

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)
MY2015 Q4 Watershed Sampling_Mortandad

SAMPLE ID: CAMO-15-102588

WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	8-5-15	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1504		MEDIA:	UA	↓
PRS ID:	OK		SAMPLE TECH CODE:	UA	GSP
LOCATION ID:	R-50 S1		FIELD PREP:	UF	OK
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: NA

LOCATION COMMENTS: Sampled 50 ft from diesel generator

FIELD PARAMETERS:

Dissolved Oxygen	<u>5.52</u>	mg/L	Flow (in gpm)	<u>2.56</u>	GPM	Oxidation-Reduction Potential	<u>58.9</u>	mV
pH	<u>7.79</u>	SU	Specific Conductance	<u>199</u>	uS/cm	Temperature	<u>21.90</u>	deg C
Turbidity	<u>0.7</u>	NTU						

COLLECTED BY (PRINT): A. Stocker

RELINQUISHED BY (Printed Name) Tanner Bonham (Signature) <i>Tanner Bonham</i>	Date/Time 8-5-15 1600	RECEIVED BY (Printed Name) J. Sherwood (Signature) <i>J. Sherwood</i>	Date/Time 8/5/15 1600
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)
MY2015 Q4 Watershed Sampling_Mortandad

SAMPLE ID: CAMO-15-102589

WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	8-5-15	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1307		MEDIA:	UA	OK
PRS ID:	OK		SAMPLE TECH CODE:	UA	GSP
LOCATION ID:	R-50 S2		FIELD PREP:	UF	OK
LOCATION TYPE:	MON		FIELD QC TYPE:	REG	
TOP DEPTH:	OK		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:	YES / NO / <u>NA</u>	

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

SAMPLE COMMENTS: M

LOCATION COMMENTS: Sampled SO A from Diesel generator

FIELD PARAMETERS:

Dissolved Oxygen	8.12	mg/L	Flow (in gpm)	1.69	GPM	Oxidation-Reduction Potential	70.8	mV
pH	7.81	SU	Specific Conductance	136	uS/cm	Temperature	21.68	deg C
Turbidity	16.0	NTU						

COLLECTED BY (PRINT): A. Stocker

RELINQUISHED BY (Printed Name) (Signature)	Tanner Bonham <i>Tanner Bonham</i>	Date/Time 8-5-15 1600	RECEIVED BY (Printed Name) (Signature)	S. Sherwood <i>S. Sherwood</i>	Date/Time 8/5/15 1600
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)
MY2015 Q4 Watershed Sampling_Mortandad

SAMPLE ID: CAMO-15-102612

WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	8-5-15	at	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1504		MEDIA:	UA	↓
PRS ID:	OK		SAMPLE TECH CODE:	UA	GSP
LOCATION ID:	R-50 S1		FIELD PREP:	F	OK
LOCATION TYPE:	MON		FIELD QC TYPE:	REG	↓
TOP DEPTH:	OK		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:	YES / NO / <u>NA</u>	

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

SAMPLE COMMENTS: NA

LOCATION COMMENTS: Sampled 50 ft. from diesel generator

FIELD PARAMETERS:

Dissolved Oxygen	5.52	mg/L	Flow (in gpm)	2.56	GPM	Oxidation-Reduction Potential	58.9	mV
pH	7.79	SU	Specific Conductance	199	uS/cm	Temperature	21.90	deg C
Turbidity	0.7	NTU						

COLLECTED BY (PRINT): A. Stocker

RELINQUISHED BY (Printed Name) Tanner Bonham	Date/Time 8-5-15 1600	RECEIVED BY (Printed Name) D. Sherwood	Date/Time 8/5/15 1600
RELINQUISHED BY (Signature) <i>Tanner Bonham</i>		RECEIVED BY (Signature) <i>D. Sherwood</i>	
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)
MY2015 Q4 Watershed Sampling_Mortandad

SAMPLE ID: CAMO-15-102613

WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	8-5-15	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1307	↓	MEDIA:	UA	↓
PRS ID:	OK	↓	SAMPLE TECH CODE:	UA	GSP
LOCATION ID:	R-50 S2	↓	FIELD PREP:	F	OK
LOCATION TYPE:	MON	↓	FIELD QC TYPE:	REG	↓
TOP DEPTH:	OK	↓	SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:	YES / NO / <u>NA</u>	

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

SAMPLE COMMENTS: NA

LOCATION COMMENTS: Sampled 50 ft from Diesel generator

FIELD PARAMETERS:

Dissolved Oxygen	8.12	mg/L	Flow (in gpm)	1.69	GPM	Oxidation-Reduction Potential	20.8	mV
pH	7.81	SU	Specific Conductance	136	uS/cm	Temperature	21.68	deg C
Turbidity	16.0	NTU						

COLLECTED BY (PRINT): A. Stocker

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 8-5-15 1600	RECEIVED BY (Printed Name) (Signature)	Date/Time 8/5/15 1600
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

DATA VALIDATION REPORT

Chain Of Custody No. 2015-2048

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
378836	EPA:120.1	2				
378836	EPA:150.1	2				
378836	EPA:160.1	2				
378836	EPA:245.2	4				
378836	EPA:300.0	2				
378836	EPA:310.1	2				
378836	EPA:335.4	2				
378836	EPA:350.1	2				
378836	EPA:351.2	2				
378836	EPA:353.2	2				
378836	EPA:365.4	2				
378836	SM:A2340B	2				
378836	SW-846:6010C	2				
378836	SW-846:6020	2				
378836	SW-846:6850	2				
378836	SW-846:9060	2				

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
378836	EPA:120.1	1499473	1499473	2										1				1			
378836	EPA:150.1	1499481	1499481	2										1				2			
378836	EPA:160.1	1498978	1498978	2					1					1				1			
378836	EPA:245.2	1502174	1502173	4					1	2				1				2			
378836	EPA:300.0	1498824	1498824	2					1					1				1			
378836	EPA:310.1	1499840	1499840	2					1	1				1				1			
378836	EPA:335.4	1498586	1498585	2					1	1				1				1			
378836	EPA:350.1	1498650	1498649	2					1	1				1				1			

DATA VALIDATION REPORT

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
378836	EPA:351.2	1498653	1498652	2					1	1				1				1			
378836	EPA:353.2	1498592	1498592	2					1					1				1			
378836	EPA:365.4	1498655	1498654	2					1	1				1				1			
378836	SM:A2340B	1501953	1501953	1																	
378836	SM:A2340B	1503257	1503257	1																	
378836	SW-846:6010C	1498686	1498684	2					1	1				1				1			
378836	SW-846:6020	1498697	1498696	2					1	1				1				1			
378836	SW-846:6850	1497475	1497474	2					1	1	1			1							
378836	SW-846:9060	1500166	1500166	2					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-15-102612	378836002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-15-102613	378836004	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CASA-15-102651	1203371783	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203371781	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-15-102610	1203371822	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-15-102612	1203371823	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-15-102612	378836002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-15-102613	378836004	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203371821	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-15-102610	1203370405	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-15-102612	378836002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-15-102613	378836004	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203370404	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203370403	MB	1	0	0	0
EPA:245.2	INORGANIC	CAMO-15-102588	378836001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-15-102589	378836003	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-15-102612	378836002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-15-102613	378836004	REG	1	0	0	0
EPA:245.2	INORGANIC	CASA-15-102633	1203378894	DUP	1	0	0	0
EPA:245.2	INORGANIC	CASA-15-102633	1203378896	MS	0	0	1	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:245.2	INORGANIC	LCS	1203378892	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203378891	MB	1	0	0	0
EPA:245.2	INORGANIC	WT_IPC-15-101991	1203378893	DUP	1	0	0	0
EPA:245.2	INORGANIC	WT_IPC-15-101991	1203378895	MS	0	0	1	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-15-102610	1203370128	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-15-102612	378836002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-15-102613	378836004	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203370127	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203370126	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-15-102612	378836002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-15-102613	378836004	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-15-102647	1203372714	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-15-102647	1203372716	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203372712	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1203372710	MB	2	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-15-102586	1203369466	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-15-102586	1203369468	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-15-102588	378836001	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-15-102589	378836003	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203369464	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203369463	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-15-102612	1203369691	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-15-102612	1203369692	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-15-102612	378836002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-15-102613	378836004	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203369688	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203369687	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-15-102588	1203369695	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-15-102588	1203369696	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-15-102588	378836001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-15-102589	378836003	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203369694	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203369693	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-15-102610	1203370075	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-15-102612	378836002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-15-102613	378836004	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203369489	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203369488	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-15-102612	1203369699	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-15-102612	1203369700	MS	0	0	1	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:365.4	GENERAL CHEMISTRY	CAMO-15-102612	378836002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-15-102613	378836004	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203369698	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203369697	MB	1	0	0	0
SM:A2340B	INORGANIC	CAMO-15-102612	378836002	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-15-102613	378836004	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAMO-15-102610	1203369766	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-15-102610	1203369767	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAMO-15-102612	378836002	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-15-102613	378836004	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203369765	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203369764	MB	17	0	0	0
SW-846:6020	INORGANIC	CAMO-15-102612	378836002	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-15-102613	1203369807	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAMO-15-102613	1203369808	MS	0	0	11	0
SW-846:6020	INORGANIC	CAMO-15-102613	378836004	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203369806	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203369805	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-15-102612	378836002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-15-102613	378836004	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-15-100894	1203366644	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-15-100894	1203366645	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203366643	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203366642	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-15-102573	1203373636	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-15-102588	378836001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-15-102589	378836003	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203373634	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203373633	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

DATA VALIDATION REPORT

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203369693	METHOD BLANK	EPA:351.2	W	Total Kjeldahl Nitrogen	0.0529	J	mg/L	0.100
MB	1203378891	METHOD BLANK	EPA:245.2	W	Mercury	.083	J	ug/L	0.200

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAMO-15-102589	1203378891	METHOD BLANK	EPA:245.2	Mercury	.083	ug/L	.069	J	0.200	Y	5	100	Y
CAMO-15-102613	1203378891	METHOD BLANK	EPA:245.2	Mercury	.083	ug/L	.069	J	0.200	Y	5	100	Y
CAMO-15-102589	1203369693	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	0.0529	mg/L	0.0515	J	0.100	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

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

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
CAMO-15-102586	1203369468		EPA:335.4	Cyanide (Total)	1498585	08-12-2015	W	113		110	90	10		

DATA VALIDATION REPORT

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-50 S2	2015-2048	CAMO-15-102589	REG	INIT	INORGANIC	EPA:245.2	Mercury	J	U	4	N	.069	ug/L	.069	ug/L			W	08/05/2015		1502174	VAL	Y
R-50 S2	2015-2048	CAMO-15-102589	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	J	U	4	N	0.0515	mg/L	0.0515	mg/L			W	08/05/2015		1498653	VAL	Y
R-50 S2	2015-2048	CAMO-15-102613	REG	INIT	INORGANIC	EPA:245.2	Mercury	J	U	4	N	.069	ug/L	.069	ug/L			W	08/05/2015		1502174	VAL	Y

Reason Code

Description

I4

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

J_LAB

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

NQ

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

U_LAB

The analytical laboratory qualified the analyte as not detected.

DATA VALIDATION REPORT

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-15-102588	R-50 S1	REG	EPA:245.2	0	1
CAMO-15-102588	R-50 S1	REG	EPA:335.4	0	1
CAMO-15-102588	R-50 S1	REG	EPA:351.2	0	1
CAMO-15-102588	R-50 S1	REG	SW-846:9060	0	1
CAMO-15-102589	R-50 S2	REG	EPA:245.2	0	1
CAMO-15-102589	R-50 S2	REG	EPA:335.4	0	1
CAMO-15-102589	R-50 S2	REG	EPA:351.2	0	1
CAMO-15-102589	R-50 S2	REG	SW-846:9060	0	1
CAMO-15-102612	R-50 S1	REG	EPA:120.1	0	1
CAMO-15-102612	R-50 S1	REG	EPA:150.1	0	1
CAMO-15-102612	R-50 S1	REG	EPA:160.1	0	1
CAMO-15-102612	R-50 S1	REG	EPA:245.2	0	1
CAMO-15-102612	R-50 S1	REG	EPA:300.0	0	4
CAMO-15-102612	R-50 S1	REG	EPA:310.1	0	2
CAMO-15-102612	R-50 S1	REG	EPA:350.1	0	1
CAMO-15-102612	R-50 S1	REG	EPA:353.2	0	1
CAMO-15-102612	R-50 S1	REG	EPA:365.4	0	1
CAMO-15-102612	R-50 S1	REG	SM:A2340B	0	1
CAMO-15-102612	R-50 S1	REG	SW-846:6010C	0	17
CAMO-15-102612	R-50 S1	REG	SW-846:6020	0	11
CAMO-15-102612	R-50 S1	REG	SW-846:6850	0	1
CAMO-15-102613	R-50 S2	REG	EPA:120.1	0	1
CAMO-15-102613	R-50 S2	REG	EPA:150.1	0	1
CAMO-15-102613	R-50 S2	REG	EPA:160.1	0	1
CAMO-15-102613	R-50 S2	REG	EPA:245.2	0	1
CAMO-15-102613	R-50 S2	REG	EPA:300.0	0	4
CAMO-15-102613	R-50 S2	REG	EPA:310.1	0	2
CAMO-15-102613	R-50 S2	REG	EPA:350.1	0	1
CAMO-15-102613	R-50 S2	REG	EPA:353.2	0	1
CAMO-15-102613	R-50 S2	REG	EPA:365.4	0	1
CAMO-15-102613	R-50 S2	REG	SM:A2340B	0	1
CAMO-15-102613	R-50 S2	REG	SW-846:6010C	0	17
CAMO-15-102613	R-50 S2	REG	SW-846:6020	0	11
CAMO-15-102613	R-50 S2	REG	SW-846:6850	0	1



September 02, 2015

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: 378836
SDG: 2015-2048

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on August 07, 2015, 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,

Hope Taylor for
Valerie Davis
Project Manager

Chain of Custody: 2015-2048
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 378836
SDG: 2015-2048

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 378836
SDG # : 2015-2048**

September 02, 2015

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on August 07, 2015 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>
378836001	CAMO-15-102588
378836002	CAMO-15-102612
378836003	CAMO-15-102589
378836004	CAMO-15-102613

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.

top a d

Hope Taylor for
Valerie Davis
Project Manager

List of current GEL Certifications as of 02 September 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
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	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-18
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation



SAMPLE RECEIPT & REVIEW FORM

Client: <u>LANL</u>		SDG/AR/COC/Work Order: <u>2015-2048</u>	
Received By: <u>Brielle Luthman</u>		Date Received: <u>8/7/15 0910</u>	
Suspected Hazard Information	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>6</u>
Classified Radioactive II or III by RSO?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____
Samples identified as Foreign Soil?	<input type="checkbox"/>	<input checked="" 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
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>E5032015835</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 (EPA 6850) have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
8 Are Encore containers present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
9 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
10 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:
11 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>5908 1779 2797-3°</u> <u>5908 1779 2823-3°</u>

Comments (Use Continuation Form if needed):

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

SHIP DATE: 06AUG15
ACTWGT: 60.0 LB MAN
CAD: 0014176/CAFE2807

LOS ALAMOS, NM 87545
UNITED STATES US

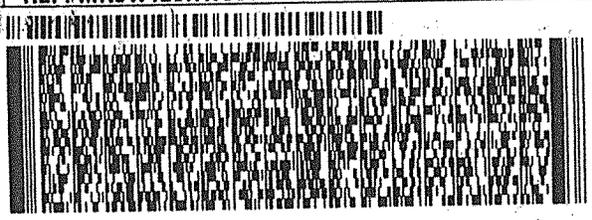
BILL SENDER

0 VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 668-8171
REF: MRSW12CHWCCO

521C1/FECA/6F03



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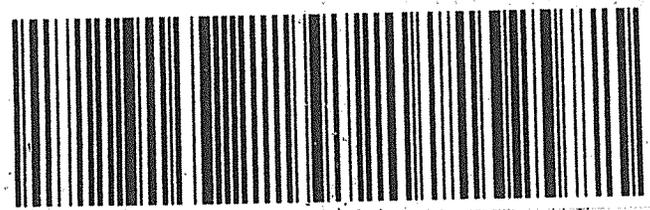
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PRIORITY OVERNIGHT

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Post # 156148-434 RIT2 10/11



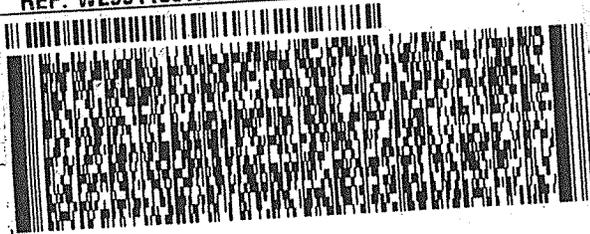
ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

10 VALERIE DAVIS
GENERAL ENGINEER
2040 SAVAGE RD

CHARLESTON SC 29407

(848) 666-8171
REF: WE991165W300



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Express



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Metr# 5908 1779 2812

0201

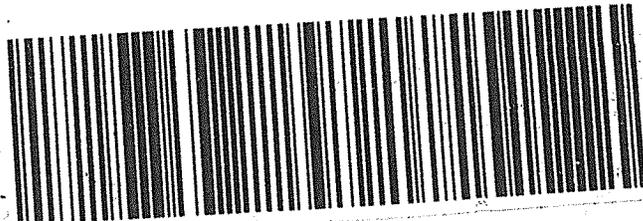
X7 CHSA

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FRI - 07 AUG 10:30A
PRIORITY OVERNIGHT

29407
SC-US CHS

Part # 456140-434 RIT2 10/11



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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 #: 2015-2048
Work Order #: 378836**

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: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1497475

Prep Batch Number: 1497474

Sample Analysis

Sample ID	Client ID
378836002	CAMO-15-102612
378836004	CAMO-15-102613
1203366646	Interference Check Sample (ICS)
1203366642	Method Blank (MB)
1203366643	Laboratory Control Sample (LCS)
1203366644	378336005(CAPA-15-100894) Matrix Spike (MS)
1203366645	378336005(CAPA-15-100894) 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# 12.

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 378336005 (CAPA-15-100894) 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.

Retention Time Standard Area Acceptance

The retention time 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 Method 332.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information

Holding Time Specifications

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

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

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 not internally corrected for using Perchlorate-O (18). They are external calibrations.

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: 2015-2048 GEL Work Order: 378836

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, 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: 19 AUG 2015

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample No.

CAMO-15-102612Lab Code: GELDate Received: 07-AUG-15Instrument: LCMSMSGEL Job No (SDG): 2015-2048Method: SW846 6850 ModifiedGEL Sample ID: 378836002Matrix: WATERDate Filtered: 08-AUG-15Extraction Batch ID: 1497474Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids: .

Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.586	ug/L		1	11-AUG-15 18:17	per0811029a
	Perchlorate Isotope Ratio			3.02			1	11-AUG-15 18:17	per0811029a
14797-73-0	Perchlorate-101	.05	.2	0.588	ug/L		1	11-AUG-15 18:17	per0811029a
	Perchlorate-O(18)			0.513	ug/L		1	11-AUG-15 18:17	per0811029a

^ 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 LLC

Client Sample No.

CAMO-15-102613Lab Code: GELDate Received: 07-AUG-15Instrument: LCMSMSGEL Job No (SDG): 2015-2048Method: SW846 6850 ModifiedGEL Sample ID: 378836004Matrix: WATERDate Filtered: 08-AUG-15Extraction Batch ID: 1497474Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids: .

Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.307	ug/L		1	11-AUG-15 18:25	per0811030a
	Perchlorate Isotope Ratio			2.97			1	11-AUG-15 18:25	per0811030a
14797-73-0	Perchlorate-101	.05	.2	0.314	ug/L		1	11-AUG-15 18:25	per0811030a
	Perchlorate-O(18)			0.479	ug/L		1	11-AUG-15 18:25	per0811030a

^ 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): 2015-2048

Extract Batch Code: 1497474

Date Filtered: 08-AUG-15

Matrix: WATER

Sample ID: 1203366643

Analyte [^]	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.194	ug/L	96.9		85 - 115
Perchlorate Isotope Ratio		3.17				-
Perchlorate-101	0.200	.186	ug/L	92.8		85 - 115
Perchlorate-O(18)		.493	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): 2015-2048

Extract Batch Code: 1497474

Date Extracted: 08-AUG-15

GEL MS/PS ID: 1203366644

Client ID: CAPA-15-100894

GEL MSD/PSD ID: 1203366645

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	0.251	ug/L	0.419	84	.425	87.1	1.46	30	75 - 125
Perchlorate Isotope Ratio	0	3.01		3.06		3.05		.333		-
Perchlorate-101	0.200	0.253	ug/L	0.415	80.7	.422	84.5	1.8	30	75 - 125
Perchlorate-O(18)	0	0.495	ug/L	0.483		.468		3.09		-

^ 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 LLC

Client Sample No.

MBLab Code: GELDate Received: 08-AUG-15Instrument: LCMSMSGEL Job No (SDG): 2015-2048Method: EPA 6850 ModifiedGEL Sample ID: 1203366642Matrix: WATERDate Filtered: 08-AUG-15Extraction Batch ID: 1497474Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids: .

Concentrated Extract Volume: 10.0

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	11-AUG-15 15:53	per0811012a
	Perchlorate Isotope Ratio						1	11-AUG-15 15:53	per0811012a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	11-AUG-15 15:53	per0811012a
	Perchlorate-O(18)			0.492	ug/L		1	11-AUG-15 15:53	per0811012a

^ 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: 1497474Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 08-AUG-15GEL Job No (SDG): 2015-2048GEL Sample ID: 1203366643Date Filtered: 08-AUG-15Injection 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	0.194	ug/L	J	1	11-AUG-15 16:01	per0811013a
	Perchlorate Isotope Ratio			3.17			1	11-AUG-15 16:01	per0811013a
14797-73-0	Perchlorate-101	.05	.2	0.186	ug/L	J	1	11-AUG-15 16:01	per0811013a
	Perchlorate-O(18)			0.493	ug/L		1	11-AUG-15 16:01	per0811013a

^ 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 LLC

Client Sample No.

ICSLab Code: GEL

Date Received:

Instrument: LCMSMSGEL Job No (SDG): 2015-2048Method: SW846 6850 ModifiedGEL Sample ID: 1203366646Matrix: WATERDate Filtered: 08-AUG-15Extraction Batch ID: 1497474Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids:

Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.218	ug/L		1	11-AUG-15 16:10	per0811014a
	Perchlorate Isotope Ratio			3.17			1	11-AUG-15 16:10	per0811014a
14797-73-0	Perchlorate-101	.05	.2	0.208	ug/L		1	11-AUG-15 16:10	per0811014a
	Perchlorate-O(18)			0.486	ug/L		1	11-AUG-15 16:10	per0811014a

^ 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: 1497474Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-15-100894MSDate Received: 31-JUL-15GEL Job No (SDG): 2015-2048GEL Sample ID: 1203366644Date Filtered: 08-AUG-15Injection 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	0.419	ug/L		1	11-AUG-15 16:52	per0811019a
	Perchlorate Isotope Ratio			3.06			1	11-AUG-15 16:52	per0811019a
14797-73-0	Perchlorate-101	.05	.2	0.415	ug/L		1	11-AUG-15 16:52	per0811019a
	Perchlorate-O(18)			0.483	ug/L		1	11-AUG-15 16:52	per0811019a

^ 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: 1497474Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-15-100894MSDDate Received: 31-JUL-15GEL Job No (SDG): 2015-2048GEL Sample ID: 1203366645Date Filtered: 08-AUG-15Injection 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	0.425	ug/L		1	11-AUG-15 17:01	per0811020a
	Perchlorate Isotope Ratio			3.05			1	11-AUG-15 17:01	per0811020a
14797-73-0	Perchlorate-101	.05	.2	0.422	ug/L		1	11-AUG-15 17:01	per0811020a
	Perchlorate-O(18)			0.468	ug/L		1	11-AUG-15 17:01	per0811020a

^ 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 #: 2015-2048
Work Order #: 378836

Sample ID	Client ID
378836001	CAMO-15-102588
378836002	CAMO-15-102612
378836003	CAMO-15-102589
378836004	CAMO-15-102613
1203369764	Method Blank (MB)ICP
1203369765	Laboratory Control Sample (LCS)
1203369768	378830002(CAMO-15-102610L) Serial Dilution (SD)
1203369766	378830002(CAMO-15-102610D) Sample Duplicate (DUP)
1203369767	378830002(CAMO-15-102610S) Matrix Spike (MS)
1203369805	Method Blank (MB)ICP-MS
1203369806	Laboratory Control Sample (LCS)
1203369809	378836004(CAMO-15-102613L) Serial Dilution (SD)
1203369807	378836004(CAMO-15-102613D) Sample Duplicate (DUP)
1203369808	378836004(CAMO-15-102613S) Matrix Spike (MS)
1203378891	Method Blank (MB)CVAA
1203378892	Laboratory Control Sample (LCS)
1203378897	378716001(WT_IPC-15-101991L) Serial Dilution (SD)
1203378893	378716001(WT_IPC-15-101991D) Sample Duplicate (DUP)
1203378895	378716001(WT_IPC-15-101991S) Matrix Spike (MS)

Sample Analysis

Method/Analysis Information

Analytical Batch:	1498686, 1498697, 1502174, 1501953 and 1503257
Prep Batch :	1498684, 1498696 and 1502173
Standard Operating Procedures:	GL-MA-E-013 REV# 24, GL-MA-E-006 REV# 12, GL-MA-E-014 REV# 26, GL-MA-E-010 REV# 30 and GL-GC-E-107 REV# 9
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C met the control limits with the exception of sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 378836002 (CAMO-15-102612) and 378836004 (CAMO-15-102613)-ICP.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

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: 378830002 (CAMO-15-102610)-ICP, 378836004 (CAMO-15-102613)-ICP-MS and 378716001 (WT_IPC-15-101991)-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: 2015-2048 GEL Work Order: 378836

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, 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: 03 SEP 2015

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2015-2048

CONTRACT: ESHL00114

METHOD TYPE: EPA

SAMPLE ID:378836001

BASIS: As Received

DATE COLLECTED 05-AUG-15

CLIENT ID: CAMO-15-102588

LEVEL: Low

DATE RECEIVED 07-AUG-15

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	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTMI	08/24/15 13:24	082415W1-4	1502174

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1502174	1502173	EPA 245.1/245.2 Prep	20	mL	20	mL	08/21/15	AXS5

***Analytical Methods:**

AV EPA 245.1/245.2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2015-2048

CONTRACT: ESHL00114

METHOD TYPE: EPA

SAMPLE ID:378836002

BASIS: As Received

DATE COLLECTED 05-AUG-15

CLIENT ID: CAMO-15-102612

LEVEL: Low

DATE RECEIVED 07-AUG-15

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	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTMI	08/24/15 13:26	082415W1-4	1502174

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2015-2048

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 378836002

BASIS: As Received

DATE COLLECTED 05-AUG-15

CLIENT ID: CAMO-15-102612

LEVEL: Low

DATE RECEIVED 07-AUG-15

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	68	ug/L	U	68	200	200	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	08/12/15 01:31	150811-2	1498697
7440-38-2	Arsenic	2.09	ug/L	J	1.7	5	5	1	MS	BAJ	08/12/15 01:31	150811-2	1498697
7440-39-3	Barium	18.6	ug/L		1	5	5	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-42-8	Boron	15.9	ug/L	J	15	50	50	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-43-9	Cadmium	0.110	ug/L	U	0.11	1	1	1	MS	BAJ	08/12/15 01:31	150811-2	1498697
7440-70-2	Calcium	16500	ug/L		50	200	200	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-47-3	Chromium	103	ug/L		2	10	10	1	MS	BAJ	08/12/15 01:31	150811-2	1498697
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	08/12/15 01:31	150811-2	1498697
7439-95-4	Magnesium	4990	ug/L		110	300	300	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7439-98-7	Molybdenum	0.878	ug/L		0.165	0.5	0.5	1	MS	BAJ	08/12/15 01:31	150811-2	1498697
7440-02-0	Nickel	8.34	ug/L		0.5	2	2	1	MS	BAJ	08/12/15 01:31	150811-2	1498697
7440-09-7	Potassium	1520	ug/L		50	150	150	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7782-49-2	Selenium	1.5	ug/L	U	1.5	5	5	1	MS	BAJ	08/12/15 01:31	150811-2	1498697
7631-86-9	Silica	68800	ug/L		53	213	213	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-22-4	Silver	0.20	ug/L	U	0.2	1	1	1	MS	BAJ	08/12/15 01:31	150811-2	1498697
7440-23-5	Sodium	13600	ug/L		100	300	300	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-24-6	Strontium	65.5	ug/L		1	5	5	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-28-0	Thallium	0.450	ug/L	U	0.45	2	2	1	MS	BAJ	08/12/15 01:31	150811-2	1498697
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-61-1	Uranium	0.549	ug/L		0.067	0.2	0.2	1	MS	BAJ	08/13/15 07:21	150812-3	1498697
7440-62-2	Vanadium	4.95	ug/L	J	1	5	5	1	P	HSC	08/17/15 22:01	081715A-1	1498686
7440-66-6	Zinc	4.16	ug/L	J	3.3	10	10	1	P	HSC	08/17/15 22:01	081715A-1	1498686

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2015-2048

CONTRACT: ESHL00114

METHOD TYPE:

SAMPLE ID:378836002

BASIS: As Received

DATE COLLECTED 05-AUG-15

CLIENT ID: CAMO-15-102612

LEVEL: Low

DATE RECEIVED 07-AUG-15

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	61.8	mg/L		0.453	1.24	1.24	1		JJ2	08/20/15 10:45		1501953

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1498686	1498684	SW846 3005A	50	mL	50	mL	08/13/15	JXM5
1498697	1498696	SW846 3005A	50	mL	50	mL	08/07/15	JP1
1502174	1502173	EPA 245.1/245.2 Prep	20	mL	20	mL	08/21/15	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: 2015-2048

CONTRACT: ESHL00114

METHOD TYPE: EPA

SAMPLE ID:378836003

BASIS: As Received

DATE COLLECTED 05-AUG-15

CLIENT ID: CAMO-15-102589

LEVEL: Low

DATE RECEIVED 07-AUG-15

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	0.069	ug/L	J	0.067	0.2	0.2	1	AV	MTM1	08/24/15 13:27	082415W1-4	1502174

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1502174	1502173	EPA 245.1/245.2 Prep	20	mL	20	mL	08/21/15	AXS5

***Analytical Methods:**

AV EPA 245.1/245.2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2015-2048

CONTRACT: ESHL00114

METHOD TYPE: EPA

SAMPLE ID:378836004

BASIS: As Received

DATE COLLECTED 05-AUG-15

CLIENT ID: CAMO-15-102613

LEVEL: Low

DATE RECEIVED 07-AUG-15

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	0.069	ug/L	J	0.067	0.2	0.2	1	AV	MTMI	08/24/15 13:29	082415W1-4	1502174

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2015-2048

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 378836004

BASIS: As Received

DATE COLLECTED 05-AUG-15

CLIENT ID: CAMO-15-102613

LEVEL: Low

DATE RECEIVED 07-AUG-15

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	68	ug/L	U	68	200	200	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	08/12/15 01:44	150811-2	1498697
7440-38-2	Arsenic	2.12	ug/L	J	1.7	5	5	1	MS	BAJ	08/12/15 01:44	150811-2	1498697
7440-39-3	Barium	25	ug/L		1	5	5	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-42-8	Boron	16	ug/L	J	15	50	50	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-43-9	Cadmium	0.110	ug/L	U	0.11	1	1	1	MS	BAJ	08/12/15 01:44	150811-2	1498697
7440-70-2	Calcium	11700	ug/L		50	200	200	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-47-3	Chromium	3.73	ug/L	J	2	10	10	1	MS	BAJ	08/12/15 01:44	150811-2	1498697
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	08/12/15 01:44	150811-2	1498697
7439-95-4	Magnesium	4180	ug/L		110	300	300	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7439-98-7	Molybdenum	1.11	ug/L		0.165	0.5	0.5	1	MS	BAJ	08/12/15 01:44	150811-2	1498697
7440-02-0	Nickel	0.924	ug/L	J	0.5	2	2	1	MS	BAJ	08/12/15 01:44	150811-2	1498697
7440-09-7	Potassium	1380	ug/L		50	150	150	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7782-49-2	Selenium	1.5	ug/L	U	1.5	5	5	1	MS	BAJ	08/12/15 01:44	150811-2	1498697
7631-86-9	Silica	77200	ug/L		53	213	213	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-22-4	Silver	0.20	ug/L	U	0.2	1	1	1	MS	BAJ	08/12/15 01:44	150811-2	1498697
7440-23-5	Sodium	10800	ug/L		100	300	300	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-24-6	Strontium	49.6	ug/L		1	5	5	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-28-0	Thallium	0.450	ug/L	U	0.45	2	2	1	MS	BAJ	08/12/15 01:44	150811-2	1498697
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-61-1	Uranium	0.517	ug/L		0.067	0.2	0.2	1	MS	BAJ	08/13/15 07:26	150812-3	1498697
7440-62-2	Vanadium	7.41	ug/L		1	5	5	1	P	HSC	08/17/15 22:05	081715A-1	1498686
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	08/17/15 22:05	081715A-1	1498686

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2015-2048

CONTRACT: ESHL00114

METHOD TYPE:

SAMPLE ID:378836004

BASIS: As Received

DATE COLLECTED 05-AUG-15

CLIENT ID: CAMO-15-102613

LEVEL: Low

DATE RECEIVED 07-AUG-15

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	46.5	mg/L		0.453	1.24	1.24	1		JJ2	08/26/15 12:52		1503257

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1498686	1498684	SW846 3005A	50	mL	50	mL	08/13/15	JXM5
1498697	1498696	SW846 3005A	50	mL	50	mL	08/07/15	JP1
1502174	1502173	EPA 245.1/245.2 Prep	20	mL	20	mL	08/21/15	AXS5

***Analytical Methods:**

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

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2015-2048
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>
1203369764								
	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
1203369805								
	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	1.7	ug/L	+/-5	U	MS	1.7	5
	Cadmium	0.11	ug/L	+/-1	U	MS	0.11	1
	Chromium	2	ug/L	+/-10	U	MS	2	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.165	ug/L	+/-0.5	U	MS	0.165	0.5
	Nickel	0.5	ug/L	+/-2	U	MS	0.5	2
	Selenium	1.5	ug/L	+/-5	U	MS	1.5	5
	Silver	0.2	ug/L	+/-1	U	MS	0.2	1
	Thallium	0.45	ug/L	+/-2	U	MS	0.45	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203378891								
	Mercury	0.083	ug/L	+/-0.2	J	AV	0.067	0.2

*Analytical Methods:

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

METALS

-5a-

Matrix Spike Summary

SDG NO. 2015-2048 Client ID: CAMO-15-102610S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 378830002 Spike ID: 1203369767

<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	5080		68	U	5000	101		P
Barium	ug/L	75-125	552		28.9		500	105		P
Beryllium	ug/L	75-125	526		1	U	500	105		P
Boron	ug/L	75-125	558		18.4	J	500	108		P
Calcium	ug/L	75-125	23400		18400		5000	101		P
Cobalt	ug/L	75-125	511		1	U	500	102		P
Copper	ug/L	75-125	543		3	U	500	109		P
Iron	ug/L	75-125	5360		30	U	5000	107		P
Magnesium	ug/L	75-125	10600		5260		5000	107		P
Manganese	ug/L	75-125	522		2	U	500	104		P
Potassium	ug/L	75-125	6380		1260		5000	102		P
Silica	ug/L		79800		69600		10700	95.1	N/A	P
Sodium	ug/L	75-125	15800		10400		5000	108		P
Strontium	ug/L	75-125	584		76.1		500	102		P
Tin	ug/L	75-125	537		2.5	U	500	107		P
Vanadium	ug/L	75-125	532		4.99	J	500	105		P
Zinc	ug/L	75-125	506		3.3	U	500	101		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2015-2048 Client ID: CAMO-15-102613S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 378836004 Spike ID: 1203369808

<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	48.6		1	U	50	96.5		MS
Arsenic	ug/L	75-125	50.1		2.12	J	50	96		MS
Cadmium	ug/L	75-125	48.8		0.11	U	50	97.6		MS
Chromium	ug/L	75-125	54.1		3.73	J	50	101		MS
Lead	ug/L	75-125	49.6		0.5	U	50	99.1		MS
Molybdenum	ug/L	75-125	51.4		1.11		50	101		MS
Nickel	ug/L	75-125	48.8		0.924	J	50	95.8		MS
Selenium	ug/L	75-125	48.9		1.5	U	50	96.7		MS
Silver	ug/L	75-125	50.8		0.2	U	50	102		MS
Thallium	ug/L	75-125	49		0.45	U	50	97.9		MS
Uranium	ug/L	75-125	53.4		0.517		50	106		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2015-2048 Client ID: WT_IPC-15-101991S

Contract: ESHL00114 Level: Low

Matrix: STORM WATER % Solids:

Sample ID: 378716001 Spike ID: 1203378895

<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	1.86		0.067	U	2	89.9		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2015-2048

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-15-102610D

Matrix: WATER

Level: Low

Sample ID: 378830002

Duplicate ID: 1203369766

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	+/-20%	28.9		28.9		.0518		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	18.4 J		18.2 J		.689		P
Calcium	ug/L	+/-20%	18400		18200		.825		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%	5260		5210		.825		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1260		1250		.958		P
Silica	ug/L	+/-20%	69600		69400		.265		P
Sodium	ug/L	+/-20%	10400		10500		1.05		P
Strontium	ug/L	+/-20%	76.1		77.5		1.88		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	4.99 J		5.04		1.06		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2015-2048

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-15-102613D

Matrix: WATER

Level: Low

Sample ID: 378836004

Duplicate ID: 1203369807

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L	+/-5	2.12 J		2.26 J		6.43		MS
Cadmium	ug/L		0.11 U		0.11 U				MS
Chromium	ug/L	+/-10	3.73 J		3.73 J		.107		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.11		1.12		.987		MS
Nickel	ug/L	+/-2	0.924 J		1.02 J		9.48		MS
Selenium	ug/L		1.5 U		1.5 U				MS
Silver	ug/L		0.2 U		0.2 U				MS
Thallium	ug/L		0.45 U		0.45 U				MS
Uranium	ug/L	+/- .2	0.517		0.547		5.64		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2015-2048

Lab Code: GEL

Contract: ESHL00114

Client ID: WT_IPC-15-101991D

Matrix: STORM WATER

Level: Low

Sample ID: 378716001

Duplicate ID: 1203378893

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		0.085 J		200		AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2015-2048

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>
1203369765	Aluminum	ug/L	5000	5030		101	80-120	P
	Barium	ug/L	500	520		104	80-120	P
	Beryllium	ug/L	500	516		103	80-120	P
	Boron	ug/L	500	527		105	80-120	P
	Calcium	ug/L	5000	5190		104	80-120	P
	Cobalt	ug/L	500	515		103	80-120	P
	Copper	ug/L	500	524		105	80-120	P
	Iron	ug/L	5000	5280		106	80-120	P
	Magnesium	ug/L	5000	5380		108	80-120	P
	Manganese	ug/L	500	521		104	80-120	P
	Potassium	ug/L	5000	5060		101	80-120	P
	Silica	ug/L	10700	10500		98.3	80-120	P
	Sodium	ug/L	5000	4910		98.2	80-120	P
	Strontium	ug/L	500	500		99.9	80-120	P
	Tin	ug/L	500	525		105	80-120	P
	Vanadium	ug/L	500	522		104	80-120	P
	Zinc	ug/L	500	502		100	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2015-2048

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>
1203369806								
	Antimony	ug/L	50	48.8		97.7	80-120	MS
	Arsenic	ug/L	50	49.3		98.5	80-120	MS
	Cadmium	ug/L	50	49.1		98.2	80-120	MS
	Chromium	ug/L	50	50.1		100	80-120	MS
	Lead	ug/L	50	50.2		100	80-120	MS
	Molybdenum	ug/L	50	48.9		97.8	80-120	MS
	Nickel	ug/L	50	48.7		97.4	80-120	MS
	Selenium	ug/L	50	47.7		95.4	80-120	MS
	Silver	ug/L	50	50.8		102	80-120	MS
	Thallium	ug/L	50	49.5		99	80-120	MS
	Uranium	ug/L	50	50.1		100	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2015-2048

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>
1203378892	Mercury	ug/L	2	2.03		102	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2015-2048 Client ID: CAMO-15-102610L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 378830002 Serial Dilution ID: 1203369768

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	28.9		29.2		.914			P
Beryllium	1	U	5	U				P
Boron	18.4	J	75	U	100			P
Calcium	18400		19000		3.44		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	5260		5100		2.89			P
Manganese	2	U	10	U				P
Potassium	1260		1090		13.8			P
Silica	69600		68600		1.51		10	P
Sodium	10400		10600		1.98		10	P
Strontium	76.1		77.2		1.47		10	P
Tin	2.5	U	12.5	U				P
Vanadium	4.99	J	5.41	J	8.34			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2015-2048 Client ID: CAMO-15-102613L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 378836004 Serial Dilution ID: 1203369809

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2.12	J	8.5	U	100			MS
Cadmium	.11	U	.55	U				MS
Chromium	3.73	J	10	U	100			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.11		1.2	J	8.21			MS
Nickel	.924	J	2.5	U	100			MS
Selenium	1.5	U	7.5	U				MS
Silver	.2	U	1	U				MS
Thallium	.45	U	2.25	U				MS
Uranium	.517		.525	J	1.55			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2015-2048 Client ID: WT_IPC-15-101991L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 378716001 Serial Dilution ID: 1203378897

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Mercury	.067	U	.415	J				AV

*Analytical Methods:

AV EPA 245.1/245.2

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2015-2048
Work Order #: 378836**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1500166

Method: SW 9060 Total Organic Carbon

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

Sample ID	Client ID
378836001	CAMO-15-102588
378836003	CAMO-15-102589
1203373633	Method Blank (MB)
1203373634	Laboratory Control Sample (LCS)
1203373636	378720001(CAMO-15-102573) Sample Duplicate (DUP)
1203373638	378720001(CAMO-15-102573) 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# 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 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 378720001 (CAMO-15-102573) 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.

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: 1498586 **Method:** WSP-CN(T)
Prep Batch : 1498585 **Method:** EPA 335.4

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 335.4:

Sample ID	Client ID
378836001	CAMO-15-102588
378836003	CAMO-15-102589
1203369463	Method Blank (MB)
1203369464	Laboratory Control Sample (LCS)
1203369466	378830001(CAMO-15-102586) Sample Duplicate (DUP)
1203369468	378830001(CAMO-15-102586) 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# 17.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 378830001 (CAMO-15-102586) was selected for QC analysis.

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

The matrix spike recovered outside of the established acceptance limits due to matrix interference.

Analyte	Sample	Value
Cyanide, Total	1203369468 (CAMO-15-102586MS)	113* (90%-110%)

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Sample 1203369464 (LCS) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

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

A data exception report (DER) 1438108 was generated for sample 1203369468 (CAMO-15-102586MS) 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: Ion Chromatography
Analytical Batch: 1498824 **Method:** EPA 300.0 Anions Liquid 28 day

Sample Analysis

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

Sample ID	Client ID
378836002	CAMO-15-102612
378836004	CAMO-15-102613
1203370126	Method Blank (MB)
1203370127	Laboratory Control Sample (LCS)
1203370128	378830002(CAMO-15-102610) Sample Duplicate (DUP)
1203370129	378830002(CAMO-15-102610) 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# 24.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 378830002 (CAMO-15-102610) 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.

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.

Manual Integrations

Samples 1203370128 (CAMO-15-102610DUP), 1203370129 (CAMO-15-102610PS), 378836002 (CAMO-15-102612) and 378836004 (CAMO-15-102613) 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: 1498650 **Method:** NH3
Prep Batch : 1498649 **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
378836002	CAMO-15-102612
378836004	CAMO-15-102613
1203369687	Method Blank (MB)
1203369688	Laboratory Control Sample (LCS)
1203369691	378836002(CAMO-15-102612) Sample Duplicate (DUP)
1203369692	378836002(CAMO-15-102612) 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

Sample 378836002 (CAMO-15-102612) 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.

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

Sample1203369687 (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:	Total Kjeldahl Nitrogen		
Analytical Batch:	1498653	Method:	TKN
Prep Batch :	1498652	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
378836001	CAMO-15-102588
378836003	CAMO-15-102589
1203369693	Method Blank (MB)
1203369694	Laboratory Control Sample (LCS)
1203369695	378836001(CAMO-15-102588) Sample Duplicate (DUP)
1203369696	378836001(CAMO-15-102588) 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.

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 378836001 (CAMO-15-102588) 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.

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

Sample1203369694 (LCS) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

Sample1203369694 (LCS) was re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was 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: Nitrate Nitrite by Cadmium Reduction
Analytical Batch: 1498592 **Method:** NO3NO2

Sample Analysis

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

Sample ID	Client ID
378836002	CAMO-15-102612
378836004	CAMO-15-102613
1203369488	Method Blank (MB)
1203369489	Laboratory Control Sample (LCS)
1203370075	378830002(CAMO-15-102610) Sample Duplicate (DUP)
1203370076	378830002(CAMO-15-102610) 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.

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 378830002 (CAMO-15-102610) 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.

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 were diluted because target analyte concentrations exceeded the calibration range. 1203370075 (CAMO-15-102610DUP) and 1203370076 (CAMO-15-102610PS).

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:	1498655	Method:	EPA 365.4 Phosphorus, Total in
Prep Batch :	1498654	Method:	EPA 365.4 Prep

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

Sample ID	Client ID
378836002	CAMO-15-102612
378836004	CAMO-15-102613
1203369697	Method Blank (MB)
1203369698	Laboratory Control Sample (LCS)
1203369699	378836002(CAMO-15-102612) Sample Duplicate (DUP)
1203369700	378836002(CAMO-15-102612) 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.

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 378836002 (CAMO-15-102612) 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.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203369697 (MB), 1203369698 (LCS) and 378836002 (CAMO-15-102612) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. Samples 1203369699 (CAMO-15-102612DUP), 1203369700 (CAMO-15-102612MS) and 378836004 (CAMO-15-102613) were re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was 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: 1498978 **Method:** TDS

Sample Analysis

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

Sample ID	Client ID
378836002	CAMO-15-102612
378836004	CAMO-15-102613
1203370403	Method Blank (MB)
1203370404	Laboratory Control Sample (LCS)
1203370405	378830002(CAMO-15-102610) 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.

Quality Control (QC) Designation

Sample 378830002 (CAMO-15-102610) 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.

Sample Aliquot

A sufficient amount of sample was provided by the client for 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: 1499473 **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
378836002	CAMO-15-102612
378836004	CAMO-15-102613
1203371781	Laboratory Control Sample (LCS)
1203371783	378714002(CASA-15-102651) 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# 11.

Preparation/Analytical Method Verification

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

Calibration Information

The Titration and Ion analysis was performed on a ManSci PC-Titrate TitraSip System.

Initial Standardization

The titrant was properly standardized

Calibration Verification Information

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

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 378714002 (CASA-15-102651) 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: 1499481 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
378836002	CAMO-15-102612
378836004	CAMO-15-102613
1203371821	Laboratory Control Sample (LCS)
1203371822	378830002(CAMO-15-102610) Sample Duplicate (DUP)
1203371823	378836002(CAMO-15-102612) 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# 21.

Preparation/Analytical Method Verification

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

Calibration Information

The Titration and Ion analysis was performed on a ManSci PC-Titrate Titrator System.

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 378830002 (CAMO-15-102610) and 378836002 (CAMO-15-102612) 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
378836002 (CAMO-15-102612)		Received 07-AUG-15, out of holding 05-AUG-15
378836004 (CAMO-15-102613)		Received 07-AUG-15, out of holding 05-AUG-15

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) 1440360 was generated for samples 378836002 (CAMO-15-102612) and 378836004 (CAMO-15-102613) 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: 1499840 **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
378836002	CAMO-15-102612
378836004	CAMO-15-102613
1203372710	Method Blank (MB)
1203372712	Laboratory Control Sample (LCS)
1203372714	379011002(CASA-15-102647) Sample Duplicate (DUP)
1203372716	379011002(CASA-15-102647) 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# 11.

Preparation/Analytical Method Verification

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

Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

Initial Standardization

The titrant was properly standardized

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 379011002 (CASA-15-102647) 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.

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

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Qualifier Definition Report for

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

Client SDG: 2015-2048 GEL Work Order: 378836

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, 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: Thomas Lewis

Date: 02 SEP 2015

Title: Data Validator

Sample Data Summary

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Certificate of Analysis

Report Date: September 2, 2015

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: 2015-2048

Client Sample ID: CAMO-15-102588
Sample ID: 378836001
Matrix: W
Collect Date: 05-AUG-15 15:04
Receive Date: 07-AUG-15
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L	1	TSM	08/15/15	0233	1500166	1
Flow Injection Analysis											
WSP-CN(T) "As Received"											
Cyanide, Total	U	ND	1.67	5.00	ug/L	1	AXH3	08/12/15	1144	1498586	2
Nutrient Analysis											
TKN "As Received"											
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1	KLP1	08/13/15	1006	1498653	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	08/11/15	1410	1498585
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	08/12/15	1800	1498652

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 335.4	
3	EPA 351.2	

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 2, 2015

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: 2015-2048

Client Sample ID: CAMO-15-102612
Sample ID: 378836002
Matrix: W
Collect Date: 05-AUG-15 15:04
Receive Date: 07-AUG-15
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	J	0.0847	0.067	0.200	mg/L	1	MXL2	08/12/15	0801	1498824	1
Chloride		8.13	0.067	0.200	mg/L	1					
Fluoride		0.255	0.033	0.100	mg/L	1					
Sulfate		11.5	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P	J	0.0332	0.017	0.050	mg/L	1	KLP1	08/12/15	1053	1498655	2
NH3 "As Received"											
Nitrogen, Ammonia		0.0718	0.017	0.050	mg/L	1	KLP1	08/10/15	1458	1498650	3
NO3NO2 "As Received"											
Nitrogen, Nitrate/Nitrite		0.398	0.017	0.050	mg/L	1	AXH3	08/10/15	1400	1498592	4
Solids Analysis											
TDS "As Received"											
Total Dissolved Solids		163	3.40	14.3	mg/L		MXB3	08/10/15	0931	1498978	5
Titration and Ion Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		58.7	0.725	1.00	mg/L		PXO1	08/13/15	1424	1499840	6
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						
EPA120.1 Specific Conductivity "As Received"											
Conductivity		177	3.63	14.5	umhos/cm	1	PXO1	08/11/15	1416	1499473	7
PH "As Received"											
pH at Temp 24.5C	H	7.99	0.010	0.100	SU	1	PXO1	08/11/15	1740	1499481	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	08/10/15	1043	1498649
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	08/11/15	1600	1498654

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Certificate of Analysis

Report Date: September 2, 2015

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: 2015-2048

Client Sample ID: CAMO-15-102612
Sample ID: 378836002

Project: ESHL00114
Client ID: ARSL004

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 365.4	
3	EPA 350.1	
4	EPA 353.2	
5	EPA 160.1	
6	EPA 310.1	
7	EPA 120.1	
8	EPA 150.1	

Notes:

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Certificate of Analysis

Report Date: September 2, 2015

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: 2015-2048

Client Sample ID: CAMO-15-102589

Project: ESHL00114

Sample ID: 378836003

Client ID: ARSL004

Matrix: W

Collect Date: 05-AUG-15 13:07

Receive Date: 07-AUG-15

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L	1	TSM	08/15/15	0314	1500166	1
Flow Injection Analysis											
WSP-CN(T) "As Received"											
Cyanide, Total	U	ND	1.67	5.00	ug/L	1	AXH3	08/12/15	1145	1498586	2
Nutrient Analysis											
TKN "As Received"											
Nitrogen, Total Kjeldahl	J	0.0515	0.033	0.100	mg/L	1	KLP1	08/13/15	1008	1498653	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	08/11/15	1410	1498585
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	08/12/15	1800	1498652

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 335.4	
3	EPA 351.2	

Notes:

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Certificate of Analysis

Report Date: September 2, 2015

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: 2015-2048

Client Sample ID: CAMO-15-102613
Sample ID: 378836004
Matrix: W
Collect Date: 05-AUG-15 13:07
Receive Date: 07-AUG-15
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	MXL2	08/12/15	0834	1498824	1
Chloride		2.00	0.067	0.200	mg/L	1					
Fluoride		0.332	0.033	0.100	mg/L	1					
Sulfate		2.25	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P	U	ND	0.017	0.050	mg/L	1	KLP1	08/12/15	1450	1498655	2
NH3 "As Received"											
Nitrogen, Ammonia		0.0642	0.017	0.050	mg/L	1	KLP1	08/10/15	1500	1498650	3
NO3NO2 "As Received"											
Nitrogen, Nitrate/Nitrite		1.43	0.017	0.050	mg/L	1	AXH3	08/10/15	1402	1498592	4
Solids Analysis											
TDS "As Received"											
Total Dissolved Solids		153	3.40	14.3	mg/L		MXB3	08/10/15	0931	1498978	5
Titration and Ion Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		60.2	0.725	1.00	mg/L		PXO1	08/13/15	1426	1498840	6
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						
EPA120.1 Specific Conductivity "As Received"											
Conductivity		127	3.63	14.5	umhos/cm	1	PXO1	08/11/15	1417	1499473	7
PH "As Received"											
pH at Temp 24.8C	H	8.06	0.010	0.100	SU	1	PXO1	08/11/15	1747	1499481	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	08/10/15	1043	1498649
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	08/11/15	1600	1498654

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Certificate of Analysis

Report Date: September 2, 2015

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: 2015-2048

Client Sample ID: CAMO-15-102613
Sample ID: 378836004

Project: ESHL00114
Client ID: ARSL004

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 365.4	
3	EPA 350.1	
4	EPA 353.2	
5	EPA 160.1	
6	EPA 310.1	
7	EPA 120.1	
8	EPA 150.1	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: September 2, 2015

Page 1 of 5

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

Contact: Mr. Keith Greene

Workorder: 378836

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1500166										
QC1203373636	378720001	DUP									
Total Organic Carbon Average		1.01		1.00	mg/L	0.597 ^		(+/-1.00)	TSM	08/14/15	23:46
QC1203373634	LCS										
Total Organic Carbon Average	10.0			9.96	mg/L		99.6	(85%-115%)		08/14/15	22:10
QC1203373633	MB										
Total Organic Carbon Average			U	ND	mg/L					08/14/15	21:57
QC1203373638	378720001	PS									
Total Organic Carbon Average	10.0	1.01		11.6	mg/L		106	(65%-120%)		08/15/15	00:28
Flow Injection Analysis											
Batch	1498586										
QC1203369466	378830001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	08/12/15	11:42
QC1203369464	LCS										
Cyanide, Total	50.0			53.8	ug/L		108	(90%-110%)		08/12/15	11:28
QC1203369463	MB										
Cyanide, Total			U	ND	ug/L					08/12/15	11:10
QC1203369468	378830001	MS									
Cyanide, Total	100	U	ND	114	ug/L		113*	(90%-110%)		08/12/15	11:41
Ion Chromatography											
Batch	1498824										
QC1203370128	378830002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MXL2	08/12/15	06:22
Chloride			4.77		4.76	mg/L	0.101	(0%-20%)			
Fluoride			0.266		0.267	mg/L	0.45 ^	(+/-0.100)			
Sulfate			7.37		7.35	mg/L	0.276	(0%-20%)			
QC1203370127	LCS										
Bromide	1.25			1.24	mg/L		99.5	(90%-110%)		08/12/15	05:16
Chloride	5.00			4.74	mg/L		94.8	(90%-110%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 378836

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1498824										
Fluoride	2.50			2.45	mg/L		97.8	(90%-110%)			
Sulfate	10.0			9.56	mg/L		95.6	(90%-110%)	MXL2	08/12/15	05:16
QC1203370126 MB											
Bromide			U	ND	mg/L					08/12/15	04:43
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203370129 378830002 PS											
Bromide	1.25	U	ND	1.32	mg/L		101	(90%-110%)		08/12/15	06:55
Chloride	5.00		4.77	9.89	mg/L		102	(90%-110%)			
Fluoride	2.50		0.266	2.62	mg/L		94.3	(90%-110%)			
Sulfate	10.0		7.37	17.4	mg/L		100	(90%-110%)			
Nutrient Analysis											
Batch	1498592										
QC1203370075 378830002 DUP											
Nitrogen, Nitrate/Nitrite			2.75	2.73	mg/L	0.73		(0%-20%)	AXH3	08/10/15	14:11
QC1203369489 LCS											
Nitrogen, Nitrate/Nitrite	1.00			0.956	mg/L		95.6	(90%-110%)		08/10/15	13:21
QC1203369488 MB											
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					08/10/15	13:20
QC1203370076 378830002 PS											
Nitrogen, Nitrate/Nitrite	1.00		0.550	1.47	mg/L		92	(90%-110%)		08/10/15	14:12
Batch 1498650											
QC1203369691 378836002 DUP											
Nitrogen, Ammonia			0.0718	J	0.0449	mg/L	46.1	^	(+/-0.050)	KLP1	08/10/15 14:59
QC1203369688 LCS											
Nitrogen, Ammonia	1.00			1.04	mg/L		104	(90%-110%)		08/10/15	14:33
QC1203369687 MB											
Nitrogen, Ammonia			U	ND	mg/L					08/10/15	14:44

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QC Summary

Workorder: 378836

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1498650										
QC1203369692	378836002	MS									
Nitrogen, Ammonia	1.00	0.0718		1.08	mg/L		101	(90%-110%)	KLP1	08/10/15	15:00
Batch	1498653										
QC1203369695	378836001	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	08/13/15	10:06
QC1203369694	LCS										
Nitrogen, Total Kjeldahl	1.00			0.936	mg/L		93.6	(90%-110%)		08/13/15	10:37
QC1203369693	MB										
Nitrogen, Total Kjeldahl			J	0.0529	mg/L					08/13/15	10:01
QC1203369696	378836001	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	1.05	mg/L		105	(90%-110%)		08/13/15	10:07
Batch	1498655										
QC1203369699	378836002	DUP									
Phosphorus, Total as P		J	0.0332	J	0.0255	mg/L	26.2 ^	(+/-0.050)	KLP1	08/12/15	14:49
QC1203369698	LCS										
Phosphorus, Total as P	1.00			0.977	mg/L		97.7	(83%-123%)		08/12/15	10:47
QC1203369697	MB										
Phosphorus, Total as P			U	ND	mg/L					08/12/15	10:46
QC1203369700	378836002	MS									
Phosphorus, Total as P	1.00	J	0.0332	1.11	mg/L		108	(59%-141%)		08/12/15	14:49
Solids Analysis											
Batch	1498978										
QC1203370405	378830002	DUP									
Total Dissolved Solids			183	180	mg/L	1.57		(0%-5%)	MXB3	08/10/15	09:31
QC1203370404	LCS										
Total Dissolved Solids	300			300	mg/L		100	(95%-105%)		08/10/15	09:31
QC1203370403	MB										
Total Dissolved Solids			U	ND	mg/L					08/10/15	09:31
Titration and Ion Analysis											
Batch	1499473										
QC1203371783	378714002	DUP									
Conductivity			156	158	umhos/cm	0.926		(0%-10%)	PXO1	08/11/15	14:10
QC1203371781	LCS										
Conductivity	1410			1400	umhos/cm		98.9	(95%-105%)		08/11/15	14:00

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QC Summary

Workorder: 378836

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1499473										
Batch	1499481										
QC1203371822	378830002	DUP									
pH		H	7.95	H	7.97	SU	0.183	(0%-5%)	PXO1	08/11/15	17:00
QC1203371823	378836002	DUP									
pH		H	7.99	H	8.00	SU	0.0767	(0%-5%)		08/11/15	17:43
QC1203371821	LCS										
pH	7.00				7.03	SU		100	(99%-101%)		08/11/15 16:28
Batch	1499840										
QC1203372714	379011002	DUP									
Alkalinity, Total as CaCO3			70.7		70.7	mg/L	0	(0%-20%)	PXO1	08/13/15	14:31
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203372712	LCS										
Alkalinity, Total as CaCO3	50.0				51.3	mg/L		103	(90%-110%)		08/13/15 13:40
QC1203372710	MB										
Alkalinity, Total as CaCO3				U	ND	mg/L					08/13/15 13:40
Carbonate alkalinity (CaCO3)				U	ND	mg/L					
QC1203372716	379011002	MS									
Alkalinity, Total as CaCO3	50.0		70.7		121	mg/L		101	(80%-120%)		08/13/15 14:33

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.
- NI See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.

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QC Summary

Workorder: 378836

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
R											
R											
U											
X											
Z											
^											
d											
e											
h											

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. 12-AUG-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 335.4, SW846 9012B	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1498586	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 378830(2015-2043),378836(2015-2048)			
Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed Recovery for MS/MSD, or PS/PSD:</p> <p>QC 1203369468MS</p>		<p>1. The matrix spike recovered outside of the established acceptance limits due to matrix interference. Cyanide, Total 1203369468 (CAMO-15-102586MS) [113* (90%-110%)].</p>	

Originator's Name:

Aubrey Kingsbury 12-AUG-15

Data Validator/Group Leader:

Kristen Mizzell 12-AUG-15

DATA EXCEPTION REPORT

Mo.Day Yr. 19-AUG-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: PC-Titrate TitraSip System	Test / Method: EPA 150.1	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1499481	Sample Numbers: See Below		
<p>Potentially affected work order(s)(SDG): 378717(2015-2016),378718(2015-2015),378723(2015-2032),378830(2015-2043),378831(2015-2044),378832(2015-2045),378833(2015-2046),378835(2015-2047),378836(2015-2048),378838(2015-2069),378841(2015-2068),378842(2015-2067)</p> <p>Application Issues:</p> <p>Sample received out of holding</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Sample received out of holding:</p> <p>378717 008</p> <p>378718 008</p> <p>378723 007,015</p> <p>378830 002,004</p> <p>378831 001</p> <p>378832 001</p> <p>378833 001</p> <p>378835 001,015</p> <p>378836 002,004</p> <p>378838 008</p> <p>378841 005</p> <p>378842 001</p>		<p>1. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.</p> <p>378717008 (WTLAP-15-103363) [See applicable report].</p> <p>378718008 (WTLAP-15-97093) [See applicable report].</p> <p>378723007 (WTESR-15-98664) [See applicable report].</p> <p>378723015 (WTESR-15-98661) [See applicable report].</p> <p>378830002 (CAMO-15-102610) [See applicable report].</p> <p>378830004 (CAMO-15-102611) [See applicable report].</p> <p>378831001 (WT_IPC-15-102874) [See applicable report].</p> <p>378832001 (Urban-15-102324) [See applicable report].</p> <p>378833001 (WTESR-15-103431) [See applicable report].</p> <p>378835001 (WTLAP-15-103454) [See applicable report].</p> <p>378835015 (WTLAP-15-103374) [See applicable report].</p> <p>378836002 (CAMO-15-102612) [See applicable report].</p> <p>378836004 (CAMO-15-102613) [See applicable report].</p> <p>378838008 (WTLAP-15-96675) [See applicable report].</p> <p>378841005 (WTESR-15-99178) [See applicable report].</p> <p>378842001 (WT_REF-15-102391) [See applicable report].</p>	

Originator's Name:

Patrick Orgel 19-AUG-15

Data Validator/Group Leader:

Elzbieta Szulc 02-SEP-15