

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:

Revised data begins on page 198.

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133279

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/12/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1345		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	8/12/17B ESP PP	
LOCATION ID:	16-61439		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <u>NO</u> / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1 LITER POLY	1	HNO3	X	NA
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: E SP test completed; Results Negative

LOCATION COMMENTS: NA

FIELD PARAMETERS:

Sample Time	1345	HH:MM	Dissolved Oxygen	7.81	Flow (in gpm)	0.67
Oxidation-Reduction Potential	NC		pH	7.49	Specific Conductance	219.1
Temperature	16.5		Turbidity	13.1		

COLLECTED BY (PRINT): A. Vigil & K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>Katrina Tow</i>	Date/Time 06/12/2017 1435	RECEIVED BY (Printed Name) (Signature)	S. Sherwood <i>S. Sherwood</i>	Date/Time 6/12/17 1435
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133283

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/12/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1312		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	CdV-16-1(i)		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <u>NO</u> / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	NA
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: ~~NA~~ HE SPOT test completed; Results negative
6/12/17TB

LOCATION COMMENTS: NA

FIELD PARAMETERS:

Sample Time	<u>1312</u>	HH:MM	Dissolved Oxygen	<u>6.00</u>	Flow (in gpm)	<u>0.92</u>
Oxidation-Reduction Potential	<u>224.5</u>		pH	<u>6.52</u>	Specific Conductance	<u>181.8</u>
Temperature	<u>13.3</u>		Turbidity	<u>1.75</u>		

COLLECTED BY (PRINT): A. Vigil & K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 06/12/2017 1435	RECEIVED BY (Printed Name) (Signature)	Sherwood <i>[Signature]</i>	Date/Time 6/12/17 1435
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133297

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/12/2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	13:18		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	RSP	
LOCATION ID:	R-25b		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	TEST	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	NA
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: None

LOCATION COMMENTS: None

FIELD PARAMETERS:

Sample Time	13:18	HH:MM	Dissolved Oxygen	0.61	Flow (in gpm)	0.185
Oxidation-Reduction Potential	86.2		pH	6.75	Specific Conductance	788
Temperature	11.0		Turbidity	22.5		

COLLECTED BY (PRINT): M. Shendo

RELINQUISHED BY (Printed Name) M. Shendo (Signature) <i>M. Shendo</i>	Date/Time 6/12/17 1440	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i>	Date/Time 6/12/17 1440
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133307

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/12/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1345		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PD	
LOCATION ID:	16-61439		FIELD PREP:	F	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <u>NO</u> / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): A. Vigil & K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 06/12/2017 1435	RECEIVED BY (Printed Name) (Signature)	S. Sherwood <i>[Signature]</i>	Date/Time 6/12/17 1435
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133311

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/12/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1312		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	CdV-16-1(i)		FIELD PREP:	F	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <input checked="" type="radio"/> NO / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): A. Vigil & K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>Katrina Tow</i>	Date/Time 06/12/2017 1435	RECEIVED BY (Printed Name) (Signature)	S. Sherwood <i>S. Sherwood</i>	Date/Time 6/12/17 1435
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133325

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/12/2017	dk	FIELD MATRIX:	W	dk
TIME COLLECTED (HH:MM):	1318	dk	MEDIA:	UA	
PRS ID:	W1		SAMPLE TECH CODE:	RSP	
LOCATION ID:	R-25b		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	TEST	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT):

D. Jaramila

RELINQUISHED BY (Printed Name) <u>D. Jaramila</u> (Signature) <u>D. Jaramila</u>	Date/Time 1440 6/12/17	RECEIVED BY (Printed Name) <u>S. Sherwood</u> (Signature) <u>S. Sherwood</u>	Date/Time 6/12/17 1440
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

DATA VALIDATION REPORT

Chain Of Custody No. 2017-1734

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
425417	EPA:120.1	2				
425417	EPA:150.1	2				
425417	EPA:160.1	2				
425417	EPA:170.0	4				
425417	EPA:245.2	4				
425417	EPA:300.0	2				
425417	EPA:310.1	2				
425417	EPA:335.4	2				
425417	EPA:350.1	2				
425417	EPA:351.2	2				
425417	EPA:353.2	2				
425417	EPA:365.4	2				
425417	SM:A2340B	2				
425417	SW-846:6010C	2				
425417	SW-846:6020	2				
425417	SW-846:6850	2				
425417	SW-846:8330B	2				
425417	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
425417	EPA:120.1	1679220	1679220	2										1				1			
425417	EPA:150.1	1676572	1676572	2										1	1			1			
425417	EPA:160.1	1675379	1675379	2					1					1				1			
425417	EPA:170.0	NA	NA	4																	
425417	EPA:245.2	1674270	1674269	4					1	1				1				1			
425417	EPA:300.0	1674234	1674234	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
425417	EPA:310.1	1676562	1676562	2						1				1				1			
425417	EPA:335.4	1674062	1674061	2					1	1	1			1				1			
425417	EPA:350.1	1673875	1673874	2					1	1				1				1			
425417	EPA:351.2	1673872	1673870	2					1	1				1				1			
425417	EPA:353.2	1674641	1674641	2					1					1				1			
425417	EPA:365.4	1673877	1673876	2					1	1				1				1			
425417	SM:A2340B	1679789	1679789	2																	
425417	SW-846:6010C	1674023	1674022	2					1	1				1				1			
425417	SW-846:6020	1674031	1674030	2					1	1				1				1			
425417	SW-846:6850	1675216	1675214	2					1	1	1			1							
425417	SW-846:8330B	1674747	1674744	2					1	1	1			1							
425417	SW-846:9060	1673634	1673634	2					1					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	CAWA-17-133307	425417002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133311	425417004	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133325	425417006	TEST	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133330	1203823673	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203823672	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133307	425417002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133311	425417004	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133325	425417006	TEST	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133335	1203817346	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203817344	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	LCSD	1203817345	LCSD	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133307	425417002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133311	425417004	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133325	1203814592	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133325	425417006	TEST	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203814591	LCS	0	0	1	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:160.1	GENERAL CHEMISTRY	MB	1203814590	MB	1	0	0	0
EPA:170.0	VOC	CAWA-17-133279	425417001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133283	425417003	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133297	425417005	TEST	1	0	0	0
EPA:170.0	VOC	CAWA-17-133307	425417002	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133311	425417004	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133325	425417006	TEST	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133279	1203811974	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133279	1203811976	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-17-133279	425417001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133283	425417003	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133297	425417005	TEST	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133307	425417002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133311	425417004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133325	425417006	TEST	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203811973	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203811972	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133307	425417002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133311	425417004	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133325	1203811882	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133325	425417006	TEST	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203811881	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203811880	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133307	425417002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133311	425417004	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133325	425417006	TEST	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133335	1203817296	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133335	1203817299	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203817292	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133279	1203811491	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133279	1203811492	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133279	1203814049	MSD	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133279	425417001	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133283	425417003	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133297	425417005	TEST	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203811490	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203811489	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133307	425417002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133311	425417004	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133314	1203811099	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:350.1	GENERAL CHEMISTRY	CAWA-17-133314	1203811100	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133325	425417006	TEST	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203811098	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203811097	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133279	425417001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133283	425417003	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133286	1203811091	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133286	1203811092	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133297	425417005	TEST	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203811090	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203811089	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133307	1203812762	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133307	425417002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133311	425417004	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133325	425417006	TEST	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203812761	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203812760	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133307	425417002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133311	425417004	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133314	1203811108	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133314	1203811109	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133325	425417006	TEST	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203811105	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203811104	MB	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133307	425417002	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133311	425417004	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133325	425417006	TEST	1	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133307	1203811393	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133307	1203811394	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-17-133307	425417002	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133311	425417004	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133325	425417006	TEST	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203811392	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203811391	MB	17	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133307	1203811413	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133307	1203811414	MS	0	0	11	0
SW-846:6020	INORGANIC	CAWA-17-133307	425417002	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133311	425417004	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133325	425417006	TEST	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203811412	LCS	0	0	11	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:6020	INORGANIC	MB	1203811411	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133307	425417002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133311	425417004	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133325	425417006	TEST	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133326	1203814196	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133326	1203814197	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203814195	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203814194	MB	1	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133279	1203813031	MS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133279	1203813032	MSD	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133279	425417001	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133283	425417003	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133297	425417005	TEST	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203813030	LCS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	MB	1203813029	MB	20	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133279	425417001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133283	425417003	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133284	1203812104	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133297	425417005	TEST	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133305	1203812105	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203812103	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	LCSD	1203812277	LCSD	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203812102	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

DATA VALIDATION REPORT

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203811104	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.0324	J	mg/L	0.050
MB	1203811391	METHOD BLANK	SW-846:6010C	W	Sodium	119	J	ug/L	300

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
CAWA-17-133307	1203811104	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0324	mg/L	0.0854		0.050	Y	5	100	Y
CAWA-17-133311	1203811104	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0324	mg/L	0.0474	J	0.050	Y	5	100	Y
CAWA-17-133325	1203811104	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0324	mg/L	0.225		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?

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
CAWA-17-133307	1203811394		SW-846:6010C	Silicon Dioxide	1674022	06-23-2017	W	126		125	75			
CAWA-17-133307	1203811394		SW-846:6010C	Silicon Dioxide	1674022	06-23-2017	W	126		125	75			
CAWA-17-133279	1203813031	1203813032	SW-846:8330B	RDX	1674744	06-30-2017	W	99	151	125	57		13	30
CAWA-17-133279	1203813031	1203813032	SW-846:8330B	TATB	1674744	06-28-2017	W	134	153	149	38		16	30

DATA VALIDATION REPORT

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
16-61439	2017-1734	CAWA-17-133307	REG	INIT	INORGANIC	SW-846:6010C	Silicon Dioxide	N	J+	I6b	Y	41000	ug/L	41	mg/L			W	06/12/2017		1674023	VAL	Y
16-61439	2017-1734	CAWA-17-133307	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0854	mg/L	0.0854	mg/L			W	06/12/2017		1673877	VAL	Y
CdV-16-1(i)	2017-1734	CAWA-17-133311	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	J	U	I4	N	0.0474	mg/L	0.0474	mg/L			W	06/12/2017		1673877	VAL	Y
R-25b	2017-1734	CAWA-17-133325	TEST	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		J	I4a	Y	0.225	mg/L	0.225	mg/L			W	06/12/2017		1673877	VAL	Y

Reason Code

Description

I4

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

I4a

The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x

I6b

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

DATA VALIDATION REPORT

Reason Code

Description

J_LAB

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

NQ

The analytical laboratory did not qualify the analyte as not detected and/or any other standard 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
CAWA-17-133279	16-61439	REG	EPA:170.0	0	1
CAWA-17-133279	16-61439	REG	EPA:245.2	0	1
CAWA-17-133279	16-61439	REG	EPA:335.4	0	1
CAWA-17-133279	16-61439	REG	EPA:351.2	0	1
CAWA-17-133279	16-61439	REG	SW-846:8330B	0	20
CAWA-17-133279	16-61439	REG	SW-846:9060	0	1
CAWA-17-133283	CdV-16-1(i)	REG	EPA:170.0	0	1
CAWA-17-133283	CdV-16-1(i)	REG	EPA:245.2	0	1
CAWA-17-133283	CdV-16-1(i)	REG	EPA:335.4	0	1
CAWA-17-133283	CdV-16-1(i)	REG	EPA:351.2	0	1
CAWA-17-133283	CdV-16-1(i)	REG	SW-846:8330B	0	20
CAWA-17-133283	CdV-16-1(i)	REG	SW-846:9060	0	1
CAWA-17-133297	R-25b	TEST	EPA:170.0	0	1
CAWA-17-133297	R-25b	TEST	EPA:245.2	0	1
CAWA-17-133297	R-25b	TEST	EPA:335.4	0	1
CAWA-17-133297	R-25b	TEST	EPA:351.2	0	1
CAWA-17-133297	R-25b	TEST	SW-846:8330B	0	20
CAWA-17-133297	R-25b	TEST	SW-846:9060	0	1
CAWA-17-133307	16-61439	REG	EPA:120.1	0	1
CAWA-17-133307	16-61439	REG	EPA:150.1	0	1
CAWA-17-133307	16-61439	REG	EPA:160.1	0	1
CAWA-17-133307	16-61439	REG	EPA:170.0	0	1
CAWA-17-133307	16-61439	REG	EPA:245.2	0	1
CAWA-17-133307	16-61439	REG	EPA:300.0	0	4
CAWA-17-133307	16-61439	REG	EPA:310.1	0	2
CAWA-17-133307	16-61439	REG	EPA:350.1	0	1
CAWA-17-133307	16-61439	REG	EPA:353.2	0	1
CAWA-17-133307	16-61439	REG	EPA:365.4	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133307	16-61439	REG	SM:A2340B	0	1
CAWA-17-133307	16-61439	REG	SW-846:6010C	0	17
CAWA-17-133307	16-61439	REG	SW-846:6020	0	11
CAWA-17-133307	16-61439	REG	SW-846:6850	0	1
CAWA-17-133311	CdV-16-1(i)	REG	EPA:120.1	0	1
CAWA-17-133311	CdV-16-1(i)	REG	EPA:150.1	0	1
CAWA-17-133311	CdV-16-1(i)	REG	EPA:160.1	0	1
CAWA-17-133311	CdV-16-1(i)	REG	EPA:170.0	0	1
CAWA-17-133311	CdV-16-1(i)	REG	EPA:245.2	0	1
CAWA-17-133311	CdV-16-1(i)	REG	EPA:300.0	0	4
CAWA-17-133311	CdV-16-1(i)	REG	EPA:310.1	0	2
CAWA-17-133311	CdV-16-1(i)	REG	EPA:350.1	0	1
CAWA-17-133311	CdV-16-1(i)	REG	EPA:353.2	0	1
CAWA-17-133311	CdV-16-1(i)	REG	EPA:365.4	0	1
CAWA-17-133311	CdV-16-1(i)	REG	SM:A2340B	0	1
CAWA-17-133311	CdV-16-1(i)	REG	SW-846:6010C	0	17
CAWA-17-133311	CdV-16-1(i)	REG	SW-846:6020	0	11
CAWA-17-133311	CdV-16-1(i)	REG	SW-846:6850	0	1
CAWA-17-133325	R-25b	TEST	EPA:120.1	0	1
CAWA-17-133325	R-25b	TEST	EPA:150.1	0	1
CAWA-17-133325	R-25b	TEST	EPA:160.1	0	1
CAWA-17-133325	R-25b	TEST	EPA:170.0	0	1
CAWA-17-133325	R-25b	TEST	EPA:245.2	0	1
CAWA-17-133325	R-25b	TEST	EPA:300.0	0	4
CAWA-17-133325	R-25b	TEST	EPA:310.1	0	2
CAWA-17-133325	R-25b	TEST	EPA:350.1	0	1
CAWA-17-133325	R-25b	TEST	EPA:353.2	0	1
CAWA-17-133325	R-25b	TEST	EPA:365.4	0	1
CAWA-17-133325	R-25b	TEST	SM:A2340B	0	1
CAWA-17-133325	R-25b	TEST	SW-846:6010C	0	17
CAWA-17-133325	R-25b	TEST	SW-846:6020	0	11
CAWA-17-133325	R-25b	TEST	SW-846:6850	0	1

DATA VALIDATION REPORT

Chain Of Custody No. 2017-1734 - Rev

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
425417	SW-846:8330B	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
425417	SW-846:8330B	1674747	1674744	2					1												

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133279	425417001	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133283	425417003	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133297	425417005	TEST	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	MB	1203813029	MB	3	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

DATA VALIDATION REPORT

6. Any surrogate recoveries outside the control limits?

No.

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

No.

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

None.

<u>Reason Code</u>	<u>Description</u>
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.

DATA VALIDATION REPORT

Reason Code

U_LAB

Description

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
CAWA-17-133279	16-61439	REG	SW-846:8330B	0	3
CAWA-17-133283	CdV-16-1(i)	REG	SW-846:8330B	0	3
CAWA-17-133297	R-25b	TEST	SW-846:8330B	0	3

July 06, 2017

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

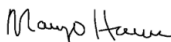
Re: LANL- WQH Water Samples
Work Order: 425417
SDG: 2017-1734

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 14, 2017, and analyzed for Explosives by LCMSMS, 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: 2017-1734
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 425417
SDG: 2017-1734

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 425417
SDG # : 2017-1734**

July 06, 2017

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 14, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
425417001	CAWA-17-133279
425417002	CAWA-17-133307
425417003	CAWA-17-133283
425417004	CAWA-17-133311
425417005	CAWA-17-133297
425417006	CAWA-17-133325

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: Explosives by LCMSMS, General Chemistry, Metals and Perchlorates by LCMSMS.

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

Margo Herron
Margo Herron for
Valerie Davis
Project Manager

List of current GEL Certifications as of 06 July 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	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 & REVIEW FORM

Client: ESHL		SDG/AR/COC/Work Order: 425417	
Received By: ZKW		Date Received: 6/14/17	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other 5908 1782 2109 5908 1782 2094 5908 1782 2083	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input 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?	Yes <input checked="" type="checkbox"/> No <input 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: 4°C
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 Damaged container Leaking container Other (describe)
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 <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No ___ N/A ___ (If unknown, select No) VOA vials free of headspace? Yes ___ No <input checked="" type="checkbox"/> N/A ___ Sample ID's and containers affected: Both vials for - 136839 read w/ headspace
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: See Below
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):

*** We received 2 VOA vials for WSTM0-17-136839 collected 6/9/17 @ 22:55, CoC says we should have received WSTM0-17-136841.**

PM (or PMA) review: Initials

met

Date

6/15/17

Page

1 of **1**

GL-CHL-SR-001 Rev 5

Subject: LANL issues for 06/13/2017 and 06/14/2017
From: Margo Herron <Margo.Herron@gel.com>
Date: 6/14/2017 2:38 PM
To: Keith Robert Greene <kgreene@lanl.gov>
CC: "team.davis" <team.davis@gel.com>

Good Afternoon,

For request number 2017-1718, All VOA vials for samples WST03-17-139347, WST03-17-139348, WST03-17-139349, and WST03-17-139350 was received with headspace. We will continue with the analysis unless instructed otherwise.

For request number 2017-1718 sample WST03-17-139351 we received a PH container that is not listed on the chain of custody. Please advise.

For request number 2017-1719 the BOD was received out of hold. We will continue with the analysis unless instructed otherwise.

** We received two VOA vials for WSTMO-17-136839 collected on 06/09/2017 at 22:55. This sample is not on the chain of custody. Both vials had headspace. We did not receive WSTMO-17-136841 but instead WSTMO-17-136839. Please advise.

Thanks,

Margo Herron

--

Margo Herron
Project Manager Assistant



2040 Savage Road, Charleston, SC 29407 | PO Box 30712, Charleston, SC 29417
Office Main: 843.556.8171 Ext. 4707 | Fax: 843.766.1178
E-Mail: Margo.Herron@gel.com | Website: www.gel.com
Environmental | Engineering | Surveying | Analytical Testing

Ask me about GEL's new testing capability for Perfluorinated chemicals (PFCs)!
<http://www.gellaboratories.com>

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 13JUN17
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

4c

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 13JUN17
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

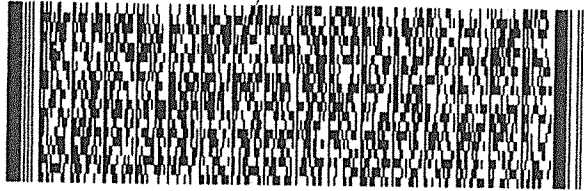
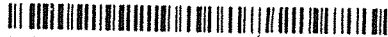
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

4c

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(843) 666-8171

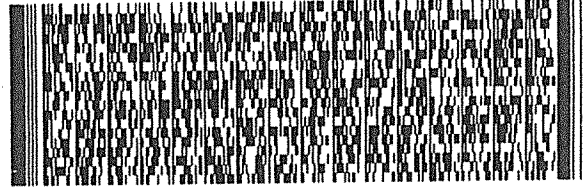
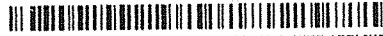
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FedEx
Express



J1513150C1301uv



FedEx
Express



J1513150C1301uv

2 of 3
MPS# 5908 1782 2094
0263

Mstr# 5908 1782 2083

0201

X7 RBWA

29407
SC-US CHS

WED - 14 JUN 10:30A
PRIORITY OVERNIGHT

3 of 3
MPS# 5908 1782 2109
0263

Mstr# 5908 1782 2083

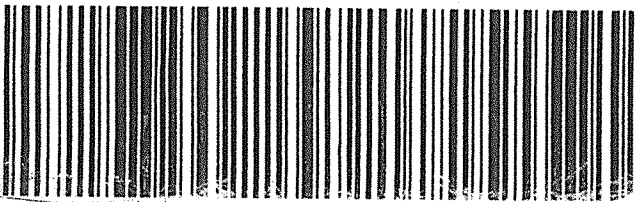
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X7 RBWA

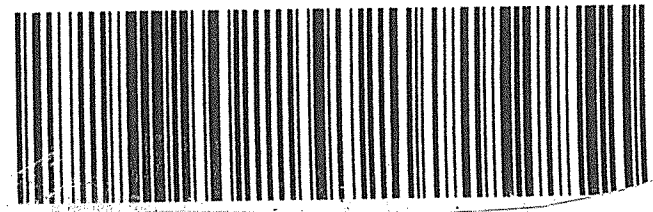
29407
SC-US CHS

WED - 14 JUN 10:30A
PRIORITY OVERNIGHT

Part # 156148V-434 RIT2 06/15



Part # 156148V-434 RIT2 06/15



SHIP DATE: 13JUN17
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

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

LOS ALAMOS, NM 87545
UNITED STATES US

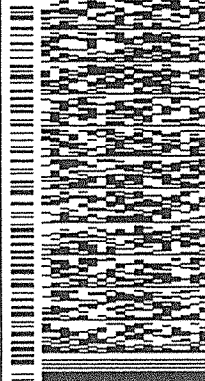
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GENERAL ENGINEERING LAB
2040 SAVAGE RD

4c

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO



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Express



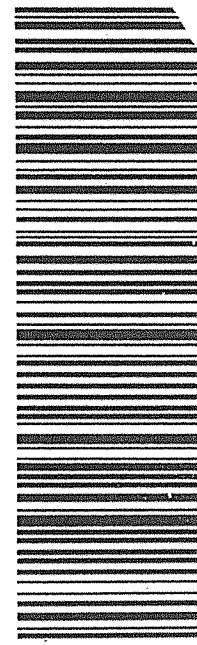
WED - 14 JUN 10:30A
PRIORITY OVERNIGHT

1 of 3
TRK# 5908 1782 2083
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MASTER

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29407
SC-US CHS



Part # 156148V-434 RIT2 06/15

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

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

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

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1734
Work Order #: 425417**

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:	1675216
Prep Batch Number:	1675214

Sample Analysis

Sample ID	Client ID
425417002	425417002 (CAWA-17-133307)
425417004	425417004 (CAWA-17-133311)
425417006	425417006 (CAWA-17-133325)
1203814204	Interference Check Sample (ICS)
1203814194	Method Blank (MB)
1203814195	Laboratory Control Sample (LCS)
1203814196	425115002(CAWA-17-133326) Matrix Spike (MS)
1203814197	425115002(CAWA-17-133326) 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 425115002 (CAWA-17-133326) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The recoveries of Perchlorate and Perchlorate-101 were not within the acceptance limits in 1203814196 (CAWA-17-133326MS) and 1203814197 (CAWA-17-133326MSD). This was due to the background concentration in the parent sample, 425115002 (CAWA-17-133326).

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

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

Retention Time

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

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: 2017-1734 GEL Work Order: 425417

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 24 JUN 2017

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133307Date Received: 14-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 425417002Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.206	ug/L		1	19-JUN-17 20:49	per0619027a
	Perchlorate Isotope Ratio			2.92			1	19-JUN-17 20:49	per0619027a
14797-73-0	Perchlorate-101	.05	.2	0.206	ug/L		1	19-JUN-17 20:49	per0619027a
	Perchlorate-O(18)			0.407	ug/L		1	19-JUN-17 20:49	per0619027a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133311Date Received: 14-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 425417004Date Filtered: 19-JUN-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	0.461	ug/L		1	19-JUN-17 21:00	per0619028a
	Perchlorate Isotope Ratio			2.78			1	19-JUN-17 21:00	per0619028a
14797-73-0	Perchlorate-101	.05	.2	0.485	ug/L		1	19-JUN-17 21:00	per0619028a
	Perchlorate-O(18)			0.418	ug/L		1	19-JUN-17 21:00	per0619028a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133325Date Received: 14-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 425417006Date Filtered: 19-JUN-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	0.252	ug/L		1	19-JUN-17 21:11	per0619029a
	Perchlorate Isotope Ratio			2.88			1	19-JUN-17 21:11	per0619029a
14797-73-0	Perchlorate-101	.05	.2	0.255	ug/L		1	19-JUN-17 21:11	per0619029a
	Perchlorate-O(18)			0.403	ug/L		1	19-JUN-17 21:11	per0619029a

^ 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): 2017-1734

Extract Batch Code: 1675214

Date Filtered: 19-JUN-17

Matrix: WATER

Sample ID: 1203814195

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		85 - 115
Perchlorate Isotope Ratio		3.04				-
Perchlorate-101	0.200	.189	ug/L	95		85 - 115
Perchlorate-O(18)		.439	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): 2017-1734

Extract Batch Code: 1675214

Date Extracted: 19-JUN-17

GEL MS/PS ID: 1203814196

Client ID: CAWA-17-133326

GEL MSD/PSD ID: 1203814197

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	1.05	ug/L	1.12	34 *	1.16	53 *	3	30	75 - 125
Perchlorate Isotope Ratio	0	2.92		2.78		2.83		2		-
Perchlorate-101	0.200	1.05	ug/L	1.17	61 *	1.19	71 *	2	30	75 - 125
Perchlorate-O(18)	0	0.410	ug/L	0.415		.423		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 LLC

Client Sample No.

MBLab Code: GELDate Received: 19-JUN-17Instrument: LCMSMSGEL Job No (SDG): 2017-1734Method: EPA 6850 ModifiedGEL Sample ID: 1203814194Matrix: WATERDate Filtered: 19-JUN-17Extraction Batch ID: 1675214Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL%Solids: Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	19-JUN-17 18:15	per0619013a
	Perchlorate Isotope Ratio						1	19-JUN-17 18:15	per0619013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	19-JUN-17 18:15	per0619013a
	Perchlorate-O(18)			0.475	ug/L		1	19-JUN-17 18:15	per0619013a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 19-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 1203814195Date Filtered: 19-JUN-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	0.197	ug/L	J	1	19-JUN-17 18:26	per0619014a
	Perchlorate Isotope Ratio			3.04			1	19-JUN-17 18:26	per0619014a
14797-73-0	Perchlorate-101	.05	.2	0.189	ug/L	J	1	19-JUN-17 18:26	per0619014a
	Perchlorate-O(18)			0.439	ug/L		1	19-JUN-17 18:26	per0619014a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1734GEL Sample ID: 1203814204Date Filtered: 19-JUN-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	0.186	ug/L	J	1	19-JUN-17 18:37	per0619015a
	Perchlorate Isotope Ratio			2.58			1	19-JUN-17 18:37	per0619015a
14797-73-0	Perchlorate-101	.05	.2	0.210	ug/L		1	19-JUN-17 18:37	per0619015a
	Perchlorate-O(18)			0.432	ug/L		1	19-JUN-17 18:37	per0619015a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326MSDate Received: 09-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 1203814196Date Filtered: 19-JUN-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	1.12	ug/L		1	19-JUN-17 18:59	per0619017a
	Perchlorate Isotope Ratio			2.78			1	19-JUN-17 18:59	per0619017a
14797-73-0	Perchlorate-101	.05	.2	1.17	ug/L		1	19-JUN-17 18:59	per0619017a
	Perchlorate-O(18)			0.415	ug/L		1	19-JUN-17 18:59	per0619017a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326MSDDate Received: 09-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 1203814197Date Filtered: 19-JUN-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	1.16	ug/L		1	19-JUN-17 19:10	per0619018a
	Perchlorate Isotope Ratio			2.83			1	19-JUN-17 19:10	per0619018a
14797-73-0	Perchlorate-101	.05	.2	1.19	ug/L		1	19-JUN-17 19:10	per0619018a
	Perchlorate-O(18)			0.423	ug/L		1	19-JUN-17 19:10	per0619018a

^ 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 =

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

Explosives by LCMSMS Analysis

Case Narrative

**Explosives by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1734
Work Order #: 425417**

Method/Analysis Information

Procedure: The Processing, Extraction, and Analysis of Nitroaromatics, Nitroamines, and Nitrate Esters by SW-846 8330B

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch Number: 1674747

Prep Batch Number: 1674744

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8330B:

Sample ID	Client ID
425417001	CAWA-17-133279
425417003	CAWA-17-133283
425417005	CAWA-17-133297
1203813029	Method Blank (MB)
1203813030	Laboratory Control Sample (LCS)
1203813031	425417001(CAWA-17-133279) Matrix Spike (MS)
1203813032	425417001(CAWA-17-133279) Matrix Spike Duplicate (MSD)

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-068 REV# 7.

Calibration Information

Initial Calibration

All initial calibration requirements for this analysis have been met for this SDG.

Calibration Verification Standard Requirements

All continuing calibration verification standards (CCV) have not met requirements of 80-120% for 1203813029 (MB), 1203813030 (LCS), 1203813031 (CAWA-17-133279MS), 1203813032 (CAWA-17-133279MSD), 425417001 (CAWA-17-133279), 425417003 (CAWA-17-133283) and 425417005 (CAWA-17-133297) in this SDG. Please refer to Form 7 of the data package for a list of recoveries. A LLOQ level standard was analyzed following the biased low CCV with all target analytes meeting acceptance limits. Since the target analyte was not

detected in the associated samples, the data are reported.

Calibration Blank Requirements

All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria. Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

CRI Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG for this analysis met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 425417001 (CAWA-17-133279) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

One or more of the required spiking analytes were not within the acceptance limits in the matrix spike duplicate (MSD). While the MSD exhibited a high bias, both the LCS and MS met acceptance limits for (insert compound name). Since (insert compound name) was not detected in the associated samples, the data are reported.

Sample	Analyte	Value
1203813032 (CAWA-17-133279MSD)	TATB	153* (38%-149%)

The MS and/or MSD (See Below) did not meet acceptance criteria for the recovery of spiked analytes. The recoveries are attributed to over range concentrations of target analytes in the parent sample.

Sample	Analyte	Value
1203813032 (CAWA-17-133279MSD)	RDX	151* (57%-125%)

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits for this analysis.

Internal Standard (ISTD) Acceptance

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

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

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water. Samples 425417001 (CAWA-17-133279) and 425417003 (CAWA-17-133283) were further diluted to bring the over range concentrations within the calibration range. The final dilution in each case takes the 1:1 v/v dilution into account.

Analyte	425417	
	001	003
HMX	5X	2X
RDX	5X	10X

Sample Re-extraction/Re-analysis

Sample 425417005 (CAWA-17-133297) was re-analyzed to confirm potential carryover from the previous sample analysis. The re-analysis data are reported.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception report (DER) 1647828 was generated for sample 1203813032 (CAWA-17-133279MSD) in this SDG/batch.

Manual Integrations

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

Additional Comments

Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct. Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data. Relative Retention Time (RRT) is used by the laboratory to establish peak identity. The RRT of each target analyte is calculated using the retention time of the corresponding internal standard. The RRT of each analyte in a sample must be within 0.1 of the analyte's calculated RRT in the ICV.

System Configuration

The laboratory utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC/MS/MS #3 or LC/MS/MS #4. The laboratory also utilizes a Shimadzu Nexera XC liquid chromatography instrument for Primary and/or Secondary analyte analysis. It is coupled with an Applied Biosystems 5500 Mass Spectrometer/ Mass Spectrometer, designated as LC/MS/MS #5. All are fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte 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 Explosives analysis was performed on a ABSciex 5500 LCMSMS.

The detection of the Primary and Secondary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

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: 2017-1734 GEL Work Order: 425417

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 05 JUL 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417001

Sample Amount 890 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0625057.wiff

Date Analyzed: 28-JUN-17 00:20

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.112	J	0.0899	0.281
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.281	U	0.0899	0.281
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.281	U	0.0899	0.281
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.281	U	0.0921	0.281
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.281	U	0.0899	0.281
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.281	U	0.0899	0.281
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.281	U	0.0899	0.281
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.281	U	0.0899	0.281
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.562	U	0.0899	0.562
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.562	U	0.112	0.562
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.562	U	0.169	0.562
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.99		0.0899	0.281
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
3058-38-6	TATB	1.12	U	0.337	1.12
<i>3058-38-6</i>	<i>TATB</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417001

Sample Amount 890 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
618-87-1	3,5-Dinitroaniline	1.12	U	0.337	1.12
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.12	U	0.337	1.12
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	1.44		0.0899	0.281
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.81	U	0.562	2.81
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.81	U	0.562	2.81
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417001

Sample Amount 890 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0630016.wiff

Date Analyzed: 30-JUN-17 19:06

Dilution Factor: 5

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	11.4		0.225	0.702
2691-41-0	HMX				
121-82-4	RDX	13.1		0.225	0.702
121-82-4	RDX				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133283

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417003

Sample Amount 950 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0630044.wiff

Date Analyzed: 01-JUL-17 11:02

Dilution Factor: 10

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	37.4		0.421	1.32
121-82-4	RDX				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133283

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417003

Sample Amount 950 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0630019.wiff

Date Analyzed: 30-JUN-17 20:49

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
35572-78-2	2-Amino-4,6-dinitrotoluene	.0904	J	0.0842	0.263
35572-78-2	2-Amino-4,6-dinitrotoluene				
19406-51-0	4-Amino-2,6-dinitrotoluene	.205	J	0.0842	0.263
19406-51-0	4-Amino-2,6-dinitrotoluene				
118-96-7	2,4,6-Trinitrotoluene	.263	U	0.0842	0.263
118-96-7	2,4,6-Trinitrotoluene				
121-14-2	2,4-Dinitrotoluene	.263	U	0.0842	0.263
121-14-2	2,4-Dinitrotoluene				
606-20-2	2,6-Dinitrotoluene	.263	U	0.0842	0.263
606-20-2	2,6-Dinitrotoluene				
88-72-2	o-Nitrotoluene	.263	U	0.0863	0.263
88-72-2	o-Nitrotoluene				
98-95-3	Nitrobenzene	.263	U	0.0842	0.263
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	.263	U	0.0842	0.263
99-08-1	m-Nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	.263	U	0.0842	0.263
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.263	U	0.0842	0.263
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.526	U	0.0842	0.526
479-45-8	Tetryl				
78-11-5	PETN	.526	U	0.105	0.526
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.526	U	0.158	0.526
99-99-0	p-Nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133283

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417003

Sample Amount 950 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.05	U	0.316	1.05
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.05	U	0.316	1.05
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.05	U	0.316	1.05
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
2691-41-0	HMX	1.74		0.0842	0.263
<i>2691-41-0</i>	<i>HMX</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.63	U	0.526	2.63
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.63	U	0.526	2.63
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133297

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417005

Sample Amount 910 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0630045.wiff

Date Analyzed: 01-JUL-17 11:37

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	.237	J	0.0879	0.275
<i>2691-41-0</i>	<i>HMX</i>				
118-96-7	2,4,6-Trinitrotoluene	.275	U	0.0879	0.275
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.275	U	0.0879	0.275
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.275	U	0.0879	0.275
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.275	U	0.0879	0.275
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.275	U	0.0879	0.275
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.275	U	0.0901	0.275
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.275	U	0.0879	0.275
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.275	U	0.0879	0.275
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.275	U	0.0879	0.275
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.275	U	0.0879	0.275
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.549	U	0.0879	0.549
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.549	U	0.110	0.549
<i>78-11-5</i>	<i>PETN</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133297

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417005

Sample Amount 910 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-99-0	p-Nitrotoluene	.549	U	0.165	0.549
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
121-82-4	RDX	.587		0.0879	0.275
<i>121-82-4</i>	<i>RDX</i>				
3058-38-6	TATB	1.1	U	0.330	1.10
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.1	U	0.330	1.10
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.1	U	0.330	1.10
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.75	U	0.549	2.75
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.75	U	0.549	2.75
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary

Lab Name: GEL Laboratories LLCGEL Job No (SDG): 2017-1734Lab Code: GEL

HPLC Column: Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
425417001	CAWA-17-133279	93	55 - 115	
425417001	CAWA-17-133279DL	96	55 - 115	
425417003	CAWA-17-133283	106	55 - 115	
425417003	CAWA-17-133283DL	113	55 - 115	
425417005	CAWA-17-133297	109	55 - 115	
1203813029	MB for batch 1674744	96	55 - 115	
1203813030	LCS for batch 1674744	109	55 - 115	
1203813031	CAWA-17-133279MS	84	55 - 115	
1203813032	CAWA-17-133279MSD	88	55 - 115	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Extract Batch Code: 1674744

Date Extracted: 16-JUN-17

GEL LCS ID: 1203813030

GEL LCSDUP ID: .

Analysis Date/Time: 28-JUN-17 08:57

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
1,3,5-Trinitrobenzene	5	4.57	91					70 - 110
2,4,6-Trinitrotoluene	5	5.18	104					69 - 113
2,4-Diamino-6-nitrotoluene	5	4.31	86					50 - 121
2,4-Dinitrotoluene	5	4.53	91					71 - 110
2,6-Diamino-4-nitrotoluene	5	3.78	76					53 - 127
2,6-Dinitrotoluene	5	4.62	92					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.63	93					70 - 112
3,5-Dinitroaniline	5	5.48	110					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.55	91					74 - 116
HMX	5	4.38	88					58 - 113
Nitrobenzene	5	4.29	86					64 - 115
PETN	5	4.95	99					57 - 126
RDX	5	3.81	76					64 - 117
TATB	2.5	2.74	110					47 - 135
Tetryl	5	3.74	75					64 - 122
m-Dinitrobenzene	5	4.86	97					74 - 117
m-Nitrotoluene	5	5.02	100					66 - 114
o-Nitrotoluene	5	3.86	77					64 - 115
p-Nitrotoluene	5	4.88	98					66 - 127
tris(o-cresyl) phosphate	5	3.77	75					43 - 104

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-17-133279

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Extract Batch Code: 1674744

Date Extracted: 16-JUN-17

GEL Spike ID: 1203813031

GEL SpikeDup ID: 1203813032

Analysis Date/Time: 28-JUN-17 00:54

MSD Analysis Date/Time: 28-JUN-17 01:28

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
o-Nitrotoluene	5.37634	.0183	3.4	63	3.71	67	9	30	56 - 119
p-Nitrotoluene	5.37634	0	3.64	68	3.94	72	8	30	61 - 129
tris(o-cresyl) phosphate	5.37634	.0926	4.8	88	4.95	88	3	30	38 - 105
m-Nitrotoluene	5.37634	0	3.83	71	4.64	84	19	30	59 - 120
1,3,5-Trinitrobenzene	5.37634	0	5.06	94	5.13	93	1	30	67 - 111
2,4,6-Trinitrotoluene	5.37634	.112	4.68	85	5.29	94	12	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.37634	0	4.86	90	5.52	100	13	30	50 - 121
2,4-Dinitrotoluene	5.37634	.0448	4.64	86	5.14	93	10	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.37634	0	6.26	116	6.63	121	6	30	53 - 127
2,6-Dinitrotoluene	5.37634	0	4.36	81	4.8	87	10	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.37634	.99	4.97	74	5.76	87	15	30	67 - 115
3,5-Dinitroaniline	5.37634	.198	5.87	106	6.11	108	4	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.37634	1.44	5.72	80	5.83	80	2	30	65 - 120
HMX	5.37634	15.2	18.8	68	18.8	66	0	30	44 - 128
Nitrobenzene	5.37634	0	4.54	84	4	73	12	30	62 - 116
PETN	5.37634	0	5.11	95	5.51	100	7	30	51 - 131
RDX	5.37634	16.1	21.4	99	24.4	151 *	13	30	57 - 125
TATB	2.68817	0	3.6	134	4.21	153 *	16	30	38 - 149
Tetryl	5.37634	0	4.27	79	4.32	79	1	30	50 - 126
m-Dinitrobenzene	5.37634	0	5.51	102	5.57	101	1	30	74 - 117

#Column to be used to flag recovery and RPD values with an asterisk

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1674744

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813029

Sample Amount 1000 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0625055.wiff

Date Analyzed: 27-JUN-17 23:12

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.25	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.25	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.25	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.25	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.25	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.25	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.25	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.25	U	0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.25	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.25	U	0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.25	U	0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.25	U	0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.5	U	0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1674744

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813029

Sample Amount 1000 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	.5	U	0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.5	U	0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1	U	0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1	U	0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1	U	0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.5	U	0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.5	U	0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1674744

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813030

Sample Amount 1000 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0625072.wiff

Date Analyzed: 28-JUN-17 08:57

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.74		0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
479-45-8	Tetryl	3.74		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
78-30-8	tris(o-cresyl) phosphate	3.77		0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	3.78		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
121-82-4	RDX	3.81		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
88-72-2	o-Nitrotoluene	3.86		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.29		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.31		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
2691-41-0	HMX	4.38		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
121-14-2	2,4-Dinitrotoluene	4.53		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.55		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.57		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
606-20-2	2,6-Dinitrotoluene	4.62		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1674744

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813030

Sample Amount 1000 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
35572-78-2	2-Amino-4,6-dinitrotoluene	4.63		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.86		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
99-99-0	p-Nitrotoluene	4.88		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
78-11-5	PETN	4.95		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-08-1	m-Nitrotoluene	5.02		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.18		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.48		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279(425417001MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813031

Sample Amount 930 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0625058.wiff

Date Analyzed: 28-JUN-17 00:54

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
88-72-2	o-Nitrotoluene	3.4		0.0882	0.269
88-72-2	<i>o</i> -Nitrotoluene				
3058-38-6	TATB	3.6		0.323	1.08
3058-38-6	<i>TATB</i>				
99-99-0	p-Nitrotoluene	3.64		0.161	0.538
99-99-0	<i>p</i> -Nitrotoluene				
99-08-1	m-Nitrotoluene	3.83		0.086	0.269
99-08-1	<i>m</i> -Nitrotoluene				
479-45-8	Tetryl	4.27		0.086	0.538
479-45-8	<i>Tetryl</i>				
606-20-2	2,6-Dinitrotoluene	4.36		0.086	0.269
606-20-2	<i>2,6-Dinitrotoluene</i>				
98-95-3	Nitrobenzene	4.54		0.086	0.269
98-95-3	<i>Nitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	4.64		0.086	0.269
121-14-2	<i>2,4-Dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.68		0.086	0.269
118-96-7	<i>2,4,6-Trinitrotoluene</i>				
78-30-8	tris(<i>o</i> -cresyl) phosphate	4.8		0.323	1.08
78-30-8	<i>tris(o-cresyl) phosphate</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.86		0.538	2.69
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.97		0.086	0.269
35572-78-2	<i>2-Amino-4,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	5.06		0.086	0.269
99-35-4	<i>1,3,5-Trinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279(425417001MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813031

Sample Amount 930 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	5.11		0.108	0.538
<i>78-11-5</i>	<i>PETN</i>				
99-65-0	m-Dinitrobenzene	5.51		0.086	0.269
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.72		0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.87		0.323	1.08
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	6.26		0.538	2.69
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
2691-41-0	HMX	18.8		0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	21.4		0.086	0.269
<i>121-82-4</i>	<i>RDX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279(425417001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813032

Sample Amount 910 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0625059.wiff

Date Analyzed: 28-JUN-17 01:28

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
88-72-2	o-Nitrotoluene	3.71		0.0901	0.275
88-72-2	<i>o</i> -Nitrotoluene				
99-99-0	p-Nitrotoluene	3.94		0.165	0.549
99-99-0	<i>p</i> -Nitrotoluene				
98-95-3	Nitrobenzene	4		0.0879	0.275
98-95-3	<i>Nitrobenzene</i>				
3058-38-6	TATB	4.21		0.330	1.10
3058-38-6	<i>TATB</i>				
479-45-8	Tetryl	4.32		0.0879	0.549
479-45-8	<i>Tetryl</i>				
99-08-1	m-Nitrotoluene	4.64		0.0879	0.275
99-08-1	<i>m</i> -Nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.8		0.0879	0.275
606-20-2	<i>2,6-Dinitrotoluene</i>				
78-30-8	tris(o-cresyl) phosphate	4.95		0.330	1.10
78-30-8	<i>tris(o-cresyl) phosphate</i>				
99-35-4	1,3,5-Trinitrobenzene	5.13		0.0879	0.275
99-35-4	<i>1,3,5-Trinitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	5.14		0.0879	0.275
121-14-2	<i>2,4-Dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.29		0.0879	0.275
118-96-7	<i>2,4,6-Trinitrotoluene</i>				
78-11-5	PETN	5.51		0.110	0.549
78-11-5	<i>PETN</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.52		0.549	2.75
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279(425417001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813032

Sample Amount 910 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	5.57		0.0879	0.275
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.76		0.0879	0.275
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.83		0.0879	0.275
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	6.11		0.330	1.10
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	6.63		0.549	2.75
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
2691-41-0	HMX	18.8		0.0879	0.275
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	24.4		0.0879	0.275
<i>121-82-4</i>	<i>RDX</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1734Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 26-JUN-17 16:29GEL Data File: EXP0625001.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.69
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1734Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 26-JUN-17 17:03GEL Data File: EXP0625002.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.41
p-Nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1734Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 30-JUN-17 10:34GEL Data File: EXP0630001.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1734Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 30-JUN-17 11:09GEL Data File: EXP0630002.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 26-JUN-17 21:36

GEL Data File: EXP0625010.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
TATB	0	1.57
3,5-Dinitroaniline	0	1.82
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	1.65
DNX	0	2.65
MNX	0	2.03
TNX	0	2.15
1,3,5-Trinitrobenzene	0	1.85
2,4,6-Trinitrotoluene	0	1.65
2,4-Dinitrotoluene	0	1.35
2,6-Dinitrotoluene	0	1.18
2-Amino-4,6-dinitrotoluene	0	1.51
4-Amino-2,6-dinitrotoluene	0	1.49
HMX	0	2.19
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	2.17
RDX	0	2.09
Tetryl	0	1.99
m-Dinitrobenzene	0	1.4
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.58
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	1.48
tris(o-cresyl) phosphate	0	6.15

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 26-JUN-17 23:52

GEL Data File: EXP0625014.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	6.41
TATB	0	0
3,5-Dinitroaniline	0	1.36
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	1.77
MNX	0	1.47
TNX	0	1.56
1,3,5-Trinitrobenzene	0	1.24
2,4,6-Trinitrotoluene	0	1.29
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	1.27
4-Amino-2,6-dinitrotoluene	0	1.32
HMX	0	1.93
Nitrobenzene	0	0
Nitroglycerin	0	2.25
PETN	0	1.68
RDX	0	1.77
Tetryl	0	1.43
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.62
p-Nitrotoluene	0	5

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 27-JUN-17 02:09

GEL Data File: EXP0625018.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.36
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 27-JUN-17 03:17

GEL Data File: EXP0625020.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.22
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	3.68

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 27-JUN-17 03:51

GEL Data File: EXP0625021.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.71
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 27-JUN-17 08:58

GEL Data File: EXP0625030.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	1.31
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 27-JUN-17 09:33

GEL Data File: EXP0625031.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MXN	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.14

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 27-JUN-17 10:41

GEL Data File: EXP0625033.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.92
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.75
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 27-JUN-17 16:56

GEL Data File: EXP0625044.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.28
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.39
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 27-JUN-17 22:03

GEL Data File: EXP0625053.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.9
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	3.81
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 28-JUN-17 04:53

GEL Data File: EXP0625065.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.7
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	3.29
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 28-JUN-17 07:44

GEL Data File: EXP0625070.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	.52
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.16
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK14

Analysis Date: 28-JUN-17 15:39

GEL Data File: EXP0625083.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	4.99
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.54
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 30-JUN-17 15:42

GEL Data File: EXP0630010.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MXN	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 30-JUN-17 17:58

GEL Data File: EXP0630014.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MXN	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 30-JUN-17 21:23

GEL Data File: EXP0630020.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 30-JUN-17 22:31

GEL Data File: EXP0630022.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 01-JUL-17 05:21

GEL Data File: EXP0630034.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 01-JUL-17 09:54

GEL Data File: EXP0630042.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MXN	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 01-JUL-17 12:11

GEL Data File: EXP0630046.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 01-JUL-17 15:36

GEL Data File: EXP0630052.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 01-JUL-17 16:44

GEL Data File: EXP0630054.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 03-JUL-17	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846 3535A/8330B	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1674747	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 425417(2017-1734),425520(2017-1749),425532(2017-1748) Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. One or more of the required spiking analytes were not within the acceptance limits in the matrix spike duplicate (MSD). 1203813032 (CAWA-17-133279MSD) recovered TATB at 153% (38%-149%) and RDX at 151% (57%-125%).		1. While the MSD exhibited a high bias, both the LCS and MS met acceptance limits for TATB. TATB was not detected in the associated samples. The biased high recovery in the MSD is attributed to an over range concentration of RDX in the parent sample. The data are reported.	

Originator's Name:
Michael Penny 03-JUL-17

Data Validator/Group Leader:
Charles Wilson 05-JUL-17

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1734
Work Order #: 425417

Sample ID	Client ID
425417001	CAWA-17-133279
425417002	CAWA-17-133307
425417003	CAWA-17-133283
425417004	CAWA-17-133311
425417005	CAWA-17-133297
425417006	CAWA-17-133325
1203811391	Method Blank (MB) ICP
1203811392	Laboratory Control Sample (LCS)
1203811395	425417002(CAWA-17-133307L) Serial Dilution (SD)
1203811393	425417002(CAWA-17-133307D) Sample Duplicate (DUP)
1203811394	425417002(CAWA-17-133307S) Matrix Spike (MS)
1203818732	425417002(CAWA-17-133307PS) Post Spike (PS)
1203811411	Method Blank (MB) ICP-MS
1203811412	Laboratory Control Sample (LCS)
1203811415	425417002(CAWA-17-133307L) Serial Dilution (SD)
1203811413	425417002(CAWA-17-133307D) Sample Duplicate (DUP)
1203811414	425417002(CAWA-17-133307S) Matrix Spike (MS)
1203811972	Method Blank (MB) CVAA
1203811973	Laboratory Control Sample (LCS)
1203811978	425417001(CAWA-17-133279L) Serial Dilution (SD)
1203811974	425417001(CAWA-17-133279D) Sample Duplicate (DUP)
1203811976	425417001(CAWA-17-133279S) Matrix Spike (MS)

Sample Analysis

Samples 425417001,002,003,004,005 and 006 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1674023, 1674031, 1674270 and 1679789
Prep Batch :	1674022, 1674030 and 1674269
Standard Operating Procedures:	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 30, GL-MA-E-010 REV# 34 and GL-GC-E-107 REV# 10
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 425417002 (CAWA-17-133307), 425417004 (CAWA-17-133311) and 425417006 (CAWA-17-133325)-ICP.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 425417002 (CAWA-17-133307)-ICP and ICP-MS and 425417001 (CAWA-17-133279)-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 MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1203811394 (CAWA-17-133307MS)	Silica	126* (75%-125%)

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.

Post Spike (PS) Recovery Statement

The PS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the absence of matrix interferences in the post-digested sample.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

Sample	Analyte	Value
1203811395 (CAWA-17-133307SDILT)	Potassium	10.6 *(0%-10%)

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

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. Samples were diluted to ensure that the silica concentrations were within the linear calibration range of the instrument. 425417002 (CAWA-17-133307), 425417004 (CAWA-17-133311) and 425417006 (CAWA-17-133325)-ICP.

Analyte	425417		
	002	004	006
Silica	10X	10X	10X

Preparation Information

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

Miscellaneous Information

Electronic Packaging Comment

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

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

Additional Comments

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1734 GEL Work Order: 425417

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- E %difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- J Value is estimated
- N Metals--The Matrix spike sample recovery is not within specified control limits
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 07 JUL 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417001**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133279**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:38	061617W1-5	1674270

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417002**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133307**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:46	061617W1-5	1674270

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425417002

BASIS: As Received

DATE COLLECTED 12-JUN-17

CLIENT ID: CAWA-17-133307

LEVEL: Low

DATE RECEIVED 14-JUN-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	329	ug/L		68	200	200	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-38-2	Arsenic	2.01	ug/L	J	2	5	5	1	MS	BAJ	06/28/17 12:35	170628-4	1674031
7440-39-3	Barium	3390	ug/L		1	5	5	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-42-8	Boron	25.1	ug/L	J	15	50	50	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-70-2	Calcium	17400	ug/L		50	200	200	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-48-4	Cobalt	1.79	ug/L	J	1	5	5	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7439-89-6	Iron	148	ug/L		30	100	100	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7439-95-4	Magnesium	4460	ug/L		110	300	300	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7439-96-5	Manganese	4.07	ug/L	J	2	10	10	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7439-98-7	Molybdenum	0.753	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-09-7	Potassium	2860	ug/L	E	50	150	150	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/28/17 12:35	170628-4	1674031
7631-86-9	Silica	41000	ug/L	N	530	2130	2130	10	P	JWJ	06/23/17 15:14	062317-2	1674023
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-23-5	Sodium	15300	ug/L		100	300	300	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-24-6	Strontium	149	ug/L		1	5	5	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-61-1	Uranium	0.086	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-62-2	Vanadium	2.39	ug/L	J	1	5	5	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	JWJ	06/22/17 22:02	062217-1	1674023

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425417002**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133307**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	61.8	mg/L		0.453	1.24	1.24	1		TXT1	07/05/17 14:28		1679789

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674023	1674022	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674031	1674030	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417003**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133283**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:52	061617W1-5	1674270

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417004**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133311**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:54	061617W1-5	1674270

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425417004

BASIS: As Received

DATE COLLECTED 12-JUN-17

CLIENT ID: CAWA-17-133311

LEVEL: Low

DATE RECEIVED 14-JUN-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	JWJ	06/22/17 22:14	062217-1	1674023
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/28/17 12:45	170628-4	1674031
7440-39-3	Barium	16	ug/L		1	5	5	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-42-8	Boron	69.2	ug/L		15	50	50	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-70-2	Calcium	13600	ug/L		50	200	200	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-50-8	Copper	21.3	ug/L		3	10	10	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7439-95-4	Magnesium	5420	ug/L		110	300	300	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7439-98-7	Molybdenum	0.535	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-02-0	Nickel	2.59	ug/L		0.6	2	2	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-09-7	Potassium	2190	ug/L	E	50	150	150	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/28/17 12:45	170628-4	1674031
7631-86-9	Silica	58100	ug/L	N	530	2130	2130	10	P	JWJ	06/23/17 15:28	062317-2	1674023
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-23-5	Sodium	12400	ug/L		100	300	300	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-24-6	Strontium	99.7	ug/L		1	5	5	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-61-1	Uranium	0.385	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-62-2	Vanadium	2.57	ug/L	J	1	5	5	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-66-6	Zinc	44.8	ug/L		3.3	10	10	1	P	JWJ	06/22/17 22:14	062217-1	1674023

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425417004**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133311**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	56.4	mg/L		0.453	1.24	1.24	1		TXT1	07/05/17 14:28		1679789

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674023	1674022	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674031	1674030	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417005**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133297**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:55	061617W1-5	1674270

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417006**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133325**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:57	061617W1-5	1674270

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425417006

BASIS: As Received

DATE COLLECTED 12-JUN-17

CLIENT ID: CAWA-17-133325

LEVEL: Low

DATE RECEIVED 14-JUN-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	JWJ	06/22/17 22:17	062217-1	1674023
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-38-2	Arsenic	2.22	ug/L	J	2	5	5	1	MS	BAJ	06/28/17 12:47	170628-4	1674031
7440-39-3	Barium	33.8	ug/L		1	5	5	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-42-8	Boron	15.9	ug/L	J	15	50	50	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-70-2	Calcium	11400	ug/L		50	200	200	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-50-8	Copper	7.23	ug/L	J	3	10	10	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7439-89-6	Iron	90.4	ug/L	J	30	100	100	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7439-95-4	Magnesium	3170	ug/L		110	300	300	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7439-96-5	Manganese	94.5	ug/L		2	10	10	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7439-98-7	Molybdenum	3.91	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-02-0	Nickel	4.95	ug/L		0.6	2	2	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-09-7	Potassium	3750	ug/L	E	50	150	150	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/28/17 12:47	170628-4	1674031
7631-86-9	Silica	67600	ug/L	N	530	2130	2130	10	P	JWJ	06/23/17 15:32	062317-2	1674023
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-23-5	Sodium	169000	ug/L		100	300	300	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-24-6	Strontium	73.8	ug/L		1	5	5	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-61-1	Uranium	0.211	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-62-2	Vanadium	2.94	ug/L	J	1	5	5	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-66-6	Zinc	108	ug/L		3.3	10	10	1	P	JWJ	06/22/17 22:17	062217-1	1674023

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425417006**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133325**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	41.5	mg/L		0.453	1.24	1.24	1		TXT1	07/05/17 14:28		1679789

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674023	1674022	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674031	1674030	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

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

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-1734

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>
1203811391	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	119	ug/L	+/-300	J	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
1203811411	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203811972	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. 2017-1734 Client ID: CAWA-17-133307S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425417002 Spike ID: 1203811394

<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	5540		329		5000	104		P
Barium	ug/L		3950		3390		500	110	N/A	P
Beryllium	ug/L	75-125	510		1	U	500	102		P
Boron	ug/L	75-125	523		25.1	J	500	99.6		P
Calcium	ug/L	75-125	22500		17400		5000	102		P
Cobalt	ug/L	75-125	512		1.79	J	500	102		P
Copper	ug/L	75-125	519		3	U	500	103		P
Iron	ug/L	75-125	5230		148		5000	102		P
Magnesium	ug/L	75-125	9690		4460		5000	105		P
Manganese	ug/L	75-125	507		4.07	J	500	101		P
Potassium	ug/L	75-125	8110		2860		5000	105		P
Silica	ug/L	75-125	54500		41000		10700	126	N	P
Sodium	ug/L	75-125	21100		15300		5000	117		P
Strontium	ug/L	75-125	674		149		500	105		P
Tin	ug/L	75-125	507		2.5	U	500	101		P
Vanadium	ug/L	75-125	509		2.39	J	500	101		P
Zinc	ug/L	75-125	484		3.3	U	500	96.4		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Matrix Spike Summary

SDG NO. 2017-1734 **Client ID:** CAWA-17-133307S

Contract: ESHL00114 **Level:** Low

Matrix: WATER **% Solids:**

Sample ID: 425417002 **Spike ID:** 1203811414

<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>
Silver	ug/L	75-125	51.2		0.3	U	50	102		MS
Thallium	ug/L	75-125	46.5		0.6	U	50	92.7		MS
Uranium	ug/L	75-125	47.5		0.086	J	50	94.9		MS
Antimony	ug/L	75-125	48		1	U	50	95.3		MS
Arsenic	ug/L	75-125	53.6		2.01	J	50	103		MS
Cadmium	ug/L	75-125	50.2		0.3	U	50	100		MS
Chromium	ug/L	75-125	50.3		3	U	50	98.9		MS
Lead	ug/L	75-125	47.7		0.5	U	50	95.2		MS
Molybdenum	ug/L	75-125	53.6		0.753		50	106		MS
Nickel	ug/L	75-125	50.5		0.6	U	50	99.9		MS
Selenium	ug/L	75-125	50.5		2	U	50	101		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1734 Client ID CAWA-17-133279S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425417001 Spike ID: 1203811976

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	1.98		0.067	U	2	99.1		AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-5a-

Spike Summary

SDG NO. 2017-1734 **Client ID:** CAWA-17-133307PS**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 425417002 **Spike ID:** 1203818732

<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>
Silica	ug/L	80-120	14900		4100		10700	101		P

*Analytical Methods:

P SW846 3005A/6010C

Metals
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Duplicate Sample Summary

SDG No.: 2017-1734

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133307D

Matrix: WATER

Level: Low

Sample ID: 425417002

Duplicate ID: 1203811393

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-200	329		289		12.8		P
Barium	ug/L	+/-20%	3390		3430		1.11		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	25.1 J		22.8 J		9.78		P
Calcium	ug/L	+/-20%	17400		17700		1.77		P
Cobalt	ug/L	+/-5	1.79 J		1.97 J		9.58		P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-100	148		147		.976		P
Magnesium	ug/L	+/-20%	4460		4510		1.14		P
Manganese	ug/L	+/-10	4.07 J		4.06 J		.148		P
Potassium	ug/L	+/-20%	2860		3030		5.77		P
Silica	ug/L	+/-20%	41000		42500		3.45		P
Sodium	ug/L	+/-20%	15300		15500		1.73		P
Strontium	ug/L	+/-20%	149		152		1.91		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	2.39 J		2.9 J		19.3		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
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Duplicate Sample Summary

SDG No.: 2017-1734

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133307D

Matrix: WATER

Level: Low

Sample ID: 425417002

Duplicate ID: 1203811413

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L	+/-5	2.01 J		2.2 J		8.65		MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.753		0.632		17.5		MS
Nickel	ug/L		0.6 U		0.6 U				MS
Selenium	ug/L		2 U		2 U				MS
Silver	ug/L		0.3 U		0.3 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L	+/- .2	0.086 J		0.085 J		1.17		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2017–1734**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA–17–133279D**Matrix:** WATER**Level:** Low**Sample ID:** 425417001**Duplicate ID:** 1203811974**Percent Solids for Dup:** N/A

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1734

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>
1203811392								
	Aluminum	ug/L	5000	5250		105	80-120	P
	Barium	ug/L	500	503		101	80-120	P
	Beryllium	ug/L	500	497		99.4	80-120	P
	Boron	ug/L	500	487		97.3	80-120	P
	Calcium	ug/L	5000	5040		101	80-120	P
	Cobalt	ug/L	500	504		101	80-120	P
	Copper	ug/L	500	504		101	80-120	P
	Iron	ug/L	5000	5040		101	80-120	P
	Magnesium	ug/L	5000	5140		103	80-120	P
	Manganese	ug/L	500	501		100	80-120	P
	Potassium	ug/L	5000	5280		106	80-120	P
	Silica	ug/L	10700	10500		98.2	80-120	P
	Sodium	ug/L	5000	5390		108	80-120	P
	Strontium	ug/L	500	509		102	80-120	P
	Tin	ug/L	500	496		99.2	80-120	P
	Vanadium	ug/L	500	497		99.5	80-120	P
	Zinc	ug/L	500	475		94.9	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1734

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>
1203811412								
	Antimony	ug/L	50	47.5		95	80-120	MS
	Arsenic	ug/L	50	52.1		104	80-120	MS
	Cadmium	ug/L	50	51.3		103	80-120	MS
	Chromium	ug/L	50	52.2		104	80-120	MS
	Lead	ug/L	50	48.3		96.7	80-120	MS
	Molybdenum	ug/L	50	51.8		104	80-120	MS
	Nickel	ug/L	50	53.8		108	80-120	MS
	Selenium	ug/L	50	50.7		101	80-120	MS
	Silver	ug/L	50	51.8		104	80-120	MS
	Thallium	ug/L	50	46.6		93.2	80-120	MS
	Uranium	ug/L	50	47.3		94.7	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1734

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>
1203811973	Mercury	ug/L	2	2.03		102	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1734

Client ID: CAWA-17-133307L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425417002

Serial Dilution ID: 1203811395

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	329		340	U	10.599			P
Barium	3390		3540		4.154		10	P
Beryllium	1	U	5	U				P
Boron	25.1	J	75	U	55.89			P
Calcium	17400		17300		.577		10	P
Cobalt	1.79	J	5	U	88.044			P
Copper	3	U	15	U				P
Iron	148		161	J	8.848			P
Magnesium	4460		4550		2.047			P
Manganese	4.07	J	10	U	3.746			P
Potassium	2860		3160		10.563	E	10	P
Silica	4100		4100		.085		10	P
Sodium	15300		16300		7.071		10	P
Strontium	149		153		2.243		10	P
Tin	2.5	U	12.5	U				P
Vanadium	2.39	J	5	U	98.982			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. 2017-1734

Client ID: CAWA-17-133307L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425417002

Serial Dilution ID: 1203811415

<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	2.01	J	10	U	27.173			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	.753		1	U	1.062			MS
Nickel	.6	U	3	U				MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.086	J	.335	U	4.651			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1734 Client ID CAWA-17-133279L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 425417001 Serial Dilution ID: 1203811978

<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 #: 2017-1734
Work Order #: 425417**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1673634

Method: SW 9060 Total Organic Carbon

Sample Analysis

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

Sample ID	Client ID
425417001	CAWA-17-133279
425417003	CAWA-17-133283
425417005	CAWA-17-133297
1203812102	Method Blank (MB)
1203812103	Laboratory Control Sample (LCS)
1203812277	Laboratory Control Sample Duplicate (LCSD)
1203812105	425300003(CAWA-17-133305) Sample Duplicate (DUP)
1203812107	425300003(CAWA-17-133305) 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.

LCS/LCSD Relative Percent Difference (RPD) Statement

The RPD between the LCS and LCSD met the acceptance limits.

Quality Control (QC) Designation

Sample 425300003 (CAWA-17-133305) 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 425417005 (CAWA-17-133297) 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	425417
	005
Total Organic Carbon Average	50X

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1674062	Method:	WSP-CN(T)
Prep Batch :	1674061	Method:	EPA 335.4

Sample Analysis

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

Sample ID	Client ID
425417001	CAWA-17-133279
425417003	CAWA-17-133283
425417005	CAWA-17-133297
1203811489	Method Blank (MB)
1203811490	Laboratory Control Sample (LCS)
1203811491	425417001(CAWA-17-133279) Sample Duplicate (DUP)
1203811492	425417001(CAWA-17-133279) Matrix Spike (MS)
1203814049	425417001(CAWA-17-133279) Matrix Spike Duplicate (MSD)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-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 425417001 (CAWA-17-133279) 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.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the spike and spike duplicate met the acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203811490 (LCS), 1203811491 (CAWA-17-133279DUP), 1203811492 (CAWA-17-133279MS), 1203814049 (CAWA-17-133279MSD) and 425417001 (CAWA-17-133279) were re-analyzed to verify the results.

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1674234

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203811880	Method Blank (MB)
1203811881	Laboratory Control Sample (LCS)
1203811882	425417006(CAWA-17-133325) Sample Duplicate (DUP)
1203811883	425417006(CAWA-17-133325) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425417006 (CAWA-17-133325) 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 1203811882 (CAWA-17-133325DUP), 1203811883 (CAWA-17-133325PS), 425417002 (CAWA-17-133307) and 425417006 (CAWA-17-133325) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	425417	
	002	006
Chloride	2X	1X
Sulfate	1X	2X

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203811882 (CAWA-17-133325DUP), 425417002 (CAWA-17-133307), 425417004 (CAWA-17-133311) and 425417006 (CAWA-17-133325) 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: 1673875 **Method:** NH3
Prep Batch : 1673874 **Method:** EPA 350.1 Prep

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203811097	Method Blank (MB)
1203811098	Laboratory Control Sample (LCS)
1203811099	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203811100	425079002(CAWA-17-133314) 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+ 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 425079002 (CAWA-17-133314) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1673872	Method:	TKN
Prep Batch :	1673870	Method:	EPA 351.2 Prep

Sample Analysis

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

Sample ID	Client ID
425417001	CAWA-17-133279
425417003	CAWA-17-133283
425417005	CAWA-17-133297
1203811089	Method Blank (MB)
1203811090	Laboratory Control Sample (LCS)
1203811091	425079001(CAWA-17-133286) Sample Duplicate (DUP)
1203811092	425079001(CAWA-17-133286) 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

Sample 425079001 (CAWA-17-133286) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203811089 (MB), 1203811090 (LCS), 1203811091 (CAWA-17-133286DUP) and 1203811092 (CAWA-17-133286MS) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported.

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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: 1674641

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203812760	Method Blank (MB)
1203812761	Laboratory Control Sample (LCS)
1203812762	425417002(CAWA-17-133307) Sample Duplicate (DUP)
1203812766	425417002(CAWA-17-133307) 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 425417002 (CAWA-17-133307) 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 sample 425417004 (CAWA-17-133311) in this sample group was diluted due to matrix interference. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	425417
	004
Nitrogen, Nitrate/Nitrite	5X

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1673877	Method:	PO4
Prep Batch :	1673876	Method:	EPA 365.4 Prep

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203811104	Method Blank (MB)
1203811105	Laboratory Control Sample (LCS)
1203811108	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203811109	425079002(CAWA-17-133314) 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 425079002 (CAWA-17-133314) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203811104 (MB) and 1203811105 (LCS) were re-analyzed due to instrument failure. The results from the reanalysis are reported.

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1675379

Method: TDS

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203814590	Method Blank (MB)
1203814591	Laboratory Control Sample (LCS)
1203814592	425417006(CAWA-17-133325) 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 425417006 (CAWA-17-133325) 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**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1679220

Method: EPA120.1 Specific Conductivity

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203823672	Laboratory Control Sample (LCS)
1203823673	425329003(CAWA-17-133330) 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 425329003 (CAWA-17-133330) 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**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product: pH
Analytical Batch: 1676572 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203817344	Laboratory Control Sample (LCS)
1203817346	425532004(CAWA-17-133335) 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 425532004 (CAWA-17-133335) 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
1203817346 (CAWA-17-133335DUP)	pH	Received 15-JUN-17, out of holding 13-JUN-17
425417002 (CAWA-17-133307)	pH	Received 14-JUN-17, out of holding 12-JUN-17
425417004 (CAWA-17-133311)	pH	Received 14-JUN-17, out of holding 12-JUN-17
425417006 (CAWA-17-133325)	pH	Received 14-JUN-17, out of holding 12-JUN-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1676562 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203817292	Laboratory Control Sample (LCS)
1203817296	425532004(CAWA-17-133335) Sample Duplicate (DUP)
1203817299	425532004(CAWA-17-133335) 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 425532004 (CAWA-17-133335) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Certification Statement

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

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: 2017-1734 GEL Work Order: 425417

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Kristen Mizzell

Date: 07 JUL 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133279
Sample ID: 425417001
Matrix: W
Collect Date: 12-JUN-17 13:45
Receive Date: 14-JUN-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		2.49	0.330	1.00	mg/L		1	TSM	06/22/17	2041	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/20/17	1025	1674062	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	1003	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/19/17	1339	1674061
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	06/19/17	1700	1673870

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

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133307
Sample ID: 425417002
Matrix: W
Collect Date: 12-JUN-17 13:45
Receive Date: 14-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	06/15/17	0937	1674234	1
Fluoride	J	0.0944	0.033	0.100	mg/L		1					
Sulfate		8.18	0.133	0.400	mg/L		1					
Chloride		14.8	0.134	0.400	mg/L		2	MAR1	06/15/17	1259	1674234	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0702	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1151	1673875	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.0507	0.017	0.050	mg/L		1	AXH3	06/21/17	0803	1674641	4
PO4 "As Received"												
Phosphorus, Total as P		0.0854	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1051	1673877	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		134	3.40	14.3	mg/L			KLP1	06/19/17	1509	1675379	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		75.0	1.45	4.00	mg/L			RXB5	06/23/17	1540	1676562	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		213	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0917	1679220	8
PH "As Received"												
pH at Temp 20.0C	H	7.09	0.010	0.100	SU		1	RXB5	06/23/17	1536	1676572	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	06/15/17	0855	1673874
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	06/19/17	1700	1673876

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Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133307
Sample ID: 425417002

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133283
Sample ID: 425417003
Matrix: W
Collect Date: 12-JUN-17 13:12
Receive Date: 14-JUN-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		1.03	0.330	1.00	mg/L		1	TSM	06/22/17	2125	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/20/17	0839	1674062	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	1004	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/19/17	1339	1674061
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	06/19/17	1700	1673870

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

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Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133311
Sample ID: 425417004
Matrix: W
Collect Date: 12-JUN-17 13:12
Receive Date: 14-JUN-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	0.0851	0.067	0.200	mg/L		1	MAR1	06/15/17	1006	1674234	1
Chloride		8.05	0.067	0.200	mg/L		1					
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate		9.87	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0366	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1152	1673875	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.890	0.085	0.250	mg/L		5	AXH3	06/21/17	0807	1674641	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0474	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1052	1673877	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		150	3.40	14.3	mg/L			KLP1	06/19/17	1509	1675379	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		75.2	1.45	4.00	mg/L			RXB5	06/23/17	1542	1676562	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		186	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0918	1679220	7
PH "As Received"												
pH at Temp 19.6C	H	7.11	0.010	0.100	SU		1	RXB5	06/23/17	1541	1676572	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	06/15/17	0855	1673874
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	06/19/17	1700	1673876

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Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133311
Sample ID: 425417004

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

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Los Alamos, New Mexico 87545

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

Client SDG: 2017-1734

Client Sample ID: CAWA-17-133297
Sample ID: 425417005
Matrix: W
Collect Date: 12-JUN-17 13:18
Receive Date: 14-JUN-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		433	16.5	50.0	mg/L		50	TSM	06/26/17	1306	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/20/17	0845	1674062	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0707	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	1005	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/19/17	1339	1674061
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	06/19/17	1700	1673870

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

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Report Date: July 7, 2017

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

Client SDG: 2017-1734

Client Sample ID: CAWA-17-133325
Sample ID: 425417006
Matrix: W
Collect Date: 12-JUN-17 13:18
Receive Date: 14-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	06/15/17	1034	1674234	1
Chloride		3.72	0.067	0.200	mg/L		1					
Fluoride	J	0.0514	0.033	0.100	mg/L		1					
Sulfate		19.4	0.266	0.800	mg/L		2	MAR1	06/15/17	1328	1674234	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0797	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1153	1673875	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.160	0.017	0.050	mg/L		1	AXH3	06/21/17	0813	1674641	4
PO4 "As Received"												
Phosphorus, Total as P		0.225	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1053	1673877	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		1280	3.40	14.3	mg/L			KLP1	06/19/17	1509	1675379	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		76.0	1.45	4.00	mg/L			RXB5	06/23/17	1545	1676562	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		813	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0920	1679220	8
PH "As Received"												
pH at Temp 19.2C	H	7.36	0.010	0.100	SU		1	RXB5	06/23/17	1544	1676572	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	06/15/17	0855	1673874
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	06/19/17	1700	1673876

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Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133325
Sample ID: 425417006

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

Quality Control Summary

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QC Summary

Report Date: July 7, 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: 425417

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1673634										
QC1203812105	425300003	DUP									
Total Organic Carbon Average		1.84		1.82	mg/L	1.15	^	(+/-1.00)	TSM	06/22/17	03:43
QC1203812103	LCS										
Total Organic Carbon Average	10.0			9.81	mg/L			98.1 (80%-120%)		06/21/17	17:57
QC1203812277	LCSD										
Total Organic Carbon Average	10.0			9.89	mg/L	0.873		98.9 (0%-20%)		06/21/17	18:09
QC1203812102	MB										
Total Organic Carbon Average			U	ND	mg/L					06/21/17	17:45
QC1203812107	425300003	PS									
Total Organic Carbon Average	10.0	1.84		11.1	mg/L			92.9 (75%-125%)		06/22/17	04:30
Flow Injection Analysis											
Batch	1674062										
QC1203811491	425417001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	06/20/17	10:26
QC1203811490	LCS										
Cyanide, Total	50.0			54.1	ug/L			108 (90%-110%)		06/20/17	08:44
QC1203811489	MB										
Cyanide, Total			U	ND	ug/L					06/20/17	08:32
QC1203811492	425417001	MS									
Cyanide, Total	100	U	ND	105	ug/L			105 (90%-110%)		06/20/17	10:27
QC1203814049	425417001	MSD									
Cyanide, Total	100	U	ND	105	ug/L	0		105 (0%-20%)		06/20/17	10:28

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QC Summary

Workorder: 425417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1674234										
QC1203811882	425417006	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	06/15/17	11:03
Chloride			3.72		3.73	mg/L	0.00805	(0%-20%)			
Fluoride		J	0.0514	J	0.0454	mg/L	12.4 ^	(+/-0.100)			
Sulfate			19.4		19.4	mg/L	0.227	(0%-20%)		06/15/17	13:57
QC1203811881	LCS										
Bromide			1.25		1.27	mg/L		102 (80%-120%)		06/15/17	09:08
Chloride			5.00		4.65	mg/L		93 (80%-120%)			
Fluoride			2.50		2.43	mg/L		97 (80%-120%)			
Sulfate			10.0		9.70	mg/L		97 (80%-120%)			
QC1203811880	MB										
Bromide				U	ND	mg/L				06/15/17	08:39
Chloride				U	ND	mg/L					
Fluoride				U	ND	mg/L					
Sulfate				U	ND	mg/L					
QC1203811883	425417006	PS									
Bromide		U	ND		1.23	mg/L		96.2 (75%-125%)		06/15/17	11:32
Chloride			3.72		8.78	mg/L		101 (75%-125%)			

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QC Summary

Workorder: 425417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1674234										
Fluoride	2.50	J	0.0514	2.50	mg/L		97.8	(75%-125%)	MAR1	06/15/17	11:32
Sulfate	10.0		9.69	20.2	mg/L		105	(75%-125%)		06/15/17	14:26

Nutrient Analysis

Batch	1673872										
QC1203811091	425079001	DUP									
Nitrogen, Total Kjeldahl		U	ND	J	0.038	mg/L	200		KLP1	06/21/17	09:54
QC1203811090	LCS										
Nitrogen, Total Kjeldahl	1.00				1.10	mg/L	110	(90%-110%)		06/21/17	09:50
QC1203811089	MB										
Nitrogen, Total Kjeldahl			U		ND	mg/L				06/21/17	09:50
QC1203811092	425079001	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND		0.974	mg/L	97.4	(90%-110%)		06/21/17	09:55
Batch	1673875										
QC1203811099	425079002	DUP									
Nitrogen, Ammonia			0.0967		0.0902	mg/L	6.96 ^	(+/-0.050)	KLP1	06/15/17	11:36
QC1203811098	LCS										
Nitrogen, Ammonia	1.00				1.01	mg/L	101	(90%-110%)		06/15/17	11:28
QC1203811097	MB										
Nitrogen, Ammonia			U		ND	mg/L				06/15/17	11:27
QC1203811100	425079002	MS									
Nitrogen, Ammonia	1.00		0.0967		1.03	mg/L	93.3	(90%-110%)		06/15/17	11:37
Batch	1673877										
QC1203811108	425079002	DUP									
Phosphorus, Total as P			0.0742		0.0979	mg/L	27.5 ^	(+/-0.050)	KLP1	06/20/17	10:29

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QC Summary

Workorder: 425417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1673877										
QC1203811105	LCS										
Phosphorus, Total as P	1.00			0.975	mg/L		97.5	(80%-124%)	KLP1	06/20/17	10:38
QC1203811104	MB										
Phosphorus, Total as P			J	0.0324	mg/L					06/20/17	10:38
QC1203811109	425079002	MS									
Phosphorus, Total as P	1.00	0.0742		1.23	mg/L		116	(63%-139%)		06/20/17	10:30
<hr/>											
Batch	1674641										
QC1203812762	425417002	DUP									
Nitrogen, Nitrate/Nitrite		0.0507	J	0.0499	mg/L	1.59	^	(+/-0.050)	AXH3	06/21/17	08:04
QC1203812761	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.959	mg/L		95.9	(90%-110%)		06/21/17	07:57
QC1203812760	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					06/21/17	07:56
QC1203812766	425417002	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.0507		1.01	mg/L		95.9	(90%-110%)		06/21/17	08:05
<hr/>											
Solids Analysis											
Batch	1675379										
QC1203814592	425417006	DUP									
Total Dissolved Solids		1280		1260	mg/L	1.58		(0%-5%)	KLP1	06/19/17	15:09
QC1203814591	LCS										
Total Dissolved Solids	300			297	mg/L		99	(95%-105%)		06/19/17	15:09
QC1203814590	MB										
Total Dissolved Solids			U	ND	mg/L					06/19/17	15:09

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QC Summary

Workorder: 425417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1676562										
QC1203817296	425532004	DUP									
Alkalinity, Total as CaCO3		56.2		55.8	mg/L	0.714		(0%-20%)	RXB5	06/23/17	16:04
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203817292	LCS										
Alkalinity, Total as CaCO3	100			110	mg/L		110	(90%-110%)		06/23/17	12:29
QC1203817299	425532004	MS									
Alkalinity, Total as CaCO3	100	56.2		158	mg/L		102	(80%-120%)		06/23/17	16:06
Batch	1676572										
QC1203817346	425532004	DUP									
pH	H	7.87	H	7.88	SU	0.127		(0%-5%)	RXB5	06/23/17	16:03
QC1203817344	LCS										
pH	7.00			7.04	SU		101	(99%-101%)		06/23/17	12:23
Batch	1679220										
QC1203823673	425329003	DUP									
Conductivity		172		172	umhos/cm	0		(0%-10%)	SXM7	07/06/17	09:16
QC1203823672	LCS										
Conductivity	1410			1370	umhos/cm		96.7	(95%-105%)		07/06/17	09:05

- Notes:**
- < Result is less than value reported
 - > Result is greater than value reported
 - B The target analyte was detected in the associated blank.
 - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
 - H Analytical holding time was exceeded
 - J Value is estimated
 - N/A RPD or %Recovery limits do not apply.
 - N1 See case narrative

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425417

Page 6 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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.

July 19, 2017

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

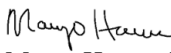
Re: LANL- WQH Water Samples
Work Order: 425417
SDG: 2017-1734

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 14, 2017, and analyzed for Explosives by LCMSMS, General Chemistry, Metals and Perchlorates by LCMSMS. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This package has been revised to include the results for DNX, MNX, and TNX on the Form 1s.

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: 2017-1734
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 425417
SDG: 2017-1734

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 425417
SDG # : 2017-1734**

July 07, 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 June 14, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
425417001	CAWA-17-133279
425417002	CAWA-17-133307
425417003	CAWA-17-133283
425417004	CAWA-17-133311
425417005	CAWA-17-133297
425417006	CAWA-17-133325

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: Explosives by LCMSMS, 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 07 July 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	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 & REVIEW FORM

Client: ESHL		SDG/AR/COC/Work Order: 425417	
Received By: ZKW		Date Received: 6/14/17	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other 5908 1782 2109 5908 1782 2094 5908 1782 2083	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input 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?	Yes <input checked="" type="checkbox"/> No <input 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: 4°C
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 Damaged container Leaking container Other (describe)
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 <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No ___ N/A ___ (If unknown, select No) VOA vials free of headspace? Yes ___ No <input checked="" type="checkbox"/> N/A ___ Sample ID's and containers affected: Both vials for - 136839 read w/ no space
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: See Below
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):

*** We received 2 VOA vials for WSTM0-17-136839 collected 6/9/17 @ 22:55, CoC says we should have received WSTM0-17-136841.**

PM (or PMA) review: Initials

met

Date

6/15/17

Page

1 of **1**

GL-CHL-SR-001 Rev 5

Subject: LANL issues for 06/13/2017 and 06/14/2017
From: Margo Herron <Margo.Herron@gel.com>
Date: 6/14/2017 2:38 PM
To: Keith Robert Greene <kgreene@lanl.gov>
CC: "team.davis" <team.davis@gel.com>

Good Afternoon,

For request number 2017-1718, All VOA vials for samples WST03-17-139347, WST03-17-139348, WST03-17-139349, and WST03-17-139350 was received with headspace. We will continue with the analysis unless instructed otherwise.

For request number 2017-1718 sample WST03-17-139351 we received a PH container that is not listed on the chain of custody. Please advise.

For request number 2017-1719 the BOD was received out of hold. We will continue with the analysis unless instructed otherwise.

** We received two VOA vials for WSTMO-17-136839 collected on 06/09/2017 at 22:55. This sample is not on the chain of custody. Both vials had headspace. We did not receive WSTMO-17-136841 but instead WSTMO-17-136839. Please advise.

Thanks,

Margo Herron

--

Margo Herron
Project Manager Assistant



2040 Savage Road, Charleston, SC 29407 | PO Box 30712, Charleston, SC 29417
Office Main: 843.556.8171 Ext. 4707 | Fax: 843.766.1178
E-Mail: Margo.Herron@gel.com | Website: www.gel.com
Environmental | Engineering | Surveying | Analytical Testing

Ask me about GEL's new testing capability for Perfluorinated chemicals (PFCs)!
<http://www.gellaboratories.com>

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 13JUN17
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

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

4c

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 13JUN17
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

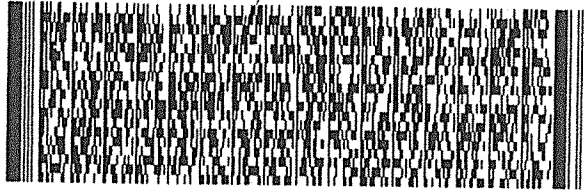
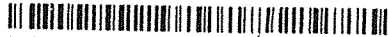
TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

4c

CHARLESTON SC 29407

(843) 666-8171

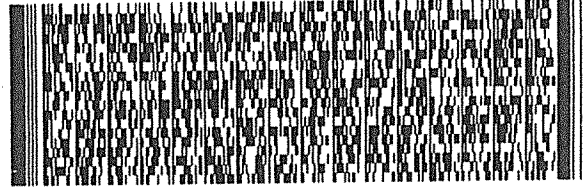
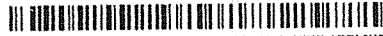
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FedEx
Express



J1513150C1301uv



FedEx
Express



J1513150C1301uv

2 of 3
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0263

Mstr# 5908 1782 2083

0201

X7 RBWA

29407
CHS

SC-US

WED - 14 JUN 10:30A
PRIORITY OVERNIGHT

3 of 3
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0263

Mstr# 5908 1782 2083

0201

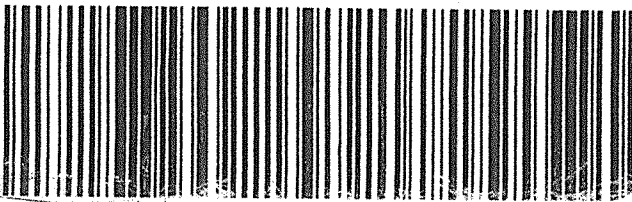
X7 RBWA

29407
CHS

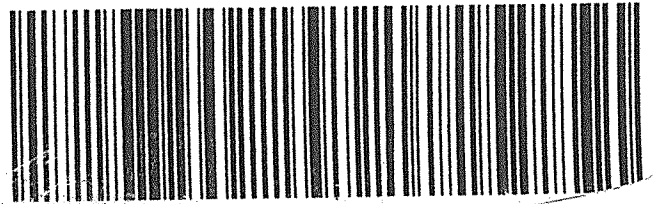
SC-US

WED - 14 JUN 10:30A
PRIORITY OVERNIGHT

Part # 156148V-434 RIT2 06/15



Part # 156148V-434 RIT2 06/15



SHIP DATE: 13JUN17
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

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

LOS ALAMOS, NM 87545
UNITED STATES US

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

4c

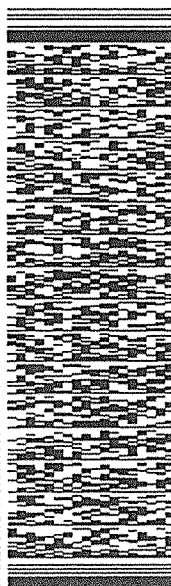
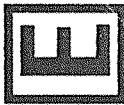
CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express



WED - 14 JUN 10:30A
PRIORITY OVERNIGHT

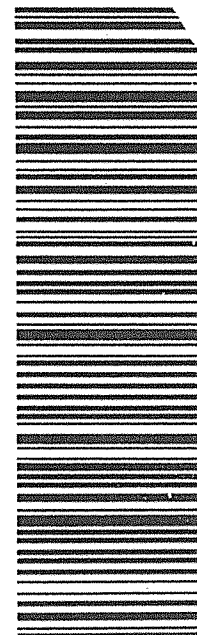
1 of 3
TRK# 5908 1782 2083
0201

MASTER

X7 RBWA

29407
CHS

SC-US



Part # 156148V-434 RIT2 06/15

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

Qualifier	Explanation
*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

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

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

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1734
Work Order #: 425417**

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:	1675216
Prep Batch Number:	1675214

Sample Analysis

Sample ID	Client ID
425417002	425417002 (CAWA-17-133307)
425417004	425417004 (CAWA-17-133311)
425417006	425417006 (CAWA-17-133325)
1203814204	Interference Check Sample (ICS)
1203814194	Method Blank (MB)
1203814195	Laboratory Control Sample (LCS)
1203814196	425115002(CAWA-17-133326) Matrix Spike (MS)
1203814197	425115002(CAWA-17-133326) 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 425115002 (CAWA-17-133326) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The recoveries of Perchlorate and Perchlorate-101 were not within the acceptance limits in 1203814196 (CAWA-17-133326MS) and 1203814197 (CAWA-17-133326MSD). This was due to the background concentration in the parent sample, 425115002 (CAWA-17-133326).

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 or sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

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

Method Comments

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

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are 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: 2017-1734 GEL Work Order: 425417

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 24 JUN 2017

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133307Date Received: 14-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 425417002Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.206	ug/L		1	19-JUN-17 20:49	per0619027a
	Perchlorate Isotope Ratio			2.92			1	19-JUN-17 20:49	per0619027a
14797-73-0	Perchlorate-101	.05	.2	0.206	ug/L		1	19-JUN-17 20:49	per0619027a
	Perchlorate-O(18)			0.407	ug/L		1	19-JUN-17 20:49	per0619027a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133311Date Received: 14-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 425417004Date Filtered: 19-JUN-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	0.461	ug/L		1	19-JUN-17 21:00	per0619028a
	Perchlorate Isotope Ratio			2.78			1	19-JUN-17 21:00	per0619028a
14797-73-0	Perchlorate-101	.05	.2	0.485	ug/L		1	19-JUN-17 21:00	per0619028a
	Perchlorate-O(18)			0.418	ug/L		1	19-JUN-17 21:00	per0619028a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133325Date Received: 14-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 425417006Date Filtered: 19-JUN-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	0.252	ug/L		1	19-JUN-17 21:11	per0619029a
	Perchlorate Isotope Ratio			2.88			1	19-JUN-17 21:11	per0619029a
14797-73-0	Perchlorate-101	.05	.2	0.255	ug/L		1	19-JUN-17 21:11	per0619029a
	Perchlorate-O(18)			0.403	ug/L		1	19-JUN-17 21:11	per0619029a

^ 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): 2017-1734

Extract Batch Code: 1675214

Date Filtered: 19-JUN-17

Matrix: WATER

Sample ID: 1203814195

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		85 - 115
Perchlorate Isotope Ratio		3.04				-
Perchlorate-101	0.200	.189	ug/L	95		85 - 115
Perchlorate-O(18)		.439	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): 2017-1734

Extract Batch Code: 1675214

Date Extracted: 19-JUN-17

GEL MS/PS ID: 1203814196

Client ID: CAWA-17-133326

GEL MSD/PSD ID: 1203814197

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	1.05	ug/L	1.12	34 *	1.16	53 *	3	30	75 - 125
Perchlorate Isotope Ratio	0	2.92		2.78		2.83		2		-
Perchlorate-101	0.200	1.05	ug/L	1.17	61 *	1.19	71 *	2	30	75 - 125
Perchlorate-O(18)	0	0.410	ug/L	0.415		.423		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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 19-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 1203814194Date Filtered: 19-JUN-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	19-JUN-17 18:15	per0619013a
	Perchlorate Isotope Ratio						1	19-JUN-17 18:15	per0619013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	19-JUN-17 18:15	per0619013a
	Perchlorate-O(18)			0.475	ug/L		1	19-JUN-17 18:15	per0619013a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 19-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 1203814195Date Filtered: 19-JUN-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	0.197	ug/L	J	1	19-JUN-17 18:26	per0619014a
	Perchlorate Isotope Ratio			3.04			1	19-JUN-17 18:26	per0619014a
14797-73-0	Perchlorate-101	.05	.2	0.189	ug/L	J	1	19-JUN-17 18:26	per0619014a
	Perchlorate-O(18)			0.439	ug/L		1	19-JUN-17 18:26	per0619014a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1734GEL Sample ID: 1203814204Date Filtered: 19-JUN-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	0.186	ug/L	J	1	19-JUN-17 18:37	per0619015a
	Perchlorate Isotope Ratio			2.58			1	19-JUN-17 18:37	per0619015a
14797-73-0	Perchlorate-101	.05	.2	0.210	ug/L		1	19-JUN-17 18:37	per0619015a
	Perchlorate-O(18)			0.432	ug/L		1	19-JUN-17 18:37	per0619015a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326MSDate Received: 09-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 1203814196Date Filtered: 19-JUN-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	1.12	ug/L		1	19-JUN-17 18:59	per0619017a
	Perchlorate Isotope Ratio			2.78			1	19-JUN-17 18:59	per0619017a
14797-73-0	Perchlorate-101	.05	.2	1.17	ug/L		1	19-JUN-17 18:59	per0619017a
	Perchlorate-O(18)			0.415	ug/L		1	19-JUN-17 18:59	per0619017a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326MSDDate Received: 09-JUN-17GEL Job No (SDG): 2017-1734GEL Sample ID: 1203814197Date Filtered: 19-JUN-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	1.16	ug/L		1	19-JUN-17 19:10	per0619018a
	Perchlorate Isotope Ratio			2.83			1	19-JUN-17 19:10	per0619018a
14797-73-0	Perchlorate-101	.05	.2	1.19	ug/L		1	19-JUN-17 19:10	per0619018a
	Perchlorate-O(18)			0.423	ug/L		1	19-JUN-17 19:10	per0619018a

^ 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 =

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

Explosives by LCMSMS Analysis

Case Narrative

**Explosives by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1734
Work Order #: 425417**

Method/Analysis Information

Procedure: The Processing, Extraction, and Analysis of Nitroaromatics, Nitroamines, and Nitrate Esters by SW-846 8330B

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch Number: 1674747

Prep Batch Number: 1674744

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8330B:

Sample ID	Client ID
425417001	CAWA-17-133279
425417003	CAWA-17-133283
425417005	CAWA-17-133297
1203813029	Method Blank (MB)
1203813030	Laboratory Control Sample (LCS)
1203813031	425417001(CAWA-17-133279) Matrix Spike (MS)
1203813032	425417001(CAWA-17-133279) Matrix Spike Duplicate (MSD)

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-068 REV# 7.

Calibration Information

Initial Calibration

All initial calibration requirements for this analysis have been met for this SDG.

Calibration Verification Standard Requirements

All continuing calibration verification standards (CCV) have not met requirements of 80-120% for 1203813029 (MB), 1203813030 (LCS), 1203813031 (CAWA-17-133279MS), 1203813032 (CAWA-17-133279MSD), 425417001 (CAWA-17-133279), 425417003 (CAWA-17-133283) and 425417005 (CAWA-17-133297) in this SDG. Please refer to Form 7 of the data package for a list of recoveries. A LLOQ level standard was analyzed following the biased low CCV with all target analytes meeting acceptance limits. Since the target analyte was not

detected in the associated samples, the data are reported.

Calibration Blank Requirements

All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria. Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

CRI Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG for this analysis met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 425417001 (CAWA-17-133279) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

One or more of the required spiking analytes were not within the acceptance limits in (See Below). While the MSD exhibited a high bias, both the LCS and MS met acceptance limits. The data are reported.

Sample	Analyte	Value
1203813032 (CAWA-17-133279MSD)	TATB	153* (38%-149%)

The MS and/or MSD (See Below) did not meet acceptance criteria for the recovery of spiked analytes. The recoveries are attributed to over range concentrations of target analytes in the parent sample.

Sample	Analyte	Value
1203813032 (CAWA-17-133279MSD)	RDX	151* (57%-125%)

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits for this analysis.

Internal Standard (ISTD) Acceptance

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

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. 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

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water. Samples 425417001 (CAWA-17-133279) and 425417003 (CAWA-17-133283) were further diluted to bring the over range concentrations within the calibration range. The final dilution in each case takes the 1:1 v/v dilution into account.

Analyte	425417	
	001	003
HMX	5X	2X
RDX	5X	10X

Sample Re-extraction/Re-analysis

Sample 425417005 (CAWA-17-133297) was re-analyzed to confirm potential carryover from the previous sample analysis. The re-analysis data are reported.

Miscellaneous Information

Manual Integrations

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

Additional Comments

Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct. Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data. Relative Retention Time (RRT) is used by the laboratory to establish peak identity. The RRT of each target analyte is calculated using the retention time of the corresponding internal standard. The RRT of each analyte in a sample must be within 0.1 of the analyte's calculated RRT in the ICV.

System Configuration

The laboratory utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC/MS/MS #3 or LC/MS/MS #4. The laboratory also utilizes a Shimadzu Nexera XC liquid chromatography instrument for Primary and/or Secondary analyte analysis. It is coupled with an Applied Biosystems 5500 Mass Spectrometer/ Mass Spectrometer, designated as LC/MS/MS #5. All are fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte 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 Explosives analysis was performed on a ABSciex 5500 LCMSMS.

The detection of the Primary and Secondary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

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: 2017-1734 GEL Work Order: 425417

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 21 JUL 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417001

Sample Amount 890 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0625057.wiff

Date Analyzed: 28-JUN-17 00:20

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.112	J	0.0899	0.281
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
80251-29-2	DNX	.259	J	0.0899	0.281
<i>80251-29-2</i>	<i>DNX</i>				
121-14-2	2,4-Dinitrotoluene	.281	U	0.0899	0.281
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.281	U	0.0899	0.281
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.281	U	0.0921	0.281
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.281	U	0.0899	0.281
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.281	U	0.0899	0.281
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.281	U	0.0899	0.281
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.281	U	0.0899	0.281
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
13980-04-6	TNX	.364		0.0899	0.281
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.527		0.0899	0.281
<i>5755-27-1</i>	<i>MNX</i>				
479-45-8	Tetryl	.562	U	0.0899	0.562
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.562	U	0.112	0.562
<i>78-11-5</i>	<i>PETN</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417001

Sample Amount 890 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-99-0	p-Nitrotoluene	.562	U	0.169	0.562
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.99		0.0899	0.281
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
3058-38-6	TATB	1.12	U	0.337	1.12
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.12	U	0.337	1.12
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.12	U	0.337	1.12
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	1.44		0.0899	0.281
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.81	U	0.562	2.81
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.81	U	0.562	2.81
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417001

Sample Amount 890 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0630016.wiff

Date Analyzed: 30-JUN-17 19:06

Dilution Factor: 5

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	11.4		0.225	0.702
2691-41-0	HMX				
121-82-4	RDX	13.1		0.225	0.702
121-82-4	RDX				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133283

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417003

Sample Amount 950 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0630044.wiff

Date Analyzed: 01-JUL-17 11:02

Dilution Factor: 10

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	37.4		0.421	1.32
121-82-4	RDX				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133283

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417003

Sample Amount 950 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0630019.wiff

Date Analyzed: 30-JUN-17 20:49

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
35572-78-2	2-Amino-4,6-dinitrotoluene	.0904	J	0.0842	0.263
35572-78-2	2-Amino-4,6-dinitrotoluene				
80251-29-2	DNX	.152	J	0.0842	0.263
80251-29-2	DNX				
19406-51-0	4-Amino-2,6-dinitrotoluene	.205	J	0.0842	0.263
19406-51-0	4-Amino-2,6-dinitrotoluene				
13980-04-6	TNX	.241	J	0.0842	0.263
13980-04-6	TNX				
118-96-7	2,4,6-Trinitrotoluene	.263	U	0.0842	0.263
118-96-7	2,4,6-Trinitrotoluene				
121-14-2	2,4-Dinitrotoluene	.263	U	0.0842	0.263
121-14-2	2,4-Dinitrotoluene				
606-20-2	2,6-Dinitrotoluene	.263	U	0.0842	0.263
606-20-2	2,6-Dinitrotoluene				
88-72-2	o-Nitrotoluene	.263	U	0.0863	0.263
88-72-2	o-Nitrotoluene				
98-95-3	Nitrobenzene	.263	U	0.0842	0.263
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	.263	U	0.0842	0.263
99-08-1	m-Nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	.263	U	0.0842	0.263
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.263	U	0.0842	0.263
99-65-0	m-Dinitrobenzene				
5755-27-1	MNX	.307		0.0842	0.263
5755-27-1	MNX				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133283

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417003

Sample Amount 950 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
479-45-8	Tetryl	.526	U	0.0842	0.526
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.526	U	0.105	0.526
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.526	U	0.158	0.526
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1.05	U	0.316	1.05
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.05	U	0.316	1.05
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.05	U	0.316	1.05
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
2691-41-0	HMX	1.74		0.0842	0.263
<i>2691-41-0</i>	<i>HMX</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.63	U	0.526	2.63
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.63	U	0.526	2.63
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133297

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417005

Sample Amount 910 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0630045.wiff

Date Analyzed: 01-JUL-17 11:37

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	.237	J	0.0879	0.275
2691-41-0	HMX				
118-96-7	2,4,6-Trinitrotoluene	.275	U	0.0879	0.275
118-96-7	2,4,6-Trinitrotoluene				
121-14-2	2,4-Dinitrotoluene	.275	U	0.0879	0.275
121-14-2	2,4-Dinitrotoluene				
13980-04-6	TNX	.275	U	0.0879	0.275
13980-04-6	TNX				
19406-51-0	4-Amino-2,6-dinitrotoluene	.275	U	0.0879	0.275
19406-51-0	4-Amino-2,6-dinitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	.275	U	0.0879	0.275
35572-78-2	2-Amino-4,6-dinitrotoluene				
5755-27-1	MXN	.275	U	0.0879	0.275
5755-27-1	MXN				
606-20-2	2,6-Dinitrotoluene	.275	U	0.0879	0.275
606-20-2	2,6-Dinitrotoluene				
80251-29-2	DNX	.275	U	0.0879	0.275
80251-29-2	DNX				
88-72-2	o-Nitrotoluene	.275	U	0.0901	0.275
88-72-2	o-Nitrotoluene				
98-95-3	Nitrobenzene	.275	U	0.0879	0.275
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	.275	U	0.0879	0.275
99-08-1	m-Nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	.275	U	0.0879	0.275
99-35-4	1,3,5-Trinitrobenzene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133297

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 425417005

Sample Amount 910 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	.275	U	0.0879	0.275
99-65-0	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.549	U	0.0879	0.549
479-45-8	<i>Tetryl</i>				
78-11-5	PETN	.549	U	0.110	0.549
78-11-5	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.549	U	0.165	0.549
99-99-0	<i>p-Nitrotoluene</i>				
121-82-4	RDX	.587		0.0879	0.275
121-82-4	<i>RDX</i>				
3058-38-6	TATB	1.1	U	0.330	1.10
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.1	U	0.330	1.10
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.1	U	0.330	1.10
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.75	U	0.549	2.75
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.75	U	0.549	2.75
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary

Lab Name: GEL Laboratories LLCGEL Job No (SDG): 2017-1734Lab Code: GEL

HPLC Column: Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
425417001	CAWA-17-133279	93	55 - 115	
425417001	CAWA-17-133279DL	96	55 - 115	
425417003	CAWA-17-133283	106	55 - 115	
425417003	CAWA-17-133283DL	113	55 - 115	
425417005	CAWA-17-133297	109	55 - 115	
1203813029	MB for batch 1674744	96	55 - 115	
1203813030	LCS for batch 1674744	109	55 - 115	
1203813031	CAWA-17-133279MS	84	55 - 115	
1203813032	CAWA-17-133279MSD	88	55 - 115	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Extract Batch Code: 1674744

Date Extracted: 16-JUN-17

GEL LCS ID: 1203813030

GEL LCSDUP ID: .

Analysis Date/Time: 28-JUN-17 08:57

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
2,4-Dinitrotoluene	5	4.53	91					71 - 110
2,6-Diamino-4-nitrotoluene	5	3.78	76					53 - 127
2,6-Dinitrotoluene	5	4.62	92					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.63	93					70 - 112
3,5-Dinitroaniline	5	5.48	110					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.55	91					74 - 116
HMX	5	4.38	88					58 - 113
Nitrobenzene	5	4.29	86					64 - 115
PETN	5	4.95	99					57 - 126
RDX	5	3.81	76					64 - 117
TATB	2.5	2.74	110					47 - 135
Tetryl	5	3.74	75					55 - 122
m-Dinitrobenzene	5	4.86	97					74 - 117
m-Nitrotoluene	5	5.02	100					66 - 114
o-Nitrotoluene	5	3.86	77					64 - 115
p-Nitrotoluene	5	4.88	98					66 - 127
tris(o-cresyl) phosphate	5	3.77	75					43 - 104
1,3,5-Trinitrobenzene	5	4.57	91					70 - 110
2,4,6-Trinitrotoluene	5	5.18	104					69 - 113
2,4-Diamino-6-nitrotoluene	5	4.31	86					50 - 121

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-17-133279

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Extract Batch Code: 1674744

Date Extracted: 16-JUN-17

GEL Spike ID: 1203813031

GEL SpikeDup ID: 1203813032

Analysis Date/Time: 28-JUN-17 00:54

MSD Analysis Date/Time: 28-JUN-17 01:28

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
1,3,5-Trinitrobenzene	5.37634	0	5.06	94	5.13	93	1	30	67 - 111
2,4,6-Trinitrotoluene	5.37634	.112	4.68	85	5.29	94	12	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.37634	0	4.28	80	5.19	94	19	30	50 - 121
2,4-Dinitrotoluene	5.37634	.0448	4.64	86	5.14	93	10	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.37634	0	6.26	116	6.63	121	6	30	53 - 127
2,6-Dinitrotoluene	5.37634	0	4.36	81	4.8	87	10	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.37634	.99	4.97	74	5.76	87	15	30	67 - 115
3,5-Dinitroaniline	5.37634	.198	5.87	106	6.11	108	4	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.37634	1.44	5.72	80	5.83	80	2	30	65 - 120
HMX	5.37634	15.2	18.8	68	18.8	66	0	30	44 - 128
Nitrobenzene	5.37634	0	4.54	84	4	73	12	30	62 - 116
PETN	5.37634	0	5.11	95	5.51	100	7	30	51 - 131
RDX	5.37634	16.1	21.4	99	24.4	151 *	13	30	57 - 125
TATB	2.68817	0	3.6	134	4.21	153 *	16	30	38 - 149
Tetryl	5.37634	0	4.27	79	4.32	79	1	30	50 - 126
m-Dinitrobenzene	5.37634	0	5.51	102	5.57	101	1	30	74 - 117
m-Nitrotoluene	5.37634	0	3.83	71	4.64	84	19	30	59 - 120
o-Nitrotoluene	5.37634	.0183	3.4	63	3.71	67	9	30	56 - 119
p-Nitrotoluene	5.37634	0	3.64	68	3.94	72	8	30	61 - 129
tris(o-cresyl) phosphate	5.37634	.0926	4.8	88	4.95	88	3	30	38 - 105

#Column to be used to flag recovery and RPD values with an asterisk

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1674744

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813029

Sample Amount 1000 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0625055.wiff

Date Analyzed: 27-JUN-17 23:12

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.25	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.25	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.25	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.25	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.25	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.25	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.25	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	.25	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.25	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.25	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.25	U	0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.25	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.25	U	0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1674744

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813029

Sample Amount 1000 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.25	U	0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.25	U	0.080	0.250
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.5	U	0.080	0.500
479-45-8	Tetryl				
78-11-5	PETN	.5	U	0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.5	U	0.150	0.500
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	1	U	0.300	1.00
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1	U	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.5	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.5	U	0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1674744

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813030

Sample Amount 1000 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0625072.wiff

Date Analyzed: 28-JUN-17 08:57

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6 <i>13980-04-6</i>	TNX <i>TNX</i>	.25	U	0.080	0.250
5755-27-1 <i>5755-27-1</i>	MNX <i>MNX</i>	.25	U	0.080	0.250
80251-29-2 <i>80251-29-2</i>	DNX <i>DNX</i>	.25	U	0.080	0.250
3058-38-6 <i>3058-38-6</i>	TATB <i>TATB</i>	2.74		0.300	1.00
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	3.74		0.080	0.500
78-30-8 <i>78-30-8</i>	tris(o-cresyl) phosphate <i>tris(o-cresyl) phosphate</i>	3.77		0.300	1.00
59229-75-3 <i>59229-75-3</i>	2,6-Diamino-4-nitrotoluene <i>2,6-Diamino-4-nitrotoluene</i>	3.78		0.500	2.50
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	3.81		0.080	0.250
88-72-2 <i>88-72-2</i>	o-Nitrotoluene <i>o-Nitrotoluene</i>	3.86		0.082	0.250
98-95-3 <i>98-95-3</i>	Nitrobenzene <i>Nitrobenzene</i>	4.29		0.080	0.250
6629-29-4 <i>6629-29-4</i>	2,4-Diamino-6-nitrotoluene <i>2,4-Diamino-6-nitrotoluene</i>	4.31		0.500	2.50
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	4.38		0.080	0.250
121-14-2 <i>121-14-2</i>	2,4-Dinitrotoluene <i>2,4-Dinitrotoluene</i>	4.53		0.080	0.250

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1674744

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813030

Sample Amount 1000 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
19406-51-0	4-Amino-2,6-dinitrotoluene	4.55		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.57		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
606-20-2	2,6-Dinitrotoluene	4.62		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.63		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.86		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
99-99-0	p-Nitrotoluene	4.88		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
78-11-5	PETN	4.95		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-08-1	m-Nitrotoluene	5.02		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.18		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.48		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279(425417001MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813031

Sample Amount 930 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0625058.wiff

Date Analyzed: 28-JUN-17 00:54

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
80251-29-2	DNX	.271		0.086	0.269
80251-29-2	DNX				
13980-04-6	TNX	.362		0.086	0.269
13980-04-6	TNX				
5755-27-1	MNX	.512		0.086	0.269
5755-27-1	MNX				
88-72-2	o-Nitrotoluene	3.4		0.0882	0.269
88-72-2	o-Nitrotoluene				
3058-38-6	TATB	3.6		0.323	1.08
3058-38-6	TATB				
99-99-0	p-Nitrotoluene	3.64		0.161	0.538
99-99-0	p-Nitrotoluene				
99-08-1	m-Nitrotoluene	3.83		0.086	0.269
99-08-1	m-Nitrotoluene				
479-45-8	Tetryl	4.27		0.086	0.538
479-45-8	Tetryl				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.28		0.538	2.69
6629-29-4	2,4-Diamino-6-nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.36		0.086	0.269
606-20-2	2,6-Dinitrotoluene				
98-95-3	Nitrobenzene	4.54		0.086	0.269
98-95-3	Nitrobenzene				
121-14-2	2,4-Dinitrotoluene	4.64		0.086	0.269
121-14-2	2,4-Dinitrotoluene				
118-96-7	2,4,6-Trinitrotoluene	4.68		0.086	0.269
118-96-7	2,4,6-Trinitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279(425417001MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813031

Sample Amount 930 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	4.8		0.323	1.08
78-30-8	tris(o-cresyl) phosphate				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.97		0.086	0.269
35572-78-2	2-Amino-4,6-dinitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	5.06		0.086	0.269
99-35-4	1,3,5-Trinitrobenzene				
78-11-5	PETN	5.11		0.108	0.538
78-11-5	PETN				
99-65-0	m-Dinitrobenzene	5.51		0.086	0.269
99-65-0	m-Dinitrobenzene				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.72		0.086	0.269
19406-51-0	4-Amino-2,6-dinitrotoluene				
618-87-1	3,5-Dinitroaniline	5.87		0.323	1.08
618-87-1	3,5-Dinitroaniline				
59229-75-3	2,6-Diamino-4-nitrotoluene	6.26		0.538	2.69
59229-75-3	2,6-Diamino-4-nitrotoluene				
2691-41-0	HMX	18.8		0.086	0.269
2691-41-0	HMX				
121-82-4	RDX	21.4		0.086	0.269
121-82-4	RDX				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279(425417001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813032

Sample Amount 910 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0625059.wiff

Date Analyzed: 28-JUN-17 01:28

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
80251-29-2	DNX	.294		0.0879	0.275
80251-29-2	DNX				
13980-04-6	TNX	.405		0.0879	0.275
13980-04-6	TNX				
5755-27-1	MNX	.568		0.0879	0.275
5755-27-1	MNX				
88-72-2	o-Nitrotoluene	3.71		0.0901	0.275
88-72-2	o-Nitrotoluene				
99-99-0	p-Nitrotoluene	3.94		0.165	0.549
99-99-0	p-Nitrotoluene				
98-95-3	Nitrobenzene	4		0.0879	0.275
98-95-3	Nitrobenzene				
3058-38-6	TATB	4.21		0.330	1.10
3058-38-6	TATB				
479-45-8	Tetryl	4.32		0.0879	0.549
479-45-8	Tetryl				
99-08-1	m-Nitrotoluene	4.64		0.0879	0.275
99-08-1	m-Nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.8		0.0879	0.275
606-20-2	2,6-Dinitrotoluene				
78-30-8	tris(o-cresyl) phosphate	4.95		0.330	1.10
78-30-8	tris(o-cresyl) phosphate				
99-35-4	1,3,5-Trinitrobenzene	5.13		0.0879	0.275
99-35-4	1,3,5-Trinitrobenzene				
121-14-2	2,4-Dinitrotoluene	5.14		0.0879	0.275
121-14-2	2,4-Dinitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133279(425417001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1734

Matrix: WATER

GEL Sample ID: 1203813032

Sample Amount 910 mL

Date Received: 14-JUN-17

Moisture: .

Extraction Batch ID: 1674744

Extraction Type Sol Exchange

Date Extracted: 16-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
6629-29-4	2,4-Diamino-6-nitrotoluene	5.19		0.549	2.75
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.29		0.0879	0.275
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
78-11-5	PETN	5.51		0.110	0.549
<i>78-11-5</i>	<i>PETN</i>				
99-65-0	m-Dinitrobenzene	5.57		0.0879	0.275
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.76		0.0879	0.275
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.83		0.0879	0.275
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	6.11		0.330	1.10
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	6.63		0.549	2.75
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
2691-41-0	HMX	18.8		0.0879	0.275
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	24.4		0.0879	0.275
<i>121-82-4</i>	<i>RDX</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1734Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 26-JUN-17 16:29GEL Data File: EXP0625001.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.69
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1734Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 26-JUN-17 17:03GEL Data File: EXP0625002.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.41
p-Nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1734Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 30-JUN-17 10:34GEL Data File: EXP0630001.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1734Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 30-JUN-17 11:09GEL Data File: EXP0630002.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 26-JUN-17 21:36

GEL Data File: EXP0625010.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	1.48
tris(o-cresyl) phosphate	0	6.15
TATB	0	1.57
3,5-Dinitroaniline	0	1.82
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	1.65
DNX	0	2.65
MNX	0	2.03
TNX	0	2.15
1,3,5-Trinitrobenzene	0	1.85
2,4,6-Trinitrotoluene	0	1.65
2,4-Dinitrotoluene	0	1.35
2,6-Dinitrotoluene	0	1.18
2-Amino-4,6-dinitrotoluene	0	1.51
4-Amino-2,6-dinitrotoluene	0	1.49
HMX	0	2.19
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	2.17
RDX	0	2.09
Tetryl	0	1.99
m-Dinitrobenzene	0	1.4
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.58
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 26-JUN-17 23:52

GEL Data File: EXP0625014.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	6.41
TATB	0	0
3,5-Dinitroaniline	0	1.36
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	1.77
MNX	0	1.47
TNX	0	1.56
1,3,5-Trinitrobenzene	0	1.24
2,4,6-Trinitrotoluene	0	1.29
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	1.27
4-Amino-2,6-dinitrotoluene	0	1.32
HMX	0	1.93
Nitrobenzene	0	0
Nitroglycerin	0	2.25
PETN	0	1.68
RDX	0	1.77
Tetryl	0	1.43
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.62
p-Nitrotoluene	0	5

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 27-JUN-17 02:09

GEL Data File: EXP0625018.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.36
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 27-JUN-17 03:17

GEL Data File: EXP0625020.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	3.68
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.22
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 27-JUN-17 03:51

GEL Data File: EXP0625021.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.71
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 27-JUN-17 08:58

GEL Data File: EXP0625030.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	1.31
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 27-JUN-17 09:33

GEL Data File: EXP0625031.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.14
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 27-JUN-17 10:41

GEL Data File: EXP0625033.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.75
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.92
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 27-JUN-17 16:56

GEL Data File: EXP0625044.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.39
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.28
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MXN	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 27-JUN-17 22:03

GEL Data File: EXP0625053.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	3.81
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.9
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 28-JUN-17 04:53

GEL Data File: EXP0625065.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	3.29
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.7
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 28-JUN-17 07:44

GEL Data File: EXP0625070.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	.16
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	.52
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK14

Analysis Date: 28-JUN-17 15:39

GEL Data File: EXP0625083.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	1.54
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	4.99
TATB	0	0
3,5-Dinitroaniline	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 30-JUN-17 15:42

GEL Data File: EXP0630010.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 30-JUN-17 17:58

GEL Data File: EXP0630014.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 30-JUN-17 21:23

GEL Data File: EXP0630020.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 30-JUN-17 22:31

GEL Data File: EXP0630022.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 01-JUL-17 05:21

GEL Data File: EXP0630034.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 01-JUL-17 09:54

GEL Data File: EXP0630042.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 01-JUL-17 12:11

GEL Data File: EXP0630046.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 01-JUL-17 15:36

GEL Data File: EXP0630052.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1734

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 01-JUL-17 16:44

GEL Data File: EXP0630054.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 03-JUL-17	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846 3535A/8330B	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1674747	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 425417(2017-1734),425520(2017-1749),425532(2017-1748) Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. One or more of the required spiking analytes were not within the acceptance limits in the matrix spike duplicate (MSD). 1203813032 (CAWA-17-133279MSD) recovered TATB at 153% (38%-149%) and RDX at 151% (57%-125%).		1. While the MSD exhibited a high bias, both the LCS and MS met acceptance limits for TATB. TATB was not detected in the associated samples. The biased high recovery in the MSD is attributed to an over range concentration of RDX in the parent sample. The data are reported.	

Originator's Name:
Michael Penny 03-JUL-17

Data Validator/Group Leader:
Charles Wilson 05-JUL-17

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1734
Work Order #: 425417

Sample ID	Client ID
425417001	CAWA-17-133279
425417002	CAWA-17-133307
425417003	CAWA-17-133283
425417004	CAWA-17-133311
425417005	CAWA-17-133297
425417006	CAWA-17-133325
1203811391	Method Blank (MB) ICP
1203811392	Laboratory Control Sample (LCS)
1203811395	425417002(CAWA-17-133307L) Serial Dilution (SD)
1203811393	425417002(CAWA-17-133307D) Sample Duplicate (DUP)
1203811394	425417002(CAWA-17-133307S) Matrix Spike (MS)
1203818732	425417002(CAWA-17-133307PS) Post Spike (PS)
1203811411	Method Blank (MB) ICP-MS
1203811412	Laboratory Control Sample (LCS)
1203811415	425417002(CAWA-17-133307L) Serial Dilution (SD)
1203811413	425417002(CAWA-17-133307D) Sample Duplicate (DUP)
1203811414	425417002(CAWA-17-133307S) Matrix Spike (MS)
1203811972	Method Blank (MB) CVAA
1203811973	Laboratory Control Sample (LCS)
1203811978	425417001(CAWA-17-133279L) Serial Dilution (SD)
1203811974	425417001(CAWA-17-133279D) Sample Duplicate (DUP)
1203811976	425417001(CAWA-17-133279S) Matrix Spike (MS)

Sample Analysis

Samples 425417001,002,003,004,005 and 006 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1674023, 1674031, 1674270 and 1679789
Prep Batch :	1674022, 1674030 and 1674269
Standard Operating Procedures:	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 30, GL-MA-E-010 REV# 34 and GL-GC-E-107 REV# 10
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 425417002 (CAWA-17-133307), 425417004 (CAWA-17-133311) and 425417006 (CAWA-17-133325)-ICP.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 425417002 (CAWA-17-133307)-ICP and ICP-MS and 425417001 (CAWA-17-133279)-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 MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1203811394 (CAWA-17-133307MS)	Silica	126* (75%-125%)

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.

Post Spike (PS) Recovery Statement

The PS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the absence of matrix interferences in the post-digested sample.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

Sample	Analyte	Value
1203811395 (CAWA-17-133307SDILT)	Potassium	10.6 *(0%-10%)

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

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. Samples were diluted to ensure that the silica concentrations were within the linear calibration range of the instrument. 425417002 (CAWA-17-133307), 425417004 (CAWA-17-133311) and 425417006 (CAWA-17-133325)-ICP.

Analyte	425417		
	002	004	006
Silica	10X	10X	10X

Preparation Information

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

Miscellaneous Information

Electronic Packaging Comment

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

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

Additional Comments

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1734 GEL Work Order: 425417

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- E %difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- J Value is estimated
- N Metals--The Matrix spike sample recovery is not within specified control limits
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 07 JUL 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417001**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133279**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:38	061617W1-5	1674270

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417002**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133307**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:46	061617W1-5	1674270

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425417002

BASIS: As Received

DATE COLLECTED 12-JUN-17

CLIENT ID: CAWA-17-133307

LEVEL: Low

DATE RECEIVED 14-JUN-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	329	ug/L		68	200	200	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-38-2	Arsenic	2.01	ug/L	J	2	5	5	1	MS	BAJ	06/28/17 12:35	170628-4	1674031
7440-39-3	Barium	3390	ug/L		1	5	5	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-42-8	Boron	25.1	ug/L	J	15	50	50	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-70-2	Calcium	17400	ug/L		50	200	200	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-48-4	Cobalt	1.79	ug/L	J	1	5	5	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7439-89-6	Iron	148	ug/L		30	100	100	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7439-95-4	Magnesium	4460	ug/L		110	300	300	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7439-96-5	Manganese	4.07	ug/L	J	2	10	10	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7439-98-7	Molybdenum	0.753	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-09-7	Potassium	2860	ug/L	E	50	150	150	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/28/17 12:35	170628-4	1674031
7631-86-9	Silica	41000	ug/L	N	530	2130	2130	10	P	JWJ	06/23/17 15:14	062317-2	1674023
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-23-5	Sodium	15300	ug/L		100	300	300	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-24-6	Strontium	149	ug/L		1	5	5	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-61-1	Uranium	0.086	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/27/17 15:10	170627-3	1674031
7440-62-2	Vanadium	2.39	ug/L	J	1	5	5	1	P	JWJ	06/22/17 22:02	062217-1	1674023
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	JWJ	06/22/17 22:02	062217-1	1674023

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425417002**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133307**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	61.8	mg/L		0.453	1.24	1.24	1		TXT1	07/05/17 14:28		1679789

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674023	1674022	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674031	1674030	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417003**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133283**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:52	061617W1-5	1674270

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417004**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133311**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:54	061617W1-5	1674270

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425417004

BASIS: As Received

DATE COLLECTED 12-JUN-17

CLIENT ID: CAWA-17-133311

LEVEL: Low

DATE RECEIVED 14-JUN-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	JWJ	06/22/17 22:14	062217-1	1674023
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/28/17 12:45	170628-4	1674031
7440-39-3	Barium	16	ug/L		1	5	5	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-42-8	Boron	69.2	ug/L		15	50	50	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-70-2	Calcium	13600	ug/L		50	200	200	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-50-8	Copper	21.3	ug/L		3	10	10	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7439-95-4	Magnesium	5420	ug/L		110	300	300	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7439-98-7	Molybdenum	0.535	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-02-0	Nickel	2.59	ug/L		0.6	2	2	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-09-7	Potassium	2190	ug/L	E	50	150	150	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/28/17 12:45	170628-4	1674031
7631-86-9	Silica	58100	ug/L	N	530	2130	2130	10	P	JWJ	06/23/17 15:28	062317-2	1674023
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-23-5	Sodium	12400	ug/L		100	300	300	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-24-6	Strontium	99.7	ug/L		1	5	5	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-61-1	Uranium	0.385	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/27/17 15:26	170627-3	1674031
7440-62-2	Vanadium	2.57	ug/L	J	1	5	5	1	P	JWJ	06/22/17 22:14	062217-1	1674023
7440-66-6	Zinc	44.8	ug/L		3.3	10	10	1	P	JWJ	06/22/17 22:14	062217-1	1674023

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425417004**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133311**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	56.4	mg/L		0.453	1.24	1.24	1		TXT1	07/05/17 14:28		1679789

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674023	1674022	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674031	1674030	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

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

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417005**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133297**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:55	061617W1-5	1674270

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425417006**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133325**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	06/16/17 10:57	061617W1-5	1674270

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425417006

BASIS: As Received

DATE COLLECTED 12-JUN-17

CLIENT ID: CAWA-17-133325

LEVEL: Low

DATE RECEIVED 14-JUN-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	JWJ	06/22/17 22:17	062217-1	1674023
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-38-2	Arsenic	2.22	ug/L	J	2	5	5	1	MS	BAJ	06/28/17 12:47	170628-4	1674031
7440-39-3	Barium	33.8	ug/L		1	5	5	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-42-8	Boron	15.9	ug/L	J	15	50	50	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-70-2	Calcium	11400	ug/L		50	200	200	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-50-8	Copper	7.23	ug/L	J	3	10	10	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7439-89-6	Iron	90.4	ug/L	J	30	100	100	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7439-95-4	Magnesium	3170	ug/L		110	300	300	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7439-96-5	Manganese	94.5	ug/L		2	10	10	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7439-98-7	Molybdenum	3.91	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-02-0	Nickel	4.95	ug/L		0.6	2	2	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-09-7	Potassium	3750	ug/L	E	50	150	150	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/28/17 12:47	170628-4	1674031
7631-86-9	Silica	67600	ug/L	N	530	2130	2130	10	P	JWJ	06/23/17 15:32	062317-2	1674023
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-23-5	Sodium	169000	ug/L		100	300	300	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-24-6	Strontium	73.8	ug/L		1	5	5	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-61-1	Uranium	0.211	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/27/17 15:29	170627-3	1674031
7440-62-2	Vanadium	2.94	ug/L	J	1	5	5	1	P	JWJ	06/22/17 22:17	062217-1	1674023
7440-66-6	Zinc	108	ug/L		3.3	10	10	1	P	JWJ	06/22/17 22:17	062217-1	1674023

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1734**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425417006**BASIS:** As Received**DATE COLLECTED** 12-JUN-17**CLIENT ID:** CAWA-17-133325**LEVEL:** Low**DATE RECEIVED** 14-JUN-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	41.5	mg/L		0.453	1.24	1.24	1		TXT1	07/05/17 14:28		1679789

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1674023	1674022	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674031	1674030	SW846 3005A	50	mL	50	mL	06/15/17	SXW1
1674270	1674269	EPA 245.1/245.2 Prep	20	mL	20	mL	06/15/17	AXS5

***Analytical Methods:**

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

Quality Control Summary

METALS
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PREPARATION BLANK SUMMARY

SDG NO. 2017-1734

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>
1203811391	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	119	ug/L	+/-300	J	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
1203811411	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203811972	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

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Matrix Spike Summary

SDG NO. 2017-1734 Client ID: CAWA-17-133307S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425417002 Spike ID: 1203811394

<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	5540		329		5000	104		P
Barium	ug/L		3950		3390		500	110	N/A	P
Beryllium	ug/L	75-125	510		1	U	500	102		P
Boron	ug/L	75-125	523		25.1	J	500	99.6		P
Calcium	ug/L	75-125	22500		17400		5000	102		P
Cobalt	ug/L	75-125	512		1.79	J	500	102		P
Copper	ug/L	75-125	519		3	U	500	103		P
Iron	ug/L	75-125	5230		148		5000	102		P
Magnesium	ug/L	75-125	9690		4460		5000	105		P
Manganese	ug/L	75-125	507		4.07	J	500	101		P
Potassium	ug/L	75-125	8110		2860		5000	105		P
Silica	ug/L	75-125	54500		41000		10700	126	N	P
Sodium	ug/L	75-125	21100		15300		5000	117		P
Strontium	ug/L	75-125	674		149		500	105		P
Tin	ug/L	75-125	507		2.5	U	500	101		P
Vanadium	ug/L	75-125	509		2.39	J	500	101		P
Zinc	ug/L	75-125	484		3.3	U	500	96.4		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Matrix Spike Summary

SDG NO. 2017-1734 Client ID CAWA-17-133307S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425417002 Spike ID: 1203811414

<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>
Silver	ug/L	75-125	51.2		0.3	U	50	102		MS
Thallium	ug/L	75-125	46.5		0.6	U	50	92.7		MS
Uranium	ug/L	75-125	47.5		0.086	J	50	94.9		MS
Antimony	ug/L	75-125	48		1	U	50	95.3		MS
Arsenic	ug/L	75-125	53.6		2.01	J	50	103		MS
Cadmium	ug/L	75-125	50.2		0.3	U	50	100		MS
Chromium	ug/L	75-125	50.3		3	U	50	98.9		MS
Lead	ug/L	75-125	47.7		0.5	U	50	95.2		MS
Molybdenum	ug/L	75-125	53.6		0.753		50	106		MS
Nickel	ug/L	75-125	50.5		0.6	U	50	99.9		MS
Selenium	ug/L	75-125	50.5		2	U	50	101		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Matrix Spike Summary

SDG NO. 2017-1734 **Client ID:** CAWA-17-133279S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 425417001 **Spike ID:** 1203811976

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	1.98		0.067	U	2	99.1		AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Spike Summary

SDG NO. 2017-1734 **Client ID:** CAWA-17-133307PS**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 425417002 **Spike ID:** 1203818732

<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>
Silica	ug/L	80-120	14900		4100		10700	101		P

*Analytical Methods:

P SW846 3005A/6010C

Metals
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Duplicate Sample Summary

SDG No.: 2017-1734

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133307D

Matrix: WATER

Level: Low

Sample ID: 425417002

Duplicate ID: 1203811393

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-200	329		289		12.8		P
Barium	ug/L	+/-20%	3390		3430		1.11		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	25.1 J		22.8 J		9.78		P
Calcium	ug/L	+/-20%	17400		17700		1.77		P
Cobalt	ug/L	+/-5	1.79 J		1.97 J		9.58		P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-100	148		147		.976		P
Magnesium	ug/L	+/-20%	4460		4510		1.14		P
Manganese	ug/L	+/-10	4.07 J		4.06 J		.148		P
Potassium	ug/L	+/-20%	2860		3030		5.77		P
Silica	ug/L	+/-20%	41000		42500		3.45		P
Sodium	ug/L	+/-20%	15300		15500		1.73		P
Strontium	ug/L	+/-20%	149		152		1.91		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	2.39 J		2.9 J		19.3		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
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Duplicate Sample Summary

SDG No.: 2017-1734

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133307D

Matrix: WATER

Level: Low

Sample ID: 425417002

Duplicate ID: 1203811413

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L	+/-5	2.01 J		2.2 J		8.65		MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.753		0.632		17.5		MS
Nickel	ug/L		0.6 U		0.6 U				MS
Selenium	ug/L		2 U		2 U				MS
Silver	ug/L		0.3 U		0.3 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L	+/- .2	0.086 J		0.085 J		1.17		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2017-1734**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA-17-133279D**Matrix:** WATER**Level:** Low**Sample ID:** 425417001**Duplicate ID:** 1203811974**Percent Solids for Dup:** N/A

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1734

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>
1203811392								
	Aluminum	ug/L	5000	5250		105	80-120	P
	Barium	ug/L	500	503		101	80-120	P
	Beryllium	ug/L	500	497		99.4	80-120	P
	Boron	ug/L	500	487		97.3	80-120	P
	Calcium	ug/L	5000	5040		101	80-120	P
	Cobalt	ug/L	500	504		101	80-120	P
	Copper	ug/L	500	504		101	80-120	P
	Iron	ug/L	5000	5040		101	80-120	P
	Magnesium	ug/L	5000	5140		103	80-120	P
	Manganese	ug/L	500	501		100	80-120	P
	Potassium	ug/L	5000	5280		106	80-120	P
	Silica	ug/L	10700	10500		98.2	80-120	P
	Sodium	ug/L	5000	5390		108	80-120	P
	Strontium	ug/L	500	509		102	80-120	P
	Tin	ug/L	500	496		99.2	80-120	P
	Vanadium	ug/L	500	497		99.5	80-120	P
	Zinc	ug/L	500	475		94.9	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1734

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>
1203811412								
	Antimony	ug/L	50	47.5		95	80-120	MS
	Arsenic	ug/L	50	52.1		104	80-120	MS
	Cadmium	ug/L	50	51.3		103	80-120	MS
	Chromium	ug/L	50	52.2		104	80-120	MS
	Lead	ug/L	50	48.3		96.7	80-120	MS
	Molybdenum	ug/L	50	51.8		104	80-120	MS
	Nickel	ug/L	50	53.8		108	80-120	MS
	Selenium	ug/L	50	50.7		101	80-120	MS
	Silver	ug/L	50	51.8		104	80-120	MS
	Thallium	ug/L	50	46.6		93.2	80-120	MS
	Uranium	ug/L	50	47.3		94.7	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1734

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>
1203811973	Mercury	ug/L	2	2.03		102	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1734

Client ID: CAWA-17-133307L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425417002

Serial Dilution ID: 1203811395

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	329		340	U	10.599			P
Barium	3390		3540		4.154		10	P
Beryllium	1	U	5	U				P
Boron	25.1	J	75	U	55.89			P
Calcium	17400		17300		.577		10	P
Cobalt	1.79	J	5	U	88.044			P
Copper	3	U	15	U				P
Iron	148		161	J	8.848			P
Magnesium	4460		4550		2.047			P
Manganese	4.07	J	10	U	3.746			P
Potassium	2860		3160		10.563	E	10	P
Silica	4100		4100		.085		10	P
Sodium	15300		16300		7.071		10	P
Strontium	149		153		2.243		10	P
Tin	2.5	U	12.5	U				P
Vanadium	2.39	J	5	U	98.982			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. 2017-1734

Client ID: CAWA-17-133307L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425417002

Serial Dilution ID: 1203811415

<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	2.01	J	10	U	27.173			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	.753		1	U	1.062			MS
Nickel	.6	U	3	U				MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.086	J	.335	U	4.651			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1734 **Client ID:** CAWA-17-133279L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 425417001 **Serial Dilution ID:** 1203811978

<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 #: 2017-1734
Work Order #: 425417**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1673634

Method: SW 9060 Total Organic Carbon

Sample Analysis

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

Sample ID	Client ID
425417001	CAWA-17-133279
425417003	CAWA-17-133283
425417005	CAWA-17-133297
1203812102	Method Blank (MB)
1203812103	Laboratory Control Sample (LCS)
1203812277	Laboratory Control Sample Duplicate (LCSD)
1203812105	425300003(CAWA-17-133305) Sample Duplicate (DUP)
1203812107	425300003(CAWA-17-133305) 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.

LCS/LCSD Relative Percent Difference (RPD) Statement

The RPD between the LCS and LCSD met the acceptance limits.

Quality Control (QC) Designation

Sample 425300003 (CAWA-17-133305) 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 425417005 (CAWA-17-133297) 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	425417
	005
Total Organic Carbon Average	50X

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1674062	Method:	WSP-CN(T)
Prep Batch :	1674061	Method:	EPA 335.4

Sample Analysis

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

Sample ID	Client ID
425417001	CAWA-17-133279
425417003	CAWA-17-133283
425417005	CAWA-17-133297
1203811489	Method Blank (MB)
1203811490	Laboratory Control Sample (LCS)
1203811491	425417001(CAWA-17-133279) Sample Duplicate (DUP)
1203811492	425417001(CAWA-17-133279) Matrix Spike (MS)
1203814049	425417001(CAWA-17-133279) Matrix Spike Duplicate (MSD)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-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 425417001 (CAWA-17-133279) 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.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the spike and spike duplicate met the acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203811490 (LCS), 1203811491 (CAWA-17-133279DUP), 1203811492 (CAWA-17-133279MS), 1203814049 (CAWA-17-133279MSD) and 425417001 (CAWA-17-133279) were re-analyzed to verify the results.

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1674234

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203811880	Method Blank (MB)
1203811881	Laboratory Control Sample (LCS)
1203811882	425417006(CAWA-17-133325) Sample Duplicate (DUP)
1203811883	425417006(CAWA-17-133325) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425417006 (CAWA-17-133325) 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 1203811882 (CAWA-17-133325DUP), 1203811883 (CAWA-17-133325PS), 425417002 (CAWA-17-133307) and 425417006 (CAWA-17-133325) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	425417	
	002	006
Chloride	2X	1X
Sulfate	1X	2X

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203811882 (CAWA-17-133325DUP), 425417002 (CAWA-17-133307), 425417004 (CAWA-17-133311) and 425417006 (CAWA-17-133325) 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:

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Method/Analysis Information

Product: Ammonia Nitrogen
Analytical Batch: 1673875 **Method:** NH3
Prep Batch : 1673874 **Method:** EPA 350.1 Prep

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203811097	Method Blank (MB)
1203811098	Laboratory Control Sample (LCS)
1203811099	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203811100	425079002(CAWA-17-133314) 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+ 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 425079002 (CAWA-17-133314) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1673872	Method:	TKN
Prep Batch :	1673870	Method:	EPA 351.2 Prep

Sample Analysis

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

Sample ID	Client ID
425417001	CAWA-17-133279
425417003	CAWA-17-133283
425417005	CAWA-17-133297
1203811089	Method Blank (MB)
1203811090	Laboratory Control Sample (LCS)
1203811091	425079001(CAWA-17-133286) Sample Duplicate (DUP)
1203811092	425079001(CAWA-17-133286) 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

Sample 425079001 (CAWA-17-133286) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203811089 (MB), 1203811090 (LCS), 1203811091 (CAWA-17-133286DUP) and 1203811092 (CAWA-17-133286MS) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported.

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1674641

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203812760	Method Blank (MB)
1203812761	Laboratory Control Sample (LCS)
1203812762	425417002(CAWA-17-133307) Sample Duplicate (DUP)
1203812766	425417002(CAWA-17-133307) 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 425417002 (CAWA-17-133307) 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 sample 425417004 (CAWA-17-133311) in this sample group was diluted due to matrix interference. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	425417
	004
Nitrogen, Nitrate/Nitrite	5X

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1673877	Method:	PO4
Prep Batch :	1673876	Method:	EPA 365.4 Prep

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203811104	Method Blank (MB)
1203811105	Laboratory Control Sample (LCS)
1203811108	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203811109	425079002(CAWA-17-133314) 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 425079002 (CAWA-17-133314) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203811104 (MB) and 1203811105 (LCS) were re-analyzed due to instrument failure. The results from the reanalysis are reported.

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1675379

Method: TDS

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203814590	Method Blank (MB)
1203814591	Laboratory Control Sample (LCS)
1203814592	425417006(CAWA-17-133325) 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 425417006 (CAWA-17-133325) 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**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1679220

Method: EPA120.1 Specific Conductivity

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203823672	Laboratory Control Sample (LCS)
1203823673	425329003(CAWA-17-133330) 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 425329003 (CAWA-17-133330) 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**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: 1676572 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203817344	Laboratory Control Sample (LCS)
1203817346	425532004(CAWA-17-133335) 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 425532004 (CAWA-17-133335) 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
1203817346 (CAWA-17-133335DUP)	pH	Received 15-JUN-17, out of holding 13-JUN-17
425417002 (CAWA-17-133307)	pH	Received 14-JUN-17, out of holding 12-JUN-17
425417004 (CAWA-17-133311)	pH	Received 14-JUN-17, out of holding 12-JUN-17
425417006 (CAWA-17-133325)	pH	Received 14-JUN-17, out of holding 12-JUN-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1676562 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

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

Sample ID	Client ID
425417002	CAWA-17-133307
425417004	CAWA-17-133311
425417006	CAWA-17-133325
1203817292	Laboratory Control Sample (LCS)
1203817296	425532004(CAWA-17-133335) Sample Duplicate (DUP)
1203817299	425532004(CAWA-17-133335) 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 425532004 (CAWA-17-133335) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Certification Statement

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

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Qualifier Definition Report for

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

Client SDG: 2017-1734 GEL Work Order: 425417

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Kristen Mizzell

Date: 07 JUL 2017

Title: Analyst I

Sample Data Summary

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Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133279
Sample ID: 425417001
Matrix: W
Collect Date: 12-JUN-17 13:45
Receive Date: 14-JUN-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		2.49	0.330	1.00	mg/L		1	TSM	06/22/17	2041	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/20/17	1025	1674062	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	1003	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/19/17	1339	1674061
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	06/19/17	1700	1673870

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

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Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133307
Sample ID: 425417002
Matrix: W
Collect Date: 12-JUN-17 13:45
Receive Date: 14-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	06/15/17	0937	1674234	1
Fluoride	J	0.0944	0.033	0.100	mg/L		1					
Sulfate		8.18	0.133	0.400	mg/L		1					
Chloride		14.8	0.134	0.400	mg/L		2	MAR1	06/15/17	1259	1674234	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0702	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1151	1673875	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.0507	0.017	0.050	mg/L		1	AXH3	06/21/17	0803	1674641	4
PO4 "As Received"												
Phosphorus, Total as P		0.0854	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1051	1673877	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		134	3.40	14.3	mg/L			KLP1	06/19/17	1509	1675379	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		75.0	1.45	4.00	mg/L			RXB5	06/23/17	1540	1676562	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		213	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0917	1679220	8
PH "As Received"												
pH at Temp 20.0C	H	7.09	0.010	0.100	SU		1	RXB5	06/23/17	1536	1676572	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	06/15/17	0855	1673874
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	06/19/17	1700	1673876

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Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133307
Sample ID: 425417002

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Report Date: July 7, 2017

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Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

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

Client SDG: 2017-1734

Client Sample ID: CAWA-17-133283
Sample ID: 425417003
Matrix: W
Collect Date: 12-JUN-17 13:12
Receive Date: 14-JUN-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		1.03	0.330	1.00	mg/L		1	TSM	06/22/17	2125	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/20/17	0839	1674062	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	1004	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/19/17	1339	1674061
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	06/19/17	1700	1673870

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

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

Client SDG: 2017-1734

Client Sample ID: CAWA-17-133311
Sample ID: 425417004
Matrix: W
Collect Date: 12-JUN-17 13:12
Receive Date: 14-JUN-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	0.0851	0.067	0.200	mg/L		1	MAR1	06/15/17	1006	1674234	1
Chloride		8.05	0.067	0.200	mg/L		1					
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate		9.87	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0366	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1152	1673875	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.890	0.085	0.250	mg/L		5	AXH3	06/21/17	0807	1674641	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0474	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1052	1673877	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		150	3.40	14.3	mg/L			KLP1	06/19/17	1509	1675379	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		75.2	1.45	4.00	mg/L			RXB5	06/23/17	1542	1676562	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		186	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0918	1679220	7
PH "As Received"												
pH at Temp 19.6C	H	7.11	0.010	0.100	SU		1	RXB5	06/23/17	1541	1676572	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	06/15/17	0855	1673874
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	06/19/17	1700	1673876

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Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133311
Sample ID: 425417004

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

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Certificate of Analysis

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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: 2017-1734

Client Sample ID: CAWA-17-133297
Sample ID: 425417005
Matrix: W
Collect Date: 12-JUN-17 13:18
Receive Date: 14-JUN-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		433	16.5	50.0	mg/L		50	TSM	06/26/17	1306	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/20/17	0845	1674062	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0707	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	1005	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/19/17	1339	1674061
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	06/19/17	1700	1673870

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

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Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133325
Sample ID: 425417006
Matrix: W
Collect Date: 12-JUN-17 13:18
Receive Date: 14-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	06/15/17	1034	1674234	1
Chloride		3.72	0.067	0.200	mg/L		1					
Fluoride	J	0.0514	0.033	0.100	mg/L		1					
Sulfate		19.4	0.266	0.800	mg/L		2	MAR1	06/15/17	1328	1674234	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0797	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1153	1673875	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.160	0.017	0.050	mg/L		1	AXH3	06/21/17	0813	1674641	4
PO4 "As Received"												
Phosphorus, Total as P		0.225	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1053	1673877	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		1280	3.40	14.3	mg/L			KLP1	06/19/17	1509	1675379	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		76.0	1.45	4.00	mg/L			RXB5	06/23/17	1545	1676562	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		813	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0920	1679220	8
PH "As Received"												
pH at Temp 19.2C	H	7.36	0.010	0.100	SU		1	RXB5	06/23/17	1544	1676572	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	06/15/17	0855	1673874
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	06/19/17	1700	1673876

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Certificate of Analysis

Report Date: July 7, 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: 2017-1734

Client Sample ID: CAWA-17-133325
Sample ID: 425417006

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

Quality Control Summary

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QC Summary

Report Date: July 7, 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: 425417

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1673634										
QC1203812105	425300003	DUP									
Total Organic Carbon Average		1.84		1.82	mg/L	1.15	^	(+/-1.00)	TSM	06/22/17	03:43
QC1203812103	LCS										
Total Organic Carbon Average	10.0			9.81	mg/L			(80%-120%)		06/21/17	17:57
QC1203812277	LCSD										
Total Organic Carbon Average	10.0			9.89	mg/L	0.873		(0%-20%)		06/21/17	18:09
QC1203812102	MB										
Total Organic Carbon Average			U	ND	mg/L					06/21/17	17:45
QC1203812107	425300003	PS									
Total Organic Carbon Average	10.0	1.84		11.1	mg/L			(75%-125%)		06/22/17	04:30
Flow Injection Analysis											
Batch	1674062										
QC1203811491	425417001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	06/20/17	10:26
QC1203811490	LCS										
Cyanide, Total	50.0			54.1	ug/L			(90%-110%)		06/20/17	08:44
QC1203811489	MB										
Cyanide, Total			U	ND	ug/L					06/20/17	08:32
QC1203811492	425417001	MS									
Cyanide, Total	100	U	ND	105	ug/L			(90%-110%)		06/20/17	10:27
QC1203814049	425417001	MSD									
Cyanide, Total	100	U	ND	105	ug/L	0		(0%-20%)		06/20/17	10:28

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QC Summary

Workorder: 425417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1674234										
QC1203811882	425417006	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	06/15/17	11:03
Chloride			3.72		3.73	mg/L	0.00805	(0%-20%)			
Fluoride		J	0.0514	J	0.0454	mg/L	12.4 ^	(+/-0.100)			
Sulfate			19.4		19.4	mg/L	0.227	(0%-20%)		06/15/17	13:57
QC1203811881	LCS										
Bromide			1.25		1.27	mg/L		102 (80%-120%)		06/15/17	09:08
Chloride			5.00		4.65	mg/L		93 (80%-120%)			
Fluoride			2.50		2.43	mg/L		97 (80%-120%)			
Sulfate			10.0		9.70	mg/L		97 (80%-120%)			
QC1203811880	MB										
Bromide				U	ND	mg/L				06/15/17	08:39
Chloride				U	ND	mg/L					
Fluoride				U	ND	mg/L					
Sulfate				U	ND	mg/L					
QC1203811883	425417006	PS									
Bromide		U	ND		1.23	mg/L		96.2 (75%-125%)		06/15/17	11:32
Chloride			3.72		8.78	mg/L		101 (75%-125%)			

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QC Summary

Workorder: 425417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1674234										
Fluoride	2.50	J	0.0514	2.50	mg/L		97.8	(75%-125%)	MAR1	06/15/17	11:32
Sulfate	10.0		9.69	20.2	mg/L		105	(75%-125%)		06/15/17	14:26
Nutrient Analysis											
Batch	1673872										
QC1203811091	425079001	DUP									
Nitrogen, Total Kjeldahl		U	ND	J	0.038	mg/L	200		KLP1	06/21/17	09:54
QC1203811090	LCS										
Nitrogen, Total Kjeldahl	1.00				1.10	mg/L	110	(90%-110%)		06/21/17	09:50
QC1203811089	MB										
Nitrogen, Total Kjeldahl			U		ND	mg/L				06/21/17	09:50
QC1203811092	425079001	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND		0.974	mg/L	97.4	(90%-110%)		06/21/17	09:55
Batch	1673875										
QC1203811099	425079002	DUP									
Nitrogen, Ammonia			0.0967		0.0902	mg/L	6.96 ^	(+/-0.050)	KLP1	06/15/17	11:36
QC1203811098	LCS										
Nitrogen, Ammonia	1.00				1.01	mg/L	101	(90%-110%)		06/15/17	11:28
QC1203811097	MB										
Nitrogen, Ammonia			U		ND	mg/L				06/15/17	11:27
QC1203811100	425079002	MS									
Nitrogen, Ammonia	1.00		0.0967		1.03	mg/L	93.3	(90%-110%)		06/15/17	11:37
Batch	1673877										
QC1203811108	425079002	DUP									
Phosphorus, Total as P			0.0742		0.0979	mg/L	27.5 ^	(+/-0.050)	KLP1	06/20/17	10:29

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QC Summary

Workorder: 425417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1673877										
QC1203811105	LCS										
Phosphorus, Total as P	1.00			0.975	mg/L		97.5	(80%-124%)	KLP1	06/20/17	10:38
QC1203811104	MB										
Phosphorus, Total as P			J	0.0324	mg/L					06/20/17	10:38
QC1203811109	425079002	MS									
Phosphorus, Total as P	1.00	0.0742		1.23	mg/L		116	(63%-139%)		06/20/17	10:30
Batch	1674641										
QC1203812762	425417002	DUP									
Nitrogen, Nitrate/Nitrite		0.0507	J	0.0499	mg/L	1.59	^	(+/-0.050)	AXH3	06/21/17	08:04
QC1203812761	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.959	mg/L		95.9	(90%-110%)		06/21/17	07:57
QC1203812760	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					06/21/17	07:56
QC1203812766	425417002	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.0507		1.01	mg/L		95.9	(90%-110%)		06/21/17	08:05
Solids Analysis											
Batch	1675379										
QC1203814592	425417006	DUP									
Total Dissolved Solids		1280		1260	mg/L	1.58		(0%-5%)	KLP1	06/19/17	15:09
QC1203814591	LCS										
Total Dissolved Solids	300			297	mg/L		99	(95%-105%)		06/19/17	15:09
QC1203814590	MB										
Total Dissolved Solids			U	ND	mg/L					06/19/17	15:09

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QC Summary

Workorder: 425417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1676562										
QC1203817296	425532004	DUP									
Alkalinity, Total as CaCO3		56.2		55.8	mg/L	0.714		(0%-20%)	RXB5	06/23/17	16:04
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203817292	LCS										
Alkalinity, Total as CaCO3	100			110	mg/L		110	(90%-110%)		06/23/17	12:29
QC1203817299	425532004	MS									
Alkalinity, Total as CaCO3	100	56.2		158	mg/L		102	(80%-120%)		06/23/17	16:06
Batch	1676572										
QC1203817346	425532004	DUP									
pH	H	7.87	H	7.88	SU	0.127		(0%-5%)	RXB5	06/23/17	16:03
QC1203817344	LCS										
pH	7.00			7.04	SU		101	(99%-101%)		06/23/17	12:23
Batch	1679220										
QC1203823673	425329003	DUP									
Conductivity		172		172	umhos/cm	0		(0%-10%)	SXM7	07/06/17	09:16
QC1203823672	LCS										
Conductivity	1410			1370	umhos/cm		96.7	(95%-105%)		07/06/17	09:05

- Notes:**
- < Result is less than value reported
 - > Result is greater than value reported
 - B The target analyte was detected in the associated blank.
 - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
 - H Analytical holding time was exceeded
 - J Value is estimated
 - N/A RPD or %Recovery limits do not apply.
 - N1 See case narrative

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QC Summary

Workorder: 425417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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.