SW-846:6020	0	11
CAMO-18-147643	R-50 S2	REG	SW-846:6850	0	1
CAMO-18-147657	R-50 S1	REG	EPA:170.0	0	1
CAMO-18-147657	R-50 S1	REG	EPA:245.2	0	1
CAMO-18-147657	R-50 S1	REG	EPA:335.4	0	1
CAMO-18-147657	R-50 S1	REG	EPA:351.2	0	1
CAMO-18-147657	R-50 S1	REG	SW-846:9060	0	1
CAMO-18-147658	R-50 S2	REG	EPA:170.0	0	1
CAMO-18-147658	R-50 S2	REG	EPA:245.2	0	1
CAMO-18-147658	R-50 S2	REG	EPA:335.4	0	1
CAMO-18-147658	R-50 S2	REG	EPA:351.2	0	1
CAMO-18-147658	R-50 S2	REG	SW-846:9060	0	1
CAPA-18-147570	R-56 S1	REG	EPA:120.1	0	1
CAPA-18-147570	R-56 S1	REG	EPA:150.1	0	1
CAPA-18-147570	R-56 S1	REG	EPA:160.1	0	1
CAPA-18-147570	R-56 S1	REG	EPA:170.0	0	1
CAPA-18-147570	R-56 S1	REG	EPA:245.2	0	1
CAPA-18-147570	R-56 S1	REG	EPA:300.0	0	4
CAPA-18-147570	R-56 S1	REG	EPA:310.1	0	2
CAPA-18-147570	R-56 S1	REG	EPA:350.1	0	1
CAPA-18-147570	R-56 S1	REG	EPA:353.2	0	1
CAPA-18-147570	R-56 S1	REG	EPA:365.4	0	1
CAPA-18-147570	R-56 S1	REG	SM:A2340B	0	1
CAPA-18-147570	R-56 S1	REG	SW-846:6010C	0	17
CAPA-18-147570	R-56 S1	REG	SW-846:6020	0	11
CAPA-18-147570	R-56 S1	REG	SW-846:6850	0	1
CAPA-18-147571	R-56 S2	REG	EPA:120.1	0	1
CAPA-18-147571	R-56 S2	REG	EPA:150.1	0	1
CAPA-18-147571	R-56 S2	REG	EPA:160.1	0	1
CAPA-18-147571	R-56 S2	REG	EPA:170.0	0	1
CAPA-18-147571	R-56 S2	REG	EPA:245.2	0	1
CAPA-18-147571	R-56 S2	REG	EPA:300.0	0	4
CAPA-18-147571	R-56 S2	REG	EPA:310.1	0	2
CAPA-18-147571	R-56 S2	REG	EPA:350.1	0	1
CAPA-18-147571	R-56 S2	REG	EPA:353.2	0	1
CAPA-18-147571	R-56 S2	REG	EPA:365.4	0	1
CAPA-18-147571	R-56 S2	REG	SM:A2340B	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-18-147571	R-56 S2	REG	SW-846:6010C	0	17
CAPA-18-147571	R-56 S2	REG	SW-846:6020	0	11
CAPA-18-147571	R-56 S2	REG	SW-846:6850	0	1
CAPA-18-147596	R-56 S1	REG	EPA:170.0	0	1
CAPA-18-147596	R-56 S1	REG	EPA:245.2	0	1
CAPA-18-147596	R-56 S1	REG	EPA:335.4	0	1
CAPA-18-147596	R-56 S1	REG	EPA:351.2	0	1
CAPA-18-147596	R-56 S1	REG	EPA:900	0	2
CAPA-18-147596	R-56 S1	REG	EPA:901.1	0	5
CAPA-18-147596	R-56 S1	REG	EPA:905.0	0	1
CAPA-18-147596	R-56 S1	REG	HASL-300:AM-241	0	1
CAPA-18-147596	R-56 S1	REG	HASL-300:ISOPU	0	2
CAPA-18-147596	R-56 S1	REG	HASL-300:ISOU	0	3
CAPA-18-147596	R-56 S1	REG	SW-846:8260B	0	80
CAPA-18-147596	R-56 S1	REG	SW-846:8270D	0	80
CAPA-18-147596	R-56 S1	REG	SW-846:9060	0	1
CAPA-18-147597	R-56 S2	REG	EPA:170.0	0	1
CAPA-18-147597	R-56 S2	REG	EPA:245.2	0	1
CAPA-18-147597	R-56 S2	REG	EPA:335.4	0	1
CAPA-18-147597	R-56 S2	REG	EPA:351.2	0	1
CAPA-18-147597	R-56 S2	REG	EPA:900	0	2
CAPA-18-147597	R-56 S2	REG	EPA:901.1	0	5
CAPA-18-147597	R-56 S2	REG	EPA:905.0	0	1
CAPA-18-147597	R-56 S2	REG	HASL-300:AM-241	0	1
CAPA-18-147597	R-56 S2	REG	HASL-300:ISOPU	0	2
CAPA-18-147597	R-56 S2	REG	HASL-300:ISOU	0	3
CAPA-18-147597	R-56 S2	REG	SW-846:8260B	0	80
CAPA-18-147597	R-56 S2	REG	SW-846:8270D	0	80
CAPA-18-147597	R-56 S2	REG	SW-846:9060	0	1
CAPA-18-147620	R-56 S1	FTB	EPA:170.0	0	1
CAPA-18-147620	R-56 S1	FTB	SW-846:8260B	0	80
CAPA-18-147621	R-56 S2	FTB	EPA:170.0	0	1
CAPA-18-147621	R-56 S2	FTB	SW-846:8260B	0	80

November 22, 2017

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

Re: LANL- WQH Water Samples
Work Order: 436504
SDG: 2018-594

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on October 28, 2017, and analyzed for GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,



Julie Robinson for
Valerie Davis
Project Manager

Chain of Custody: 2018-594
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 436504
SDG: 2018-594

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 436504
SDG # : 2018-594**

November 22, 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 October 28, 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). There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
436504001	CAMO-18-147642
436504002	CAMO-18-147657
436504003	CAMO-18-147643
436504004	CAMO-18-147658
436504005	CAPA-18-147570
436504006	CAPA-18-147596
436504007	CAPA-18-147620
436504008	CAPA-18-147571
436504009	CAPA-18-147597
436504010	CAPA-18-147621

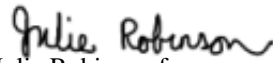
Case Narrative

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, Perchlorates by LCMSMS and Radiochemistry.

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

A handwritten signature in black ink that reads "Julie Robinson". The signature is written in a cursive, flowing style.

Julie Robinson for
Valerie Davis
Project Manager

List of current GEL Certifications as of 22 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

COC; 2018-594		TEST - Explosives		YES	NO
Samples collected from a WFO area?					
Field Test for Explosives Results				YES	NO
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
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/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO
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/100cm ² or Beta > 160,000,000 dpm*g/100cm ² . If YES - Do not ship.				
On the external surface of the sample container, alpha activity ≥ 24 dpm/cm ² , beta activity ≥ 240 dpm/cm ² , 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
<ul style="list-style-type: none"> Am-241 > 27 Cs-137 > 270 Pu-238 > 27 Pu-239/240 > 27 Th-228 > 27 U-234 > 270 U-238 > 270 H-3 > 27,000,000 	<ul style="list-style-type: none"> Am-241 > 270,000 Cs-137 > 270,000 Pu-238 > 270,000 Pu-239/240 > 270,000 Th-228 > 270,000 U-234 > 1,600,000,000 U-238 > unlimited 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	10-27-17
(Signature) <i>[Signature]</i>	1500

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) J. Sherwood	10/27/17
(Signature) <i>[Signature]</i>	15:00

SAMPLE RECEIPT & REVIEW FORM

Client: ESHL		SDG/AR/COC/Work Order: 436504	
Received By: <i>Jacy Boone</i>		Date Received: 10-28-17	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other	
		5908 1783 0736 -5c 5908 1783 0725 -17c 5908 1783 0747-2c	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <u>Ice Packs</u> Dry ice <u>None</u> Other: _____ *all temperatures are recorded in Celsius TEMP: _____
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR3-17</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes _____ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes _____ No <input checked="" type="checkbox"/> N/A (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No _____ N/A Sample ID's and containers affected: _____
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected: _____
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected: _____
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials *[Signature]* Date **10-30-2017** Page **1** of **1**

LOS ALAMOS, NM 87545
UNITED STATES US

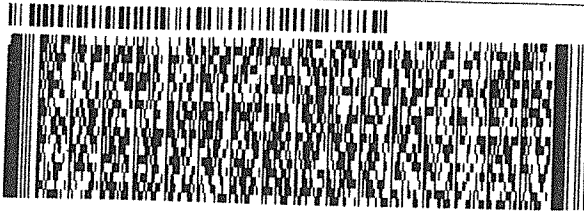
BILL SENDER

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

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWS0



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Express



1 of 2

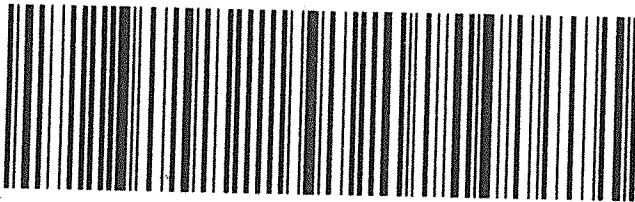
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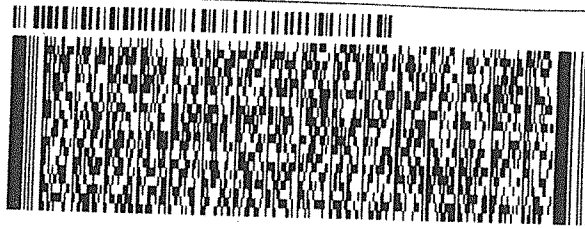
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2 of 2

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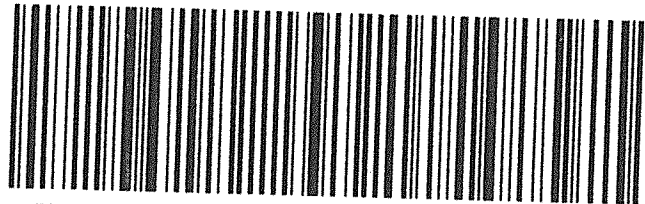
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PRIORITY OVERNIGHT

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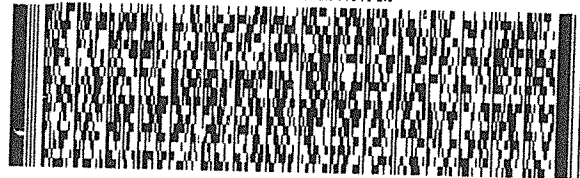
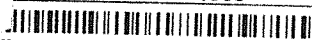
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CHARLESTON SC 29407

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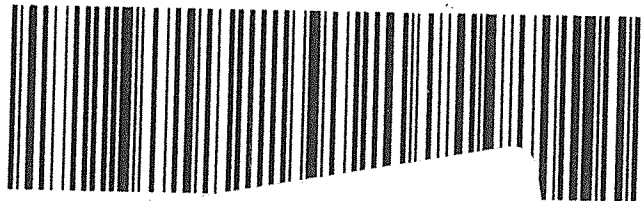


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PRIORITY OVERNIGHT

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29407
SC-US CHS



Part # 156143V-434 RIT2 06/15 33

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 #: 2018-594
Work Order #: 436504**

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
436504006	CAPA-18-147596
436504007	CAPA-18-147620
436504009	CAPA-18-147597
436504010	CAPA-18-147621
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)

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 blank 1203915326 (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 spike recoveries met the acceptance limits.

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: 2018-594 GEL Work Order: 436504

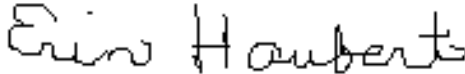
The Qualifiers in this report are defined as follows:

- * 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: 21 NOV 2017

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-594
Lab Sample ID: 436504006

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50

Matrix: W

Client ID: CAPA-18-147596

Client: ARSL004

Project: ESHL00114

Batch ID: 1717151

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Run Date: 11/08/2017 16:17

Inst: VOA6.I

Dilution: 1

Prep Date: 11/08/2017 16:17

Analyst: JP1

Purge Vol: 5 mL

Data File: 110817V6\6G315.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	BJ	0.930	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	0.740	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

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SDG Number: 2018-594

Lab Sample ID: 436504006

Date Collected: 10/26/2017 10:38

Date Received: 10/28/2017 08:50

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1717151

Inst: VOA6.I

Dilution: 1

Run Date: 11/08/2017 16:17

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/08/2017 16:17

Data File: 110817V6\6G315.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	0.970	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	J	0.740	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	J	0.320	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**

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SDG Number: 2018-594
Lab Sample ID: 436504006

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50

Matrix: W

Client ID: CAPA-18-147596

Client: ARSL004

Project: ESHL00114

Batch ID: 1717151

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Run Date: 11/08/2017 16:17

Inst: VOA6.I

Dilution: 1

Prep Date: 11/08/2017 16:17

Analyst: JP1

Purge Vol: 5 mL

Data File: 110817V6\6G315.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	50.0	50.0	ug/L 100	(70%-131%)
Toluene-d8	49.3	50.0	ug/L 99	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.688	5.84	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-594

Lab Sample ID: 436504007

Date Collected: 10/26/2017 10:38

Date Received: 10/28/2017 08:50

Matrix: W

Client ID: CAPA-18-147620

Batch ID: 1717151

Run Date: 11/08/2017 16:45

Prep Date: 11/08/2017 16:45

Data File: 110817V6\6G316.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	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	BJ	0.450	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	0.400	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

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SDG Number: 2018-594

Lab Sample ID: 436504007

Date Collected: 10/26/2017 10:38

Date Received: 10/28/2017 08:50

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1717151

Inst: VOA6.I

Dilution: 1

Run Date: 11/08/2017 16:45

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/08/2017 16:45

Data File: 110817V6\6G316.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	0.610	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**

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SDG Number: 2018-594
Lab Sample ID: 436504007

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50

Matrix: W

Client ID: CAPA-18-147620

Client: ARSL004

Project: ESHL00114

Batch ID: 1717151

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Run Date: 11/08/2017 16:45

Inst: VOA6.I

Dilution: 1

Prep Date: 11/08/2017 16:45

Analyst: JP1

Purge Vol: 5 mL

Data File: 110817V6\6G316.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	51.2	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

Page 1 of 3

SDG Number: 2018-594

Lab Sample ID: 436504009

Date Collected: 10/26/2017 12:31

Date Received: 10/28/2017 08:50

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1717151

Inst: VOA6.I

Dilution: 1

Run Date: 11/08/2017 17:14

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/08/2017 17:14

Data File: 110817V6\6G317.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: 2018-594

Lab Sample ID: 436504009

Date Collected: 10/26/2017 12:31

Date Received: 10/28/2017 08:50

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1717151

Inst: VOA6.I

Dilution: 1

Run Date: 11/08/2017 17:14

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/08/2017 17:14

Data File: 110817V6\6G317.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	0.400	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: 2018-594
Lab Sample ID: 436504009

Date Collected: 10/26/2017 12:31
Date Received: 10/28/2017 08:50

Matrix: W

Client ID: CAPA-18-147597

Client: ARSL004

Project: ESHL00114

Batch ID: 1717151

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Run Date: 11/08/2017 17:14

Inst: VOA6.I

Dilution: 1

Prep Date: 11/08/2017 17:14

Analyst: JP1

Purge Vol: 5 mL

Data File: 110817V6\6G317.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	50.8	50.0	ug/L 102	(71%-134%)
Bromofluorobenzene	50.9	50.0	ug/L 102	(70%-131%)
Toluene-d8	49.5	50.0	ug/L 99	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.688	5.67	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-594
Lab Sample ID: 436504010

Date Collected: 10/26/2017 12:31
Date Received: 10/28/2017 08:50

Matrix: W

Client ID: CAPA-18-147621
Batch ID: 1717151
Run Date: 11/08/2017 17:42
Prep Date: 11/08/2017 17:42
Data File: 110817V6\6G318.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

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

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-594
Lab Sample ID: 436504010

Date Collected: 10/26/2017 12:31
Date Received: 10/28/2017 08:50

Matrix: W

Client ID: CAPA-18-147621

Client: ARSL004

Project: ESHL00114

Batch ID: 1717151

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Run Date: 11/08/2017 17:42

Inst: VOA6.I

Dilution: 1

Prep Date: 11/08/2017 17:42

Analyst: JP1

Purge Vol: 5 mL

Data File: 110817V6\6G318.D

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-594
Lab Sample ID: 436504010

Date Collected: 10/26/2017 12:31
Date Received: 10/28/2017 08:50

Matrix: W

Client ID: CAPA-18-147621

Client: ARSL004

Project: ESHL00114

Batch ID: 1717151

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Run Date: 11/08/2017 17:42

Inst: VOA6.I

Dilution: 1

Prep Date: 11/08/2017 17:42

Analyst: JP1

Purge Vol: 5 mL

Data File: 110817V6\6G318.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	50.6	50.0	ug/L 101	(70%-131%)
Toluene-d8	49.8	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		

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-594**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
436504006	CAPA-18-147596	101	99	100
436504007	CAPA-18-147620	101	100	102
436504009	CAPA-18-147597	102	99	102
436504010	CAPA-18-147621	102	100	101
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

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4 (71%-134%)
TOL = Toluene-d8 (74%-124%)
BFB = Bromofluorobenzene (70%-131%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-594

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

Page 2 of 4

SDG Number: 2018-594

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

Page 3 of 4

SDG Number: 2018-594

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

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-594

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

Page 1 of 1

SDG Number: 2018-594

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

Page 1 of 8

SDG Number: 2018-594

Client ID: CAPA-18-147596PS

Lab Sample ID 1203915332

Instrument: VOA6.I

Analyst: JP1

Purge Vol: 5 mL

Sample Type: Post Spike

Matrix: W

Analysis Date: 11/08/2017 19:06

Dilution: 1

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

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SDG Number: 2018-594

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

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SDG Number: 2018-594

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

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-594

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

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-594

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

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SDG Number: 2018-594

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

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-594

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

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SDG Number: 2018-594

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

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-594

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	U	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

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Quality Control Summary Spike Recovery Report

SDG Number: 2018-594

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	U	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

Method Blank Summary

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SDG Number:	2018-594	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-18-147596	436504006	110817V6\6G315.D	11/08/17	1617
04 CAPA-18-147620	436504007	110817V6\6G316.D	11/08/17	1645
05 CAPA-18-147597	436504009	110817V6\6G317.D	11/08/17	1714
06 CAPA-18-147621	436504010	110817V6\6G318.D	11/08/17	1742
07 CAPA-18-147596PS	1203915332	110817V6\6G321.D	11/08/17	1906
08 CAPA-18-147596PSD	1203915334	110817V6\6G322.D	11/08/17	1935
09 CAPA-18-147596PS	1203915333	110817V6\6G325.D	11/08/17	2059
10 CAPA-18-147596PSD	1203915335	110817V6\6G326.D	11/08/17	2127

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-594
Lab Sample ID: 1203915326
Client Sample: QC for batch 1717151
Client ID: MB for batch 1717151
Batch ID: 1717151
Run Date: 11/08/2017 12:59
Prep Date: 11/08/2017 12:59
Data File: 110817V6\6G308BA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	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: 2018-594
Lab Sample ID: 1203915326
Client Sample: QC for batch 1717151
Client ID: MB for batch 1717151
Batch ID: 1717151
Run Date: 11/08/2017 12:59
Prep Date: 11/08/2017 12:59
Data File: 110817V6\6G308BA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	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

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SDG Number:	2018-594	Matrix:	WATER
Lab Sample ID:	1203915326		
Client Sample:	QC for batch 1717151	Client:	ARSL004
Client ID:	MB for batch 1717151	Method:	SW-846:8260B
Batch ID:	1717151	Inst:	VOA6.I
Run Date:	11/08/2017 12:59	Analyst:	JP1
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

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SDG Number: 2018-594
Lab Sample ID: 1203915328
Client Sample: QC for batch 1717151
Client ID: LCS for batch 1717151
Batch ID: 1717151
Run Date: 11/08/2017 10:38
Prep Date: 11/08/2017 10:38
Data File: 110817V6\6G303LA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		54.7	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: 2018-594
Lab Sample ID: 1203915328
Client Sample: QC for batch 1717151
Client ID: LCS for batch 1717151
Batch ID: 1717151
Run Date: 11/08/2017 10:38
Prep Date: 11/08/2017 10:38
Data File: 110817V6\6G303LA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		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

Page 3 of 3

SDG Number:	2018-594	Matrix:	WATER
Lab Sample ID:	1203915328		
Client Sample:	QC for batch 1717151	Client:	ARSL004
Client ID:	LCS for batch 1717151	Method:	SW-846:8260B
Batch ID:	1717151	Inst:	VOA6.I
Run Date:	11/08/2017 10:38	Analyst:	JP1
Prep Date:	11/08/2017 10:38	Purge Vol:	5 mL
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

Page 1 of 3

SDG Number: 2018-594
Lab Sample ID: 1203915329
Client Sample: QC for batch 1717151
Client ID: LCS for batch 1717151
Batch ID: 1717151
Run Date: 11/08/2017 12:31
Prep Date: 11/08/2017 12:31
Data File: 110817V6\6G307LA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		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: 2018-594
Lab Sample ID: 1203915329
Client Sample: QC for batch 1717151
Client ID: LCS for batch 1717151
Batch ID: 1717151
Run Date: 11/08/2017 12:31
Prep Date: 11/08/2017 12:31
Data File: 110817V6\6G307LA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		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:	2018-594	Matrix:	WATER
Lab Sample ID:	1203915329		
Client Sample:	QC for batch 1717151	Client:	ARSL004
Client ID:	LCS for batch 1717151	Method:	SW-846:8260B
Batch ID:	1717151	Inst:	VOA6.I
Run Date:	11/08/2017 12:31	Analyst:	JP1
Prep Date:	11/08/2017 12:31	Purge Vol:	5 mL
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

Page 1 of 3

SDG Number: 2018-594
Lab Sample ID: 1203915332
Client Sample: QC for batch 1717151
Client ID: CAPA-18-147596PS
Batch ID: 1717151
Run Date: 11/08/2017 19:06
Prep Date: 11/08/2017 19:06
Data File: 110817V6\6G321.D

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		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: 2018-594	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:	2018-594	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

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SDG Number: 2018-594
Lab Sample ID: 1203915333
Client Sample: QC for batch 1717151
Client ID: CAPA-18-147596PS
Batch ID: 1717151
Run Date: 11/08/2017 20:59
Prep Date: 11/08/2017 20:59
Data File: 110817V6\6G325.D

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		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

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SDG Number: 2018-594
Lab Sample ID: 1203915333
Client Sample: QC for batch 1717151
Client ID: CAPA-18-147596PS
Batch ID: 1717151
Run Date: 11/08/2017 20:59
Prep Date: 11/08/2017 20:59
Data File: 110817V6\6G325.D

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		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:	2018-594	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

Page 1 of 3

SDG Number: 2018-594
Lab Sample ID: 1203915334
Client Sample: QC for batch 1717151
Client ID: CAPA-18-147596PSD
Batch ID: 1717151
Run Date: 11/08/2017 19:35
Prep Date: 11/08/2017 19:35
Data File: 110817V6\6G322.D

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		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: 2018-594
Lab Sample ID: 1203915334
Client Sample: QC for batch 1717151
Client ID: CAPA-18-147596PSD
Batch ID: 1717151
Run Date: 11/08/2017 19:35
Prep Date: 11/08/2017 19:35
Data File: 110817V6\6G322.D

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		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:	2018-594	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

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SDG Number: 2018-594
Lab Sample ID: 1203915335
Client Sample: QC for batch 1717151
Client ID: CAPA-18-147596PSD
Batch ID: 1717151
Run Date: 11/08/2017 21:27
Prep Date: 11/08/2017 21:27
Data File: 110817V6\6G326.D

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		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: 2018-594
Lab Sample ID: 1203915335
Client Sample: QC for batch 1717151
Client ID: CAPA-18-147596PSD
Batch ID: 1717151
Run Date: 11/08/2017 21:27
Prep Date: 11/08/2017 21:27
Data File: 110817V6\6G326.D

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		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: 2018-594	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%)

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-594
Work Order #: 436504**

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:	1715004
Prep Batch Number:	1715003

Sample Analysis

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

Sample ID	Client ID
436504006	CAPA-18-147596
436504009	CAPA-18-147597
1203910073	Method Blank (MB)
1203910074	Laboratory Control Sample (LCS)
1203910075	436504006(CAPA-18-147596) Matrix Spike (MS)
1203910076	436504006(CAPA-18-147596) 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 and the associated QC. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. If required, a CRDL was analyzed after the CCVs to demonstrate that there is adequate sensitivity to detect the failed compounds at the applicable lower quantitation limit.

Quality Control (QC) Information

Method Blank (MB) Statement

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

Surrogate Recoveries

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

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 436504006 (CAPA-18-147596) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

The MS and MSD recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information:

Holding Time Specifications

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

Preparation/Analytical Method Verification

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

Sample Dilutions

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

Sample Re-extraction/Re-analysis

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 436504006 (CAPA-18-147596) and 436504009 (CAPA-18-147597) 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
MSD1.I	Agilent 6890N/5973 GC/MS w/ 7683 Autosampler	HP6890/HP5973	DB-5MS	25m x 0.2mm, 0.33um (5% Polysilarylene-95% Polydimethylsiloxane)

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: 2018-594 GEL Work Order: 436504

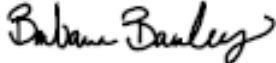
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Barbara Bailey

Date: 03 NOV 2017

Title: Data Validator

Sample Data Summary

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

Page 1 of 3

SDG Number: 2018-594
Lab Sample ID: 436504006

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD1.I
Analyst: JLD1
Aliquot: 1000 mL
Column: 25x.20x.33

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

Client ID: CAPA-18-147596
Batch ID: 1715004
Run Date: 11/02/2017 13:37
Prep Date: 11/02/2017 06:11
Data File: s110217.B\s1h0210.D

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
	<i>1,2-Diphenylhydrazine</i>					
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
	<i>4-Chloro-3-methylphenol</i>					
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**

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SDG Number: 2018-594
Lab Sample ID: 436504006

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD1.I
Analyst: JLD1
Aliquot: 1000 mL
Column: 25x.20x.33

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

Client ID: CAPA-18-147596
Batch ID: 1715004
Run Date: 11/02/2017 13:37
Prep Date: 11/02/2017 06:11
Data File: s110217.B\s1h0210.D

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

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

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SDG Number: 2018-594
Lab Sample ID: 436504006

Date Collected: 10/26/2017 10:38
Date Received: 10/28/2017 08:50

Matrix: W

Client ID: CAPA-18-147596

Client: ARSL004

Project: ESHL00114

Batch ID: 1715004

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Run Date: 11/02/2017 13:37

Inst: MSD1.I

Dilution: 1

Prep Date: 11/02/2017 06:11

Analyst: JLD1

Inj. Vol: 1 uL

Data File: s110217.B\sh0210.D

Aliquot: 1000 mL

Final Volume: 1 mL

Column: 25x.20x.33

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	57.3	100	ug/L	57 (32%-124%)
2-Fluorobiphenyl	39.7	50.0	ug/L	79 (32%-112%)
2-Fluorophenol	37.7	100	ug/L	38 (15%-88%)
Nitrobenzene-d5	41.6	50.0	ug/L	83 (36%-115%)
Phenol-d5	25.9	100	ug/L	26 (15%-91%)
p-Terphenyl-d14	35.5	50.0	ug/L	71 (36%-121%)

Tentatively Identified Compound Summary

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

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

Page 1 of 3

SDG Number: 2018-594
Lab Sample ID: 436504009

Date Collected: 10/26/2017 12:31
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD1.I
Analyst: JLD1
Aliquot: 900 mL
Column: 25x.20x.33

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

Client ID: CAPA-18-147597
Batch ID: 1715004
Run Date: 11/02/2017 15:10
Prep Date: 11/02/2017 06:11
Data File: s110217.B\s1h0213.D

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.33	ug/L	3.33	11.1
120-82-1	1,2,4-Trichlorobenzene	U	3.33	ug/L	3.33	11.1
95-50-1	1,2-Dichlorobenzene	U	3.33	ug/L	3.33	11.1
122-66-7	Azobenzene	U	3.33	ug/L	3.33	11.1
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.33	ug/L	3.33	11.1
106-46-7	1,4-Dichlorobenzene	U	3.33	ug/L	3.33	11.1
123-91-1	1,4-Dioxane	U	3.33	ug/L	3.33	11.1
90-12-0	1-Methylnaphthalene	U	0.333	ug/L	0.333	1.11
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.33	ug/L	3.33	11.1
95-95-4	2,4,5-Trichlorophenol	U	3.33	ug/L	3.33	11.1
88-06-2	2,4,6-Trichlorophenol	U	3.33	ug/L	3.33	11.1
120-83-2	2,4-Dichlorophenol	U	3.33	ug/L	3.33	11.1
105-67-9	2,4-Dimethylphenol	U	3.33	ug/L	3.33	11.1
51-28-5	2,4-Dinitrophenol	U	5.56	ug/L	5.56	22.2
121-14-2	2,4-Dinitrotoluene	U	3.33	ug/L	3.33	11.1
606-20-2	2,6-Dinitrotoluene	U	3.33	ug/L	3.33	11.1
91-58-7	2-Chloronaphthalene	U	0.456	ug/L	0.456	1.11
95-57-8	2-Chlorophenol	U	3.33	ug/L	3.33	11.1
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.33	ug/L	3.33	11.1
91-57-6	2-Methylnaphthalene	U	0.333	ug/L	0.333	1.11
88-75-5	2-Nitrophenol	U	3.33	ug/L	3.33	11.1
91-94-1	3,3'-Dichlorobenzidine	U	3.33	ug/L	3.33	11.1
101-55-3	4-Bromophenylphenylether	U	3.33	ug/L	3.33	11.1
59-50-7	Parachlorometa cresol	U	3.33	ug/L	3.33	11.1
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.67	ug/L	3.67	11.1
7005-72-3	4-Chlorophenylphenylether	U	3.33	ug/L	3.33	11.1
100-02-7	4-Nitrophenol	U	3.33	ug/L	3.33	11.1
83-32-9	Acenaphthene	U	0.333	ug/L	0.333	1.11
208-96-8	Acenaphthylene	U	0.333	ug/L	0.333	1.11
62-53-3	Aniline	U	4.67	ug/L	4.67	11.1
120-12-7	Anthracene	U	0.333	ug/L	0.333	1.11
1912-24-9	Atrazine	U	3.33	ug/L	3.33	11.1
92-87-5	Benzidine	U	4.33	ug/L	4.33	11.1
56-55-3	Benzo(a)anthracene	U	0.333	ug/L	0.333	1.11
50-32-8	Benzo(a)pyrene	U	0.333	ug/L	0.333	1.11
205-99-2	Benzo(b)fluoranthene	U	0.333	ug/L	0.333	1.11
191-24-2	Benzo(ghi)perylene	U	0.333	ug/L	0.333	1.11

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

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SDG Number: 2018-594
Lab Sample ID: 436504009

Date Collected: 10/26/2017 12:31
Date Received: 10/28/2017 08:50
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD1.I
Analyst: JLD1
Aliquot: 900 mL
Column: 25x.20x.33

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

Client ID: CAPA-18-147597
Batch ID: 1715004
Run Date: 11/02/2017 15:10
Prep Date: 11/02/2017 06:11
Data File: s110217.B\s1h0213.D

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.333	ug/L	0.333	1.11
65-85-0	Benzoic acid	U	6.67	ug/L	6.67	22.2
100-51-6	Benzyl alcohol	U	3.33	ug/L	3.33	11.1
85-68-7	Butylbenzylphthalate	U	3.33	ug/L	3.33	11.1
218-01-9	Chrysene	U	0.333	ug/L	0.333	1.11
84-74-2	Di-n-butylphthalate	U	3.33	ug/L	3.33	11.1
117-84-0	Di-n-octylphthalate	U	3.33	ug/L	3.33	11.1
53-70-3	Dibenzo(a,h)anthracene	U	0.333	ug/L	0.333	1.11
132-64-9	Dibenzofuran	U	3.33	ug/L	3.33	11.1
84-66-2	Diethylphthalate	U	3.33	ug/L	3.33	11.1
131-11-3	Dimethylphthalate	U	3.33	ug/L	3.33	11.1
88-85-7	Dinoseb	U	3.33	ug/L	3.33	11.1
122-39-4	Diphenylamine	U	3.33	ug/L	3.33	11.1
206-44-0	Fluoranthene	U	0.333	ug/L	0.333	1.11
86-73-7	Fluorene	U	0.333	ug/L	0.333	1.11
118-74-1	Hexachlorobenzene	U	3.33	ug/L	3.33	11.1
87-68-3	Hexachlorobutadiene	U	3.33	ug/L	3.33	11.1
77-47-4	Hexachlorocyclopentadiene	U	3.33	ug/L	3.33	11.1
67-72-1	Hexachloroethane	U	3.33	ug/L	3.33	11.1
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.333	ug/L	0.333	1.11
78-59-1	Isophorone	U	3.89	ug/L	3.89	11.1
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.33	ug/L	3.33	11.1
924-16-3	N-Nitrosodi-n-butylamine	U	3.33	ug/L	3.33	11.1
55-18-5	N-Nitrosodiethylamine	U	3.33	ug/L	3.33	11.1
621-64-7	N-Nitrosodi--n-propylamine	U	3.33	ug/L	3.33	11.1
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.33	ug/L	3.33	11.1
91-20-3	Naphthalene	U	0.333	ug/L	0.333	1.11
98-95-3	Nitrobenzene	U	3.33	ug/L	3.33	11.1
608-93-5	Pentachlorobenzene	U	3.33	ug/L	3.33	11.1
87-86-5	Pentachlorophenol	U	3.33	ug/L	3.33	11.1
85-01-8	Phenanthrene	U	0.333	ug/L	0.333	1.11
108-95-2	Phenol	U	3.33	ug/L	3.33	11.1
129-00-0	Pyrene	U	0.333	ug/L	0.333	1.11
110-86-1	Pyridine	U	3.33	ug/L	3.33	11.1
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.33	ug/L	3.33	11.1
111-91-1	bis(2-Chloroethoxy)methane	U	3.33	ug/L	3.33	11.1
111-44-4	bis(2-Chloroethyl) ether	U	3.33	ug/L	3.33	11.1
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.33	ug/L	3.33	11.1

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

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SDG Number: 2018-594
Lab Sample ID: 436504009

Date Collected: 10/26/2017 12:31
Date Received: 10/28/2017 08:50

Matrix: W

Client ID: CAPA-18-147597

Client: ARSL004

Project: ESHL00114

Batch ID: 1715004

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Run Date: 11/02/2017 15:10

Inst: MSD1.I

Dilution: 1

Prep Date: 11/02/2017 06:11

Analyst: JLD1

Inj. Vol: 1 uL

Data File: s110217.B\s1h0213.D

Aliquot: 900 mL

Final Volume: 1 mL

Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	4.11	ug/L	4.11	11.1
99-09-2	3-Nitroaniline	U	3.33	ug/L	3.33	11.1
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	3.33	ug/L	3.33	11.1
88-74-4	2-Nitroaniline	U	3.33	ug/L	3.33	11.1
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	3.33	ug/L	3.33	11.1
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	68.9	111	ug/L	62 (32%-124%)
2-Fluorobiphenyl	44.7	55.6	ug/L	80 (32%-112%)
2-Fluorophenol	46.4	111	ug/L	42 (15%-88%)
Nitrobenzene-d5	47.3	55.6	ug/L	85 (36%-115%)
Phenol-d5	32.6	111	ug/L	29 (15%-91%)
p-Terphenyl-d14	39.5	55.6	ug/L	71 (36%-121%)

Tentatively Identified Compound Summary

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

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-594

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203910073	MB for batch 1715003	46	31	87	75	64	70
1203910074	LCS for batch 1715003	50	32	82	74	72	84
436504006	CAPA-18-147596	38	26	83	79	57	71
1203910075	CAPA-18-147596MS	53	41	76	70	64	73
1203910076	CAPA-18-147596MSD	63	47	90	80	73	91
436504009	CAPA-18-147597	42	29	85	80	62	71

Surrogate**Acceptance Limits**

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

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-594

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1715003

Matrix: WATER

Lab Sample ID 1203910074

Instrument: MSD1.I

Analysis Date: 11/02/2017 13:06

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

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-nitrosomethylam	50.0	0.0	27.2	54	30-88
110-86-1	LCS Pyridine	50.0	0.0	27.5	55	27-89
62-53-3	LCS Aniline	50.0	0.0	38.3	77	49-112
108-95-2	LCS Phenol	50.0	0.0	17.4	35	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	45.6	91	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	38.3	77	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	32.8	66	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	31.0	62	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	32.9	66	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	55.1	110	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	37.4	75	44-102
95-48-7	LCS o-Cresol	50.0	0.0	36.1	72	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	35.6	71	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	41.8	84	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	28.9	58	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	45.1	90	53-115
78-59-1	LCS Isophorone	50.0	0.0	41.0	82	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	42.5	85	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	34.6	69	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	43.4	87	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	40.3	81	53-109
65-85-0	LCS Benzoic acid	100	0.0	29.9	30	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-594

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1715003

Matrix: WATER

Lab Sample ID 1203910074

Instrument: MSD1.I

Analysis Date: 11/02/2017 13:06

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

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	44.5	89	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	25.5	51	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	41.8	84	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	35.5	71	42-103
91-20-3	LCS Naphthalene	50.0	0.0	35.5	71	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	35.6	71	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	23.3	47	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	39.5	79	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	39.8	80	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	33.9	68	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	48.4	97	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	47.6	95	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	43.7	87	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	42.0	84	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	43.4	87	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	40.3	81	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	39.8	80	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	32.9	66	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	39.7	79	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	40.0	80	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	41.3	83	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	14.7	29	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-594

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1715003

Matrix: WATER

Lab Sample ID 1203910074

Instrument: MSD1.I

Analysis Date: 11/02/2017 13:06

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

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	37.7	75	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	38.7	77	52-121
100-01-6	LCS 4-Nitroaniline <i>p-Nitroaniline</i>	50.0	0.0	38.7	77	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	36.4	73	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	38.1	76	55-113
122-66-7	LCS Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	45.8	92	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	41.3	83	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	40.8	82	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	34.1	68	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	39.9	80	55-110
120-12-7	LCS Anthracene	50.0	0.0	39.6	79	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	43.0	86	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	44.1	88	54-118
129-00-0	LCS Pyrene	50.0	0.0	41.8	84	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	43.3	87	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	39.8	80	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	43.0	86	57-112
218-01-9	LCS Chrysene	50.0	0.0	41.8	84	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	38.0	76	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	41.0	82	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	40.8	82	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	41.9	84	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-594

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1715003

Matrix: WATER

Lab Sample ID 1203910074

Instrument: MSD1.I

Analysis Date: 11/02/2017 13:06

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

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	49.1	98	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	48.6	97	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	50.7	101	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	29.4	59	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	41.3	83	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	33.8	68	44-102
1912-24-9	LCS Atrazine	50.0	0.0	44.3	89	60-131
92-87-5	LCS Benzidine	100	0.0	73.2	73	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	50.8	102	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	32.2	64	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-594

Sample Type: Matrix Spike

Client ID: CAPA-18-147596MS

Matrix: W

Lab Sample ID 1203910075

Instrument: MSD1.I

Analysis Date: 11/02/2017 14:08

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

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-nitrosomethylam	111	0.00 U	72.1	65	25-106
110-86-1	MS Pyridine	111	0.00 U	63.6	57	24-93
62-53-3	MS Aniline	111	0.00 U	82.2	74	37-113
108-95-2	MS Phenol	111	0.00 U	49.8	45	23-82
111-44-4	MS bis(2-Chloroethyl) ether	111	0.00 U	94.4	85	39-114
95-57-8	MS 2-Chlorophenol	111	0.00 U	78.8	71	37-108
541-73-1	MS 1,3-Dichlorobenzene	111	0.00 U	68.9	62	27-97
106-46-7	MS 1,4-Dichlorobenzene	111	0.00 U	67.8	61	28-97
95-50-1	MS 1,2-Dichlorobenzene	111	0.00 U	70.6	64	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)et	111	0.00 U	115	104	32-127
100-51-6	MS Benzyl alcohol	111	0.00 U	84.9	76	37-116
95-48-7	MS o-Cresol	111	0.00 U	76.8	69	34-109
65794-96-9	MS m,p-Cresols	111	0.00 U	79.6	72	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	111	0.00 U	86.7	78	42-118
67-72-1	MS Hexachloroethane	111	0.00 U	64.6	58	29-94
98-95-3	MS Nitrobenzene	111	0.00 U	92.6	83	38-123
78-59-1	MS Isophorone	111	0.00 U	86.7	78	43-120
88-75-5	MS 2-Nitrophenol	111	0.00 U	88.6	80	39-115
105-67-9	MS 2,4-Dimethylphenol	111	0.00 U	71.2	64	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	111	0.00 U	92.1	83	42-118
120-83-2	MS 2,4-Dichlorophenol	111	0.00 U	80.5	72	40-111
65-85-0	MS Benzoic acid	222	0.00 U	89.2	40	17-95

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-594

Sample Type: Matrix Spike

Client ID: CAPA-18-147596MS

Matrix: W

Lab Sample ID 1203910075

Instrument: MSD1.I

Analysis Date: 11/02/2017 14:08

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	111	0.00	U	89.2	80	44-138
87-68-3	MS	Hexachlorobutadiene	111	0.00	U	57.9	52	26-98
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	111	0.00	U	85.0	76	41-122
91-57-6	MS	2-Methylnaphthalene	111	0.00	U	75.4	68	29-109
91-20-3	MS	Naphthalene	111	0.00	U	76.3	69	31-108
90-12-0	MS	1-Methylnaphthalene	111	0.00	U	78.3	70	33-112
77-47-4	MS	Hexachlorocyclopentadiene	111	0.00	U	49.3	44	26-79
88-06-2	MS	2,4,6-Trichlorophenol	111	0.00	U	80.2	72	39-124
95-95-4	MS	2,4,5-Trichlorophenol	111	0.00	U	80.5	72	42-120
91-58-7	MS	2-Chloronaphthalene	111	0.00	U	72.8	65	29-113
88-74-4	MS	2-Nitroaniline o-Nitroaniline	111	0.00	U	96.4	87	41-121
99-09-2	MS	3-Nitroaniline m-Nitroaniline	111	0.00	U	96.0	86	42-144
131-11-3	MS	Dimethylphthalate	111	0.00	U	89.7	81	45-128
606-20-2	MS	2,6-Dinitrotoluene	111	0.00	U	85.3	77	46-124
121-14-2	MS	2,4-Dinitrotoluene	111	0.00	U	84.1	76	45-125
208-96-8	MS	Acenaphthylene	111	0.00	U	83.9	76	35-120
83-32-9	MS	Acenaphthene	111	0.00	U	84.2	76	35-117
51-28-5	MS	2,4-Dinitrophenol	111	0.00	U	71.3	64	27-122
132-64-9	MS	Dibenzofuran	111	0.00	U	81.6	73	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	111	0.00	U	79.8	72	40-128
84-66-2	MS	Diethylphthalate	111	0.00	U	85.9	77	43-127
100-02-7	MS	4-Nitrophenol	111	0.00	U	43.7	39	17-85

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-594

Sample Type: Matrix Spike

Client ID: CAPA-18-147596MS

Matrix: W

Lab Sample ID 1203910075

Instrument: MSD1.I

Analysis Date: 11/02/2017 14:08

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	111	0.00	U	77.5	70	39-117
7005-72-3	MS	4-Chlorophenylphenylether	111	0.00	U	81.7	74	39-121
100-01-6	MS	4-Nitroaniline <i>p</i> -Nitroaniline	111	0.00	U	73.5	66	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	111	0.00	U	72.3	65	32-126
122-39-4	MS	Diphenylamine	111	0.00	U	79.1	71	37-118
122-66-7	MS	Azobenzene <i>1,2-Diphenylhydrazine</i>	111	0.00	U	96.4	87	38-120
101-55-3	MS	4-Bromophenylphenylether	111	0.00	U	87.8	79	39-121
118-74-1	MS	Hexachlorobenzene	111	0.00	U	84.4	76	40-118
87-86-5	MS	Pentachlorophenol	111	0.00	U	69.7	63	35-121
85-01-8	MS	Phenanthrene	111	0.00	U	81.0	73	40-115
120-12-7	MS	Anthracene	111	0.00	U	80.7	73	38-120
84-74-2	MS	Di-n-butylphthalate	111	0.00	U	90.2	81	41-128
206-44-0	MS	Fluoranthene	111	0.00	U	86.9	78	41-119
129-00-0	MS	Pyrene	111	0.00	U	82.8	75	35-128
85-68-7	MS	Butylbenzylphthalate	111	0.00	U	87.4	79	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	111	0.00	U	80.3	72	38-131
56-55-3	MS	Benzo(a)anthracene	111	0.00	U	86.9	78	39-120
218-01-9	MS	Chrysene	111	0.00	U	86.2	78	41-124
117-84-0	MS	Di-n-octylphthalate	111	0.00	U	77.3	70	37-134
205-99-2	MS	Benzo(b)fluoranthene	111	0.00	U	83.0	75	31-122
207-08-9	MS	Benzo(k)fluoranthene	111	0.00	U	84.1	76	33-123
50-32-8	MS	Benzo(a)pyrene	111	0.00	U	86.1	77	32-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-594

Sample Type: Matrix Spike

Client ID: CAPA-18-147596MS

Matrix: W

Lab Sample ID 1203910075

Instrument: MSD1.I

Analysis Date: 11/02/2017 14:08

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	MS Indeno(1,2,3-cd)pyrene	111	0.00 U	99.0	89	27-121
53-70-3	MS Dibenzo(a,h)anthracene	111	0.00 U	100	90	30-125
191-24-2	MS Benzo(ghi)perylene	111	0.00 U	104	94	24-126
123-91-1	MS 1,4-Dioxane	111	0.00 U	76.7	69	24-110
930-55-2	MS N-Nitrosopyrrolidine	111	0.00 U	89.9	81	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	111	0.00 U	76.2	69	32-101
1912-24-9	MS Atrazine	111	0.00 U	91.8	83	42-129
92-87-5	MS Benzidine	222	0.00 U	127	57	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	111	0.00 U	104	94	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	111	0.00 U	71.8	65	26-102

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-594

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-147596MSD

Matrix: W

Lab Sample ID 1203910076

Instrument: MSD1.I

Analysis Date: 11/02/2017 14:39

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

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-nitrosomethylam	111	0.00 U	84.9	76	25-106	16	0-30
110-86-1	MSD Pyridine	111	0.00 U	77.6	70	24-93	20	0-30
62-53-3	MSD Aniline	111	0.00 U	93.7	84	37-113	13	0-30
108-95-2	MSD Phenol	111	0.00 U	55.0	50	23-82	10	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	111	0.00 U	109	98	39-114	14	0-30
95-57-8	MSD 2-Chlorophenol	111	0.00 U	89.3	80	37-108	13	0-30
541-73-1	MSD 1,3-Dichlorobenzene	111	0.00 U	77.3	70	27-97	11	0-30
106-46-7	MSD 1,4-Dichlorobenzene	111	0.00 U	76.6	69	28-97	12	0-30
95-50-1	MSD 1,2-Dichlorobenzene	111	0.00 U	80.4	72	28-99	13	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	111	0.00 U	133	120	32-127	14	0-30
100-51-6	MSD Benzyl alcohol	111	0.00 U	96.0	86	37-116	12	0-30
95-48-7	MSD o-Cresol	111	0.00 U	87.4	79	34-109	13	0-30
65794-96-9	MSD m,p-Cresols	111	0.00 U	87.8	79	36-120	10	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	111	0.00 U	97.3	88	42-118	11	0-30
67-72-1	MSD Hexachloroethane	111	0.00 U	71.0	64	29-94	9	0-30
98-95-3	MSD Nitrobenzene	111	0.00 U	108	97	38-123	15	0-30
78-59-1	MSD Isophorone	111	0.00 U	98.7	89	43-120	13	0-30
88-75-5	MSD 2-Nitrophenol	111	0.00 U	100	90	39-115	12	0-30
105-67-9	MSD 2,4-Dimethylphenol	111	0.00 U	80.6	73	39-107	12	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	111	0.00 U	104	94	42-118	13	0-30
120-83-2	MSD 2,4-Dichlorophenol	111	0.00 U	91.3	82	40-111	13	0-30
65-85-0	MSD Benzoic acid	222	0.00 U	91.3	41	17-95	2	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-594

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-147596MSD

Matrix: W

Lab Sample ID 1203910076

Instrument: MSD1.I

Analysis Date: 11/02/2017 14:39

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	MSD 4-Chloroaniline	111	0.00 U	100	90	44-138	12	0-30
87-68-3	MSD Hexachlorobutadiene	111	0.00 U	63.3	57	26-98	9	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	111	0.00 U	93.2	84	41-122	9	0-30
91-57-6	MSD 2-Methylnaphthalene	111	0.00 U	84.9	76	29-109	12	0-30
91-20-3	MSD Naphthalene	111	0.00 U	86.1	77	31-108	12	0-30
90-12-0	MSD 1-Methylnaphthalene	111	0.00 U	88.4	80	33-112	12	0-30
77-47-4	MSD Hexachlorocyclopentadiene	111	0.00 U	48.1	43	26-79	2	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	111	0.00 U	90.2	81	39-124	12	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	111	0.00 U	89.9	81	42-120	11	0-30
91-58-7	MSD 2-Chloronaphthalene	111	0.00 U	82.2	74	29-113	12	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	111	0.00 U	106	95	41-121	9	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	111	0.00 U	101	91	42-144	6	0-30
131-11-3	MSD Dimethylphthalate	111	0.00 U	99.4	90	45-128	10	0-30
606-20-2	MSD 2,6-Dinitrotoluene	111	0.00 U	95.8	86	46-124	12	0-30
121-14-2	MSD 2,4-Dinitrotoluene	111	0.00 U	92.5	83	45-125	10	0-30
208-96-8	MSD Acenaphthylene	111	0.00 U	93.6	84	35-120	11	0-30
83-32-9	MSD Acenaphthene	111	0.00 U	95.2	86	35-117	12	0-30
51-28-5	MSD 2,4-Dinitrophenol	111	0.00 U	70.1	63	27-122	2	0-30
132-64-9	MSD Dibenzofuran	111	0.00 U	89.8	81	38-113	10	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	111	0.00 U	86.4	78	40-128	8	0-30
84-66-2	MSD Diethylphthalate	111	0.00 U	95.1	86	43-127	10	0-30
100-02-7	MSD 4-Nitrophenol	111	0.00 U	46.2	42	17-85	6	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-594

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-147596MSD

Matrix: W

Lab Sample ID 1203910076

Instrument: MSD1.I

Analysis Date: 11/02/2017 14:39

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	MSD Fluorene	111	0.00 U	85.9	77	39-117	10	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	111	0.00 U	90.3	81	39-121	10	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	111	0.00 U	78.7	71	30-133	7	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	111	0.00 U	79.2	71	32-126	9	0-30
122-39-4	MSD Diphenylamine	111	0.00 U	89.3	80	37-118	12	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	111	0.00 U	112	101	38-120	15	0-30
101-55-3	MSD 4-Bromophenylphenylether	111	0.00 U	103	93	39-121	16	0-30
118-74-1	MSD Hexachlorobenzene	111	0.00 U	98.6	89	40-118	16	0-30
87-86-5	MSD Pentachlorophenol	111	0.00 U	78.5	71	35-121	12	0-30
85-01-8	MSD Phenanthrene	111	0.00 U	91.7	83	40-115	12	0-30
120-12-7	MSD Anthracene	111	0.00 U	90.0	81	38-120	11	0-30
84-74-2	MSD Di-n-butylphthalate	111	0.00 U	102	92	41-128	13	0-30
206-44-0	MSD Fluoranthene	111	0.00 U	94.4	85	41-119	8	0-30
129-00-0	MSD Pyrene	111	0.00 U	99.8	90	35-128	19	0-30
85-68-7	MSD Butylbenzylphthalate	111	0.00 U	102	92	40-129	16	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	111	0.00 U	94.0	85	38-131	16	0-30
56-55-3	MSD Benzo(a)anthracene	111	0.00 U	96.9	87	39-120	11	0-30
218-01-9	MSD Chrysene	111	0.00 U	96.6	87	41-124	11	0-30
117-84-0	MSD Di-n-octylphthalate	111	0.00 U	86.9	78	37-134	12	0-30
205-99-2	MSD Benzo(b)fluoranthene	111	0.00 U	92.8	84	31-122	11	0-30
207-08-9	MSD Benzo(k)fluoranthene	111	0.00 U	94.0	85	33-123	11	0-30
50-32-8	MSD Benzo(a)pyrene	111	0.00 U	93.3	84	32-118	8	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-594

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-147596MSD

Matrix: W

Lab Sample ID 1203910076

Instrument: MSD1.I

Analysis Date: 11/02/2017 14:39

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1715003

Inj. Vol: 1 uL

Batch ID: 1715004

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	111	0.00 U	115	104	27-121	15	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	111	0.00 U	114	103	30-125	13	0-30
191-24-2	MSD Benzo(ghi)perylene	111	0.00 U	121	109	24-126	15	0-30
123-91-1	MSD 1,4-Dioxane	111	0.00 U	88.5	80	24-110	14	0-30
930-55-2	MSD N-Nitrosopyrrolidine	111	0.00 U	97.3	88	47-119	8	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	111	0.00 U	85.3	77	32-101	11	0-30
1912-24-9	MSD Atrazine	111	0.00 U	108	97	42-129	16	0-30
92-87-5	MSD Benzidine	222	0.00 U	134	60	15-130	6	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	111	0.00 U	108	97	34-124	4	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	111	0.00 U	79.8	72	26-102	11	0-30

Method Blank Summary

Page 1 of 1

SDG Number:	2018-594	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1715003	Instrument ID:	MSD1.I	Data File:	s110217.B\s1h0208.D
Lab Sample ID:	1203910073	Prep Date:	11/02/2017 06:11	Analyzed:	11/02/17 12:35
Column:	25x.20x.33				

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 1715003	1203910074	s110217.B\s1h0209.D	11/02/17	1306
02 CAPA-18-147596	436504006	s110217.B\s1h0210.D	11/02/17	1337
03 CAPA-18-147596MS	1203910075	s110217.B\s1h0211.D	11/02/17	1408
04 CAPA-18-147596MSD	1203910076	s110217.B\s1h0212.D	11/02/17	1439
05 CAPA-18-147597	436504009	s110217.B\s1h0213.D	11/02/17	1510

Quality Control Data

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

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SDG Number: 2018-594

Matrix: WATER

Lab Sample ID: 1203910073

Client Sample: QC for batch 1715003

Client: ARSL004

Project: QC

Client ID: MB for batch 1715003

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1715004

Inst: MSD1.I

Dilution: 1

Run Date: 11/02/2017 12:35

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 11/02/2017 06:11

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s110217.B\s1h0208.D

Column: 25x.20x.33

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
	<i>1,2-Diphenylhydrazine</i>					
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
	<i>4-Chloro-3-methylphenol</i>					
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**

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SDG Number: 2018-594

Matrix: WATER

Lab Sample ID: 1203910073

Client Sample: QC for batch 1715003

Client: ARSL004

Project: QC

Client ID: MB for batch 1715003

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1715004

Inst: MSD1.I

Dilution: 1

Run Date: 11/02/2017 12:35

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 11/02/2017 06:11

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s110217.B\s1h0208.D

Column: 25x.20x.33

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

**Semi-Volatile
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Sample Summary**

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SDG Number: 2018-594

Lab Sample ID: 1203910073

Client Sample: QC for batch 1715003

Client ID: MB for batch 1715003

Batch ID: 1715004

Run Date: 11/02/2017 12:35

Prep Date: 11/02/2017 06:11

Data File: s110217.B\1h0208.D

Matrix: WATER

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JLD1

Aliquot: 1000 mL

Column: 25x.20x.33

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	64.5	100	ug/L	64 (32%-124%)
2-Fluorobiphenyl	37.6	50.0	ug/L	75 (32%-112%)
2-Fluorophenol	45.5	100	ug/L	46 (15%-88%)
Nitrobenzene-d5	43.3	50.0	ug/L	87 (36%-115%)
Phenol-d5	31.1	100	ug/L	31 (15%-91%)
p-Terphenyl-d14	35.2	50.0	ug/L	70 (36%-121%)

Tentatively Identified Compound Summary

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

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Sample Summary**

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SDG Number: 2018-594

Lab Sample ID: 1203910074

Client Sample: QC for batch 1715003

Client ID: LCS for batch 1715003

Batch ID: 1715004

Run Date: 11/02/2017 13:06

Prep Date: 11/02/2017 06:11

Data File: s110217.B\s1h0209.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD1.I
Analyst: JLD1
Aliquot: 1000 mL
Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		33.8	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		32.2	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		32.9	ug/L	3.00	10.0
122-66-7	Azobenzene		45.8	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		32.8	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		31.0	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		29.4	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		35.6	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		40.0	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		39.8	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		39.5	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		40.3	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		34.6	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		32.9	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		43.4	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		42.0	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		33.9	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		38.3	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		36.4	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		35.5	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		42.5	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		50.8	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		41.3	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		41.8	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		44.5	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		38.7	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		14.7	ug/L	3.00	10.0
83-32-9	Acenaphthene		39.8	ug/L	0.300	1.00
208-96-8	Acenaphthylene		40.3	ug/L	0.300	1.00
62-53-3	Aniline		38.3	ug/L	4.20	10.0
120-12-7	Anthracene		39.6	ug/L	0.300	1.00
1912-24-9	Atrazine		44.3	ug/L	3.00	10.0
92-87-5	Benzidine		73.2	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		43.0	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		41.9	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		41.0	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		50.7	ug/L	0.300	1.00

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Sample Summary**

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SDG Number: 2018-594

Lab Sample ID: 1203910074

Client Sample: QC for batch 1715003

Client ID: LCS for batch 1715003

Batch ID: 1715004

Run Date: 11/02/2017 13:06

Prep Date: 11/02/2017 06:11

Data File: s110217.B\s1h0209.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JLD1

Aliquot: 1000 mL

Column: 25x.20x.33

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		40.8	ug/L	0.300	1.00
65-85-0	Benzoic acid		29.9	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		37.4	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		43.3	ug/L	3.00	10.0
218-01-9	Chrysene		41.8	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		43.0	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		38.0	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		48.6	ug/L	0.300	1.00
132-64-9	Dibenzofuran		39.7	ug/L	3.00	10.0
84-66-2	Diethylphthalate		41.3	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		43.7	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		38.1	ug/L	3.00	10.0
206-44-0	Fluoranthene		44.1	ug/L	0.300	1.00
86-73-7	Fluorene		37.7	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		40.8	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		25.5	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		23.3	ug/L	3.00	10.0
67-72-1	Hexachloroethane		28.9	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		49.1	ug/L	0.300	1.00
78-59-1	Isophorone		41.0	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		27.2	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		41.8	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		41.3	ug/L	3.00	10.0
91-20-3	Naphthalene		35.5	ug/L	0.300	1.00
98-95-3	Nitrobenzene		45.1	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		34.1	ug/L	3.00	10.0
85-01-8	Phenanthrene		39.9	ug/L	0.300	1.00
108-95-2	Phenol		17.4	ug/L	3.00	10.0
129-00-0	Pyrene		41.8	ug/L	0.300	1.00
110-86-1	Pyridine		27.5	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		55.1	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		43.4	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		45.6	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		39.8	ug/L	3.00	10.0

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Sample Summary**

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SDG Number: 2018-594	Matrix: WATER
Lab Sample ID: 1203910074	
Client Sample: QC for batch 1715003	Client: ARSL004
Client ID: LCS for batch 1715003	Method: SW846 3510C/8270D
Batch ID: 1715004	Inst: MSD1.I
Run Date: 11/02/2017 13:06	Analyst: JLD1
Prep Date: 11/02/2017 06:11	Aliquot: 1000 mL
Data File: s110217.B\s1h0209.D	Column: 25x.20x.33
	Project: QC
	SOP Ref: GL-OA-E-009
	Dilution: 1
	Inj. Vol: 1 uL
	Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		35.6	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		47.6	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		36.1	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		48.4	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		38.7	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	71.8	100	ug/L	72	(32%-124%)
2-Fluorobiphenyl	37.1	50.0	ug/L	74	(32%-112%)
2-Fluorophenol	50.1	100	ug/L	50	(15%-88%)
Nitrobenzene-d5	41.1	50.0	ug/L	82	(36%-115%)
Phenol-d5	32.0	100	ug/L	32	(15%-91%)
p-Terphenyl-d14	41.9	50.0	ug/L	84	(36%-121%)

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Sample Summary**

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SDG Number: 2018-594	Date Collected: 10/26/2017 10:38	Matrix: W
Lab Sample ID: 1203910075	Date Received: 10/28/2017 08:50	
Client Sample: QC for batch 1715003	Client: ARSL004	Project: QC
Client ID: CAPA-18-147596MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1715004	Inst: MSD1.I	Dilution: 1
Run Date: 11/02/2017 14:08	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/02/2017 06:11	Aliquot: 450 mL	Final Volume: 1 mL
Data File: s110217.B\s1h0211.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		76.2	ug/L	6.67	22.2
120-82-1	1,2,4-Trichlorobenzene		71.8	ug/L	6.67	22.2
95-50-1	1,2-Dichlorobenzene		70.6	ug/L	6.67	22.2
122-66-7	Azobenzene		96.4	ug/L	6.67	22.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		68.9	ug/L	6.67	22.2
106-46-7	1,4-Dichlorobenzene		67.8	ug/L	6.67	22.2
123-91-1	1,4-Dioxane		76.7	ug/L	6.67	22.2
90-12-0	1-Methylnaphthalene		78.3	ug/L	0.667	2.22
58-90-2	2,3,4,6-Tetrachlorophenol		79.8	ug/L	6.67	22.2
95-95-4	2,4,5-Trichlorophenol		80.5	ug/L	6.67	22.2
88-06-2	2,4,6-Trichlorophenol		80.2	ug/L	6.67	22.2
120-83-2	2,4-Dichlorophenol		80.5	ug/L	6.67	22.2
105-67-9	2,4-Dimethylphenol		71.2	ug/L	6.67	22.2
51-28-5	2,4-Dinitrophenol		71.3	ug/L	11.1	44.4
121-14-2	2,4-Dinitrotoluene		84.1	ug/L	6.67	22.2
606-20-2	2,6-Dinitrotoluene		85.3	ug/L	6.67	22.2
91-58-7	2-Chloronaphthalene		72.8	ug/L	0.911	2.22
95-57-8	2-Chlorophenol		78.8	ug/L	6.67	22.2
534-52-1	2-Methyl-4,6-dinitrophenol		72.3	ug/L	6.67	22.2
91-57-6	2-Methylnaphthalene		75.4	ug/L	0.667	2.22
88-75-5	2-Nitrophenol		88.6	ug/L	6.67	22.2
91-94-1	3,3'-Dichlorobenzidine		104	ug/L	6.67	22.2
101-55-3	4-Bromophenylphenylether		87.8	ug/L	6.67	22.2
59-50-7	Parachlorometa cresol		85.0	ug/L	6.67	22.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		89.2	ug/L	7.33	22.2
7005-72-3	4-Chlorophenylphenylether		81.7	ug/L	6.67	22.2
100-02-7	4-Nitrophenol		43.7	ug/L	6.67	22.2
83-32-9	Acenaphthene		84.2	ug/L	0.667	2.22
208-96-8	Acenaphthylene		83.9	ug/L	0.667	2.22
62-53-3	Aniline		82.2	ug/L	9.33	22.2
120-12-7	Anthracene		80.7	ug/L	0.667	2.22
1912-24-9	Atrazine		91.8	ug/L	6.67	22.2
92-87-5	Benzidine		127	ug/L	8.67	22.2
56-55-3	Benzo(a)anthracene		86.9	ug/L	0.667	2.22
50-32-8	Benzo(a)pyrene		86.1	ug/L	0.667	2.22
205-99-2	Benzo(b)fluoranthene		83.0	ug/L	0.667	2.22
191-24-2	Benzo(ghi)perylene		104	ug/L	0.667	2.22

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SDG Number: 2018-594	Date Collected: 10/26/2017 10:38	Matrix: W
Lab Sample ID: 1203910075	Date Received: 10/28/2017 08:50	
Client Sample: QC for batch 1715003	Client: ARSL004	Project: QC
Client ID: CAPA-18-147596MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1715004	Inst: MSD1.I	Dilution: 1
Run Date: 11/02/2017 14:08	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/02/2017 06:11	Aliquot: 450 mL	Final Volume: 1 mL
Data File: s110217.B\s1h0211.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		84.1	ug/L	0.667	2.22
65-85-0	Benzoic acid		89.2	ug/L	13.3	44.4
100-51-6	Benzyl alcohol		84.9	ug/L	6.67	22.2
85-68-7	Butylbenzylphthalate		87.4	ug/L	6.67	22.2
218-01-9	Chrysene		86.2	ug/L	0.667	2.22
84-74-2	Di-n-butylphthalate		90.2	ug/L	6.67	22.2
117-84-0	Di-n-octylphthalate		77.3	ug/L	6.67	22.2
53-70-3	Dibenzo(a,h)anthracene		100	ug/L	0.667	2.22
132-64-9	Dibenzofuran		81.6	ug/L	6.67	22.2
84-66-2	Diethylphthalate		85.9	ug/L	6.67	22.2
131-11-3	Dimethylphthalate		89.7	ug/L	6.67	22.2
88-85-7	Dinoseb	U	6.67	ug/L	6.67	22.2
122-39-4	Diphenylamine		79.1	ug/L	6.67	22.2
206-44-0	Fluoranthene		86.9	ug/L	0.667	2.22
86-73-7	Fluorene		77.5	ug/L	0.667	2.22
118-74-1	Hexachlorobenzene		84.4	ug/L	6.67	22.2
87-68-3	Hexachlorobutadiene		57.9	ug/L	6.67	22.2
77-47-4	Hexachlorocyclopentadiene		49.3	ug/L	6.67	22.2
67-72-1	Hexachloroethane		64.6	ug/L	6.67	22.2
193-39-5	Indeno(1,2,3-cd)pyrene		99.0	ug/L	0.667	2.22
78-59-1	Isophorone		86.7	ug/L	7.78	22.2
62-75-9	N-Methyl-N-nitrosomethylamine		72.1	ug/L	6.67	22.2
924-16-3	N-Nitrosodi-n-butylamine	U	6.67	ug/L	6.67	22.2
55-18-5	N-Nitrosodiethylamine	U	6.67	ug/L	6.67	22.2
621-64-7	N-Nitrosodi--n-propylamine		86.7	ug/L	6.67	22.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		89.9	ug/L	6.67	22.2
91-20-3	Naphthalene		76.3	ug/L	0.667	2.22
98-95-3	Nitrobenzene		92.6	ug/L	6.67	22.2
608-93-5	Pentachlorobenzene	U	6.67	ug/L	6.67	22.2
87-86-5	Pentachlorophenol		69.7	ug/L	6.67	22.2
85-01-8	Phenanthrene		81.0	ug/L	0.667	2.22
108-95-2	Phenol		49.8	ug/L	6.67	22.2
129-00-0	Pyrene		82.8	ug/L	0.667	2.22
110-86-1	Pyridine		63.6	ug/L	6.67	22.2
108-60-1	bis(2-Chloro-1-methylethyl)ether		115	ug/L	6.67	22.2
111-91-1	bis(2-Chloroethoxy)methane		92.1	ug/L	6.67	22.2
111-44-4	bis(2-Chloroethyl) ether		94.4	ug/L	6.67	22.2
117-81-7	bis(2-Ethylhexyl)phthalate		80.3	ug/L	6.67	22.2

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SDG Number: 2018-594	Date Collected: 10/26/2017 10:38	Matrix: W
Lab Sample ID: 1203910075	Date Received: 10/28/2017 08:50	
Client Sample: QC for batch 1715003	Client: ARSL004	Project: QC
Client ID: CAPA-18-147596MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1715004	Inst: MSD1.I	Dilution: 1
Run Date: 11/02/2017 14:08	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/02/2017 06:11	Aliquot: 450 mL	Final Volume: 1 mL
Data File: s110217.B\s1h0211.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		79.6	ug/L	8.22	22.2
99-09-2	3-Nitroaniline		96.0	ug/L	6.67	22.2
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		76.8	ug/L	6.67	22.2
88-74-4	2-Nitroaniline		96.4	ug/L	6.67	22.2
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		73.5	ug/L	6.67	22.2
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	143	222	ug/L	64	(32%-124%)
2-Fluorobiphenyl	77.3	111	ug/L	70	(32%-112%)
2-Fluorophenol	118	222	ug/L	53	(15%-88%)
Nitrobenzene-d5	84.2	111	ug/L	76	(36%-115%)
Phenol-d5	91.3	222	ug/L	41	(15%-91%)
p-Terphenyl-d14	81.4	111	ug/L	73	(36%-121%)

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SDG Number: 2018-594	Date Collected: 10/26/2017 10:38	Matrix: W
Lab Sample ID: 1203910076	Date Received: 10/28/2017 08:50	
Client Sample: QC for batch 1715003	Client: ARSL004	Project: QC
Client ID: CAPA-18-147596MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1715004	Inst: MSD1.I	Dilution: 1
Run Date: 11/02/2017 14:39	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/02/2017 06:11	Aliquot: 450 mL	Final Volume: 1 mL
Data File: s110217.B\s1h0212.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		85.3	ug/L	6.67	22.2
120-82-1	1,2,4-Trichlorobenzene		79.8	ug/L	6.67	22.2
95-50-1	1,2-Dichlorobenzene		80.4	ug/L	6.67	22.2
122-66-7	Azobenzene		112	ug/L	6.67	22.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		77.3	ug/L	6.67	22.2
106-46-7	1,4-Dichlorobenzene		76.6	ug/L	6.67	22.2
123-91-1	1,4-Dioxane		88.5	ug/L	6.67	22.2
90-12-0	1-Methylnaphthalene		88.4	ug/L	0.667	2.22
58-90-2	2,3,4,6-Tetrachlorophenol		86.4	ug/L	6.67	22.2
95-95-4	2,4,5-Trichlorophenol		89.9	ug/L	6.67	22.2
88-06-2	2,4,6-Trichlorophenol		90.2	ug/L	6.67	22.2
120-83-2	2,4-Dichlorophenol		91.3	ug/L	6.67	22.2
105-67-9	2,4-Dimethylphenol		80.6	ug/L	6.67	22.2
51-28-5	2,4-Dinitrophenol		70.1	ug/L	11.1	44.4
121-14-2	2,4-Dinitrotoluene		92.5	ug/L	6.67	22.2
606-20-2	2,6-Dinitrotoluene		95.8	ug/L	6.67	22.2
91-58-7	2-Chloronaphthalene		82.2	ug/L	0.911	2.22
95-57-8	2-Chlorophenol		89.3	ug/L	6.67	22.2
534-52-1	2-Methyl-4,6-dinitrophenol		79.2	ug/L	6.67	22.2
91-57-6	2-Methylnaphthalene		84.9	ug/L	0.667	2.22
88-75-5	2-Nitrophenol		100	ug/L	6.67	22.2
91-94-1	3,3'-Dichlorobenzidine		108	ug/L	6.67	22.2
101-55-3	4-Bromophenylphenylether		103	ug/L	6.67	22.2
59-50-7	Parachlorometa cresol		93.2	ug/L	6.67	22.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		100	ug/L	7.33	22.2
7005-72-3	4-Chlorophenylphenylether		90.3	ug/L	6.67	22.2
100-02-7	4-Nitrophenol		46.2	ug/L	6.67	22.2
83-32-9	Acenaphthene		95.2	ug/L	0.667	2.22
208-96-8	Acenaphthylene		93.6	ug/L	0.667	2.22
62-53-3	Aniline		93.7	ug/L	9.33	22.2
120-12-7	Anthracene		90.0	ug/L	0.667	2.22
1912-24-9	Atrazine		108	ug/L	6.67	22.2
92-87-5	Benzidine		134	ug/L	8.67	22.2
56-55-3	Benzo(a)anthracene		96.9	ug/L	0.667	2.22
50-32-8	Benzo(a)pyrene		93.3	ug/L	0.667	2.22
205-99-2	Benzo(b)fluoranthene		92.8	ug/L	0.667	2.22
191-24-2	Benzo(ghi)perylene		121	ug/L	0.667	2.22

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

SDG Number:	2018-594	Date Collected:	10/26/2017 10:38	Matrix:	W
Lab Sample ID:	1203910076	Date Received:	10/28/2017 08:50		
Client Sample:	QC for batch 1715003	Client:	ARSL004	Project:	QC
Client ID:	CAPA-18-147596MSD	Method:	SW846 3510C/8270D	SOP Ref:	GL-OA-E-009
Batch ID:	1715004	Inst:	MSD1.I	Dilution:	1
Run Date:	11/02/2017 14:39	Analyst:	JLD1	Inj. Vol:	1 uL
Prep Date:	11/02/2017 06:11	Aliquot:	450 mL	Final Volume:	1 mL
Data File:	s110217.B\1h0212.D	Column:	25x.20x.33		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		94.0	ug/L	0.667	2.22
65-85-0	Benzoic acid		91.3	ug/L	13.3	44.4
100-51-6	Benzyl alcohol		96.0	ug/L	6.67	22.2
85-68-7	Butylbenzylphthalate		102	ug/L	6.67	22.2
218-01-9	Chrysene		96.6	ug/L	0.667	2.22
84-74-2	Di-n-butylphthalate		102	ug/L	6.67	22.2
117-84-0	Di-n-octylphthalate		86.9	ug/L	6.67	22.2
53-70-3	Dibenzo(a,h)anthracene		114	ug/L	0.667	2.22
132-64-9	Dibenzofuran		89.8	ug/L	6.67	22.2
84-66-2	Diethylphthalate		95.1	ug/L	6.67	22.2
131-11-3	Dimethylphthalate		99.4	ug/L	6.67	22.2
88-85-7	Dinoseb	U	6.67	ug/L	6.67	22.2
122-39-4	Diphenylamine		89.3	ug/L	6.67	22.2
206-44-0	Fluoranthene		94.4	ug/L	0.667	2.22
86-73-7	Fluorene		85.9	ug/L	0.667	2.22
118-74-1	Hexachlorobenzene		98.6	ug/L	6.67	22.2
87-68-3	Hexachlorobutadiene		63.3	ug/L	6.67	22.2
77-47-4	Hexachlorocyclopentadiene		48.1	ug/L	6.67	22.2
67-72-1	Hexachloroethane		71.0	ug/L	6.67	22.2
193-39-5	Indeno(1,2,3-cd)pyrene		115	ug/L	0.667	2.22
78-59-1	Isophorone		98.7	ug/L	7.78	22.2
62-75-9	N-Methyl-N-nitrosomethylamine		84.9	ug/L	6.67	22.2
924-16-3	N-Nitrosodi-n-butylamine	U	6.67	ug/L	6.67	22.2
55-18-5	N-Nitrosodiethylamine	U	6.67	ug/L	6.67	22.2
621-64-7	N-Nitrosodi--n-propylamine		97.3	ug/L	6.67	22.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		97.3	ug/L	6.67	22.2
91-20-3	Naphthalene		86.1	ug/L	0.667	2.22
98-95-3	Nitrobenzene		108	ug/L	6.67	22.2
608-93-5	Pentachlorobenzene	U	6.67	ug/L	6.67	22.2
87-86-5	Pentachlorophenol		78.5	ug/L	6.67	22.2
85-01-8	Phenanthrene		91.7	ug/L	0.667	2.22
108-95-2	Phenol		55.0	ug/L	6.67	22.2
129-00-0	Pyrene		99.8	ug/L	0.667	2.22
110-86-1	Pyridine		77.6	ug/L	6.67	22.2
108-60-1	bis(2-Chloro-1-methylethyl)ether		133	ug/L	6.67	22.2
111-91-1	bis(2-Chloroethoxy)methane		104	ug/L	6.67	22.2
111-44-4	bis(2-Chloroethyl) ether		109	ug/L	6.67	22.2
117-81-7	bis(2-Ethylhexyl)phthalate		94.0	ug/L	6.67	22.2

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

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SDG Number: 2018-594	Date Collected: 10/26/2017 10:38	Matrix: W
Lab Sample ID: 1203910076	Date Received: 10/28/2017 08:50	
Client Sample: QC for batch 1715003	Client: ARSL004	Project: QC
Client ID: CAPA-18-147596MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1715004	Inst: MSD1.I	Dilution: 1
Run Date: 11/02/2017 14:39	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/02/2017 06:11	Aliquot: 450 mL	Final Volume: 1 mL
Data File: s110217.B\s1h0212.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		87.8	ug/L	8.22	22.2
99-09-2	3-Nitroaniline		101	ug/L	6.67	22.2
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		87.4	ug/L	6.67	22.2
88-74-4	2-Nitroaniline		106	ug/L	6.67	22.2
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		78.7	ug/L	6.67	22.2
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	161	222	ug/L	73	(32%-124%)
2-Fluorobiphenyl	88.7	111	ug/L	80	(32%-112%)
2-Fluorophenol	141	222	ug/L	63	(15%-88%)
Nitrobenzene-d5	99.9	111	ug/L	90	(36%-115%)
Phenol-d5	105	222	ug/L	47	(15%-91%)
p-Terphenyl-d14	101	111	ug/L	91	(36%-121%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-594
Work Order #: 436504**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW-846:6850

Prep Method: SW-846:6850

Analytical Batch Number: 1714762

Prep Batch Number: 1714758

Sample Analysis

Sample ID	Client ID
436504001	436504001 (CAMO-18-147642)
436504003	436504003 (CAMO-18-147643)
436504005	436504005 (CAPA-18-147570)
436504008	436504008 (CAPA-18-147571)
1203909517	Interference Check Sample (ICS)
1203909513	Method Blank (MB)
1203909514	Laboratory Control Sample (LCS)
1203909515	436322001(CAPA-18-147551) Matrix Spike (MS)
1203909516	436322001(CAPA-18-147551) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

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

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

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

CCB Requirements

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

CCV Requirements

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

Low Level Standard (CRI) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

QC Sample Designation

Client sample 436322001 (CAPA-18-147551) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

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

Retention Time

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

Technical Information

Holding Time Specifications

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based

on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

Method Comments

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

Additional Comments

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

Perchlorate Isotope Ratio

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

System Configuration

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

Electronic Packaging Comment

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

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

Chromatographic Columns

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

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

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-594 GEL Work Order: 436504

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 08 NOV 2017

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147642Date Received: 28-OCT-17GEL Job No (SDG): 2018-594GEL Sample ID: 436504001Date Filtered: 01-NOV-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.598	ug/L		1	03-NOV-17 20:47	per1103028a
	Perchlorate Isotope Ratio			3.11			1	03-NOV-17 20:47	per1103028a
14797-73-0	Perchlorate-101	.05	.2	0.583	ug/L		1	03-NOV-17 20:47	per1103028a
	Perchlorate-O(18)			0.358	ug/L		1	03-NOV-17 20:47	per1103028a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147643Date Received: 28-OCT-17GEL Job No (SDG): 2018-594GEL Sample ID: 436504003Date Filtered: 01-NOV-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.348	ug/L		1	03-NOV-17 20:58	per1103029a
	Perchlorate Isotope Ratio			3.01			1	03-NOV-17 20:58	per1103029a
14797-73-0	Perchlorate-101	.05	.2	0.350	ug/L		1	03-NOV-17 20:58	per1103029a
	Perchlorate-O(18)			0.352	ug/L		1	03-NOV-17 20:58	per1103029a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147570Date Received: 28-OCT-17GEL Job No (SDG): 2018-594GEL Sample ID: 436504005Date Filtered: 01-NOV-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.339	ug/L		1	03-NOV-17 21:08	per1103030a
	Perchlorate Isotope Ratio			3.1			1	03-NOV-17 21:08	per1103030a
14797-73-0	Perchlorate-101	.05	.2	0.332	ug/L		1	03-NOV-17 21:08	per1103030a
	Perchlorate-O(18)			0.341	ug/L		1	03-NOV-17 21:08	per1103030a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147571Date Received: 28-OCT-17GEL Job No (SDG): 2018-594GEL Sample ID: 436504008Date Filtered: 01-NOV-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.263	ug/L		1	03-NOV-17 21:18	per1103031a
	Perchlorate Isotope Ratio			3.22			1	03-NOV-17 21:18	per1103031a
14797-73-0	Perchlorate-101	.05	.2	0.247	ug/L		1	03-NOV-17 21:18	per1103031a
	Perchlorate-O(18)			0.343	ug/L		1	03-NOV-17 21:18	per1103031a

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

*Concentration =

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

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 2018-594

Extract Batch Code: 1714758

Date Filtered: 01-NOV-17

Matrix: WATER

Sample ID: 1203909514

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.187	ug/L	93		85 - 115
Perchlorate Isotope Ratio		2.7				-
Perchlorate-101	0.200	.21	ug/L	105		85 - 115
Perchlorate-O(18)		.411	ug/L			-

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

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 2018-594

Extract Batch Code: 1714758

Date Extracted: 01-NOV-17

GEL MS/PS ID: 1203909515

Client ID: CAPA-18-147551

GEL MSD/PSD ID: 1203909516

QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	0.237	ug/L	0.427	95	.48	121	12	30	75 - 125
Perchlorate Isotope Ratio	0	3.02		2.98		3.04		2		-
Perchlorate-101	0.200	0.238	ug/L	0.435	98	.478	120	9	30	75 - 125
Perchlorate-O(18)	0	0.401	ug/L	0.399		.399		0		-

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

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 01-NOV-17GEL Job No (SDG): 2018-594GEL Sample ID: 1203909513Date Filtered: 01-NOV-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.050	ug/L	U	1	03-NOV-17 18:10	per1103013a
	Perchlorate Isotope Ratio						1	03-NOV-17 18:10	per1103013a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	03-NOV-17 18:10	per1103013a
	Perchlorate-O(18)			0.409	ug/L		1	03-NOV-17 18:10	per1103013a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 01-NOV-17GEL Job No (SDG): 2018-594GEL Sample ID: 1203909514Date Filtered: 01-NOV-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.187	ug/L	J	1	03-NOV-17 18:21	per1103014a
	Perchlorate Isotope Ratio			2.7			1	03-NOV-17 18:21	per1103014a
14797-73-0	Perchlorate-101	.05	.2	0.210	ug/L		1	03-NOV-17 18:21	per1103014a
	Perchlorate-O(18)			0.411	ug/L		1	03-NOV-17 18:21	per1103014a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2018-594GEL Sample ID: 1203909517Date Filtered: 01-NOV-17Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.233	ug/L		1	03-NOV-17 18:31	per1103015a
	Perchlorate Isotope Ratio			3.32			1	03-NOV-17 18:31	per1103015a
14797-73-0	Perchlorate-101	.05	.2	0.213	ug/L		1	03-NOV-17 18:31	per1103015a
	Perchlorate-O(18)			0.409	ug/L		1	03-NOV-17 18:31	per1103015a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147551MSDate Received: 26-OCT-17GEL Job No (SDG): 2018-594GEL Sample ID: 1203909515Date Filtered: 01-NOV-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.427	ug/L		1	03-NOV-17 19:03	per1103018a
	Perchlorate Isotope Ratio			2.98			1	03-NOV-17 19:03	per1103018a
14797-73-0	Perchlorate-101	.05	.2	0.435	ug/L		1	03-NOV-17 19:03	per1103018a
	Perchlorate-O(18)			0.399	ug/L		1	03-NOV-17 19:03	per1103018a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147551MSDDate Received: 26-OCT-17GEL Job No (SDG): 2018-594GEL Sample ID: 1203909516Date Filtered: 01-NOV-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.480	ug/L		1	03-NOV-17 19:13	per1103019a
	Perchlorate Isotope Ratio			3.04			1	03-NOV-17 19:13	per1103019a
14797-73-0	Perchlorate-101	.05	.2	0.478	ug/L		1	03-NOV-17 19:13	per1103019a
	Perchlorate-O(18)			0.399	ug/L		1	03-NOV-17 19:13	per1103019a

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

*Concentration =

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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-594
Work Order #: 436504

Sample ID	Client ID
436504001	CAMO-18-147642
436504002	CAMO-18-147657
436504003	CAMO-18-147643
436504004	CAMO-18-147658
436504005	CAPA-18-147570
436504006	CAPA-18-147596
436504008	CAPA-18-147571
436504009	CAPA-18-147597
1203907532	Method Blank (MB) ICP
1203907533	Laboratory Control Sample (LCS)
1203907536	436504001(CAMO-18-147642L) Serial Dilution (SD)
1203907534	436504001(CAMO-18-147642D) Sample Duplicate (DUP)
1203907535	436504001(CAMO-18-147642S) Matrix Spike (MS)
1203907552	Method Blank (MB) ICP-MS
1203907553	Laboratory Control Sample (LCS)
1203907556	436504001(CAMO-18-147642L) Serial Dilution (SD)
1203907554	436504001(CAMO-18-147642D) Sample Duplicate (DUP)
1203907555	436504001(CAMO-18-147642S) Matrix Spike (MS)
1203920275	Method Blank (MB) CVAA
1203920276	Laboratory Control Sample (LCS)
1203920281	436504001(CAMO-18-147642L) Serial Dilution (SD)
1203920277	436504001(CAMO-18-147642D) Sample Duplicate (DUP)
1203920279	436504001(CAMO-18-147642S) Matrix Spike (MS)

Sample Analysis

Samples 436504001,002,003,004,005,006,008 and 009 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1714025, 1714033, 1719070 and 1721461
Prep Batch :	1714024, 1714032 and 1719065
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 PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 436504001 (CAMO-18-147642), 436504003 (CAMO-18-147643), 436504005 (CAPA-18-147570) and 436504008 (CAPA-18-147571)-ICP.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 436504001 (CAMO-18-147642)-ICP, ICP-MS and CVAA.

Matrix Spike (MS/MSD) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. The relative percent differences (RPD) between the sample and its duplicate (DUP) were within acceptable limits for all applicable analytes.

Serial Dilution % Difference Statement

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

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information**Electronic Packaging Comment**

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

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

Additional Comments

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

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: 2018-594 GEL Work Order: 436504

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 22 NOV 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436504001**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAMO-18-147642**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	11/16/17 11:29	111617W4-5	1719070

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436504001

BASIS: As Received

DATE COLLECTED 26-OCT-17

CLIENT ID: CAMO-18-147642

LEVEL: Low

DATE RECEIVED 28-OCT-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	HSC	11/21/17 14:08	112117-1	1714025
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	11/01/17 21:47	171101-3	1714033
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	11/01/17 21:47	171101-3	1714033
7440-39-3	Barium	21.8	ug/L		1	5	5	1	P	HSC	11/21/17 14:08	112117-1	1714025
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	11/21/17 14:08	112117-1	1714025
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	11/21/17 14:08	112117-1	1714025
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/01/17 21:47	171101-3	1714033
7440-70-2	Calcium	16600	ug/L		50	200	200	1	P	HSC	11/22/17 10:57	112217-2	1714025
7440-47-3	Chromium	150	ug/L		3	10	10	1	MS	BAJ	11/01/17 21:47	171101-3	1714033
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	11/21/17 14:08	112117-1	1714025
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	11/21/17 14:08	112117-1	1714025
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	11/21/17 14:08	112117-1	1714025
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	11/01/17 21:47	171101-3	1714033
7439-95-4	Magnesium	4950	ug/L		110	300	300	1	P	HSC	11/21/17 14:08	112117-1	1714025
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	11/21/17 14:08	112117-1	1714025
7439-98-7	Molybdenum	0.761	ug/L		0.2	0.5	0.5	1	MS	BAJ	11/01/17 21:47	171101-3	1714033
7440-02-0	Nickel	4.31	ug/L		0.6	2	2	1	MS	BAJ	11/01/17 21:47	171101-3	1714033
7440-09-7	Potassium	1180	ug/L		50	150	150	1	P	HSC	11/21/17 14:08	112117-1	1714025
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	11/01/17 21:47	171101-3	1714033
7631-86-9	Silica	65400	ug/L		53	213	213	1	P	HSC	11/21/17 14:08	112117-1	1714025
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/01/17 21:47	171101-3	1714033
7440-23-5	Sodium	11300	ug/L		100	300	300	1	P	HSC	11/22/17 10:57	112217-2	1714025
7440-24-6	Strontium	71.4	ug/L		1	5	5	1	P	HSC	11/22/17 10:57	112217-2	1714025
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/01/17 21:47	171101-3	1714033
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	11/21/17 14:08	112117-1	1714025
7440-61-1	Uranium	0.466	ug/L		0.067	0.2	0.2	1	MS	BAJ	11/02/17 03:43	171101-4	1714033
7440-62-2	Vanadium	4.21	ug/L	J	1	5	5	1	P	HSC	11/21/17 14:08	112117-1	1714025
7440-66-6	Zinc	14.4	ug/L		3.3	10	10	1	P	HSC	11/22/17 10:57	112217-2	1714025

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436504001**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAMO-18-147642**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	61.7	mg/L		0.453	1.24	1.24	1		JJ2	11/22/17 14:22		1721461

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1714025	1714024	SW846 3005A	50	mL	50	mL	10/29/17	SXW1
1714033	1714032	SW846 3005A	50	mL	50	mL	10/29/17	SXW1
1719070	1719065	EPA 245.1/245.2 Prep	20	mL	20	mL	11/15/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436504002**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAMO-18-147657**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	11/16/17 11:38	111617W4-5	1719070

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1719070	1719065	EPA 245.1/245.2 Prep	20	mL	20	mL	11/15/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436504003**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAMO-18-147643**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	11/16/17 11:39	111617W4-5	1719070

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436504003

BASIS: As Received

DATE COLLECTED 26-OCT-17

CLIENT ID: CAMO-18-147643

LEVEL: Low

DATE RECEIVED 28-OCT-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	HSC	11/21/17 14:23	112117-1	1714025
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	11/01/17 22:13	171101-3	1714033
7440-38-2	Arsenic	2.04	ug/L	J	2	5	5	1	MS	BAJ	11/01/17 22:13	171101-3	1714033
7440-39-3	Barium	23.5	ug/L		1	5	5	1	P	HSC	11/21/17 14:23	112117-1	1714025
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	11/21/17 14:23	112117-1	1714025
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	11/21/17 14:23	112117-1	1714025
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/01/17 22:13	171101-3	1714033
7440-70-2	Calcium	11000	ug/L		50	200	200	1	P	HSC	11/22/17 10:48	112217-2	1714025
7440-47-3	Chromium	4.89	ug/L	J	3	10	10	1	MS	BAJ	11/01/17 22:13	171101-3	1714033
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	11/21/17 14:23	112117-1	1714025
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	11/21/17 14:23	112117-1	1714025
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	11/21/17 14:23	112117-1	1714025
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	11/01/17 22:13	171101-3	1714033
7439-95-4	Magnesium	3860	ug/L		110	300	300	1	P	HSC	11/21/17 14:23	112117-1	1714025
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	11/21/17 14:23	112117-1	1714025
7439-98-7	Molybdenum	1.11	ug/L		0.2	0.5	0.5	1	MS	BAJ	11/01/17 22:13	171101-3	1714033
7440-02-0	Nickel	0.930	ug/L	J	0.6	2	2	1	MS	BAJ	11/01/17 22:13	171101-3	1714033
7440-09-7	Potassium	1180	ug/L		50	150	150	1	P	HSC	11/21/17 14:23	112117-1	1714025
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	11/01/17 22:13	171101-3	1714033
7631-86-9	Silica	72500	ug/L		53	213	213	1	P	HSC	11/21/17 14:23	112117-1	1714025
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/01/17 22:13	171101-3	1714033
7440-23-5	Sodium	9870	ug/L		100	300	300	1	P	HSC	11/22/17 10:48	112217-2	1714025
7440-24-6	Strontium	49.1	ug/L		1	5	5	1	P	HSC	11/22/17 10:48	112217-2	1714025
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/01/17 22:13	171101-3	1714033
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	11/21/17 14:23	112117-1	1714025
7440-61-1	Uranium	0.481	ug/L		0.067	0.2	0.2	1	MS	BAJ	11/02/17 04:10	171101-4	1714033
7440-62-2	Vanadium	6.33	ug/L		1	5	5	1	P	HSC	11/21/17 14:23	112117-1	1714025
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	11/22/17 10:48	112217-2	1714025

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436504003**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAMO-18-147643**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	43.4	mg/L		0.453	1.24	1.24	1		JJ2	11/22/17 14:22		1721461

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1714025	1714024	SW846 3005A	50	mL	50	mL	10/29/17	SXW1
1714033	1714032	SW846 3005A	50	mL	50	mL	10/29/17	SXW1
1719070	1719065	EPA 245.1/245.2 Prep	20	mL	20	mL	11/15/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436504004**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAMO-18-147658**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	11/16/17 11:41	111617W4-5	1719070

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1719070	1719065	EPA 245.1/245.2 Prep	20	mL	20	mL	11/15/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436504005**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAPA-18-147570**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	11/16/17 11:46	111617W4-5	1719070

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436504005

BASIS: As Received

DATE COLLECTED 26-OCT-17

CLIENT ID: CAPA-18-147570

LEVEL: Low

DATE RECEIVED 28-OCT-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	HSC	11/21/17 14:26	112117-1	1714025
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	11/01/17 22:17	171101-3	1714033
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	11/01/17 22:17	171101-3	1714033
7440-39-3	Barium	30.8	ug/L		1	5	5	1	P	HSC	11/21/17 14:26	112117-1	1714025
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	11/21/17 14:26	112117-1	1714025
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	11/21/17 14:26	112117-1	1714025
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/01/17 22:17	171101-3	1714033
7440-70-2	Calcium	13300	ug/L		50	200	200	1	P	HSC	11/22/17 10:51	112217-2	1714025
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	11/01/17 22:17	171101-3	1714033
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	11/21/17 14:26	112117-1	1714025
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	11/21/17 14:26	112117-1	1714025
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	11/21/17 14:26	112117-1	1714025
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	11/01/17 22:17	171101-3	1714033
7439-95-4	Magnesium	4190	ug/L		110	300	300	1	P	HSC	11/21/17 14:26	112117-1	1714025
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	11/21/17 14:26	112117-1	1714025
7439-98-7	Molybdenum	1.99	ug/L		0.2	0.5	0.5	1	MS	BAJ	11/01/17 22:17	171101-3	1714033
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/01/17 22:17	171101-3	1714033
7440-09-7	Potassium	1580	ug/L		50	150	150	1	P	HSC	11/21/17 14:26	112117-1	1714025
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	11/01/17 22:17	171101-3	1714033
7631-86-9	Silica	65600	ug/L		53	213	213	1	P	HSC	11/21/17 14:26	112117-1	1714025
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/01/17 22:17	171101-3	1714033
7440-23-5	Sodium	12400	ug/L		100	300	300	1	P	HSC	11/22/17 10:51	112217-2	1714025
7440-24-6	Strontium	63.9	ug/L		1	5	5	1	P	HSC	11/22/17 10:51	112217-2	1714025
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/01/17 22:17	171101-3	1714033
7440-31-5	Tin	3.12	ug/L	J	2.5	10	10	1	P	HSC	11/21/17 14:26	112117-1	1714025
7440-61-1	Uranium	0.673	ug/L		0.067	0.2	0.2	1	MS	BAJ	11/02/17 04:13	171101-4	1714033
7440-62-2	Vanadium	3.44	ug/L	J	1	5	5	1	P	HSC	11/21/17 14:26	112117-1	1714025
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	11/22/17 10:51	112217-2	1714025

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436504005**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAPA-18-147570**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	50.5	mg/L		0.453	1.24	1.24	1		JJ2	11/22/17 14:22		1721461

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1714025	1714024	SW846 3005A	50	mL	50	mL	10/29/17	SXW1
1714033	1714032	SW846 3005A	50	mL	50	mL	10/29/17	SXW1
1719070	1719065	EPA 245.1/245.2 Prep	20	mL	20	mL	11/15/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436504006**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAPA-18-147596**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	11/16/17 11:48	111617W4-5	1719070

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1719070	1719065	EPA 245.1/245.2 Prep	20	mL	20	mL	11/15/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436504008**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAPA-18-147571**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	11/16/17 11:50	111617W4-5	1719070

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436504008

BASIS: As Received

DATE COLLECTED 26-OCT-17

CLIENT ID: CAPA-18-147571

LEVEL: Low

DATE RECEIVED 28-OCT-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	HSC	11/21/17 14:30	112117-1	1714025
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	11/01/17 22:20	171101-3	1714033
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	11/01/17 22:20	171101-3	1714033
7440-39-3	Barium	23.1	ug/L		1	5	5	1	P	HSC	11/21/17 14:30	112117-1	1714025
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	11/21/17 14:30	112117-1	1714025
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	11/21/17 14:30	112117-1	1714025
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/01/17 22:20	171101-3	1714033
7440-70-2	Calcium	11400	ug/L		50	200	200	1	P	HSC	11/22/17 10:54	112217-2	1714025
7440-47-3	Chromium	3.98	ug/L	J	3	10	10	1	MS	BAJ	11/01/17 22:20	171101-3	1714033
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	11/21/17 14:30	112117-1	1714025
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	11/21/17 14:30	112117-1	1714025
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	11/21/17 14:30	112117-1	1714025
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	11/01/17 22:20	171101-3	1714033
7439-95-4	Magnesium	3130	ug/L		110	300	300	1	P	HSC	11/21/17 14:30	112117-1	1714025
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	11/21/17 14:30	112117-1	1714025
7439-98-7	Molybdenum	1.55	ug/L		0.2	0.5	0.5	1	MS	BAJ	11/01/17 22:20	171101-3	1714033
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/01/17 22:20	171101-3	1714033
7440-09-7	Potassium	1540	ug/L		50	150	150	1	P	HSC	11/21/17 14:30	112117-1	1714025
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	11/01/17 22:20	171101-3	1714033
7631-86-9	Silica	65700	ug/L		53	213	213	1	P	HSC	11/21/17 14:30	112117-1	1714025
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/01/17 22:20	171101-3	1714033
7440-23-5	Sodium	9810	ug/L		100	300	300	1	P	HSC	11/22/17 10:54	112217-2	1714025
7440-24-6	Strontium	48.8	ug/L		1	5	5	1	P	HSC	11/22/17 10:54	112217-2	1714025
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/01/17 22:20	171101-3	1714033
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	11/21/17 14:30	112117-1	1714025
7440-61-1	Uranium	0.363	ug/L		0.067	0.2	0.2	1	MS	BAJ	11/02/17 04:16	171101-4	1714033
7440-62-2	Vanadium	4.78	ug/L	J	1	5	5	1	P	HSC	11/21/17 14:30	112117-1	1714025
7440-66-6	Zinc	3.86	ug/L	J	3.3	10	10	1	P	HSC	11/22/17 10:54	112217-2	1714025

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436504008**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAPA-18-147571**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	41.4	mg/L		0.453	1.24	1.24	1		JJ2	11/22/17 14:22		1721461

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1714025	1714024	SW846 3005A	50	mL	50	mL	10/29/17	SXW1
1714033	1714032	SW846 3005A	50	mL	50	mL	10/29/17	SXW1
1719070	1719065	EPA 245.1/245.2 Prep	20	mL	20	mL	11/15/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-594**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436504009**BASIS:** As Received**DATE COLLECTED** 26-OCT-17**CLIENT ID:** CAPA-18-147597**LEVEL:** Low**DATE RECEIVED** 28-OCT-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	11/16/17 11:51	111617W4-5	1719070

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1719070	1719065	EPA 245.1/245.2 Prep	20	mL	20	mL	11/15/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2018-594
Contract: ESHL00114
Matrix: W

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Acceptance Window</u>	<u>Conc Qual</u>	<u>M*</u>	<u>MDL</u>	<u>RDL</u>
1203907532	Potassium	-108	ug/L	+/-150	J	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Barium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Iron	30	ug/L	+/-100	U	P	30	100
	Manganese	2	ug/L	+/-10	U	P	2	10
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Copper	3	ug/L	+/-10	U	P	3	10
	Calcium	50	ug/L	+/-200	U	P	50	200
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Aluminum	68	ug/L	+/-200	U	P	68	200
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203907552	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	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203920275	Mercury	-0.131	ug/L	+/-0.2	J	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. 2018-594

Client ID: CAMO-18-147642S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 436504001

Spike ID: 1203907535

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Beryllium	ug/L	75-125	482		1	U	500	96.4		P
Boron	ug/L	75-125	513		15	U	500	100		P
Calcium	ug/L	75-125	20800		16600		5000	84		P
Cobalt	ug/L	75-125	477		1	U	500	95.4		P
Copper	ug/L	75-125	511		3	U	500	102		P
Iron	ug/L	75-125	5240		30	U	5000	105		P
Magnesium	ug/L	75-125	9740		4950		5000	95.9		P
Manganese	ug/L	75-125	477		2	U	500	95.4		P
Potassium	ug/L	75-125	5730		1180		5000	91.1		P
Silica	ug/L		74400		65400		10700	83.8	N/A	P
Sodium	ug/L	75-125	15600		11300		5000	85.9		P
Strontium	ug/L	75-125	567		71.4		500	99		P
Tin	ug/L	75-125	469		2.5	U	500	93.3		P
Vanadium	ug/L	75-125	492		4.21	J	500	97.5		P
Zinc	ug/L	75-125	469		14.4		500	90.8		P
Aluminum	ug/L	75-125	4970		68	U	5000	98.9		P
Barium	ug/L	75-125	498		21.8		500	95.3		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-594

Client ID: CAMO-18-147642S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 436504001

Spike ID: 1203907555

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Arsenic	ug/L	75-125	55.2		2	U	50	107		MS
Cadmium	ug/L	75-125	55		0.3	U	50	110		MS
Chromium	ug/L	75-125	199		150		50	98		MS
Antimony	ug/L	75-125	53.9		1	U	50	107		MS
Lead	ug/L	75-125	52.3		0.5	U	50	105		MS
Molybdenum	ug/L	75-125	55.8		0.761		50	110		MS
Nickel	ug/L	75-125	56.7		4.31		50	105		MS
Selenium	ug/L	75-125	55.3		2	U	50	109		MS
Silver	ug/L	75-125	53.6		0.3	U	50	107		MS
Thallium	ug/L	75-125	49.2		0.6	U	50	98.4		MS
Uranium	ug/L	75-125	50.2		0.466		50	99.5		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-594

Client ID: CAMO-18-147642S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 436504001

Spike ID: 1203920279

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.05		0.067	U	2	102		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
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Duplicate Sample Summary

SDG No.: 2018-594

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-18-147642D

Matrix: WATER

Level: Low

Sample ID: 436504001

Duplicate ID: 1203907534

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	21.8		22		.648		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	16600		16500		.605		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%	4950		4840		2.15		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1180		1100		6.19		P
Silica	ug/L	+/-20%	65400		65200		.39		P
Sodium	ug/L	+/-20%	11300		11300		.257		P
Strontium	ug/L	+/-20%	71.4		71.4		.0378		P
Tin	ug/L		2.5 U		2.79 J		200		P
Vanadium	ug/L	+/-5	4.21 J		4.5 J		6.56		P
Zinc	ug/L	+/-10	14.4		9.42 J		41.7		P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-594

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-18-147642D

Matrix: WATER

Level: Low

Sample ID: 436504001

Duplicate ID: 1203907554

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	+/-20%	150		134		10.9		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.761		0.744		2.26		MS
Nickel	ug/L	+/-2	4.31		3.88		10.5		MS
Selenium	ug/L		2 U		2 U				MS
Silver	ug/L		0.3 U		0.3 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L	+/- .2	0.466		0.432		7.57		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2018–594**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAMO–18–147642D**Matrix:** WATER**Level:** Low**Sample ID:** 436504001**Duplicate ID:** 1203920277**Percent Solids for Dup:** N/A

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

*Analytical Methods:
AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-594

Contract: ESHL00114

Aqueous LCS Source:OS2I

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203907533								
	Aluminum	ug/L	5000	5050		101	80-120	P
	Barium	ug/L	500	473		94.6	80-120	P
	Beryllium	ug/L	500	469		93.9	80-120	P
	Boron	ug/L	500	481		96.3	80-120	P
	Calcium	ug/L	5000	4880		97.5	80-120	P
	Cobalt	ug/L	500	478		95.5	80-120	P
	Copper	ug/L	500	493		98.5	80-120	P
	Iron	ug/L	5000	5220		104	80-120	P
	Magnesium	ug/L	5000	4960		99.2	80-120	P
	Manganese	ug/L	500	475		95.1	80-120	P
	Potassium	ug/L	5000	4570		91.4	80-120	P
	Silica	ug/L	10700	9650		90.2	80-120	P
	Sodium	ug/L	5000	4660		93.2	80-120	P
	Strontium	ug/L	500	488		97.7	80-120	P
	Tin	ug/L	500	455		91	80-120	P
	Vanadium	ug/L	500	474		94.8	80-120	P
	Zinc	ug/L	500	461		92.3	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-594

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203907553								
	Antimony	ug/L	50	53.7		107	80-120	MS
	Arsenic	ug/L	50	53		106	80-120	MS
	Cadmium	ug/L	50	54.4		109	80-120	MS
	Chromium	ug/L	50	53.7		107	80-120	MS
	Lead	ug/L	50	51.7		103	80-120	MS
	Molybdenum	ug/L	50	52.8		106	80-120	MS
	Nickel	ug/L	50	52.6		105	80-120	MS
	Selenium	ug/L	50	53.4		107	80-120	MS
	Silver	ug/L	50	55		110	80-120	MS
	Thallium	ug/L	50	49.5		98.9	80-120	MS
	Uranium	ug/L	50	45.6		91.3	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-594

Contract: ESHL00114

Aqueous LCS Source: GEL

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203920276	Mercury	ug/L	2	2.04		102	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2018-594

Client ID: CAMO-18-147642L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 436504001

Serial Dilution ID: 1203907536

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	21.8		21.9	J	.444			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	16600		17600		6.023		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	4950		5130		3.623			P
Manganese	2	U	10	U				P
Potassium	1180		1030		12.127			P
Silica	65400		65800		.602		10	P
Sodium	11300		11800		5.075		10	P
Strontium	71.4		72.4		1.365		10	P
Tin	2.5	U	12.5	U				P
Vanadium	4.21	J	5	U	27.491			P
Zinc	14.4		52.9		267.355			P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Serial Dilution Sample Summary

SDG NO. 2018-594

Client ID: CAMO-18-147642L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 436504001

Serial Dilution ID: 1203907556

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2	U	10	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	150		115		22.982			MS
Lead	.5	U	2.5	U				MS
Molybdenum	.761		1	U	7.096			MS
Nickel	4.31		3.45	J	20.107			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.466		.45	J	3.433			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2018-594 **Client ID:** CAMO-18-147642L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 436504001 **Serial Dilution ID:** 1203920281

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

*Analytical Methods:

AV EPA 245.1/245.2

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-594
Work Order #: 436504**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1714357

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
436504002	CAMO-18-147657
436504004	CAMO-18-147658
436504006	CAPA-18-147596
436504009	CAPA-18-147597
1203908472	Method Blank (MB)
1203908473	Laboratory Control Sample (LCS)
1203908474	436322006(CAPA-18-147578) Sample Duplicate (DUP)
1203908476	436322006(CAPA-18-147578) 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 436322006 (CAPA-18-147578) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages

electronically. The following change from traditional packages should be noted:

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1713610	Method:	WSP-CN(T)
Prep Batch :	1713609	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
436504002	CAMO-18-147657
436504004	CAMO-18-147658
436504006	CAPA-18-147596
436504009	CAPA-18-147597
1203906458	Method Blank (MB)
1203906459	Laboratory Control Sample (LCS)
1203906461	436463002(CAPA-18-147576) Sample Duplicate (DUP)
1203906463	436463002(CAPA-18-147576) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 20.

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.

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 436463002 (CAPA-18-147576) 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: Ion Chromatography

Analytical Batch: 1715567 and 1715632 **Method:** WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
436504001	CAMO-18-147642
436504003	CAMO-18-147643
436504005	CAPA-18-147570
436504008	CAPA-18-147571
1203911413	Method Blank (MB)
1203911576	Method Blank (MB)
1203911414	Laboratory Control Sample (LCS)
1203911577	Laboratory Control Sample (LCS)
1203911415	436504005(CAPA-18-147570) Sample Duplicate (DUP)
1203911578	436689005(CAMO-18-147648) Sample Duplicate (DUP)
1203911416	436504005(CAPA-18-147570) Post Spike (PS)
1203911579	436689005(CAMO-18-147648) 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 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) Designation

Samples 436504005 (CAPA-18-147570) and 436689005 (CAMO-18-147648) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Manual Integrations**

Samples 1203911415 (CAPA-18-147570DUP), 1203911416 (CAPA-18-147570PS), 436504001 (CAMO-18-147642), 436504003 (CAMO-18-147643), 436504005 (CAPA-18-147570), 1203911578 (CAMO-18-147648DUP) and 436504008 (CAPA-18-147571) 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: 1715525 **Method:** NH3
Prep Batch : 1715524 **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
436504001	CAMO-18-147642
436504003	CAMO-18-147643
436504005	CAPA-18-147570
436504008	CAPA-18-147571
1203911273	Method Blank (MB)
1203911274	Laboratory Control Sample (LCS)
1203911275	436504001(CAMO-18-147642) Sample Duplicate (DUP)
1203911276	436504001(CAMO-18-147642) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 436504001 (CAMO-18-147642) 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:	Total Kjeldahl Nitrogen		
Analytical Batch:	1715519	Method:	TKN
Prep Batch :	1715516	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
436504002	CAMO-18-147657
436504004	CAMO-18-147658
436504006	CAPA-18-147596
436504009	CAPA-18-147597
1203911261	Method Blank (MB)
1203911262	Laboratory Control Sample (LCS)
1203911263	436504002(CAMO-18-147657) Sample Duplicate (DUP)
1203911264	436504004(CAMO-18-147658) Sample Duplicate (DUP)
1203911265	436504002(CAMO-18-147657) Matrix Spike (MS)
1203911266	436504004(CAMO-18-147658) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 436504002 (CAMO-18-147657) and 436504004 (CAMO-18-147658) were selected for QC analysis.

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

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

Analyte	Sample	Value
Nitrogen, Total Kjeldahl	1203911265 (CAMO-18-147657MS)	116* (90%-110%)
	1203911266 (CAMO-18-147658MS)	115* (90%-110%)

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1714065

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
436504001	CAMO-18-147642
436504003	CAMO-18-147643
436504005	CAPA-18-147570
436504008	CAPA-18-147571
1203907654	Method Blank (MB)
1203907655	Laboratory Control Sample (LCS)
1203907656	436322001(CAPA-18-147551) Sample Duplicate (DUP)
1203907659	436322001(CAPA-18-147551) 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 436322001 (CAPA-18-147551) 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 sample 436504001 (CAMO-18-147642) was diluted because target analyte concentrations exceeded the calibration range. The following samples 1203907656 (CAPA-18-147551DUP) and 1203907659 (CAPA-18-147551PS) in this sample group were diluted due to matrix interference. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	436504
	001
Nitrogen, Nitrate/Nitrite	5X

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:	1715514	Method:	PO4
Prep Batch :	1715513	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
436504001	CAMO-18-147642
436504003	CAMO-18-147643
436504005	CAPA-18-147570
436504008	CAPA-18-147571
1203911255	Method Blank (MB)
1203911256	Laboratory Control Sample (LCS)
1203911257	436315001(CAPA-18-147554) Sample Duplicate (DUP)
1203911259	436504001(CAMO-18-147642) Sample Duplicate (DUP)
1203911258	436315001(CAPA-18-147554) Matrix Spike (MS)
1203911260	436504001(CAMO-18-147642) 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

Samples 436315001 (CAPA-18-147554) and 436504001 (CAMO-18-147642) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1714366

Method: TDS

Sample Analysis

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

Sample ID	Client ID
436504001	CAMO-18-147642
436504003	CAMO-18-147643
436504005	CAPA-18-147570
436504008	CAPA-18-147571
1203908511	Method Blank (MB)
1203908512	Laboratory Control Sample (LCS)
1203910423	436463001(CAPA-18-147550) 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 436463001 (CAPA-18-147550) 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	1203910423 (CAPA-18-147550DUP)	8.77* (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:

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Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1714428 and 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
436504001	CAMO-18-147642
436504003	CAMO-18-147643
436504005	CAPA-18-147570
436504008	CAPA-18-147571
1203908702	Laboratory Control Sample (LCS)
1203915374	Laboratory Control Sample (LCS)
1203908703	436027001(CAPA-18-147558) Sample Duplicate (DUP)
1203915375	436504008(CAPA-18-147571) 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 recoveries met the acceptance limits.

Quality Control (QC) Designation

Samples 436027001 (CAPA-18-147558) and 436504008 (CAPA-18-147571) were 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:

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Method/Analysis Information

Product: pH

Analytical Batch: 1715386 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
436504001	CAMO-18-147642
436504003	CAMO-18-147643
436504005	CAPA-18-147570
436504008	CAPA-18-147571
1203910983	Laboratory Control Sample (LCS)
1203910984	436615004(CAPA-18-147567) Sample Duplicate (DUP)
1203911838	435335001(NonSDG) 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

Samples 435335001 (NonSDG) and 436615004 (CAPA-18-147567) were 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
1203910984 (CAPA-18-147567DUP)	pH	Received 31-OCT-17, out of holding 27-OCT-17
1203911838 (Non SDG 435335001DUP)	pH	Received 17-OCT-17, out of holding 05-OCT-17
436504001 (CAMO-18-147642)	pH	Received 28-OCT-17, out of holding 26-OCT-17
436504003 (CAMO-18-147643)	pH	Received 28-OCT-17, out of holding 26-OCT-17
436504005 (CAPA-18-147570)	pH	Received 28-OCT-17, out of holding 26-OCT-17
436504008 (CAPA-18-147571)	pH	Received 28-OCT-17, out of holding 26-OCT-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:

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Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1715371 **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
436504001	CAMO-18-147642
436504003	CAMO-18-147643
436504005	CAPA-18-147570
436504008	CAPA-18-147571
1203910950	Laboratory Control Sample (LCS)
1203910953	436615004(CAPA-18-147567) Sample Duplicate (DUP)
1203910955	436615004(CAPA-18-147567) 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 436615004 (CAPA-18-147567) 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:

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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: 2018-594 GEL Work Order: 436504


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: 17 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 17, 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: 2018-594

Client Sample ID: CAMO-18-147642
Sample ID: 436504001
Matrix: W
Collect Date: 26-OCT-17 10:59
Receive Date: 28-OCT-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.0775	0.067	0.200	mg/L		1	MXL2	11/02/17	2229	1715567	1
Chloride		9.46	0.067	0.200	mg/L		1					
Fluoride		0.198	0.033	0.100	mg/L		1					
Sulfate		13.2	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.018	0.017	0.050	mg/L	1.00	1	KLP1	11/06/17	1515	1715525	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		2.09	0.085	0.250	mg/L		5	KLP1	10/30/17	1203	1714065	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0278	0.020	0.050	mg/L	1.00	1	KLP1	11/07/17	1423	1715514	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		163	3.40	14.3	mg/L			KLP1	10/31/17	1343	1714366	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		58.9	1.45	4.00	mg/L			RXB5	11/07/17	1304	1715371	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		226	1.00	1.00	umhos/cm		1	VH1	11/08/17	1032	1714428	7
PH "As Received"												
pH at Temp 17.7C	H	7.93	0.010	0.100	SU		1	RXB5	11/07/17	1302	1715386	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	11/06/17	0910	1715524
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/06/17	1700	1715513

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Certificate of Analysis

Report Date: November 17, 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: 2018-594

Client Sample ID: CAMO-18-147642
Sample ID: 436504001

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

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Certificate of Analysis

Report Date: November 17, 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: 2018-594

Client Sample ID: CAMO-18-147657
Sample ID: 436504002
Matrix: W
Collect Date: 26-OCT-17 10:59
Receive Date: 28-OCT-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	11/05/17	1254	1714357	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	10/30/17	1021	1713610	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/07/17	1248	1715519	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	10/30/17	0847	1713609
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/06/17	1700	1715516

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

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Certificate of Analysis

Report Date: November 17, 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: 2018-594

Client Sample ID: CAMO-18-147643
Sample ID: 436504003
Matrix: W
Collect Date: 26-OCT-17 14:13
Receive Date: 28-OCT-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	MXL2	11/02/17	2358	1715567	1
Chloride		2.06	0.067	0.200	mg/L		1					
Fluoride		0.284	0.033	0.100	mg/L		1					
Sulfate		2.45	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	U	ND	0.017	0.050	mg/L	1.00	1	KLP1	11/06/17	1518	1715525	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.489	0.017	0.050	mg/L		1	KLP1	10/30/17	1204	1714065	3
PO4 "As Received"												
Phosphorus, Total as P		0.0583	0.020	0.050	mg/L	1.00	1	KLP1	11/07/17	1426	1715514	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		146	3.40	14.3	mg/L			KLP1	10/31/17	1343	1714366	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		63.1	1.45	4.00	mg/L			RXB5	11/07/17	1307	1715371	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		157	1.00	1.00	umhos/cm		1	VH1	11/08/17	1033	1714428	7
PH "As Received"												
pH at Temp 17.2C	H	8.08	0.010	0.100	SU		1	RXB5	11/07/17	1305	1715386	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	11/06/17	0910	1715524
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/06/17	1700	1715513

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Certificate of Analysis

Report Date: November 17, 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: 2018-594

Client Sample ID: CAMO-18-147643
Sample ID: 436504003

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

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Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-594

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-147658

Project: ESHL00114

Sample ID: 436504004

Client ID: ARSL004

Matrix: W

Collect Date: 26-OCT-17 14:13

Receive Date: 28-OCT-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	11/05/17	1341	1714357	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	10/30/17	1026	1713610	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/07/17	1251	1715519	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	10/30/17	0847	1713609
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/06/17	1700	1715516

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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Certificate of Analysis

Report Date: November 17, 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: 2018-594

Client Sample ID: CAPA-18-147570
Sample ID: 436504005
Matrix: W
Collect Date: 26-OCT-17 10:38
Receive Date: 28-OCT-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	MXL2	11/03/17	0027	1715567	1
Chloride		2.41	0.067	0.200	mg/L		1					
Fluoride		0.239	0.033	0.100	mg/L		1					
Sulfate		3.22	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	U	ND	0.017	0.050	mg/L	1.00	1	KLP1	11/06/17	1519	1715525	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.910	0.017	0.050	mg/L		1	KLP1	10/30/17	1206	1714065	3
PO4 "As Received"												
Phosphorus, Total as P		0.0652	0.020	0.050	mg/L	1.00	1	KLP1	11/07/17	1427	1715514	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		157	3.40	14.3	mg/L			KLP1	10/31/17	1343	1714366	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		66.5	1.45	4.00	mg/L			RXB5	11/07/17	1311	1715371	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		173	1.00	1.00	umhos/cm		1	VH1	11/08/17	1033	1714428	7
PH "As Received"												
pH at Temp 17.2C	H	8.13	0.010	0.100	SU		1	RXB5	11/07/17	1309	1715386	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	11/06/17	0910	1715524
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/06/17	1700	1715513

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Report Date: November 17, 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: 2018-594

Client Sample ID: CAPA-18-147570
Sample ID: 436504005

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

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Report Date: November 17, 2017

Company : Los Alamos National Laboratory
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Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-594

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147596

Project: ESHL00114

Sample ID: 436504006

Client ID: ARSL004

Matrix: W

Collect Date: 26-OCT-17 10:38

Receive Date: 28-OCT-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	11/05/17	1428	1714357	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	10/30/17	1027	1713610	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/07/17	1253	1715519	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	10/30/17	0847	1713609
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/06/17	1700	1715516

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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Certificate of Analysis

Report Date: November 17, 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: 2018-594

Client Sample ID: CAPA-18-147571
Sample ID: 436504008
Matrix: W
Collect Date: 26-OCT-17 12:31
Receive Date: 28-OCT-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	11/03/17	1953	1715632	1
Chloride		1.84	0.067	0.200	mg/L		1					
Fluoride		0.244	0.033	0.100	mg/L		1					
Sulfate		2.33	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0397	0.017	0.050	mg/L	1.00	1	KLP1	11/06/17	1520	1715525	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.380	0.017	0.050	mg/L		1	KLP1	10/30/17	1207	1714065	3
PO4 "As Received"												
Phosphorus, Total as P		0.0649	0.020	0.050	mg/L	1.00	1	KLP1	11/07/17	1432	1715514	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		141	3.40	14.3	mg/L			KLP1	10/31/17	1343	1714366	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		62.1	1.45	4.00	mg/L			RXB5	11/07/17	1331	1715371	6
Carbonate alkalinity (CaCO3)		4.39	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		149	1.00	1.00	umhos/cm		1	VH1	11/14/17	1330	1717163	7
PH "As Received"												
pH at Temp 16.3C	H	8.56	0.010	0.100	SU		1	RXB5	11/07/17	1330	1715386	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	11/06/17	0910	1715524
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/06/17	1700	1715513

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Certificate of Analysis

Report Date: November 17, 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: 2018-594

Client Sample ID: CAPA-18-147571
Sample ID: 436504008

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

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Report Date: November 17, 2017

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Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

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

Client SDG: 2018-594

Client Sample ID: CAPA-18-147597
Sample ID: 436504009
Matrix: W
Collect Date: 26-OCT-17 12:31
Receive Date: 28-OCT-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	11/05/17	1515	1714357	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	10/30/17	1028	1713610	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/07/17	1254	1715519	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	10/30/17	0847	1713609
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/06/17	1700	1715516

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

Quality Control Summary

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QC Summary

Report Date: November 17, 2017

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

Contact: Ms. Nita Patel

Workorder: 436504

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1714357										
QC1203908474	436322006	DUP									
Total Organic Carbon Average		J	0.524	J	0.395	mg/L	28.1	^	(+/-1.00)	TSM	11/05/17 04:41
QC1203908473	LCS										
Total Organic Carbon Average	10.0				10.2	mg/L			102	(80%-120%)	11/05/17 01:46
QC1203908472	MB										
Total Organic Carbon Average			U		ND	mg/L					11/05/17 01:34
QC1203908476	436322006	PS									
Total Organic Carbon Average	10.0	J	0.524		11.3	mg/L			107	(75%-125%)	11/05/17 05:28
Flow Injection Analysis											
Batch	1713610										
QC1203906461	436463002	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A			AXH3	10/30/17 10:15
QC1203906459	LCS										
Cyanide, Total	50.0				48.6	ug/L			97.2	(90%-110%)	10/30/17 09:51
QC1203906458	MB										
Cyanide, Total			U		ND	ug/L					10/30/17 09:50
QC1203906463	436463002	MS									
Cyanide, Total	100	U	ND		107	ug/L			107	(90%-110%)	10/30/17 10:16
Ion Chromatography											
Batch	1715567										
QC1203911415	436504005	DUP									
Bromide		U	ND	U	ND	mg/L	N/A			MXL2	11/03/17 00:57

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QC Summary

Workorder: 436504

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1715567										
Chloride		2.41		2.36	mg/L	2		(0%-20%)	MXL2	11/03/17	00:57
Fluoride		0.239		0.243	mg/L	1.53	^	(+/-0.100)			
Sulfate		3.22		3.18	mg/L	1.26		(0%-20%)			
QC1203911414 LCS											
Bromide	1.25			1.16	mg/L		92.5	(80%-120%)		11/02/17	18:34
Chloride	5.00			4.62	mg/L		92.5	(80%-120%)			
Fluoride	2.50			2.48	mg/L		99.1	(80%-120%)			
Sulfate	10.0			9.46	mg/L		94.6	(80%-120%)			
QC1203911413 MB											
Bromide			U	ND	mg/L					11/02/17	18:04
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203911416 436504005 PS											
Bromide	1.25	U	ND	1.24	mg/L		95.7	(75%-125%)		11/03/17	01:26
Chloride	5.00		2.41	7.29	mg/L		97.6	(75%-125%)			
Fluoride	2.50		0.239	2.74	mg/L		100	(75%-125%)			
Sulfate	10.0		3.22	12.8	mg/L		95.5	(75%-125%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1715632										
QC1203911578	436689005	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	11/03/17	23:44
Chloride			2.24		2.23	mg/L	0.277	(0%-20%)			
Fluoride			0.191		0.162	mg/L	16.4 ^	(+/-0.100)			
Sulfate			2.88		2.89	mg/L	0.329	(0%-20%)			
QC1203911577	LCS										
Bromide	1.25				1.22	mg/L	97.8	(80%-120%)		11/03/17	18:26
Chloride	5.00				4.86	mg/L	97.3	(80%-120%)			
Fluoride	2.50				2.58	mg/L	103	(80%-120%)			
Sulfate	10.0				9.99	mg/L	99.9	(80%-120%)			
QC1203911576	MB										
Bromide			U		ND	mg/L				11/03/17	17:57
Chloride			U		ND	mg/L					
Fluoride			U		ND	mg/L					
Sulfate			U		ND	mg/L					
QC1203911579	436689005	PS									
Bromide	1.25	U	ND		1.28	mg/L	99.4	(75%-125%)		11/04/17	00:13
Chloride	5.00		2.24		7.60	mg/L	107	(75%-125%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1715632										
Fluoride	2.50	0.191		2.92	mg/L		109	(75%-125%)	MAR1	11/04/17	00:13
Sulfate	10.0	2.88		13.2	mg/L		103	(75%-125%)			
Nutrient Analysis											
Batch	1714065										
QC1203907656	436322001	DUP									
Nitrogen, Nitrate/Nitrite		0.945		0.885	mg/L	6.56	^	(+/-0.250)	KLP1	10/30/17	11:30
QC1203907655	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.07	mg/L		107	(90%-110%)		10/30/17	11:26
QC1203907654	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					10/30/17	11:25
QC1203907659	436322001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.189		1.28	mg/L		109	(90%-110%)		10/30/17	11:31
Batch	1715514										
QC1203911257	436315001	DUP									
Phosphorus, Total as P		0.0726		0.0601	mg/L	18.8	^	(+/-0.050)	KLP1	11/07/17	14:22
QC1203911259	436504001	DUP									
Phosphorus, Total as P		J	0.0278	0.0519	mg/L	60.5	^	(+/-0.050)		11/07/17	14:24
QC1203911256	LCS										
Phosphorus, Total as P	1.00			1.04	mg/L		104	(80%-124%)		11/07/17	14:20
QC1203911255	MB										
Phosphorus, Total as P			J	0.0231	mg/L					11/07/17	14:19
QC1203911258	436315001	MS									
Phosphorus, Total as P	1.00	0.0726		0.977	mg/L		90.4	(63%-139%)		11/07/17	14:23

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1715514										
QC1203911260	436504001	MS									
Phosphorus, Total as P	1.00	J	0.0278		1.04	mg/L	101	(63%-139%)	KLP1	11/07/17	14:25
Batch	1715519										
QC1203911263	436504002	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	11/07/17	12:49
QC1203911264	436504004	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A			11/07/17	12:52
QC1203911262	LCS										
Nitrogen, Total Kjeldahl	1.00				1.05	mg/L	105	(90%-110%)		11/07/17	12:47
QC1203911261	MB										
Nitrogen, Total Kjeldahl			U		ND	mg/L				11/07/17	12:47
QC1203911265	436504002	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND		1.16	mg/L	116 *	(90%-110%)		11/07/17	12:50
QC1203911266	436504004	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND		1.16	mg/L	115 *	(90%-110%)		11/07/17	12:52
Batch	1715525										
QC1203911275	436504001	DUP									
Nitrogen, Ammonia		J	0.018	U	ND	mg/L	200 ^		KLP1	11/06/17	15:16
QC1203911274	LCS										
Nitrogen, Ammonia	1.00				1.08	mg/L	108	(90%-110%)		11/06/17	15:11
QC1203911273	MB										
Nitrogen, Ammonia			U		ND	mg/L				11/06/17	15:10
QC1203911276	436504001	MS									
Nitrogen, Ammonia	1.00	J	0.018		1.04	mg/L	102	(90%-110%)		11/06/17	15:17

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	1714366										
QC1203910423	436463001	DUP									
Total Dissolved Solids		156		170	mg/L	8.77*		(0%-5%)	KLP1	10/31/17	13:43
QC1203908512	LCS										
Total Dissolved Solids	300			289	mg/L		96.2	(95%-105%)		10/31/17	13:43
QC1203908511	MB										
Total Dissolved Solids			U	ND	mg/L					10/31/17	13:43
Titration and Ion Analysis											
Batch	1714428										
QC1203908703	436027001	DUP									
Conductivity		307		306	umhos/cm	0.326		(0%-10%)	VH1	11/08/17	10:29
QC1203908702	LCS										
Conductivity	1410			1400	umhos/cm		98.7	(95%-105%)		11/08/17	10:27
Batch	1715371										
QC1203910953	436615004	DUP									
Alkalinity, Total as CaCO3		59.9		61.3	mg/L	2.31		(0%-20%)	RXB5	11/07/17	14:40
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203910950	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)		11/07/17	12:44
QC1203910955	436615004	MS									
Alkalinity, Total as CaCO3	100	59.9		162	mg/L		102	(80%-120%)		11/07/17	14:41
Batch	1715386										
QC1203910984	436615004	DUP									
pH		H	8.12	H	8.13	SU	0.123	(0%-5%)	RXB5	11/07/17	14:37

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1715386										
QC1203911838	435335001	DUP									
pH		H	7.63	H	7.62	SU	0.131	(0%-5%)	RXB5	11/07/17	13:38
QC1203910983	LCS										
pH	7.00				7.00	SU		100	(99%-101%)		11/07/17 12:44
Batch	1717163										
QC1203915375	436504008	DUP									
Conductivity			149		145	umhos/cm	2.18	(0%-10%)	VH1	11/14/17	13:31
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
- 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

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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 #: 2018-594
Work Order #: 436504**

Method/Analysis Information

Product: Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1715443

Sample ID	Client ID
436504006	CAPA-18-147596
436504009	CAPA-18-147597
1203911096	Method Blank (MB)
1203911098	Laboratory Control Sample (LCS)
1203911097	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-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 October 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 1203911096 (MB) and 1203911098 (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: 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

Sample (See Below) did not meet the detection limit 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 sample was counted the maximum count time of in order to achieve the lowest possible MDAs.

Sample	Analyte	Value
436504006 (CAPA-18-147596)	Americium-241	Result 0.0094 < MDA 0.0549 > 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

None of the samples in this sample set were recounted.

Miscellaneous Information:

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: ISOPU
Analytical Method: HASL-300:ISOPU
Analytical Batch Number: 1715444

Sample ID	Client ID
436504006	CAPA-18-147596
436504009	CAPA-18-147597
1203911099	Method Blank (MB)
1203911101	Laboratory Control Sample (LCS)
1203911100	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-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibrations were performed in November 2017 and October 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 1203911099 (MB) and 1203911101 (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: 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

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
1203911100 (CAPA-18-147576DUP)	Plutonium-239/240	Result 0.0273 < MDA 0.0576 > RDL 0.05 pCi/L
436504006 (CAPA-18-147596)	Plutonium-239/240	Result 0.00295 < MDA 0.0623 > RDL 0.05 pCi/L
436504009 (CAPA-18-147597)	Plutonium-239/240	Result -0.0256 < MDA 0.0674 > 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

None of the samples in this sample set were recounted.

Miscellaneous Information:**Manual Integration**

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: IsoU
Analytical Method: HASL-300:ISOU
Analytical Batch Number: 1715445

Sample ID	Client ID
436504006	CAPA-18-147596
436504009	CAPA-18-147597
1203911103	Method Blank (MB)
1203911105	Laboratory Control Sample (LCS)
1203911104	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-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 1203911103 (MB) and 1203911105 (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: 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.

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: **Gammasec**

Analytical Method: EPA:901.1

Analytical Batch Number: 1716271

Sample ID	Client ID
436504006	CAPA-18-147596
436504009	CAPA-18-147597
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 August 2017, July 2017, June 2017, March 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: GFPC, Sr90, liquid

Analytical Method: EPA:905.0

Analytical Batch Number: 1714184

Sample ID	Client ID
436504006	CAPA-18-147596
436504009	CAPA-18-147597
1203907994	Method Blank (MB)
1203907997	Laboratory Control Sample (LCS)
1203907995	436149002(CAPA-18-147574) Sample Duplicate (DUP)
1203907996	436149002(CAPA-18-147574) 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 1203907994 (MB) and 1203907997 (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: 436149002 (CAPA-18-147574). The QC was from ARSL work order 436149.

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 1203907997 (LCS) was recounted due to high 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, 1203907996 (CAPA-18-147574MS), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

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

Sample ID	Client ID
436504006	CAPA-18-147596
436504009	CAPA-18-147597
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.

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.

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Qualifier Definition Report for

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

Client SDG: 2018-594 GEL Work Order: 436504

The Qualifiers in this report are defined as follows:

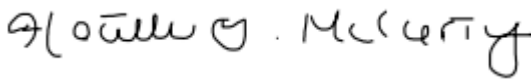
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

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

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

Signature:



Name: Heather McCarty

Date: 22 NOV 2017

Title: Analyst II

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Report Date: November 22, 2017

Client Sample ID: CAPA-18-147596
Sample ID: 436504006
Matrix: W
Collect Date: 26-OCT-17
Receive Date: 28-OCT-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Alpha Spec Analysis

Alphaspec Am241 Liquid "As Received"

Americium-241	U	0.0094	+/-0.00701	0.0549	0.0232	+/-0.00702	0.050	pCi/L			HAKB	11/16/17	1514	1715443	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.00887	+/-0.00782	0.0436	0.0178	+/-0.00784	0.050	pCi/L			HAKB	11/19/17	1059	1715444	2
Plutonium-239/240	U	0.00295	+/-0.00661	0.0623	0.0271	+/-0.00661	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.587	+/-0.0553	0.0936	0.040	+/-0.065	1.00	pCi/L			HAKB	11/16/17	0731	1715445	3
Uranium-235/236	U	0.00924	+/-0.0116	0.0999	0.0416	+/-0.0116	1.00	pCi/L							
Uranium-238		0.280	+/-0.0388	0.0905	0.0385	+/-0.0421	0.500	pCi/L							

Rad Gamma Spec Analysis

Gammasespec "As Received"

Cesium-137	U	1.08	+/-1.15	4.45	1.99	+/-1.18	8.00	pCi/L			BSW1	11/16/17	0908	1716271	4
Cobalt-60	U	1.82	+/-0.921	4.47	1.89	+/-1.02	8.00	pCi/L							
Neptunium-237	U	-1.1	+/-1.98	7.12	3.24	+/-2.00		pCi/L							
Potassium-40	U	-2.3	+/-14.9	54.9	24.0	+/-14.9		pCi/L							
Sodium-22	U	1.46	+/-1.30	5.40	2.36	+/-1.34		pCi/L							

Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	0.107	+/-0.128	0.450	0.199	+/-0.129	0.500	pCi/L			LXB3	11/11/17	1542	1714184	5
<i>WSP-GrossA/B "As Received"</i>															
Beta		4.87	+/-0.913	2.46	1.11	+/-0.999	3.00	pCi/L			AXH4	11/15/17	1141	1716449	6
Alpha		2.46	+/-0.804	2.14	0.835	+/-0.832	3.00	pCi/L			AXH4	11/15/17	1649	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"	1715443	75.5	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1715444	75.3	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1715445	74.9	(50%-105%)

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Certificate of Analysis

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147596

Sample ID: 436504006

Project: ESHL00114

Client ID: ARSL004

Report Date: November 22, 2017

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"						1714184	98.1	(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

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147597

Sample ID: 436504009

Matrix: W

Collect Date: 26-OCT-17

Receive Date: 28-OCT-17

Collector: Client

Report Date: November 22, 2017

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Alpha Spec Analysis

Alphaspec Am241 Liquid "As Received"

Americium-241	U	0.0104	+/-0.00638	0.0456	0.0193	+/-0.00639	0.050	pCi/L			HAKB	11/16/17	1514	1715443	1
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ISOPU "As Received"

Plutonium-238	U	0.0096	+/-0.00847	0.0472	0.0193	+/-0.00849	0.050	pCi/L			HAKB	11/19/17	1059	1715444	2
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Plutonium-239/240	U	-0.0256	+/-0.012	0.0674	0.0294	+/-0.012	0.050	pCi/L							
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IsoU "As Received"

Uranium-234		0.268	+/-0.0362	0.0851	0.0364	+/-0.0392	1.00	pCi/L			HAKB	11/16/17	0731	1715445	3
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Uranium-235/236	U	0.0168	+/-0.0135	0.0908	0.0378	+/-0.0135	1.00	pCi/L							
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Uranium-238		0.159	+/-0.0279	0.0824	0.035	+/-0.0293	0.500	pCi/L							
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Rad Gamma Spec Analysis

Gammasespec "As Received"

Cesium-137	U	0.131	+/-1.35	4.93	2.17	+/-1.35	8.00	pCi/L			BSW1	11/16/17	0907	1716271	4
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Cobalt-60	U	1.77	+/-1.45	6.22	2.66	+/-1.51	8.00	pCi/L							
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Neptunium-237	U	2.21	+/-2.51	9.58	4.43	+/-2.57		pCi/L							
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Potassium-40	U	-7.26	+/-20.1	77.9	34.5	+/-20.2		pCi/L							
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Sodium-22	U	-0.843	+/-1.27	4.56	1.85	+/-1.28		pCi/L							
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Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	0.103	+/-0.129	0.453	0.199	+/-0.129	0.500	pCi/L			LXB3	11/11/17	1544	1714184	5
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WSP-GrossA/B "As Received"

Beta		3.10	+/-0.859	2.54	1.15	+/-0.897	3.00	pCi/L			AXH4	11/15/17	1141	1716449	6
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Alpha	U	0.973	+/-0.596	1.94	0.721	+/-0.602	3.00	pCi/L			AXH4	11/15/17	1649	1716449	7
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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"	1715443	85.5	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1715444	70.3	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1715445	89.9	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1714184	93	(50%-105%)

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Certificate of Analysis

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147597

Sample ID: 436504009

Project: ESHL00114

Client ID: ARSL004

Report Date: November 22, 2017

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

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QC Summary

Report Date: November 22, 2017

Page 1 of 6

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

Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 436504

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1715443										
QC1203911097	436463002	DUP									
Americium-241	U	0.00533	U	0.0101	pCi/L	0.164		(0-1)	HAKB	11/16/17	16:22
	Uncert:	+/-0.00653		+/-0.00798							
	TPU:	+/-0.00653		+/-0.00799							
**Americium-243 Tracer	5.24	2.53		5.26	pCi/L		100	(50%-105%)			
	Uncert:	+/-0.0833		+/-0.115							
	TPU:	+/-0.147		+/-0.240							
QC1203911098	LCS										
Americium-241	1.97			1.94	pCi/L		98.4	(80%-120%)	HAKB	11/16/17	16:23
	Uncert:			+/-0.0635							
	TPU:			+/-0.110							
**Americium-243 Tracer	2.10			1.81	pCi/L		86.2	(50%-105%)			
	Uncert:			+/-0.0658							
	TPU:			+/-0.117							
QC1203911096	MB										
Americium-241			U	0.00	pCi/L				HAKB	11/16/17	16:22
	Uncert:			+/-0.0054							
	TPU:			+/-0.0054							
**Americium-243 Tracer	2.10			1.99	pCi/L		94.8	(50%-105%)			
	Uncert:			+/-0.0631							
	TPU:			+/-0.114							
Batch	1715444										
QC1203911100	436463002	DUP									
Plutonium-238	U	0.0041	U	0.0109	pCi/L	0.23		(0-1)	HAKB	11/19/17	10:59
	Uncert:	+/-0.0071		+/-0.00773							
	TPU:	+/-0.0071		+/-0.00775							
Plutonium-239/240	U	0.00	U	0.0273	pCi/L	0.587		(0-1)			
	Uncert:	+/-0.013		+/-0.0102							
	TPU:	+/-0.013		+/-0.0103							
**Plutonium-242 Tracer	2.47	1.34		1.94	pCi/L		78.7	(50%-105%)			
	Uncert:	+/-0.101		+/-0.0826							
	TPU:	+/-0.179		+/-0.160							
QC1203911101	LCS										
Plutonium-238			U	0.0216	pCi/L			(80%-120%)	HAKB	11/19/17	10:59
	Uncert:			+/-0.00864							
	TPU:			+/-0.00872							
Plutonium-239/240	1.98			2.03	pCi/L		103	(80%-120%)			
	Uncert:			+/-0.0663							
	TPU:			+/-0.130							
**Plutonium-242 Tracer	1.97			1.57	pCi/L		79.4	(50%-105%)			
	Uncert:			+/-0.0657							
	TPU:			+/-0.127							

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QC Summary

Workorder: 436504

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1715444										
QC1203911099	MB										
Plutonium-238			U	0.007	pCi/L				HAKB	11/19/17	10:59
				Uncert:							
				TPU:							
Plutonium-239/240			U	0.00933	pCi/L						
				Uncert:							
				TPU:							
**Plutonium-242 Tracer	1.97			1.49	pCi/L		75.3	(50%-105%)			
				Uncert:							
				TPU:							
Batch	1715445										
QC1203911104	436463002	DUP									
Uranium-234		0.442		0.292	pCi/L	0.857		(0-1)	HAKB	11/16/17	07:31
		Uncert:		+/-0.0367							
		TPU:		+/-0.0401							
Uranium-235/236		U	0.0536	U	0.0152	pCi/L	0.594	(0-1)			
		Uncert:		+/-0.0122							
		TPU:		+/-0.0122							
Uranium-238		0.164		0.168	pCi/L	0.035		(0-1)			
		Uncert:		+/-0.029							
		TPU:		+/-0.0304							
**Uranium-232 Tracer	2.62	2.23		2.27	pCi/L		86.5	(50%-105%)			
		Uncert:		+/-0.106							
		TPU:		+/-0.173							
QC1203911105	LCS										
Uranium-234				2.48	pCi/L				HAKB	11/16/17	07:31
		Uncert:		+/-0.0861							
		TPU:		+/-0.158							
Uranium-235/236				0.141	pCi/L						
		Uncert:		+/-0.0233							
		TPU:		+/-0.0245							
Uranium-238	2.70			2.71	pCi/L		100	(80%-120%)			
		Uncert:		+/-0.0902							
		TPU:		+/-0.171							
**Uranium-232 Tracer	2.09			2.12	pCi/L		101	(50%-105%)			
		Uncert:		+/-0.0802							
		TPU:		+/-0.138							
QC1203911103	MB										
Uranium-234			U	0.00781	pCi/L				HAKB	11/16/17	07:31
		Uncert:		+/-0.0118							
		TPU:		+/-0.0118							
Uranium-235/236			U	0.0138	pCi/L						
		Uncert:		+/-0.0105							
		TPU:		+/-0.0105							
Uranium-238			U	0.00476	pCi/L						
		Uncert:		+/-0.00718							
		TPU:		+/-0.00719							

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QC Summary

Workorder: 436504

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1715445										
**Uranium-232 Tracer	2.09			1.93	pCi/L		92.2	(50%-105%)			
	Uncert:			+/-0.0835							
	TPU:			+/-0.141							
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							

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QC Summary

Workorder: 436504

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1716271										
Neptunium-237	TPU:			+/-1.27							
			U	-0.0134	pCi/L						
	Uncert:			+/-1.88							
Potassium-40	TPU:			+/-1.88							
			U	15.3	pCi/L						
	Uncert:			+/-12.7							
Sodium-22	TPU:			+/-13.2							
			U	0.346	pCi/L						
	Uncert:			+/-1.15							
	TPU:			+/-1.16							
Rad Gas Flow											
Batch	1714184										
QC1203907995	436149002	DUP									
Strontium-90	U	-0.105	U	0.0561	pCi/L	0.355		(0-1)	LXB3	11/11/17	15:43
	Uncert:	+/-0.104		+/-0.123							
	TPU:	+/-0.104		+/-0.123							
**Strontium Carrier	7.85	6.80		7.80	mg		99.4	(50%-105%)			
QC1203907997	LCS										
Strontium-90	23.7			26.9	pCi/L		113	(80%-120%)	LXB3	11/13/17	08:20
	Uncert:			+/-0.700							
	TPU:			+/-2.41							
**Strontium Carrier	7.85			4.80	mg		61.1	(50%-105%)			
QC1203907994	MB										
Strontium-90			U	-0.0173	pCi/L				LXB3	11/11/17	15:43
	Uncert:			+/-0.0672							
	TPU:			+/-0.0672							
**Strontium Carrier	7.85			6.70	mg		85.4	(50%-105%)			
QC1203907996	436149002	MS									
Strontium-90	237	U	-0.105	181	pCi/L		76.3	(75%-125%)	LXB3	11/11/17	15:43
	Uncert:		+/-0.104	+/-4.90							
	TPU:		+/-0.104	+/-15.4							
**Strontium Carrier	7.85	6.80		8.10	mg		103	(50%-105%)			
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

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time	
Rad Gas Flow												
Batch	1716449											
				Uncert:								
				TPU:								
QC1203913664	MB											
Alpha			U	0.235	pCi/L				AXH4	11/15/17	16:48	
				Uncert:								
				TPU:								
Beta			U	0.276	pCi/L					11/15/17	12:08	
				Uncert:								
				TPU:								
QC1203913666	437078009	MS										
Alpha		483	2.35	371	pCi/L		76.3	(75%-125%)	AXH4	11/16/17	10:18	
				Uncert:								
				TPU:								
Beta		1900	U	2.54	2020	pCi/L	107	(75%-125%)		11/15/17	12:08	
				Uncert:								
				TPU:								
QC1203913667	437078009	MSD										
Alpha		483	2.35	453	pCi/L	0.494	93.3	(0-1)	AXH4	11/15/17	16:50	
				Uncert:								
				TPU:								
Beta		1900	U	2.54	1790	pCi/L	0.364	94.2	(0-1)		11/15/17	12:08
				Uncert:								
				TPU:								

Notes:

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

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMF Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.

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

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

** Indicates analyte is a surrogate/tracer compound.

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

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

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