

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:

[illegible]

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11366

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q4

SAMPLE ID: CAMO-17-141974

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08/03/2017	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1508		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-13		FIELD PREP:	F	
LOCATION TYPE:	non		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	NA		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	y	
	WSP- NH3+NO3/NO2	500 ML AMBER GLASS	1	H2SO4	y	

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): K. Tow, T. Vander Vies

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 8/3/17 1556	RECEIVED BY (Printed Name) (Signature)	S. Sherwood <i>[Signature]</i>	Date/Time 8/3/17 1556
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 07/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11366

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q4

SAMPLE ID: CAMO-17-141975

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08/03/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1001		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-15		FIELD PREP:	F	
LOCATION TYPE:	mon		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	NA	↓	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	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): K. Todd, T. Vander Vis

RELINQUISHED BY (Printed Name) Tanya Vander Vis (Signature) Tanya Vander Vis	Date/Time 8/3/17 1410	RECEIVED BY (Printed Name) M. Martin (Signature) [Signature]	Date/Time 8/3/17 1410
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11366

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q4

SAMPLE ID: CAMO-17-141980

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08-03-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	10:58		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-44 S1		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	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT):

D. Jaramillo, A. Vigil

RELINQUISHED BY (Printed Name) Andrew Vigil (Signature) <i>Andrew Vigil</i>	Date/Time 08-03-2017 1410	RECEIVED BY (Printed Name) <i>Al. Montoya</i> (Signature) <i>[Signature]</i>	Date/Time 8/3/17 1410
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11366

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q4

SAMPLE ID: CAMO-17-141981

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08-03-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:45		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-44 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	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.V. 81

RELINQUISHED BY (Printed Name) ANDREW JIGLE (Signature) <i>Andrew Jigle</i>	Date/Time 08-03-2017 1410	RECEIVED BY (Printed Name) <i>M. Martin</i> (Signature) <i>M. Martin</i>	Date/Time 8/3/17 1410
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11366

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q4

SAMPLE ID: CAMO-17-141990

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08/03/2017	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1508		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-13		FIELD PREP:	UF	
LOCATION TYPE:	mon		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1000 500-ML POLY KT 8/3/17	1	HNO3	y	NA
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: generator Running at about 50' away

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	1508	HH:MM	Dissolved Oxygen	6.21 mg/L	Flow (in gpm)	5.66 gpm
Oxidation-Reduction Potential	156.8 mV		pH	8.19	Specific Conductance	144.2 uS/cm
Temperature	21.7°C		Turbidity	0.24 NTU		

COLLECTED BY (PRINT): K. Tow, T. Vander Vis

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 8/3/17 1556	RECEIVED BY (Printed Name) (Signature)	S. Sherwood <i>[Signature]</i>	Date/Time 8/3/17 1556
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 07/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11366

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q4

SAMPLE ID: CAMO-17-141991

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08/03/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	10:01		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-15		FIELD PREP:	UF	
LOCATION TYPE:	mon		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	NA	↓	EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1000 500 ML POLY KT 8/3/17	1	HNO3	↓	NA
↓	WSP-CN(T)	250 ML POLY	1	NAOH	↓	↓
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS: generator running at 60' away

LOCATION COMMENTS: none.

FIELD PARAMETERS:

Sample Time	10:01	HH:MM	Dissolved Oxygen	6.62 mg/L	Flow (in gpm)	8.10 gpm
Oxidation-Reduction Potential	189.6 mV		pH	7.84	Specific Conductance	154.6 µS/cm
Temperature	20.2 °C		Turbidity	0.92 NTU		

COLLECTED BY (PRINT): K. Tow, T. Vander Vies

RELINQUISHED BY (Printed Name) Tanya Vander Vies (Signature) Tanya Vander Vies	Date/Time 8/3/17 1410	RECEIVED BY (Printed Name) M. Martin (Signature) M. Martin	Date/Time 8/3/17 1410
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11366

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q4

SAMPLE ID: CAMO-17-142301

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	08-03-2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	10:58		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-44 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	TEST	
TOP DEPTH:	↓		SAMPLE USAGE:	TEST	
BOTTOM DEPTH:	↓		EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-EES- Tracers(CrStudy)+D2H	40 mL Glass	2	NONE	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT):

D. Jaramillo, A. Vigil

RELINQUISHED BY (Printed Name) ANDREW VIGIL (Signature) <i>[Signature]</i>	Date/Time 08-03-2017 1410	RECEIVED BY (Printed Name) <i>[Signature]</i> (Signature) <i>[Signature]</i>	Date/Time 8/3/17 1410
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11366

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q4

SAMPLE ID: CAMO-17-142302

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08-03-2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	12:45		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-44 S2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	TEST	
TOP DEPTH:			SAMPLE USAGE:	TEST	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-EES- Tracers(CrStudy)+D2H	40 mL Glass	2	NONE	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time _____ HH:MM _____ Dissolved Oxygen 08-03-2017 Flow (in gpm) _____
Oxidation-Reduction _____ pH _____ Specific _____
Potential _____ Conductance _____
Temperature _____ Turbidity _____

COLLECTED BY (PRINT): A. Vigil

RELINQUISHED BY (Printed Name) Andrew Vigil (Signature) [Signature]	Date/Time 08-03-2017 1410	RECEIVED BY (Printed Name) M. Marty (Signature) [Signature]	Date/Time 8/3/17 1410
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11366

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q4

SAMPLE ID: CAMO-17-142308

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08-03-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	10:58 12:45 → 12:17 08-03-17		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-44 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	1000 500 ML POLY A.V. 5/11/17	1	HNO3	Y	NA
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	10:58	HH:MM	Dissolved Oxygen	6.92	Flow (in gpm)	3.26
Oxidation-Reduction Potential	191.8		pH	7.71	Specific Conductance	134.9
Temperature	21.2		Turbidity	0.4		

COLLECTED BY (PRINT): D. Savanillo, A.V.G.1

RELINQUISHED BY (Printed Name) ANOREW 0161 (Signature) <i>[Signature]</i>	Date/Time 08-03-2017 1410	RECEIVED BY (Printed Name) <i>[Signature]</i> (Signature) <i>[Signature]</i>	Date/Time 8/3/17 1410
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11366

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q4

SAMPLE ID: CAMO-17-142309

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08-03-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:45		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-44 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	1000 500 ML POLY DHA 8037	1	HNO3	Y	NA
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time 12:45 HH:MM Dissolved Oxygen 6.99 Flow (in gpm) 3.45
 Oxidation-Reduction Potential 204.1 pH 7.81 Specific Conductance 140.7
 Temperature 21.4 Turbidity 0.19

COLLECTED BY (PRINT): A. Vigil

RELINQUISHED BY (Printed Name) ANDREW VIGIL (Signature) <i>Andrew Vigil</i>	Date/Time 08-03-2017 1410	RECEIVED BY (Printed Name) <i>M. Montoya</i> (Signature) <i>M. Montoya</i>	Date/Time 8/3/17 1410
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

DATA VALIDATION REPORT

Chain Of Custody No. 2017-2339

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
429873	EPA:120.1	4				
429873	EPA:150.1	4				
429873	EPA:160.1	4				
429873	EPA:170.0	8				
429873	EPA:245.2	8				
429873	EPA:300.0	4				
429873	EPA:310.1	4				
429873	EPA:335.4	4				
429873	EPA:350.1	4				
429873	EPA:351.2	4				
429873	EPA:353.2	4				
429873	EPA:365.4	4				
429873	SM:A2340B	4				
429873	SW-846:6010C	4				
429873	SW-846:6020	4				
429873	SW-846:6850	4				
429873	SW-846:9060	4				

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
429873	EPA:120.1	1689860	1689860	4										1			2				
429873	EPA:150.1	1691073	1691073	4										1			1				
429873	EPA:160.1	1688765	1688765	4					1					1			2				
429873	EPA:170.0	NA	NA	8																	
429873	EPA:245.2	1695110	1695109	8					1	1				1			1				
429873	EPA:300.0	1691290	1691290	4					1					1			2				
429873	EPA:310.1	1691070	1691070	4						1				1			1				

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
429873	EPA:335.4	1688863	1688862	4					1	1				1				1			
429873	EPA:350.1	1692774	1692772	4					1	2				1				2			
429873	EPA:351.2	1692771	1692769	4					1	2				1				2			
429873	EPA:353.2	1689327	1689327	4					1					1				2			
429873	EPA:365.4	1692781	1692780	4					1	2				1				2			
429873	SM:A2340B	1697698	1697698	4																	
429873	SW-846:6010C	1689149	1689148	4					1	1				1				1			
429873	SW-846:6020	1689157	1689156	4					1	1				1				1			
429873	SW-846:6850	1691881	1691880	4					1	1	1			1							
429873	SW-846:9060	1689290	1689290	4					1					1				1			

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAMO-17-141974	1203849510	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-17-141974	429873001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-17-141975	429873003	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-17-141980	429873005	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-17-141981	429873008	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-17-142780	1203849509	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203849508	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-141974	429873001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-141975	429873003	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-141976	1203852561	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-141980	429873005	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-141981	429873008	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203852560	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-141974	429873001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-141975	429873003	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-141980	429873005	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-141981	429873008	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-142778	1203847994	DUP	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:160.1	GENERAL CHEMISTRY	LCS	1203846810	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203846809	MB	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	WT_SEP-PO-17-141446	1203846811	DUP	1	0	0	0
EPA:170.0	VOC	CAMO-17-141974	429873001	REG	1	0	0	0
EPA:170.0	VOC	CAMO-17-141975	429873003	REG	1	0	0	0
EPA:170.0	VOC	CAMO-17-141980	429873005	REG	1	0	0	0
EPA:170.0	VOC	CAMO-17-141981	429873008	REG	1	0	0	0
EPA:170.0	VOC	CAMO-17-141990	429873002	REG	1	0	0	0
EPA:170.0	VOC	CAMO-17-141991	429873004	REG	1	0	0	0
EPA:170.0	VOC	CAMO-17-142308	429873007	REG	1	0	0	0
EPA:170.0	VOC	CAMO-17-142309	429873010	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-141974	429873001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-141975	429873003	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-141980	429873005	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-141981	429873008	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-141990	429873002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-141991	429873004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-142308	429873007	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-142309	429873010	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-142310	1203861646	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-142310	1203861648	MS	0	0	1	0
EPA:245.2	INORGANIC	LCS	1203861645	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203861644	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-141974	429873001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-141975	429873003	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-141976	1203853102	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-141980	429873005	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-141981	429873008	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CASA-17-142776	1203853103	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203853101	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203853100	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-141974	429873001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-141975	429873003	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-141976	1203852503	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-141976	1203852506	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-141980	429873005	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-141981	429873008	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203852501	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-141990	429873002	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-141991	429873004	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:335.4	GENERAL CHEMISTRY	CAMO-17-142308	429873007	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-142309	429873010	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203847021	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203847020	MB	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	WT_SEP-PO-17-141442	1203847022	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	WT_SEP-PO-17-141442	1203847023	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-141974	429873001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-141975	429873003	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-141980	429873005	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-141981	429873008	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-142070	1203856523	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-142070	1203856525	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203856521	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203856520	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WT_SEP-PO-17-141444	1203856522	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WT_SEP-PO-17-141444	1203856524	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-141990	1203856517	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-141990	1203856519	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-141990	429873002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-141991	429873004	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-141992	1203856516	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-141992	1203856518	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-142308	429873007	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-142309	429873010	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203856515	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203856514	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-141974	429873001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-141975	429873003	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-141977	1203848237	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-141980	429873005	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-141981	429873008	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-142236	1203848236	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203848235	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203848234	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-141974	429873001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-141975	429873003	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-141979	1203856559	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-141979	1203856561	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-141980	429873005	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-141981	429873008	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:365.4	GENERAL CHEMISTRY	CAMO-17-141985	1203856560	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-141985	1203856562	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203856558	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203856557	MB	1	0	0	0
SM:A2340B	INORGANIC	CAMO-17-141974	429873001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-17-141975	429873003	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-17-141980	429873005	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-17-141981	429873008	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-141974	1203847762	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-141974	1203847763	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAMO-17-141974	429873001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-141975	429873003	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-141980	429873005	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-141981	429873008	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203847761	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203847760	MB	17	0	0	0
SW-846:6020	INORGANIC	CAMO-17-141974	1203847785	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAMO-17-141974	1203847786	MS	0	0	11	0
SW-846:6020	INORGANIC	CAMO-17-141974	429873001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-17-141975	429873003	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-17-141980	429873005	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-17-141981	429873008	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203847784	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203847783	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-141974	1203854487	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-141974	1203854488	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-141974	429873001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-141975	429873003	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-141980	429873005	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-141981	429873008	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203854486	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203854485	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-141990	1203849665	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-141990	429873002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-141991	429873004	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-142308	429873007	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-142309	429873010	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203849663	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203849662	MB	1	0	0	0

DATA VALIDATION REPORT

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203847783	METHOD BLANK	SW-846:6020	W	Molybdenum	0.242	J	ug/L	0.500

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-17-141974	1203847783	METHOD BLANK	SW-846:6020	Molybdenum	0.242	ug/L	1.13		0.500	Y	5	100	Y
CAMO-17-141975	1203847783	METHOD BLANK	SW-846:6020	Molybdenum	0.242	ug/L	1.12		0.500	Y	5	100	Y
CAMO-17-141980	1203847783	METHOD BLANK	SW-846:6020	Molybdenum	0.242	ug/L	0.885		0.500	Y	5	100	Y
CAMO-17-141981	1203847783	METHOD BLANK	SW-846:6020	Molybdenum	0.242	ug/L	0.865		0.500	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

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

DATA VALIDATION REPORT

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
WT_SEP-PO-17-141442	1203847023		EPA:335.4	Cyanide (Total)	1688862	08-09-2017	W	112		110	90	10		

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-13	2017-2339	CAMO-17-141974	REG	INIT	INORGANIC	SW-846:6020	Molybdenum		U	14	N	1.13	ug/L	1.13	ug/L			W	08/03/2017		1689157	VAL	Y
R-15	2017-2339	CAMO-17-141975	REG	INIT	INORGANIC	SW-846:6020	Molybdenum		U	14	N	1.12	ug/L	1.12	ug/L			W	08/03/2017		1689157	VAL	Y
R-44 S1	2017-2339	CAMO-17-141980	REG	INIT	INORGANIC	SW-846:6020	Molybdenum		U	14	N	0.885	ug/L	0.885	ug/L			W	08/03/2017		1689157	VAL	Y

DATA VALIDATION REPORT

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Paramter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-44 S2	2017-2339	CAMO-17-141981	REG	INIT	INORGANIC	SW-846:6020	Molybdenum		U	I4	N	0.865	ug/L	0.865	ug/L			W	08/03/2017		1689157	VAL	Y

Reason Code

Description

I4

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

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 qualify. The analyte is detected in the sample.

U_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-17-141974	R-13	REG	EPA:120.1	0	1
CAMO-17-141974	R-13	REG	EPA:150.1	0	1
CAMO-17-141974	R-13	REG	EPA:160.1	0	1
CAMO-17-141974	R-13	REG	EPA:170.0	0	1
CAMO-17-141974	R-13	REG	EPA:245.2	0	1
CAMO-17-141974	R-13	REG	EPA:300.0	0	4
CAMO-17-141974	R-13	REG	EPA:310.1	0	2
CAMO-17-141974	R-13	REG	EPA:350.1	0	1
CAMO-17-141974	R-13	REG	EPA:353.2	0	1
CAMO-17-141974	R-13	REG	EPA:365.4	0	1
CAMO-17-141974	R-13	REG	SM:A2340B	0	1
CAMO-17-141974	R-13	REG	SW-846:6010C	0	17
CAMO-17-141974	R-13	REG	SW-846:6020	0	11
CAMO-17-141974	R-13	REG	SW-846:6850	0	1
CAMO-17-141975	R-15	REG	EPA:120.1	0	1
CAMO-17-141975	R-15	REG	EPA:150.1	0	1
CAMO-17-141975	R-15	REG	EPA:160.1	0	1
CAMO-17-141975	R-15	REG	EPA:170.0	0	1
CAMO-17-141975	R-15	REG	EPA:245.2	0	1
CAMO-17-141975	R-15	REG	EPA:300.0	0	4

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-17-141975	R-15	REG	EPA:310.1	0	2
CAMO-17-141975	R-15	REG	EPA:350.1	0	1
CAMO-17-141975	R-15	REG	EPA:353.2	0	1
CAMO-17-141975	R-15	REG	EPA:365.4	0	1
CAMO-17-141975	R-15	REG	SM:A2340B	0	1
CAMO-17-141975	R-15	REG	SW-846:6010C	0	17
CAMO-17-141975	R-15	REG	SW-846:6020	0	11
CAMO-17-141975	R-15	REG	SW-846:6850	0	1
CAMO-17-141980	R-44 S1	REG	EPA:120.1	0	1
CAMO-17-141980	R-44 S1	REG	EPA:150.1	0	1
CAMO-17-141980	R-44 S1	REG	EPA:160.1	0	1
CAMO-17-141980	R-44 S1	REG	EPA:170.0	0	1
CAMO-17-141980	R-44 S1	REG	EPA:245.2	0	1
CAMO-17-141980	R-44 S1	REG	EPA:300.0	0	4
CAMO-17-141980	R-44 S1	REG	EPA:310.1	0	2
CAMO-17-141980	R-44 S1	REG	EPA:350.1	0	1
CAMO-17-141980	R-44 S1	REG	EPA:353.2	0	1
CAMO-17-141980	R-44 S1	REG	EPA:365.4	0	1
CAMO-17-141980	R-44 S1	REG	SM:A2340B	0	1
CAMO-17-141980	R-44 S1	REG	SW-846:6010C	0	17
CAMO-17-141980	R-44 S1	REG	SW-846:6020	0	11
CAMO-17-141980	R-44 S1	REG	SW-846:6850	0	1
CAMO-17-141981	R-44 S2	REG	EPA:120.1	0	1
CAMO-17-141981	R-44 S2	REG	EPA:150.1	0	1
CAMO-17-141981	R-44 S2	REG	EPA:160.1	0	1
CAMO-17-141981	R-44 S2	REG	EPA:170.0	0	1
CAMO-17-141981	R-44 S2	REG	EPA:245.2	0	1
CAMO-17-141981	R-44 S2	REG	EPA:300.0	0	4
CAMO-17-141981	R-44 S2	REG	EPA:310.1	0	2
CAMO-17-141981	R-44 S2	REG	EPA:350.1	0	1
CAMO-17-141981	R-44 S2	REG	EPA:353.2	0	1
CAMO-17-141981	R-44 S2	REG	EPA:365.4	0	1
CAMO-17-141981	R-44 S2	REG	SM:A2340B	0	1
CAMO-17-141981	R-44 S2	REG	SW-846:6010C	0	17
CAMO-17-141981	R-44 S2	REG	SW-846:6020	0	11
CAMO-17-141981	R-44 S2	REG	SW-846:6850	0	1
CAMO-17-141990	R-13	REG	EPA:170.0	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-17-141990	R-13	REG	EPA:245.2	0	1
CAMO-17-141990	R-13	REG	EPA:335.4	0	1
CAMO-17-141990	R-13	REG	EPA:351.2	0	1
CAMO-17-141990	R-13	REG	SW-846:9060	0	1
CAMO-17-141991	R-15	REG	EPA:170.0	0	1
CAMO-17-141991	R-15	REG	EPA:245.2	0	1
CAMO-17-141991	R-15	REG	EPA:335.4	0	1
CAMO-17-141991	R-15	REG	EPA:351.2	0	1
CAMO-17-141991	R-15	REG	SW-846:9060	0	1
CAMO-17-142308	R-44 S1	REG	EPA:170.0	0	1
CAMO-17-142308	R-44 S1	REG	EPA:245.2	0	1
CAMO-17-142308	R-44 S1	REG	EPA:335.4	0	1
CAMO-17-142308	R-44 S1	REG	EPA:351.2	0	1
CAMO-17-142308	R-44 S1	REG	SW-846:9060	0	1
CAMO-17-142309	R-44 S2	REG	EPA:170.0	0	1
CAMO-17-142309	R-44 S2	REG	EPA:245.2	0	1
CAMO-17-142309	R-44 S2	REG	EPA:335.4	0	1
CAMO-17-142309	R-44 S2	REG	EPA:351.2	0	1
CAMO-17-142309	R-44 S2	REG	SW-846:9060	0	1



August 30, 2017

gel.com

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

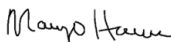
Re: LANL- WQH Water Samples
Work Order: 429873
SDG: 2017-2339

Dear Ms. Patel:

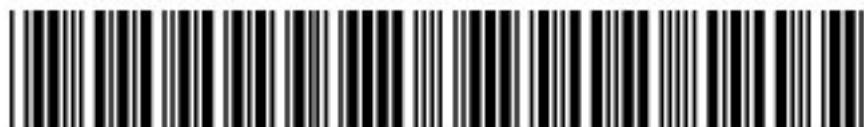
GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on August 05, 2017, and analyzed for General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,


Margo Herron for
Valerie Davis
Project Manager

Chain of Custody: 2017-2339 and
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 429873
SDG: 2017-2339

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 429873
SDG # : 2017-2339**

August 30, 2017

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on August 05, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
429873001	CAMO-17-141974
429873002	CAMO-17-141990
429873003	CAMO-17-141975
429873004	CAMO-17-141991
429873005	CAMO-17-141980
429873007	CAMO-17-142308
429873008	CAMO-17-141981
429873010	CAMO-17-142309
429873011	CAMO-17-141986

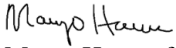
Case Narrative

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: General Chemistry, Metals and Perchlorates by LCMSMS.

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


Margo Herron for
Valerie Davis
Project Manager

List of current GEL Certifications as of 30 August 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	SC000122017-23
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

General Engineering

Charleston SC

Chain of Custody/Analysis Request

COC/Lab Request #:

2017-2339

Page 1 of 1

Client Contact:

Lab Agreement #:

Site Name: Los Alamos National Laboratory

Project Number: ADEP

Analysis Turnaround Time:

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

Field Sample ID

Sample Date

Sample Time

Sample Matrix

CAMO-17-141974

Aug 3 2017

15:08

W

CAMO-17-141990

Aug 3 2017

15:08

W

CAMO-17-141975

Aug 3 2017

10:01

W

CAMO-17-141991

Aug 3 2017

10:01

W

CAMO-17-141980

Aug 3 2017

10:58

W

CAMO-17-142301

Aug 3 2017

10:58

W

CAMO-17-142308

Aug 3 2017

10:58

W

CAMO-17-141981

Aug 3 2017

12:45

W

CAMO-17-142302

Aug 3 2017

12:45

W

CAMO-17-142309

Aug 3 2017

12:45

W

Rad Screening Info:

Lab Reporting Limit Type:

Sample Quantitation

Limit MDL

Special Instructions:

Relinquished by:

Print Name: MAT ENGLISH

Date/Time: 8-4-17

Received by: Stacy Brown

Date/Time: 8-5-17

Relinquished by:

Print Name:

Date/Time:

Relinquished by:

Print Name:

Date/Time:

SAMPLE RECEIPT & REVIEW FORM

Client: LANL / ESHL		SDG/AR/COC/Work Order: 429 873			
Received By: STACY BOONE		Date Received: 5-AUG-17			
Carrier and Tracking Number		Circle Applicable:			
		FedEx Express FedEx Ground UPS Field Services Courier Other			
		5908 1782 5016-6c 5908 1782 4980-5c			
		5908 1782 4491-6c 5908 1782 5049-5c			
		5908 1782 5038-6c 5908 1782 4970-6c			
5908 1782 5027-6c 5908 1782 5005-6c					
Suspected Hazard Information		Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?			<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?			<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?			<input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____	
Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Wet Ice Ice Packs Dry ice None Other: _____ *all temperatures are recorded in Celsius TEMP: _____
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: 1R3-17 Secondary Temperature Device Serial # (If Applicable): _____
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's and Containers Affected: If Preservation added, Lot#: _____
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>			If Yes, Are Encores or Soil Kits present? Yes _____ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No _____ N/A (If unknown, select No) VOA vials free of headspace? Yes _____ No <input checked="" type="checkbox"/> N/A Sample ID's and containers affected: WSTMO-17-143808 2 of 2
8	Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?			<input checked="" type="checkbox"/>	Sample ID's affected: SEE BELOW
11	Number of containers received match number indicated on COC?			<input checked="" type="checkbox"/>	Sample ID's affected: CAMO-17-141986 NOT ON COC 1 RECEIVED
12	Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
Comments (Use Continuation Form if needed): WO: 429874 ID: NOP-1601N170803 OUT170803 SAMPLE ID'S WASHED OFF ID'S DON'T MATCH CHAIN					

PM (or PMA) review: Initials MZH Date 8/9/17 Page 1 of 1

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 04AUG17
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 04AUG17
ACTWGT: 53.0 LB MAN
CAD: 0014176/CAFE2916

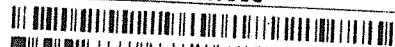
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: SRSW12CHWCC0



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Express

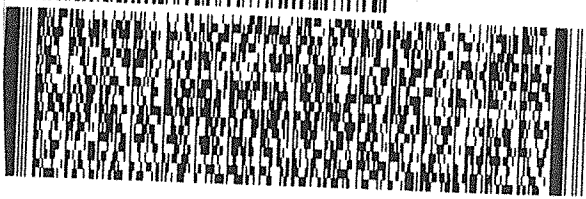
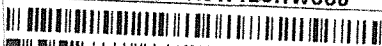


TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21 PDOASRSW12CHWCC0



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1 of 2
TRK# 5908 1782 5005
0201
MASTER

XO RBWA

SATURDAY 12:00P
PRIORITY OVERNIGHT

6c 29407
SC-US CHS



ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 04AUG17
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CAD: 0014176/CAFE2916

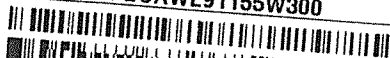
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GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

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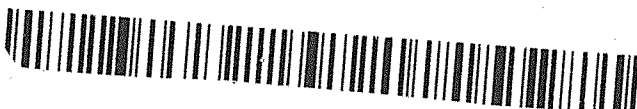


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MASTER

XO RBWA

SATURDAY 12:00P
PRIORITY OVERNIGHT

6c 29407
SC-US CHS



TRK# 5908 1782 5049
0201

XO RBWA

SATURDAY 12:00P
PRIORITY OVERNIGHT

5c 29407
SC-US CHS



ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 04AUG17
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2916

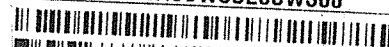
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PDOACSWSE0SWS00



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1 of 3
TRK# 5908 1782 4970
0201
MASTER

XO RBWA

SATURDAY 12:00P
PRIORITY OVERNIGHT

6c 29407
SC-US CHS



LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: SRSW12CHWCCO



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LOS BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

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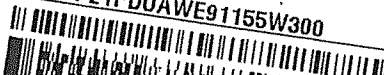
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PDOAWE91155W300



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2 of 2
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0263

Mstr# 5908 1782 5005

0201

XO RBWA

SATURDAY 12:00
PRIORITY OVERNIGHT

294

SC-US

CHS



ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 04AUG17
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CAD: 0014176/CAFE2916

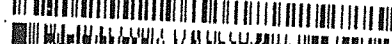
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ACSWSE0SWS00



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3 of 3
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Mstr# 5908 1782 4970

0201

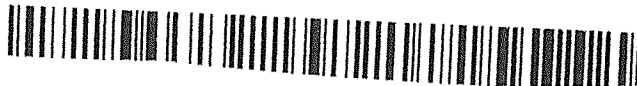
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SATURDAY 12:00P
PRIORITY OVERNIGHT

29407

SC-US

CHS



2 of 2
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Mstr# 5908 1782 5027

0201

XO RBWA

SATURDAY 12:00P
PRIORITY OVERNIGHT

29407

SC-US

CHS



ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 04AUG17
ACTWGT: 58.0 LB MAN
CAD: 0014176/CAFE

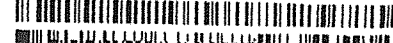
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ACSWSE0SWS00



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2 of 3
MPS# 5908 1782 4980
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Mstr# 5908 1782 4970

0201

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SATURDAY
PRIORITY OVERNIGHT

SC-US



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.

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2339
Work Order #: 429873**

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: 1691881

Prep Batch Number: 1691880

Sample Analysis

Sample ID	Client ID
429873001	429873001 (CAMO-17-141974)
429873003	429873003 (CAMO-17-141975)
429873005	429873005 (CAMO-17-141980)
429873008	429873008 (CAMO-17-141981)
1203854494	Interference Check Sample (ICS)
1203854485	Method Blank (MB)
1203854486	Laboratory Control Sample (LCS)
1203854487	429873001(CAMO-17-141974) Matrix Spike (MS)
1203854488	429873001(CAMO-17-141974) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

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

Calibration Information

Initial Calibration

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

ICV Requirements

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

CCB Requirements

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

CCV Requirements

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

Low Level Standard (CRI) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 429873001 (CAMO-17-141974) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

In QC sample 1203854487 (CAMO-17-141974MS), Perchlorate-101 was recovered at 65%. The acceptance range is from 75-125%. The failure in the MS was either due to the background concentration in the parent sample, 429873001 (CAMO-17-141974) or vagaries in the extraction process. The LCS and MSD were within the acceptance ranges.

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

Sample 429873003 (CAMO-17-141975) was diluted to bring the over range concentration within the calibration range.

Sample Re-extraction/Re-analysis

Sample 429873005 (CAMO-17-141980) was re-analyzed to confirm potential carryover from the previous sample analysis. The re-analysis data are reported.

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: 2017-2339 GEL Work Order: 429873

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 21 AUG 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: 1691880Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-141974Date Received: 05-AUG-17GEL Job No (SDG): 2017-2339GEL Sample ID: 429873001Date Filtered: 15-AUG-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	0.447	ug/L		1	15-AUG-17 20:14	per0815016a
	Perchlorate Isotope Ratio			2.95			1	15-AUG-17 20:14	per0815016a
14797-73-0	Perchlorate-101	.05	.2	0.438	ug/L		1	15-AUG-17 20:14	per0815016a
	Perchlorate-O(18)			0.441	ug/L		1	15-AUG-17 20:14	per0815016a

^ 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: 1691880Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-141975Date Received: 05-AUG-17GEL Job No (SDG): 2017-2339GEL Sample ID: 429873003Date Filtered: 15-AUG-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.5	2	9.52	ug/L		10	16-AUG-17 19:45	per0816013a
	Perchlorate Isotope Ratio			2.88			10	16-AUG-17 19:45	per0816013a
14797-73-0	Perchlorate-101	.5	2	10.2	ug/L		10	16-AUG-17 19:45	per0816013a
	Perchlorate-O(18)			5.13	ug/L		10	16-AUG-17 19:45	per0816013a

^ 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: 1691880Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-141980Date Received: 05-AUG-17GEL Job No (SDG): 2017-2339GEL Sample ID: 429873005Date Filtered: 15-AUG-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	0.410	ug/L		1	16-AUG-17 19:57	per0816014a
	Perchlorate Isotope Ratio			2.86			1	16-AUG-17 19:57	per0816014a
14797-73-0	Perchlorate-101	.05	.2	0.442	ug/L		1	16-AUG-17 19:57	per0816014a
	Perchlorate-O(18)			0.530	ug/L		1	16-AUG-17 19:57	per0816014a

^ 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: 1691880Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-141981Date Received: 05-AUG-17GEL Job No (SDG): 2017-2339GEL Sample ID: 429873008Date Filtered: 15-AUG-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	0.349	ug/L		1	15-AUG-17 21:22	per0815021a
	Perchlorate Isotope Ratio			2.72			1	15-AUG-17 21:22	per0815021a
14797-73-0	Perchlorate-101	.05	.2	0.371	ug/L		1	15-AUG-17 21:22	per0815021a
	Perchlorate-O(18)			0.439	ug/L		1	15-AUG-17 21:22	per0815021a

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

*Concentration =

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

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 2017-2339

Extract Batch Code: 1691880

Date Filtered: 15-AUG-17

Matrix: WATER

Sample ID: 1203854486

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.203	ug/L	102		85 - 115
Perchlorate Isotope Ratio		2.75				-
Perchlorate-101	0.200	.214	ug/L	107		85 - 115
Perchlorate-O(18)		.451	ug/L			-

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

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 2017-2339

Extract Batch Code: 1691880

Date Extracted: 15-AUG-17

GEL MS/PS ID: 1203854487

Client ID: CAMO-17-141974

GEL MSD/PSD ID: 1203854488

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	0.447	ug/L	0.605	79	.607	80	0	30	75 - 125
Perchlorate Isotope Ratio	0	2.95		3.08		2.88		7		-
Perchlorate-101	0.200	0.438	ug/L	0.569	65 *	.608	85	7	30	75 - 125
Perchlorate-O(18)	0	0.441	ug/L	0.453		.459		1		-

^ 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: 1691880Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 15-AUG-17GEL Job No (SDG): 2017-2339GEL Sample ID: 1203854485Date Filtered: 15-AUG-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	15-AUG-17 19:34	per0815013a
	Perchlorate Isotope Ratio						1	15-AUG-17 19:34	per0815013a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	15-AUG-17 19:34	per0815013a
	Perchlorate-O(18)			0.456	ug/L		1	15-AUG-17 19:34	per0815013a

^ 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: 1691880Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 15-AUG-17GEL Job No (SDG): 2017-2339GEL Sample ID: 1203854486Date Filtered: 15-AUG-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	0.203	ug/L		1	15-AUG-17 19:47	per0815014a
	Perchlorate Isotope Ratio			2.75			1	15-AUG-17 19:47	per0815014a
14797-73-0	Perchlorate-101	.05	.2	0.214	ug/L		1	15-AUG-17 19:47	per0815014a
	Perchlorate-O(18)			0.451	ug/L		1	15-AUG-17 19:47	per0815014a

^ 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: 1691880Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-2339GEL Sample ID: 1203854494Date Filtered: 15-AUG-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	0.221	ug/L		1	15-AUG-17 20:01	per0815015a
	Perchlorate Isotope Ratio			3			1	15-AUG-17 20:01	per0815015a
14797-73-0	Perchlorate-101	.05	.2	0.213	ug/L		1	15-AUG-17 20:01	per0815015a
	Perchlorate-O(18)			0.485	ug/L		1	15-AUG-17 20:01	per0815015a

^ 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: 1691880Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-141974MSDate Received: 05-AUG-17GEL Job No (SDG): 2017-2339GEL Sample ID: 1203854487Date Filtered: 15-AUG-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	0.605	ug/L		1	15-AUG-17 20:28	per0815017a
	Perchlorate Isotope Ratio			3.08			1	15-AUG-17 20:28	per0815017a
14797-73-0	Perchlorate-101	.05	.2	0.569	ug/L		1	15-AUG-17 20:28	per0815017a
	Perchlorate-O(18)			0.453	ug/L		1	15-AUG-17 20:28	per0815017a

^ 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: 1691880Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-141974MSDDate Received: 05-AUG-17GEL Job No (SDG): 2017-2339GEL Sample ID: 1203854488Date Filtered: 15-AUG-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	0.607	ug/L		1	15-AUG-17 20:41	per0815018a
	Perchlorate Isotope Ratio			2.88			1	15-AUG-17 20:41	per0815018a
14797-73-0	Perchlorate-101	.05	.2	0.608	ug/L		1	15-AUG-17 20:41	per0815018a
	Perchlorate-O(18)			0.459	ug/L		1	15-AUG-17 20:41	per0815018a

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

*Concentration =

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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2339
Work Order #: 429873

Sample ID	Client ID
429873001	CAMO-17-141974
429873002	CAMO-17-141990
429873003	CAMO-17-141975
429873004	CAMO-17-141991
429873005	CAMO-17-141980
429873007	CAMO-17-142308
429873008	CAMO-17-141981
429873010	CAMO-17-142309
1203847760	Method Blank (MB) ICP
1203847761	Laboratory Control Sample (LCS)
1203847764	429873001(CAMO-17-141974L) Serial Dilution (SD)
1203847762	429873001(CAMO-17-141974D) Sample Duplicate (DUP)
1203847763	429873001(CAMO-17-141974S) Matrix Spike (MS)
1203847783	Method Blank (MB) ICP-MS
1203847784	Laboratory Control Sample (LCS)
1203847787	429873001(CAMO-17-141974L) Serial Dilution (SD)
1203847785	429873001(CAMO-17-141974D) Sample Duplicate (DUP)
1203847786	429873001(CAMO-17-141974S) Matrix Spike (MS)
1203861644	Method Blank (MB) CVAA
1203861645	Laboratory Control Sample (LCS)
1203861650	429754001(CAMO-17-142310L) Serial Dilution (SD)
1203861646	429754001(CAMO-17-142310D) Sample Duplicate (DUP)
1203861648	429754001(CAMO-17-142310S) Matrix Spike (MS)

Sample Analysis

Samples 429873001,002,003,004,005,007,008 and 010 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1689149, 1689157, 1695110 and 1697698
Prep Batch :	1689148, 1689156 and 1695109
Standard Operating Procedures:	GL-MA-E-013 REV# 29, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 31, GL-MA-E-010 REV# 35 and GL-GC-E-107 REV# 10
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 300X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

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

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 429873001 (CAMO-17-141974)-ICP and ICP-MS and 429754001 (CAMO-17-142310)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

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

Serial Dilution % Difference Statement

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

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information**Electronic Packaging Comment**

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

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

Additional Comments

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-2339 GEL Work Order: 429873

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: 01 SEP 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 429873001**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-141974**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	08/25/17 10:03	082517W1-6	1695110

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 429873001

BASIS: As Received

DATE COLLECTED 03-AUG-17

CLIENT ID: CAMO-17-141974

LEVEL: Low

DATE RECEIVED 05-AUG-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	PRB	08/11/17 17:42	170811-5	1689157
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	PRB	08/11/17 12:38	170811-4	1689157
7440-39-3	Barium	24.7	ug/L		1	5	5	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	PRB	08/11/17 12:38	170811-4	1689157
7440-70-2	Calcium	14100	ug/L		50	200	200	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7440-47-3	Chromium	3.7	ug/L	J	3	10	10	1	MS	PRB	08/11/17 12:38	170811-4	1689157
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	PRB	08/11/17 11:29	170811-3	1689157
7439-95-4	Magnesium	3500	ug/L		110	300	300	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7439-98-7	Molybdenum	1.13	ug/L		0.2	0.5	0.5	1	MS	PRB	08/11/17 12:38	170811-4	1689157
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	PRB	08/11/17 12:38	170811-4	1689157
7440-09-7	Potassium	1250	ug/L		50	150	150	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	PRB	08/11/17 12:38	170811-4	1689157
7631-86-9	Silica	64900	ug/L		53	213	213	1	P	JWJ	08/31/17 16:21	083117-2	1689149
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	PRB	08/11/17 12:38	170811-4	1689157
7440-23-5	Sodium	10200	ug/L		100	300	300	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7440-24-6	Strontium	50.8	ug/L		1	5	5	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	PRB	08/11/17 11:29	170811-3	1689157
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7440-61-1	Uranium	0.382	ug/L		0.067	0.2	0.2	1	MS	PRB	08/11/17 11:29	170811-3	1689157
7440-62-2	Vanadium	4.52	ug/L	J	1	5	5	1	P	JWJ	08/10/17 18:33	081017-1	1689149
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	08/10/17 18:33	081017-1	1689149

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 429873001**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-141974**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	49.7	mg/L		0.453	1.24	1.24	1		TXT1	08/31/17 18:52		1697698

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1689149	1689148	SW846 3005A	50	mL	50	mL	08/07/17	SXW1
1689157	1689156	SW846 3005A	50	mL	50	mL	08/07/17	SXW1
1695110	1695109	EPA 245.1/245.2 Prep	20	mL	20	mL	08/24/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 429873002**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-141990**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	08/25/17 10:05	082517W1-6	1695110

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1695110	1695109	EPA 245.1/245.2 Prep	20	mL	20	mL	08/24/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 429873003**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-141975**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	08/25/17 10:07	082517W1-6	1695110

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 429873003

BASIS: As Received

DATE COLLECTED 03-AUG-17

CLIENT ID: CAMO-17-141975

LEVEL: Low

DATE RECEIVED 05-AUG-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	PRB	08/11/17 17:49	170811-5	1689157
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	PRB	08/11/17 12:49	170811-4	1689157
7440-39-3	Barium	28.7	ug/L		1	5	5	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	PRB	08/11/17 12:49	170811-4	1689157
7440-70-2	Calcium	14500	ug/L		50	200	200	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7440-47-3	Chromium	12.7	ug/L		3	10	10	1	MS	PRB	08/11/17 12:49	170811-4	1689157
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	PRB	08/11/17 11:36	170811-3	1689157
7439-95-4	Magnesium	3910	ug/L		110	300	300	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7439-98-7	Molybdenum	1.12	ug/L		0.2	0.5	0.5	1	MS	PRB	08/11/17 12:49	170811-4	1689157
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	PRB	08/11/17 12:49	170811-4	1689157
7440-09-7	Potassium	1700	ug/L		50	150	150	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	PRB	08/11/17 12:49	170811-4	1689157
7631-86-9	Silica	67200	ug/L		53	213	213	1	P	JWJ	08/31/17 16:35	083117-2	1689149
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	PRB	08/11/17 12:49	170811-4	1689157
7440-23-5	Sodium	10600	ug/L		100	300	300	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7440-24-6	Strontium	62.2	ug/L		1	5	5	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	PRB	08/11/17 11:36	170811-3	1689157
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7440-61-1	Uranium	0.362	ug/L		0.067	0.2	0.2	1	MS	PRB	08/11/17 11:36	170811-3	1689157
7440-62-2	Vanadium	6.11	ug/L		1	5	5	1	P	JWJ	08/10/17 18:45	081017-1	1689149
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	08/10/17 18:45	081017-1	1689149

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 429873003**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-141975**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	52.2	mg/L		0.453	1.24	1.24	1		TXT1	08/31/17 18:52		1697698

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1689149	1689148	SW846 3005A	50	mL	50	mL	08/07/17	SXW1
1689157	1689156	SW846 3005A	50	mL	50	mL	08/07/17	SXW1
1695110	1695109	EPA 245.1/245.2 Prep	20	mL	20	mL	08/24/17	AXS5

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 429873004**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-141991**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	08/25/17 10:08	082517W1-6	1695110

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1695110	1695109	EPA 245.1/245.2 Prep	20	mL	20	mL	08/24/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 429873005**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-141980**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	08/25/17 10:10	082517W1-6	1695110

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 429873005

BASIS: As Received

DATE COLLECTED 03-AUG-17

CLIENT ID: CAMO-17-141980

LEVEL: Low

DATE RECEIVED 05-AUG-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	PRB	08/11/17 17:51	170811-5	1689157
7440-38-2	Arsenic	2	ug/L	J	2	5	5	1	MS	PRB	08/11/17 12:51	170811-4	1689157
7440-39-3	Barium	19.8	ug/L		1	5	5	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	PRB	08/11/17 12:51	170811-4	1689157
7440-70-2	Calcium	12700	ug/L		50	200	200	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7440-47-3	Chromium	13.6	ug/L		3	10	10	1	MS	PRB	08/11/17 12:51	170811-4	1689157
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	PRB	08/11/17 11:38	170811-3	1689157
7439-95-4	Magnesium	3500	ug/L		110	300	300	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7439-98-7	Molybdenum	0.885	ug/L		0.2	0.5	0.5	1	MS	PRB	08/11/17 12:51	170811-4	1689157
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	PRB	08/11/17 12:51	170811-4	1689157
7440-09-7	Potassium	1030	ug/L		50	150	150	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	PRB	08/11/17 12:51	170811-4	1689157
7631-86-9	Silica	64100	ug/L		53	213	213	1	P	JWJ	08/31/17 16:37	083117-2	1689149
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	PRB	08/11/17 12:51	170811-4	1689157
7440-23-5	Sodium	9580	ug/L		100	300	300	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7440-24-6	Strontium	53.5	ug/L		1	5	5	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	PRB	08/11/17 11:38	170811-3	1689157
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7440-61-1	Uranium	0.401	ug/L		0.067	0.2	0.2	1	MS	PRB	08/11/17 11:38	170811-3	1689157
7440-62-2	Vanadium	4.5	ug/L	J	1	5	5	1	P	JWJ	08/10/17 18:48	081017-1	1689149
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	08/10/17 18:48	081017-1	1689149

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 429873005**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-141980**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	46.2	mg/L		0.453	1.24	1.24	1		TXT1	08/31/17 18:52		1697698

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1689149	1689148	SW846 3005A	50	mL	50	mL	08/07/17	SXW1
1689157	1689156	SW846 3005A	50	mL	50	mL	08/07/17	SXW1
1695110	1695109	EPA 245.1/245.2 Prep	20	mL	20	mL	08/24/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 429873007**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-142308**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	08/25/17 10:12	082517W1-6	1695110

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1695110	1695109	EPA 245.1/245.2 Prep	20	mL	20	mL	08/24/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 429873008**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-141981**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	08/25/17 10:17	082517W1-6	1695110

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 429873008

BASIS: As Received

DATE COLLECTED 03-AUG-17

CLIENT ID: CAMO-17-141981

LEVEL: Low

DATE RECEIVED 05-AUG-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	PRB	08/11/17 17:52	170811-5	1689157
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	PRB	08/11/17 12:54	170811-4	1689157
7440-39-3	Barium	20.7	ug/L		1	5	5	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	PRB	08/11/17 12:54	170811-4	1689157
7440-70-2	Calcium	12800	ug/L		50	200	200	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7440-47-3	Chromium	5.95	ug/L	J	3	10	10	1	MS	PRB	08/11/17 12:54	170811-4	1689157
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	PRB	08/11/17 11:40	170811-3	1689157
7439-95-4	Magnesium	3860	ug/L		110	300	300	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7439-98-7	Molybdenum	0.865	ug/L		0.2	0.5	0.5	1	MS	PRB	08/11/17 12:54	170811-4	1689157
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	PRB	08/11/17 12:54	170811-4	1689157
7440-09-7	Potassium	1180	ug/L		50	150	150	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	PRB	08/11/17 12:54	170811-4	1689157
7631-86-9	Silica	66000	ug/L		53	213	213	1	P	JWJ	08/31/17 16:41	083117-2	1689149
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	PRB	08/11/17 12:54	170811-4	1689157
7440-23-5	Sodium	10200	ug/L		100	300	300	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7440-24-6	Strontium	53.4	ug/L		1	5	5	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	PRB	08/11/17 11:40	170811-3	1689157
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7440-61-1	Uranium	0.401	ug/L		0.067	0.2	0.2	1	MS	PRB	08/11/17 11:40	170811-3	1689157
7440-62-2	Vanadium	5.33	ug/L		1	5	5	1	P	JWJ	08/10/17 18:51	081017-1	1689149
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	08/10/17 18:51	081017-1	1689149

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 429873008**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-141981**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	47.9	mg/L		0.453	1.24	1.24	1		TXT1	08/31/17 18:52		1697698

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1689149	1689148	SW846 3005A	50	mL	50	mL	08/07/17	SXW1
1689157	1689156	SW846 3005A	50	mL	50	mL	08/07/17	SXW1
1695110	1695109	EPA 245.1/245.2 Prep	20	mL	20	mL	08/24/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2339**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 429873010**BASIS:** As Received**DATE COLLECTED** 03-AUG-17**CLIENT ID:** CAMO-17-142309**LEVEL:** Low**DATE RECEIVED** 05-AUG-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	08/25/17 10:18	082517W1-6	1695110

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1695110	1695109	EPA 245.1/245.2 Prep	20	mL	20	mL	08/24/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-2339

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>
1203847760	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203847783	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	0.242	ug/L	+/-0.5	J	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203861644	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

*Analytical Methods:

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

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2339 Client ID CAMO-17-141974S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 429873001 Spike ID: 1203847763

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Aluminum	ug/L	75-125	5020		68	U	5000	100		P
Barium	ug/L	75-125	508		24.7		500	96.6		P
Beryllium	ug/L	75-125	481		1	U	500	96.1		P
Boron	ug/L	75-125	491		15	U	500	96.2		P
Calcium	ug/L	75-125	18800		14100		5000	93.2		P
Cobalt	ug/L	75-125	489		1	U	500	97.7		P
Copper	ug/L	75-125	496		3	U	500	99		P
Iron	ug/L	75-125	5050		30	U	5000	101		P
Magnesium	ug/L	75-125	8490		3500		5000	99.9		P
Manganese	ug/L	75-125	485		2	U	500	96.8		P
Potassium	ug/L	75-125	6130		1250		5000	97.6		P
Silica	ug/L		74500		64900		10700	89.6	N/A	P
Sodium	ug/L	75-125	15200		10200		5000	98.9		P
Strontium	ug/L	75-125	536		50.8		500	97.1		P
Tin	ug/L	75-125	476		2.5	U	500	95.2		P
Vanadium	ug/L	75-125	492		4.52	J	500	97.5		P
Zinc	ug/L	75-125	470		3.3	U	500	93.7		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2339 Client ID CAMO-17-141974S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 429873001 Spike ID: 1203847786

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	47.7		1	U	50	95.4		MS
Arsenic	ug/L	75-125	48.7		2	U	50	93.6		MS
Cadmium	ug/L	75-125	49.4		0.3	U	50	98.8		MS
Chromium	ug/L	75-125	53.1		3.7	J	50	98.8		MS
Lead	ug/L	75-125	48.6		0.5	U	50	97.3		MS
Molybdenum	ug/L	75-125	50.2		1.13		50	98.1		MS
Nickel	ug/L	75-125	48.8		0.6	U	50	97.5		MS
Selenium	ug/L	75-125	46.5		2	U	50	93.1		MS
Silver	ug/L	75-125	49.6		0.3	U	50	99.3		MS
Thallium	ug/L	75-125	44.7		0.6	U	50	89.4		MS
Uranium	ug/L	75-125	48.1		0.382		50	95.5		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2339 Client ID CAMO-17-142310S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 429754001 Spike ID: 1203861648

<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	2.01		0.067	U	2	100		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
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Duplicate Sample Summary

SDG No.: 2017–2339

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO–17–141974D

Matrix: WATER

Level: Low

Sample ID: 429873001

Duplicate ID: 1203847762

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	24.7		24.1		2.4		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	14100		13700		2.94		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%	3500		3400		2.77		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1250		1270		1.46		P
Silica	ug/L	+/-20%	64900		62600		3.66		P
Sodium	ug/L	+/-20%	10200		9930		2.9		P
Strontium	ug/L	+/-20%	50.8		49.5		2.67		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	4.52 J		4.55 J		.798		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
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Duplicate Sample Summary

SDG No.: 2017-2339

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-17-141974D

Matrix: WATER

Level: Low

Sample ID: 429873001

Duplicate ID: 1203847785

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	+/-10	3.7 J		3.87 J		4.44		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.13		1.13		0		MS
Nickel	ug/L		0.6 U		0.6 U				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	0.382		0.391		2.33		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2017–2339**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAMO–17–142310D**Matrix:** WATER**Level:** Low**Sample ID:** 429754001**Duplicate ID:** 1203861646**Percent Solids for Dup:** N/A

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

***Analytical Methods:**

AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-2339

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>
1203847761								
	Aluminum	ug/L	5000	5200		104	80-120	P
	Barium	ug/L	500	490		98.1	80-120	P
	Beryllium	ug/L	500	481		96.2	80-120	P
	Boron	ug/L	500	480		96	80-120	P
	Calcium	ug/L	5000	5230		105	80-120	P
	Cobalt	ug/L	500	496		99.2	80-120	P
	Copper	ug/L	500	493		98.7	80-120	P
	Iron	ug/L	5000	5140		103	80-120	P
	Magnesium	ug/L	5000	5310		106	80-120	P
	Manganese	ug/L	500	494		98.8	80-120	P
	Potassium	ug/L	5000	5040		101	80-120	P
	Silica	ug/L	10700	10100		93.9	80-120	P
	Sodium	ug/L	5000	5390		108	80-120	P
	Strontium	ug/L	500	495		99	80-120	P
	Tin	ug/L	500	482		96.4	80-120	P
	Vanadium	ug/L	500	490		98.1	80-120	P
	Zinc	ug/L	500	476		95.3	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-2339

Contract: ESHL00114

Aqueous LCS Source:O2Si

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203847784								
	Arsenic	ug/L	50	50.9		102	80-120	MS
	Cadmium	ug/L	50	50.9		102	80-120	MS
	Chromium	ug/L	50	50		100	80-120	MS
	Lead	ug/L	50	51.3		103	80-120	MS
	Molybdenum	ug/L	50	51.1		102	80-120	MS
	Nickel	ug/L	50	50.2		100	80-120	MS
	Selenium	ug/L	50	51.4		103	80-120	MS
	Silver	ug/L	50	52.6		105	80-120	MS
	Thallium	ug/L	50	46.8		93.6	80-120	MS
	Antimony	ug/L	50	49.3		98.6	80-120	MS
	Uranium	ug/L	50	49.2		98.3	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-2339

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>
1203861645	Mercury	ug/L	2	2.03		101	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2339 Client ID CAMO-17-141974L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 429873001 Serial Dilution ID: 1203847764

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	24.7		26		5.238			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	14100		15200		7.817		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	3500		3890		11.197			P
Manganese	2	U	10	U				P
Potassium	1250		1340		6.907			P
Silica	64900		67400		3.793		10	P
Sodium	10200		11200		9.163		10	P
Strontium	50.8		53.7		5.711		10	P
Tin	2.5	U	12.5	U				P
Vanadium	4.52	J	5	U	17.561			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2339

Client ID: CAMO-17-141974L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 429873001

Serial Dilution ID: 1203847787

<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	3.7	J	15	U	1.513			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.13		1.57	J	38.448			MS
Nickel	.6	U	3	U				MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.382		.43	J	12.565			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2339 **Client ID:** CAMO-17-142310L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 429754001 **Serial Dilution ID:** 1203861650

<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 #: 2017-2339
Work Order #: 429873**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1689290

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
429873002	CAMO-17-141990
429873004	CAMO-17-141991
429873007	CAMO-17-142308
429873010	CAMO-17-142309
1203849662	Method Blank (MB)
1203849663	Laboratory Control Sample (LCS)
1203849665	429873002(CAMO-17-141990) Sample Duplicate (DUP)
1203849667	429873002(CAMO-17-141990) 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 429873002 (CAMO-17-141990) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1688863	Method:	WSP-CN(T)
Prep Batch :	1688862	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
429873002	CAMO-17-141990
429873004	CAMO-17-141991
429873007	CAMO-17-142308
429873010	CAMO-17-142309
1203847020	Method Blank (MB)
1203847021	Laboratory Control Sample (LCS)
1203847022	429712004(NonSDG) Sample Duplicate (DUP)
1203847023	429712004(NonSDG) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 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 429712004 (NonSDG) was selected for QC analysis.

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

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

Analyte	Sample	Value
Cyanide, Total	1203847023 (Non SDG 429712004MS)	112* (90%-110%)

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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: 1691290

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
429873001	CAMO-17-141974
429873003	CAMO-17-141975
429873005	CAMO-17-141980
429873008	CAMO-17-141981
1203853100	Method Blank (MB)
1203853101	Laboratory Control Sample (LCS)
1203853102	429717001(CAMO-17-141976) Sample Duplicate (DUP)
1203853103	430398002(CASA-17-142776) Sample Duplicate (DUP)
1203853104	429717001(CAMO-17-141976) Post Spike (PS)
1203853105	430398002(CASA-17-142776) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

acceptance limits.

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 429717001 (CAMO-17-141976) and 430398002 (CASA-17-142776) 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 following samples 1203853102 (CAMO-17-141976DUP) and 1203853104 (CAMO-17-141976PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203853102 (CAMO-17-141976DUP), 1203853103 (CASA-17-142776DUP), 1203853104 (CAMO-17-141976PS), 1203853105 (CASA-17-142776PS), 429873001 (CAMO-17-141974), 429873003 (CAMO-17-141975), 429873005 (CAMO-17-141980) and 429873008 (CAMO-17-141981) 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: 1692774 **Method:** NH3
Prep Batch : 1692772 **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
429873001	CAMO-17-141974
429873003	CAMO-17-141975
429873005	CAMO-17-141980
429873008	CAMO-17-141981
429873011	CAMO-17-141986
1203856520	Method Blank (MB)
1203856521	Laboratory Control Sample (LCS)
1203856522	429712005(NonSDG) Sample Duplicate (DUP)
1203856523	429317001(CAMO-17-142070) Sample Duplicate (DUP)
1203856524	429712005(NonSDG) Matrix Spike (MS)
1203856525	429317001(CAMO-17-142070) 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.

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 429317001 (CAMO-17-142070) and 429712005 (NonSDG) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Analyte	Sample	Value
Nitrogen, Ammonia	1203856523 (CAMO-17-142070DUP)	abs(.0818 - .0235)* (+/- .05 mg/L)

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

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:	1692771	Method:	TKN
Prep Batch :	1692769	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
429873002	CAMO-17-141990
429873004	CAMO-17-141991
429873007	CAMO-17-142308
429873010	CAMO-17-142309
1203856514	Method Blank (MB)
1203856515	Laboratory Control Sample (LCS)
1203856516	429717002(CAMO-17-141992) Sample Duplicate (DUP)
1203856517	429873002(CAMO-17-141990) Sample Duplicate (DUP)
1203856518	429717002(CAMO-17-141992) Matrix Spike (MS)
1203856519	429873002(CAMO-17-141990) 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 429717002 (CAMO-17-141992) and 429873002 (CAMO-17-141990) 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

Sample 429873002 (CAMO-17-141990) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1689327

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
429873001	CAMO-17-141974
429873003	CAMO-17-141975
429873005	CAMO-17-141980
429873008	CAMO-17-141981
429873011	CAMO-17-141986
1203848234	Method Blank (MB)
1203848235	Laboratory Control Sample (LCS)
1203848236	429449001(CAMO-17-142236) Sample Duplicate (DUP)
1203848237	429570001(CAMO-17-141977) Sample Duplicate (DUP)
1203848238	429449001(CAMO-17-142236) Post Spike (PS)
1203848239	429570001(CAMO-17-141977) 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

Samples 429449001 (CAMO-17-142236) and 429570001 (CAMO-17-141977) 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 following sample 429873003 (CAMO-17-141975) was diluted because target analyte concentrations exceeded the calibration range. The following samples 429873001 (CAMO-17-141974) and 429873011 (CAMO-17-141986) 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	429873		
	001	003	011
Nitrogen, Nitrate/Nitrite	5X	5X	5X

Sample Re-analysis

Samples 429873001 (CAMO-17-141974), 429873003 (CAMO-17-141975), 429873005 (CAMO-17-141980), 429873008 (CAMO-17-141981) and 429873011 (CAMO-17-141986) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported.

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1692781	Method:	PO4
Prep Batch :	1692780	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
429873001	CAMO-17-141974
429873003	CAMO-17-141975
429873005	CAMO-17-141980
429873008	CAMO-17-141981
429873011	CAMO-17-141986
1203856557	Method Blank (MB)
1203856558	Laboratory Control Sample (LCS)
1203856559	429324001(CAMO-17-141979) Sample Duplicate (DUP)
1203856560	429324005(CAMO-17-141985) Sample Duplicate (DUP)
1203856561	429324001(CAMO-17-141979) Matrix Spike (MS)
1203856562	429324005(CAMO-17-141985) 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 429324001 (CAMO-17-141979) and 429324005 (CAMO-17-141985) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1688765

Method: TDS

Sample Analysis

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

Sample ID	Client ID
429873001	CAMO-17-141974
429873003	CAMO-17-141975
429873005	CAMO-17-141980
429873008	CAMO-17-141981
1203846809	Method Blank (MB)
1203846810	Laboratory Control Sample (LCS)
1203846811	429712006(NonSDG) Sample Duplicate (DUP)
1203847994	429754003(CAMO-17-142778) 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

Samples 429712006 (NonSDG) and 429754003 (CAMO-17-142778) 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

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

Sample	Analyte	Value
1203846811 (Non SDG 429712006DUP)	Total Dissolved Solids	Received 04-AUG-17, out of holding 03-AUG-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1689860

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
429873001	CAMO-17-141974
429873003	CAMO-17-141975
429873005	CAMO-17-141980
429873008	CAMO-17-141981
1203849508	Laboratory Control Sample (LCS)
1203849509	429324004(CAMO-17-142780) Sample Duplicate (DUP)
1203849510	429873001(CAMO-17-141974) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 429324004 (CAMO-17-142780) and 429873001 (CAMO-17-141974) 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:

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

Method/Analysis Information

Product: pH

Analytical Batch: 1691073 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
429873001	CAMO-17-141974
429873003	CAMO-17-141975
429873005	CAMO-17-141980
429873008	CAMO-17-141981
1203852560	Laboratory Control Sample (LCS)
1203852561	429717001(CAMO-17-141976) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 429717001 (CAMO-17-141976) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

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

Sample	Analyte	Value
1203852561 (CAMO-17-141976DUP)	pH	Received 04-AUG-17, out of holding 02-AUG-17
429873001 (CAMO-17-141974)	pH	Received 05-AUG-17, out of holding 03-AUG-17
429873003 (CAMO-17-141975)	pH	Received 05-AUG-17, out of holding 03-AUG-17
429873005 (CAMO-17-141980)	pH	Received 05-AUG-17, out of holding 03-AUG-17
429873008 (CAMO-17-141981)	pH	Received 05-AUG-17, out of holding 03-AUG-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1691070 **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
429873001	CAMO-17-141974
429873003	CAMO-17-141975
429873005	CAMO-17-141980
429873008	CAMO-17-141981
1203852501	Laboratory Control Sample (LCS)
1203852503	429717001(CAMO-17-141976) Sample Duplicate (DUP)
1203852506	429717001(CAMO-17-141976) 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 429717001 (CAMO-17-141976) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Certification Statement

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

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Qualifier Definition Report for

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

Client SDG: 2017-2339 GEL Work Order: 429873

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Kristen Mizzell

Date: 30 AUG 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141974
Sample ID: 429873001
Matrix: W
Collect Date: 03-AUG-17 15:08
Receive Date: 05-AUG-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	08/12/17	0159	1691290	1
Chloride		2.44	0.067	0.200	mg/L		1					
Fluoride		0.213	0.033	0.100	mg/L		1					
Sulfate		3.38	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	08/22/17	1232	1692774	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.670	0.085	0.250	mg/L		5	AXH3	08/10/17	0759	1689327	3
PO4 "As Received"												
Phosphorus, Total as P	U	ND	0.020	0.050	mg/L	1.00	1	KLP1	08/23/17	1121	1692781	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		144	3.40	14.3	mg/L			KLP1	08/07/17	1011	1688765	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		65.4	1.45	4.00	mg/L			RXB5	08/16/17	1226	1691070	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		151	1.00	1.00	umhos/cm		1	RXB5	08/15/17	1407	1689860	7
PH "As Received"												
pH at Temp 15.6C	H	8.27	0.010	0.100	SU		1	RXB5	08/16/17	1224	1691073	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	08/22/17	0952	1692772
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	08/22/17	1700	1692780

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Certificate of Analysis

Report Date: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141974
Sample ID: 429873001

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141990
Sample ID: 429873002
Matrix: W
Collect Date: 03-AUG-17 15:08
Receive Date: 05-AUG-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.383	0.330	1.00	mg/L		1	TSM	08/11/17	1003	1689290	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	08/09/17	0812	1688863	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	08/25/17	0927	1692771	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	08/09/17	0737	1688862
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	08/23/17	1700	1692769

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: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141975
Sample ID: 429873003
Matrix: W
Collect Date: 03-AUG-17 10:01
Receive Date: 05-AUG-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	0.0701	0.067	0.200	mg/L		1	MXL2	08/12/17	0328	1691290	1
Chloride		4.04	0.067	0.200	mg/L		1					
Fluoride		0.109	0.033	0.100	mg/L		1					
Sulfate		6.44	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0511	0.017	0.050	mg/L	1.00	1	KLP1	08/22/17	1232	1692774	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.89	0.085	0.250	mg/L		5	AXH3	08/10/17	0801	1689327	3
PO4 "As Received"												
Phosphorus, Total as P	U	ND	0.020	0.050	mg/L	1.00	1	KLP1	08/23/17	1121	1692781	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		157	3.40	14.3	mg/L			KLP1	08/07/17	1011	1688765	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		56.9	1.45	4.00	mg/L			RXB5	08/16/17	1228	1691070	6
Carbonate alkalinity (CaCO3)		4.03	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		161	1.00	1.00	umhos/cm		1	RXB5	08/15/17	1408	1689860	7
PH "As Received"												
pH at Temp 13.3C	H	8.45	0.010	0.100	SU		1	RXB5	08/16/17	1227	1691073	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	08/22/17	0952	1692772
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	08/22/17	1700	1692780

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Certificate of Analysis

Report Date: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141975
Sample ID: 429873003

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: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141991
Sample ID: 429873004
Matrix: W
Collect Date: 03-AUG-17 10:01
Receive Date: 05-AUG-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	08/11/17	1224	1689290	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	08/09/17	0813	1688863	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	08/25/17	0903	1692771	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	08/09/17	0737	1688862
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	08/23/17	1700	1692769

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: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141980
Sample ID: 429873005
Matrix: W
Collect Date: 03-AUG-17 10:58
Receive Date: 05-AUG-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	08/12/17	0357	1691290	1
Chloride		2.31	0.067	0.200	mg/L		1					
Fluoride		0.231	0.033	0.100	mg/L		1					
Sulfate		3.38	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0399	0.017	0.050	mg/L	1.00	1	KLP1	08/22/17	1233	1692774	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.07	0.017	0.050	mg/L		1	AXH3	08/10/17	0802	1689327	3
PO4 "As Received"												
Phosphorus, Total as P	U	ND	0.020	0.050	mg/L	1.00	1	KLP1	08/23/17	1122	1692781	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		137	3.40	14.3	mg/L			KLP1	08/07/17	1011	1688765	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		58.7	1.45	4.00	mg/L			RXB5	08/16/17	1231	1691070	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		142	1.00	1.00	umhos/cm		1	RXB5	08/15/17	1409	1689860	7
PH "As Received"												
pH at Temp 13.4C	H	7.96	0.010	0.100	SU		1	RXB5	08/16/17	1229	1691073	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	08/22/17	0952	1692772
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	08/22/17	1700	1692780

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Certificate of Analysis

Report Date: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141980
Sample ID: 429873005

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: August 30, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2017-2339

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-17-142308

Project: ESHL00114

Sample ID: 429873007

Client ID: ARSL004

Matrix: W

Collect Date: 03-AUG-17 10:58

Receive Date: 05-AUG-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	08/11/17	1311	1689290	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	08/09/17	0814	1688863	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	08/25/17	0903	1692771	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	08/09/17	0737	1688862
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	08/23/17	1700	1692769

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141981
Sample ID: 429873008
Matrix: W
Collect Date: 03-AUG-17 12:45
Receive Date: 05-AUG-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	08/12/17	0426	1691290	1
Chloride		2.19	0.067	0.200	mg/L		1					
Fluoride		0.276	0.033	0.100	mg/L		1					
Sulfate		2.66	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	08/22/17	1234	1692774	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.668	0.017	0.050	mg/L		1	AXH3	08/10/17	0803	1689327	3
PO4 "As Received"												
Phosphorus, Total as P	U	ND	0.020	0.050	mg/L	1.00	1	KLP1	08/23/17	1123	1692781	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		150	3.40	14.3	mg/L			KLP1	08/07/17	1011	1688765	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		65.1	1.45	4.00	mg/L			RXB5	08/16/17	1236	1691070	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		148	1.00	1.00	umhos/cm		1	RXB5	08/15/17	1409	1689860	7
PH "As Received"												
pH at Temp 15.2C	H	8.01	0.010	0.100	SU		1	RXB5	08/16/17	1232	1691073	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	08/22/17	0952	1692772
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	08/22/17	1700	1692780

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Certificate of Analysis

Report Date: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141981
Sample ID: 429873008

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: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-142309
Sample ID: 429873010
Matrix: W
Collect Date: 03-AUG-17 12:45
Receive Date: 05-AUG-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	08/11/17	1358	1689290	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	08/09/17	0815	1688863	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	08/25/17	0904	1692771	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	08/09/17	0737	1688862
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	08/23/17	1700	1692769

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: August 30, 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: 2017-2339

Client Sample ID: CAMO-17-141986
Sample ID: 429873011
Matrix: W
Collect Date: 03-AUG-17 00:00
Receive Date: 05-AUG-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	U	ND	0.017	0.050	mg/L	1.00	1	KLP1	08/22/17	1235	1692774	1
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.48	0.085	0.250	mg/L		5	AXH3	08/10/17	0804	1689327	2
PO4 "As Received"												
Phosphorus, Total as P	U	ND	0.020	0.050	mg/L	1.00	1	KLP1	08/23/17	1124	1692781	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	08/22/17	0952	1692772
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	08/22/17	1700	1692780

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA:350.1	
2	EPA:353.2	
3	EPA 365.4 1974	

Notes:

Column headers are defined as follows:

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

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: August 30, 2017

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

Contact: Ms. Nita Patel

Workorder: 429873

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1689290										
QC1203849665	429873002	DUP									
Total Organic Carbon Average		J	0.383	J	0.346	mg/L	10.2 ^	(+/-1.00)	TSM	08/11/17	10:50
QC1203849663	LCS										
Total Organic Carbon Average	10.0				9.47	mg/L		94.7 (80%-120%)		08/11/17	00:52
QC1203849662	MB										
Total Organic Carbon Average			U	ND	mg/L					08/11/17	00:41
QC1203849667	429873002	PS									
Total Organic Carbon Average	10.0	J	0.383		8.52	mg/L		81.4 (75%-125%)		08/11/17	11:37
Flow Injection Analysis											
Batch	1688863										
QC1203847022	429712004	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	08/09/17	07:58
QC1203847021	LCS										
Cyanide, Total	50.0				54.3	ug/L		109 (90%-110%)		08/09/17	07:56
QC1203847020	MB										
Cyanide, Total			U	ND	ug/L					08/09/17	07:51
QC1203847023	429712004	MS									
Cyanide, Total	100	U	ND		113	ug/L		112* (90%-110%)		08/09/17	07:59
Ion Chromatography											
Batch	1691290										
QC1203853102	429717001	DUP									
Bromide			0.274		0.275	mg/L	0.328 ^	(+/-0.200)	MXL2	08/11/17	23:03

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QC Summary

Workorder: 429873

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1691290										
Chloride		38.9		39.0	mg/L	0.0462		(0%-20%)	MXL2	08/14/17	18:01
Fluoride		0.193		0.198	mg/L	2.45	^	(+/-0.100)		08/11/17	23:03
Sulfate		55.9		56.1	mg/L	0.23		(0%-20%)		08/14/17	18:01
QC1203853103 430398002 DUP											
Bromide		J 0.0965	J	0.0985	mg/L	2.05	^	(+/-0.200)		08/12/17	10:49
Chloride		8.37		8.39	mg/L	0.165		(0%-20%)			
Fluoride		0.281		0.287	mg/L	1.87	^	(+/-0.100)			
Sulfate		17.1		17.0	mg/L	0.428		(0%-20%)			
QC1203853101 LCS											
Bromide	1.25			1.23	mg/L			98.3 (80%-120%)		08/11/17	22:04
Chloride	5.00			4.63	mg/L			92.5 (80%-120%)			
Fluoride	2.50			2.41	mg/L			96.2 (80%-120%)			
Sulfate	10.0			9.47	mg/L			94.7 (80%-120%)			
QC1203853100 MB											
Bromide			U	ND	mg/L					08/11/17	21:35
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						

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QC Summary

Workorder: 429873

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1691290										
QC1203853104 429717001 PS											
Bromide	1.25	0.274		1.51	mg/L		98.5	(75%-125%)	MXL2	08/11/17	23:32
Chloride	5.00	7.79		13.3	mg/L		110	(75%-125%)		08/14/17	18:30
Fluoride	2.50	0.193		2.58	mg/L		95.5	(75%-125%)		08/11/17	23:32
Sulfate	10.0	11.2		21.7	mg/L		106	(75%-125%)		08/14/17	18:30
QC1203853105 430398002 PS											
Bromide	1.25	J 0.0965		1.31	mg/L		96.8	(75%-125%)		08/12/17	11:18
Chloride	5.00	8.37		14.0	mg/L		113	(75%-125%)			
Fluoride	2.50	0.281		2.66	mg/L		95.3	(75%-125%)			
Sulfate	10.0	17.1		28.0	mg/L		109	(75%-125%)			
Nutrient Analysis											
Batch	1689327										
QC1203848236 429449001 DUP											
Nitrogen, Nitrate/Nitrite		0.693		0.694	mg/L	0.144		(0%-20%)	AXH3	08/10/17	06:54
QC1203848237 429570001 DUP											
Nitrogen, Nitrate/Nitrite		0.544		0.540	mg/L	0.738		(0%-20%)		08/10/17	06:58
QC1203848235 LCS											
Nitrogen, Nitrate/Nitrite	1.00			0.999	mg/L		99.9	(90%-110%)		08/10/17	06:52
QC1203848234 MB											
Nitrogen, Nitrate/Nitrite		U		ND	mg/L					08/10/17	06:46

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QC Summary

Workorder: 429873

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1689327										
QC1203848238	429449001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.693		1.69	mg/L		99.7	(90%-110%)	AXH3	08/10/17	06:55
QC1203848239	429570001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.544		1.55	mg/L		101	(90%-110%)		08/10/17	06:59
Batch	1692771										
QC1203856516	429717002	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	08/25/17	08:58
QC1203856517	429873002	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A			08/25/17	09:01
QC1203856515	LCS										
Nitrogen, Total Kjeldahl	1.00			1.08	mg/L		108	(90%-110%)		08/25/17	08:52
QC1203856514	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					08/25/17	08:51
QC1203856518	429717002	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	1.00	mg/L		97.8	(90%-110%)		08/25/17	08:59
QC1203856519	429873002	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	1.05	mg/L		105	(90%-110%)		08/25/17	09:02
Batch	1692774										
QC1203856522	429712005	DUP									
Nitrogen, Ammonia			1.45	1.35	mg/L	7.14		(0%-20%)	KLP1	08/22/17	12:23
QC1203856523	429317001	DUP									
Nitrogen, Ammonia		J	0.0235	0.0818	mg/L	111*^		(+/-0.050)		08/22/17	12:08
QC1203856521	LCS										
Nitrogen, Ammonia	1.00			1.00	mg/L		100	(90%-110%)		08/22/17	12:07

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QC Summary

Workorder: 429873

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1692774										
QC1203856520	MB										
Nitrogen, Ammonia			U	ND	mg/L				KLP1	08/22/17	12:06
QC1203856524	429712005	MS									
Nitrogen, Ammonia	1.00	1.45		2.47	mg/L		102	(90%-110%)		08/22/17	12:28
QC1203856525	429317001	MS									
Nitrogen, Ammonia	1.00	J	0.0235	1.02	mg/L		99.7	(90%-110%)		08/22/17	12:09
Batch	1692781										
QC1203856559	429324001	DUP									
Phosphorus, Total as P		U	ND	U	ND	mg/L	N/A		KLP1	08/23/17	10:57
QC1203856560	429324005	DUP									
Phosphorus, Total as P		U	ND	U	ND	mg/L	N/A			08/23/17	11:04
QC1203856558	LCS										
Phosphorus, Total as P	1.00			1.07	mg/L		107	(80%-124%)		08/23/17	10:55
QC1203856557	MB										
Phosphorus, Total as P			U	ND	mg/L					08/23/17	10:54
QC1203856561	429324001	MS									
Phosphorus, Total as P	1.00	U	ND	1.07	mg/L		107	(63%-139%)		08/23/17	10:58
QC1203856562	429324005	MS									
Phosphorus, Total as P	1.00	U	ND	1.06	mg/L		104	(63%-139%)		08/23/17	11:05
Solids Analysis											
Batch	1688765										
QC1203846811	429712006	DUP									
Total Dissolved Solids		H	513	H	520	mg/L	1.38	(0%-5%)	KLP1	08/07/17	10:11

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QC Summary

Workorder: 429873

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	1688765										
QC1203847994	429754003	DUP									
Total Dissolved Solids		164		173	mg/L	1.67		(0%-5%)	KLP1	08/07/17	10:11
QC1203846810	LCS										
Total Dissolved Solids	300			290	mg/L		96.7	(95%-105%)		08/07/17	10:11
QC1203846809	MB										
Total Dissolved Solids			U	ND	mg/L					08/07/17	10:11
Titration and Ion Analysis											
Batch	1689860										
QC1203849509	429324004	DUP									
Conductivity		198		201	umhos/cm	1.4		(0%-10%)	RXB5	08/15/17	14:01
QC1203849510	429873001	DUP									
Conductivity		151		150	umhos/cm	0.797		(0%-10%)		08/15/17	14:07
QC1203849508	LCS										
Conductivity	1410			1430	umhos/cm		101	(95%-105%)		08/15/17	13:59
Batch	1691070										
QC1203852503	429717001	DUP									
Alkalinity, Total as CaCO3		78.3		78.7	mg/L	0.514		(0%-20%)	RXB5	08/16/17	12:05
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203852501	LCS										
Alkalinity, Total as CaCO3	100			109	mg/L		109	(90%-110%)		08/16/17	11:19
QC1203852506	429717001	MS									
Alkalinity, Total as CaCO3	100	78.3		183	mg/L		104	(80%-120%)		08/16/17	12:06

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QC Summary

Workorder: 429873

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1691073										
QC1203852561	429717001	DUP									
pH	H	7.95	H	7.96	SU	0.126		(0%-5%)	RXB5	08/16/17	12:04
QC1203852560	LCS										
pH	7.00			7.01	SU		100	(99%-101%)		08/16/17	12:01

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
- 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.