

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: 11097

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q2

SAMPLE ID: CAMO-17-129289

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	2/8/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1104		MEDIA:	UA	↓
PRS ID:	OK		SAMPLE TECH CODE:	OK	RSP
LOCATION ID:	MCOI-5		FIELD PREP:	F	OK
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	↓
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / NA

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

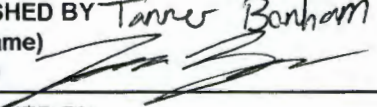
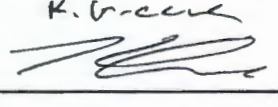
SAMPLE COMMENTS: ~~Sampled SD PI~~
2/8/17 TB

LOCATION COMMENTS: Breezy while Sampling

FIELD PARAMETERS:

Dissolved Oxygen	_____	mg/L	Flow (in gpm)	_____	GPM	Oxidation-Reduction Potential	_____	mV
pH	_____	SU	Specific Conductance	2/8/2017	µS/cm	Temperature	_____	deg C
Turbidity	_____	NTU						

COLLECTED BY (PRINT): A. Tash

RELINQUISHED BY (Printed Name) (Signature)	Tanner Bonham 	Date/Time 2/8/2017 1315	RECEIVED BY (Printed Name) (Signature)	K. Greene 	Date/Time 2/8/17 1115
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 01/18/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11097

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q2

SAMPLE ID: CAMO-17-129290

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	2/18/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1300		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	MCOI-6		FIELD PREP:	F	
LOCATION TYPE:	Mon		FIELD QC TYPE:	REG	
TOP DEPTH:	OK		SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
	WSP-CR52/53	1 LITER POLY	1	ICE		
	WSP- GENINORG+PerChlorat e	1 LITER POLY	1	ICE		
	WSP- NH3+NO3/NO2	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: Sampled 40 ft. from running diesel generator

LOCATION COMMENTS: Windy while sampling

FIELD PARAMETERS:

Dissolved Oxygen	6.90	mg/L	Flow (in gpm)	1.02	GPM	Oxidation-Reduction Potential	147.0	mV
pH	7.08	SU	Specific Conductance	561	uS/cm	Temperature	15.0	deg C
Turbidity	0.3	NTU						

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

RELINQUISHED BY (Printed Name) <i>Allyson Stanfield</i> (Signature) <i>[Signature]</i>	Date/Time 2/18/17 1400	RECEIVED BY (Printed Name) <i>[Signature]</i> (Signature) <i>[Signature]</i>	Date/Time 2/18/17 1400
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11097

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q2

SAMPLE ID: CAMO-17-129292

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	2/8/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12/0		MEDIA:	UA	↓
PRS ID:	OK		SAMPLE TECH CODE:	OK	GSP
LOCATION ID:	R-15		FIELD PREP:	F	OK
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	↓
TOP DEPTH:			SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS: Sampled 50 ft. from running diesel generator

LOCATION COMMENTS:

FIELD PARAMETERS:

2/8/2017

Dissolved Oxygen	_____	mg/L	Flow (in gpm)	_____	GPM	Oxidation-Reduction Potential	_____	mV
pH	_____	°C	Specific Conductance	_____	uS/cm	Temperature	_____	deg C
Turbidity	_____	NTU						

COLLECTED BY (PRINT): A. Tosh

RELINQUISHED BY (Printed Name) (Signature)	Tanner Bonham 2/8/2017 1315	RECEIVED BY (Printed Name) (Signature)	K. G. Carr 2/8/17 1:15
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 01/18/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11097

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q2

SAMPLE ID: CAMO-17-129305

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	2/8/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1104		MEDIA:	UA	↓
PRS ID:	OK		SAMPLE TECH CODE:	OK	BSP
LOCATION ID:	MCOI-5		FIELD PREP:	UF	OK
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	↓
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / NA

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

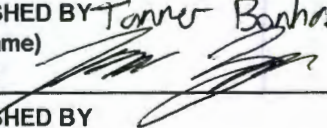
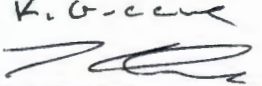
SAMPLE COMMENTS: NA

LOCATION COMMENTS: Breezy while sampling

FIELD PARAMETERS:

Dissolved Oxygen	6.96	mg/L	Flow (in gpm)	0.38	GPM	Oxidation-Reduction Potential	218.8	mV
pH	8.60	SU	Specific Conductance	286.2	uS/cm	Temperature	12.3	deg C
Turbidity	2.86	NTU						

COLLECTED BY (PRINT): A. Tosh

RELINQUISHED BY (Printed Name) (Signature)	Tanner Bonham 	Date/Time 2/8/2017 1315	RECEIVED BY (Printed Name) (Signature)	K. G. ... 	Date/Time 2/8/17 1:15
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 01/18/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11097

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q2

SAMPLE ID: CAMO-17-129306

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	2/8/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1300		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	6SP	
LOCATION ID:	MCOI-6		FIELD PREP:	UF	
LOCATION TYPE:	Mon		FIELD QC TYPE:	REG	
TOP DEPTH:	OK	✓	SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓		EXCAVATED:		YES / NO / (NA)

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV
 pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C
 Turbidity _____ NTU

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

RELINQUISHED BY (Printed Name) <i>A. Vigil</i> (Signature) <i>[Signature]</i>	Date/Time 2/8/17 1400	RECEIVED BY (Printed Name) <i>A. Montoya</i> (Signature) <i>[Signature]</i>	Date/Time 2/8/17 1400
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 01/18/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11097

EVENT NAME: Mortandad/Sandia (Cr Inv) MY2017 Q2

SAMPLE ID: CAMO-17-129308

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	2/8/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1210		MEDIA:	UA	↓
PRS ID:	OK		SAMPLE TECH CODE:	OK	GSP
LOCATION ID:	R-15		FIELD PREP:	UF	OK
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	↓
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / <u>NO</u> / NA

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

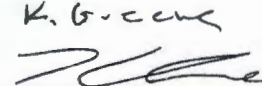
SAMPLE COMMENTS: Sampled 50 ft. from running diesel generator

LOCATION COMMENTS: Breezy while sampling

FIELD PARAMETERS:

Dissolved Oxygen	6.76	mg/L	Flow (in gpm)	7.89	GPM	Oxidation-Reduction Potential	205.2	mV
pH	8.27	SU	Specific Conductance	154.4	uS/cm	Temperature	19.0	deg C
Turbidity	1.20	NTU						

COLLECTED BY (PRINT): A. Tosh

RELINQUISHED BY (Printed Name) (Signature)	Turner Borham 	Date/Time 2/8/2017 1315	RECEIVED BY (Printed Name) (Signature)	K. G. C. C. C. 	Date/Time 2/8/17 1:15
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 01/18/2017

DATA VALIDATION REPORT

Chain Of Custody No. 2017-993

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
416111	EPA:120.1	3				
416111	EPA:150.1	3				
416111	EPA:160.1	3				
416111	EPA:245.2	6				
416111	EPA:300.0	3				
416111	EPA:310.1	3				
416111	EPA:335.4	3				
416111	EPA:350.1	3				
416111	EPA:351.2	3				
416111	EPA:353.2	3				
416111	EPA:365.4	3				
416111	SM:A2340B	3				
416111	SW-846:6010C	3				
416111	SW-846:6020	3				
416111	SW-846:6850	3				
416111	SW-846:9060	3				

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
416111	EPA:120.1	1638832	1638832	3										1			1				
416111	EPA:150.1	1639321	1639321	3										1			2				
416111	EPA:160.1	1637881	1637881	3					1					1			1				
416111	EPA:245.2	1638797	1638796	6					1	1				1			1				
416111	EPA:300.0	1638597	1638597	3					1					1			1				
416111	EPA:310.1	1639313	1639313	3						2				1			2				
416111	EPA:335.4	1638310	1638309	3					1	1				1			1				
416111	EPA:350.1	1638313	1638312	3					1	2				1			2				

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
416111	EPA:351.2	1637591	1637590	3					1	1				1			1				
416111	EPA:353.2	1638418	1638418	3					1					1			1				
416111	EPA:365.4	1638315	1638314	3					1	1				1			1				
416111	SM:A2340B	1645320	1645320	3																	
416111	SW-846:6010C	1638466	1638465	3					1	1				1			1				
416111	SW-846:6020	1638479	1638478	3					1	1				1			1				
416111	SW-846:6850	1639267	1639266	3					1	1	1			1							
416111	SW-846:9060	1639272	1639272	3					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-17-129289	416111001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-17-129290	416111003	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-17-129292	416111005	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203727093	LCS	0	0	1	0
EPA:120.1	GENERAL CHEMISTRY	WST09-17-129397	1203727095	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-129289	416111001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-129290	416111003	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-129292	416111005	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-129297	1203728233	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203728231	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	WST09-17-129397	1203728232	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-129289	416111001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-129290	416111003	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-129292	416111005	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-129293	1203726966	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203724669	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203724668	MB	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-129289	1203726982	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-129289	1203726984	MS	0	0	1	0
EPA:245.2	INORGANIC	CAMO-17-129289	416111001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-129290	416111003	REG	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:245.2	INORGANIC	CAMO-17-129292	416111005	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-129305	416111002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-129306	416111004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-129308	416111006	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203726980	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203726979	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-129289	1203726492	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-129289	416111001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-129290	416111003	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-129292	416111005	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203726491	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203726490	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-129289	416111001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-129290	416111003	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-129292	416111005	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-129297	1203728224	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-129297	1203728226	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203728222	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	WST09-17-129397	1203728223	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	WST09-17-129397	1203728225	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-129305	416111002	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-129306	416111004	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-129308	416111006	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-129315	1203725830	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-129315	1203725831	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203725829	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203725828	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-129289	416111001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-129290	416111003	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-129292	416111005	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-129411	1203725835	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-129411	1203725836	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-129412	1203726128	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-129412	1203726129	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203725834	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203725833	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-129305	416111002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-129306	416111004	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-129308	416111006	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-129309	1203725837	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:351.2	GENERAL CHEMISTRY	CAMO-17-129309	1203725839	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203723921	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203723920	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-129289	416111001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-129290	416111003	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-129292	416111005	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-129411	1203726123	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203726121	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203726120	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-129289	416111001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-129290	416111003	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-129292	416111005	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-129411	1203725844	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-129411	1203725846	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203725842	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203725841	MB	1	0	0	0
SM:A2340B	INORGANIC	CAMO-17-129289	416111001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-17-129290	416111003	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-17-129292	416111005	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-129289	1203726226	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-129289	1203726227	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAMO-17-129289	416111001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-129290	416111003	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-129292	416111005	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203726225	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203726224	MB	17	0	0	0
SW-846:6020	INORGANIC	CAMO-17-129289	1203726251	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAMO-17-129289	1203726252	MS	0	0	11	0
SW-846:6020	INORGANIC	CAMO-17-129289	416111001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-17-129290	416111003	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-17-129292	416111005	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203726250	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203726249	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-129289	416111001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-129290	416111003	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-129292	416111005	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-129411	1203728090	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-129411	1203728091	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203728089	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203728088	MB	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
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-129305	416111002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-129306	416111004	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-129308	1203728544	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-129308	416111006	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203728543	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203728542	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

6. Any surrogate recoveries outside the control limits?

No.

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

No.

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

DATA VALIDATION REPORT

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.

None.

Reason Code

Description

J_LAB	The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL
NQ	The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample.
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-17-129289	MCOI-5	REG	EPA:120.1	0	1
CAMO-17-129289	MCOI-5	REG	EPA:150.1	0	1
CAMO-17-129289	MCOI-5	REG	EPA:160.1	0	1
CAMO-17-129289	MCOI-5	REG	EPA:245.2	0	1
CAMO-17-129289	MCOI-5	REG	EPA:300.0	0	4
CAMO-17-129289	MCOI-5	REG	EPA:310.1	0	2
CAMO-17-129289	MCOI-5	REG	EPA:350.1	0	1
CAMO-17-129289	MCOI-5	REG	EPA:353.2	0	1
CAMO-17-129289	MCOI-5	REG	EPA:365.4	0	1
CAMO-17-129289	MCOI-5	REG	SM:A2340B	0	1
CAMO-17-129289	MCOI-5	REG	SW-846:6010C	0	17

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-17-129289	MCOI-5	REG	SW-846:6020	0	11
CAMO-17-129289	MCOI-5	REG	SW-846:6850	0	1
CAMO-17-129290	MCOI-6	REG	EPA:120.1	0	1
CAMO-17-129290	MCOI-6	REG	EPA:150.1	0	1
CAMO-17-129290	MCOI-6	REG	EPA:160.1	0	1
CAMO-17-129290	MCOI-6	REG	EPA:245.2	0	1
CAMO-17-129290	MCOI-6	REG	EPA:300.0	0	4
CAMO-17-129290	MCOI-6	REG	EPA:310.1	0	2
CAMO-17-129290	MCOI-6	REG	EPA:350.1	0	1
CAMO-17-129290	MCOI-6	REG	EPA:353.2	0	1
CAMO-17-129290	MCOI-6	REG	EPA:365.4	0	1
CAMO-17-129290	MCOI-6	REG	SM:A2340B	0	1
CAMO-17-129290	MCOI-6	REG	SW-846:6010C	0	17
CAMO-17-129290	MCOI-6	REG	SW-846:6020	0	11
CAMO-17-129290	MCOI-6	REG	SW-846:6850	0	1
CAMO-17-129292	R-15	REG	EPA:120.1	0	1
CAMO-17-129292	R-15	REG	EPA:150.1	0	1
CAMO-17-129292	R-15	REG	EPA:160.1	0	1
CAMO-17-129292	R-15	REG	EPA:245.2	0	1
CAMO-17-129292	R-15	REG	EPA:300.0	0	4
CAMO-17-129292	R-15	REG	EPA:310.1	0	2
CAMO-17-129292	R-15	REG	EPA:350.1	0	1
CAMO-17-129292	R-15	REG	EPA:353.2	0	1
CAMO-17-129292	R-15	REG	EPA:365.4	0	1
CAMO-17-129292	R-15	REG	SM:A2340B	0	1
CAMO-17-129292	R-15	REG	SW-846:6010C	0	17
CAMO-17-129292	R-15	REG	SW-846:6020	0	11
CAMO-17-129292	R-15	REG	SW-846:6850	0	1
CAMO-17-129305	MCOI-5	REG	EPA:245.2	0	1
CAMO-17-129305	MCOI-5	REG	EPA:335.4	0	1
CAMO-17-129305	MCOI-5	REG	EPA:351.2	0	1
CAMO-17-129305	MCOI-5	REG	SW-846:9060	0	1
CAMO-17-129306	MCOI-6	REG	EPA:245.2	0	1
CAMO-17-129306	MCOI-6	REG	EPA:335.4	0	1
CAMO-17-129306	MCOI-6	REG	EPA:351.2	0	1
CAMO-17-129306	MCOI-6	REG	SW-846:9060	0	1
CAMO-17-129308	R-15	REG	EPA:245.2	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-17-129308	R-15	REG	EPA:335.4	0	1
CAMO-17-129308	R-15	REG	EPA:351.2	0	1
CAMO-17-129308	R-15	REG	SW-846:9060	0	1



March 06, 2017

gel.com

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

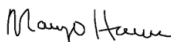
Re: LANL- WQH Water Samples
Work Order: 416111
SDG: 2017-993

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on February 10, 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: 2017-993
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 416111
SDG: 2017-993

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 416111
SDG # : 2017-993**

March 06, 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 February 10, 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>
416111001	CAMO-17-129289
416111002	CAMO-17-129305
416111003	CAMO-17-129290
416111004	CAMO-17-129306
416111005	CAMO-17-129292
416111006	CAMO-17-129308

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
Margo Herron for
Valerie Davis
Project Manager

List of current GEL Certifications as of 06 March 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	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122016-21
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation



SAMPLE RECEIPT & REVIEW FORM

Client: <u>LAHL</u>			SDG/AR/COC/Work Order: <u>416111</u>		
Received By: <u>FEW</u>			Date Received: <u>2/10/17</u>		
Suspected Hazard Information		Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	<input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0cpm</u>	
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?	
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.	
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hazard Class Shipped: UN#:	
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags <u>Blue ice</u> Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>1°C</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>IR3-16</u>
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16 Carrier and tracking number.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <input checked="" type="checkbox"/> FedEx Air <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>5908 1781 7073</u>

Comments (Use Continuation Form if needed):

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

LOS ALAMOS, NM 87545
UNITED STATES US

RT 251
ST F1

09FEB17
56.0 LB MAN
J014176/CAFE2916

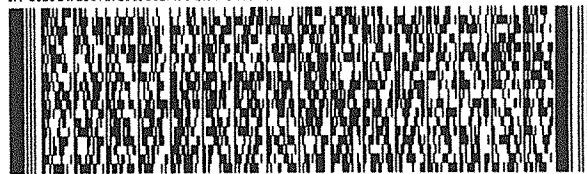
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29405

(843) 666-8171

REF: 6A000ASRGW04BAGWS0



FedEx
Express



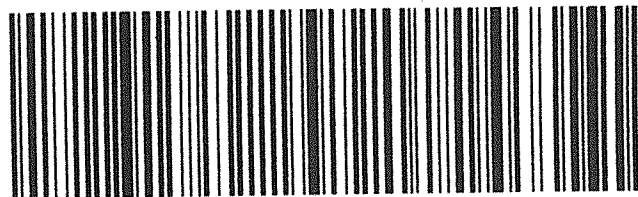
TRK# 5908 1781 7073
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PRIORITY OVERNIGHT

X7 CHSA

29407
SC-US CHS

Part # 156148V-434 RIT2 06/15



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 #: 2017-993
Work Order #: 416111**

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: 1639267

Prep Batch Number: 1639266

Sample Analysis

Sample ID	Client ID
416111001	416111001 (CAMO-17-129289)
416111003	416111003 (CAMO-17-129290)
416111005	416111005 (CAMO-17-129292)
1203728092	Interference Check Sample (ICS)
1203728088	Method Blank (MB)
1203728089	Laboratory Control Sample (LCS)
1203728090	415984002(CAMO-17-129411) Matrix Spike (MS)
1203728091	415984002(CAMO-17-129411) 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 415984002 (CAMO-17-129411) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

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

Retention Time

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

Technical Information

Holding Time Specifications

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

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Samples 416111001 (CAMO-17-129289), 416111003 (CAMO-17-129290) and 416111005 (CAMO-17-129292) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

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

Method Comments

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

Additional Comments

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

Perchlorate Isotope Ratio

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

System Configuration

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

Electronic Packaging Comment

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

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

Chromatographic Columns

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

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

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-993 GEL Work Order: 416111

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 FEB 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: 1639266Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-129289Date Received: 10-FEB-17GEL Job No (SDG): 2017-993GEL Sample ID: 416111001Date Filtered: 14-FEB-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	12.5	50	174	ug/L		250	16-FEB-17 19:30	per0216030a
	Perchlorate Isotope Ratio			3.01			250	16-FEB-17 19:30	per0216030a
14797-73-0	Perchlorate-101	12.5	50	176	ug/L		250	16-FEB-17 19:30	per0216030a
	Perchlorate-O(18)			121	ug/L		250	16-FEB-17 19:30	per0216030a

^ 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: 1639266Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-129290Date Received: 10-FEB-17GEL Job No (SDG): 2017-993GEL Sample ID: 416111003Date Filtered: 14-FEB-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	20	79.1	ug/L		100	16-FEB-17 19:37	per0216031a
	Perchlorate Isotope Ratio			3.02			100	16-FEB-17 19:37	per0216031a
14797-73-0	Perchlorate-101	5	20	79.6	ug/L		100	16-FEB-17 19:37	per0216031a
	Perchlorate-O(18)			48.5	ug/L		100	16-FEB-17 19:37	per0216031a

^ 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: 1639266Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-129292Date Received: 10-FEB-17GEL Job No (SDG): 2017-993GEL Sample ID: 416111005Date Filtered: 14-FEB-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	9.62	ug/L		10	16-FEB-17 19:45	per0216032a
	Perchlorate Isotope Ratio			3.04			10	16-FEB-17 19:45	per0216032a
14797-73-0	Perchlorate-101	.5	2	9.62	ug/L		10	16-FEB-17 19:45	per0216032a
	Perchlorate-O(18)			4.82	ug/L		10	16-FEB-17 19:45	per0216032a

^ 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): 2017-993

Extract Batch Code: 1639266

Date Filtered: 14-FEB-17

Matrix: WATER

Sample ID: 1203728089

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.215	ug/L	108		85 - 115
Perchlorate Isotope Ratio		2.98				-
Perchlorate-101	0.200	.214	ug/L	107		85 - 115
Perchlorate-O(18)		.477	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): 2017-993

Extract Batch Code: 1639266

Date Extracted: 14-FEB-17

GEL MS/PS ID: 1203728090

Client ID: CAMO-17-129411

GEL MSD/PSD ID: 1203728091

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	0.603	ug/L	0.818	107	.811	104	1	30	75 - 125
Perchlorate Isotope Ratio	0	2.94		2.98		3.01		1		-
Perchlorate-101	0.200	0.607	ug/L	0.812	102	.798	95	2	30	75 - 125
Perchlorate-O(18)	0	0.519	ug/L	0.510		.513		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: 1639266Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 14-FEB-17GEL Job No (SDG): 2017-993GEL Sample ID: 1203728088Date Filtered: 14-FEB-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	14-FEB-17 17:14	per0214013a
	Perchlorate Isotope Ratio						1	14-FEB-17 17:14	per0214013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	14-FEB-17 17:14	per0214013a
	Perchlorate-O(18)			0.499	ug/L		1	14-FEB-17 17:14	per0214013a

^ 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: 1639266Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 14-FEB-17GEL Job No (SDG): 2017-993GEL Sample ID: 1203728089Date Filtered: 14-FEB-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	0.215	ug/L		1	14-FEB-17 17:22	per0214014a
	Perchlorate Isotope Ratio			2.98			1	14-FEB-17 17:22	per0214014a
14797-73-0	Perchlorate-101	.05	.2	0.214	ug/L		1	14-FEB-17 17:22	per0214014a
	Perchlorate-O(18)			0.477	ug/L		1	14-FEB-17 17:22	per0214014a

^ 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: 1639266Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-993GEL Sample ID: 1203728092Date Filtered: 14-FEB-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	0.206	ug/L		1	14-FEB-17 17:30	per0214015a
	Perchlorate Isotope Ratio			3.03			1	14-FEB-17 17:30	per0214015a
14797-73-0	Perchlorate-101	.05	.2	0.201	ug/L		1	14-FEB-17 17:30	per0214015a
	Perchlorate-O(18)			0.522	ug/L		1	14-FEB-17 17:30	per0214015a

^ 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: 1639266Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-129411MSDate Received: 09-FEB-17GEL Job No (SDG): 2017-993GEL Sample ID: 1203728090Date Filtered: 14-FEB-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	0.818	ug/L		1	14-FEB-17 17:46	per0214017a
	Perchlorate Isotope Ratio			2.98			1	14-FEB-17 17:46	per0214017a
14797-73-0	Perchlorate-101	.05	.2	0.812	ug/L		1	14-FEB-17 17:46	per0214017a
	Perchlorate-O(18)			0.510	ug/L		1	14-FEB-17 17:46	per0214017a

^ 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: 1639266Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-129411MSDDate Received: 09-FEB-17GEL Job No (SDG): 2017-993GEL Sample ID: 1203728091Date Filtered: 14-FEB-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	0.811	ug/L		1	14-FEB-17 17:54	per0214018a
	Perchlorate Isotope Ratio			3.01			1	14-FEB-17 17:54	per0214018a
14797-73-0	Perchlorate-101	.05	.2	0.798	ug/L		1	14-FEB-17 17:54	per0214018a
	Perchlorate-O(18)			0.513	ug/L		1	14-FEB-17 17:54	per0214018a

^ 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 #: 2017-993
Work Order #: 416111

Sample ID	Client ID
416111001	CAMO-17-129289
416111002	CAMO-17-129305
416111003	CAMO-17-129290
416111004	CAMO-17-129306
416111005	CAMO-17-129292
416111006	CAMO-17-129308
1203726224	Method Blank (MB) ICP
1203726225	Laboratory Control Sample (LCS)
1203726228	416111001(CAMO-17-129289L) Serial Dilution (SD)
1203726226	416111001(CAMO-17-129289D) Sample Duplicate (DUP)
1203726227	416111001(CAMO-17-129289S) Matrix Spike (MS)
1203726249	Method Blank (MB) ICP-MS
1203726250	Laboratory Control Sample (LCS)
1203726253	416111001(CAMO-17-129289L) Serial Dilution (SD)
1203726251	416111001(CAMO-17-129289D) Sample Duplicate (DUP)
1203726252	416111001(CAMO-17-129289S) Matrix Spike (MS)
1203726979	Method Blank (MB) CVAA
1203726980	Laboratory Control Sample (LCS)
1203726986	416111001(CAMO-17-129289L) Serial Dilution (SD)
1203726982	416111001(CAMO-17-129289D) Sample Duplicate (DUP)
1203726984	416111001(CAMO-17-129289S) Matrix Spike (MS)

Sample Analysis

Samples 416111001,002,003,004,005 and 006 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1638466, 1638479, 1638797 and 1645320
Prep Batch :	1638465, 1638478 and 1638796
Standard Operating Procedures:	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 29, GL-MA-E-010 REV# 33 and GL-GC-E-107 REV# 10
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The 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. However, the ICSA contained 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 (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: 416111001 (CAMO-17-129289)-ICP, ICP-MS and CVAA.

Matrix Spike (MS/MSD) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

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

Serial Dilution % Difference Statement

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

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information**Electronic Packaging Comment**

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

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

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

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: 2017-993 GEL Work Order: 416111

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: 07 MAR 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 416111001**BASIS:** As Received**DATE COLLECTED** 08-FEB-17**CLIENT ID:** CAMO-17-129289**LEVEL:** Low**DATE RECEIVED** 10-FEB-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/14/17 10:09	021417W1-5	1638797

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 416111001

BASIS: As Received

DATE COLLECTED 08-FEB-17

CLIENT ID: CAMO-17-129289

LEVEL: Low

DATE RECEIVED 10-FEB-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	02/14/17 15:34	021417-1	1638466
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	02/22/17 11:12	170222-4	1638479
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	02/21/17 20:12	170221-3	1638479
7440-39-3	Barium	24.1	ug/L		1	5	5	1	P	HSC	02/14/17 15:34	021417-1	1638466
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	02/14/17 15:34	021417-1	1638466
7440-42-8	Boron	21	ug/L	J	15	50	50	1	P	HSC	02/14/17 15:34	021417-1	1638466
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	02/21/17 20:12	170221-3	1638479
7440-70-2	Calcium	32200	ug/L		50	200	200	1	P	HSC	02/14/17 15:34	021417-1	1638466
7440-47-3	Chromium	7.4	ug/L	J	3	10	10	1	MS	BAJ	02/21/17 20:12	170221-3	1638479
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	02/14/17 15:34	021417-1	1638466
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	02/14/17 15:34	021417-1	1638466
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	02/28/17 14:23	022817-2	1638466
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	02/21/17 20:12	170221-3	1638479
7439-95-4	Magnesium	5910	ug/L		110	300	300	1	P	HSC	02/14/17 15:34	021417-1	1638466
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	02/14/17 15:34	021417-1	1638466
7439-98-7	Molybdenum	0.880	ug/L		0.3	0.5	0.5	1	MS	BAJ	02/21/17 20:12	170221-3	1638479
7440-02-0	Nickel	0.551	ug/L	J	0.5	2	2	1	MS	BAJ	02/21/17 20:12	170221-3	1638479
7440-09-7	Potassium	612	ug/L		50	150	150	1	P	HSC	02/14/17 15:34	021417-1	1638466
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	02/21/17 20:12	170221-3	1638479
7631-86-9	Silica	67800	ug/L		53	213	213	1	P	HSC	02/14/17 15:34	021417-1	1638466
7440-22-4	Silver	1	ug/L	U	0.4	1	1	1	MS	BAJ	02/21/17 20:12	170221-3	1638479
7440-23-5	Sodium	16000	ug/L		100	300	300	1	P	HSC	02/28/17 14:23	022817-2	1638466
7440-24-6	Strontium	145	ug/L		1	5	5	1	P	HSC	02/14/17 15:34	021417-1	1638466
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	02/21/17 20:12	170221-3	1638479
7440-31-5	Tin	3.17	ug/L	J	2.5	10	10	1	P	HSC	02/14/17 15:34	021417-1	1638466
7440-61-1	Uranium	0.163	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	02/21/17 20:12	170221-3	1638479
7440-62-2	Vanadium	1.77	ug/L	J	1	5	5	1	P	HSC	02/14/17 15:34	021417-1	1638466
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	02/28/17 14:23	022817-2	1638466

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 416111001**BASIS:** As Received**DATE COLLECTED** 08-FEB-17**CLIENT ID:** CAMO-17-129289**LEVEL:** Low**DATE RECEIVED** 10-FEB-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	105	mg/L		0.453	1.24	1.24	1		TXT1	03/07/17 15:09		1645320

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1638466	1638465	SW846 3005A	50	mL	50	mL	02/10/17	CXW4
1638479	1638478	SW846 3005A	50	mL	50	mL	02/10/17	CXW4
1638797	1638796	EPA 245.1/245.2 Prep	20	mL	20	mL	02/13/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 416111002**BASIS:** As Received**DATE COLLECTED** 08-FEB-17**CLIENT ID:** CAMO-17-129305**LEVEL:** Low**DATE RECEIVED** 10-FEB-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/14/17 10:17	021417W1-5	1638797

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1638797	1638796	EPA 245.1/245.2 Prep	20	mL	20	mL	02/13/17	AXS5

***Analytical Methods:**

AV EPA 245.1/245.2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 416111003**BASIS:** As Received**DATE COLLECTED** 08-FEB-17**CLIENT ID:** CAMO-17-129290**LEVEL:** Low**DATE RECEIVED** 10-FEB-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/14/17 10:19	021417W1-5	1638797

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 416111003

BASIS: As Received

DATE COLLECTED 08-FEB-17

CLIENT ID: CAMO-17-129290

LEVEL: Low

DATE RECEIVED 10-FEB-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	02/14/17 15:27	021417-1	1638466
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	02/22/17 11:17	170222-4	1638479
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	02/21/17 20:25	170221-3	1638479
7440-39-3	Barium	41.4	ug/L		1	5	5	1	P	HSC	02/14/17 15:27	021417-1	1638466
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	02/14/17 15:27	021417-1	1638466
7440-42-8	Boron	54.1	ug/L		15	50	50	1	P	HSC	02/14/17 15:27	021417-1	1638466
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	02/21/17 20:25	170221-3	1638479
7440-70-2	Calcium	66600	ug/L		50	200	200	1	P	HSC	02/14/17 15:27	021417-1	1638466
7440-47-3	Chromium	76.3	ug/L		3	10	10	1	MS	BAJ	02/21/17 20:25	170221-3	1638479
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	02/14/17 15:27	021417-1	1638466
7440-50-8	Copper	5.76	ug/L	J	3	10	10	1	P	HSC	02/14/17 15:27	021417-1	1638466
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	02/28/17 14:17	022817-2	1638466
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	02/21/17 20:25	170221-3	1638479
7439-95-4	Magnesium	13100	ug/L		110	300	300	1	P	HSC	02/14/17 15:27	021417-1	1638466
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	02/14/17 15:27	021417-1	1638466
7439-98-7	Molybdenum	1.97	ug/L		0.3	0.5	0.5	1	MS	BAJ	02/21/17 20:25	170221-3	1638479
7440-02-0	Nickel	21.9	ug/L		0.5	2	2	1	MS	BAJ	02/21/17 20:25	170221-3	1638479
7440-09-7	Potassium	889	ug/L		50	150	150	1	P	HSC	02/14/17 15:27	021417-1	1638466
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	02/21/17 20:25	170221-3	1638479
7631-86-9	Silica	70200	ug/L		53	213	213	1	P	HSC	02/14/17 15:27	021417-1	1638466
7440-22-4	Silver	1	ug/L	U	0.4	1	1	1	MS	BAJ	02/21/17 20:25	170221-3	1638479
7440-23-5	Sodium	26500	ug/L		100	300	300	1	P	HSC	02/28/17 14:17	022817-2	1638466
7440-24-6	Strontium	300	ug/L		1	5	5	1	P	HSC	02/14/17 15:27	021417-1	1638466
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	02/21/17 20:25	170221-3	1638479
7440-31-5	Tin	4.88	ug/L	J	2.5	10	10	1	P	HSC	02/14/17 15:27	021417-1	1638466
7440-61-1	Uranium	0.979	ug/L		0.067	0.2	0.2	1	MS	BAJ	02/21/17 20:25	170221-3	1638479
7440-62-2	Vanadium	1.66	ug/L	J	1	5	5	1	P	HSC	02/14/17 15:27	021417-1	1638466
7440-66-6	Zinc	20.5	ug/L		3.3	10	10	1	P	HSC	02/28/17 14:17	022817-2	1638466

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 416111003**BASIS:** As Received**DATE COLLECTED** 08-FEB-17**CLIENT ID:** CAMO-17-129290**LEVEL:** Low**DATE RECEIVED** 10-FEB-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	220	mg/L		0.453	1.24	1.24	1		TXT1	03/07/17 15:09		1645320

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1638466	1638465	SW846 3005A	50	mL	50	mL	02/10/17	CXW4
1638479	1638478	SW846 3005A	50	mL	50	mL	02/10/17	CXW4
1638797	1638796	EPA 245.1/245.2 Prep	20	mL	20	mL	02/13/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 416111004**BASIS:** As Received**DATE COLLECTED** 08-FEB-17**CLIENT ID:** CAMO-17-129306**LEVEL:** Low**DATE RECEIVED** 10-FEB-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/14/17 10:21	021417W1-5	1638797

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1638797	1638796	EPA 245.1/245.2 Prep	20	mL	20	mL	02/13/17	AXS5

***Analytical Methods:**

AV EPA 245.1/245.2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 416111005**BASIS:** As Received**DATE COLLECTED** 08-FEB-17**CLIENT ID:** CAMO-17-129292**LEVEL:** Low**DATE RECEIVED** 10-FEB-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/14/17 10:26	021417W1-5	1638797

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 416111005

BASIS: As Received

DATE COLLECTED 08-FEB-17

CLIENT ID: CAMO-17-129292

LEVEL: Low

DATE RECEIVED 10-FEB-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	02/14/17 15:31	021417-1	1638466
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	02/22/17 11:18	170222-4	1638479
7440-38-2	Arsenic	1.98	ug/L	J	1.7	5	5	1	MS	BAJ	02/21/17 20:28	170221-3	1638479
7440-39-3	Barium	30.4	ug/L		1	5	5	1	P	HSC	02/14/17 15:31	021417-1	1638466
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	02/14/17 15:31	021417-1	1638466
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	02/14/17 15:31	021417-1	1638466
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	02/21/17 20:28	170221-3	1638479
7440-70-2	Calcium	15000	ug/L		50	200	200	1	P	HSC	02/14/17 15:31	021417-1	1638466
7440-47-3	Chromium	14.5	ug/L		3	10	10	1	MS	BAJ	02/21/17 20:28	170221-3	1638479
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	02/14/17 15:31	021417-1	1638466
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	02/14/17 15:31	021417-1	1638466
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	02/28/17 14:20	022817-2	1638466
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	02/21/17 20:28	170221-3	1638479
7439-95-4	Magnesium	3980	ug/L		110	300	300	1	P	HSC	02/14/17 15:31	021417-1	1638466
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	02/14/17 15:31	021417-1	1638466
7439-98-7	Molybdenum	1.07	ug/L		0.3	0.5	0.5	1	MS	BAJ	02/21/17 20:28	170221-3	1638479
7440-02-0	Nickel	2	ug/L	U	0.5	2	2	1	MS	BAJ	02/21/17 20:28	170221-3	1638479
7440-09-7	Potassium	1900	ug/L		50	150	150	1	P	HSC	02/14/17 15:31	021417-1	1638466
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	02/21/17 20:28	170221-3	1638479
7631-86-9	Silica	73200	ug/L		53	213	213	1	P	HSC	02/14/17 15:31	021417-1	1638466
7440-22-4	Silver	1	ug/L	U	0.4	1	1	1	MS	BAJ	02/21/17 20:28	170221-3	1638479
7440-23-5	Sodium	10600	ug/L		100	300	300	1	P	HSC	02/28/17 14:20	022817-2	1638466
7440-24-6	Strontium	66	ug/L		1	5	5	1	P	HSC	02/14/17 15:31	021417-1	1638466
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	02/21/17 20:28	170221-3	1638479
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	02/14/17 15:31	021417-1	1638466
7440-61-1	Uranium	0.411	ug/L		0.067	0.2	0.2	1	MS	BAJ	02/21/17 20:28	170221-3	1638479
7440-62-2	Vanadium	7.14	ug/L		1	5	5	1	P	HSC	02/14/17 15:31	021417-1	1638466
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	02/28/17 14:20	022817-2	1638466

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 416111005**BASIS:** As Received**DATE COLLECTED** 08-FEB-17**CLIENT ID:** CAMO-17-129292**LEVEL:** Low**DATE RECEIVED** 10-FEB-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	53.8	mg/L		0.453	1.24	1.24	1		TXT1	03/07/17 15:09		1645320

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1638466	1638465	SW846 3005A	50	mL	50	mL	02/10/17	CXW4
1638479	1638478	SW846 3005A	50	mL	50	mL	02/10/17	CXW4
1638797	1638796	EPA 245.1/245.2 Prep	20	mL	20	mL	02/13/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-993**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 416111006**BASIS:** As Received**DATE COLLECTED** 08-FEB-17**CLIENT ID:** CAMO-17-129308**LEVEL:** Low**DATE RECEIVED** 10-FEB-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/14/17 10:27	021417W1-5	1638797

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1638797	1638796	EPA 245.1/245.2 Prep	20	mL	20	mL	02/13/17	AXS5

***Analytical Methods:**

AV EPA 245.1/245.2

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-993
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>
1203726224	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
1203726249	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	1.7	ug/L	+/-5	U	MS	1.7	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	0.3	ug/L	+/-0.5	U	MS	0.3	0.5
	Nickel	0.5	ug/L	+/-2	U	MS	0.5	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.4	ug/L	+/-1	U	MS	0.4	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
1203726979	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. 2017-993

Client ID: CAMO-17-129289S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 416111001

Spike ID: 1203726227

<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	5330		68	U	5000	107		P
Barium	ug/L	75-125	540		24.1		500	103		P
Beryllium	ug/L	75-125	523		1	U	500	105		P
Boron	ug/L	75-125	565		21	J	500	109		P
Calcium	ug/L		36900		32200		5000	94.1	N/A	P
Cobalt	ug/L	75-125	506		1	U	500	101		P
Copper	ug/L	75-125	538		3	U	500	107		P
Iron	ug/L	75-125	4830		30	U	5000	96.4		P
Magnesium	ug/L	75-125	10900		5910		5000	99.8		P
Manganese	ug/L	75-125	512		2	U	500	102		P
Potassium	ug/L	75-125	5860		612		5000	105		P
Silica	ug/L		78600		67800		10700	101	N/A	P
Sodium	ug/L	75-125	20500		16000		5000	91		P
Strontium	ug/L	75-125	655		145		500	102		P
Tin	ug/L	75-125	529		3.17	J	500	105		P
Vanadium	ug/L	75-125	533		1.77	J	500	106		P
Zinc	ug/L	75-125	473		3.3	U	500	94.6		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Matrix Spike Summary

SDG NO. 2017-993

Client ID: CAMO-17-129289S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 416111001

Spike ID: 1203726252

<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	53.3		1	U	50	106		MS
Arsenic	ug/L	75-125	54.2		1.7	U	50	106		MS
Cadmium	ug/L	75-125	50.5		0.3	U	50	101		MS
Chromium	ug/L	75-125	59.2		7.4	J	50	104		MS
Lead	ug/L	75-125	51.8		0.5	U	50	104		MS
Molybdenum	ug/L	75-125	54		0.88		50	106		MS
Nickel	ug/L	75-125	50.4		0.551	J	50	99.7		MS
Selenium	ug/L	75-125	51.5		2	U	50	103		MS
Silver	ug/L	75-125	52.2		0.4	U	50	104		MS
Thallium	ug/L	75-125	47.5		0.6	U	50	94.4		MS
Uranium	ug/L	75-125	51.9		0.163	J	50	103		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-993

Client ID: CAMO-17-129289S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 416111001

Spike ID: 1203726984

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	1.94		0.067	U	2	97.2		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
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Duplicate Sample Summary

SDG No.: 2017-993

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-17-129289D

Matrix: WATER

Level: Low

Sample ID: 416111001

Duplicate ID: 1203726226

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	24.1		24.2		.253		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	21 J		21.1 J		.356		P
Calcium	ug/L	+/-20%	32200		32200		.0962		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%	5910		5860		.85		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-150	612		595		2.87		P
Silica	ug/L	+/-20%	67800		67800		.0752		P
Sodium	ug/L	+/-20%	16000		15700		1.57		P
Strontium	ug/L	+/-20%	145		145		.407		P
Tin	ug/L	+/-10	3.17 J		3.17 J		.0569		P
Vanadium	ug/L	+/-5	1.77 J		2.09 J		16.6		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-993

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-17-129289D

Matrix: WATER

Level: Low

Sample ID: 416111001

Duplicate ID: 1203726251

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		1.7 U		1.79 J		200		MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L	+/-10	7.4 J		7.22 J		2.45		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.88		0.773		12.9		MS
Nickel	ug/L		0.551 J		0.5 U		200		MS
Selenium	ug/L		2 U		2 U				MS
Silver	ug/L		0.4 U		0.4 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L	+/- .2	0.163 J		0.15 J		8.31		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2017–993**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAMO–17–129289D**Matrix:** WATER**Level:** Low**Sample ID:** 416111001**Duplicate ID:** 1203726982**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. 2017-993

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>
1203726225								
	Aluminum	ug/L	5000	5310		106	80-120	P
	Barium	ug/L	500	524		105	80-120	P
	Beryllium	ug/L	500	523		105	80-120	P
	Boron	ug/L	500	537		107	80-120	P
	Calcium	ug/L	5000	5300		106	80-120	P
	Cobalt	ug/L	500	519		104	80-120	P
	Copper	ug/L	500	535		107	80-120	P
	Iron	ug/L	5000	4820		96.4	80-120	P
	Magnesium	ug/L	5000	5330		107	80-120	P
	Manganese	ug/L	500	527		105	80-120	P
	Potassium	ug/L	5000	5320		106	80-120	P
	Silica	ug/L	10700	10900		102	80-120	P
	Sodium	ug/L	5000	4870		97.4	80-120	P
	Strontium	ug/L	500	531		106	80-120	P
	Tin	ug/L	500	524		105	80-120	P
	Vanadium	ug/L	500	529		106	80-120	P
	Zinc	ug/L	500	473		94.5	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-993

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>
1203726250								
	Nickel	ug/L	50	52.8		106	80-120	MS
	Selenium	ug/L	50	54.4		109	80-120	MS
	Silver	ug/L	50	53.2		106	80-120	MS
	Thallium	ug/L	50	45.7		91.4	80-120	MS
	Uranium	ug/L	50	50.9		102	80-120	MS
	Molybdenum	ug/L	50	52.7		105	80-120	MS
	Antimony	ug/L	50	53.1		106	80-120	MS
	Arsenic	ug/L	50	53.5		107	80-120	MS
	Cadmium	ug/L	50	51.6		103	80-120	MS
	Chromium	ug/L	50	52.1		104	80-120	MS
	Lead	ug/L	50	51.6		103	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-993

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>
1203726980	Mercury	ug/L	2	2.02		101	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-993

Client ID: CAMO-17-129289L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 416111001

Serial Dilution ID: 1203726228

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	24.1		23.4	J	2.766			P
Beryllium	1	U	5	U				P
Boron	21	J	75	U	19.843			P
Calcium	32200		31400		2.612		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	5910		5800		1.791		10	P
Manganese	2	U	10	U				P
Potassium	612		670	J	9.475			P
Silica	67800		65300		3.731		10	P
Sodium	16000		17400		8.846		10	P
Strontium	145		145		.169		10	P
Tin	3.17	J	12.5	U	163.815			P
Vanadium	1.77	J	5	U	117.809			P
Zinc	3.3	U	28.6	J				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-993

Client ID: CAMO-17-129289L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 416111001

Serial Dilution ID: 1203726253

<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	1.7	U	8.5	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	7.4	J	15	U	4.029			MS
Lead	.5	U	2.5	U				MS
Molybdenum	.88		1.5	U	15.341			MS
Nickel	.551	J	2.5	U	1.996			MS
Selenium	2	U	10	U				MS
Silver	.4	U	2	U				MS
Thallium	.6	U	3	U				MS
Uranium	.163	J	.335	U	19.632			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-993 **Client ID:** CAMO-17-129289L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 416111001 **Serial Dilution ID:** 1203726986

<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 #: 2017-993
Work Order #: 416111**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1639272

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
416111002	CAMO-17-129305
416111004	CAMO-17-129306
416111006	CAMO-17-129308
1203728542	Method Blank (MB)
1203728543	Laboratory Control Sample (LCS)
1203728544	416111006(CAMO-17-129308) Sample Duplicate (DUP)
1203728546	416111006(CAMO-17-129308) 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# 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 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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 416111006 (CAMO-17-129308) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1638310	Method:	WSP-CN(T)
Prep Batch :	1638309	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
416111002	CAMO-17-129305
416111004	CAMO-17-129306
416111006	CAMO-17-129308
1203725828	Method Blank (MB)
1203725829	Laboratory Control Sample (LCS)
1203725830	415984001(CAMO-17-129315) Sample Duplicate (DUP)
1203725831	415984001(CAMO-17-129315) 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# 18.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 415984001 (CAMO-17-129315) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1638597

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
416111001	CAMO-17-129289
416111003	CAMO-17-129290
416111005	CAMO-17-129292
1203726490	Method Blank (MB)
1203726491	Laboratory Control Sample (LCS)
1203726492	416111001(CAMO-17-129289) Sample Duplicate (DUP)
1203726493	416111001(CAMO-17-129289) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-5000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 416111001 (CAMO-17-129289) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples 1203726492 (CAMO-17-129289DUP), 1203726493 (CAMO-17-129289PS), 416111001 (CAMO-17-129289) and 416111003 (CAMO-17-129290) 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.

Analyte	416111	
	001	003
Chloride	2X	10X
Sulfate	2X	10X

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

Samples 1203726492 (CAMO-17-129289DUP), 1203726493 (CAMO-17-129289PS), 416111001

(CAMO-17-129289), 416111003 (CAMO-17-129290) and 416111005 (CAMO-17-129292) 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:	1638313	Method:	NH3
Prep Batch :	1638312	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
416111001	CAMO-17-129289
416111003	CAMO-17-129290
416111005	CAMO-17-129292
1203725833	Method Blank (MB)
1203725834	Laboratory Control Sample (LCS)
1203725835	415984002(CAMO-17-129411) Sample Duplicate (DUP)
1203726128	415984004(CAMO-17-129412) Sample Duplicate (DUP)
1203725836	415984002(CAMO-17-129411) Matrix Spike (MS)
1203726129	415984004(CAMO-17-129412) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 415984002 (CAMO-17-129411) and 415984004 (CAMO-17-129412) 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**Data Exception (DER) Documentation**

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1637591	Method:	TKN
Prep Batch :	1637590	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
416111002	CAMO-17-129305
416111004	CAMO-17-129306
416111006	CAMO-17-129308
1203723920	Method Blank (MB)
1203723921	Laboratory Control Sample (LCS)
1203725837	415985002(CAMO-17-129309) Sample Duplicate (DUP)
1203725839	415985002(CAMO-17-129309) 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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 415985002 (CAMO-17-129309) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Sample1203723920 (MB) was re-analyzed due to instrument failure. The results from the reanalysis are reported. Samples1203723920 (MB), 1203725837 (CAMO-17-129309DUP) and 1203725839 (CAMO-17-129309MS) were re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was reported. Sample1203723920 (MB) was re-analyzed to verify the result.

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1638418

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
416111001	CAMO-17-129289
416111003	CAMO-17-129290
416111005	CAMO-17-129292
1203726120	Method Blank (MB)
1203726121	Laboratory Control Sample (LCS)
1203726123	415984002(CAMO-17-129411) Sample Duplicate (DUP)
1203726126	415984002(CAMO-17-129411) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

acceptance limits.

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 415984002 (CAMO-17-129411) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The following samples 1203726123 (CAMO-17-129411DUP), 1203726126 (CAMO-17-129411PS), 416111001 (CAMO-17-129289), 416111003 (CAMO-17-129290) and 416111005 (CAMO-17-129292) 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.

Analyte	416111		
	001	003	005
Nitrogen, Nitrate/Nitrite	10X	10X	5X

Sample Re-analysis

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

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

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced

SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1638315	Method:	PO4
Prep Batch :	1638314	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
416111001	CAMO-17-129289
416111003	CAMO-17-129290
416111005	CAMO-17-129292
1203725841	Method Blank (MB)
1203725842	Laboratory Control Sample (LCS)
1203725844	415984002(CAMO-17-129411) Sample Duplicate (DUP)
1203725846	415984002(CAMO-17-129411) 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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 415984002 (CAMO-17-129411) 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

Sample1203725841 (MB) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1637881

Method: TDS

Sample Analysis

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

Sample ID	Client ID
416111001	CAMO-17-129289
416111003	CAMO-17-129290
416111005	CAMO-17-129292
1203724668	Method Blank (MB)
1203724669	Laboratory Control Sample (LCS)
1203726966	415985001(CAMO-17-129293) 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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Consecutive Weight Checks

All consecutive weight checks were met.

Quality Control (QC) Designation

Sample 415985001 (CAMO-17-129293) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1638832

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
416111001	CAMO-17-129289
416111003	CAMO-17-129290
416111005	CAMO-17-129292
1203727093	Laboratory Control Sample (LCS)
1203727095	415847001(WST09-17-129397) 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# 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 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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 415847001 (WST09-17-129397) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1639321 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
416111001	CAMO-17-129289
416111003	CAMO-17-129290
416111005	CAMO-17-129292
1203728231	Laboratory Control Sample (LCS)
1203728232	415847001(WST09-17-129397) Sample Duplicate (DUP)
1203728233	416572010(CAMO-17-129297) 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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 415847001 (WST09-17-129397) and 416572010 (CAMO-17-129297) were selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

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

Sample	Analyte	Value
1203728232 (WST09-17-129397DUP)	pH	Received 08-FEB-17, out of holding 06-FEB-17
1203728233 (CAMO-17-129297DUP)	pH	Received 14-FEB-17, out of holding 10-FEB-17
416111001 (CAMO-17-129289)	pH	Received 10-FEB-17, out of holding 08-FEB-17
416111003 (CAMO-17-129290)	pH	Received 10-FEB-17, out of holding 08-FEB-17
416111005 (CAMO-17-129292)	pH	Received 10-FEB-17, out of holding 08-FEB-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

A data exception report (DER) 1605726 was generated for samples 416111001 (CAMO-17-129289), 416111003 (CAMO-17-129290), 416111005 (CAMO-17-129292), 1203728232 (WST09-17-129397DUP) and 1203728233 (CAMO-17-129297DUP) in this SDG/batch.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1639313 **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
416111001	CAMO-17-129289
416111003	CAMO-17-129290
416111005	CAMO-17-129292
1203728222	Laboratory Control Sample (LCS)
1203728223	415847001(WST09-17-129397) Sample Duplicate (DUP)
1203728224	416572010(CAMO-17-129297) Sample Duplicate (DUP)
1203728225	415847001(WST09-17-129397) Matrix Spike (MS)
1203728226	416572010(CAMO-17-129297) 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 manually operated 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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 415847001 (WST09-17-129397) and 416572010 (CAMO-17-129297) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-993 GEL Work Order: 416111

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: 03 MAR 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: March 3, 2017

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

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

Client SDG: 2017-993

Client Sample ID: CAMO-17-129289
Sample ID: 416111001
Matrix: W
Collect Date: 08-FEB-17 11:04
Receive Date: 10-FEB-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	0.192	0.067	0.200	mg/L		1	MXL2	02/11/17	0450	1638597	1
Fluoride	J	0.0959	0.033	0.100	mg/L		1					
Chloride		12.9	0.134	0.400	mg/L		2	MXL2	02/13/17	1416	1638597	2
Sulfate		24.7	0.266	0.800	mg/L		2					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.102	0.017	0.050	mg/L	1.00	1	KLP1	02/13/17	1209	1638313	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		10.3	0.170	0.500	mg/L		10	AXH3	02/13/17	1356	1638418	4
PO4 "As Received"												
Phosphorus, Total as P		0.303	0.020	0.050	mg/L	1.00	1	KLP1	02/14/17	1351	1638315	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		227	3.40	14.3	mg/L			KLP1	02/14/17	1408	1637881	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		55.0	1.45	4.00	mg/L			RXB5	02/16/17	1308	1639313	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		281	1.00	1.00	umhos/cm		1	VH1	02/14/17	1010	1638832	8
PH "As Received"												
pH at Temp 17.6C	H	8.32	0.010	0.100	SU		1	RXB5	02/16/17	1308	1639321	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/13/17	1000	1638312
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	02/13/17	1700	1638314

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Certificate of Analysis

Report Date: March 3, 2017

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

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

Client SDG: 2017-993

Client Sample ID: CAMO-17-129289
Sample ID: 416111001

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: March 3, 2017

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

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

Client SDG: 2017-993

Client Sample ID: CAMO-17-129305
Sample ID: 416111002
Matrix: W
Collect Date: 08-FEB-17 11:04
Receive Date: 10-FEB-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	0.454	0.330	1.00	mg/L		1	TSM	02/15/17	2328	1639272	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/14/17	1102	1638310	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.140	0.033	0.100	mg/L	1.00	1	KLP1	02/14/17	1134	1637591	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/14/17	0930	1638309
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	02/13/17	1700	1637590

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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Report Date: March 3, 2017

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

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

Client SDG: 2017-993

Client Sample ID: CAMO-17-129290
Sample ID: 416111003
Matrix: W
Collect Date: 08-FEB-17 13:00
Receive Date: 10-FEB-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		0.533	0.067	0.200	mg/L		1	MXL2	02/11/17	0611	1638597	1
Fluoride		0.427	0.033	0.100	mg/L		1					
Chloride		56.0	0.670	2.00	mg/L		10	MXL2	02/13/17	1536	1638597	2
Sulfate		57.2	1.33	4.00	mg/L		10					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0516	0.017	0.050	mg/L	1.00	1	KLP1	02/13/17	1209	1638313	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		9.19	0.170	0.500	mg/L		10	AXH3	02/13/17	1357	1638418	4
PO4 "As Received"												
Phosphorus, Total as P		0.334	0.020	0.050	mg/L	1.00	1	KLP1	02/14/17	1351	1638315	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		416	3.40	14.3	mg/L			KLP1	02/14/17	1408	1637881	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		96.0	1.45	4.00	mg/L			RXB5	02/16/17	1313	1639313	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		550	1.00	1.00	umhos/cm		1	VH1	02/14/17	1010	1638832	8
PH "As Received"												
pH at Temp 17.5C	H	7.52	0.010	0.100	SU		1	RXB5	02/16/17	1313	1639321	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/13/17	1000	1638312
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	02/13/17	1700	1638314

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Certificate of Analysis

Report Date: March 3, 2017

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

Client SDG: 2017-993

Client Sample ID: CAMO-17-129290
Sample ID: 416111003

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

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Los Alamos, New Mexico 87545

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

Client SDG: 2017-993

Client Sample ID: CAMO-17-129306
Sample ID: 416111004
Matrix: W
Collect Date: 08-FEB-17 13:00
Receive Date: 10-FEB-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	0.921	0.330	1.00	mg/L		1	TSM	02/16/17	0014	1639272	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	J	1.84	1.67	5.00	ug/L	1.00	1	AXH3	02/14/17	1103	1638310	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.142	0.033	0.100	mg/L	1.00	1	KLP1	02/14/17	1139	1637591	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/14/17	0930	1638309
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	02/13/17	1700	1637590

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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Report Date: March 3, 2017

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

Client SDG: 2017-993

Client Sample ID: CAMO-17-129292
Sample ID: 416111005
Matrix: W
Collect Date: 08-FEB-17 12:10
Receive Date: 10-FEB-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	02/11/17	0638	1638597	1
Chloride		4.13	0.067	0.200	mg/L		1					
Fluoride	J	0.0959	0.033	0.100	mg/L		1					
Sulfate		6.71	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.103	0.017	0.050	mg/L	1.00	1	KLP1	02/13/17	1210	1638313	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.93	0.085	0.250	mg/L		5	AXH3	02/13/17	1341	1638418	3
PO4 "As Received"												
Phosphorus, Total as P		0.315	0.020	0.050	mg/L	1.00	1	KLP1	02/14/17	1352	1638315	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		154	3.40	14.3	mg/L			KLP1	02/14/17	1408	1637881	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		59.0	1.45	4.00	mg/L			RXB5	02/16/17	1317	1639313	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		152	1.00	1.00	umhos/cm		1	VH1	02/14/17	1011	1638832	7
PH "As Received"												
pH at Temp 17.4C	H	8.31	0.010	0.100	SU		1	RXB5	02/16/17	1317	1639321	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	02/13/17	1000	1638312
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	02/13/17	1700	1638314

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Certificate of Analysis

Report Date: March 3, 2017

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

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

Client SDG: 2017-993

Client Sample ID: CAMO-17-129292
Sample ID: 416111005

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: March 3, 2017

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

Los Alamos, New Mexico 87545

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

Client SDG: 2017-993

Client Sample ID: CAMO-17-129308
Sample ID: 416111006
Matrix: W
Collect Date: 08-FEB-17 12:10
Receive Date: 10-FEB-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	0.355	0.330	1.00	mg/L		1	TSM	02/16/17	0059	1639272	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/14/17	1104	1638310	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.118	0.033	0.100	mg/L	1.00	1	KLP1	02/14/17	1140	1637591	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/14/17	0930	1638309
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	02/13/17	1700	1637590

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

Quality Control Summary

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QC Summary

Report Date: March 3, 2017

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

Contact: Mr. Keith Greene

Workorder: 416111

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1639272										
QC1203728544	416111006	DUP									
Total Organic Carbon Average		J	0.355	U	ND	mg/L	200	^	TSM	02/16/17	01:44
QC1203728543	LCS										
Total Organic Carbon Average	10.0				10.2	mg/L	102	(80%-120%)		02/15/17	23:17
QC1203728542	MB										
Total Organic Carbon Average			U	ND	mg/L					02/15/17	23:02
QC1203728546	416111006	PS									
Total Organic Carbon Average	10.0	J	0.355		10.8	mg/L	104	(75%-125%)		02/16/17	02:29
Flow Injection Analysis											
Batch	1638310										
QC1203725830	415984001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	02/14/17	10:43
QC1203725829	LCS										
Cyanide, Total	50.0				48.3	ug/L	96.6	(90%-110%)		02/14/17	10:41
QC1203725828	MB										
Cyanide, Total			U	ND	ug/L					02/14/17	10:40
QC1203725831	415984001	MS									
Cyanide, Total	100	U	ND		106	ug/L	106	(90%-110%)		02/14/17	10:44
Ion Chromatography											
Batch	1638597										
QC1203726492	416111001	DUP									
Bromide		J	0.192	J	0.193	mg/L	0.779	^	(+/-0.200) MXL2	02/11/17	05:17

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QC Summary

Workorder: 416111

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1638597										
Chloride		12.9		12.9	mg/L	0.0279		(0%-20%)	MXL2	02/13/17	14:43
Fluoride	J	0.0959	J	0.0928	mg/L	3.29	^	(+/-0.100)		02/11/17	05:17
Sulfate		24.7		24.7	mg/L	0.0737		(0%-20%)		02/13/17	14:43
QC1203726491 LCS											
Bromide	1.25			1.20	mg/L		96.3	(80%-120%)		02/11/17	04:23
Chloride	5.00			4.77	mg/L		95.5	(80%-120%)			
Fluoride	2.50			2.34	mg/L		93.5	(80%-120%)			
Sulfate	10.0			9.89	mg/L		98.9	(80%-120%)			
QC1203726490 MB											
Bromide			U	ND	mg/L					02/11/17	03:56
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203726493 416111001 PS											
Bromide	1.25	J	0.192	1.38	mg/L		95.4	(75%-125%)		02/11/17	05:44
Chloride	5.00		6.45	11.8	mg/L		107	(75%-125%)		02/13/17	15:10
Fluoride	2.50	J	0.0959	2.32	mg/L		89.1	(75%-125%)		02/11/17	05:44
Sulfate	10.0		12.3	23.1	mg/L		108	(75%-125%)		02/13/17	15:10

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QC Summary

Workorder: 416111

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1637591										
QC1203725837	415985002	DUP									
Nitrogen, Total Kjeldahl		0.112		0.128	mg/L	13.3	^	(+/-0.100)	KLP1	02/14/17	11:21
QC1203723921	LCS										
Nitrogen, Total Kjeldahl	1.00			0.994	mg/L			99.4	(90%-110%)	02/14/17	10:23
QC1203723920	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					02/14/17	11:27
QC1203725839	415985002	MS									
Nitrogen, Total Kjeldahl	1.00	0.112		1.13	mg/L			102	(90%-110%)	02/14/17	11:21
Batch	1638313										
QC1203725835	415984002	DUP									
Nitrogen, Ammonia		0.0832		0.081	mg/L	2.68	^	(+/-0.050)	KLP1	02/13/17	11:55
QC1203726128	415984004	DUP									
Nitrogen, Ammonia		0.0648		0.085	mg/L	27	^	(+/-0.050)		02/13/17	11:58
QC1203725834	LCS										
Nitrogen, Ammonia	1.00			0.990	mg/L			99	(90%-110%)	02/13/17	11:53
QC1203725833	MB										
Nitrogen, Ammonia			U	ND	mg/L					02/13/17	11:48
QC1203725836	415984002	MS									
Nitrogen, Ammonia	1.00	0.0832		1.06	mg/L			97.7	(90%-110%)	02/13/17	11:56
QC1203726129	415984004	MS									
Nitrogen, Ammonia	1.00	0.0648		1.04	mg/L			97.5	(90%-110%)	02/13/17	11:59
Batch	1638315										
QC1203725844	415984002	DUP									
Phosphorus, Total as P		0.199		0.206	mg/L	3.46	^	(+/-0.050)	KLP1	02/14/17	13:26

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QC Summary

Workorder: 416111

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1638315										
QC1203725842	LCS										
Phosphorus, Total as P	1.00			0.918	mg/L		91.8	(80%-124%)	KLP1	02/14/17	13:24
QC1203725841	MB										
Phosphorus, Total as P			U	ND	mg/L					02/14/17	13:49
QC1203725846	415984002	MS									
Phosphorus, Total as P	1.00	0.199		1.24	mg/L		104	(63%-139%)		02/14/17	13:27
Batch	1638418										
QC1203726123	415984002	DUP									
Nitrogen, Nitrate/Nitrite		2.93		2.96	mg/L	0.85		(0%-20%)	AXH3	02/13/17	13:48
QC1203726121	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.01	mg/L		101	(90%-110%)		02/13/17	13:03
QC1203726120	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					02/13/17	13:02
QC1203726126	415984002	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.586		1.59	mg/L		100	(90%-110%)		02/13/17	13:49
Solids Analysis											
Batch	1637881										
QC1203726966	415985001	DUP									
Total Dissolved Solids		323		340	mg/L	0		(0%-5%)	KLP1	02/14/17	14:08
QC1203724669	LCS										
Total Dissolved Solids	300			297	mg/L		99	(95%-105%)		02/14/17	14:08
QC1203724668	MB										
Total Dissolved Solids			U	ND	mg/L					02/14/17	14:08

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QC Summary

Workorder: 416111

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1638832										
QC1203727095	415847001	DUP									
Conductivity		257		256	umhos/cm	0.39		(0%-10%)	VH1	02/14/17	10:06
QC1203727093	LCS										
Conductivity	1410			1390	umhos/cm		98.3	(95%-105%)		02/14/17	10:04
Batch	1639313										
QC1203728223	415847001	DUP									
Alkalinity, Total as CaCO3		88.0		86.0	mg/L	2.3		(0%-20%)	RXB5	02/16/17	12:24
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203728224	416572010	DUP									
Alkalinity, Total as CaCO3		58.0		59.0	mg/L	1.71		(0%-20%)		02/16/17	13:45
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203728222	LCS										
Alkalinity, Total as CaCO3	100			110	mg/L		110	(90%-110%)		02/16/17	12:12
QC1203728225	415847001	MS									
Alkalinity, Total as CaCO3	100	88.0		177	mg/L		89	(80%-120%)		02/16/17	12:26
QC1203728226	416572010	MS									
Alkalinity, Total as CaCO3	100	58.0		165	mg/L		107	(80%-120%)		02/16/17	13:47
Batch	1639321										
QC1203728232	415847001	DUP									
pH	H	7.82	H	7.81	SU	0.128		(0%-5%)	RXB5	02/16/17	12:20
QC1203728233	416572010	DUP									
pH	H	7.99	H	7.97	SU	0.251		(0%-5%)		02/16/17	13:44

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1639321										
QC1203728231	LCS										
pH	7.00			6.97	SU		99.6	(99%-101%)	RXB5	02/16/17	12:03

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.

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 16-FEB-17	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: EPA 150.1	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1639321	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 415847(2017-978),415848(2017-977),415984(2017-986),415985(2017-985),416111(2017-993),416562(2017-1003),416572(2017-1005),416765(2017-1019) Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample received out of holding: 415847 001,005 415848 005 415984 002,004 415985 001,004 416111 001,003,005 416562 001 416572 001,004,005,006,008,010 416765 001 QC 1203728232DUP,1203728233DUP		1. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 1203728232 (WST09-17-129397DUP) [Received 08-FEB-17, out of holding 06-FEB-17]. 1203728233 (CAMO-17-129297DUP) [Received 14-FEB-17, out of holding 10-FEB-17]. 415847001 (WST09-17-129397) [Received 08-FEB-17, out of holding 06-FEB-17]. 415847005 (WST09-17-129398) [Received 08-FEB-17, out of holding 06-FEB-17]. 415848005 (CTU6A-17-130110) [Received 08-FEB-17, out of holding 06-FEB-17]. 415984002 (CAMO-17-129411) [Received 09-FEB-17, out of holding 07-FEB-17]. 415984004 (CAMO-17-129412) [Received 09-FEB-17, out of holding 07-FEB-17]. 415985001 (CAMO-17-129293) [Received 09-FEB-17, out of holding 07-FEB-17]. 415985004 (CAMO-17-129322) [Received 09-FEB-17, out of holding 07-FEB-17]. 416111001 (CAMO-17-129289) [Received 10-FEB-17, out of holding 08-FEB-17]. 416111003 (CAMO-17-129290) [Received 10-FEB-17, out of holding 08-FEB-17]. 416111005 (CAMO-17-129292) [Received 10-FEB-17, out of holding 08-FEB-17]. 416562001 (CASA-17-129325) [Received 14-FEB-17, out of holding 09-FEB-17]. 416572001 (CASA-17-129323) [Received 14-FEB-17, out of holding 09-FEB-17]. 416572004 (CASA-17-129339) [Received 14-FEB-17, out of holding 09-FEB-17]. 416572005 (CAMO-17-129578) [Received 14-FEB-17, out of holding 09-FEB-17]. 416572006 (CAMO-17-129291) [Received 14-FEB-17, out of holding 10-FEB-17]. 416572008 (CASA-17-129326) [Received 14-FEB-17, out of holding 09-FEB-17]. 416572010 (CAMO-17-129297) [Received 14-FEB-17, out of holding 10-FEB-17]. 416765001 (CAMO-17-129353) [Received 16-FEB-17, out of holding 14-FEB-17].	

Originator's Name:

Rachael Bell

16-FEB-17

Data Validator/Group Leader:

Elzbieta Szulc

23-FEB-17

Originator's Name:

Rachael Bell 16-FEB-17

Data Validator/Group Leader:

Elzbieta Szulc 23-FEB-17