

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 181.

[illegible]

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133280

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/09/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1345		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	Burning Ground Spring		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
MA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	MA
	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: HE SpA test completed; results negative

LOCATION COMMENTS: NA

FIELD PARAMETERS:

Sample Time	1345	HH:MM	Dissolved Oxygen	8.11	Flow (in gpm)	8.08
Oxidation-Reduction Potential	NC		pH	7.62	Specific Conductance	176.0
Temperature	17.9		Turbidity	4.6		

COLLECTED BY (PRINT): A. Stanfield

RELINQUISHED BY (Printed Name) Allizyn Stanfield (Signature)	Date/Time 06/09/2017 1500	RECEIVED BY (Printed Name) K. Greene (Signature)	Date/Time 6/9/17 3:00
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-17-133305

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/09/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1300 1200 6/9/17 13		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	SWSC Spring		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
MA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	MA
	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		

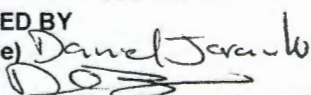
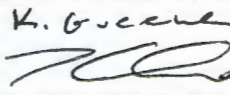
SAMPLE COMMENTS: ~~MA~~ 6/9/17 HE SPT test conducted; results negative

LOCATION COMMENTS: MA

FIELD PARAMETERS:

Sample Time	1200	HH:MM	Dissolved Oxygen	7.56	Flow (in gpm)	0.75
Oxidation-Reduction Potential	NC		pH	8.24	Specific Conductance	177.7
Temperature	14.9		Turbidity	6.5		

COLLECTED BY (PRINT): D. Jarama:110

RELINQUISHED BY (Printed Name) Daniel Jarama (Signature) 	Date/Time 06/09/2017 1500	RECEIVED BY (Printed Name) K. Greene (Signature) 	Date/Time 6/9/17 3100
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-17-133308

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/09/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1345	.	MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	Burning Ground Spring		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	Y	MA
	WSP- GENINORG+PerChlorat e	1 LITER POLY	1	ICE		
	WSP- NH3+NO3/NO2	500 ML AMBER GLASS	1	H2SO4		

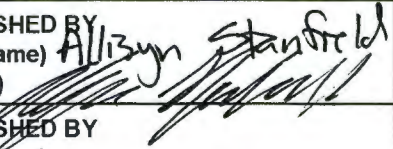
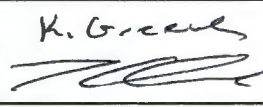
SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): A. Stanford

RELINQUISHED BY (Printed Name) Allison Stanford (Signature) 	Date/Time 06/09/2017 1500	RECEIVED BY (Printed Name) K. Green (Signature) 	Date/Time 6/9/17 3100
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-17-133333

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/09/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1300 1700 081117B		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	SWSC Spring		FIELD PREP:	F	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
MA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	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 Potential _____ pH _____ Specific Conductance _____
 Temperature _____ Turbidity _____

COLLECTED BY (PRINT): D. Jarami:110

RELINQUISHED BY (Printed Name) Daniel Jarami (Signature) <i>[Signature]</i>	Date/Time 06/09/2017 1500	RECEIVED BY (Printed Name) K. Green (Signature) <i>[Signature]</i>	Date/Time 6/9/17 3100
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-17-133349

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/09/2017	OK	FIELD MATRIX:	WS	OK
TIME COLLECTED (HH:MM):	1000		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	Water at Beta		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	Y	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

COLLECTED BY (PRINT): A. Stanfield

RELINQUISHED BY (Printed Name) <i>Allyn Stanfield</i> (Signature) <i>[Signature]</i>	Date/Time 06/09/2017 1500	RECEIVED BY (Printed Name) <i>K. Green</i> (Signature) <i>[Signature]</i>	Date/Time 6/9/17 15:00
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-17-133350

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/09/2017	OK	FIELD MATRIX:	WS	OK
TIME COLLECTED (HH:MM):	1000		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	Water at Beta		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
MA	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE	Y	MA
	WSP-All Metals	1 LITER POLY	1	HNO3		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: MA

LOCATION COMMENTS: MA

FIELD PARAMETERS:

Sample Time

1000

HH:MM

PH(SU): 7.60

Temp(°C): 14.4

SP. Cond(µS/cm): 185.6 Turbidity(NTU): 1.1

DO(mg/L): 5.12 Discharge(GPM): 2.68

COLLECTED BY (PRINT): A. Stanfield

RELINQUISHED BY (Printed Name) Allison Stanfield (Signature)	Date/Time 06/09/2017 1500	RECEIVED BY (Printed Name) L. G. ... (Signature)	Date/Time 6/9/17 3:00
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. 2017-1720

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
425300	EPA:120.1	3				
425300	EPA:150.1	3				
425300	EPA:160.1	3				
425300	EPA:170.0	6				
425300	EPA:245.2	6				
425300	EPA:300.0	3				
425300	EPA:310.1	3				
425300	EPA:335.4	3				
425300	EPA:350.1	3				
425300	EPA:351.2	3				
425300	EPA:353.2	3				
425300	EPA:365.4	3				
425300	SM:A2340B	4				
425300	SW-846:6010C	4				
425300	SW-846:6020	4				
425300	SW-846:6850	3				
425300	SW-846:8330B	3				
425300	SW-846:9060	3				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
425300	EPA:120.1	1679220	1679220	3										1				1			
425300	EPA:150.1	1675817	1675817	3										1				1			
425300	EPA:160.1	1673670	1673670	3					1					1				1			
425300	EPA:170.0	NA	NA	6																	
425300	EPA:245.2	1673861	1673859	6					1	1				1				1			
425300	EPA:300.0	1673741	1673741	3					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
425300	EPA:310.1	1675815	1675815	3						1				1				1			
425300	EPA:335.4	1673690	1673689	3					1	1				1				1			
425300	EPA:350.1	1673875	1673874	3					1	1				1				1			
425300	EPA:351.2	1673872	1673870	3					1	1				1				1			
425300	EPA:353.2	1673506	1673506	3					1					1	1			1			
425300	EPA:365.4	1673877	1673876	3					1	1				1				1			
425300	SM:A2340B	1679789	1679789	4																	
425300	SW-846:6010C	1675026	1675025	4					1	1				1				1			
425300	SW-846:6020	1675028	1675027	4					1	1				1				1			
425300	SW-846:6850	1675216	1675214	3					1	1	1			1							
425300	SW-846:8330B	1673869	1673868	3					1	1	1			1							
425300	SW-846:9060	1673634	1673634	3					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-17-133308	425300002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133330	1203823673	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133333	425300004	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133349	425300005	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203823672	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133308	425300002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133330	1203815600	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133333	425300004	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133349	425300005	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203815599	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133308	1203810572	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133308	425300002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133333	425300004	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133349	425300005	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203810570	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203810569	MB	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:170.0	VOC	CAWA-17-133280	425300001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133305	425300003	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133308	425300002	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133333	425300004	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133349	425300005	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133350	425300006	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133280	425300001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133305	425300003	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133308	425300002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133333	425300004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133349	425300005	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133350	425300006	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203811041	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203811040	MB	1	0	0	0
EPA:245.2	INORGANIC	WT_ESR-17-137413	1203811042	DUP	1	0	0	0
EPA:245.2	INORGANIC	WT_ESR-17-137413	1203811044	MS	0	0	1	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133308	425300002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133314	1203810743	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133333	425300004	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133349	425300005	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203810742	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203810741	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133308	425300002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133330	1203815593	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133330	1203815594	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133333	425300004	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133349	425300005	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203815591	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133280	1203810625	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133280	1203810627	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133280	425300001	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133305	425300003	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133350	425300006	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203810624	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203810623	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133308	425300002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133314	1203811099	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133314	1203811100	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133333	425300004	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133349	425300005	REG	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA: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-17-133280	425300001	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-17-133305	425300003	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133350	425300006	REG	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-17-133308	425300002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133312	1203810167	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133333	425300004	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133349	425300005	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203810165	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	LCSD	1203810166	LCSD	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203810164	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133308	425300002	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-17-133333	425300004	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133349	425300005	REG	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-17-133308	425300002	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133333	425300004	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133349	425300005	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133350	425300006	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133308	425300002	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133330	1203813736	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133330	1203813737	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-17-133333	425300004	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133349	425300005	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133350	425300006	REG	16	0	0	0
SW-846:6010C	INORGANIC	LCS	1203813735	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203813734	MB	17	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133308	425300002	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133330	1203813741	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133330	1203813742	MS	0	0	11	0
SW-846:6020	INORGANIC	CAWA-17-133333	425300004	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133349	425300005	REG	11	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:6020	INORGANIC	CAWA-17-133350	425300006	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203813740	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203813739	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133308	425300002	REG	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	CAWA-17-133333	425300004	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133349	425300005	REG	1	0	0	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-17-133280	425300001	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133305	425300003	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133350	425300006	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-135753	1203811084	MS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-135753	1203811085	MSD	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203811083	LCS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	MB	1203811082	MB	20	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133280	425300001	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-17-133305	1203812105	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133305	425300003	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133350	425300006	REG	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	1203813734	METHOD BLANK	SW-846:6010C	W	Calcium	105	J	ug/L	200

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAWA-17-133308	1203811104	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0324	mg/L	0.0881		0.050	Y	5	100	Y
CAWA-17-133333	1203811104	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0324	mg/L	0.0952		0.050	Y	5	100	Y
CAWA-17-133349	1203811104	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0324	mg/L	0.073		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-17-133330	1203813737		SW-846:6010C	Silicon Dioxide	1675025	06-28-2017	W	28.2		125	75			

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

DATA VALIDATION REPORT

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
Burning Ground Spring	2017-1720	CAWA-17-133308	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0881	mg/L	0.0881	mg/L			W	06/09/2017		1673877	VAL	Y
SWSC Spring	2017-1720	CAWA-17-133333	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0952	mg/L	0.0952	mg/L			W	06/09/2017		1673877	VAL	Y
Water at Beta	2017-1720	CAWA-17-133349	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.073	mg/L	0.073	mg/L			W	06/09/2017		1673877	VAL	Y

Reason Code

Description

I4

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

J_LAB

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

NQ

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

U_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133280	Burning Ground Spring	REG	EPA:170.0	0	1
CAWA-17-133280	Burning Ground Spring	REG	EPA:245.2	0	1
CAWA-17-133280	Burning Ground Spring	REG	EPA:335.4	0	1
CAWA-17-133280	Burning Ground Spring	REG	EPA:351.2	0	1
CAWA-17-133280	Burning Ground Spring	REG	SW-846:8330B	0	20
CAWA-17-133280	Burning Ground Spring	REG	SW-846:9060	0	1
CAWA-17-133305	SWSC Spring	REG	EPA:170.0	0	1
CAWA-17-133305	SWSC Spring	REG	EPA:245.2	0	1
CAWA-17-133305	SWSC Spring	REG	EPA:335.4	0	1
CAWA-17-133305	SWSC Spring	REG	EPA:351.2	0	1
CAWA-17-133305	SWSC Spring	REG	SW-846:8330B	0	20
CAWA-17-133305	SWSC Spring	REG	SW-846:9060	0	1
CAWA-17-133308	Burning Ground Spring	REG	EPA:120.1	0	1
CAWA-17-133308	Burning Ground Spring	REG	EPA:150.1	0	1
CAWA-17-133308	Burning Ground Spring	REG	EPA:160.1	0	1
CAWA-17-133308	Burning Ground Spring	REG	EPA:170.0	0	1
CAWA-17-133308	Burning Ground Spring	REG	EPA:245.2	0	1
CAWA-17-133308	Burning Ground Spring	REG	EPA:300.0	0	4
CAWA-17-133308	Burning Ground Spring	REG	EPA:310.1	0	2
CAWA-17-133308	Burning Ground Spring	REG	EPA:350.1	0	1
CAWA-17-133308	Burning Ground Spring	REG	EPA:353.2	0	1
CAWA-17-133308	Burning Ground Spring	REG	EPA:365.4	0	1
CAWA-17-133308	Burning Ground Spring	REG	SM:A2340B	0	1
CAWA-17-133308	Burning Ground Spring	REG	SW-846:6010C	0	17
CAWA-17-133308	Burning Ground Spring	REG	SW-846:6020	0	11
CAWA-17-133308	Burning Ground Spring	REG	SW-846:6850	0	1
CAWA-17-133333	SWSC Spring	REG	EPA:120.1	0	1
CAWA-17-133333	SWSC Spring	REG	EPA:150.1	0	1
CAWA-17-133333	SWSC Spring	REG	EPA:160.1	0	1
CAWA-17-133333	SWSC Spring	REG	EPA:170.0	0	1
CAWA-17-133333	SWSC Spring	REG	EPA:245.2	0	1
CAWA-17-133333	SWSC Spring	REG	EPA:300.0	0	4
CAWA-17-133333	SWSC Spring	REG	EPA:310.1	0	2
CAWA-17-133333	SWSC Spring	REG	EPA:350.1	0	1
CAWA-17-133333	SWSC Spring	REG	EPA:353.2	0	1
CAWA-17-133333	SWSC Spring	REG	EPA:365.4	0	1
CAWA-17-133333	SWSC Spring	REG	SM:A2340B	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133333	SWSC Spring	REG	SW-846:6010C	0	17
CAWA-17-133333	SWSC Spring	REG	SW-846:6020	0	11
CAWA-17-133333	SWSC Spring	REG	SW-846:6850	0	1
CAWA-17-133349	Water at Beta	REG	EPA:120.1	0	1
CAWA-17-133349	Water at Beta	REG	EPA:150.1	0	1
CAWA-17-133349	Water at Beta	REG	EPA:160.1	0	1
CAWA-17-133349	Water at Beta	REG	EPA:170.0	0	1
CAWA-17-133349	Water at Beta	REG	EPA:245.2	0	1
CAWA-17-133349	Water at Beta	REG	EPA:300.0	0	4
CAWA-17-133349	Water at Beta	REG	EPA:310.1	0	2
CAWA-17-133349	Water at Beta	REG	EPA:350.1	0	1
CAWA-17-133349	Water at Beta	REG	EPA:353.2	0	1
CAWA-17-133349	Water at Beta	REG	EPA:365.4	0	1
CAWA-17-133349	Water at Beta	REG	SM:A2340B	0	1
CAWA-17-133349	Water at Beta	REG	SW-846:6010C	0	17
CAWA-17-133349	Water at Beta	REG	SW-846:6020	0	11
CAWA-17-133349	Water at Beta	REG	SW-846:6850	0	1
CAWA-17-133350	Water at Beta	REG	EPA:170.0	0	1
CAWA-17-133350	Water at Beta	REG	EPA:245.2	0	1
CAWA-17-133350	Water at Beta	REG	EPA:335.4	0	1
CAWA-17-133350	Water at Beta	REG	EPA:351.2	0	1
CAWA-17-133350	Water at Beta	REG	SM:A2340B	0	1
CAWA-17-133350	Water at Beta	REG	SW-846:6010C	0	16
CAWA-17-133350	Water at Beta	REG	SW-846:6020	0	11
CAWA-17-133350	Water at Beta	REG	SW-846:8330B	0	20
CAWA-17-133350	Water at Beta	REG	SW-846:9060	0	1

DATA VALIDATION REPORT

Chain Of Custody No. 2017-1720 - Rev

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
425300	SW-846:8330B	3				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
425300	SW-846:8330B	1673869	1673868	3					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-17-133280	425300001	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133305	425300003	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133350	425300006	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	MB	1203811082	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
U_LAB	The analytical laboratory qualified the analyte as not detected.

DATA VALIDATION REPORT

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133280	Burning Ground Spring	REG	SW-846:8330B	0	3
CAWA-17-133305	SWSC Spring	REG	SW-846:8330B	0	3
CAWA-17-133350	Water at Beta	REG	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

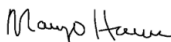
Re: LANL- WQH Water Samples
Work Order: 425300
SDG: 2017-1720

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 13, 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: 2017-1720
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 425300
SDG: 2017-1720

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 425300
SDG # : 2017-1720**

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 13, 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>
425300001	CAWA-17-133280
425300002	CAWA-17-133308
425300003	CAWA-17-133305
425300004	CAWA-17-133333
425300005	CAWA-17-133349
425300006	CAWA-17-133350

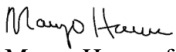
Case Narrative

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 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

Chain of Custody/Analysis Request



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: ESHL		SDG/AR/COC/Work Order: 425300	
Received By: ZKW		Date Received: 6/13/17	
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 1970 -5c 5908 1782 1960 -6c 5908 1782 1959 -6c 5908 1782 2050 -6c 5908 1782 2040 -5c 5908 1782 2017 -6c 5908 1782 1937 -24c 5908 1782 1948 -5c 5908 1782 2061 -5c	
Suspected Hazard Information	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 PM mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	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 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 type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <u>Ice Packs</u> Dry ice None Other: *all temperatures are recorded in Celsius See TEMP: Above
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: IR3-16 Secondary Temperature Device Serial # (If Applicable):
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and Containers Affected: Metals cont. for WST-139746 rec'd unpreserved If Preservation added, Lot#:
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input 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 ___ No <input checked="" type="checkbox"/> 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 -139346 and All vials for -139347, -348, -349, 350, and 351 rec'd w/ headspace
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected: 300 Sample for -138988 rec'd out of hold
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: We rec'd a pH container for WST-139351
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials

AMDate **6/14/17**

Page ____ of ____

GL-CHL-SR-001 Rev 5

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
ACTWT: 52.0 LB MAN
CAD: 0014176/CAFE2916

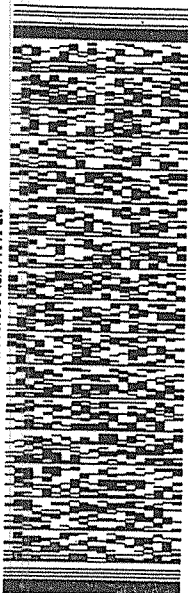
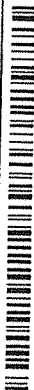
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO



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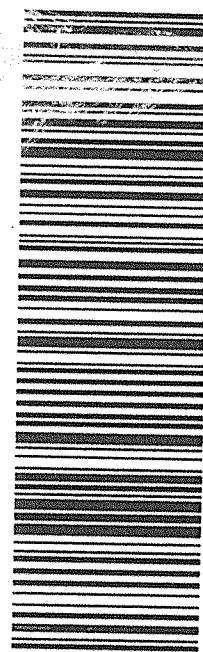
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MPS# 5908 1782 1970

Mstr# 5908 1782 1960

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Part# 156148V-434 RIT2 06/15

5BRCL/4502/329B

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TR00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
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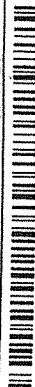
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2040 SAVAGE RD

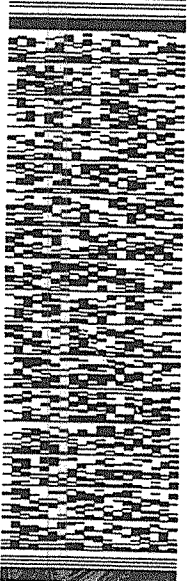
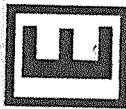
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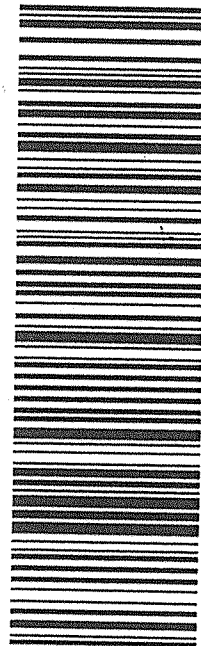
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Part # 156148V-434 RIT2 06/15

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ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TR00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
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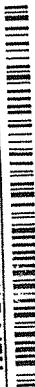
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GENERAL ENGINEERING LAB
2040 SAVAGE RD

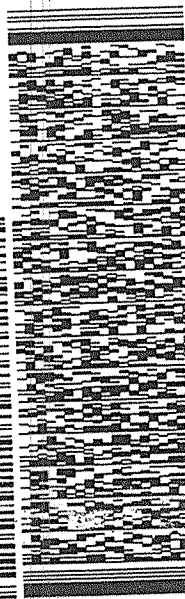
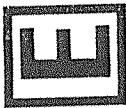
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(843) 566-8171

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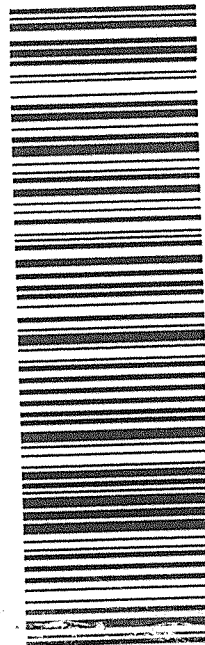
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Part # 156148V-434 RIT2 06/15

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ACTWGT: 24.0 LB TAN
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KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

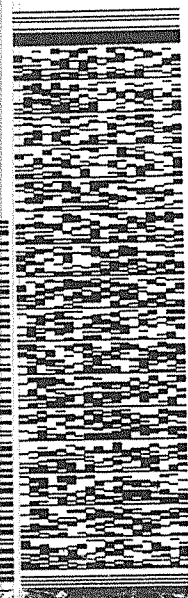
LOS ALAMOS, NM 87545
UNITED STATES US

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GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171
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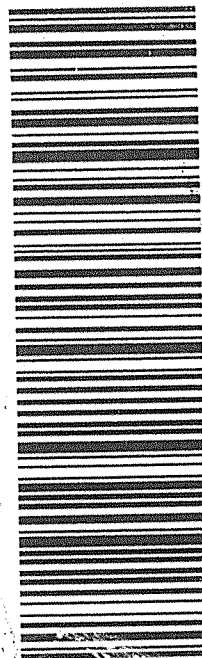
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Part # 156148V-434 RIT2 06/15

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KEITH GREENE
LOS ALAMOS NATL LAB.
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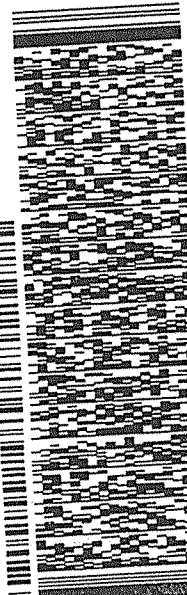
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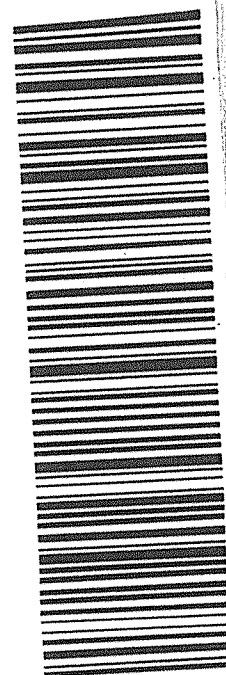
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Part # 156148V-434 RIT2 06/15

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KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
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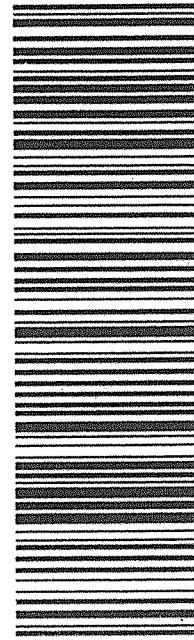
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KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
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2040 SAVAGE RD
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REF: 21PD0ASRGW04BAGWEO

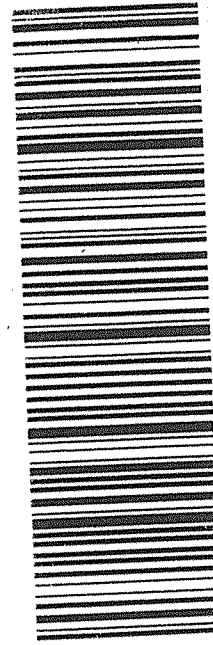


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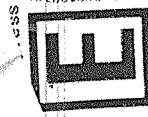
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KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

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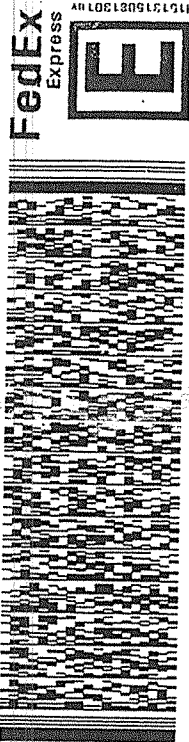
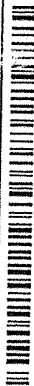
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(843) 556-8171

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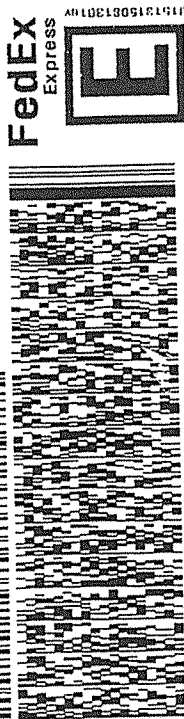
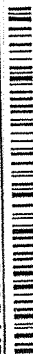
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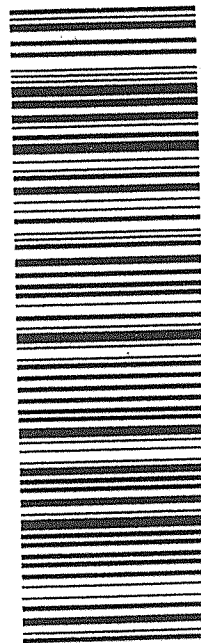
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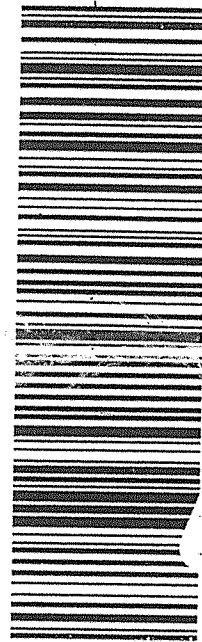
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Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

Qualifier	Explanation
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*	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 #: 2017-1720
Work Order #: 425300**

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
425300002	425300002 (CAWA-17-133308)
425300004	425300004 (CAWA-17-133333)
425300005	425300005 (CAWA-17-133349)
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: 2017-1720 GEL Work Order: 425300

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-17-133308Date Received: 13-JUN-17GEL Job No (SDG): 2017-1720GEL Sample ID: 425300002Date 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	0.446	ug/L		1	19-JUN-17 19:32	per0619020a
	Perchlorate Isotope Ratio			2.7			1	19-JUN-17 19:32	per0619020a
14797-73-0	Perchlorate-101	.05	.2	0.482	ug/L		1	19-JUN-17 19:32	per0619020a
	Perchlorate-O(18)			0.413	ug/L		1	19-JUN-17 19:32	per0619020a

^ 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-17-133333Date Received: 13-JUN-17GEL Job No (SDG): 2017-1720GEL Sample ID: 425300004Date 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	0.428	ug/L		1	19-JUN-17 19:43	per0619021a
	Perchlorate Isotope Ratio			2.82			1	19-JUN-17 19:43	per0619021a
14797-73-0	Perchlorate-101	.05	.2	0.444	ug/L		1	19-JUN-17 19:43	per0619021a
	Perchlorate-O(18)			0.420	ug/L		1	19-JUN-17 19:43	per0619021a

^ 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-17-133349Date Received: 13-JUN-17GEL Job No (SDG): 2017-1720GEL Sample ID: 425300005Date 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 19:54	per0619022a
	Perchlorate Isotope Ratio						1	19-JUN-17 19:54	per0619022a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	19-JUN-17 19:54	per0619022a
	Perchlorate-O(18)			0.409	ug/L		1	19-JUN-17 19:54	per0619022a

^ 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): 2017-1720

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): 2017-1720

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): 2017-1720GEL 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): 2017-1720GEL 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): 2017-1720GEL 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): 2017-1720GEL 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): 2017-1720GEL 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 #: 2017-1720
Work Order #: 425300**

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: 1673869

Prep Batch Number: 1673868

Sample Analysis

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

Sample ID	Client ID
425300001	CAWA-17-133280
425300003	CAWA-17-133305
425300006	CAWA-17-133350
1203811082	Method Blank (MB)
1203811083	Laboratory Control Sample (LCS)
1203811084	425329006(CAWA-17-135753) Matrix Spike (MS)
1203811085	425329006(CAWA-17-135753) 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 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

The Low Level Calibration Verification Standard (CRI) did not meet requirements of 70-130% for samples in this SDG. Please refer to Form 7 of the data package for a list of recoveries. Since the recoveries are biased high and target analytes were not detected in the associated samples, the data are considered unaffected. The data are reported.

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 425329006 (CAWA-17-135753) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS and/or MSD (See Below) did not meet acceptance criteria for the recovery of spiked analytes. Since similar recoveries were observed, the non-conforming recoveries are attributed to sample matrix interference. The data are reported.

Sample	Analyte	Value
1203811084 (CAWA-17-135753MS)	Tetryl	38* (50%-126%)
1203811085 (CAWA-17-135753MSD)	Tetryl	45* (50%-126%)

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. Sample 425300003 (CAWA-17-133305) was further diluted due to over range target analytes. The final dilution in each case takes the 1:1 v/v dilution into account.

	425300
Analyte	003
RDX	5X

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

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: 2017-1720 GEL Work Order: 425300

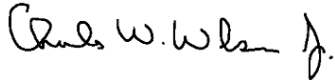
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Charles Wilson

Date: 10 JUL 2017

Title: Analyst II

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133280

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300001

Sample Amount 940 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706018.wiff

Date Analyzed: 06-JUL-17 20:01

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
19406-51-0	4-Amino-2,6-dinitrotoluene	.119	J	0.0851	0.266
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.163	J	0.0851	0.266
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
118-96-7	2,4,6-Trinitrotoluene	.266	U	0.0851	0.266
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.266	U	0.0851	0.266
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.266	U	0.0851	0.266
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.266	U	0.0851	0.266
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.266	U	0.0872	0.266
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.266	U	0.0851	0.266
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.266	U	0.0851	0.266
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	.266	U	0.0851	0.266
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
2691-41-0	HMX	.475		0.0851	0.266
<i>2691-41-0</i>	<i>HMX</i>				
479-45-8	Tetryl	.532	U	0.0851	0.532
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.532	U	0.106	0.532
<i>78-11-5</i>	<i>PETN</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133280

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300001

Sample Amount 940 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-99-0	p-Nitrotoluene	.532	U	0.160	0.532
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1.06	U	0.319	1.06
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.06	U	0.319	1.06
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.06	U	0.319	1.06
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.66	U	0.532	2.66
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.66	U	0.532	2.66
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	7.5		0.0851	0.266
<i>121-82-4</i>	<i>RDX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133305

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300003

Sample Amount 895 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706019.wiff

Date Analyzed: 06-JUL-17 20:35

Dilution Factor: 5

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	12.7		0.223	0.698
121-82-4	RDX				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133305

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300003

Sample Amount 895 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706020.wiff

Date Analyzed: 06-JUL-17 21:09

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.0965	J	0.0894	0.279
99-35-4	1,3,5-Trinitrobenzene				
35572-78-2	2-Amino-4,6-dinitrotoluene	.144	J	0.0894	0.279
35572-78-2	2-Amino-4,6-dinitrotoluene				
118-96-7	2,4,6-Trinitrotoluene	.279	U	0.0894	0.279
118-96-7	2,4,6-Trinitrotoluene				
121-14-2	2,4-Dinitrotoluene	.279	U	0.0894	0.279
121-14-2	2,4-Dinitrotoluene				
606-20-2	2,6-Dinitrotoluene	.279	U	0.0894	0.279
606-20-2	2,6-Dinitrotoluene				
88-72-2	o-Nitrotoluene	.279	U	0.0916	0.279
88-72-2	o-Nitrotoluene				
98-95-3	Nitrobenzene	.279	U	0.0894	0.279
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	.279	U	0.0894	0.279
99-08-1	m-Nitrotoluene				
99-65-0	m-Dinitrobenzene	.279	U	0.0894	0.279
99-65-0	m-Dinitrobenzene				
19406-51-0	4-Amino-2,6-dinitrotoluene	.317		0.0894	0.279
19406-51-0	4-Amino-2,6-dinitrotoluene				
479-45-8	Tetryl	.559	U	0.0894	0.559
479-45-8	Tetryl				
78-11-5	PETN	.559	U	0.112	0.559
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.559	U	0.168	0.559
99-99-0	p-Nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133305

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300003

Sample Amount 895 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	.638		0.0894	0.279
<i>2691-41-0</i>	<i>HMX</i>				
3058-38-6	TATB	1.12	U	0.335	1.12
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.12	U	0.335	1.12
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.12	U	0.335	1.12
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.79	U	0.559	2.79
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.79	U	0.559	2.79
<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-17-133350

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300006

Sample Amount 930 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706022.wiff

Date Analyzed: 06-JUL-17 22:17

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.269	U	0.086	0.269
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.269	U	0.086	0.269
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.269	U	0.086	0.269
<i>121-82-4</i>	<i>RDX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.269	U	0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.269	U	0.086	0.269
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.269	U	0.086	0.269
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.269	U	0.0882	0.269
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.269	U	0.086	0.269
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.269	U	0.086	0.269
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.269	U	0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.269	U	0.086	0.269
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
2691-41-0	HMX	.375		0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				
479-45-8	Tetryl	.538	U	0.086	0.538
<i>479-45-8</i>	<i>Tetryl</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133350

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300006

Sample Amount 930 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	.538	U	0.108	0.538
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.538	U	0.161	0.538
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1.08	U	0.323	1.08
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.08	U	0.323	1.08
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.08	U	0.323	1.08
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.69	U	0.538	2.69
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.69	U	0.538	2.69
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary

Lab Name: GEL Laboratories LLC

GEL Job No (SDG): 2017-1720

Lab Code: GEL

HPLC Column: Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
425300001	CAWA-17-133280	88	55 - 115	
425300003	CAWA-17-133305DL	91	55 - 115	
425300003	CAWA-17-133305	95	55 - 115	
425300006	CAWA-17-133350	100	55 - 115	
1203811082	MB for batch 1673868	97	55 - 115	
1203811083	LCS for batch 1673868	90	55 - 115	
1203811084	CAWA-17-135753MS	92	55 - 115	
1203811085	CAWA-17-135753MSD	91	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) 2017-1720

Extract Batch Code: 1673868

Date Extracted: 14-JUN-17

GEL LCS ID: 1203811083

GEL LCSDUP ID: .

Analysis Date/Time: 06-JUL-17 19:27

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	4.68	94					70 - 110
2,4,6-Trinitrotoluene	5	4.76	95					69 - 113
2,4-Diamino-6-nitrotoluene	5	4.41	88					50 - 121
2,4-Dinitrotoluene	5	4.46	89					71 - 110
2,6-Diamino-4-nitrotoluene	5	5.18	104					53 - 127
2,6-Dinitrotoluene	5	4.23	85					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.6	92					70 - 112
3,5-Dinitroaniline	5	4.79	96					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.7	94					74 - 116
HMX	5	3.87	77					58 - 113
Nitrobenzene	5	4.29	86					64 - 115
PETN	5	4.76	95					57 - 126
RDX	5	4.13	83					64 - 117
TATB	2.5	1.7	68					47 - 135
Tetryl	5	2.94	59					55 - 122
m-Dinitrobenzene	5	4.42	88					74 - 117
m-Nitrotoluene	5	4.15	83					66 - 114
o-Nitrotoluene	5	4.32	86					64 - 115
p-Nitrotoluene	5	4.55	91					66 - 127
tris(o-cresyl) phosphate	5	2.32	46					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-17-135753

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Extract Batch Code: 1673868

Date Extracted: 14-JUN-17

GEL Spike ID: 1203811084

GEL SpikeDup ID: 1203811085

Analysis Date/Time: 07-JUL-17 01:42

MSD Analysis Date/Time: 07-JUL-17 02:16

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
4-Amino-2,6-dinitrotoluene	5.55556	0	5.11	92	5.44	98	6	30	65 - 120
HMX	5.55556	0	4.24	76	3.94	71	7	30	44 - 128
Nitrobenzene	5.55556	0	4.3	77	4.4	80	2	30	62 - 116
PETN	5.55556	0	4.77	86	5.41	98	13	30	51 - 131
RDX	5.55556	.012	4.65	83	4.18	75	11	30	57 - 125
TATB	2.77778	0	2.04	74	1.8	65	13	30	38 - 149
Tetryl	5.55556	0	2.11	38 *	2.51	45 *	17	30	50 - 126
m-Dinitrobenzene	5.55556	0	5.04	91	5.17	94	3	30	74 - 117
m-Nitrotoluene	5.55556	0	4.27	77	4.59	83	7	30	59 - 120
o-Nitrotoluene	5.55556	0	3.82	69	4.13	75	8	30	56 - 119
p-Nitrotoluene	5.55556	0	4.45	80	4.59	83	3	30	61 - 129
tris(o-cresyl) phosphate	5.55556	0	2.99	54	3.43	62	14	30	38 - 105
1,3,5-Trinitrobenzene	5.55556	0	4.99	90	4.7	85	6	30	67 - 111
2,4,6-Trinitrotoluene	5.55556	0	5.11	92	5.62	102	9	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.55556	0	5.1	92	6.5	118	24	30	50 - 121
2,4-Dinitrotoluene	5.55556	0	4.77	86	5.41	98	13	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.55556	0	5.82	105	5.77	104	1	30	53 - 127
2,6-Dinitrotoluene	5.55556	0	4.63	83	4.94	89	6	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.55556	0	4.8	86	5.1	92	6	30	67 - 115
3,5-Dinitroaniline	5.55556	0	5.43	98	5.61	102	3	30	70 - 121

#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 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811082

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706016.wiff

Date Analyzed: 06-JUL-17 18:53

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 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811082

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-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 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811083

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706017.wiff

Date Analyzed: 06-JUL-17 19:27

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.7		0.300	1.00
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	2.32		0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
479-45-8	Tetryl	2.94		0.080	0.500
479-45-8	Tetryl				
2691-41-0	HMX	3.87		0.080	0.250
2691-41-0	HMX				
121-82-4	RDX	4.13		0.080	0.250
121-82-4	RDX				
99-08-1	m-Nitrotoluene	4.15		0.080	0.250
99-08-1	m-Nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.23		0.080	0.250
606-20-2	2,6-Dinitrotoluene				
98-95-3	Nitrobenzene	4.29		0.080	0.250
98-95-3	Nitrobenzene				
88-72-2	o-Nitrotoluene	4.32		0.082	0.250
88-72-2	o-Nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.41		0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				
99-65-0	m-Dinitrobenzene	4.42		0.080	0.250
99-65-0	m-Dinitrobenzene				
121-14-2	2,4-Dinitrotoluene	4.46		0.080	0.250
121-14-2	2,4-Dinitrotoluene				
99-99-0	p-Nitrotoluene	4.55		0.150	0.500
99-99-0	p-Nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811083

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-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	4.6		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.68		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.7		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.76		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
78-11-5	PETN	4.76		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
618-87-1	3,5-Dinitroaniline	4.79		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.18		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811084

Sample Amount 900 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706028.wiff

Date Analyzed: 07-JUL-17 01:42

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.04		0.333	1.11
<i>3058-38-6</i>	<i>TATB</i>				
479-45-8	Tetryl	2.11		0.0889	0.556
<i>479-45-8</i>	<i>Tetryl</i>				
78-30-8	tris(o-cresyl) phosphate	2.99		0.333	1.11
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
88-72-2	o-Nitrotoluene	3.82		0.0911	0.278
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
2691-41-0	HMX	4.24		0.0889	0.278
<i>2691-41-0</i>	<i>HMX</i>				
99-08-1	m-Nitrotoluene	4.27		0.0889	0.278
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.3		0.0889	0.278
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-99-0	p-Nitrotoluene	4.45		0.167	0.556
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.63		0.0889	0.278
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
121-82-4	RDX	4.65		0.0889	0.278
<i>121-82-4</i>	<i>RDX</i>				
121-14-2	2,4-Dinitrotoluene	4.77		0.0889	0.278
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
78-11-5	PETN	4.77		0.111	0.556
<i>78-11-5</i>	<i>PETN</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.8		0.0889	0.278
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811084

Sample Amount 900 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-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	4.99		0.0889	0.278
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	5.04		0.0889	0.278
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.1		0.556	2.78
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.11		0.0889	0.278
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.11		0.0889	0.278
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.43		0.333	1.11
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.82		0.556	2.78
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811085

Sample Amount 905 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706029.wiff

Date Analyzed: 07-JUL-17 02:16

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.8		0.331	1.10
<i>3058-38-6</i>	<i>TATB</i>				
479-45-8	Tetryl	2.51		0.0884	0.552
<i>479-45-8</i>	<i>Tetryl</i>				
78-30-8	tris(o-cresyl) phosphate	3.43		0.331	1.10
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
2691-41-0	HMX	3.94		0.0884	0.276
<i>2691-41-0</i>	<i>HMX</i>				
88-72-2	o-Nitrotoluene	4.13		0.0906	0.276
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
121-82-4	RDX	4.18		0.0884	0.276
<i>121-82-4</i>	<i>RDX</i>				
98-95-3	Nitrobenzene	4.4		0.0884	0.276
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.59		0.0884	0.276
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.59		0.166	0.552
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.7		0.0884	0.276
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
606-20-2	2,6-Dinitrotoluene	4.94		0.0884	0.276
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.1		0.0884	0.276
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.17		0.0884	0.276
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811085

Sample Amount 905 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	5.41		0.0884	0.276
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
78-11-5	PETN	5.41		0.110	0.552
<i>78-11-5</i>	<i>PETN</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.44		0.0884	0.276
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.61		0.331	1.10
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
118-96-7	2,4,6-Trinitrotoluene	5.62		0.0884	0.276
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.77		0.552	2.76
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	6.5		0.552	2.76
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1720Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 06-JUL-17 10:20GEL Data File: EXP0706001.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	1.11
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	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	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1720Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 06-JUL-17 10:55GEL Data File: EXP0706002.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 06-JUL-17 15:28

GEL Data File: EXP0706010.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	1.68
tris(o-cresyl) phosphate	0	11.24
TATB	0	1.35
3,5-Dinitroaniline	0	1.88
2,4-Diamino-6-nitrotoluene	0	1.38
2,6-Diamino-4-nitrotoluene	0	1.71
1,3,5-Trinitrobenzene	0	1.64
2,4,6-Trinitrotoluene	0	1.88
2,4-Dinitrotoluene	0	1.85
2,6-Dinitrotoluene	0	1.71
2-Amino-4,6-dinitrotoluene	0	1.75
4-Amino-2,6-dinitrotoluene	0	2.03
HMX	0	2.05
Nitrobenzene	0	0
Nitroglycerin	0	3.38
PETN	0	3.24
RDX	0	1.77
Tetryl	0	1.74
m-Dinitrobenzene	0	1.58
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): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 06-JUL-17 17:44

GEL Data File: EXP0706014.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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	7.71
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	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	.97
RDX	0	0
Tetryl	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 06-JUL-17 21:43

GEL Data File: EXP0706021.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
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	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 06-JUL-17 23:26

GEL Data File: EXP0706024.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
m-Dinitrobenzene	0	.99
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	1.04
tris(o-cresyl) phosphate	0	7.15
TATB	0	0
3,5-Dinitroaniline	0	.96
2,4-Diamino-6-nitrotoluene	0	.97
2,6-Diamino-4-nitrotoluene	0	0
1,3,5-Trinitrobenzene	0	.86
2,4,6-Trinitrotoluene	0	1.19
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	.87
4-Amino-2,6-dinitrotoluene	0	1.03
HMX	0	.88
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	1.92
RDX	0	.87
Tetryl	0	1.04

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 07-JUL-17 02:50

GEL Data File: EXP0706030.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	10.65
TATB	0	0
3,5-Dinitroaniline	0	1.1
2,4-Diamino-6-nitrotoluene	0	1.2
2,6-Diamino-4-nitrotoluene	0	1.33
1,3,5-Trinitrobenzene	0	1.02
2,4,6-Trinitrotoluene	0	1.27
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	1.19
4-Amino-2,6-dinitrotoluene	0	1.32
HMX	0	1.11
Nitrobenzene	0	1.25
Nitroglycerin	0	1.42
PETN	0	2.8
RDX	0	.83
Tetryl	0	.78
m-Dinitrobenzene	0	.93
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): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 07-JUL-17 03:59

GEL Data File: EXP0706032.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
m-Dinitrobenzene	0	.89
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	1.06
tris(o-cresyl) phosphate	0	6.27
TATB	0	0
3,5-Dinitroaniline	0	.92
2,4-Diamino-6-nitrotoluene	0	.99
2,6-Diamino-4-nitrotoluene	0	0
1,3,5-Trinitrobenzene	0	.85
2,4,6-Trinitrotoluene	0	1.07
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	1.03
4-Amino-2,6-dinitrotoluene	0	1.14
HMX	0	1
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	1.79
RDX	0	.85
Tetryl	0	1

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1720
Work Order #: 425300

Sample ID	Client ID
425300001	CAWA-17-133280
425300002	CAWA-17-133308
425300003	CAWA-17-133305
425300004	CAWA-17-133333
425300005	CAWA-17-133349
425300006	CAWA-17-133350
1203813734	Method Blank (MB) ICP
1203813735	Laboratory Control Sample (LCS)
1203813738	425329003(CAWA-17-133330L) Serial Dilution (SD)
1203813736	425329003(CAWA-17-133330D) Sample Duplicate (DUP)
1203813737	425329003(CAWA-17-133330S) Matrix Spike (MS)
1203813739	Method Blank (MB) ICP-MS
1203813740	Laboratory Control Sample (LCS)
1203813743	425329003(CAWA-17-133330L) Serial Dilution (SD)
1203813741	425329003(CAWA-17-133330D) Sample Duplicate (DUP)
1203813742	425329003(CAWA-17-133330S) Matrix Spike (MS)
1203811040	Method Blank (MB) CVAA
1203811041	Laboratory Control Sample (LCS)
1203811046	425358001(NonSDGL) Serial Dilution (SD)
1203811042	425358001(NonSDGD) Sample Duplicate (DUP)
1203811044	425358001(NonSDGS) Matrix Spike (MS)

Sample Analysis

Samples 425300001,002,003,004,005 and 006 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1675026, 1675028, 1673861 and 1679789
Prep Batch :	1675025, 1675027 and 1673859
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 P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

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

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria. 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: 425329003 (CAWA-17-133330)-ICP and ICP-MS and 425358001 (NonSDG)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

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

Serial Dilution % Difference Statement

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information

Electronic Packaging Comment

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

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

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

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

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

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

higher of the two calculated values of Ca or Mg.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1720 GEL Work Order: 425300

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 05 JUL 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300001**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133280**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:02	061517W1-4	1673861

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300002**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133308**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:04	061517W1-4	1673861

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425300002

BASIS: As Received

DATE COLLECTED 09-JUN-17

CLIENT ID: CAWA-17-133308

LEVEL: Low

DATE RECEIVED 13-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	386	ug/L		68	200	200	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-39-3	Barium	166	ug/L		1	5	5	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-70-2	Calcium	13200	ug/L		50	200	200	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/28/17 19:19	062817-1	1675026
7439-89-6	Iron	169	ug/L		30	100	100	1	P	HSC	06/28/17 19:19	062817-1	1675026
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7439-95-4	Magnesium	4040	ug/L		110	300	300	1	P	HSC	06/28/17 19:19	062817-1	1675026
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/28/17 19:19	062817-1	1675026
7439-98-7	Molybdenum	0.622	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-02-0	Nickel	0.891	ug/L	J	0.6	2	2	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-09-7	Potassium	2740	ug/L		50	150	150	1	P	HSC	06/28/17 19:19	062817-1	1675026
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7631-86-9	Silica	39400	ug/L		53	213	213	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-23-5	Sodium	12500	ug/L		100	300	300	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-24-6	Strontium	87.5	ug/L		1	5	5	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-61-1	Uranium	0.169	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-62-2	Vanadium	3.02	ug/L	J	1	5	5	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/28/17 19:19	062817-1	1675026

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425300002**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133308**LEVEL:** Low**DATE RECEIVED** 13-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	49.5	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
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5
1675026	1675025	SW846 3005A	50	mL	50	mL	06/19/17	SXW1
1675028	1675027	SW846 3005A	50	mL	50	mL	06/19/17	SXW1

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300003**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133305**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:06	061517W1-4	1673861

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300004**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133333**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:07	061517W1-4	1673861

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425300004

BASIS: As Received

DATE COLLECTED 09-JUN-17

CLIENT ID: CAWA-17-133333

LEVEL: Low

DATE RECEIVED 13-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	258	ug/L		68	200	200	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-39-3	Barium	224	ug/L		1	5	5	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-42-8	Boron	16.8	ug/L	J	15	50	50	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-70-2	Calcium	13900	ug/L		50	200	200	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/28/17 19:22	062817-1	1675026
7439-89-6	Iron	117	ug/L		30	100	100	1	P	HSC	06/28/17 19:22	062817-1	1675026
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7439-95-4	Magnesium	4300	ug/L		110	300	300	1	P	HSC	06/28/17 19:22	062817-1	1675026
7439-96-5	Manganese	3.48	ug/L	J	2	10	10	1	P	HSC	06/28/17 19:22	062817-1	1675026
7439-98-7	Molybdenum	0.578	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-02-0	Nickel	0.641	ug/L	J	0.6	2	2	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-09-7	Potassium	2790	ug/L		50	150	150	1	P	HSC	06/28/17 19:22	062817-1	1675026
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7631-86-9	Silica	38300	ug/L		53	213	213	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-23-5	Sodium	13400	ug/L		100	300	300	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-24-6	Strontium	94.4	ug/L		1	5	5	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-61-1	Uranium	0.151	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-62-2	Vanadium	2.33	ug/L	J	1	5	5	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/28/17 19:22	062817-1	1675026

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425300004**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133333**LEVEL:** Low**DATE RECEIVED** 13-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	52.5	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
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5
1675026	1675025	SW846 3005A	50	mL	50	mL	06/19/17	SXW1
1675028	1675027	SW846 3005A	50	mL	50	mL	06/19/17	SXW1

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300005**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133349**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:09	061517W1-4	1673861

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425300005

BASIS: As Received

DATE COLLECTED 09-JUN-17

CLIENT ID: CAWA-17-133349

LEVEL: Low

DATE RECEIVED 13-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	HSC	06/28/17 19:25	062817-1	1675026
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-39-3	Barium	240	ug/L		1	5	5	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-42-8	Boron	17.3	ug/L	J	15	50	50	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-70-2	Calcium	16900	ug/L		50	200	200	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/28/17 19:25	062817-1	1675026
7439-89-6	Iron	36.3	ug/L	J	30	100	100	1	P	HSC	06/28/17 19:25	062817-1	1675026
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7439-95-4	Magnesium	4740	ug/L		110	300	300	1	P	HSC	06/28/17 19:25	062817-1	1675026
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/28/17 19:25	062817-1	1675026
7439-98-7	Molybdenum	0.874	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-09-7	Potassium	4810	ug/L		50	150	150	1	P	HSC	06/28/17 19:25	062817-1	1675026
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7631-86-9	Silica	39500	ug/L		53	213	213	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-23-5	Sodium	13700	ug/L		100	300	300	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-24-6	Strontium	113	ug/L		1	5	5	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-31-5	Tin	2.5	ug/L	J	2.5	10	10	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-61-1	Uranium	0.068	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-62-2	Vanadium	1.68	ug/L	J	1	5	5	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/28/17 19:25	062817-1	1675026

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425300005**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133349**LEVEL:** Low**DATE RECEIVED** 13-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
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5
1675026	1675025	SW846 3005A	50	mL	50	mL	06/19/17	SXW1
1675028	1675027	SW846 3005A	50	mL	50	mL	06/19/17	SXW1

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300006**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133350**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:11	061517W1-4	1673861

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425300006

BASIS: As Received

DATE COLLECTED 09-JUN-17

CLIENT ID: CAWA-17-133350

LEVEL: Low

DATE RECEIVED 13-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	80.1	ug/L	J	68	200	200	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-39-3	Barium	237	ug/L		1	5	5	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-42-8	Boron	17.1	ug/L	J	15	50	50	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-70-2	Calcium	16400	ug/L		50	200	200	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/28/17 19:28	062817-1	1675026
7439-89-6	Iron	40.8	ug/L	J	30	100	100	1	P	HSC	06/28/17 19:28	062817-1	1675026
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7439-95-4	Magnesium	4660	ug/L		110	300	300	1	P	HSC	06/28/17 19:28	062817-1	1675026
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/28/17 19:28	062817-1	1675026
7439-98-7	Molybdenum	0.870	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-09-7	Potassium	4700	ug/L		50	150	150	1	P	HSC	06/28/17 19:28	062817-1	1675026
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-23-5	Sodium	13800	ug/L		100	300	300	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-24-6	Strontium	111	ug/L		1	5	5	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-61-1	Uranium	0.075	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-62-2	Vanadium	1.76	ug/L	J	1	5	5	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/28/17 19:28	062817-1	1675026

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425300006**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133350**LEVEL:** Low**DATE RECEIVED** 13-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	60.2	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
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5
1675026	1675025	SW846 3005A	50	mL	50	mL	06/19/17	SXW1
1675028	1675027	SW846 3005A	50	mL	50	mL	06/19/17	SXW1

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. 2017-1720

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>
1203811040	Mercury	0.067	ug/L	+/-1	U	AV	0.067	1
1203813734	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Calcium	105	ug/L	+/-200	J	P	50	200
	Boron	15	ug/L	+/-50	U	P	15	50
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Barium	1	ug/L	+/-5	U	P	1	5
	Aluminum	68	ug/L	+/-200	U	P	68	200
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203813739	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
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2

*Analytical Methods:

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

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1720 Client ID: WT_ESR-17-137413S

Contract: ESHL00114 Level: Low

Matrix: STORM WATER % Solids:

Sample ID: 425358001 Spike ID: 1203811044

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.15		0.067	U	2	107		AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1720 Client ID: CAWA-17-133330S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425329003 Spike ID: 1203813737

<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>
Tin	ug/L	75-125	496		2.5	U	500	99		P
Vanadium	ug/L	75-125	509		8.58		500	100		P
Zinc	ug/L	75-125	469		3.3	U	500	93.3		P
Aluminum	ug/L	75-125	4750		68	U	5000	94.9		P
Barium	ug/L	75-125	501		12.2		500	97.8		P
Beryllium	ug/L	75-125	497		1	U	500	99.3		P
Boron	ug/L	75-125	514		15	U	500	101		P
Calcium	ug/L	75-125	13100		8810		5000	86.3		P
Cobalt	ug/L	75-125	493		1	U	500	98.7		P
Copper	ug/L	75-125	510		3	U	500	102		P
Iron	ug/L	75-125	4870		30	U	5000	97		P
Magnesium	ug/L	75-125	7250		2560		5000	93.8		P
Manganese	ug/L	75-125	483		2	U	500	96.5		P
Potassium	ug/L	75-125	6390		1520		5000	97.4		P
Silica	ug/L		60300		57300		10700	28.2	N/A	P
Sodium	ug/L	75-125	18400		14000		5000	88.8		P
Strontium	ug/L	75-125	530		59.8		500	94.1		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1720 Client ID CAWA-17-133330S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425329003 Spike ID: 1203813742

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	50.4		1	U	50	99.5		MS
Arsenic	ug/L	75-125	50.5		2.53	J	50	95.9		MS
Cadmium	ug/L	75-125	50.2		0.3	U	50	100		MS
Chromium	ug/L	75-125	50.5		3	U	50	97.1		MS
Lead	ug/L	75-125	49.4		0.5	U	50	98.6		MS
Molybdenum	ug/L	75-125	53.8		2.55		50	103		MS
Nickel	ug/L	75-125	48.3		0.6	U	50	95.9		MS
Selenium	ug/L	75-125	49.8		2	U	50	99.3		MS
Silver	ug/L	75-125	49		0.3	U	50	98.1		MS
Thallium	ug/L	75-125	47.2		0.6	U	50	94.3		MS
Uranium	ug/L	75-125	49.2		0.915		50	96.6		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2017-1720**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** WT_ESR-17-137413D**Matrix:** STORM WATER**Level:** Low**Sample ID:** 425358001**Duplicate ID:** 1203811042**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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Duplicate Sample Summary

SDG No.: 2017-1720

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133330D

Matrix: WATER

Level: Low

Sample ID: 425329003

Duplicate ID: 1203813736

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-5	12.2		11.8		3.72		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	8810		8640		1.99		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	2560		2510		2.13		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1520		1560		2.4		P
Silica	ug/L	+/-20%	57300		55800		2.64		P
Sodium	ug/L	+/-20%	14000		13900		.781		P
Strontium	ug/L	+/-20%	59.8		58.4		2.37		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	8.58		8.34		2.83		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.: 2017-1720

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133330D

Matrix: WATER

Level: Low

Sample ID: 425329003

Duplicate ID: 1203813741

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	2.53 J		2.45 J		3.25		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	+/-20%	2.55		2.58		1.33		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	0.915		0.883		3.56		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1720

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>
1203811041	Mercury	ug/L	2	2.16		108	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1720

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>
1203813735								
	Aluminum	ug/L	5000	5240		105	80-120	P
	Barium	ug/L	500	535		107	80-120	P
	Beryllium	ug/L	500	532		106	80-120	P
	Boron	ug/L	500	540		108	80-120	P
	Calcium	ug/L	5000	5280		106	80-120	P
	Cobalt	ug/L	500	531		106	80-120	P
	Copper	ug/L	500	539		108	80-120	P
	Iron	ug/L	5000	5340		107	80-120	P
	Magnesium	ug/L	5000	5380		108	80-120	P
	Manganese	ug/L	500	532		106	80-120	P
	Potassium	ug/L	5000	5400		108	80-120	P
	Silica	ug/L	10700	11100		104	80-120	P
	Sodium	ug/L	5000	5450		109	80-120	P
	Strontium	ug/L	500	525		105	80-120	P
	Tin	ug/L	500	525		105	80-120	P
	Vanadium	ug/L	500	535		107	80-120	P
	Zinc	ug/L	500	504		101	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1720

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>
1203813740								
	Antimony	ug/L	50	49.8		99.6	80-120	MS
	Arsenic	ug/L	50	50.5		101	80-120	MS
	Cadmium	ug/L	50	50.1		100	80-120	MS
	Chromium	ug/L	50	56.2		112	80-120	MS
	Lead	ug/L	50	50.2		100	80-120	MS
	Molybdenum	ug/L	50	50.6		101	80-120	MS
	Nickel	ug/L	50	54		108	80-120	MS
	Selenium	ug/L	50	50.6		101	80-120	MS
	Silver	ug/L	50	50.1		100	80-120	MS
	Thallium	ug/L	50	48.7		97.3	80-120	MS
	Uranium	ug/L	50	49		98	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1720 **Client ID:** WT_ESR-17-137413L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 425358001 **Serial Dilution ID:** 1203811046

<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

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1720

Client ID: CAWA-17-133330L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425329003

Serial Dilution ID: 1203813738

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	12.2		12	J	2.237			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	8810		8460		4.014		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	2560		2580		.488			P
Manganese	2	U	10	U				P
Potassium	1520		1530		.553			P
Silica	57300		54700		4.583		10	P
Sodium	14000		14500		3.791		10	P
Strontium	59.8		58.9		1.463		10	P
Tin	2.5	U	12.5	U				P
Vanadium	8.58		5.76	J	32.8			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. 2017-1720

Client ID: CAWA-17-133330L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425329003

Serial Dilution ID: 1203813743

<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	2.53	J	10	U	28.346			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	2.55		2.56		.589			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	.915		.885	J	3.279			MS

*Analytical Methods:

MS SW846 3005A/6020A

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1720
Work Order #: 425300**

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
425300001	CAWA-17-133280
425300003	CAWA-17-133305
425300006	CAWA-17-133350
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 samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1673690	Method:	WSP-CN(T)
Prep Batch :	1673689	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
425300001	CAWA-17-133280
425300003	CAWA-17-133305
425300006	CAWA-17-133350
1203810623	Method Blank (MB)
1203810624	Laboratory Control Sample (LCS)
1203810625	425300001(CAWA-17-133280) Sample Duplicate (DUP)
1203810627	425300001(CAWA-17-133280) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 19.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425300001 (CAWA-17-133280) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Sample1203810624 (LCS) was re-analyzed to verify the result.

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: 1673741

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
1203810741	Method Blank (MB)
1203810742	Laboratory Control Sample (LCS)
1203810743	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203810744	425079002(CAWA-17-133314) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425079002 (CAWA-17-133314) 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 1203810743 (CAWA-17-133314DUP), 1203810744 (CAWA-17-133314PS), 425300002 (CAWA-17-133308), 425300004 (CAWA-17-133333) and 425300005 (CAWA-17-133349) 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	425300		
	002	004	005
Chloride	2X	2X	2X

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203810743 (CAWA-17-133314DUP), 1203810744 (CAWA-17-133314PS), 425300002 (CAWA-17-133308), 425300004 (CAWA-17-133333) and 425300005 (CAWA-17-133349) 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
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
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
425300001	CAWA-17-133280
425300003	CAWA-17-133305
425300006	CAWA-17-133350
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), 1203811092 (CAWA-17-133286MS), 425300001 (CAWA-17-133280), 425300003 (CAWA-17-133305) and 425300006 (CAWA-17-133350) 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: 1673506

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
1203810164	Method Blank (MB)
1203810165	Laboratory Control Sample (LCS)
1203810166	Laboratory Control Sample Duplicate (LCSD)
1203810167	425075002(CAWA-17-133312) Sample Duplicate (DUP)
1203810168	425075002(CAWA-17-133312) 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.

LCS/LCSD Relative Percent Difference (RPD) Statement

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

Quality Control (QC) Designation

Sample 425075002 (CAWA-17-133312) 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 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
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
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: 1673670

Method: TDS

Sample Analysis

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

Sample ID	Client ID
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
1203810569	Method Blank (MB)
1203810570	Laboratory Control Sample (LCS)
1203810572	425300002(CAWA-17-133308) 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 425300002 (CAWA-17-133308) 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
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
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: 1675817 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
1203815599	Laboratory Control Sample (LCS)
1203815600	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-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 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

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

Sample	Analyte	Value
1203815600 (CAWA-17-133330DUP)	pH	Received 13-JUN-17, out of holding 08-JUN-17
425300002 (CAWA-17-133308)	pH	Received 13-JUN-17, out of holding 09-JUN-17
425300004 (CAWA-17-133333)	pH	Received 13-JUN-17, out of holding 09-JUN-17
425300005 (CAWA-17-133349)	pH	Received 13-JUN-17, out of holding 09-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: 1675815 **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
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
1203815591	Laboratory Control Sample (LCS)
1203815593	425329003(CAWA-17-133330) Sample Duplicate (DUP)
1203815594	425329003(CAWA-17-133330) 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 425329003 (CAWA-17-133330) 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: 2017-1720 GEL Work Order: 425300


The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Aubrey Kingsbury

Date: 07 JUL 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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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: 2017-1720

Client Sample ID: CAWA-17-133280
Sample ID: 425300001
Matrix: W
Collect Date: 09-JUN-17 13:45
Receive Date: 13-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		1.84	0.330	1.00	mg/L		1	TSM	06/22/17	0209	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/15/17	1105	1673690	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0772	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	0955	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/15/17	1041	1673689
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: 2017-1720

Client Sample ID: CAWA-17-133308
Sample ID: 425300002
Matrix: W
Collect Date: 09-JUN-17 13:45
Receive Date: 13-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	MXL2	06/13/17	2201	1673741	1
Fluoride		0.128	0.033	0.100	mg/L		1					
Sulfate		7.83	0.133	0.400	mg/L		1					
Chloride		13.8	0.134	0.400	mg/L		2	MXL2	06/14/17	1544	1673741	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.061	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1138	1673875	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.849	0.017	0.050	mg/L		1	AXH3	06/14/17	0816	1673506	4
PO4 "As Received"												
Phosphorus, Total as P		0.0881	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1031	1673877	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		121	3.40	14.3	mg/L			KLP1	06/15/17	1544	1673670	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		52.4	1.45	4.00	mg/L			RXB5	06/22/17	1829	1675815	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		175	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0906	1679220	8
PH "As Received"												
pH at Temp 19.1C	H	7.36	0.010	0.100	SU		1	RXB5	06/22/17	1826	1675817	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: 2017-1720

Client Sample ID: CAWA-17-133308
Sample ID: 425300002

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

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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: 2017-1720

Client Sample ID: CAWA-17-133305
Sample ID: 425300003
Matrix: W
Collect Date: 09-JUN-17 13:00
Receive Date: 13-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		1.84	0.330	1.00	mg/L		1	TSM	06/22/17	0256	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/15/17	1112	1673690	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0648	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	0956	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/15/17	1041	1673689
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: 2017-1720

Client Sample ID: CAWA-17-133333
Sample ID: 425300004
Matrix: W
Collect Date: 09-JUN-17 13:00
Receive Date: 13-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	MXL2	06/13/17	2230	1673741	1
Fluoride		0.129	0.033	0.100	mg/L		1					
Sulfate		8.02	0.133	0.400	mg/L		1					
Chloride		13.5	0.134	0.400	mg/L		2	MXL2	06/14/17	1613	1673741	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0379	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1138	1673875	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.773	0.017	0.050	mg/L		1	AXH3	06/14/17	0817	1673506	4
PO4 "As Received"												
Phosphorus, Total as P		0.0952	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1032	1673877	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		131	3.40	14.3	mg/L			KLP1	06/15/17	1544	1673670	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		52.8	1.45	4.00	mg/L			RXB5	06/22/17	1831	1675815	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		176	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0909	1679220	8
PH "As Received"												
pH at Temp 18.8C	H	7.32	0.010	0.100	SU		1	RXB5	06/22/17	1829	1675817	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: 2017-1720

Client Sample ID: CAWA-17-133333
Sample ID: 425300004

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: 2017-1720

Client Sample ID: CAWA-17-133349
Sample ID: 425300005
Matrix: W
Collect Date: 09-JUN-17 10:00
Receive Date: 13-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	MXL2	06/13/17	2259	1673741	1
Fluoride		0.122	0.033	0.100	mg/L		1					
Sulfate		6.83	0.133	0.400	mg/L		1					
Chloride		16.6	0.134	0.400	mg/L		2	MXL2	06/14/17	1642	1673741	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.085	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1139	1673875	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite	U	ND	0.017	0.050	mg/L		1	AXH3	06/14/17	0818	1673506	4
PO4 "As Received"												
Phosphorus, Total as P		0.073	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1039	1673877	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		134	3.40	14.3	mg/L			KLP1	06/15/17	1544	1673670	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		73.4	1.45	4.00	mg/L			RXB5	06/22/17	1837	1675815	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		212	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0910	1679220	8
PH "As Received"												
pH at Temp 19.1C	H	7.33	0.010	0.100	SU		1	RXB5	06/22/17	1833	1675817	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: 2017-1720

Client Sample ID: CAWA-17-133349
Sample ID: 425300005

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

GEL LABORATORIES LLC

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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: 2017-1720

Client Sample ID: CAWA-17-133350
Sample ID: 425300006
Matrix: W
Collect Date: 09-JUN-17 10:00
Receive Date: 13-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		2.96	0.330	1.00	mg/L		1	TSM	06/22/17	0517	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/15/17	1113	1673690	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	0957	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/15/17	1041	1673689
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

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: July 7, 2017

Page 1 of 6

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

Contact: Mr. Keith Greene

Workorder: 425300

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	1673690										
QC1203810625	425300001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	06/15/17	11:06
QC1203810624	LCS										
Cyanide, Total	50.0			52.8	ug/L			106 (90%-110%)		06/15/17	11:04
QC1203810623	MB										
Cyanide, Total			U	ND	ug/L					06/15/17	10:57
QC1203810627	425300001	MS									
Cyanide, Total	100	U	ND	110	ug/L			110 (90%-110%)		06/15/17	11:07

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QC Summary

Workorder: 425300

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673741										
QC1203810743	425079002	DUP									
Bromide	J	0.0867	J	0.0848	mg/L	2.22	^	(+/-0.200)	MXL2	06/13/17	21:03
Chloride		13.8		13.8	mg/L	0.084		(0%-20%)		06/14/17	14:46
Fluoride		0.171		0.169	mg/L	1	^	(+/-0.100)		06/13/17	21:03
Sulfate		6.08		5.94	mg/L	2.35		(0%-20%)			
QC1203810742	LCS										
Bromide	1.25			1.26	mg/L			101	(80%-120%)	06/13/17	20:06
Chloride	5.00			4.72	mg/L			94.3	(80%-120%)		
Fluoride	2.50			2.45	mg/L			97.9	(80%-120%)		
Sulfate	10.0			9.78	mg/L			97.8	(80%-120%)		
QC1203810741	MB										
Bromide			U	ND	mg/L					06/13/17	19:37
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203810744	425079002	PS									
Bromide	1.25	J	0.0867	1.31	mg/L			97.8	(75%-125%)	06/13/17	21:32
Chloride	5.00		6.91	12.4	mg/L			110	(75%-125%)	06/14/17	15:15

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QC Summary

Workorder: 425300

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673741										
Fluoride	2.50	0.171		2.57	mg/L		96	(75%-125%)	MXL2	06/13/17	21:32
Sulfate	10.0	6.08		16.3	mg/L		102	(75%-125%)			
Nutrient Analysis											
Batch	1673506										
QC1203810167	425075002	DUP									
Nitrogen, Nitrate/Nitrite		0.593		0.591	mg/L	0.338		(0%-20%)	AXH3	06/14/17	08:04
QC1203810165	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.985	mg/L		98.5	(90%-110%)		06/14/17	08:01
QC1203810166	LCSD										
Nitrogen, Nitrate/Nitrite	1.00			1.00	mg/L	1.51	100	(0%-20%)		06/14/17	08:02
QC1203810164	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					06/14/17	07:59
QC1203810168	425075002	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.593		1.55	mg/L		95.7	(90%-110%)		06/14/17	08:05
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

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QC Summary

Workorder: 425300

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
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
QC1203811105	LCS										
Phosphorus, Total as P	1.00			0.975	mg/L			97.5 (80%-124%)		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
Solids Analysis											
Batch	1673670										
QC1203810572	425300002	DUP									
Total Dissolved Solids		121		123	mg/L	1.17		(0%-5%)	KLP1	06/15/17	15:44
QC1203810570	LCS										
Total Dissolved Solids	300			296	mg/L			98.6 (95%-105%)		06/15/17	15:44

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QC Summary

Workorder: 425300

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	1673670										
QC1203810569	MB										
Total Dissolved Solids			U	ND	mg/L				KLP1	06/15/17	15:44
Titration and Ion Analysis											
Batch	1675815										
QC1203815593	425329003	DUP									
Alkalinity, Total as CaCO3			60.4	60.6	mg/L	0.331		(0%-20%)	RXB5	06/22/17	18:42
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203815591	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)		06/22/17	18:02
QC1203815594	425329003	MS									
Alkalinity, Total as CaCO3	100		60.4	165	mg/L		105	(80%-120%)		06/22/17	18:43
Batch	1675817										
QC1203815600	425329003	DUP									
pH		H	8.21	H	8.19	SU	0.244	(0%-5%)	RXB5	06/22/17	18:42
QC1203815599	LCS										
pH	7.00			7.00	SU		100	(99%-101%)		06/22/17	18:25
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.

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QC Summary

Workorder: 425300

Page 6 of 6

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

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

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

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

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

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

July 19, 2017

gel.com

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

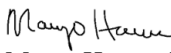
Re: LANL- WQH Water Samples
Work Order: 425300
SDG: 2017-1720

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 13, 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 HMX, DNX, and TNX on the HE 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: 2017-1720
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 425300
SDG: 2017-1720

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 425300
SDG # : 2017-1720**

July 10, 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 13, 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>
425300001	CAWA-17-133280
425300002	CAWA-17-133308
425300003	CAWA-17-133305
425300004	CAWA-17-133333
425300005	CAWA-17-133349
425300006	CAWA-17-133350

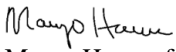
Case Narrative

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 for
Valerie Davis
Project Manager

List of current GEL Certifications as of 10 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

Chain of Custody/Analysis Request



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: ESHL		SDG/AR/COC/Work Order: 425300	
Received By: ZKW		Date Received: 6/13/17	
Carrier and Tracking Number		Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other 5908 1782 1970 -5c 5908 1782 1960 -6c 5908 1782 1959 -6c 5908 1782 2050 -6c 5908 1782 2040 -5c 5908 1782 2017 -6c 5908 1782 1937 -24c 5908 1782 1948 -5c 5908 1782 2061 -5c	
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 type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 PM mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <input checked="" type="checkbox"/> Dry ice None Other: *all temperatures are recorded in Celsius See TEMP: Above
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: IR3-16 Secondary Temperature Device Serial # (If Applicable):
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: Metals cont. for WST-139746 rec'd unpreserved If Preservation added, Lot#:
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input 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 ___ 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 -139346 and All vials for -139347, -348, -349, -350, and -351 rec'd w/ headspace
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input type="checkbox"/>	300 Sample for -138988 rec'd out of hold Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: We rec'd a pH container for WST-139351
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials

AM

Date 6/14/17

Page ____ of ____

GL-CHL-SR-001 Rev 5

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
ACTWT: 52.0 LB MAN
CAD: 0014176/CAFE2916

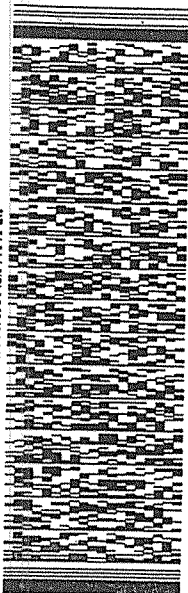
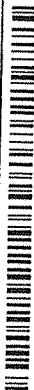
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express

TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

2 of 2

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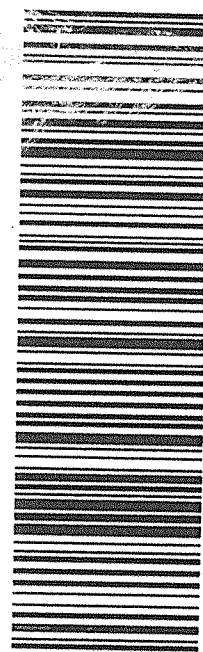
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Mstr# 5908 1782 1960

0201

X7 RBWA

29407
SC - US CHS



Part# 156148V-434 R1T2 06/15

5BRCL/4502/329B

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TR00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
ACTWT: 50.0 LB MAN
CRD: 0014176/CAFE2916

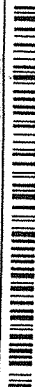
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

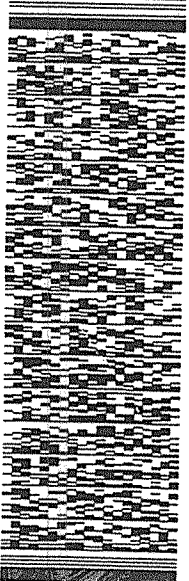
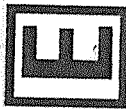
CHARLESTON SC 29407

(843) 566-8171

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Express



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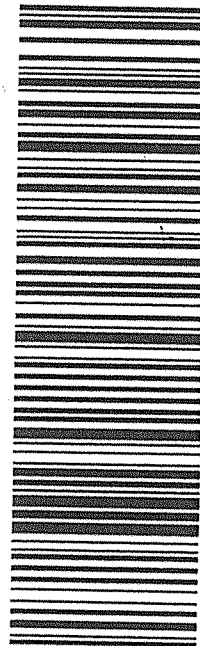
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Mstr# 5908 1782 2040

0201

X7 RBWA

29407
SC-US CHS



Part # 156148V-434 RIT2 06/15

RT0
FZ 0

2050
06.13

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TR00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
ACTWT: 59.0 LB MAN
CRD: 0014176/CAFE2916

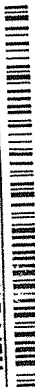
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

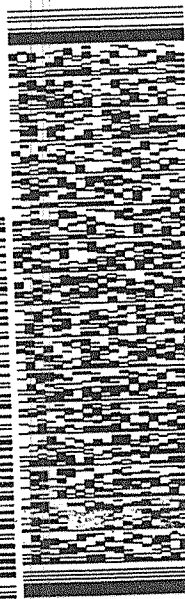
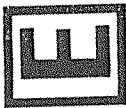
CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO



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Express



TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

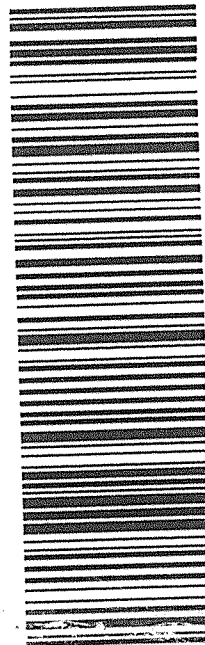
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0263

Mstr# 5908 1782 2040

0201

X7 RBWA

29407
SC-US CHS



Part # 156148V-434 RIT2 06/15

SHIP DATE: 12JUN17
ACTWGT: 24.0 LB TAN
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

CHARLESTON SC 29407

(843) 566-8171
REF: 21PD0ASRGW04BAGWEO

FedEx
Express



TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

1 of 3

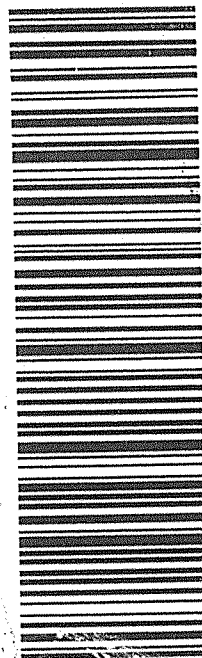
TRK# 5908 1782 2040

MASTER

X7 RBWA

29407

SC-US CHS



Part # 156148V-434 RIT2 06/15
156148V-434 RIT2 06/15

SHIP DATE: 12JUN17
ACTWGT: 30.0 LB TAN
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

CHARLESTON SC 29407

(843) 566-8171
REF: 21PD0ASRAE20DF6X0A

FedEx
Express



TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

1 of 3

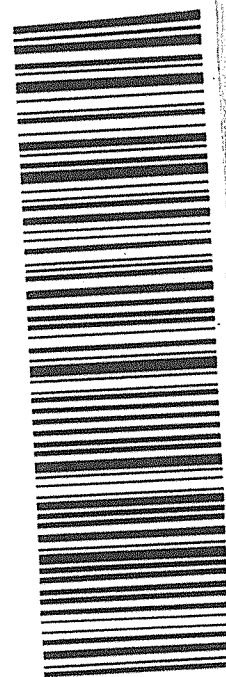
TRK# 5908 1782 1937

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SC-US CHS



Part # 156148V-434 RIT2 06/15

SHIP DATE: 12 JUN 17
ACTWGT: 48.0 LB MAN
CAD: 0014176/CRFE2916

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
CHARLESTON SC 29407

(843) 556-8171
REF: 21PD0ASRAE20DF6X0A

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TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

2 of 3

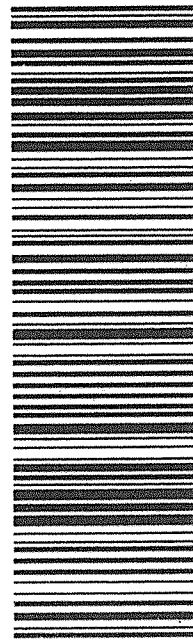
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SHIP DATE: 12 JUN 17
ACTWGT: 48.0 LB MAN
CAD: 0014176/CRFE2916

BILL SENDER

ORIGIN ID: SAFA (505) 665-9966
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UNITED STATES US

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD
CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



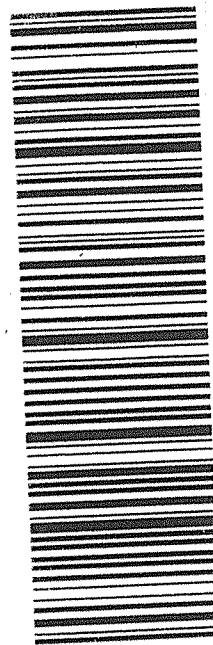
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PRIORITY OVERNIGHT

TRK# 5908 1782 2017

0201

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29407
SC-US
CHS



Part # 156148V-434 RIT2 06/15 3

ORIGIN ID: SAFA (505) 665-3366
KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
ACTWT: 51.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

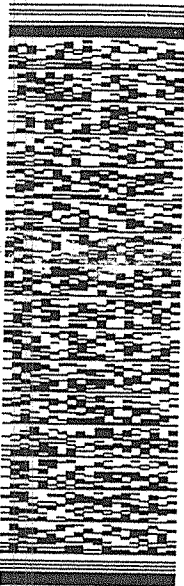
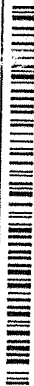
TO VALERIE DAVIS

GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD00ASRAE20DF6X0A



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TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

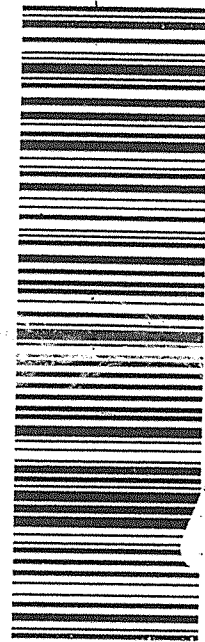
3 of 3

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Mstr# 5908 1782 1937

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SHIP DATE: 12JUN17
ACTWT: 52.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

GIN ID: SAFA (505) 665-9866

TH GREENE

LOS ALAMOS NATL LAB

IO BLDG 1237 DPU 03

LOS ALAMOS, NM 87545

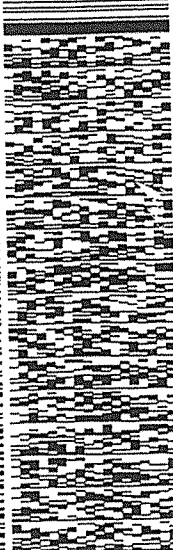
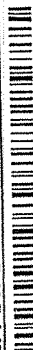
UNITED STATES US

VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD00ASRGW04BAGWEO



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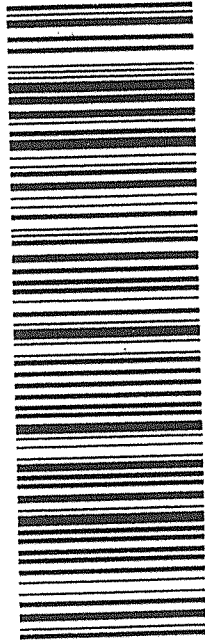
1 of 2

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Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

Qualifier	Explanation
-----------	-------------

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

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

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

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1720
Work Order #: 425300**

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
425300002	425300002 (CAWA-17-133308)
425300004	425300004 (CAWA-17-133333)
425300005	425300005 (CAWA-17-133349)
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: 2017-1720 GEL Work Order: 425300

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-17-133308Date Received: 13-JUN-17GEL Job No (SDG): 2017-1720GEL Sample ID: 425300002Date 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	0.446	ug/L		1	19-JUN-17 19:32	per0619020a
	Perchlorate Isotope Ratio			2.7			1	19-JUN-17 19:32	per0619020a
14797-73-0	Perchlorate-101	.05	.2	0.482	ug/L		1	19-JUN-17 19:32	per0619020a
	Perchlorate-O(18)			0.413	ug/L		1	19-JUN-17 19:32	per0619020a

^ 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-17-133333Date Received: 13-JUN-17GEL Job No (SDG): 2017-1720GEL Sample ID: 425300004Date 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	0.428	ug/L		1	19-JUN-17 19:43	per0619021a
	Perchlorate Isotope Ratio			2.82			1	19-JUN-17 19:43	per0619021a
14797-73-0	Perchlorate-101	.05	.2	0.444	ug/L		1	19-JUN-17 19:43	per0619021a
	Perchlorate-O(18)			0.420	ug/L		1	19-JUN-17 19:43	per0619021a

^ 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-17-133349Date Received: 13-JUN-17GEL Job No (SDG): 2017-1720GEL Sample ID: 425300005Date 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 19:54	per0619022a
	Perchlorate Isotope Ratio						1	19-JUN-17 19:54	per0619022a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	19-JUN-17 19:54	per0619022a
	Perchlorate-O(18)			0.409	ug/L		1	19-JUN-17 19:54	per0619022a

^ 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): 2017-1720

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): 2017-1720

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): 2017-1720GEL 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): 2017-1720GEL 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): 2017-1720GEL 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): 2017-1720GEL 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): 2017-1720GEL 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 #: 2017-1720
Work Order #: 425300**

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: 1673869

Prep Batch Number: 1673868

Sample Analysis

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

Sample ID	Client ID
425300001	CAWA-17-133280
425300003	CAWA-17-133305
425300006	CAWA-17-133350
1203811082	Method Blank (MB)
1203811083	Laboratory Control Sample (LCS)
1203811084	425329006(CAWA-17-135753) Matrix Spike (MS)
1203811085	425329006(CAWA-17-135753) 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 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

The Low Level Calibration Verification Standard (CRI) did not meet requirements of 70-130% for samples in this SDG. Please refer to Form 7 of the data package for a list of recoveries. Since the recoveries are biased high and target analytes were not detected in the associated samples, the data are considered unaffected. The data are reported.

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 425329006 (CAWA-17-135753) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS and/or MSD (See Below) did not meet acceptance criteria for the recovery of spiked analytes. Since similar recoveries were observed, the non-conforming recoveries are attributed to sample matrix interference. The data are reported.

Sample	Analyte	Value
1203811084 (CAWA-17-135753MS)	Tetryl	38* (50%-126%)
1203811085 (CAWA-17-135753MSD)	Tetryl	45* (50%-126%)

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. Sample 425300003 (CAWA-17-133305) was further diluted due to over range target analytes. The final dilution in each case takes the 1:1 v/v dilution into account.

	425300
Analyte	003
RDX	5X

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

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: 2017-1720 GEL Work Order: 425300

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-17-133280

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300001

Sample Amount 940 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706018.wiff

Date Analyzed: 06-JUL-17 20:01

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
19406-51-0	4-Amino-2,6-dinitrotoluene	.119	J	0.0851	0.266
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.163	J	0.0851	0.266
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
118-96-7	2,4,6-Trinitrotoluene	.266	U	0.0851	0.266
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.266	U	0.0851	0.266
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.266	U	0.0851	0.266
<i>13980-04-6</i>	<i>TNX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.266	U	0.0851	0.266
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MXN	.266	U	0.0851	0.266
<i>5755-27-1</i>	<i>MXN</i>				
606-20-2	2,6-Dinitrotoluene	.266	U	0.0851	0.266
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.266	U	0.0851	0.266
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.266	U	0.0872	0.266
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.266	U	0.0851	0.266
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.266	U	0.0851	0.266
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	.266	U	0.0851	0.266
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133280

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300001

Sample Amount 940 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	.475		0.0851	0.266
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	.532	U	0.0851	0.532
78-11-5 <i>78-11-5</i>	PETN <i>PETN</i>	.532	U	0.106	0.532
99-99-0 <i>99-99-0</i>	p-Nitrotoluene <i>p-Nitrotoluene</i>	.532	U	0.160	0.532
3058-38-6 <i>3058-38-6</i>	TATB <i>TATB</i>	1.06	U	0.319	1.06
618-87-1 <i>618-87-1</i>	3,5-Dinitroaniline <i>3,5-Dinitroaniline</i>	1.06	U	0.319	1.06
78-30-8 <i>78-30-8</i>	tris(o-cresyl) phosphate <i>tris(o-cresyl) phosphate</i>	1.06	U	0.319	1.06
59229-75-3 <i>59229-75-3</i>	2,6-Diamino-4-nitrotoluene <i>2,6-Diamino-4-nitrotoluene</i>	2.66	U	0.532	2.66
6629-29-4 <i>6629-29-4</i>	2,4-Diamino-6-nitrotoluene <i>2,4-Diamino-6-nitrotoluene</i>	2.66	U	0.532	2.66
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	7.5		0.0851	0.266

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133305

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300003

Sample Amount 895 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706019.wiff

Date Analyzed: 06-JUL-17 20:35

Dilution Factor: 5

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	12.7		0.223	0.698
121-82-4	RDX				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133305

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300003

Sample Amount 895 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706020.wiff

Date Analyzed: 06-JUL-17 21:09

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
5755-27-1	MNX	.0897	J	0.0894	0.279
<i>5755-27-1</i>	<i>MNX</i>				
99-35-4	1,3,5-Trinitrobenzene	.0965	J	0.0894	0.279
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.144	J	0.0894	0.279
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	.279	U	0.0894	0.279
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.279	U	0.0894	0.279
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.279	U	0.0894	0.279
<i>13980-04-6</i>	<i>TNX</i>				
606-20-2	2,6-Dinitrotoluene	.279	U	0.0894	0.279
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.279	U	0.0894	0.279
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.279	U	0.0916	0.279
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.279	U	0.0894	0.279
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.279	U	0.0894	0.279
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	.279	U	0.0894	0.279
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.317		0.0894	0.279
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133305

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300003

Sample Amount 895 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	.559	U	0.0894	0.559
78-11-5 <i>78-11-5</i>	PETN <i>PETN</i>	.559	U	0.112	0.559
99-99-0 <i>99-99-0</i>	p-Nitrotoluene <i>p-Nitrotoluene</i>	.559	U	0.168	0.559
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	.638		0.0894	0.279
3058-38-6 <i>3058-38-6</i>	TATB <i>TATB</i>	1.12	U	0.335	1.12
618-87-1 <i>618-87-1</i>	3,5-Dinitroaniline <i>3,5-Dinitroaniline</i>	1.12	U	0.335	1.12
78-30-8 <i>78-30-8</i>	tris(o-cresyl) phosphate <i>tris(o-cresyl) phosphate</i>	1.12	U	0.335	1.12
59229-75-3 <i>59229-75-3</i>	2,6-Diamino-4-nitrotoluene <i>2,6-Diamino-4-nitrotoluene</i>	2.79	U	0.559	2.79
6629-29-4 <i>6629-29-4</i>	2,4-Diamino-6-nitrotoluene <i>2,4-Diamino-6-nitrotoluene</i>	2.79	U	0.559	2.79

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133350

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300006

Sample Amount 930 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706022.wiff

Date Analyzed: 06-JUL-17 22:17

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.269	U	0.086	0.269
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.269	U	0.086	0.269
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.269	U	0.086	0.269
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.269	U	0.086	0.269
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.269	U	0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.269	U	0.086	0.269
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MXN	.269	U	0.086	0.269
<i>5755-27-1</i>	<i>MXN</i>				
606-20-2	2,6-Dinitrotoluene	.269	U	0.086	0.269
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.269	U	0.086	0.269
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.269	U	0.0882	0.269
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.269	U	0.086	0.269
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.269	U	0.086	0.269
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.269	U	0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133350

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 425300006

Sample Amount 930 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	.269	U	0.086	0.269
99-65-0	<i>m-Dinitrobenzene</i>				
2691-41-0	HMX	.375		0.086	0.269
2691-41-0	<i>HMX</i>				
479-45-8	Tetryl	.538	U	0.086	0.538
479-45-8	<i>Tetryl</i>				
78-11-5	PETN	.538	U	0.108	0.538
78-11-5	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.538	U	0.161	0.538
99-99-0	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1.08	U	0.323	1.08
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.08	U	0.323	1.08
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.08	U	0.323	1.08
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.69	U	0.538	2.69
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.69	U	0.538	2.69
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-1720**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
425300001	CAWA-17-133280	88	55 - 115	
425300003	CAWA-17-133305DL	91	55 - 115	
425300003	CAWA-17-133305	95	55 - 115	
425300006	CAWA-17-133350	100	55 - 115	
1203811082	MB for batch 1673868	97	55 - 115	
1203811083	LCS for batch 1673868	90	55 - 115	
1203811084	CAWA-17-135753MS	92	55 - 115	
1203811085	CAWA-17-135753MSD	91	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) 2017-1720

Extract Batch Code: 1673868

Date Extracted: 14-JUN-17

GEL LCS ID: 1203811083

GEL LCSDUP ID: .

Analysis Date/Time: 06-JUL-17 19:27

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	4.68	94					70 - 110
2,4,6-Trinitrotoluene	5	4.76	95					69 - 113
2,4-Diamino-6-nitrotoluene	5	4.41	88					50 - 121
2,4-Dinitrotoluene	5	4.46	89					71 - 110
2,6-Diamino-4-nitrotoluene	5	5.18	104					53 - 127
2,6-Dinitrotoluene	5	4.23	85					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.6	92					70 - 112
3,5-Dinitroaniline	5	4.79	96					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.7	94					74 - 116
HMX	5	3.87	77					58 - 113
Nitrobenzene	5	4.29	86					64 - 115
PETN	5	4.76	95					57 - 126
RDX	5	4.13	83					64 - 117
TATB	2.5	1.7	68					47 - 135
Tetryl	5	2.94	59					55 - 122
m-Dinitrobenzene	5	4.42	88					74 - 117
m-Nitrotoluene	5	4.15	83					66 - 114
o-Nitrotoluene	5	4.32	86					64 - 115
p-Nitrotoluene	5	4.55	91					66 - 127
tris(o-cresyl) phosphate	5	2.32	46					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-17-135753

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Extract Batch Code: 1673868

Date Extracted: 14-JUN-17

GEL Spike ID: 1203811084

GEL SpikeDup ID: 1203811085

Analysis Date/Time: 07-JUL-17 01:42

MSD Analysis Date/Time: 07-JUL-17 02:16

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
2,6-Diamino-4-nitrotoluene	5.55556	0	5.82	105	5.77	104	1	30	53 - 127
2,6-Dinitrotoluene	5.55556	0	4.63	83	4.94	89	6	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.55556	0	4.8	86	5.1	92	6	30	67 - 115
3,5-Dinitroaniline	5.55556	0	5.43	98	5.61	102	3	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.55556	0	5.11	92	5.44	98	6	30	65 - 120
HMX	5.55556	0	4.24	76	3.94	71	7	30	44 - 128
Nitrobenzene	5.55556	0	4.3	77	4.4	80	2	30	62 - 116
PETN	5.55556	0	4.77	86	5.41	98	13	30	51 - 131
RDX	5.55556	.012	4.65	83	4.18	75	11	30	57 - 125
TATB	2.77778	0	2.04	74	1.8	65	13	30	38 - 149
Tetryl	5.55556	0	2.11	38 *	2.51	45 *	17	30	50 - 126
m-Dinitrobenzene	5.55556	0	5.04	91	5.17	94	3	30	74 - 117
m-Nitrotoluene	5.55556	0	4.27	77	4.59	83	7	30	59 - 120
o-Nitrotoluene	5.55556	0	3.82	69	4.13	75	8	30	56 - 119
p-Nitrotoluene	5.55556	0	4.45	80	4.59	83	3	30	61 - 129
tris(o-cresyl) phosphate	5.55556	0	2.99	54	3.43	62	14	30	38 - 105
1,3,5-Trinitrobenzene	5.55556	0	4.99	90	4.7	85	6	30	67 - 111
2,4,6-Trinitrotoluene	5.55556	0	5.11	92	5.62	102	9	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.55556	0	5.1	92	6.5	118	24	30	50 - 121
2,4-Dinitrotoluene	5.55556	0	4.77	86	5.41	98	13	30	69 - 113

#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 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811082

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706016.wiff

Date Analyzed: 06-JUL-17 18:53

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 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811082

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-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 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811083

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706017.wiff

Date Analyzed: 06-JUL-17 19:27

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>	1.7		0.300	1.00
78-30-8 <i>78-30-8</i>	tris(o-cresyl) phosphate <i>tris(o-cresyl) phosphate</i>	2.32		0.300	1.00
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	2.94		0.080	0.500
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	3.87		0.080	0.250
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	4.13		0.080	0.250
99-08-1 <i>99-08-1</i>	m-Nitrotoluene <i>m-Nitrotoluene</i>	4.15		0.080	0.250
606-20-2 <i>606-20-2</i>	2,6-Dinitrotoluene <i>2,6-Dinitrotoluene</i>	4.23		0.080	0.250
98-95-3 <i>98-95-3</i>	Nitrobenzene <i>Nitrobenzene</i>	4.29		0.080	0.250
88-72-2 <i>88-72-2</i>	o-Nitrotoluene <i>o-Nitrotoluene</i>	4.32		0.082	0.250
6629-29-4 <i>6629-29-4</i>	2,4-Diamino-6-nitrotoluene <i>2,4-Diamino-6-nitrotoluene</i>	4.41		0.500	2.50

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811083

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	4.42		0.080	0.250
99-65-0	<i>m-Dinitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	4.46		0.080	0.250
121-14-2	<i>2,4-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.55		0.150	0.500
99-99-0	<i>p-Nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.6		0.080	0.250
35572-78-2	<i>2-Amino-4,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.68		0.080	0.250
99-35-4	<i>1,3,5-Trinitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.7		0.080	0.250
19406-51-0	<i>4-Amino-2,6-dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.76		0.080	0.250
118-96-7	<i>2,4,6-Trinitrotoluene</i>				
78-11-5	PETN	4.76		0.100	0.500
78-11-5	<i>PETN</i>				
618-87-1	3,5-Dinitroaniline	4.79		0.300	1.00
618-87-1	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.18		0.500	2.50
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811084

Sample Amount 900 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706028.wiff

Date Analyzed: 07-JUL-17 01:42

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>	.278	U	0.0889	0.278
5755-27-1 <i>5755-27-1</i>	MNX <i>MNX</i>	.278	U	0.0889	0.278
80251-29-2 <i>80251-29-2</i>	DNX <i>DNX</i>	.278	U	0.0889	0.278
3058-38-6 <i>3058-38-6</i>	TATB <i>TATB</i>	2.04		0.333	1.11
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	2.11		0.0889	0.556
78-30-8 <i>78-30-8</i>	tris(o-cresyl) phosphate <i>tris(o-cresyl) phosphate</i>	2.99		0.333	1.11
88-72-2 <i>88-72-2</i>	o-Nitrotoluene <i>o-Nitrotoluene</i>	3.82		0.0911	0.278
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	4.24		0.0889	0.278
99-08-1 <i>99-08-1</i>	m-Nitrotoluene <i>m-Nitrotoluene</i>	4.27		0.0889	0.278
98-95-3 <i>98-95-3</i>	Nitrobenzene <i>Nitrobenzene</i>	4.3		0.0889	0.278
99-99-0 <i>99-99-0</i>	p-Nitrotoluene <i>p-Nitrotoluene</i>	4.45		0.167	0.556
606-20-2 <i>606-20-2</i>	2,6-Dinitrotoluene <i>2,6-Dinitrotoluene</i>	4.63		0.0889	0.278
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	4.65		0.0889	0.278

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811084

Sample Amount 900 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	4.77		0.0889	0.278
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
78-11-5	PETN	4.77		0.111	0.556
<i>78-11-5</i>	<i>PETN</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.8		0.0889	0.278
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.99		0.0889	0.278
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	5.04		0.0889	0.278
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.1		0.556	2.78
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.11		0.0889	0.278
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.11		0.0889	0.278
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.43		0.333	1.11
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.82		0.556	2.78
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811085

Sample Amount 905 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706029.wiff

Date Analyzed: 07-JUL-17 02:16

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.276	U	0.0884	0.276
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.276	U	0.0884	0.276
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	.276	U	0.0884	0.276
<i>80251-29-2</i>	<i>DNX</i>				
3058-38-6	TATB	1.8		0.331	1.10
<i>3058-38-6</i>	<i>TATB</i>				
479-45-8	Tetryl	2.51		0.0884	0.552
<i>479-45-8</i>	<i>Tetryl</i>				
78-30-8	tris(o-cresyl) phosphate	3.43		0.331	1.10
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
2691-41-0	HMX	3.94		0.0884	0.276
<i>2691-41-0</i>	<i>HMX</i>				
88-72-2	o-Nitrotoluene	4.13		0.0906	0.276
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
121-82-4	RDX	4.18		0.0884	0.276
<i>121-82-4</i>	<i>RDX</i>				
98-95-3	Nitrobenzene	4.4		0.0884	0.276
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.59		0.0884	0.276
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.59		0.166	0.552
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.7		0.0884	0.276
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1720

Matrix: WATER

GEL Sample ID: 1203811085

Sample Amount 905 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
606-20-2	2,6-Dinitrotoluene	4.94		0.0884	0.276
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.1		0.0884	0.276
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.17		0.0884	0.276
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	5.41		0.0884	0.276
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
78-11-5	PETN	5.41		0.110	0.552
<i>78-11-5</i>	<i>PETN</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.44		0.0884	0.276
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.61		0.331	1.10
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
118-96-7	2,4,6-Trinitrotoluene	5.62		0.0884	0.276
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.77		0.552	2.76
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	6.5		0.552	2.76
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1720Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 06-JUL-17 10:20GEL Data File: EXP0706001.wiffInstrument ID: LCMSMS7Column: 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
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	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	1.11
TATB	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1720Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 06-JUL-17 10:55GEL Data File: EXP0706002.wiffInstrument ID: LCMSMS7Column: 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
Nitroglycerin	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): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 06-JUL-17 15:28

GEL Data File: EXP0706010.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	1.68
tris(o-cresyl) phosphate	0	11.24
TATB	0	1.35
3,5-Dinitroaniline	0	1.88
2,4-Diamino-6-nitrotoluene	0	1.38
2,6-Diamino-4-nitrotoluene	0	1.71
DNX	0	1.94
MNX	0	1.65
TNX	0	1.66
1,3,5-Trinitrobenzene	0	1.64
2,4,6-Trinitrotoluene	0	1.88
2,4-Dinitrotoluene	0	1.85
2,6-Dinitrotoluene	0	1.71
2-Amino-4,6-dinitrotoluene	0	1.75
4-Amino-2,6-dinitrotoluene	0	2.03
HMX	0	2.05
Nitrobenzene	0	0
Nitroglycerin	0	3.38
PETN	0	3.24
RDX	0	1.77
Tetryl	0	1.74
m-Dinitrobenzene	0	1.58
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): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 06-JUL-17 17:44

GEL Data File: EXP0706014.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
Nitroglycerin	0	0
PETN	0	.97
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	7.71
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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 06-JUL-17 21:43

GEL Data File: EXP0706021.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	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 06-JUL-17 23:26

GEL Data File: EXP0706024.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	.87
4-Amino-2,6-dinitrotoluene	0	1.03
HMX	0	.88
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	1.92
RDX	0	.87
Tetryl	0	1.04
m-Dinitrobenzene	0	.99
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	1.04
tris(o-cresyl) phosphate	0	7.15
TATB	0	0
3,5-Dinitroaniline	0	.96
2,4-Diamino-6-nitrotoluene	0	.97
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	.83
TNX	0	.99
1,3,5-Trinitrobenzene	0	.86
2,4,6-Trinitrotoluene	0	1.19
2,4-Dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 07-JUL-17 02:50

GEL Data File: EXP0706030.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	10.65
TATB	0	0
3,5-Dinitroaniline	0	1.1
2,4-Diamino-6-nitrotoluene	0	1.2
2,6-Diamino-4-nitrotoluene	0	1.33
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	1.02
2,4,6-Trinitrotoluene	0	1.27
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	1.19
4-Amino-2,6-dinitrotoluene	0	1.32
HMX	0	1.11
Nitrobenzene	0	1.25
Nitroglycerin	0	1.42
PETN	0	2.8
RDX	0	.83
Tetryl	0	.78
m-Dinitrobenzene	0	.93
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): 2017-1720

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 07-JUL-17 03:59

GEL Data File: EXP0706032.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
DNX	0	0
MNX	0	.72
TNX	0	0
1,3,5-Trinitrobenzene	0	.85
2,4,6-Trinitrotoluene	0	1.07
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	1.03
4-Amino-2,6-dinitrotoluene	0	1.14
HMX	0	1
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	1.79
RDX	0	.85
Tetryl	0	1
m-Dinitrobenzene	0	.89
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	1.06
tris(o-cresyl) phosphate	0	6.27
TATB	0	0
3,5-Dinitroaniline	0	.92
2,4-Diamino-6-nitrotoluene	0	.99
2,6-Diamino-4-nitrotoluene	0	0

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1720
Work Order #: 425300

Sample ID	Client ID
425300001	CAWA-17-133280
425300002	CAWA-17-133308
425300003	CAWA-17-133305
425300004	CAWA-17-133333
425300005	CAWA-17-133349
425300006	CAWA-17-133350
1203813734	Method Blank (MB) ICP
1203813735	Laboratory Control Sample (LCS)
1203813738	425329003(CAWA-17-133330L) Serial Dilution (SD)
1203813736	425329003(CAWA-17-133330D) Sample Duplicate (DUP)
1203813737	425329003(CAWA-17-133330S) Matrix Spike (MS)
1203813739	Method Blank (MB) ICP-MS
1203813740	Laboratory Control Sample (LCS)
1203813743	425329003(CAWA-17-133330L) Serial Dilution (SD)
1203813741	425329003(CAWA-17-133330D) Sample Duplicate (DUP)
1203813742	425329003(CAWA-17-133330S) Matrix Spike (MS)
1203811040	Method Blank (MB) CVAA
1203811041	Laboratory Control Sample (LCS)
1203811046	425358001(NonSDGL) Serial Dilution (SD)
1203811042	425358001(NonSDGD) Sample Duplicate (DUP)
1203811044	425358001(NonSDGS) Matrix Spike (MS)

Sample Analysis

Samples 425300001,002,003,004,005 and 006 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1675026, 1675028, 1673861 and 1679789
Prep Batch :	1675025, 1675027 and 1673859
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 P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

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

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria. 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: 425329003 (CAWA-17-133330)-ICP and ICP-MS and 425358001 (NonSDG)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

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

Serial Dilution % Difference Statement

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information

Electronic Packaging Comment

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

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

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

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

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

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

higher of the two calculated values of Ca or Mg.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1720 GEL Work Order: 425300

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 05 JUL 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300001**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133280**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:02	061517W1-4	1673861

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300002**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133308**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:04	061517W1-4	1673861

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425300002

BASIS: As Received

DATE COLLECTED 09-JUN-17

CLIENT ID: CAWA-17-133308

LEVEL: Low

DATE RECEIVED 13-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	386	ug/L		68	200	200	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-39-3	Barium	166	ug/L		1	5	5	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-70-2	Calcium	13200	ug/L		50	200	200	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/28/17 19:19	062817-1	1675026
7439-89-6	Iron	169	ug/L		30	100	100	1	P	HSC	06/28/17 19:19	062817-1	1675026
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7439-95-4	Magnesium	4040	ug/L		110	300	300	1	P	HSC	06/28/17 19:19	062817-1	1675026
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/28/17 19:19	062817-1	1675026
7439-98-7	Molybdenum	0.622	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-02-0	Nickel	0.891	ug/L	J	0.6	2	2	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-09-7	Potassium	2740	ug/L		50	150	150	1	P	HSC	06/28/17 19:19	062817-1	1675026
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7631-86-9	Silica	39400	ug/L		53	213	213	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-23-5	Sodium	12500	ug/L		100	300	300	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-24-6	Strontium	87.5	ug/L		1	5	5	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-61-1	Uranium	0.169	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/27/17 14:13	170627-2	1675028
7440-62-2	Vanadium	3.02	ug/L	J	1	5	5	1	P	HSC	06/28/17 19:19	062817-1	1675026
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/28/17 19:19	062817-1	1675026

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425300002**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133308**LEVEL:** Low**DATE RECEIVED** 13-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	49.5	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
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5
1675026	1675025	SW846 3005A	50	mL	50	mL	06/19/17	SXW1
1675028	1675027	SW846 3005A	50	mL	50	mL	06/19/17	SXW1

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300003**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133305**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:06	061517W1-4	1673861

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300004**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133333**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:07	061517W1-4	1673861

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425300004

BASIS: As Received

DATE COLLECTED 09-JUN-17

CLIENT ID: CAWA-17-133333

LEVEL: Low

DATE RECEIVED 13-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	258	ug/L		68	200	200	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-39-3	Barium	224	ug/L		1	5	5	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-42-8	Boron	16.8	ug/L	J	15	50	50	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-70-2	Calcium	13900	ug/L		50	200	200	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/28/17 19:22	062817-1	1675026
7439-89-6	Iron	117	ug/L		30	100	100	1	P	HSC	06/28/17 19:22	062817-1	1675026
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7439-95-4	Magnesium	4300	ug/L		110	300	300	1	P	HSC	06/28/17 19:22	062817-1	1675026
7439-96-5	Manganese	3.48	ug/L	J	2	10	10	1	P	HSC	06/28/17 19:22	062817-1	1675026
7439-98-7	Molybdenum	0.578	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-02-0	Nickel	0.641	ug/L	J	0.6	2	2	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-09-7	Potassium	2790	ug/L		50	150	150	1	P	HSC	06/28/17 19:22	062817-1	1675026
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7631-86-9	Silica	38300	ug/L		53	213	213	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-23-5	Sodium	13400	ug/L		100	300	300	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-24-6	Strontium	94.4	ug/L		1	5	5	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-61-1	Uranium	0.151	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/27/17 14:16	170627-2	1675028
7440-62-2	Vanadium	2.33	ug/L	J	1	5	5	1	P	HSC	06/28/17 19:22	062817-1	1675026
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/28/17 19:22	062817-1	1675026

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425300004**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133333**LEVEL:** Low**DATE RECEIVED** 13-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	52.5	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
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5
1675026	1675025	SW846 3005A	50	mL	50	mL	06/19/17	SXW1
1675028	1675027	SW846 3005A	50	mL	50	mL	06/19/17	SXW1

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300005**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133349**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:09	061517W1-4	1673861

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425300005

BASIS: As Received

DATE COLLECTED 09-JUN-17

CLIENT ID: CAWA-17-133349

LEVEL: Low

DATE RECEIVED 13-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	HSC	06/28/17 19:25	062817-1	1675026
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-39-3	Barium	240	ug/L		1	5	5	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-42-8	Boron	17.3	ug/L	J	15	50	50	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-70-2	Calcium	16900	ug/L		50	200	200	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/28/17 19:25	062817-1	1675026
7439-89-6	Iron	36.3	ug/L	J	30	100	100	1	P	HSC	06/28/17 19:25	062817-1	1675026
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7439-95-4	Magnesium	4740	ug/L		110	300	300	1	P	HSC	06/28/17 19:25	062817-1	1675026
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/28/17 19:25	062817-1	1675026
7439-98-7	Molybdenum	0.874	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-09-7	Potassium	4810	ug/L		50	150	150	1	P	HSC	06/28/17 19:25	062817-1	1675026
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7631-86-9	Silica	39500	ug/L		53	213	213	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-23-5	Sodium	13700	ug/L		100	300	300	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-24-6	Strontium	113	ug/L		1	5	5	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-31-5	Tin	2.5	ug/L	J	2.5	10	10	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-61-1	Uranium	0.068	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/27/17 14:19	170627-2	1675028
7440-62-2	Vanadium	1.68	ug/L	J	1	5	5	1	P	HSC	06/28/17 19:25	062817-1	1675026
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/28/17 19:25	062817-1	1675026

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425300005**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133349**LEVEL:** Low**DATE RECEIVED** 13-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
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5
1675026	1675025	SW846 3005A	50	mL	50	mL	06/19/17	SXW1
1675028	1675027	SW846 3005A	50	mL	50	mL	06/19/17	SXW1

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425300006**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133350**LEVEL:** Low**DATE RECEIVED** 13-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	06/15/17 13:11	061517W1-4	1673861

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425300006

BASIS: As Received

DATE COLLECTED 09-JUN-17

CLIENT ID: CAWA-17-133350

LEVEL: Low

DATE RECEIVED 13-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	80.1	ug/L	J	68	200	200	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-39-3	Barium	237	ug/L		1	5	5	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-42-8	Boron	17.1	ug/L	J	15	50	50	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-70-2	Calcium	16400	ug/L		50	200	200	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/28/17 19:28	062817-1	1675026
7439-89-6	Iron	40.8	ug/L	J	30	100	100	1	P	HSC	06/28/17 19:28	062817-1	1675026
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7439-95-4	Magnesium	4660	ug/L		110	300	300	1	P	HSC	06/28/17 19:28	062817-1	1675026
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/28/17 19:28	062817-1	1675026
7439-98-7	Molybdenum	0.870	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-09-7	Potassium	4700	ug/L		50	150	150	1	P	HSC	06/28/17 19:28	062817-1	1675026
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-23-5	Sodium	13800	ug/L		100	300	300	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-24-6	Strontium	111	ug/L		1	5	5	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-61-1	Uranium	0.075	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/27/17 14:22	170627-2	1675028
7440-62-2	Vanadium	1.76	ug/L	J	1	5	5	1	P	HSC	06/28/17 19:28	062817-1	1675026
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/28/17 19:28	062817-1	1675026

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1720**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425300006**BASIS:** As Received**DATE COLLECTED** 09-JUN-17**CLIENT ID:** CAWA-17-133350**LEVEL:** Low**DATE RECEIVED** 13-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	60.2	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
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5
1675026	1675025	SW846 3005A	50	mL	50	mL	06/19/17	SXW1
1675028	1675027	SW846 3005A	50	mL	50	mL	06/19/17	SXW1

***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. 2017-1720

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>
1203811040	Mercury	0.067	ug/L	+/-1	U	AV	0.067	1
1203813734	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Calcium	105	ug/L	+/-200	J	P	50	200
	Boron	15	ug/L	+/-50	U	P	15	50
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Barium	1	ug/L	+/-5	U	P	1	5
	Aluminum	68	ug/L	+/-200	U	P	68	200
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203813739	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
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	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. 2017-1720 Client ID: WT_ESR-17-137413S

Contract: ESHL00114 Level: Low

Matrix: STORM WATER % Solids:

Sample ID: 425358001 Spike ID: 1203811044

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.15		0.067	U	2	107		AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1720 Client ID: CAWA-17-133330S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425329003 Spike ID: 1203813737

<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>
Tin	ug/L	75-125	496		2.5	U	500	99		P
Vanadium	ug/L	75-125	509		8.58		500	100		P
Zinc	ug/L	75-125	469		3.3	U	500	93.3		P
Aluminum	ug/L	75-125	4750		68	U	5000	94.9		P
Barium	ug/L	75-125	501		12.2		500	97.8		P
Beryllium	ug/L	75-125	497		1	U	500	99.3		P
Boron	ug/L	75-125	514		15	U	500	101		P
Calcium	ug/L	75-125	13100		8810		5000	86.3		P
Cobalt	ug/L	75-125	493		1	U	500	98.7		P
Copper	ug/L	75-125	510		3	U	500	102		P
Iron	ug/L	75-125	4870		30	U	5000	97		P
Magnesium	ug/L	75-125	7250		2560		5000	93.8		P
Manganese	ug/L	75-125	483		2	U	500	96.5		P
Potassium	ug/L	75-125	6390		1520		5000	97.4		P
Silica	ug/L		60300		57300		10700	28.2	N/A	P
Sodium	ug/L	75-125	18400		14000		5000	88.8		P
Strontium	ug/L	75-125	530		59.8		500	94.1		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1720 Client ID CAWA-17-133330S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425329003 Spike ID: 1203813742

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	50.4		1	U	50	99.5		MS
Arsenic	ug/L	75-125	50.5		2.53	J	50	95.9		MS
Cadmium	ug/L	75-125	50.2		0.3	U	50	100		MS
Chromium	ug/L	75-125	50.5		3	U	50	97.1		MS
Lead	ug/L	75-125	49.4		0.5	U	50	98.6		MS
Molybdenum	ug/L	75-125	53.8		2.55		50	103		MS
Nickel	ug/L	75-125	48.3		0.6	U	50	95.9		MS
Selenium	ug/L	75-125	49.8		2	U	50	99.3		MS
Silver	ug/L	75-125	49		0.3	U	50	98.1		MS
Thallium	ug/L	75-125	47.2		0.6	U	50	94.3		MS
Uranium	ug/L	75-125	49.2		0.915		50	96.6		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2017-1720**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** WT_ESR-17-137413D**Matrix:** STORM WATER**Level:** Low**Sample ID:** 425358001**Duplicate ID:** 1203811042**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
-6-
Duplicate Sample Summary

SDG No.: 2017-1720

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133330D

Matrix: WATER

Level: Low

Sample ID: 425329003

Duplicate ID: 1203813736

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-5	12.2		11.8		3.72		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	8810		8640		1.99		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	2560		2510		2.13		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1520		1560		2.4		P
Silica	ug/L	+/-20%	57300		55800		2.64		P
Sodium	ug/L	+/-20%	14000		13900		.781		P
Strontium	ug/L	+/-20%	59.8		58.4		2.37		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	8.58		8.34		2.83		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.: 2017-1720

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133330D

Matrix: WATER

Level: Low

Sample ID: 425329003

Duplicate ID: 1203813741

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	2.53 J		2.45 J		3.25		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	+/-20%	2.55		2.58		1.33		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	0.915		0.883		3.56		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1720

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>
1203811041	Mercury	ug/L	2	2.16		108	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1720

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>
1203813735								
	Aluminum	ug/L	5000	5240		105	80-120	P
	Barium	ug/L	500	535		107	80-120	P
	Beryllium	ug/L	500	532		106	80-120	P
	Boron	ug/L	500	540		108	80-120	P
	Calcium	ug/L	5000	5280		106	80-120	P
	Cobalt	ug/L	500	531		106	80-120	P
	Copper	ug/L	500	539		108	80-120	P
	Iron	ug/L	5000	5340		107	80-120	P
	Magnesium	ug/L	5000	5380		108	80-120	P
	Manganese	ug/L	500	532		106	80-120	P
	Potassium	ug/L	5000	5400		108	80-120	P
	Silica	ug/L	10700	11100		104	80-120	P
	Sodium	ug/L	5000	5450		109	80-120	P
	Strontium	ug/L	500	525		105	80-120	P
	Tin	ug/L	500	525		105	80-120	P
	Vanadium	ug/L	500	535		107	80-120	P
	Zinc	ug/L	500	504		101	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1720

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>
1203813740								
	Antimony	ug/L	50	49.8		99.6	80-120	MS
	Arsenic	ug/L	50	50.5		101	80-120	MS
	Cadmium	ug/L	50	50.1		100	80-120	MS
	Chromium	ug/L	50	56.2		112	80-120	MS
	Lead	ug/L	50	50.2		100	80-120	MS
	Molybdenum	ug/L	50	50.6		101	80-120	MS
	Nickel	ug/L	50	54		108	80-120	MS
	Selenium	ug/L	50	50.6		101	80-120	MS
	Silver	ug/L	50	50.1		100	80-120	MS
	Thallium	ug/L	50	48.7		97.3	80-120	MS
	Uranium	ug/L	50	49		98	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1720 Client ID WT_ESR-17-137413L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 425358001 Serial Dilution ID: 1203811046

<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

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1720

Client ID: CAWA-17-133330L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425329003

Serial Dilution ID: 1203813738

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	12.2		12	J	2.237			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	8810		8460		4.014		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	2560		2580		.488			P
Manganese	2	U	10	U				P
Potassium	1520		1530		.553			P
Silica	57300		54700		4.583		10	P
Sodium	14000		14500		3.791		10	P
Strontium	59.8		58.9		1.463		10	P
Tin	2.5	U	12.5	U				P
Vanadium	8.58		5.76	J	32.8			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. 2017-1720

Client ID: CAWA-17-133330L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425329003

Serial Dilution ID: 1203813743

<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	2.53	J	10	U	28.346			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	2.55		2.56		.589			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	.915		.885	J	3.279			MS

*Analytical Methods:

MS SW846 3005A/6020A

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1720
Work Order #: 425300**

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
425300001	CAWA-17-133280
425300003	CAWA-17-133305
425300006	CAWA-17-133350
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 samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1673690	Method:	WSP-CN(T)
Prep Batch :	1673689	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
425300001	CAWA-17-133280
425300003	CAWA-17-133305
425300006	CAWA-17-133350
1203810623	Method Blank (MB)
1203810624	Laboratory Control Sample (LCS)
1203810625	425300001(CAWA-17-133280) Sample Duplicate (DUP)
1203810627	425300001(CAWA-17-133280) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 19.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425300001 (CAWA-17-133280) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Sample1203810624 (LCS) was re-analyzed to verify the result.

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: 1673741

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
1203810741	Method Blank (MB)
1203810742	Laboratory Control Sample (LCS)
1203810743	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203810744	425079002(CAWA-17-133314) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425079002 (CAWA-17-133314) 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 1203810743 (CAWA-17-133314DUP), 1203810744 (CAWA-17-133314PS), 425300002 (CAWA-17-133308), 425300004 (CAWA-17-133333) and 425300005 (CAWA-17-133349) 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	425300		
	002	004	005
Chloride	2X	2X	2X

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203810743 (CAWA-17-133314DUP), 1203810744 (CAWA-17-133314PS), 425300002 (CAWA-17-133308), 425300004 (CAWA-17-133333) and 425300005 (CAWA-17-133349) 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
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
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
425300001	CAWA-17-133280
425300003	CAWA-17-133305
425300006	CAWA-17-133350
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), 1203811092 (CAWA-17-133286MS), 425300001 (CAWA-17-133280), 425300003 (CAWA-17-133305) and 425300006 (CAWA-17-133350) 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: 1673506

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
1203810164	Method Blank (MB)
1203810165	Laboratory Control Sample (LCS)
1203810166	Laboratory Control Sample Duplicate (LCSD)
1203810167	425075002(CAWA-17-133312) Sample Duplicate (DUP)
1203810168	425075002(CAWA-17-133312) 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.

LCS/LCSD Relative Percent Difference (RPD) Statement

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

Quality Control (QC) Designation

Sample 425075002 (CAWA-17-133312) 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 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
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
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: 1673670

Method: TDS

Sample Analysis

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

Sample ID	Client ID
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
1203810569	Method Blank (MB)
1203810570	Laboratory Control Sample (LCS)
1203810572	425300002(CAWA-17-133308) 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 425300002 (CAWA-17-133308) 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: 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
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
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: 1675817 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
1203815599	Laboratory Control Sample (LCS)
1203815600	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-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 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

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

Sample	Analyte	Value
1203815600 (CAWA-17-133330DUP)	pH	Received 13-JUN-17, out of holding 08-JUN-17
425300002 (CAWA-17-133308)	pH	Received 13-JUN-17, out of holding 09-JUN-17
425300004 (CAWA-17-133333)	pH	Received 13-JUN-17, out of holding 09-JUN-17
425300005 (CAWA-17-133349)	pH	Received 13-JUN-17, out of holding 09-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: 1675815 **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
425300002	CAWA-17-133308
425300004	CAWA-17-133333
425300005	CAWA-17-133349
1203815591	Laboratory Control Sample (LCS)
1203815593	425329003(CAWA-17-133330) Sample Duplicate (DUP)
1203815594	425329003(CAWA-17-133330) 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 425329003 (CAWA-17-133330) 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:

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Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1720 GEL Work Order: 425300


The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Aubrey Kingsbury

Date: 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: 2017-1720

Client Sample ID: CAWA-17-133280
Sample ID: 425300001
Matrix: W
Collect Date: 09-JUN-17 13:45
Receive Date: 13-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		1.84	0.330	1.00	mg/L		1	TSM	06/22/17	0209	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/15/17	1105	1673690	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0772	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	0955	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/15/17	1041	1673689
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: 2017-1720

Client Sample ID: CAWA-17-133308
Sample ID: 425300002
Matrix: W
Collect Date: 09-JUN-17 13:45
Receive Date: 13-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	MXL2	06/13/17	2201	1673741	1
Fluoride		0.128	0.033	0.100	mg/L		1					
Sulfate		7.83	0.133	0.400	mg/L		1					
Chloride		13.8	0.134	0.400	mg/L		2	MXL2	06/14/17	1544	1673741	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.061	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1138	1673875	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.849	0.017	0.050	mg/L		1	AXH3	06/14/17	0816	1673506	4
PO4 "As Received"												
Phosphorus, Total as P		0.0881	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1031	1673877	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		121	3.40	14.3	mg/L			KLP1	06/15/17	1544	1673670	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		52.4	1.45	4.00	mg/L			RXB5	06/22/17	1829	1675815	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		175	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0906	1679220	8
PH "As Received"												
pH at Temp 19.1C	H	7.36	0.010	0.100	SU		1	RXB5	06/22/17	1826	1675817	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: 2017-1720

Client Sample ID: CAWA-17-133308
Sample ID: 425300002

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

Client SDG: 2017-1720

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-17-133305

Project: ESHL00114

Sample ID: 425300003

Client ID: ARSL004

Matrix: W

Collect Date: 09-JUN-17 13:00

Receive Date: 13-JUN-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		1.84	0.330	1.00	mg/L		1	TSM	06/22/17	0256	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/15/17	1112	1673690	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0648	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	0956	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/15/17	1041	1673689
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: 2017-1720

Client Sample ID: CAWA-17-133333
Sample ID: 425300004
Matrix: W
Collect Date: 09-JUN-17 13:00
Receive Date: 13-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	MXL2	06/13/17	2230	1673741	1
Fluoride		0.129	0.033	0.100	mg/L		1					
Sulfate		8.02	0.133	0.400	mg/L		1					
Chloride		13.5	0.134	0.400	mg/L		2	MXL2	06/14/17	1613	1673741	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0379	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1138	1673875	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.773	0.017	0.050	mg/L		1	AXH3	06/14/17	0817	1673506	4
PO4 "As Received"												
Phosphorus, Total as P		0.0952	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1032	1673877	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		131	3.40	14.3	mg/L			KLP1	06/15/17	1544	1673670	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		52.8	1.45	4.00	mg/L			RXB5	06/22/17	1831	1675815	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		176	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0909	1679220	8
PH "As Received"												
pH at Temp 18.8C	H	7.32	0.010	0.100	SU		1	RXB5	06/22/17	1829	1675817	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

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

Client SDG: 2017-1720

Client Sample ID: CAWA-17-133333
Sample ID: 425300004

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: 2017-1720

Client Sample ID: CAWA-17-133349
Sample ID: 425300005
Matrix: W
Collect Date: 09-JUN-17 10:00
Receive Date: 13-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	MXL2	06/13/17	2259	1673741	1
Fluoride		0.122	0.033	0.100	mg/L		1					
Sulfate		6.83	0.133	0.400	mg/L		1					
Chloride		16.6	0.134	0.400	mg/L		2	MXL2	06/14/17	1642	1673741	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.085	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1139	1673875	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite	U	ND	0.017	0.050	mg/L		1	AXH3	06/14/17	0818	1673506	4
PO4 "As Received"												
Phosphorus, Total as P		0.073	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1039	1673877	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		134	3.40	14.3	mg/L			KLP1	06/15/17	1544	1673670	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		73.4	1.45	4.00	mg/L			RXB5	06/22/17	1837	1675815	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		212	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0910	1679220	8
PH "As Received"												
pH at Temp 19.1C	H	7.33	0.010	0.100	SU		1	RXB5	06/22/17	1833	1675817	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: 2017-1720

Client Sample ID: CAWA-17-133349
Sample ID: 425300005

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: 2017-1720

Client Sample ID: CAWA-17-133350
Sample ID: 425300006
Matrix: W
Collect Date: 09-JUN-17 10:00
Receive Date: 13-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		2.96	0.330	1.00	mg/L		1	TSM	06/22/17	0517	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/15/17	1113	1673690	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	0957	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/15/17	1041	1673689
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

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: July 7, 2017

Page 1 of 6

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

Contact: Mr. Keith Greene

Workorder: 425300

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	1673690										
QC1203810625	425300001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	06/15/17	11:06
QC1203810624	LCS										
Cyanide, Total	50.0			52.8	ug/L			106 (90%-110%)		06/15/17	11:04
QC1203810623	MB										
Cyanide, Total			U	ND	ug/L					06/15/17	10:57
QC1203810627	425300001	MS									
Cyanide, Total	100	U	ND	110	ug/L			110 (90%-110%)		06/15/17	11:07

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QC Summary

Workorder: 425300

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673741										
QC1203810743	425079002	DUP									
Bromide	J	0.0867	J	0.0848	mg/L	2.22	^	(+/-0.200)	MXL2	06/13/17	21:03
Chloride		13.8		13.8	mg/L	0.084		(0%-20%)		06/14/17	14:46
Fluoride		0.171		0.169	mg/L	1	^	(+/-0.100)		06/13/17	21:03
Sulfate		6.08		5.94	mg/L	2.35		(0%-20%)			
QC1203810742	LCS										
Bromide	1.25			1.26	mg/L			101	(80%-120%)	06/13/17	20:06
Chloride	5.00			4.72	mg/L			94.3	(80%-120%)		
Fluoride	2.50			2.45	mg/L			97.9	(80%-120%)		
Sulfate	10.0			9.78	mg/L			97.8	(80%-120%)		
QC1203810741	MB										
Bromide			U	ND	mg/L					06/13/17	19:37
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203810744	425079002	PS									
Bromide	1.25	J	0.0867	1.31	mg/L			97.8	(75%-125%)	06/13/17	21:32
Chloride	5.00		6.91	12.4	mg/L			110	(75%-125%)	06/14/17	15:15

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QC Summary

Workorder: 425300

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673741										
Fluoride	2.50	0.171		2.57	mg/L		96	(75%-125%)	MXL2	06/13/17	21:32
Sulfate	10.0	6.08		16.3	mg/L		102	(75%-125%)			
Nutrient Analysis											
Batch	1673506										
QC1203810167	425075002	DUP									
Nitrogen, Nitrate/Nitrite		0.593		0.591	mg/L	0.338		(0%-20%)	AXH3	06/14/17	08:04
QC1203810165	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.985	mg/L		98.5	(90%-110%)		06/14/17	08:01
QC1203810166	LCSD										
Nitrogen, Nitrate/Nitrite	1.00			1.00	mg/L	1.51	100	(0%-20%)		06/14/17	08:02
QC1203810164	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					06/14/17	07:59
QC1203810168	425075002	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.593		1.55	mg/L		95.7	(90%-110%)		06/14/17	08:05
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

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QC Summary

Workorder: 425300

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
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
QC1203811105	LCS										
Phosphorus, Total as P	1.00			0.975	mg/L			97.5 (80%-124%)		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
Solids Analysis											
Batch	1673670										
QC1203810572	425300002	DUP									
Total Dissolved Solids		121		123	mg/L	1.17		(0%-5%)	KLP1	06/15/17	15:44
QC1203810570	LCS										
Total Dissolved Solids	300			296	mg/L			98.6 (95%-105%)		06/15/17	15:44

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	1673670										
QC1203810569	MB										
Total Dissolved Solids			U	ND	mg/L				KLP1	06/15/17	15:44
Titration and Ion Analysis											
Batch	1675815										
QC1203815593	425329003	DUP									
Alkalinity, Total as CaCO3			60.4	60.6	mg/L	0.331		(0%-20%)	RXB5	06/22/17	18:42
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203815591	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)		06/22/17	18:02
QC1203815594	425329003	MS									
Alkalinity, Total as CaCO3	100		60.4	165	mg/L		105	(80%-120%)		06/22/17	18:43
Batch	1675817										
QC1203815600	425329003	DUP									
pH		H	8.21	H	8.19	SU	0.244	(0%-5%)	RXB5	06/22/17	18:42
QC1203815599	LCS										
pH	7.00			7.00	SU		100	(99%-101%)		06/22/17	18:25
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.

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

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

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

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

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

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