

The order of this data package is as follows:

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

Comments:

[illegible]

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11212

EVENT NAME: Mortandad/Sandia (Cr Inv/MDA C)  
MY2017 Q3

SAMPLE ID: CAMO-17-132201

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	05-15-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	11:22		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-1		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): T. Walker

RELINQUISHED BY (Printed Name) (Signature)	T. Walker <i>T. Walker</i>	Date/Time 5/15/17 1400	RECEIVED BY (Printed Name) (Signature)	S. Sherwood <i>S. Sherwood</i>	Date/Time 5/15/17 1400
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 04/25/2017



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11212

EVENT NAME: Mortandad/Sandia (Cr Inv/MDA C)  
MY2017 Q3

SAMPLE ID: CAMO-17-132204

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	05-15-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:41		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-15		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	1		SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO <del>NA</del>

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time \_\_\_\_\_ HH:MM \_\_\_\_\_ Dissolved Oxygen 5.74 Flow (in gpm) \_\_\_\_\_  
 Oxidation-Reduction Potential \_\_\_\_\_ pH \_\_\_\_\_ Specific Conductance \_\_\_\_\_  
 Temperature \_\_\_\_\_ Turbidity \_\_\_\_\_

COLLECTED BY (PRINT): D. Jaramillo, T. Walker

RELINQUISHED BY (Printed Name) Daniel Jaramillo (Signature) <i>D. Jaramillo</i>	Date/Time 5/15/17 1400	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i>	Date/Time 5/15/17 1400
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 04/25/2017

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11212

EVENT NAME: Mortandad/Sandia (Cr Inv/MDA C)  
MY2017 Q3

SAMPLE ID: CAMO-17-132221

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	05-15-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	11:22		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

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

## SAMPLE COMMENTS:

Sampled  $\approx 50'$  from running diesel generator

## LOCATION COMMENTS:

None

## FIELD PARAMETERS:

Sample Time	11:22	HH:MM	Dissolved Oxygen ( $\frac{mg}{L}$ )	6.09	Flow (in gpm)	3.37
Oxidation-Reduction Potential (mV)	126.4		pH (SM)	8.03	Specific Conductance ( $\frac{\mu S}{cm}$ )	139.4
Temperature ( $^{\circ}C$ )	21.7		Turbidity (NTU)	0.33		

COLLECTED BY (PRINT): T. Walker

RELINQUISHED BY (Printed Name) (Signature)	T. Walker <i>T. Walker</i>	Date/Time 5/15/17 1400	RECEIVED BY (Printed Name) (Signature)	G. Sherwood <i>G. Sherwood</i>	Date/Time 5/15/17 1400
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 04/25/2017



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11212

EVENT NAME: Mortandad/Sandia (Cr Inv/MDA C)  
MY2017 Q3

SAMPLE ID: CAMO-17-132224

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	05-15-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:41		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-15		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <input checked="" type="radio"/> NA

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

## SAMPLE COMMENTS:

Sampled ~30' from running diesel generator.

## LOCATION COMMENTS:

None

## FIELD PARAMETERS:

Sample Time	12:41	HH:MM	Dissolved Oxygen ( $\frac{mS}{L}$ )	6.74	Flow (in gpm)	8.33
Oxidation-Reduction Potential (mV)	127.2	pH	(SU)	8.52	Specific Conductance ( $\frac{mS}{cm}$ )	154.6
Temperature (°C)	20.3	Turbidity (NTU)		1.02		

COLLECTED BY (PRINT): D. Jaramillo, T. Walker

RELINQUISHED BY (Printed Name) Daniel Jaramillo (Signature) <i>[Signature]</i>	Date/Time 5/15/17 1400	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>[Signature]</i>	Date/Time 5/15/17 1400
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 04/25/2017

## DATA VALIDATION REPORT

Chain Of Custody No. 2017-1533

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
423330	EPA:120.1	2				
423330	EPA:150.1	2				
423330	EPA:160.1	2				
423330	EPA:170.0	4				
423330	EPA:245.2	4				
423330	EPA:300.0	2				
423330	EPA:310.1	2				
423330	EPA:335.4	2				
423330	EPA:350.1	2				
423330	EPA:351.2	2				
423330	EPA:353.2	2				
423330	EPA:365.4	2				
423330	SM:A2340B	2				
423330	SW-846:6010C	2				
423330	SW-846:6020	2				
423330	SW-846:6850	2				
423330	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
423330	EPA:120.1	1668501	1668501	2										1			1				
423330	EPA:150.1	1668218	1668218	2										1			1				
423330	EPA:160.1	1665589	1665589	2					1					1			1				
423330	EPA:170.0	NA	NA	4																	
423330	EPA:245.2	1668006	1668004	4					1	2				1			2				
423330	EPA:300.0	1668293	1668293	2					1					1			1				
423330	EPA:310.1	1668214	1668214	2						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
423330	EPA:335.4	1666251	1666250	2					1	1				1				1			
423330	EPA:350.1	1666189	1666188	2					1	1				1				1			
423330	EPA:351.2	1666192	1666191	2					1	2				1				2			
423330	EPA:353.2	1666115	1666115	2					1					1				1			
423330	EPA:365.4	1666194	1666193	2					1	1				1				1			
423330	SM:A2340B	1673236	1673236	2																	
423330	SW-846:6010C	1666051	1666050	2					1	1				1				1			
423330	SW-846:6020	1666047	1666046	2					1	1				1				1			
423330	SW-846:6850	1667580	1667579	2					1	1	1			1							
423330	SW-846:9060	1666622	1666622	2					1					1				2			

### 2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAMO-17-132201	423330001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-17-132204	423330003	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CASA-17-132339	1203797708	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203797707	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-132201	1203797013	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-132201	423330001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-17-132204	423330003	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203797011	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-132201	1203794808	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-132201	423330001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-17-132204	423330003	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203790696	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203790695	MB	1	0	0	0
EPA:170.0	VOC	CAMO-17-132201	423330001	REG	1	0	0	0
EPA:170.0	VOC	CAMO-17-132204	423330003	REG	1	0	0	0
EPA:170.0	VOC	CAMO-17-132221	423330002	REG	1	0	0	0
EPA:170.0	VOC	CAMO-17-132224	423330004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-132201	1203796487	DUP	1	0	0	0



## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:245.2	INORGANIC	CAMO-17-132201	1203796489	MS	0	0	1	0
EPA:245.2	INORGANIC	CAMO-17-132201	423330001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-132202	1203796488	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-132202	1203796490	MS	0	0	1	0
EPA:245.2	INORGANIC	CAMO-17-132204	423330003	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-132221	423330002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-132224	423330004	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203796486	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203796485	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-132200	1203797179	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-132201	423330001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-17-132204	423330003	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203797178	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203797177	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-132201	1203797003	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-132201	1203797007	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-132201	423330001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-17-132204	423330003	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203797000	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-132221	1203792203	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-132221	1203792205	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-132221	423330002	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-17-132224	423330004	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203792202	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203792201	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-132201	423330001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-17-132204	423330003	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203792074	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203792073	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WST53-17-133059	1203792075	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WST53-17-133059	1203792076	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-132220	1203792085	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-132220	1203792086	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-132221	423330002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-17-132224	423330004	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203792082	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203792081	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	WST15-17-135039	1203792083	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	WST15-17-135039	1203792084	MS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-132201	1203791986	DUP	1	0	0	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-132201	423330001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-17-132204	423330003	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203791985	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203791984	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-132201	423330001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-17-132204	423330003	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203792088	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203792087	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WST53-17-133059	1203792089	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WST53-17-133059	1203792090	MS	0	0	1	0
SM:A2340B	INORGANIC	CAMO-17-132201	423330001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-17-132204	423330003	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-132201	1203791832	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-132201	1203791833	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAMO-17-132201	423330001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-17-132204	423330003	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203791831	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203791830	MB	17	0	0	0
SW-846:6020	INORGANIC	CAMO-17-132201	1203791822	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAMO-17-132201	1203791823	MS	0	0	11	0
SW-846:6020	INORGANIC	CAMO-17-132201	423330001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-17-132204	423330003	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203791821	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203791820	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-132201	1203795362	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-132201	1203795363	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-132201	423330001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-132204	423330003	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203795361	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203795360	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-132221	423330002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-132224	423330004	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-132228	1203793104	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-17-132307	1203793105	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203793103	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203793102	MB	1	0	0	0

3. Are any analytes missing?

## DATA VALIDATION REPORT

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203791830	METHOD BLANK	SW-846:6010C	W	Potassium	60.2	J	ug/L	150
MB	1203792073	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0307	J	mg/L	0.050

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAMO-17-132201	1203792073	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0307	mg/L	0.0565		0.050	Y	5	100	Y
CAMO-17-132204	1203792073	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0307	mg/L	0.0544		0.050	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

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



## DATA VALIDATION REPORT

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
WST53-17-133059	1203792076		EPA:350.1	Ammonia as Nitrogen	1666188	05-22-2017	W	74.8		110	90	10		
WST15-17-135039	1203792084		EPA:351.2	Total Kjeldahl Nitrogen	1666191	05-24-2017	W	153		110	90	10		
WST53-17-133059	1203792090		EPA:365.4	Total Phosphate as Phosphorus	1666193	05-23-2017	W	360		139	63	10		

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

Field Sample ID	Lab Sample ID	LD Lab Sample ID	Analytical Method	Parameter Name	Sample Matrix	Lab Result	LD Lab Result	Lab Units	Detect Flag	LD Detect Flag	RPD	RPD Limit
CAMO-17-132201	423330001	1203794808	EPA:160.1	Total Dissolved	W	124	143	mg/L	Y	Y	10.5	5

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	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
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## DATA VALIDATION REPORT

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-1	2017-1533	CAMO-17-132201	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N	0.0565	mg/L	0.0565	mg/L			W	05/15/2017		1666189	VAL	Y
R-1	2017-1533	CAMO-17-132201	REG	INIT	GENERAL CHEMISTRY	EPA:160.1	Total Dissolved Solids		U	I10b	Y	124	mg/L	124	mg/L			W	05/15/2017		1665589	VAL	Y
R-15	2017-1533	CAMO-17-132204	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N	0.0544	mg/L	0.0544	mg/L			W	05/15/2017		1666189	VAL	Y

### Reason Code

### Description

I10b

The sample and/or the duplicate sample results RPD is not within the acceptance limits. Follow the external laboratory limits located within the associated data package

I4

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

J\_LAB

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

NQ

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

U\_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-17-132201	R-1	REG	EPA:120.1	0	1
CAMO-17-132201	R-1	REG	EPA:150.1	0	1
CAMO-17-132201	R-1	REG	EPA:160.1	0	1
CAMO-17-132201	R-1	REG	EPA:170.0	0	1
CAMO-17-132201	R-1	REG	EPA:245.2	0	1
CAMO-17-132201	R-1	REG	EPA:300.0	0	4
CAMO-17-132201	R-1	REG	EPA:310.1	0	2
CAMO-17-132201	R-1	REG	EPA:350.1	0	1
CAMO-17-132201	R-1	REG	EPA:353.2	0	1
CAMO-17-132201	R-1	REG	EPA:365.4	0	1
CAMO-17-132201	R-1	REG	SM:A2340B	0	1
CAMO-17-132201	R-1	REG	SW-846:6010C	0	17
CAMO-17-132201	R-1	REG	SW-846:6020	0	11
CAMO-17-132201	R-1	REG	SW-846:6850	0	1
CAMO-17-132204	R-15	REG	EPA:120.1	0	1
CAMO-17-132204	R-15	REG	EPA:150.1	0	1

## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-17-132204	R-15	REG	EPA:160.1	0	1
CAMO-17-132204	R-15	REG	EPA:170.0	0	1
CAMO-17-132204	R-15	REG	EPA:245.2	0	1
CAMO-17-132204	R-15	REG	EPA:300.0	0	4
CAMO-17-132204	R-15	REG	EPA:310.1	0	2
CAMO-17-132204	R-15	REG	EPA:350.1	0	1
CAMO-17-132204	R-15	REG	EPA:353.2	0	1
CAMO-17-132204	R-15	REG	EPA:365.4	0	1
CAMO-17-132204	R-15	REG	SM:A2340B	0	1
CAMO-17-132204	R-15	REG	SW-846:6010C	0	17
CAMO-17-132204	R-15	REG	SW-846:6020	0	11
CAMO-17-132204	R-15	REG	SW-846:6850	0	1
CAMO-17-132221	R-1	REG	EPA:170.0	0	1
CAMO-17-132221	R-1	REG	EPA:245.2	0	1
CAMO-17-132221	R-1	REG	EPA:335.4	0	1
CAMO-17-132221	R-1	REG	EPA:351.2	0	1
CAMO-17-132221	R-1	REG	SW-846:9060	0	1
CAMO-17-132224	R-15	REG	EPA:170.0	0	1
CAMO-17-132224	R-15	REG	EPA:245.2	0	1
CAMO-17-132224	R-15	REG	EPA:335.4	0	1
CAMO-17-132224	R-15	REG	EPA:351.2	0	1
CAMO-17-132224	R-15	REG	SW-846:9060	0	1



June 12, 2017

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

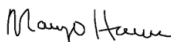
Re: LANL- WQH Water Samples  
Work Order: 423330  
SDG: 2017-1533

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on May 17, 2017, and analyzed for General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

  
Margo Herron for  
Valerie Davis  
Project Manager

Chain of Custody: 2017-1533  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 423330**  
**SDG: 2017-1533**

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# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 423330  
SDG # : 2017-1533**

**June 12, 2017**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on May 17, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
423330001	CAMO-17-132201
423330002	CAMO-17-132221
423330003	CAMO-17-132204
423330004	CAMO-17-132224

**Case Narrative**

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

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: General Chemistry, Metals and Perchlorates by LCMSMS.

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

*Margo Herron*  
Margo Herron for  
Valerie Davis  
Project Manager



**List of current GEL Certifications as of 12 June 2017**

<b>State</b>	<b>Certification</b>
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# **Chain of Custody and Supporting Documentation**





Laboratories LLC

## SAMPLE RECEIPT &amp; REVIEW FORM

Client:		SDG/AR/COC/Work Order: <u>923330</u>	
Received By: <u>ZKW</u>		Date Received: <u>5/17/17</u>	
Carrier and Tracking Number		Circle Applicable:- <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other  <u>5908 1702 0920</u> <u>5908 1702 0930</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> <input checked="" type="checkbox"/> (CPM) mR/Hr Classified as: Rad 1    Rad 2    Rad 3	
Is package, COC, and/or Samples marked HAZ?	<input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's    Flammable    Foreign Soil    RCRA    Asbestos    Beryllium    Other: _____	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken    Damaged container    Leaking container    Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs    Dry ice    None    Other: _____ *all temperatures are recorded in Celsius    TEMP: <u>2°C</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR3-16</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken <input checked="" type="checkbox"/> Damaged container    Leaking container    Other (describe) <u>CAN 17-132352 for NH3, NO2, NOx, 1 TEN rec'd broken</u>
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes ___ No ___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes ___ No ___ N/A ___ (If unknown, select No) VOA vials free of headspace? Yes ___ No ___ N/A ___ Sample ID's and containers affected: _____
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected: _____
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected: _____
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials ABPDate 5/17/17Page 1 of 1

GL-CHL-SR-001 Rev 5

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

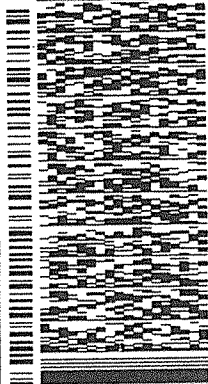
SHIP DATE: 16MAY17  
ACTGRT: 50.0 LB MAN  
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 21PD0ASRGW04BAGWEO



WED - 17 MAY 10:30A  
PRIORITY OVERNIGHT

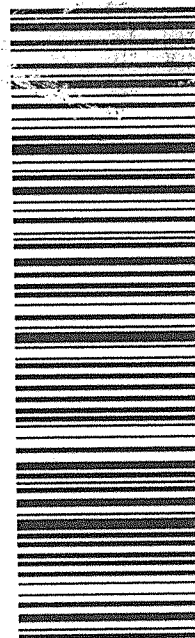
1 of 2

TRK# 5908 1782 0920

## MASTER ##

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15 333

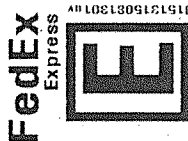
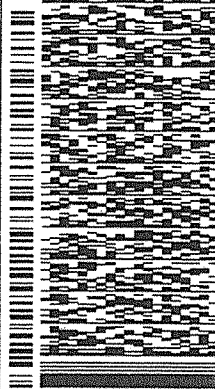
ORIGIN ID:SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
TA00 BLDG 1237 DPU 03  
UNITED STATES US

LOS ALAMOS, NM 87545

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 21PD0ASRGW04BAGWEO



WED - 17 MAY 10:30A  
PRIORITY OVERNIGHT

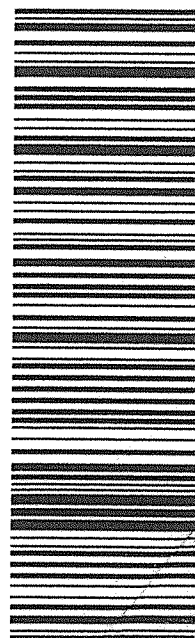
2 of 2

MPS# 5908 1782 0930

Mstr# 5908 1782 0920

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15 333

538C1/B734/3298

# **Data Review Qualifier Flag Definition Sheet**

## Data Review Qualifier Definitions

Qualifier      Explanation

\*      A quality control analyte recovery is outside of specified acceptance criteria

\*\*      Analyte is a surrogate compound

<      Result is less than value reported

>      Result is greater than value reported

^      RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL

A      The TIC is a suspected aldol-condensation product

B      Target analyte was detected in the associated blank

B      Metals-Either presence of analyte detected in the associated blank, or  
MDL/IDL < sample value < PQL

BD      Results are either below the MDC or tracer recovery is low

C      Analyte has been confirmed by GC/MS analysis

D      Results are reported from a diluted aliquot of the sample

d      5-day BOD-The 2:1 depletion requirement was not met for this sample

E      Organics-Concentration of the target analyte exceeds the instrument calibration range

E      Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria

H      Analytical holding time was exceeded

h      Preparation or preservation holding time was exceeded

J      Value is estimated

N      Metals-The Matrix spike sample recovery is not within specified control limits

N      Organics-Presumptive evidence based on mass spectral library search to make a tentative  
identification of the analyte (TIC). Quantitation is based on nearest internal standard  
response factor

N/A      Spike recovery limits do not apply. Sample concentration exceeds spike concentration  
by 4X or more

ND      Analyte concentration is not detected above the reporting limit

UI      Gamma Spectroscopy-Uncertain identification

X      Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Y      QC Samples were not spiked with this compound

Z      Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.



P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.  
For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

# **Perchlorates by LCMSMS Analysis**

# Case Narrative

**Perchlorates by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1533  
Work Order #: 423330**

**Method/Analysis Information**

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

Analytical Method: SW-846:6850

Prep Method: SW-846:6850

Analytical Batch Number: 1667580

Prep Batch Number: 1667579

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
423330001	423330001 (CAMO-17-132201)
423330003	423330003 (CAMO-17-132204)
1203795366	Interference Check Sample (ICS)
1203795360	Method Blank (MB)
1203795361	Laboratory Control Sample (LCS)
1203795362	423330001(CAMO-17-132201) Matrix Spike (MS)
1203795363	423330001(CAMO-17-132201) Matrix Spike Duplicate (MSD)

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

**Preparation/Analytical Method Verification**

**SOP Reference**

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

## **Calibration Information**

### **Initial Calibration**

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

### **ICV Requirements**

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

### **CCB Requirements**

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

### **CCV Requirements**

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

### **Low Level Standard (CRI) Requirements**

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

## **Quality Control (QC) Information**

### **Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

### **Interference Check Sample (ICS)**

The ICS spike recoveries met the acceptance criteria.

### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

### **QC Sample Designation**

Client sample 423330001 (CAMO-17-132201) was chosen for matrix spike and matrix spike duplicate analysis.

### **Matrix Spike (MS) Recovery Statement**

The MS recoveries were within the established acceptance limits.

### **MS/MSD Relative Percent Difference (RPD) Statement**

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

### **Internal Standard Area Acceptance**

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

### **Retention Time**

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

## **Technical Information**

### **Holding Time Specifications**

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

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

#### **Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

#### **Sample Dilutions**

Sample 423330003 (CAMO-17-132204) was diluted to bring the over range concentration within the calibration range.

#### **Sample Re-extraction/Re-analysis**

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

#### **Miscellaneous Information**

##### **Data Exception (DER) Documentation**

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

##### **Manual Integrations**

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

##### **Method Comments**

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

##### **Additional Comments**

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

##### **Perchlorate Isotope Ratio**

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

#### **System Configuration**

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

##### **Electronic Packaging Comment**

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

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

### **Chromatographic Columns**

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

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

Dionex: IonPac AG-16 2 x 50 mm.

### **Certification Statement**

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



## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1533 GEL Work Order: 423330

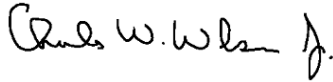
#### The Qualifiers in this report are defined as follows:

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

#### Review/Validation

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

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

Signature: 

Name: Charles Wilson

Date: 06 JUN 2017

Title: Analyst II

# **Sample Data Summary**

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1667579Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-132201Date Received: 17-MAY-17GEL Job No (SDG): 2017-1533GEL Sample ID: 423330001Date Filtered: 23-MAY-17Injection Volume (uL): 20%Solids:         

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.377	ug/L		1	23-MAY-17 21:10	per0523040a
	Perchlorate Isotope Ratio			2.92			1	23-MAY-17 21:10	per0523040a
14797-73-0	Perchlorate-101	.05	.2	0.371	ug/L		1	23-MAY-17 21:10	per0523040a
	Perchlorate-O(18)			0.392	ug/L		1	23-MAY-17 21:10	per0523040a

^ 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: 1667579Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-132204Date Received: 17-MAY-17GEL Job No (SDG): 2017-1533GEL Sample ID: 423330003Date Filtered: 23-MAY-17Injection Volume (uL): 20%Solids:           

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.5	2	9.95	ug/L		10	24-MAY-17 18:16	per0524019a
	Perchlorate Isotope Ratio			2.89			10	24-MAY-17 18:16	per0524019a
14797-73-0	Perchlorate-101	.5	2	10.1	ug/L		10	24-MAY-17 18:16	per0524019a
	Perchlorate-O(18)			4.29	ug/L		10	24-MAY-17 18:16	per0524019a

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

\*Concentration =

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

# **Quality Control Summary**

**Perchlorate Laboratory Control Sample**

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2017-1533

**Extract Batch Code:** 1667579

**Date Filtered:** 23-MAY-17

**Matrix:** WATER

**Sample ID:** 1203795361

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.205	ug/L	102		85 - 115
Perchlorate Isotope Ratio		2.74				-
Perchlorate-101	0.200	.215	ug/L	108		85 - 115
Perchlorate-O(18)		.382	ug/L			-

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

### Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2017-1533

**Extract Batch Code:** 1667579

**Date Extracted:** 23-MAY-17

**GEL MS/PS ID:** 1203795362

**Client ID:** CAMO-17-132201

**GEL MSD/PSD ID:** 1203795363

**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	0.377	ug/L	0.555	89	.544	84	2	30	75 - 125
Perchlorate Isotope Ratio	0	2.92		2.96		2.78		6		-
Perchlorate-101	0.200	0.371	ug/L	0.539	84	.563	96	4	30	75 - 125
Perchlorate-O(18)	0	0.392	ug/L	0.394		.387		2		-

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



# Quality Control Data

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1667579Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 23-MAY-17GEL Job No (SDG): 2017-1533GEL Sample ID: 1203795360Date Filtered: 23-MAY-17Injection Volume (uL): 20%Solids:         

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	23-MAY-17 20:16	per0523034a
	Perchlorate Isotope Ratio						1	23-MAY-17 20:16	per0523034a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	23-MAY-17 20:16	per0523034a
	Perchlorate-O(18)			0.411	ug/L		1	23-MAY-17 20:16	per0523034a

^ 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: 1667579Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 23-MAY-17GEL Job No (SDG): 2017-1533GEL Sample ID: 1203795361Date Filtered: 23-MAY-17Injection Volume (uL): 20%Solids:     

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.205	ug/L		1	23-MAY-17 20:25	per0523035a
	Perchlorate Isotope Ratio			2.74			1	23-MAY-17 20:25	per0523035a
14797-73-0	Perchlorate-101	.05	.2	0.215	ug/L		1	23-MAY-17 20:25	per0523035a
	Perchlorate-O(18)			0.382	ug/L		1	23-MAY-17 20:25	per0523035a

^ 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): 2017-1533Method: SW846 6850 ModifiedGEL Sample ID: 1203795366Matrix: WATERDate Filtered: 23-MAY-17Extraction Batch ID: 1667579Injection 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	0.201	ug/L		1	23-MAY-17 21:01	per0523039a
	Perchlorate Isotope Ratio			3.04			1	23-MAY-17 21:01	per0523039a
14797-73-0	Perchlorate-101	.05	.2	0.190	ug/L	J	1	23-MAY-17 21:01	per0523039a
	Perchlorate-O(18)			0.403	ug/L		1	23-MAY-17 21:01	per0523039a

^ 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: 1667579Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-132201MSDate Received: 17-MAY-17GEL Job No (SDG): 2017-1533GEL Sample ID: 1203795362Date Filtered: 23-MAY-17Injection Volume (uL): 20%Solids:     

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.555	ug/L		1	23-MAY-17 21:19	per0523041a
	Perchlorate Isotope Ratio			2.96			1	23-MAY-17 21:19	per0523041a
14797-73-0	Perchlorate-101	.05	.2	0.539	ug/L		1	23-MAY-17 21:19	per0523041a
	Perchlorate-O(18)			0.394	ug/L		1	23-MAY-17 21:19	per0523041a

^ 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: 1667579Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-132201MSDDate Received: 17-MAY-17GEL Job No (SDG): 2017-1533GEL Sample ID: 1203795363Date Filtered: 23-MAY-17Injection Volume (uL): 20%Solids:     

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.544	ug/L		1	23-MAY-17 21:28	per0523042a
	Perchlorate Isotope Ratio			2.78			1	23-MAY-17 21:28	per0523042a
14797-73-0	Perchlorate-101	.05	.2	0.563	ug/L		1	23-MAY-17 21:28	per0523042a
	Perchlorate-O(18)			0.387	ug/L		1	23-MAY-17 21:28	per0523042a

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

\*Concentration =

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

# Metals Analysis



# Case Narrative

**Metals**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2017-1533**  
**Work Order #: 423330**

<b>Sample ID</b>	<b>Client ID</b>
423330001	CAMO-17-132201
423330002	CAMO-17-132221
423330003	CAMO-17-132204
423330004	CAMO-17-132224
1203791830	Method Blank (MB) <b>ICP</b>
1203791831	Laboratory Control Sample (LCS)
1203791834	423330001(CAMO-17-132201L) Serial Dilution (SD)
1203791832	423330001(CAMO-17-132201D) Sample Duplicate (DUP)
1203791833	423330001(CAMO-17-132201S) Matrix Spike (MS)
1203791820	Method Blank (MB) <b>ICP-MS</b>
1203791821	Laboratory Control Sample (LCS)
1203791824	423330001(CAMO-17-132201L) Serial Dilution (SD)
1203791822	423330001(CAMO-17-132201D) Sample Duplicate (DUP)
1203791823	423330001(CAMO-17-132201S) Matrix Spike (MS)
1203796485	Method Blank (MB) <b>CVAA</b>
1203796486	Laboratory Control Sample (LCS)
1203796491	423330001(CAMO-17-132201L) Serial Dilution (SD)
1203796487	423330001(CAMO-17-132201D) Sample Duplicate (DUP)
1203796489	423330001(CAMO-17-132201S) Matrix Spike (MS)

**Sample Analysis**

Samples 423330001,002,003 and 004 in this SDG were analyzed for metals and mercury on an "as received" basis.

**Method/Analysis Information**

<b>Analytical Batch:</b>	1666051, 1666047, 1668006 and 1673236
<b>Prep Batch :</b>	1666050, 1666046 and 1668004
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 29, GL-MA-E-010 REV# 34 and GL-GC-E-107 REV# 10
<b>Analytical Method:</b>	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
<b>Prep Method :</b>	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 CaCO<sub>3</sub> is calculated from Calcium and Magnesium results.

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

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

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

## **Calibration Information**

### **Instrument Calibration**

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

### **CRDL/PQL Requirements**

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

### **ICSA/ICSAB Statement**

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria. However, the ICSA contained analyte concentrations which are verified trace impurities indigenous to the purchased standard.

### **Continuing Calibration Blanks (CCB) Requirements**

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

### **Continuing Calibration Verification (CCV) Requirements**

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

## **Quality Control (QC) Information**

### **Method Blank (MB) Statement**

The MBs analyzed with this SDG met the acceptance criteria.

### **Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

### **Quality Control (QC) Sample Statement**

The following samples were selected as the quality control (QC) samples for this SDG: 423330001 (CAMO-17-132201)-ICP, ICP-MS and CVAA.

### **Matrix Spike (MS/MSD) Recovery Statement**

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

**Duplicate Relative Percent Difference (RPD) Statement**

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

**Serial Dilution % Difference Statement**

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

**Technical Information****Holding Time Specifications**

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

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Preparation Information**

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

**Miscellaneous Information****Electronic Packaging Comment**

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

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

**Data Exception (DER) Documentation**

A data exception report was not required for this SDG.

**Additional Comments**

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

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

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

**Certification Statement**

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

## **GEL LABORATORIES LLC**

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

### **Qualifier Definition Report for**

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

Client SDG: 2017-1533 GEL Work Order: 423330

#### **The Qualifiers in this report are defined as follows:**

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

#### **Review/Validation**

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

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

**Signature:**



**Name: Nik-Cole Elmore**

**Date: 12 JUN 2017**

**Title: Data Validator**

# **Sample Data Summary**

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2017-1533**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 423330001**BASIS:** As Received**DATE COLLECTED** 15-MAY-17**CLIENT ID:** CAMO-17-132201**LEVEL:** Low**DATE RECEIVED** 17-MAY-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	05/25/17 11:15	052517W3-6	1668006



**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: 2017-1533

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 423330001

BASIS: As Received

DATE COLLECTED 15-MAY-17

CLIENT ID: CAMO-17-132201

LEVEL: Low

DATE RECEIVED 17-MAY-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	05/27/17 09:25	170526-5	1666047
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	05/26/17 23:23	170526-3	1666047
7440-39-3	Barium	12.5	ug/L		1	5	5	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	05/26/17 23:23	170526-3	1666047
7440-70-2	Calcium	10700	ug/L		50	200	200	1	P	HSC	06/10/17 13:24	061017A-2	1666051
7440-47-3	Chromium	5.74	ug/L	J	3	10	10	1	MS	BAJ	05/26/17 23:23	170526-3	1666047
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	05/26/17 23:23	170526-3	1666047
7439-95-4	Magnesium	3610	ug/L		110	300	300	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7439-98-7	Molybdenum	1.13	ug/L		0.2	0.5	0.5	1	MS	BAJ	05/26/17 23:23	170526-3	1666047
7440-02-0	Nickel	2.02	ug/L		0.6	2	2	1	MS	BAJ	05/26/17 23:23	170526-3	1666047
7440-09-7	Potassium	1640	ug/L		50	150	150	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	05/26/17 23:23	170526-3	1666047
7631-86-9	Silica	70100	ug/L		53	213	213	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	05/26/17 23:23	170526-3	1666047
7440-23-5	Sodium	11900	ug/L		100	300	300	1	P	HSC	06/10/17 13:24	061017A-2	1666051
7440-24-6	Strontium	47.9	ug/L		1	5	5	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	05/26/17 23:23	170526-3	1666047
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7440-61-1	Uranium	0.787	ug/L		0.067	0.2	0.2	1	MS	BAJ	05/27/17 09:25	170526-5	1666047
7440-62-2	Vanadium	7.51	ug/L		1	5	5	1	P	HSC	06/07/17 18:06	060717A-1	1666051
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/10/17 13:24	061017A-2	1666051

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2017-1533**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 423330001**BASIS:** As Received**DATE COLLECTED** 15-MAY-17**CLIENT ID:** CAMO-17-132201**LEVEL:** Low**DATE RECEIVED** 17-MAY-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	41.6	mg/L		0.453	1.24	1.24	1		TXT1	06/12/17 11:51		1673236

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1666047	1666046	SW846 3005A	50	mL	50	mL	05/17/17	CXW4
1666051	1666050	SW846 3005A	50	mL	50	mL	05/17/17	CXW4
1668006	1668004	EPA 245.1/245.2 Prep	20	mL	20	mL	05/24/17	AXS5

**\*Analytical Methods:**

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

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2017-1533**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 423330002**BASIS:** As Received**DATE COLLECTED** 15-MAY-17**CLIENT ID:** CAMO-17-132221**LEVEL:** Low**DATE RECEIVED** 17-MAY-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	05/25/17 11:24	052517W3-6	1668006

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1668006	1668004	EPA 245.1/245.2 Prep	20	mL	20	mL	05/24/17	AXS5

**\*Analytical Methods:**

AV EPA 245.2 1974

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2017-1533**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 423330003**BASIS:** As Received**DATE COLLECTED** 15-MAY-17**CLIENT ID:** CAMO-17-132204**LEVEL:** Low**DATE RECEIVED** 17-MAY-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	05/25/17 11:25	052517W3-6	1668006

**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: 2017-1533

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 423330003

BASIS: As Received

DATE COLLECTED 15-MAY-17

CLIENT ID: CAMO-17-132204

LEVEL: Low

DATE RECEIVED 17-MAY-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	05/27/17 09:31	170526-5	1666047
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	05/26/17 23:39	170526-3	1666047
7440-39-3	Barium	27.7	ug/L		1	5	5	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	05/26/17 23:39	170526-3	1666047
7440-70-2	Calcium	13800	ug/L		50	200	200	1	P	HSC	06/10/17 13:21	061017A-2	1666051
7440-47-3	Chromium	12.8	ug/L		3	10	10	1	MS	BAJ	05/26/17 23:39	170526-3	1666047
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	05/26/17 23:39	170526-3	1666047
7439-95-4	Magnesium	3530	ug/L		110	300	300	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7439-98-7	Molybdenum	0.973	ug/L		0.2	0.5	0.5	1	MS	BAJ	05/26/17 23:39	170526-3	1666047
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	05/26/17 23:39	170526-3	1666047
7440-09-7	Potassium	1740	ug/L		50	150	150	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	05/26/17 23:39	170526-3	1666047
7631-86-9	Silica	67100	ug/L		53	213	213	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	05/26/17 23:39	170526-3	1666047
7440-23-5	Sodium	10600	ug/L		100	300	300	1	P	HSC	06/10/17 13:21	061017A-2	1666051
7440-24-6	Strontium	59.4	ug/L		1	5	5	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	05/26/17 23:39	170526-3	1666047
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7440-61-1	Uranium	0.352	ug/L		0.067	0.2	0.2	1	MS	BAJ	05/27/17 09:31	170526-5	1666047
7440-62-2	Vanadium	6.2	ug/L		1	5	5	1	P	HSC	06/07/17 18:03	060717A-1	1666051
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/10/17 13:21	061017A-2	1666051

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2017-1533**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 423330003**BASIS:** As Received**DATE COLLECTED** 15-MAY-17**CLIENT ID:** CAMO-17-132204**LEVEL:** Low**DATE RECEIVED** 17-MAY-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	48.9	mg/L		0.453	1.24	1.24	1		TXT1	06/12/17 11:51		1673236

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1666047	1666046	SW846 3005A	50	mL	50	mL	05/17/17	CXW4
1666051	1666050	SW846 3005A	50	mL	50	mL	05/17/17	CXW4
1668006	1668004	EPA 245.1/245.2 Prep	20	mL	20	mL	05/24/17	AXS5

**\*Analytical Methods:**

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

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2017-1533**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 423330004**BASIS:** As Received**DATE COLLECTED** 15-MAY-17**CLIENT ID:** CAMO-17-132224**LEVEL:** Low**DATE RECEIVED** 17-MAY-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	05/25/17 11:27	052517W3-6	1668006

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1668006	1668004	EPA 245.1/245.2 Prep	20	mL	20	mL	05/24/17	AXS5

**\*Analytical Methods:**

AV EPA 245.2 1974

# **Quality Control Summary**



**METALS**  
**-3b-**  
**PREPARATION BLANK SUMMARY**

SDG NO. 2017-1533

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>
1203791820	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203791830	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	60.2	ug/L	+/-150	J	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203796485	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

## \*Analytical Methods:

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

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1533 Client ID CAMO-17-132201S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 423330001 Spike ID: 1203791823

<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	49.8		1	U	50	98.7		MS
Arsenic	ug/L	75-125	51		2	U	50	98.3		MS
Cadmium	ug/L	75-125	51.6		0.3	U	50	103		MS
Chromium	ug/L	75-125	55.9		5.74	J	50	100		MS
Molybdenum	ug/L	75-125	53		1.13		50	104		MS
Nickel	ug/L	75-125	54.8		2.02		50	106		MS
Selenium	ug/L	75-125	52.5		2	U	50	104		MS
Silver	ug/L	75-125	52.4		0.3	U	50	105		MS
Thallium	ug/L	75-125	48.1		0.6	U	50	95.9		MS
Uranium	ug/L	75-125	46.4		0.787		50	91.3		MS
Lead	ug/L	75-125	50.4		0.5	U	50	101		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1533 Client ID CAMO-17-132201S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 423330001 Spike ID: 1203791833

<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	4700		68	U	5000	93.3		P
Barium	ug/L	75-125	488		12.5		500	95.1		P
Beryllium	ug/L	75-125	480		1	U	500	95.9		P
Boron	ug/L	75-125	502		15	U	500	98.1		P
Calcium	ug/L	75-125	15300		10700		5000	91		P
Cobalt	ug/L	75-125	471		1	U	500	94.3		P
Copper	ug/L	75-125	494		3	U	500	98.6		P
Iron	ug/L	75-125	4800		30	U	5000	95.9		P
Magnesium	ug/L	75-125	8150		3610		5000	90.8		P
Manganese	ug/L	75-125	475		2	U	500	95		P
Potassium	ug/L	75-125	6480		1640		5000	96.8		P
Silica	ug/L		79700		70100		10700	89.7	N/A	P
Sodium	ug/L	75-125	16700		11900		5000	94.3		P
Strontium	ug/L	75-125	515		47.9		500	93.4		P
Tin	ug/L	75-125	479		2.5	U	500	95.7		P
Vanadium	ug/L	75-125	490		7.51		500	96.5		P
Zinc	ug/L	75-125	460		3.3	U	500	91.8		P

\*Analytical Methods:

P SW846 3005A/6010C

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2017-1533 **Client ID:** CAMO-17-132201S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 423330001 **Spike ID:** 1203796489

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.01		0.067	U	2	100		AV

## \*Analytical Methods:

AV EPA 245.1/245.2

**Metals**  
**-6-**  
**Duplicate Sample Summary**

SDG No.: 2017-1533

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-17-132201D

Matrix: WATER

Level: Low

Sample ID: 423330001

Duplicate ID: 1203791822

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		2 U		2 U				MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L	+/-10	5.74 J		5.8 J		1.04		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.13		1.01		10.9		MS
Nickel	ug/L	+/-2	2.02		1.95 J		3.83		MS
Selenium	ug/L		2 U		2 U				MS
Silver	ug/L		0.3 U		0.3 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L	+/- .2	0.787		0.807		2.51		MS

\*Analytical Methods:

MS SW846 3005A/6020A

**Metals**  
**-6-**  
**Duplicate Sample Summary**

SDG No.: 2017-1533

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-17-132201D

Matrix: WATER

Level: Low

Sample ID: 423330001

Duplicate ID: 1203791832

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-5	12.5		12.7		1.37		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	10700		10700		.159		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%	3610		3610		.0526		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1640		1650		.741		P
Silica	ug/L	+/-20%	70100		70500		.566		P
Sodium	ug/L	+/-20%	11900		12300		2.57		P
Strontium	ug/L	+/-20%	47.9		48.7		1.58		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	7.51		7.33		2.47		P
Zinc	ug/L		3.3 U		3.3 U				P

\*Analytical Methods:

P SW846 3005A/6010C

**Metals**  
**–6–**  
**Duplicate Sample Summary**

**SDG No.:** 2017–1533**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAMO–17–132201D**Matrix:** WATER**Level:** Low**Sample ID:** 423330001**Duplicate ID:** 1203796487**Percent Solids for Dup:** N/A

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

\*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1533

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>
1203791821								
	Antimony	ug/L	50	50		100	80-120	MS
	Arsenic	ug/L	50	51.5		103	80-120	MS
	Cadmium	ug/L	50	52.5		105	80-120	MS
	Chromium	ug/L	50	49.4		98.8	80-120	MS
	Lead	ug/L	50	51.9		104	80-120	MS
	Molybdenum	ug/L	50	50.3		101	80-120	MS
	Nickel	ug/L	50	51		102	80-120	MS
	Selenium	ug/L	50	52.7		105	80-120	MS
	Silver	ug/L	50	53.6		107	80-120	MS
	Thallium	ug/L	50	50.1		100	80-120	MS
	Uranium	ug/L	50	44.9		89.9	80-120	MS

## \*Analytical Methods:

MS SW846 3005A/6020A



## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1533

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>
1203791831								
	Aluminum	ug/L	5000	4740		94.9	80-120	P
	Barium	ug/L	500	481		96.1	80-120	P
	Beryllium	ug/L	500	475		95.1	80-120	P
	Boron	ug/L	500	486		97.3	80-120	P
	Calcium	ug/L	5000	4820		96.3	80-120	P
	Cobalt	ug/L	500	477		95.4	80-120	P
	Copper	ug/L	500	481		96.3	80-120	P
	Iron	ug/L	5000	4790		95.9	80-120	P
	Magnesium	ug/L	5000	4690		93.9	80-120	P
	Manganese	ug/L	500	478		95.6	80-120	P
	Potassium	ug/L	5000	4900		98	80-120	P
	Silica	ug/L	10700	9940		92.8	80-120	P
	Sodium	ug/L	5000	5370		107	80-120	P
	Strontium	ug/L	500	471		94.1	80-120	P
	Tin	ug/L	500	476		95.2	80-120	P
	Vanadium	ug/L	500	478		95.7	80-120	P
	Zinc	ug/L	500	445		89.1	80-120	P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

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## Laboratory Control Sample Summary

SDG NO. 2017-1533

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>
1203796486	Mercury	ug/L	2	2.01		101	85-115	AV

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

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## Serial Dilution Sample Summary

SDG NO. 2017-1533

Client ID: CAMO-17-132201L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 423330001

Serial Dilution ID: 1203791824

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2	U	10	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	5.74	J	15	U	6.433			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.13		1.29	J	14.667			MS
Nickel	2.02		3	U	11.084			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.787		.815	J	3.558			MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

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## Serial Dilution Sample Summary

SDG NO. 2017-1533

Client ID: CAMO-17-132201L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 423330001

Serial Dilution ID: 1203791834

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	12.5		13	J	3.898			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	10700		10800		.863		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	194	J				P
Magnesium	3610		3740		3.369			P
Manganese	2	U	10	U				P
Potassium	1640		1430		12.568			P
Silica	70100		70200		.06		10	P
Sodium	11900		12000		.343		10	P
Strontium	47.9		46.5		2.977			P
Tin	2.5	U	12.5	U				P
Vanadium	7.51		8.71	J	15.933			P
Zinc	3.3	U	16.5	U				P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

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## Serial Dilution Sample Summary

**SDG NO.** 2017-1533 **Client ID:** CAMO-17-132201L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 423330001 **Serial Dilution ID:** 1203796491

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

## \*Analytical Methods:

AV EPA 245.1/245.2

# **General Chem Analysis**

# Case Narrative

**General Chemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1533  
Work Order #: 423330**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1666622

**Method:** SW 9060 Total Organic Carbon

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW-846:9060:

<b>Sample ID</b>	<b>Client ID</b>
423330002	CAMO-17-132221
423330004	CAMO-17-132224
1203793102	Method Blank (MB)
1203793103	Laboratory Control Sample (LCS)
1203793104	423072004(CAMO-17-132228) Sample Duplicate (DUP)
1203793105	423194005(CAMO-17-132307) Sample Duplicate (DUP)
1203793106	423072004(CAMO-17-132228) Post Spike (PS)
1203793107	423194005(CAMO-17-132307) Post Spike (PS)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 15.

**Preparation/Analytical Method Verification**

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

**Calibration Information**

The Carbon analysis was performed on a O-I Analytical 1030W Carbon Analyzer.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

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



**Calibration Verification Information (CCV)**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Samples 423072004 (CAMO-17-132228) and 423194005 (CAMO-17-132307) were selected for QC analysis.

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

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

**Duplicate Relative Percent Difference (RPD) Statement**

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Cyanide and Total</b>		
<b>Analytical Batch:</b>	1666251	<b>Method:</b>	WSP-CN(T)
<b>Prep Batch :</b>	1666250	<b>Method:</b>	EPA 335.4

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 335.4 1993:

<b>Sample ID</b>	<b>Client ID</b>
423330002	CAMO-17-132221
423330004	CAMO-17-132224
1203792201	Method Blank (MB)
1203792202	Laboratory Control Sample (LCS)
1203792203	423330002(CAMO-17-132221) Sample Duplicate (DUP)
1203792205	423330002(CAMO-17-132221) 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# 19.

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

### **Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 423330002 (CAMO-17-132221) was selected for QC analysis.

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

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

**Duplicate Relative Percent Difference (RPD) Statement**

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Ion Chromatography

**Analytical Batch:** 1668293

**Method:** WSP-ANIONS

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
423330001	CAMO-17-132201
423330003	CAMO-17-132204
1203797177	Method Blank (MB)
1203797178	Laboratory Control Sample (LCS)
1203797179	423194001(CAMO-17-132200) Sample Duplicate (DUP)
1203797180	423194001(CAMO-17-132200) Post Spike (PS)

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

### **SOP Reference**

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

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

### **Calibration Verification Information (CCV)**

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

### **Y Intercept Rule**

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

### **Quality Control (QC) Information**

#### **Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

#### **Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

#### **Quality Control (QC) Designation**

Sample 423194001 (CAMO-17-132200) was selected for QC analysis.

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

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

#### **Duplicate Relative Percent Difference (RPD) Statement**

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

### **Technical Information**

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

#### **Holding Times**

All samples in this SDG met the specified holding time.

#### **Sample Dilutions**

The following samples 1203797179 (CAMO-17-132200DUP) and 1203797180 (CAMO-17-132200PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

#### **Sample Re-analysis**

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

### **Miscellaneous Information**

#### **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 1203797179 (CAMO-17-132200DUP), 1203797180 (CAMO-17-132200PS), 423330001 (CAMO-17-132201) and 423330003 (CAMO-17-132204) 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:** 1666189 **Method:** NH3  
**Prep Batch :** 1666188 **Method:** EPA 350.1 Prep

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA:350.1:

<b>Sample ID</b>	<b>Client ID</b>
423330001	CAMO-17-132201
423330003	CAMO-17-132204
1203792073	Method Blank (MB)
1203792074	Laboratory Control Sample (LCS)
1203792075	423224002(WST53-17-133059) Sample Duplicate (DUP)
1203792076	423224002(WST53-17-133059) Matrix Spike (MS)

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

### **SOP Reference**

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

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

### **Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 423224002 (WST53-17-133059) was selected for QC analysis.

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

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

Analyte	Sample	Value
Nitrogen, Ammonia	1203792076 (WST53-17-133059MS)	74.8* (90%-110%)

**Duplicate Relative Percent Difference (RPD) Statement**

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

Analyte	Sample	Value
Nitrogen, Ammonia	1203792075 (WST53-17-133059DUP)	35.1* (0%-20%)

**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 1203792073 (MB), 1203792074 (LCS), 1203792075 (WST53-17-133059DUP) and 1203792076 (WST53-17-133059MS) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported.

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

A data exception report (DER) 1634279 was generated for samples 1203792075 (WST53-17-133059DUP) and 1203792076 (WST53-17-133059MS) 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**

<b>Product:</b>	<b>Total Kjeldahl Nitrogen</b>		
<b>Analytical Batch:</b>	1666192	<b>Method:</b>	TKN
<b>Prep Batch :</b>	1666191	<b>Method:</b>	EPA 351.2 Prep

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA:351.2:

<b>Sample ID</b>	<b>Client ID</b>
423330002	CAMO-17-132221
423330004	CAMO-17-132224
1203792081	Method Blank (MB)
1203792082	Laboratory Control Sample (LCS)
1203792083	422869005(WST15-17-135039) Sample Duplicate (DUP)
1203792085	423194002(CAMO-17-132220) Sample Duplicate (DUP)
1203792084	422869005(WST15-17-135039) Matrix Spike (MS)
1203792086	423194002(CAMO-17-132220) Matrix Spike (MS)

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

### **SOP Reference**

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

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Samples 422869005 (WST15-17-135039) and 423194002 (CAMO-17-132220) were selected for QC analysis.

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

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

Analyte	Sample	Value
Nitrogen, Total Kjeldahl	1203792084 (WST15-17-135039MS)	153* (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**

Sample1203792082 (LCS) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

Samples 1203792082 (LCS), 1203792083 (WST15-17-135039DUP), 1203792084 (WST15-17-135039MS), 1203792085 (CAMO-17-132220DUP) and 1203792086 (CAMO-17-132220MS) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported.

### **Miscellaneous Information**

#### **Data Exception (DER) Documentation**

A data exception report (DER) 1635178 was generated for sample 1203792084 (WST15-17-135039MS) 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:** Nitrate Nitrite by Cadmium Reduction

**Analytical Batch:** 1666115

**Method:** NO3NO2

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
423330001	CAMO-17-132201
423330003	CAMO-17-132204
1203791984	Method Blank (MB)
1203791985	Laboratory Control Sample (LCS)
1203791986	423330001(CAMO-17-132201) Sample Duplicate (DUP)
1203791989	423330001(CAMO-17-132201) Post Spike (PS)

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

### **SOP Reference**

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

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Calibration Verification Information**

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

#### **Continuing Calibration Blanks**

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

#### **Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 423330001 (CAMO-17-132201) was selected for QC analysis.

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

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

**Duplicate Relative Percent Difference (RPD) Statement**

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The following sample 423330003 (CAMO-17-132204) was diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	423330
	003
Nitrogen, Nitrate/Nitrite	5X

**Sample Re-analysis**

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

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



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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Phosphorus</b>		
<b>Analytical Batch:</b>	1666194	<b>Method:</b>	PO4
<b>Prep Batch :</b>	1666193	<b>Method:</b>	EPA 365.4 Prep

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 365.4 1974:

<b>Sample ID</b>	<b>Client ID</b>
423330001	CAMO-17-132201
423330003	CAMO-17-132204
1203792087	Method Blank (MB)
1203792088	Laboratory Control Sample (LCS)
1203792089	423224002(WST53-17-133059) Sample Duplicate (DUP)
1203792090	423224002(WST53-17-133059) Matrix Spike (MS)

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

### **SOP Reference**

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

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

### **Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 423224002 (WST53-17-133059) was selected for QC analysis.

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

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

**Duplicate Relative Percent Difference (RPD) Statement**

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The following samples 1203792089 (WST53-17-133059DUP) and 1203792090 (WST53-17-133059MS) were diluted because target analyte concentrations exceeded the calibration range. Samples 1203792089 (WST53-17-133059DUP) and 1203792090 (WST53-17-133059MS) were diluted at the prep step due to high concentration. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

**Sample Re-analysis**

Sample 423330001 (CAMO-17-132201) was re-analyzed due to (its) proximity to an overrange sample. The results from the reanalysis are reported.

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Solids and Total Dissolved

**Analytical Batch:** 1665589

**Method:** TDS

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
423330001	CAMO-17-132201
423330003	CAMO-17-132204
1203790695	Method Blank (MB)
1203790696	Laboratory Control Sample (LCS)
1203794808	423330001(CAMO-17-132201) Sample Duplicate (DUP)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Quality Control (QC) Information**

#### **Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

#### **Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Consecutive Weight Checks**

All consecutive weight checks were met.

**Quality Control (QC) Designation**

Sample 423330001 (CAMO-17-132201) was selected for QC analysis.

**Duplicate Relative Percent Difference (RPD) Statement**

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

Analyte	Sample	Value
Total Dissolved Solids	1203794808 (CAMO-17-132201DUP)	10.5* (0%-5%)

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

A data exception report (DER) 1634782 was generated for sample 1203794808 (CAMO-17-132201DUP) 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:

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### **Method/Analysis Information**

**Product:** Specific Conductivity

**Analytical Batch:** 1668501

**Method:** EPA120.1 Specific Conductivity

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA:120.1:

<b>Sample ID</b>	<b>Client ID</b>
423330001	CAMO-17-132201
423330003	CAMO-17-132204
1203797707	Laboratory Control Sample (LCS)
1203797708	423220001(CASA-17-132339) Sample Duplicate (DUP)

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

### **SOP Reference**

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

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

### **Quality Control (QC) Information**

#### **Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

### **Quality Control (QC) Designation**

Sample 423220001 (CASA-17-132339) 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:** 1668218 **Method:** PH

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
423330001	CAMO-17-132201
423330003	CAMO-17-132204
1203797011	Laboratory Control Sample (LCS)
1203797013	423330001(CAMO-17-132201) Sample Duplicate (DUP)

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

### **SOP Reference**

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

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

### **Quality Control (QC) Information**

#### **Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

### **Quality Control (QC) Designation**

Sample 423330001 (CAMO-17-132201) was selected for QC analysis.

**Duplicate Relative Percent Difference (RPD) Statement**

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

**Technical Information**

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

**Holding Times**

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

Sample	Analyte	Value
1203797013 (CAMO-17-132201DUP)	pH	Received 17-MAY-17, out of holding 15-MAY-17
423330001 (CAMO-17-132201)	pH	Received 17-MAY-17, out of holding 15-MAY-17
423330003 (CAMO-17-132204)	pH	Received 17-MAY-17, out of holding 15-MAY-17

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

A data exception report (DER) 1636380 was generated for samples 423330001 (CAMO-17-132201), 423330003 (CAMO-17-132204) and 1203797013 (CAMO-17-132201DUP) 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:** 1668214      **Method:** EPA 310.1 Total Alkalinity

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA:310.1:

<b>Sample ID</b>	<b>Client ID</b>
423330001	CAMO-17-132201
423330003	CAMO-17-132204
1203797000	Laboratory Control Sample (LCS)
1203797003	423330001(CAMO-17-132201) Sample Duplicate (DUP)
1203797007	423330001(CAMO-17-132201) Matrix Spike (MS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 13.

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

The Titration and Ion analysis was performed on a Electronic bottle-top buret.

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Initial Standardization**

The titrant was properly standardized

### **Quality Control (QC) Information**

#### **Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 423330001 (CAMO-17-132201) was selected for QC analysis.

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

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

**Duplicate Relative Percent Difference (RPD) Statement**

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information****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:

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**Certification Statement**

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

## **GEL LABORATORIES LLC**

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

### **Qualifier Definition Report for**

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

Client SDG: 2017-1533 GEL Work Order: 423330


#### **The Qualifiers in this report are defined as follows:**

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

#### **Review/Validation**

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

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

**Signature:** 

**Name:** Aubrey Kingsbury

**Date:** 12 JUN 2017

**Title:** Analyst I

# **Sample Data Summary**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 12, 2017

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

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

Client SDG: 2017-1533

Client Sample ID: CAMO-17-132201  
Sample ID: 423330001  
Matrix: W  
Collect Date: 15-MAY-17 11:22  
Receive Date: 17-MAY-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	05/26/17	0143	1668293	1
Chloride		2.01	0.067	0.200	mg/L		1					
Fluoride		0.153	0.033	0.100	mg/L		1					
Sulfate		2.40	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0565	0.017	0.050	mg/L	1.00	1	KLP1	05/22/17	1259	1666189	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.324	0.017	0.050	mg/L		1	AXH3	05/19/17	1052	1666115	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0232	0.020	0.050	mg/L	1.00	1	KLP1	05/23/17	1529	1666194	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		124	3.40	14.3	mg/L			KLP1	05/22/17	1435	1665589	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		66.4	1.45	4.00	mg/L			RXB5	05/27/17	1352	1668214	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		123	1.00	1.00	umhos/cm		1	VH1	05/30/17	1503	1668501	7
PH "As Received"												
pH at Temp 9.90C	H	7.96	0.010	0.100	SU		1	RXB5	05/27/17	1351	1668218	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	05/22/17	1105	1666188
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	05/23/17	1200	1666193

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 12, 2017

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

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

Client SDG: 2017-1533

Client Sample ID: CAMO-17-132201  
Sample ID: 423330001

Project: ESHL00114  
Client ID: ARSL004

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

### Notes:

#### Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit



# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 12, 2017

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene

Client SDG: 2017-1533

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-17-132221

Project: ESHL00114

Sample ID: 423330002

Client ID: ARSL004

Matrix: W

Collect Date: 15-MAY-17 11:22

Receive Date: 17-MAY-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	05/21/17	1602	1666622	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	05/19/17	1043	1666251	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	05/24/17	1121	1666192	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	05/19/17	1018	1666250
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	05/23/17	1700	1666191

The following Analytical Methods were performed:

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

### Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: June 12, 2017

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

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

Client SDG: 2017-1533

Client Sample ID: CAMO-17-132204  
Sample ID: 423330003  
Matrix: W  
Collect Date: 15-MAY-17 12:41  
Receive Date: 17-MAY-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.0678	0.067	0.200	mg/L		1	MXL2	05/26/17	0309	1668293	1
Chloride		4.44	0.067	0.200	mg/L		1					
Fluoride		0.166	0.033	0.100	mg/L		1					
Sulfate		7.01	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0544	0.017	0.050	mg/L	1.00	1	KLP1	05/22/17	1300	1666189	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.91	0.085	0.250	mg/L		5	AXH3	05/19/17	1100	1666115	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0455	0.020	0.050	mg/L	1.00	1	KLP1	05/23/17	1507	1666194	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		140	3.40	14.3	mg/L			KLP1	05/22/17	1435	1665589	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		58.2	1.45	4.00	mg/L			RXB5	05/27/17	1359	1668214	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		128	1.00	1.00	umhos/cm		1	VH1	05/30/17	1503	1668501	7
PH "As Received"												
pH at Temp 11.9C	H	8.36	0.010	0.100	SU		1	RXB5	05/27/17	1357	1668218	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	05/22/17	1105	1666188
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	05/23/17	1200	1666193

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## Certificate of Analysis

Report Date: June 12, 2017

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

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

Client SDG: 2017-1533

Client Sample ID: CAMO-17-132204  
Sample ID: 423330003

Project: ESHL00114  
Client ID: ARSL004

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

### Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: June 12, 2017

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

Los Alamos, New Mexico 87545

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

Client SDG: 2017-1533

Client Sample ID: CAMO-17-132224  
Sample ID: 423330004  
Matrix: W  
Collect Date: 15-MAY-17 12:41  
Receive Date: 17-MAY-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	05/21/17	1649	1666622	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	05/19/17	1050	1666251	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0788	0.033	0.100	mg/L	1.00	1	KLP1	05/24/17	1122	1666192	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	05/19/17	1018	1666250
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	05/23/17	1700	1666191

The following Analytical Methods were performed:

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

### Notes:

Column headers are defined as follows:

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

# **Quality Control Summary**

# GEL LABORATORIES LLC

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## QC Summary

Report Date: June 12, 2017

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

Contact: Mr. Keith Greene

Workorder: 423330

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1666622										
QC1203793104	423072004	DUP									
Total Organic Carbon Average	J	0.792	J	0.784	mg/L	1.02	^	(+/-1.00)	TSM	05/21/17	07:01
QC1203793105	423194005	DUP									
Total Organic Carbon Average	J	0.962	J	0.942	mg/L	2.1	^	(+/-1.00)		05/21/17	10:33
QC1203793103	LCS										
Total Organic Carbon Average	10.0			9.91	mg/L			99.1	(80%-120%)	05/21/17	05:15
QC1203793102	MB										
Total Organic Carbon Average			U	ND	mg/L					05/21/17	05:04
QC1203793106	423072004	PS									
Total Organic Carbon Average	10.0	J	0.792	11.4	mg/L			106	(75%-125%)	05/21/17	07:48
QC1203793107	423194005	PS									
Total Organic Carbon Average	10.0	J	0.962	11.7	mg/L			107	(75%-125%)	05/21/17	11:20
<b>Flow Injection Analysis</b>											
Batch	1666251										
QC1203792203	423330002	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	05/19/17	10:48
QC1203792202	LCS										
Cyanide, Total	50.0			50.5	ug/L			101	(90%-110%)	05/19/17	10:42
QC1203792201	MB										
Cyanide, Total			U	ND	ug/L					05/19/17	10:41
QC1203792205	423330002	MS									
Cyanide, Total	100	U	ND	102	ug/L			102	(90%-110%)	05/19/17	10:49

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## QC Summary

Workorder: 423330

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1668293										
QC1203797179	423194001	DUP									
Bromide		0.570		0.590	mg/L	3.34	^	(+/-0.200)	MXL2	05/25/17	22:49
Chloride		60.1		60.2	mg/L	0.0283		(0%-20%)		05/26/17	05:34
Fluoride		0.569		0.567	mg/L	0.388		(0%-20%)		05/25/17	22:49
Sulfate		60.0		60.1	mg/L	0.0749		(0%-20%)		05/26/17	05:34
QC1203797178	LCS										
Bromide	1.25			1.36	mg/L			109	(80%-120%)	05/25/17	21:51
Chloride	5.00			5.20	mg/L			104	(80%-120%)		
Fluoride	2.50			2.67	mg/L			107	(80%-120%)		
Sulfate	10.0			10.5	mg/L			105	(80%-120%)		
QC1203797177	MB										
Bromide		U		ND	mg/L					05/25/17	21:22
Chloride		U		ND	mg/L						
Fluoride		U		ND	mg/L						
Sulfate		U		ND	mg/L						
QC1203797180	423194001	PS									
Bromide	1.25	0.570		1.93	mg/L			109	(75%-125%)	05/25/17	23:18
Chloride	5.00	6.01		11.9	mg/L			117	(75%-125%)	05/26/17	06:03

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## QC Summary

Workorder: 423330

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1668293										
Fluoride	2.50	0.569		3.20	mg/L		105	(75%-125%)	MXL2	05/25/17	23:18
Sulfate	10.0	6.00		16.8	mg/L		108	(75%-125%)		05/26/17	06:03
<b>Nutrient Analysis</b>											
Batch	1666115										
QC1203791986	423330001	DUP									
Nitrogen, Nitrate/Nitrite		0.324		0.328	mg/L	1.23		(0%-20%)	AXH3	05/19/17	10:53
QC1203791985	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.01	mg/L		101	(90%-110%)		05/19/17	10:51
QC1203791984	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					05/19/17	10:50
QC1203791989	423330001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.324		1.34	mg/L		102	(90%-110%)		05/19/17	10:59
Batch	1666189										
QC1203792075	423224002	DUP									
Nitrogen, Ammonia		0.912		0.640	mg/L	35.1 *		(0%-20%)	KLP1	05/22/17	12:51
QC1203792074	LCS										
Nitrogen, Ammonia	1.00			1.02	mg/L		102	(90%-110%)		05/22/17	12:15
QC1203792073	MB										
Nitrogen, Ammonia			J	0.0307	mg/L					05/22/17	12:14
QC1203792076	423224002	MS									
Nitrogen, Ammonia	1.00	0.912		1.66	mg/L		74.8 *	(90%-110%)		05/22/17	12:51
Batch	1666192										
QC1203792083	422869005	DUP									
Nitrogen, Total Kjeldahl		0.589		0.605	mg/L	2.68		(0%-20%)	KLP1	05/24/17	11:04



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## QC Summary

Workorder: 423330

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1666192										
QC1203792085	423194002	DUP									
Nitrogen, Total Kjeldahl		0.214		0.180	mg/L	17.3	^	(+/-0.100)	KLP1	05/24/17	11:07
QC1203792082	LCS										
Nitrogen, Total Kjeldahl	1.00			1.08	mg/L			108 (90%-110%)		05/24/17	11:03
QC1203792081	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					05/24/17	10:38
QC1203792084	422869005	MS									
Nitrogen, Total Kjeldahl	1.00	0.589		2.12	mg/L			153* (90%-110%)		05/24/17	11:05
QC1203792086	423194002	MS									
Nitrogen, Total Kjeldahl	1.00	0.214		1.15	mg/L			93.6 (90%-110%)		05/24/17	11:08
Batch	1666194										
QC1203792089	423224002	DUP									
Phosphorus, Total as P		78.6		101	mg/L	24.7		(0%-27%)	KLP1	05/23/17	15:23
QC1203792088	LCS										
Phosphorus, Total as P	1.00			1.05	mg/L			105 (80%-124%)		05/23/17	15:03
QC1203792087	MB										
Phosphorus, Total as P			U	ND	mg/L					05/23/17	15:02
QC1203792090	423224002	MS									
Phosphorus, Total as P	4.00	78.6		93.0	mg/L			N/A (63%-139%)		05/23/17	15:28
<b>Solids Analysis</b>											
Batch	1665589										
QC1203794808	423330001	DUP									
Total Dissolved Solids		124		143	mg/L	10.5*		(0%-5%)	KLP1	05/22/17	14:35

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## QC Summary

Workorder: 423330

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	1665589										
QC1203790696	LCS										
Total Dissolved Solids	300			291	mg/L		97.1	(95%-105%)	KLP1	05/22/17	14:35
QC1203790695	MB										
Total Dissolved Solids			U	ND	mg/L					05/22/17	14:35
Titration and Ion Analysis											
Batch	1668214										
QC1203797003	423330001	DUP									
Alkalinity, Total as CaCO3		66.4		66.2	mg/L	0.302		(0%-20%)	RXB5	05/27/17	13:53
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203797000	LCS										
Alkalinity, Total as CaCO3	100			105	mg/L		105	(90%-110%)		05/27/17	13:10
QC1203797007	423330001	MS									
Alkalinity, Total as CaCO3	100	66.4		173	mg/L		107	(80%-120%)		05/27/17	13:55
Batch	1668218										
QC1203797013	423330001	DUP									
pH	H	7.96	H	7.94	SU	0.252		(0%-5%)	RXB5	05/27/17	13:55
QC1203797011	LCS										
pH	7.00			7.00	SU		100	(99%-101%)		05/27/17	13:10
Batch	1668501										
QC1203797708	423220001	DUP									
Conductivity		213		214	umhos/cm	0.468		(0%-10%)	VH1	05/30/17	15:02
QC1203797707	LCS										
Conductivity	1410			1400	umhos/cm		98.9	(95%-105%)		05/30/17	15:00

Notes:

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## QC Summary

Workorder: 423330

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<	Result is less than value reported										
>	Result is greater than value reported										
B	The target analyte was detected in the associated blank.										
E	General Chemistry--Concentration of the target analyte exceeds the instrument calibration range										
H	Analytical holding time was exceeded										
J	Value is estimated										
N/A	RPD or %Recovery limits do not apply.										
N1	See case narrative										
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.										
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
d	5-day BOD--The 2:1 depletion requirement was not met for this sample										
e	5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes										
h	Preparation or preservation holding time was exceeded										

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

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

\* Indicates that a Quality Control parameter was not within specifications.

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

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

# Miscellaneous

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 22-MAY-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 350.1	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, WASP
<b>Batch ID:</b> 1666189	<b>Sample Numbers:</b> See Below		
<p><b>Potentially affected work order(s)(SDG):</b> 423185,423194(2017-1529),423213(2017-1526),423215(2017-1525),423220(2017-1522),423224(2017-1524),423313,423330(2017-1533),423339(2017-1534),423575(2017-1552)</p> <p><b>Application Issues:</b></p> <p>Failed Recovery for MS/MSD, or PS/PSD</p> <p>Failed RPD for DUP</p>			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
<p>1. Failed RPD for DUP:</p> <p>QC 1203792075DUP,1203792079DUP</p> <p>2. Failed Recovery for MS/MSD, or PS/PSD:</p> <p>QC 1203792076MS,</p> <p>1203792078MS</p>		<p>1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: Nitrogen, Ammonia 1203792075 (WST53-17-133059DUP) [35.1* (0%-20%)] and 1203792079 (17-WS-05-151DUP) [abs(.139 - .076)* (+/- .05 mg/L)].</p> <p>2. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity. Nitrogen, Ammonia 1203792076 (WST53-17-133059MS) [74.8* (90%-110%)] and 1203792078 (17-WS-05-150MS) [75.7* (90%-110%)].</p>	

**Originator's Name:**

Kristen Mizzell 22-MAY-17

**Data Validator/Group Leader:**

Aubrey Kingsbury 22-MAY-17

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 23-MAY-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> BALANCE ANALYTICAL	<b>Test / Method:</b> EPA 160.1, SM 2540C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> BRKL, ESHL
<b>Batch ID:</b> 1665589	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 423221(38768),423330(2017-1533),423339(2017-1534),423448(2017-1541),423575(2017-1552) <b>Application Issues:</b> Failed RPD for DUP			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed RPD for DUP:  QC   1203790697DUP,1203794808DUP		1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: Total Dissolved Solids 1203790697 (38768-001DUP) [5.13* (0%-5%)] and 1203794808 (CAMO-17-132201DUP) [10.5* (0%-5%)].	

**Originator's Name:**  
Kristen Mizzell      23-MAY-17

**Data Validator/Group Leader:**  
Aubrey Kingsbury      23-MAY-17

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 24-MAY-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 351.2, EPA 351.2 SC	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1666192	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 422869(2017-1504),423194(2017-1529),423213(2017-1526),423215(2017-1525),423220(2017-1522),423224(2017-1524),423330(2017-1533),423339(2017-1534) <b>Application Issues:</b> Failed Recovery for MS/MSD, or PS/PSD			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Failed Recovery for MS/MSD, or PS/PSD: QC 1203792084MS		1. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity. Nitrogen, Total Kjeldahl 1203792084 (WST15-17-135039MS) [153* (90%-110%)].	

**Originator's Name:**  
Kristen Mizzell 24-MAY-17

**Data Validator/Group Leader:**  
Aubrey Kingsbury 24-MAY-17

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 27-MAY-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ELECTRODE	<b>Test / Method:</b> EPA 150.1, SW846 9040C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, SCPO
<b>Batch ID:</b> 1668218	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 423177,423301,423330(2017-1533),423448(2017-1541)</b> <b>Application Issues:</b> Sample received out of holding			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Sample received out of holding: 423177 001,002,003,004,005 423301 001,002,003 423330 001,003 423448 001,003 QC 1203797012DUP,1203797013DUP		1. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 1203797012 (DEPO-0515-SW-001-17DUP) [Received 16-MAY-17, out of holding 15-MAY-17]. 1203797013 (CAMO-17-132201DUP) [Received 17-MAY-17, out of holding 15-MAY-17]. 423177001 (DEPO-0515-SW-001-17) [Received 16-MAY-17, out of holding 15-MAY-17]. 423177002 (DEPO-0515-SW-020-17) [Received 16-MAY-17, out of holding 15-MAY-17]. 423177003 (DEPO-0515-SW-030-17) [Received 16-MAY-17, out of holding 15-MAY-17]. 423177004 (DEPO-0515-SW-031-17) [Received 16-MAY-17, out of holding 15-MAY-17]. 423177005 (DEPO-0515-SW-033-17) [Received 16-MAY-17, out of holding 15-MAY-17]. 423301001 (DEPO-0516-RG-001-17) [Received 17-MAY-17, out of holding 16-MAY-17]. 423301002 (DEPO-0516-RG-002-17) [Received 17-MAY-17, out of holding 16-MAY-17]. 423301003 (DEPO-0516-SW-043-17) [Received 17-MAY-17, out of holding 16-MAY-17]. 423330001 (CAMO-17-132201) [Received 17-MAY-17, out of holding 15-MAY-17]. 423330003 (CAMO-17-132204) [Received 17-MAY-17, out of holding 15-MAY-17]. 423448001 (CAMO-17-132202) [Received 18-MAY-17, out of holding 16-MAY-17]. 423448003 (CAMO-17-132218) [Received 18-MAY-17, out of holding 16-MAY-17].	

**Originator's Name:**

Rachael Bell 27-MAY-17

**Data Validator/Group Leader:**

Elzbieta Szulc 30-MAY-17