

The order of this data package is as follows:

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

Comments:

General Engineering Charleston SC		Chain of Custody/Analysis Request														COC/Lab Request #: 2018-1705 Page 1 of 1																																																
Client Contact:		Lab Agreement #: <u>ADEP</u>			Site Name: Los Alamos National Laboratory														Rad Screening Info: <u>Location, no</u> Lab Reporting Limit Type: Method Detection Limit																																													
		Project Number: <u>ADEP</u>			<table border="1"><tr><td>MSGP-Hg</td><td>WSP-8260B-VOA</td><td>WSP-8270C-SVOA</td><td>WSP-8330B-NIMED HEXMOD</td><td>WSP-All Metals</td><td>WSP-CN(T)</td><td>WSP-GENINORG+PerChlorate</td><td>WSP-GrossA/B</td><td>WSP-NH3+NO3/NO2+PO4</td><td>WSP-RAD</td><td>WSP-TKN+TOC</td></tr><tr><td colspan="11"></td></tr><tr><td colspan="11"></td></tr><tr><td colspan="11"></td></tr></table>																MSGP-Hg	WSP-8260B-VOA	WSP-8270C-SVOA	WSP-8330B-NIMED HEXMOD	WSP-All Metals	WSP-CN(T)	WSP-GENINORG+PerChlorate	WSP-GrossA/B	WSP-NH3+NO3/NO2+PO4	WSP-RAD	WSP-TKN+TOC																																	
MSGP-Hg	WSP-8260B-VOA	WSP-8270C-SVOA	WSP-8330B-NIMED HEXMOD	WSP-All Metals																	WSP-CN(T)	WSP-GENINORG+PerChlorate	WSP-GrossA/B	WSP-NH3+NO3/NO2+PO4	WSP-RAD	WSP-TKN+TOC																																						
		Analysis Turnaround Time:																																																														
		24 Hour - <input type="checkbox"/> Other - <input type="checkbox"/>																																																														
		7 Days - <input type="checkbox"/>																																																														
		14 Days - <input type="checkbox"/>																																																														
		21 Days - <input type="checkbox"/>																																																														
		28 Days - <input checked="" type="checkbox"/>																																																														
Field Sample ID	Sample Date	Sample Time	Sample Matrix	MSGP-Hg	WSP-8260B-VOA	WSP-8270C-SVOA	WSP-8330B-NIMED HEXMOD	WSP-All Metals	WSP-CN(T)	WSP-GENINORG+PerChlorate	WSP-GrossA/B	WSP-NH3+NO3/NO2+PO4	WSP-RAD	WSP-TKN+TOC																																																		
CAWA-18-15	Feb 10 2018	11:08	W					1		1		1																																																				
CAWA-18-16	Feb 10 2018	11:08	W	1	2	2	3		1		1		1	1																																																		
CAWA-18-98	Feb 10 2018	11:08	W		2																																																											
CAWA-18-50	Feb 9 2018	14:36	W					1		1		1																																																				
CAWA-18-51	Feb 9 2018	14:36	W	1	2	2	3		1		1		1	1																																																		
CAWA-18-52	Feb 9 2018	14:36	W																																																													
Special Instructions:																																																																
Relinquished by: <u>Ranee Oshoff</u>				Print Name: <u>Ranee Oshoff</u>				Date/Time: <u>2/13/18</u>				Received by:				Print Name:		Date/Time:																																														
Relinquished by:				Print Name:				Date/Time:				Received by:				Print Name:		Date/Time:																																														
Relinquished by:				Print Name:				Date/Time:				Received by:				Print Name:		Date/Time:																																														

[illegible]

[illegible]

Sampling Plan ID/Name: 11669 R-256, CdV-16-02656COC: 2018-1705

TEST – Explosives		YES	NO
Samples collected from a WFO area? (TAs -08, 09, 11, 14, 15, 16, 22, 36, 37, 39, 40, and 49)		<input checked="" type="checkbox"/>	
Field Test for Explosives Results		YES	NO
HE SPOT test result positive. If YES - Do not transport.			<input checked="" type="checkbox"/>

TEST – Chemical Preservation		YES	NO
Samples are chemically preserved?		<input checked="" type="checkbox"/>	
Field Team Member Statement		YES	NO
Chemical preservation exceeds limits given 40 CFR 136, Table II – Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship.			<input checked="" type="checkbox"/>

TEST – Field Screen			YES	NO
The sample has field screening measurements of alpha activity and beta activity?				<input checked="" type="checkbox"/>
Sample Activity (dpm/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO
Alpha detectable	AND Alpha $\geq 160,000$	AT TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49		
Alpha ≥ 125	AND Alpha $\geq 1,250,000$	AT other locations		
Beta $\geq 1,500$	AND Beta $\geq 15,000,000$	AT any location		
The sample Alpha $\geq 16,000,000$ dpm*g/100cm ² or Beta $\geq 160,000,000$ dpm*g/100cm ² . If YES – Do not ship.				
On the external surface of the sample container, alpha activity ≥ 24 dpm/cm ² , beta activity ≥ 240 dpm/cm ² , or surface activity ≥ 0.5 mR/hr. If YES – Do not ship.				
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package – Limited Quantity of Material – UN2910, based on field screening measurements of alpha and beta activity.				

TEST - Location			YES	NO
Prior analytical measurements of radioactive isotopes are available?			<input checked="" type="checkbox"/>	
Sample Activity (pCi/g)	Shipment Activity (pCi)		YES	NO
• Am-241 ≥ 27 pCi/g	AND	Am-241 $\geq 270,000$ pCi Total		
• Cs-137 ≥ 270 pCi/g	AND	Cs-137 $\geq 270,000$ pCi Total		
• Pu-238 ≥ 27 pCi/g	AND	Pu-238 $\geq 270,000$ pCi Total		
• Pu-239/240 ≥ 27 pCi/g	AND	Pu-239/240 $\geq 270,000$ pCi Total		
• Th-228 ≥ 27 pCi/g	AND	Th-228 $\geq 270,000$ pCi Total		
• U-234 ≥ 270 pCi/g	AND	U-234 $\geq 1,600,000,000$ pCi Total		
• U-238 ≥ 270 pCi/g	AND	U-238 \geq unlimited		
• H-3 $\geq 27,000,000$ pCi/g	AND	H-3 $\geq 27,000,000,000$ pCi Total		
Am-241, Pu-238, Pu-239/240, or Th-228 $\geq 27,000,000$ pCi; or Cs-137 $\geq 270,000,000$ pCi or U-234 $\geq 160,000,000$ pCi; or H-3 ≥ 1 Ci. If YES – Do not ship.				
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package – Limited Quantity of Material – UN2910, based on prior analytical measurements of radioactive isotopes.				

TEST – AK		YES	NO
The shippers documented knowledge of the sample positively identifies appropriate labeling.			<input checked="" type="checkbox"/>
Documented Field Team Member Statement		YES	NO
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package – Limited Quantity of Material – UN2910</i> , and the sample is submitted to ARS or RP for hazard classification analysis.			<input checked="" type="checkbox"/>

These samples do not meet the criteria for classification in any hazard class according to regulation OSHA 29 CFR 1910.1200. The sample(s) contained in this shipment have been assigned a tentative proper DOT shipping name, hazard class, identification number, and packing group, based on the shipper's knowledge of the sample:

Hazard Assessment Completed By:	Date/Time
(Printed Name) <u>Tanya VanderVliet</u>	<u>2-13-18</u>
(Signature) <u>Tanya VanderVliet</u>	<u>1301</u>

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) <u>Ranee Onstott</u>	<u>2/13/18</u>
(Signature) <u>Ranee Onstott</u>	<u>1301</u>

ER-SOP-10094, R1, Attachment

DATA VALIDATION REPORT

Chain Of Custody No. 2018-1705

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
443794	EPA:120.1					
443794	EPA:120.1	1				
443794	EPA:150.1					
443794	EPA:150.1	1				
443794	EPA:160.1					
443794	EPA:160.1	1				
443794	EPA:170.0					
443794	EPA:170.0	2		1		
443794	EPA:245.2					
443794	EPA:245.2	2				
443794	EPA:300.0					
443794	EPA:300.0	1				
443794	EPA:310.1					
443794	EPA:310.1	1				
443794	EPA:335.4					
443794	EPA:335.4	1				
443794	EPA:350.1					
443794	EPA:350.1	1				
443794	EPA:351.2					
443794	EPA:351.2	1				
443794	EPA:353.2					
443794	EPA:353.2	1				
443794	EPA:365.4					
443794	EPA:365.4	1				
443794	EPA:900					
443794	EPA:900	1				
443794	EPA:901.1					
443794	EPA:901.1	1				
443794	EPA:905.0					
443794	EPA:905.0	1				
443794	HASL-300:AM-241					

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DATA VALIDATION REPORT

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
443794	HASL-300:AM-241	1				
443794	HASL-300:ISOPU					
443794	HASL-300:ISOPU	1				
443794	HASL-300:ISOU					
443794	HASL-300:ISOU	1				
443794	SM:A2340B					
443794	SM:A2340B	1				
443794	SW-846:6010C					
443794	SW-846:6010C	1				
443794	SW-846:6020					
443794	SW-846:6020	1				
443794	SW-846:6850					
443794	SW-846:6850	1				
443794	SW-846:8260B					
443794	SW-846:8260B	1		1		
443794	SW-846:8270D					
443794	SW-846:8270D	1				
443794	SW-846:8330B					
443794	SW-846:8330B	1				
443794	SW-846:9060					
443794	SW-846:9060	1				

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
443794	EPA:120.1	1740142	1740142	1										1			2				
443794	EPA:150.1	1739668	1739668	1										1			1				
443794	EPA:160.1	1739392	1739392	1					1					1			1				
443794	EPA:170.0	NA	NA	2		1															
443794	EPA:245.2	1739409	1739408	2					1	1				1			1				
443794	EPA:300.0	1740419	1740419	1					1					1			1				

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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
443794	EPA:310.1	1739667	1739667	1						1				1				1			
443794	EPA:335.4	1740052	1740051	1					1	1				1				1			
443794	EPA:350.1	1740091	1740090	1					1	1				1				1			
443794	EPA:351.2	1742072	1742071	1					1	1				1				1			
443794	EPA:353.2	1740472	1740472	1					1					1				1			
443794	EPA:365.4	1740095	1740094	1					1	1				1				1			
443794	EPA:900	1740250	1740250	1					1	1	1			1				1			
443794	EPA:901.1	1739356	1739356	1					1					1				1			
443794	EPA:905.0	1740247	1740247	1					1	1				1				1			
443794	HASL-300:AM-241	1739284	1739284	1					1					1				1			
443794	HASL-300:ISOPU	1739285	1739285	1					1					1				1			
443794	HASL-300:ISOU	1739286	1739286	1					1					1				1			
443794	SM:A2340B	1746508	1746508	1																	
443794	SW-846:6010C	1739215	1739214	1					1	1				1				1			
443794	SW-846:6020	1739222	1739221	1					1	1				1				1			
443794	SW-846:6850	1739916	1739915	1					1	1	1			1							
443794	SW-846:8260B	1740473	1740473	1		1			1					2							
443794	SW-846:8270D	1739303	1739302	1					1	1	1			1							
443794	SW-846:8330B	1739397	1739396	1					1	1	1			1							
443794	SW-846:9060	1739763	1739763	1					1					1				1			

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-15	443794001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-45	1203974210	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-50	1203974211	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-50	443794005	TEST	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203974209	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-15	443794001	REG	1	0	0	0

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DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-3	1203972902	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-50	443794005	TEST	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203972901	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-15	443794001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-50	1203972171	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-50	443794005	TEST	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203972170	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203972169	MB	1	0	0	0
EPA:170.0	VOC	CAWA-18-15	443794001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-18-16	443794002	REG	1	0	0	0
EPA:170.0	VOC	CAWA-18-50	443794005	TEST	1	0	0	0
EPA:170.0	VOC	CAWA-18-51	443794007	TEST	1	0	0	0
EPA:170.0	VOC	CAWA-18-98	443794004	FTB	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-15	1203972222	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-15	1203972224	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-18-15	443794001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-16	443794002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-50	443794005	TEST	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-51	443794006	TEST	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203972220	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203972219	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-15	443794001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-50	443794005	TEST	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-9	1203974914	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203974913	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203974912	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-15	443794001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-3	1203972897	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-3	1203972899	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-50	443794005	TEST	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203972896	LCS	0	0	1	0
EPA:335.4	INORGANIC	CAWA-18-16	443794002	REG	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-46	1203974006	DUP	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-46	1203974010	MS	0	0	1	0
EPA:335.4	INORGANIC	CAWA-18-51	443794006	TEST	1	0	0	0
EPA:335.4	INORGANIC	LCS	1203974005	LCS	0	0	1	0
EPA:335.4	INORGANIC	MB	1203974004	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-15	443794001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-45	1203974093	DUP	1	0	0	0

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DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-45	1203974095	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-50	443794005	TEST	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203974092	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203974091	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-16	443794002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-46	1203978460	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-46	1203978461	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-51	443794006	TEST	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203978459	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203978458	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-15	443794001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-50	443794005	TEST	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-9	1203975072	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203975071	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203975070	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-15	443794001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-50	443794005	TEST	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-9	1203974106	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-9	1203974108	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203974104	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203974103	MB	1	0	0	0
EPA:900	RAD	CAWA-18-16	443794002	REG	2	0	0	0
EPA:900	RAD	CAWA-18-20	1203974522	DUP	2	0	0	0
EPA:900	RAD	CAWA-18-20	1203974523	MS	0	0	2	0
EPA:900	RAD	CAWA-18-20	1203974524	MSD	0	0	2	0
EPA:900	RAD	CAWA-18-51	443794006	TEST	2	0	0	0
EPA:900	RAD	LCS	1203974525	LCS	0	0	2	0
EPA:900	RAD	MB	1203974521	MB	2	0	0	0
EPA:901.1	RAD	CAWA-18-10	1203972047	DUP	5	0	0	0
EPA:901.1	RAD	CAWA-18-16	443794002	REG	5	0	0	0
EPA:901.1	RAD	CAWA-18-51	443794006	TEST	5	0	0	0
EPA:901.1	RAD	LCS	1203972048	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203972046	MB	5	0	0	0
EPA:905.0	RAD	CAWA-18-16	443794002	REG	1	0	0	0
EPA:905.0	RAD	CAWA-18-46	1203974511	DUP	1	0	0	0
EPA:905.0	RAD	CAWA-18-46	1203974512	MS	0	0	1	0
EPA:905.0	RAD	CAWA-18-51	443794006	TEST	1	0	0	0
EPA:905.0	RAD	LCS	1203974513	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203974510	MB	1	0	0	0

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Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
HASL-300:AM-241	RAD	CAWA-18-10	1203971867	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-16	443794002	REG	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-51	443794006	TEST	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203971868	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203971866	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-10	1203971870	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-16	443794002	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-51	443794006	TEST	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203971871	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203971869	MB	2	0	0	0
HASL-300:ISOU	RAD	CAWA-18-10	1203971873	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-16	443794002	REG	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-51	443794006	TEST	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203971874	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203971872	MB	3	0	0	0
SM:A2340B	INORGANIC	CAWA-18-15	443794001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-18-50	443794005	TEST	1	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-15	443794001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-50	443794005	TEST	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-9	1203971712	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-9	1203971713	MS	0	0	17	0
SW-846:6010C	INORGANIC	LCS	1203971711	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203971710	MB	17	0	0	0
SW-846:6020	INORGANIC	CAWA-18-15	443794001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-50	443794005	TEST	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-9	1203971727	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-9	1203971728	MS	0	0	11	0
SW-846:6020	INORGANIC	LCS	1203971726	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203971725	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-15	443794001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-50	443794005	TEST	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-9	1203973626	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-9	1203973627	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203973625	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203973624	MB	1	0	0	0
SW-846:8260B	VOC	CAWA-18-16	443794002	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-18-51	443794006	TEST	80	3	0	0
SW-846:8260B	VOC	CAWA-18-98	443794004	FTB	80	3	0	0
SW-846:8260B	VOC	LCS	1203975098	LCS	0	3	70	0

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DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8260B	VOC	LCS	1203975099	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203975095	MB	80	3	0	0
SW-846:8270D	SVOC	CAWA-18-10	1203971929	MS	0	6	76	0
SW-846:8270D	SVOC	CAWA-18-10	1203971930	MSD	0	6	76	0
SW-846:8270D	SVOC	CAWA-18-16	443794002	REG	80	6	0	0
SW-846:8270D	SVOC	CAWA-18-51	443794006	TEST	80	6	0	0
SW-846:8270D	SVOC	LCS	1203971928	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203971927	MB	80	6	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-10	1203972180	MS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-10	1203972181	MSD	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-16	443794003	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-51	443794007	TEST	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203972179	LCS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	MB	1203972178	MB	23	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-16	1203973206	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-16	443794002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-51	443794006	TEST	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203973204	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203973203	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203971710	METHOD BLANK	SW-846:6010C	W	Potassium	54.5	J	ug/L	150

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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	1203974103	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.035	J	mg/L	0.050
CAWA-18-98	443794004	TRIP BLANK	EPA:170.0	W	Temperature	4		Deg C	

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-18-15	1203974103	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.035	mg/L	0.0609		0.050	Y	5	100	Y
CAWA-18-50	1203974103	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.035	mg/L	0.0978		0.050	Y	5	100	Y
CAWA-18-15	1203971710	METHOD BLANK	SW-846:6010C	Potassium	54.5	ug/L	2420		150	Y	5	100	Y
CAWA-18-50	1203971710	METHOD BLANK	SW-846:6010C	Potassium	54.5	ug/L	2890		150	Y	5	100	Y

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?

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DATA VALIDATION REPORT

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Paramter 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
CDV-16-02656	2018-1705	CAWA-18-15	REG	INIT	INORGANIC	SW-846:6010C	Potassium		J+	I4a	Y	2420	ug/L	2.42	mg/L			W	02/10/2018		1739215	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-15	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0609	mg/L	0.0609	mg/L			W	02/10/2018		1740095	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00359	pCi/L	0.00359	pCi/L	0.0303	0.00802	W	02/10/2018		1739284	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.262	pCi/L	0.262	pCi/L	4.77	1.36	W	02/10/2018		1739356	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	2.38	pCi/L	2.38	pCi/L	5.12	1.19	W	02/10/2018		1739356	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-1.49	pCi/L	-1.49	pCi/L	7.29	2.93	W	02/10/2018		1739356	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	-0.00251	pCi/L	-0.00251	pCi/L	0.0435	0.00831	W	02/10/2018		1739285	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.00501	pCi/L	0.00501	pCi/L	0.0351	0.00709	W	02/10/2018		1739285	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-4.71	pCi/L	-4.71	pCi/L	56.4	15.2	W	02/10/2018		1739356	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.748	pCi/L	0.748	pCi/L	4.59	1.18	W	02/10/2018		1739356	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.0843	pCi/L	-0.0843	pCi/L	0.489	0.134	W	02/10/2018		1740247	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	HASL-300:ISOU	Uranium-234	U	U	R5	N	0.113	pCi/L	0.113	pCi/L	0.173	0.0258	W	02/10/2018		1739286	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0316	pCi/L	0.0316	pCi/L	0.0975	0.0156	W	02/10/2018		1739286	VAL	Y
CDV-16-02656	2018-1705	CAWA-18-16	REG	INIT	RAD	HASL-300:ISOU	Uranium-238	U	U	R5	N	0.0425	pCi/L	0.0425	pCi/L	0.0883	0.0169	W	02/10/2018		1739286	VAL	Y
R-25b	2018-1705	CAWA-18-50	TEST	INIT	INORGANIC	SW-846:6010C	Potassium		J+	I4a	Y	2890	ug/L	2.89	mg/L			W	02/09/2018		1739215	VAL	Y
R-25b	2018-1705	CAWA-18-50	TEST	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0978	mg/L	0.0978	mg/L			W	02/09/2018		1740095	VAL	Y
R-25b	2018-1705	CAWA-18-51	TEST	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0	pCi/L	0	pCi/L	0.039	0.0073	W	02/09/2018		1739284	VAL	Y

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DATA VALIDATION REPORT

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-25b	2018-1705	CAWA-18-51	TEST	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-0.667	pCi/L	-0.667	pCi/L	4.10	1.20	W	02/09/2018		1739356	VAL	Y
R-25b	2018-1705	CAWA-18-51	TEST	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	0.483	pCi/L	0.483	pCi/L	4.11	1.10	W	02/09/2018		1739356	VAL	Y
R-25b	2018-1705	CAWA-18-51	TEST	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-2.08	pCi/L	-2.08	pCi/L	7.08	2.05	W	02/09/2018		1739356	VAL	Y
R-25b	2018-1705	CAWA-18-51	TEST	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0	pCi/L	0	pCi/L	0.0376	0.00967	W	02/09/2018		1739285	VAL	Y
R-25b	2018-1705	CAWA-18-51	TEST	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.0151	pCi/L	-0.0151	pCi/L	0.0303	0.00891	W	02/09/2018		1739285	VAL	Y
R-25b	2018-1705	CAWA-18-51	TEST	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-18.6	pCi/L	-18.6	pCi/L	58.6	16.7	W	02/09/2018		1739356	VAL	Y
R-25b	2018-1705	CAWA-18-51	TEST	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	-0.0395	pCi/L	-0.0395	pCi/L	4.74	1.25	W	02/09/2018		1739356	VAL	Y
R-25b	2018-1705	CAWA-18-51	TEST	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.105	pCi/L	-0.105	pCi/L	0.480	0.129	W	02/09/2018		1740247	VAL	Y
R-25b	2018-1705	CAWA-18-51	TEST	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0542	pCi/L	0.0542	pCi/L	0.126	0.0223	W	02/09/2018		1739286	VAL	Y

Reason Code

Description

I4	the sample result is =<5x the concentration of related analyte in the method blank.
I4a	The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x
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.
R5	Analyte is not detected because the amount reported is less than the MDC.
U_LAB	The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-15	CDV-16-02656	REG	EPA:120.1	0	1
CAWA-18-15	CDV-16-02656	REG	EPA:150.1	0	1
CAWA-18-15	CDV-16-02656	REG	EPA:160.1	0	1
CAWA-18-15	CDV-16-02656	REG	EPA:170.0	0	1
CAWA-18-15	CDV-16-02656	REG	EPA:245.2	0	1
CAWA-18-15	CDV-16-02656	REG	EPA:300.0	0	4
CAWA-18-15	CDV-16-02656	REG	EPA:310.1	0	2
CAWA-18-15	CDV-16-02656	REG	EPA:350.1	0	1

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DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-15	CDV-16-02656	REG	EPA:353.2	0	1
CAWA-18-15	CDV-16-02656	REG	EPA:365.4	0	1
CAWA-18-15	CDV-16-02656	REG	SM:A2340B	0	1
CAWA-18-15	CDV-16-02656	REG	SW-846:6010C	0	17
CAWA-18-15	CDV-16-02656	REG	SW-846:6020	0	11
CAWA-18-15	CDV-16-02656	REG	SW-846:6850	0	1
CAWA-18-16	CDV-16-02656	REG	EPA:170.0	0	1
CAWA-18-16	CDV-16-02656	REG	EPA:245.2	0	1
CAWA-18-16	CDV-16-02656	REG	EPA:335.4	0	1
CAWA-18-16	CDV-16-02656	REG	EPA:351.2	0	1
CAWA-18-16	CDV-16-02656	REG	EPA:900	0	2
CAWA-18-16	CDV-16-02656	REG	EPA:901.1	0	5
CAWA-18-16	CDV-16-02656	REG	EPA:905.0	0	1
CAWA-18-16	CDV-16-02656	REG	HASL-300:AM-241	0	1
CAWA-18-16	CDV-16-02656	REG	HASL-300:ISOPU	0	2
CAWA-18-16	CDV-16-02656	REG	HASL-300:ISOU	0	3
CAWA-18-16	CDV-16-02656	REG	SW-846:8260B	0	80
CAWA-18-16	CDV-16-02656	REG	SW-846:8270D	0	80
CAWA-18-16	CDV-16-02656	REG	SW-846:8330B	0	23
CAWA-18-16	CDV-16-02656	REG	SW-846:9060	0	1
CAWA-18-50	R-25b	TEST	EPA:120.1	0	1
CAWA-18-50	R-25b	TEST	EPA:150.1	0	1
CAWA-18-50	R-25b	TEST	EPA:160.1	0	1
CAWA-18-50	R-25b	TEST	EPA:170.0	0	1
CAWA-18-50	R-25b	TEST	EPA:245.2	0	1
CAWA-18-50	R-25b	TEST	EPA:300.0	0	4
CAWA-18-50	R-25b	TEST	EPA:310.1	0	2
CAWA-18-50	R-25b	TEST	EPA:350.1	0	1
CAWA-18-50	R-25b	TEST	EPA:353.2	0	1
CAWA-18-50	R-25b	TEST	EPA:365.4	0	1
CAWA-18-50	R-25b	TEST	SM:A2340B	0	1
CAWA-18-50	R-25b	TEST	SW-846:6010C	0	17
CAWA-18-50	R-25b	TEST	SW-846:6020	0	11
CAWA-18-50	R-25b	TEST	SW-846:6850	0	1
CAWA-18-51	R-25b	TEST	EPA:170.0	0	1
CAWA-18-51	R-25b	TEST	EPA:245.2	0	1

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DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-51	R-25b	TEST	EPA:335.4	0	1
CAWA-18-51	R-25b	TEST	EPA:351.2	0	1
CAWA-18-51	R-25b	TEST	EPA:900	0	2
CAWA-18-51	R-25b	TEST	EPA:901.1	0	5
CAWA-18-51	R-25b	TEST	EPA:905.0	0	1
CAWA-18-51	R-25b	TEST	HASL-300:AM-241	0	1
CAWA-18-51	R-25b	TEST	HASL-300:ISOPU	0	2
CAWA-18-51	R-25b	TEST	HASL-300:ISOU	0	3
CAWA-18-51	R-25b	TEST	SW-846:8260B	0	80
CAWA-18-51	R-25b	TEST	SW-846:8270D	0	80
CAWA-18-51	R-25b	TEST	SW-846:8330B	0	23
CAWA-18-51	R-25b	TEST	SW-846:9060	0	1
CAWA-18-98	CDV-16-02656	FTB	EPA:170.0	0	1
CAWA-18-98	CDV-16-02656	FTB	SW-846:8260B	0	80



March 12, 2018

Ms. Nita Patel
Los Alamos National Laboratory
TA-00, SM1237, Rm104C
Los Alamos, New Mexico 87545

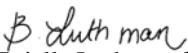
Re: LANL- WQH Water Samples
Work Order: 443794
SDG: 2018-1705

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on February 14, 2018, and analyzed for Explosives by LCMSMS, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. 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,


Brielle Luthman for
Valerie Davis
Project Manager

Chain of Custody: 2018-1705
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 443794
SDG: 2018-1705

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	5
Data Review Qualifier Flag Definition Sheet.....	12
Volatile Analysis.....	15
Case Narrative.....	16
Sample Data Summary.....	21
Quality Control Summary.....	31
Quality Control Data.....	49
Semi-Volatile Analysis.....	71
Case Narrative.....	72
Sample Data Summary.....	78
Quality Control Summary.....	85
Quality Control Data.....	96
Perchlorates by LCMSMS Analysis.....	109
Case Narrative.....	110
Sample Data Summary.....	116
Quality Control Summary.....	119
Quality Control Data.....	122
Explosives by LCMSMS Analysis.....	128
Case Narrative.....	129

Sample Data Summary.....	134
Quality Control Summary.....	139
Quality Control Data.....	143
Metals Analysis.....	173
Case Narrative.....	174
Sample Data Summary.....	180
Quality Control Summary.....	189
General Chem Analysis.....	204
Case Narrative.....	205
Sample Data Summary.....	235
Quality Control Summary.....	242
Radiological Analysis.....	249
Case Narrative.....	250
Sample Data Summary.....	264
Quality Control Summary.....	269

Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 443794
SDG # : 2018-1705**

March 12, 2018

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on February 14, 2018 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 temperatures were checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
443794001	CAWA-18-15
443794002	CAWA-18-16
443794003	CAWA-18-16
443794004	CAWA-18-98
443794005	CAWA-18-50
443794006	CAWA-18-51
443794007	CAWA-18-51

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, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry.

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.

B Luthman
Brielle Luthman for
Valerie Davis
Project Manager

List of current GEL Certifications as of 12 March 2018

State	Certification
Alaska	17-018
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	LA180011
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
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
Puerto Rico	SC00012
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-18-13
Utah NELAP	SC000122017-25
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

[illegible]

Special Instructions:

Relinquished by: <u>Lance Ostoff</u>	Print Name: <u>Lance Ostoff</u>	Date/Time: <u>2/13/15</u>	Received by: <u>[Signature]</u>	Print Name: <u>Lance Worsham</u>	Date/Time: <u>2/14/15</u>
Relinquished by:	Print Name:	Date/Time:	Received by:	Print Name:	Date/Time:
Relinquished by:	Print Name:	Date/Time:	Received by:	Print Name:	Date/Time:

SAMPLE RECEIPT & REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>443794</u>	
Received By: <u>ZKW</u>		Date Received: <u>2/14/18</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>See Attached</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	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): <u>0</u> <input checked="" type="checkbox"/> CPM/ mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input 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"/> Ice Packs Dry ice <input checked="" type="checkbox"/> None Other: _____ *all temperatures are recorded in Celsius
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR3-16</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input 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: _____ 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 <input checked="" type="checkbox"/> No _____ N/A _____ (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No _____ N/A _____ Sample ID's and containers affected: _____
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"/>	Sample ID's and containers affected: <u>All the NOP- Samples end w/- 0213</u>
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: <u>See Below</u>
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):

* We only rec'd 2 containers for CAWA-18-26 HEXP and one container for SVOA.
* only rec'd one vial for CAWA-18-104

PM (or PMA) review: Initials TMC Date 2/14/18 Page 1 of 2

CLL Laboratories LLC SAMPLE RECEIPT & REVIEW CONTINUATION FORM

Client: ESHL Received By: ZKW Date Received: 2/14/18 SDG/AR/COC/Work Order: 443794

Fed-ex

5908 1783 4970 -4°C

" " 4981 -4°C

" " 4960 -3°C

" " 4948 -4°C

" " 4992 -3°C

" " 4959 -3°C

" " 5006 -2°C

" " 4987 -12°C

PM (or PMA) review: Initials TMC Date 2/14/18 Page 2 of 2

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 13FEB18
ACTWGT: 61.0 LB MAN
CAD: 0014176/CAFE2916

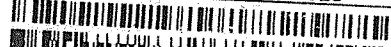
BILL SENDER

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

CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express



J151315081301 UV

1 of 2
TRK# 5908 1783 4937
0201
MASTER

WED - 14 FEB 10:30A
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS



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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 13FEB18
ACTWGT: 29.0 LB MAN
CAD: 0014176/CAFE2916

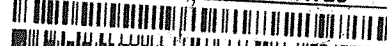
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TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO



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Express



J151315081301 UV

3 of 3
MPS# 5908 1783 5006
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Mstr# 5908 1783 4981

WED - 14 FEB 10:30A
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS



Part # 156148V-434 RIT2 EXP 02/18 **

SHIP DATE: 13FEB18
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2916

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KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

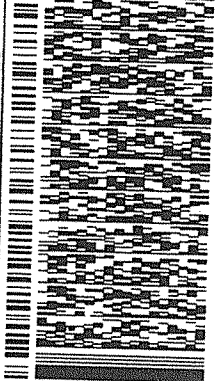
LOS ALAMOS, NM 87545
UNITED STATES US

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

CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express

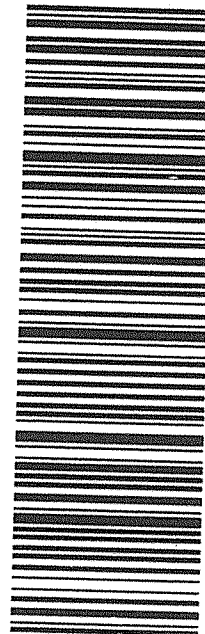


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PRIORITY OVERNIGHT

1 of 3
TRK# 5908 1783 4959
0201
MASTER

X7 RBWA

29407
SC-US CHS



Part # 156148V-434 RIT2 EXP 02/18 **

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

DATE: 13FEB18
JT: 41.0 LB MAN
0014176/CAFE2916

LOS ALAMOS, NM 87545
UNITED STATES US

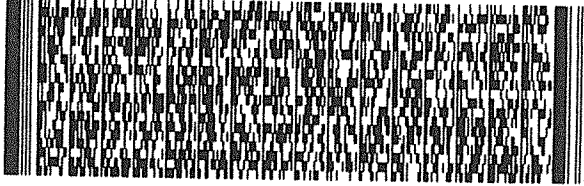
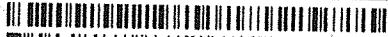
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TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWEO



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Express



J1513150813010V

2 of 3

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0263

Mstr# 5908 1783 4981

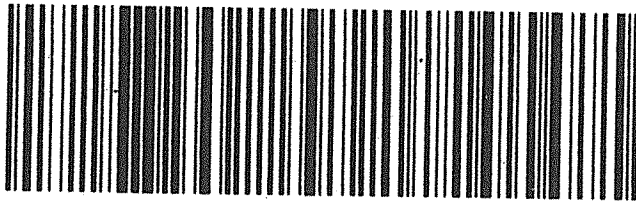
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X7 RBWA

29407

SC-US CHS

WED - 14 FEB 10:30A
PRIORITY OVERNIGHT



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

SHIP DATE: 13FEB18
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545
UNITED STATES US

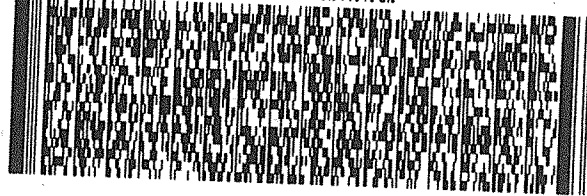
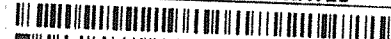
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TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWEO



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Express



J1513150813010V

2 of 2

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Mstr# 5908 1783 4937

0201

X7 RBWA

29407

SC-US CHS

WED - 14 FEB 10:30A
PRIORITY OVERNIGHT



SHIP DATE: 13FEB18
ACTWGT: 47.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

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

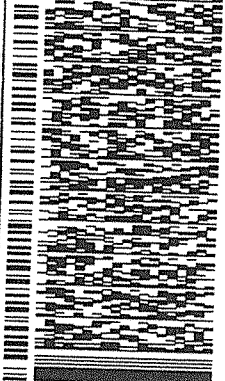
LOS ALAMOS, NM 87545
UNITED STATES US

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

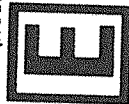
CHARLESTON SC 29407

(843) 556-8171

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PRIORITY OVERNIGHT

2 of 3

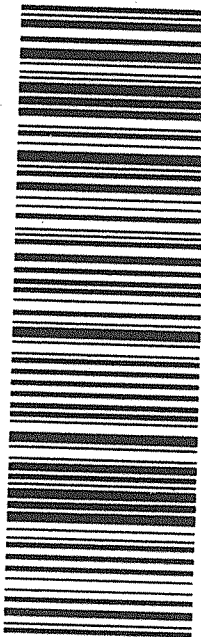
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0201

X7 RBWA

29407
SC-US CHS



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

SHIP DATE: 13FEB18
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545
UNITED STATES US

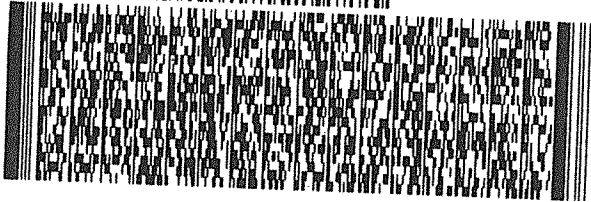
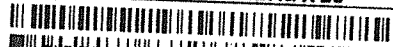
BILL SENDER

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

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express



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3 of 3
MPS# 5908 1783 4970
0263
Mstr# 5908 1783 4959

WED - 14 FEB 10:30A
PRIORITY OVERNIGHT

0201

X7 RBWA

29407
SC-US CHS



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

SHIP DATE: 13FEB18
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545
UNITED STATES US

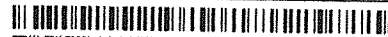
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TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express



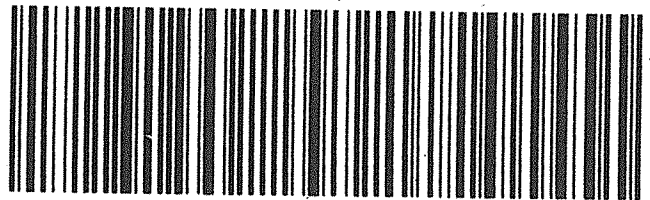
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1 of 3
TRK# 5908 1783 4981
0201
MASTER

WED - 14 FEB 10:30A
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS



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.

Volatile Analysis

Case Narrative

**GC/MS Volatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1705
Work Order #: 443794**

Method/Analysis Information

Procedure: Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

Analytical Method: SW-846:8260B

Analytical Batch Number: 1740473

Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

Sample ID	Client ID
443794002	CAWA-18-16
443794004	CAWA-18-98
443794006	CAWA-18-51
1203975095	Method Blank (MB)
1203975098	Laboratory Control Sample (LCS)
1203975099	Laboratory Control Sample (LCS)
1203975100	443794006(CAWA-18-51) Post Spike (PS)
1203975101	443794006(CAWA-18-51) Post Spike (PS)
1203975102	443794006(CAWA-18-51) Post Spike Duplicate (PSD)
1203975103	443794006(CAWA-18-51) Post Spike Duplicate (PSD)

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The data results reported met all SOP and method criteria, unless otherwise discussed below.

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-038 REV# 26.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration

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

Continuing Calibration Verification Requirements

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

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

The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

Surrogate recoveries in all client and quality control samples were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 443794006 (CAWA-18-51) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the required acceptance limits.

Relative Percent Difference (RPD) Statement

The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information**Holding Time Specifications**

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

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-analyses were not required for samples in this SDG.

Miscellaneous Information**Manual Integrations**

Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment

Tentatively identified compounds (TIC) may be requested for samples 443794002 (CAWA-18-16), 443794004 (CAWA-18-98) and 443794006 (CAWA-18-51) in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of

Analysis as TICs. TIC data, if requested, were included on the Sample Data Summary (Form 1) and included with the sample raw data.

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

Residual Chlorine was not detected in any of the samples in this SDG.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually 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 of each electronic package will indicate the reviewer name associated with the generation of the data and package. 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.

System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA9.I	Agilent 6890/5973 GC/MS w/ OI Eclipse/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

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: 2018-1705 GEL Work Order: 443794

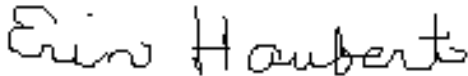
The Qualifiers in this report are defined as follows:

- * 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: Erin Haubert

Date: 09 MAR 2018

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794002

Date Collected: 02/10/2018 11:08

Date Received: 02/14/2018 09:30

Matrix: W

Client ID: CAWA-18-16

Batch ID: 1740473

Run Date: 02/20/2018 17:39

Prep Date: 02/20/2018 17:39

Data File: 022018V9\9G216.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794002

Date Collected: 02/10/2018 11:08

Date Received: 02/14/2018 09:30

Matrix: W

Client ID: CAWA-18-16

Batch ID: 1740473

Run Date: 02/20/2018 17:39

Prep Date: 02/20/2018 17:39

Data File: 022018V9\9G216.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794002

Date Collected: 02/10/2018 11:08

Date Received: 02/14/2018 09:30

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-16

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/20/2018 17:39

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/20/2018 17:39

Column: DB-624

Data File: 022018V9\9G216.D

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	55.7	50.0	ug/L 111	(71%-134%)
Bromofluorobenzene	51.7	50.0	ug/L 103	(70%-131%)
Toluene-d8	53.4	50.0	ug/L 107	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	5.75	ug/L	0	J
	unknown siloxane	14.652	7.16	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794004

Date Collected: 02/10/2018 11:08

Date Received: 02/14/2018 09:30

Matrix: W

Client ID: CAWA-18-98

Batch ID: 1740473

Run Date: 02/20/2018 15:15

Prep Date: 02/20/2018 15:15

Data File: 022018V9\9G211.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794004

Date Collected: 02/10/2018 11:08

Date Received: 02/14/2018 09:30

Matrix: W

Client ID: CAWA-18-98

Batch ID: 1740473

Run Date: 02/20/2018 15:15

Prep Date: 02/20/2018 15:15

Data File: 022018V9\9G211.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1705

Lab Sample ID: 443794004

Date Collected: 02/10/2018 11:08

Date Received: 02/14/2018 09:30

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/20/2018 15:15

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/20/2018 15:15

Data File: 022018V9\9G211.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.9	50.0	ug/L 108	(71%-134%)
Bromofluorobenzene	51.7	50.0	ug/L 103	(70%-131%)
Toluene-d8	53.7	50.0	ug/L 107	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	11	ug/L	0	J
	unknown siloxane	14.651	25.4	ug/L	0	J
	unknown siloxane	16.62	7.69	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794006

Date Collected: 02/09/2018 14:36

Date Received: 02/14/2018 09:30

Matrix: W

Client ID: CAWA-18-51

Batch ID: 1740473

Run Date: 02/20/2018 18:07

Prep Date: 02/20/2018 18:07

Data File: 022018V9\9G217.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	J	0.410	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794006

Date Collected: 02/09/2018 14:36

Date Received: 02/14/2018 09:30

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/20/2018 18:07

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/20/2018 18:07

Data File: 022018V9\9G217.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	J	0.540	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	J	0.560	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794006

Date Collected: 02/09/2018 14:36

Date Received: 02/14/2018 09:30

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1740473

Inst: VOA9.I

Dilution: 1

Run Date: 02/20/2018 18:07

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 02/20/2018 18:07

Data File: 022018V9\9G217.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	55.4	50.0	ug/L 111	(71%-134%)
Bromofluorobenzene	53.2	50.0	ug/L 106	(70%-131%)
Toluene-d8	54.4	50.0	ug/L 109	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.292	9.53	ug/L	0	J
	unknown siloxane	14.651	13.4	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-1705**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203975098	LCS for batch 1740473	103	106	105
1203975099	LCS for batch 1740473	105	105	101
1203975095	MB for batch 1740473	108	106	104
443794004	CAWA-18-98	108	107	103
443794002	CAWA-18-16	111	107	103
443794006	CAWA-18-51	111	109	106
1203975100	CAWA-18-51PS	109	107	105
1203975102	CAWA-18-51PSD	107	107	104
1203975101	CAWA-18-51PS	107	106	103
1203975103	CAWA-18-51PSD	107	107	101

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4

(71%-134%)

TOL = Toluene-d8

(74%-124%)

BFB = Bromofluorobenzene

(70%-131%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1705

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975098

Instrument: VOA9.I

Analysis Date: 02/20/2018 11:53

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	107	107	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1250	100	61-125
67-64-1	LCS Acetone	250	0.0	326	130	48-157
74-88-4	LCS Iodomethane	250	0.0	223	89	72-128
75-15-0	LCS Carbon disulfide	250	0.0	245	98	69-138
108-05-4	LCS Vinyl acetate	250	0.0	275	110	67-125
78-93-3	LCS 2-Butanone	250	0.0	299	120	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	271	108	66-124
591-78-6	LCS 2-Hexanone	250	0.0	320	128	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	49.2	98	40-160
74-87-3	LCS Chloromethane	50.0	0.0	56.5	113	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	57.6	115	65-137
74-83-9	LCS Bromomethane	50.0	0.0	49.9	100	63-137
75-00-3	LCS Chloroethane	50.0	0.0	53.5	107	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	52.0	104	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.7	103	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	52.9	106	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	46.9	94	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	50.0	100	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	53.8	108	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	52.9	106	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	53.3	107	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1705

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975098

Instrument: VOA9.I

Analysis Date: 02/20/2018 11:53

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	54.2	108	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	47.6	95	76-125
67-66-3	LCS Chloroform	50.0	0.0	50.3	101	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	51.0	102	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	52.1	104	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	51.2	102	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	51.5	103	74-122
71-43-2	LCS Benzene	50.0	0.0	51.0	102	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	51.8	104	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	51.8	104	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	49.2	98	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	53.1	106	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	53.2	106	78-131
108-88-3	LCS Toluene	50.0	0.0	52.4	105	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	57.9	116	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	52.7	105	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	51.4	103	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	50.5	101	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	54.3	109	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	52.3	105	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	50.3	101	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	51.5	103	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-1705

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975098

Instrument: VOA9.I

Analysis Date: 02/20/2018 11:53

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	LCS o-Xylene	50.0	0.0	51.8	104	74-126
100-42-5	LCS Styrene	50.0	0.0	51.5	103	72-130
75-25-2	LCS Bromoform	50.0	0.0	48.3	97	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	53.6	107	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	55.9	112	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	53.8	108	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	50.3	101	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	54.0	108	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	55.0	110	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	52.8	106	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	53.1	106	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	54.4	109	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	53.5	107	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	54.4	109	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	53.8	108	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	49.4	99	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	50.7	101	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	54.7	109	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	47.5	95	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	55.1	110	72-136
91-20-3	LCS Naphthalene	50.0	0.0	56.1	112	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	55.9	112	70-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-1705

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975098

Instrument: VOA9.I

Analysis Date: 02/20/2018 11:53

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	55.5	111	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	54.9	110	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	49.1	98	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5550	111	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2018-1705

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1740473

Matrix: WATER

Lab Sample ID 1203975099

Instrument: VOA9.I

Analysis Date: 02/20/2018 12:51

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS	Acrolein	250	0.0	291	116	60-140
76-13-1	LCS	Trichlorotrifluoroethane	250	0.0	259	104	61-148
107-05-1	LCS	Allyl chloride	250	0.0	272	109	59-125
107-13-1	LCS	Acrylonitrile	250	0.0	285	114	65-122
107-12-0	LCS	Propionitrile	250	0.0	279	112	64-124
126-98-7	LCS	Methacrylonitrile	250	0.0	283	113	64-126
80-62-6	LCS	Methyl methacrylate	250	0.0	269	108	69-127
97-63-2	LCS	Ethyl methacrylate	250	0.0	275	110	66-130
78-83-1	LCS	Isobutyl alcohol	2500	0.0	2810	112	65-135
126-99-8	LCS	2-Chloro-1,3-butadiene	50.0	0.0	53.2	106	66-147

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-1705

Sample Type: Post Spike

Client ID: CAWA-18-51PS

Matrix: W

Lab Sample ID 1203975100

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:00

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	PS m,p-Xylenes	100	0.00 U	109	109	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1400	112	56-131
67-64-1	PS Acetone	250	0.00 U	221	88	25-155
74-88-4	PS Iodomethane	250	0.00 U	221	88	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	251	100	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	270	108	48-133
78-93-3	PS 2-Butanone	250	0.00 U	266	106	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	284	114	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	283	113	33-138
67-66-3	PS Chloroform	50.0	0.540 J	52.7	104	71-129
75-27-4	PS Bromodichloromethane	50.0	0.410 J	56.2	112	70-138
124-48-1	PS Dibromochloromethane	50.0	0.560 J	56.9	113	68-143
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	44.2	88	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	54.6	109	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	56.1	112	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	45.6	91	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	49.5	99	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	47.6	95	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	51.0	102	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	54.1	108	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	48.1	96	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	51.3	103	69-132

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-1705

Sample Type: Post Spike

Client ID: CAWA-18-51PS

Matrix: W

Lab Sample ID 1203975100

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:00

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	55.2	110	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	55.2	110	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	55.1	110	69-127
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	52.1	104	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	48.3	97	71-130
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	51.7	103	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	52.1	104	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	51.6	103	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	56.1	112	69-130
71-43-2	PS Benzene	50.0	0.00 U	52.3	105	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	52.4	105	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	55.7	111	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	52.4	105	72-129
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	55.2	110	70-134
108-88-3	PS Toluene	50.0	0.00 U	53.1	106	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	59.3	119	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	56.2	112	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	55.9	112	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	49.5	99	60-130
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	54.4	109	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	51.8	104	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	53.2	106	61-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2018-1705

Sample Type: Post Spike

Client ID: CAWA-18-51PS

Matrix: W

Lab Sample ID 1203975100

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:00

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	PS o-Xylene	50.0	0.00 U	52.6	105	62-131
100-42-5	PS Styrene	50.0	0.00 U	53.1	106	59-135
75-25-2	PS Bromoform	50.0	0.00 U	49.1	98	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	53.8	108	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	59.2	118	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	57.9	116	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	50.8	102	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	54.8	110	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	55.1	110	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	53.5	107	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	53.9	108	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	53.9	108	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	53.9	108	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	55.0	110	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	54.0	108	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	49.1	98	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	50.4	101	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	54.7	109	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	47.3	95	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	53.3	107	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	54.3	109	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	51.5	103	52-135

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2018-1705

Sample Type: Post Spike

Client ID: CAWA-18-51PS

Matrix: W

Lab Sample ID 1203975100

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:00

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	PS	1,2,4-Trichlorobenzene	50.0	0.00	U	51.1	102	50-133
630-20-6	PS	1,1,1,2-Tetrachloroethane	50.0	0.00	U	56.0	112	71-133
95-50-1	PS	1,2-Dichlorobenzene	50.0	0.00	U	49.6	99	60-125
71-36-3	PS	n-Butyl alcohol	5000	0.00	U	6520	130	60-140

Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2018-1705

Sample Type: Post Spike Duplicate

Client ID: CAWA-18-51PSD

Matrix: W

Lab Sample ID 1203975102

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:29

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits	
179601-23-1	PSD m,p-Xylenes	100	0.00	U	112	112	59-132	3	0-20
75-05-8	PSD Acetonitrile	1250	0.00	U	1380	110	56-131	2	0-20
67-64-1	PSD Acetone	250	0.00	U	217	87	25-155	2	0-20
74-88-4	PSD Iodomethane	250	0.00	U	233	93	66-133	6	0-20
75-15-0	PSD Carbon disulfide	250	0.00	U	260	104	61-141	4	0-20
108-05-4	PSD Vinyl acetate	250	0.00	U	282	113	48-133	4	0-20
78-93-3	PSD 2-Butanone	250	0.00	U	259	104	25-143	2	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00	U	290	116	61-127	2	0-20
591-78-6	PSD 2-Hexanone	250	0.00	U	276	110	33-138	2	0-20
67-66-3	PSD Chloroform	50.0	0.540	J	54.2	107	71-129	3	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.410	J	57.5	114	70-138	2	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.560	J	58.7	116	68-143	3	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00	U	49.4	99	33-164	11	0-20
74-87-3	PSD Chloromethane	50.0	0.00	U	61.3	123	53-139	12	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00	U	63.5	127	58-140	12	0-20
74-83-9	PSD Bromomethane	50.0	0.00	U	52.9	106	59-146	15	0-20
75-00-3	PSD Chloroethane	50.0	0.00	U	56.9	114	65-129	14	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00	U	53.9	108	65-141	12	0-20
60-29-7	PSD Ethyl ether	50.0	0.00	U	56.1	112	69-127	9	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00	U	56.5	113	59-130	4	0-20
75-09-2	PSD Methylene chloride	50.0	0.00	U	50.3	101	62-123	4	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00	U	53.2	106	69-132	4	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2018-1705

Sample Type: Post Spike Duplicate

Client ID: CAWA-18-51PSD

Matrix: W

Lab Sample ID 1203975102

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:29

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00	U 56.6	113	65-127	3	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00	U 56.9	114	67-127	3	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00	U 57.0	114	69-127	3	0-20
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00	U 54.6	109	66-137	5	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00	U 50.0	100	71-130	3	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00	U 54.5	109	69-139	5	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00	U 54.5	109	67-130	5	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	U 54.5	109	66-143	6	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	U 56.5	113	69-130	1	0-20
71-43-2	PSD Benzene	50.0	0.00	U 54.1	108	66-125	3	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00	U 54.1	108	65-131	3	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	U 56.2	112	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	U 52.9	106	72-129	1	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	U 55.9	112	70-134	1	0-20
108-88-3	PSD Toluene	50.0	0.00	U 55.6	111	60-126	5	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	U 60.8	122	69-135	2	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	U 57.7	115	66-125	3	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	U 56.7	113	67-124	1	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00	U 52.2	104	60-130	5	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00	U 55.7	111	71-127	2	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	U 53.3	107	64-124	3	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	U 54.6	109	61-130	3	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2018-1705

Sample Type: Post Spike Duplicate

Client ID: CAWA-18-51PSD

Matrix: W

Lab Sample ID 1203975102

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:29

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-47-6	PSD o-Xylene	50.0	0.00	U 55.3	111	62-131	5	0-20
100-42-5	PSD Styrene	50.0	0.00	U 54.5	109	59-135	3	0-20
75-25-2	PSD Bromoform	50.0	0.00	U 50.2	100	64-138	2	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00	U 56.1	112	55-133	4	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00	U 59.3	119	62-129	0	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00	U 56.8	114	70-124	2	0-20
108-86-1	PSD Bromobenzene	50.0	0.00	U 52.1	104	62-124	2	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00	U 56.1	112	50-133	2	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00	U 56.8	114	53-135	3	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00	U 54.9	110	56-128	2	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00	U 54.9	110	53-130	2	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00	U 57.7	115	55-135	7	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00	U 55.9	112	53-132	4	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00	U 57.3	115	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00	U 56.1	112	49-138	4	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00	U 50.8	102	56-126	3	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00	U 52.2	104	55-125	3	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00	U 56.5	113	43-142	3	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00	U 48.8	98	62-141	3	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00	U 57.0	114	40-147	7	0-20
91-20-3	PSD Naphthalene	50.0	0.00	U 58.0	116	62-134	6	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00	U 56.3	113	52-135	9	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2018-1705

Sample Type: Post Spike Duplicate

Client ID: CAWA-18-51PSD

Matrix: W

Lab Sample ID 1203975102

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:29

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

			Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
CAS No	Parmname									
120-82-1	PSD	1,2,4-Trichlorobenzene	50.0	0.00	U	55.1	110	50-133	7	0-20
630-20-6	PSD	1,1,1,2-Tetrachloroethane	50.0	0.00	U	59.8	120	71-133	7	0-20
95-50-1	PSD	1,2-Dichlorobenzene	50.0	0.00	U	51.2	102	60-125	3	0-20
71-36-3	PSD	n-Butyl alcohol	5000	0.00	U	5890	118	60-140	10	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2018-1705

Sample Type: Post Spike

Client ID: CAWA-18-51PS

Matrix: W

Lab Sample ID 1203975101

Instrument: VOA9.I

Analysis Date: 02/20/2018 21:59

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	PS Acrolein	250	0.00 U	272	109	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	273	109	57-149
107-05-1	PS Allyl chloride	250	0.00 U	280	112	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	279	111	59-129
107-12-0	PS Propionitrile	250	0.00 U	267	107	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	281	112	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	263	105	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	271	109	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2650	106	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	53.7	107	63-146

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 2

SDG Number: 2018-1705

Sample Type: Post Spike Duplicate

Client ID: CAWA-18-51PSD

Matrix: W

Lab Sample ID 1203975103

Instrument: VOA9.I

Analysis Date: 02/20/2018 22:28

Dilution: 1

Analyst: RXY1

Purge Vol: 5 mL

Batch ID: 1740473

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD	Acrolein	250	0.00	U	300	120	49-141	10	0-20
76-13-1	PSD	Trichlorotrifluoroethane	250	0.00	U	293	117	57-149	7	0-20
107-05-1	PSD	Allyl chloride	250	0.00	U	296	118	54-128	6	0-20
107-13-1	PSD	Acrylonitrile	250	0.00	U	309	124	59-129	10	0-20
107-12-0	PSD	Propionitrile	250	0.00	U	297	119	58-131	11	0-20
126-98-7	PSD	Methacrylonitrile	250	0.00	U	306	122	59-134	9	0-20
80-62-6	PSD	Methyl methacrylate	250	0.00	U	279	112	62-135	6	0-20
97-63-2	PSD	Ethyl methacrylate	250	0.00	U	290	116	60-136	7	0-20
78-83-1	PSD	Isobutyl alcohol	2500	0.00	U	2910	116	60-143	9	0-20
126-99-8	PSD	2-Chloro-1,3-butadiene	50.0	0.00	U	57.7	115	63-146	7	0-20

Method Blank Summary

Page 1 of 1

SDG Number:	2018-1705	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1740473	Instrument ID:	VOA9.I	Data File:	022018V9\9G207B.D
Lab Sample ID:	1203975095	Prep Date:	02/20/2018 13:20	Analyzed:	02/20/18 13:20
Column:	DB-624				

This method blank applies to the following samples and quality control samples:

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1740473	1203975098	022018V9\9G204L.D	02/20/18	1153
02 LCS for batch 1740473	1203975099	022018V9\9G206L.D	02/20/18	1251
03 CAWA-18-98	443794004	022018V9\9G211.D	02/20/18	1515
04 CAWA-18-16	443794002	022018V9\9G216.D	02/20/18	1739
05 CAWA-18-51	443794006	022018V9\9G217.D	02/20/18	1807
06 CAWA-18-51PS	1203975100	022018V9\9G223.D	02/20/18	2100
07 CAWA-18-51PSD	1203975102	022018V9\9G224.D	02/20/18	2129
08 CAWA-18-51PS	1203975101	022018V9\9G225.D	02/20/18	2159
09 CAWA-18-51PSD	1203975103	022018V9\9G226.D	02/20/18	2228

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705

Lab Sample ID: 1203975095

Client Sample: QC for batch 1740473

Client ID: MB for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 13:20

Prep Date: 02/20/2018 13:20

Data File: 022018V9\9G207B.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1705

Lab Sample ID: 1203975095

Client Sample: QC for batch 1740473

Client ID: MB for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 13:20

Prep Date: 02/20/2018 13:20

Data File: 022018V9\9G207B.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number: 2018-1705

Lab Sample ID: 1203975095

Client Sample: QC for batch 1740473

Client ID: MB for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 13:20

Prep Date: 02/20/2018 13:20

Data File: 022018V9\9G207B.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	54.2	50.0	ug/L 108	(71%-134%)
Bromofluorobenzene	52.1	50.0	ug/L 104	(70%-131%)
Toluene-d8	53.1	50.0	ug/L 106	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
No Tentatively Identified Compounds Found				ug/L		

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705

Lab Sample ID: 1203975098

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 11:53

Prep Date: 02/20/2018 11:53

Data File: 022018V9\9G204L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		54.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		51.0	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		55.9	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		52.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		52.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		52.1	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		55.9	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		53.8	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		55.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		53.5	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		47.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.3	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.1	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		51.5	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		51.8	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		55.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		49.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		51.4	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		50.7	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		54.2	ug/L	0.300	1.00
78-93-3	2-Butanone		299	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		52.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		320	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		53.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		53.8	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		271	ug/L	1.50	5.00
67-64-1	Acetone		326	ug/L	1.50	10.0
75-05-8	Acetonitrile		1250	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		51.0	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		47.6	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		53.1	ug/L	0.300	1.00
75-25-2	Bromoform		48.3	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1705
Lab Sample ID: 1203975098
Client Sample: QC for batch 1740473
Client ID: LCS for batch 1740473
Batch ID: 1740473
Run Date: 02/20/2018 11:53
Prep Date: 02/20/2018 11:53
Data File: 022018V9\9G204L.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: WATER

Project: QC
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		49.9	ug/L	0.300	1.00
75-15-0	Carbon disulfide		245	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		51.2	ug/L	0.300	1.00
108-90-7	Chlorobenzene		50.3	ug/L	0.300	1.00
75-00-3	Chloroethane		53.5	ug/L	0.300	1.00
67-66-3	Chloroform		50.3	ug/L	0.300	1.00
74-87-3	Chloromethane		56.5	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		54.3	ug/L	0.300	1.00
74-95-3	Dibromomethane		49.2	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		49.2	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		51.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		55.1	ug/L	0.300	1.00
74-88-4	Iodomethane		223	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		53.6	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		46.9	ug/L	1.00	10.0
91-20-3	Naphthalene		56.1	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		51.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		50.5	ug/L	0.300	1.00
108-88-3	Toluene		52.4	ug/L	0.300	1.00
79-01-6	Trichloroethylene		51.8	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		52.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		275	ug/L	1.50	5.00
75-01-4	Vinyl chloride		57.6	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.3	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		107	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5550	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		54.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		54.0	ug/L	0.300	1.00
95-47-6	o-Xylene		51.8	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		54.4	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1705	Matrix:	WATER
Lab Sample ID:	1203975098		
Client Sample:	QC for batch 1740473	Client:	ARSL004
Client ID:	LCS for batch 1740473	Method:	SW-846:8260B
Batch ID:	1740473	Inst:	VOA9.I
Run Date:	02/20/2018 11:53	Analyst:	RXY1
Prep Date:	02/20/2018 11:53		
Data File:	022018V9\9G204L.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		50.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		54.4	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		53.8	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		57.9	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.5	50.0	ug/L	103	(71%-134%)
Bromofluorobenzene	52.3	50.0	ug/L	105	(70%-131%)
Toluene-d8	52.8	50.0	ug/L	106	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705

Lab Sample ID: 1203975099

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 12:51

Prep Date: 02/20/2018 12:51

Data File: 022018V9\9G206L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		53.2	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		291	ug/L	1.50	5.00
107-13-1	Acrylonitrile		285	ug/L	1.50	5.00
107-05-1	Allyl chloride		272	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1705

Lab Sample ID: 1203975099

Client Sample: QC for batch 1740473

Client ID: LCS for batch 1740473

Batch ID: 1740473

Run Date: 02/20/2018 12:51

Prep Date: 02/20/2018 12:51

Data File: 022018V9\9G206L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA9.I

Analyst: RXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		275	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2810	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		283	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		269	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		279	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		259	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number:	2018-1705	Matrix:	WATER
Lab Sample ID:	1203975099		
Client Sample:	QC for batch 1740473	Client:	ARSL004
Client ID:	LCS for batch 1740473	Method:	SW-846:8260B
Batch ID:	1740473	Inst:	VOA9.I
Run Date:	02/20/2018 12:51	Analyst:	RXY1
Prep Date:	02/20/2018 12:51	Purge Vol:	5 mL
Data File:	022018V9\9G206L.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.4	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	50.3	50.0	ug/L 101	(70%-131%)
Toluene-d8	52.6	50.0	ug/L 105	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203975100
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PS
Batch ID: 1740473
Run Date: 02/20/2018 21:00
Prep Date: 02/20/2018 21:00
Data File: 022018V9\9G223.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

Project: QC
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		56.0	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		51.7	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		59.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		56.2	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		55.2	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		54.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		52.1	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		51.5	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		57.9	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		51.1	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		53.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		47.3	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		54.4	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.6	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		56.1	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		55.7	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		55.1	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		49.1	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		55.9	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		50.4	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		52.1	ug/L	0.300	1.00
78-93-3	2-Butanone		266	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		53.5	ug/L	0.300	1.00
591-78-6	2-Hexanone		283	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		53.9	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		54.0	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		284	ug/L	1.50	5.00
67-64-1	Acetone		221	ug/L	1.50	10.0
75-05-8	Acetonitrile		1400	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		52.3	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.8	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.3	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		56.2	ug/L	0.300	1.00
75-25-2	Bromoform		49.1	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-1705
Lab Sample ID: 1203975100
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PS
Batch ID: 1740473
Run Date: 02/20/2018 21:00
Prep Date: 02/20/2018 21:00
Data File: 022018V9\9G223.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

Project: QC
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		45.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		251	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		51.6	ug/L	0.300	1.00
108-90-7	Chlorobenzene		51.8	ug/L	0.300	1.00
75-00-3	Chloroethane		49.5	ug/L	0.300	1.00
67-66-3	Chloroform		52.7	ug/L	0.300	1.00
74-87-3	Chloromethane		54.6	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		56.9	ug/L	0.300	1.00
74-95-3	Dibromomethane		52.4	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		44.2	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.0	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		53.2	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		53.3	ug/L	0.300	1.00
74-88-4	Iodomethane		221	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		53.8	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.1	ug/L	1.00	10.0
91-20-3	Naphthalene		54.3	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		53.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		49.5	ug/L	0.300	1.00
108-88-3	Toluene		53.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.4	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		47.6	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		270	ug/L	1.50	5.00
75-01-4	Vinyl chloride		56.1	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		55.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		55.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		109	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6520	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		54.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		54.8	ug/L	0.300	1.00
95-47-6	o-Xylene		52.6	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		55.0	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1705	Date Collected:	02/09/2018 14:36	Matrix:	W
Lab Sample ID:	1203975100	Date Received:	02/14/2018 09:30		
Client Sample:	QC for batch 1740473	Client:	ARSL004	Project:	QC
Client ID:	CAWA-18-51PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1740473	Inst:	VOA9.I	Dilution:	1
Run Date:	02/20/2018 21:00	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/20/2018 21:00				
Data File:	022018V9\9G223.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		51.3	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		53.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		55.2	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		59.3	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	54.6	50.0	ug/L	109	(71%-134%)
Bromofluorobenzene	52.5	50.0	ug/L	105	(70%-131%)
Toluene-d8	53.3	50.0	ug/L	107	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203975101
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PS
Batch ID: 1740473
Run Date: 02/20/2018 21:59
Prep Date: 02/20/2018 21:59
Data File: 022018V9\9G225.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

Project: QC
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		53.7	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		272	ug/L	1.50	5.00
107-13-1	Acrylonitrile		279	ug/L	1.50	5.00
107-05-1	Allyl chloride		280	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203975101
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PS
Batch ID: 1740473
Run Date: 02/20/2018 21:59
Prep Date: 02/20/2018 21:59
Data File: 022018V9\9G225.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

Project: QC
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		271	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2650	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		281	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		263	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		267	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		273	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1705	Date Collected:	02/09/2018 14:36	Matrix:	W
Lab Sample ID:	1203975101	Date Received:	02/14/2018 09:30		
Client Sample:	QC for batch 1740473	Client:	ARSL004	Project:	QC
Client ID:	CAWA-18-51PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1740473	Inst:	VOA9.I	Dilution:	1
Run Date:	02/20/2018 21:59	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/20/2018 21:59				
Data File:	022018V9\9G225.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.4	50.0	ug/L	107	(71%-134%)
Bromofluorobenzene	51.4	50.0	ug/L	103	(70%-131%)
Toluene-d8	53.2	50.0	ug/L	106	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203975102
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PSD
Batch ID: 1740473
Run Date: 02/20/2018 21:29
Prep Date: 02/20/2018 21:29
Data File: 022018V9\9G224.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

Project: QC
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		59.8	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		54.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		59.3	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		57.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		56.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		56.5	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		54.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		56.3	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		56.8	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		55.1	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		55.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		48.8	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		55.7	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		51.2	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		56.5	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		56.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		56.8	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		50.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		56.7	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		52.2	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		54.6	ug/L	0.300	1.00
78-93-3	2-Butanone		259	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		54.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		276	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		54.9	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		56.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		290	ug/L	1.50	5.00
67-64-1	Acetone		217	ug/L	1.50	10.0
75-05-8	Acetonitrile		1380	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		54.1	ug/L	0.300	1.00
108-86-1	Bromobenzene		52.1	ug/L	0.300	1.00
74-97-5	Bromochloromethane		50.0	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		57.5	ug/L	0.300	1.00
75-25-2	Bromoform		50.2	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1705	Date Collected: 02/09/2018 14:36	Matrix: W
Lab Sample ID: 1203975102	Date Received: 02/14/2018 09:30	
Client Sample: QC for batch 1740473	Client: ARSL004	Project: QC
Client ID: CAWA-18-51PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1740473	Inst: VOA9.I	Dilution: 1
Run Date: 02/20/2018 21:29	Analyst: RXY1	Purge Vol: 5 mL
Prep Date: 02/20/2018 21:29		
Data File: 022018V9\9G224.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		52.9	ug/L	0.300	1.00
75-15-0	Carbon disulfide		260	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		54.5	ug/L	0.300	1.00
108-90-7	Chlorobenzene		53.3	ug/L	0.300	1.00
75-00-3	Chloroethane		56.9	ug/L	0.300	1.00
67-66-3	Chloroform		54.2	ug/L	0.300	1.00
74-87-3	Chloromethane		61.3	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		58.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		52.9	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		49.4	ug/L	0.300	1.00
60-29-7	Ethyl ether		56.1	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		54.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		57.0	ug/L	0.300	1.00
74-88-4	Iodomethane		233	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		56.1	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		50.3	ug/L	1.00	10.0
91-20-3	Naphthalene		58.0	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		54.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		52.2	ug/L	0.300	1.00
108-88-3	Toluene		55.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene		54.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		53.9	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		282	ug/L	1.50	5.00
75-01-4	Vinyl chloride		63.5	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		57.0	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		55.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		112	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5890	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		56.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		56.1	ug/L	0.300	1.00
95-47-6	o-Xylene		55.3	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		57.3	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1705	Date Collected: 02/09/2018 14:36	Matrix: W
Lab Sample ID: 1203975102	Date Received: 02/14/2018 09:30	
Client Sample: QC for batch 1740473	Client: ARSL004	Project: QC
Client ID: CAWA-18-51PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1740473	Inst: VOA9.I	Dilution: 1
Run Date: 02/20/2018 21:29	Analyst: RXY1	Purge Vol: 5 mL
Prep Date: 02/20/2018 21:29		
Data File: 022018V9\9G224.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		53.2	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		57.7	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		56.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		60.8	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.5	50.0	ug/L	107	(71%-134%)
Bromofluorobenzene	51.9	50.0	ug/L	104	(70%-131%)
Toluene-d8	53.6	50.0	ug/L	107	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203975103
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PSD
Batch ID: 1740473
Run Date: 02/20/2018 22:28
Prep Date: 02/20/2018 22:28
Data File: 022018V9\9G226.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

Project: QC
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		57.7	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		300	ug/L	1.50	5.00
107-13-1	Acrylonitrile		309	ug/L	1.50	5.00
107-05-1	Allyl chloride		296	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203975103
Client Sample: QC for batch 1740473
Client ID: CAWA-18-51PSD
Batch ID: 1740473
Run Date: 02/20/2018 22:28
Prep Date: 02/20/2018 22:28
Data File: 022018V9\9G226.D

Date Collected: 02/09/2018 14:36
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW-846:8260B
Inst: VOA9.I
Analyst: RXY1

Column: DB-624

Matrix: W

Project: QC
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		290	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2910	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		306	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		279	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		297	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		293	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2018-1705	Date Collected:	02/09/2018 14:36	Matrix:	W
Lab Sample ID:	1203975103	Date Received:	02/14/2018 09:30		
Client Sample:	QC for batch 1740473	Client:	ARSL004	Project:	QC
Client ID:	CAWA-18-51PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1740473	Inst:	VOA9.I	Dilution:	1
Run Date:	02/20/2018 22:28	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	02/20/2018 22:28				
Data File:	022018V9\9G226.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.3	50.0	ug/L	107	(71%-134%)
Bromofluorobenzene	50.6	50.0	ug/L	101	(70%-131%)
Toluene-d8	53.5	50.0	ug/L	107	(74%-124%)

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1705
Work Order #: 443794**

Method/Analysis Information

Procedure:	Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
Analytical Method:	SW846 3510C/8270D
Prep Method:	SW846 3510C
Analytical Batch Number:	1739303
Prep Batch Number:	1739302

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

Sample ID	Client ID
443794002	CAWA-18-16
443794006	CAWA-18-51
1203971927	Method Blank (MB)
1203971928	Laboratory Control Sample (LCS)
1203971929	443786002(CAWA-18-10) Matrix Spike (MS)
1203971930	443786002(CAWA-18-10) 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-009 REV# 40.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

CCV Requirements

All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D for samples 443794002 (CAWA-18-16) and 443794006 (CAWA-18-51) and the associated QC. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. If required, a CRDL was analyzed after the CCVs to demonstrate that there is adequate sensitivity to detect the failed compounds at the applicable lower quantitation limit.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG in this batch met the acceptance criteria.

Surrogate Recoveries

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

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.

QC Sample Designation

Sample 443786002 (CAWA-18-10) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

The MS or MSD (See Below) recovered spiked analytes outside of the established acceptance limits. Because the recoveries were biased high and the target analytes were not detected in the associated samples above the reporting limit, the data were reported.

Sample	Analyte	Value
1203971929 (CAWA-18-10MS)	Benzidine	138* (15%-130%)

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses used to quantitate the requested target analytes were within the required acceptance criteria for the SDG associated samples in this batch.

Technical Information:

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

Sample Dilutions

The samples in this SDG in this batch did not require dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

Miscellaneous Information:

Manual Integrations

Manual integrations were not required on samples in this batch in this SDG for detected target analytes or surrogates.

TIC Comment

Tentatively identified compounds (TIC) were requested for samples 443794002 (CAWA-18-16) and 443794006 (CAWA-18-51) in this SDG in this batch.

Additional Comments

Additional comments were not required for the SDG associated samples in this batch.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually 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 of each electronic package will indicate the reviewer name associated with the generation of the data and package. 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.

System Configuration

The Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
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MSD3.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP7890A/HP5975C	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)
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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: 2018-1705 GEL Work Order: 443794

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
- E Concentration of the target analyte exceeds the instrument calibration range
- 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: Barbara Bailey

Date: 12 MAR 2018

Title: Data Validator

Sample Data Summary

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794002

Date Collected: 02/10/2018 11:08

Date Received: 02/14/2018 09:30

Matrix: W

Client ID: CAWA-18-16

Batch ID: 1739303

Run Date: 02/15/2018 23:07

Prep Date: 02/15/2018 08:55

Data File: s021518.s\3b1520.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 920 mL

Column: DB-5ms

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.26	ug/L	3.26	10.9
120-82-1	1,2,4-Trichlorobenzene	U	3.26	ug/L	3.26	10.9
95-50-1	1,2-Dichlorobenzene	U	3.26	ug/L	3.26	10.9
122-66-7	Azobenzene	U	3.26	ug/L	3.26	10.9
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.26	ug/L	3.26	10.9
106-46-7	1,4-Dichlorobenzene	U	3.26	ug/L	3.26	10.9
123-91-1	1,4-Dioxane	U	3.26	ug/L	3.26	10.9
90-12-0	1-Methylnaphthalene	U	0.326	ug/L	0.326	1.09
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.26	ug/L	3.26	10.9
95-95-4	2,4,5-Trichlorophenol	U	3.26	ug/L	3.26	10.9
88-06-2	2,4,6-Trichlorophenol	U	3.26	ug/L	3.26	10.9
120-83-2	2,4-Dichlorophenol	U	3.26	ug/L	3.26	10.9
105-67-9	2,4-Dimethylphenol	U	3.26	ug/L	3.26	10.9
51-28-5	2,4-Dinitrophenol	U	5.43	ug/L	5.43	21.7
121-14-2	2,4-Dinitrotoluene	U	3.26	ug/L	3.26	10.9
606-20-2	2,6-Dinitrotoluene	U	3.26	ug/L	3.26	10.9
91-58-7	2-Chloronaphthalene	U	0.446	ug/L	0.446	1.09
95-57-8	2-Chlorophenol	U	3.26	ug/L	3.26	10.9
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.26	ug/L	3.26	10.9
91-57-6	2-Methylnaphthalene	U	0.326	ug/L	0.326	1.09
88-75-5	2-Nitrophenol	U	3.26	ug/L	3.26	10.9
91-94-1	3,3'-Dichlorobenzidine	U	3.26	ug/L	3.26	10.9
101-55-3	4-Bromophenylphenylether	U	3.26	ug/L	3.26	10.9
59-50-7	Parachlorometa cresol	U	3.26	ug/L	3.26	10.9
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.59	ug/L	3.59	10.9
7005-72-3	4-Chlorophenylphenylether	U	3.26	ug/L	3.26	10.9
100-02-7	4-Nitrophenol	U	3.26	ug/L	3.26	10.9
83-32-9	Acenaphthene	U	0.326	ug/L	0.326	1.09
208-96-8	Acenaphthylene	U	0.326	ug/L	0.326	1.09
62-53-3	Aniline	U	4.57	ug/L	4.57	10.9
120-12-7	Anthracene	U	0.326	ug/L	0.326	1.09
1912-24-9	Atrazine	U	3.26	ug/L	3.26	10.9
92-87-5	Benzidine	U	4.24	ug/L	4.24	10.9
56-55-3	Benzo(a)anthracene	U	0.326	ug/L	0.326	1.09
50-32-8	Benzo(a)pyrene	U	0.326	ug/L	0.326	1.09
205-99-2	Benzo(b)fluoranthene	U	0.326	ug/L	0.326	1.09
191-24-2	Benzo(ghi)perylene	U	0.326	ug/L	0.326	1.09

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794002

Date Collected: 02/10/2018 11:08

Date Received: 02/14/2018 09:30

Matrix: W

Client: ARSL004

Method: SW846 3510C/8270D

Project: ESHL00114

SOP Ref: GL-OA-E-009

Client ID: CAWA-18-16

Batch ID: 1739303

Inst: MSD3.I

Dilution: 1

Run Date: 02/15/2018 23:07

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/15/2018 08:55

Aliquot: 920 mL

Final Volume: 1 mL

Data File: s021518.s\s3b1520.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.326	ug/L	0.326	1.09
65-85-0	Benzoic acid	U	6.52	ug/L	6.52	21.7
100-51-6	Benzyl alcohol	U	3.26	ug/L	3.26	10.9
85-68-7	Butylbenzylphthalate	U	3.26	ug/L	3.26	10.9
218-01-9	Chrysene	U	0.326	ug/L	0.326	1.09
84-74-2	Di-n-butylphthalate	U	3.26	ug/L	3.26	10.9
117-84-0	Di-n-octylphthalate	U	3.26	ug/L	3.26	10.9
53-70-3	Dibenzo(a,h)anthracene	U	0.326	ug/L	0.326	1.09
132-64-9	Dibenzofuran	U	3.26	ug/L	3.26	10.9
84-66-2	Diethylphthalate	U	3.26	ug/L	3.26	10.9
131-11-3	Dimethylphthalate	U	3.26	ug/L	3.26	10.9
88-85-7	Dinoseb	U	3.26	ug/L	3.26	10.9
122-39-4	Diphenylamine	U	3.26	ug/L	3.26	10.9
206-44-0	Fluoranthene	U	0.326	ug/L	0.326	1.09
86-73-7	Fluorene	U	0.326	ug/L	0.326	1.09
118-74-1	Hexachlorobenzene	U	3.26	ug/L	3.26	10.9
87-68-3	Hexachlorobutadiene	U	3.26	ug/L	3.26	10.9
77-47-4	Hexachlorocyclopentadiene	U	3.26	ug/L	3.26	10.9
67-72-1	Hexachloroethane	U	3.26	ug/L	3.26	10.9
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.326	ug/L	0.326	1.09
78-59-1	Isophorone	U	3.80	ug/L	3.80	10.9
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.26	ug/L	3.26	10.9
924-16-3	N-Nitrosodi-n-butylamine	U	3.26	ug/L	3.26	10.9
55-18-5	N-Nitrosodiethylamine	U	3.26	ug/L	3.26	10.9
621-64-7	N-Nitrosodi-n-propylamine	U	3.26	ug/L	3.26	10.9
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.26	ug/L	3.26	10.9
91-20-3	Naphthalene	U	0.326	ug/L	0.326	1.09
98-95-3	Nitrobenzene	U	3.26	ug/L	3.26	10.9
608-93-5	Pentachlorobenzene	U	3.26	ug/L	3.26	10.9
87-86-5	Pentachlorophenol	U	3.26	ug/L	3.26	10.9
85-01-8	Phenanthrene	U	0.326	ug/L	0.326	1.09
108-95-2	Phenol	U	3.26	ug/L	3.26	10.9
129-00-0	Pyrene	U	0.326	ug/L	0.326	1.09
110-86-1	Pyridine	U	3.26	ug/L	3.26	10.9
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.26	ug/L	3.26	10.9
111-91-1	bis(2-Chloroethoxy)methane	U	3.26	ug/L	3.26	10.9
111-44-4	bis(2-Chloroethyl) ether	U	3.26	ug/L	3.26	10.9
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.26	ug/L	3.26	1.09

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794002

Date Collected: 02/10/2018 11:08

Date Received: 02/14/2018 09:30

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-16

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1739303

Inst: MSD3.I

Dilution: 1

Run Date: 02/15/2018 23:07

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/15/2018 08:55

Aliquot: 920 mL

Final Volume: 1 mL

Data File: s021518.s\s3b1520.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	4.02	ug/L	4.02	10.9
99-09-2	3-Nitroaniline	U	3.26	ug/L	3.26	10.9
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.26	ug/L	3.26	10.9
88-74-4	2-Nitroaniline	U	3.26	ug/L	3.26	10.9
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.26	ug/L	3.26	10.9
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	76.5	109	ug/L	70	(32%-124%)
2-Fluorobiphenyl	28.2	54.3	ug/L	52	(32%-112%)
2-Fluorophenol	36.2	109	ug/L	33	(15%-88%)
Nitrobenzene-d5	29.7	54.3	ug/L	55	(36%-115%)
Phenol-d5	23.8	109	ug/L	22	(15%-91%)
p-Terphenyl-d14	33.2	54.3	ug/L	61	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	2.291	4.37	ug/L	98	NJ
000050-84-0	Benzoic acid, 2,4-dichloro-	9.827	24.3	ug/L	99	NJ

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794006

Date Collected: 02/09/2018 14:36

Date Received: 02/14/2018 09:30

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1739303

Run Date: 02/15/2018 23:36

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/15/2018 08:55

Aliquot: 880 mL

Final Volume: 1 mL

Data File: s021518.s\s3b1521.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.41	ug/L	3.41	11.4
120-82-1	1,2,4-Trichlorobenzene	U	3.41	ug/L	3.41	11.4
95-50-1	1,2-Dichlorobenzene	U	3.41	ug/L	3.41	11.4
122-66-7	Azobenzene	U	3.41	ug/L	3.41	11.4
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.41	ug/L	3.41	11.4
106-46-7	1,4-Dichlorobenzene	U	3.41	ug/L	3.41	11.4
123-91-1	1,4-Dioxane	U	3.41	ug/L	3.41	11.4
90-12-0	1-Methylnaphthalene	U	0.341	ug/L	0.341	1.14
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.41	ug/L	3.41	11.4
95-95-4	2,4,5-Trichlorophenol	U	3.41	ug/L	3.41	11.4
88-06-2	2,4,6-Trichlorophenol	U	3.41	ug/L	3.41	11.4
120-83-2	2,4-Dichlorophenol	U	3.41	ug/L	3.41	11.4
105-67-9	2,4-Dimethylphenol	U	3.41	ug/L	3.41	11.4
51-28-5	2,4-Dinitrophenol	U	5.68	ug/L	5.68	22.7
121-14-2	2,4-Dinitrotoluene	U	3.41	ug/L	3.41	11.4
606-20-2	2,6-Dinitrotoluene	U	3.41	ug/L	3.41	11.4
91-58-7	2-Chloronaphthalene	U	0.466	ug/L	0.466	1.14
95-57-8	2-Chlorophenol	U	3.41	ug/L	3.41	11.4
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.41	ug/L	3.41	11.4
91-57-6	2-Methylnaphthalene	U	0.341	ug/L	0.341	1.14
88-75-5	2-Nitrophenol	U	3.41	ug/L	3.41	11.4
91-94-1	3,3'-Dichlorobenzidine	U	3.41	ug/L	3.41	11.4
101-55-3	4-Bromophenylphenylether	U	3.41	ug/L	3.41	11.4
59-50-7	Parachlorometa cresol	U	3.41	ug/L	3.41	11.4
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.75	ug/L	3.75	11.4
7005-72-3	4-Chlorophenylphenylether	U	3.41	ug/L	3.41	11.4
100-02-7	4-Nitrophenol	U	3.41	ug/L	3.41	11.4
83-32-9	Acenaphthene	U	0.341	ug/L	0.341	1.14
208-96-8	Acenaphthylene	U	0.341	ug/L	0.341	1.14
62-53-3	Aniline	U	4.77	ug/L	4.77	11.4
120-12-7	Anthracene	U	0.341	ug/L	0.341	1.14
1912-24-9	Atrazine	U	3.41	ug/L	3.41	11.4
92-87-5	Benzidine	U	4.43	ug/L	4.43	11.4
56-55-3	Benzo(a)anthracene	U	0.341	ug/L	0.341	1.14
50-32-8	Benzo(a)pyrene	U	0.341	ug/L	0.341	1.14
205-99-2	Benzo(b)fluoranthene	U	0.341	ug/L	0.341	1.14
191-24-2	Benzo(ghi)perylene	U	0.341	ug/L	0.341	1.14

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794006

Date Collected: 02/09/2018 14:36

Date Received: 02/14/2018 09:30

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1739303

Run Date: 02/15/2018 23:36

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/15/2018 08:55

Aliquot: 880 mL

Final Volume: 1 mL

Data File: s021518.s\s3b1521.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.341	ug/L	0.341	1.14
65-85-0	Benzoic acid	U	6.82	ug/L	6.82	22.7
100-51-6	Benzyl alcohol	U	3.41	ug/L	3.41	11.4
85-68-7	Butylbenzylphthalate	U	3.41	ug/L	3.41	11.4
218-01-9	Chrysene	U	0.341	ug/L	0.341	1.14
84-74-2	Di-n-butylphthalate	U	3.41	ug/L	3.41	11.4
117-84-0	Di-n-octylphthalate	U	3.41	ug/L	3.41	11.4
53-70-3	Dibenzo(a,h)anthracene	U	0.341	ug/L	0.341	1.14
132-64-9	Dibenzofuran	U	3.41	ug/L	3.41	11.4
84-66-2	Diethylphthalate	U	3.41	ug/L	3.41	11.4
131-11-3	Dimethylphthalate	U	3.41	ug/L	3.41	11.4
88-85-7	Dinoseb	U	3.41	ug/L	3.41	11.4
122-39-4	Diphenylamine	U	3.41	ug/L	3.41	11.4
206-44-0	Fluoranthene	U	0.341	ug/L	0.341	1.14
86-73-7	Fluorene	U	0.341	ug/L	0.341	1.14
118-74-1	Hexachlorobenzene	U	3.41	ug/L	3.41	11.4
87-68-3	Hexachlorobutadiene	U	3.41	ug/L	3.41	11.4
77-47-4	Hexachlorocyclopentadiene	U	3.41	ug/L	3.41	11.4
67-72-1	Hexachloroethane	U	3.41	ug/L	3.41	11.4
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.341	ug/L	0.341	1.14
78-59-1	Isophorone	U	3.98	ug/L	3.98	11.4
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.41	ug/L	3.41	11.4
924-16-3	N-Nitrosodi-n-butylamine	U	3.41	ug/L	3.41	11.4
55-18-5	N-Nitrosodiethylamine	U	3.41	ug/L	3.41	11.4
621-64-7	N-Nitrosodi-n-propylamine	U	3.41	ug/L	3.41	11.4
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.41	ug/L	3.41	11.4
91-20-3	Naphthalene	U	0.341	ug/L	0.341	1.14
98-95-3	Nitrobenzene	U	3.41	ug/L	3.41	11.4
608-93-5	Pentachlorobenzene	U	3.41	ug/L	3.41	11.4
87-86-5	Pentachlorophenol	U	3.41	ug/L	3.41	11.4
85-01-8	Phenanthrene	U	0.341	ug/L	0.341	1.14
108-95-2	Phenol	U	3.41	ug/L	3.41	11.4
129-00-0	Pyrene	U	0.341	ug/L	0.341	1.14
110-86-1	Pyridine	U	3.41	ug/L	3.41	11.4
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.41	ug/L	3.41	11.4
111-91-1	bis(2-Chloroethoxy)methane	U	3.41	ug/L	3.41	11.4
111-44-4	bis(2-Chloroethyl) ether	U	3.41	ug/L	3.41	11.4
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.41	ug/L	3.41	1.14

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1705

Lab Sample ID: 443794006

Date Collected: 02/09/2018 14:36

Date Received: 02/14/2018 09:30

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Client ID: CAWA-18-51

Inst: MSD3.I

Dilution: 1

Batch ID: 1739303

Run Date: 02/15/2018 23:36

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 02/15/2018 08:55

Aliquot: 880 mL

Final Volume: 1 mL

Data File: s021518.s\s3b1521.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	4.20	ug/L	4.20	11.4
99-09-2	3-Nitroaniline	U	3.41	ug/L	3.41	11.4
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.41	ug/L	3.41	11.4
88-74-4	2-Nitroaniline	U	3.41	ug/L	3.41	11.4
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.41	ug/L	3.41	11.4
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	56.0	114	ug/L	49	(32%-124%)
2-Fluorobiphenyl	24.5	56.8	ug/L	43	(32%-112%)
2-Fluorophenol	33.6	114	ug/L	30	(15%-88%)
Nitrobenzene-d5	26.0	56.8	ug/L	46	(36%-115%)
Phenol-d5	23.1	114	ug/L	20	(15%-91%)
p-Terphenyl-d14	27.4	56.8	ug/L	48	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	2.296	5.39	ug/L	98	NJ

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-1705**Matrix Type: LIQUID**

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203971927	MB for batch 1739302	54	34	95	90	100	98
1203971928	LCS for batch 1739302	43	28	74	66	96	71
1203971929	CAWA-18-10MS	56	46	73	69	95	71
1203971930	CAWA-18-10MSD	52	43	68	67	95	69
443794002	CAWA-18-16	33	22	55	52	70	61
443794006	CAWA-18-51	30	20	46	43	49	48

Surrogate**Acceptance Limits**

2FP	= 2-Fluorophenol	(15%-88%)
PHL	= Phenol-d5	(15%-91%)
NBZ	= Nitrobenzene-d5	(36%-115%)
FBP	= 2-Fluorobiphenyl	(32%-112%)
TBP	= 2,4,6-Tribromophenol	(32%-124%)
TPH	= p-Terphenyl-d14	(36%-121%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1705

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1739302

Matrix: WATER

Lab Sample ID 1203971928

Instrument: MSD3.I

Analysis Date: 02/15/2018 18:42

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1739302

Inj. Vol: 1 uL

Batch ID: 1739303

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	LCS N-Methyl-N-nitrosomethylamine	50.0	0.0	22.1	44	30-88
110-86-1	LCS Pyridine	50.0	0.0	23.3	47	27-89
62-53-3	LCS Aniline	50.0	0.0	34.4	69	49-112
108-95-2	LCS Phenol	50.0	0.0	14.3	29	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	39.1	78	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	34.6	69	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	31.2	62	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	31.6	63	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	32.8	66	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)ether	50.0	0.0	40.9	82	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	31.5	63	44-102
95-48-7	LCS o-Cresol	50.0	0.0	31.2	62	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	32.9	66	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	41.2	82	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	29.7	59	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	38.1	76	53-115
78-59-1	LCS Isophorone	50.0	0.0	37.1	74	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	37.4	75	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	29.9	60	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	38.5	77	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	37.9	76	53-109
65-85-0	LCS Benzoic acid	100	0.0	31.3	31	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1705

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1739302

Matrix: WATER

Lab Sample ID 1203971928

Instrument: MSD3.I

Analysis Date: 02/15/2018 18:42

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1739302

Inj. Vol: 1 uL

Batch ID: 1739303

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	LCS 4-Chloroaniline	50.0	0.0	49.0	98	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	33.3	67	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	39.2	78	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	35.8	72	42-103
91-20-3	LCS Naphthalene	50.0	0.0	35.8	72	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	37.4	75	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	21.1	42	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	36.4	73	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	36.0	72	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	35.7	71	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	40.6	81	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	51.9	104	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	41.3	83	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	40.1	80	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	43.0	86	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	38.3	77	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	40.8	82	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	38.9	78	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	40.2	80	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	39.0	78	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	44.2	88	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	16.9	34	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-1705

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1739302

Matrix: WATER

Lab Sample ID 1203971928

Instrument: MSD3.I

Analysis Date: 02/15/2018 18:42

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1739302

Inj. Vol: 1 uL

Batch ID: 1739303

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	LCS Fluorene	50.0	0.0	41.2	82	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	42.2	84	52-121
100-01-6	LCS 4-Nitroaniline	50.0	0.0	51.5	103	44-137
	<i>p</i> -Nitroaniline					
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	39.5	79	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	34.9	70	55-113
122-66-7	LCS Azobenzene	50.0	0.0	33.4	67	53-115
	<i>1,2-Diphenylhydrazine</i>					
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	36.3	73	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	37.4	75	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	44.7	89	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	38.9	78	55-110
120-12-7	LCS Anthracene	50.0	0.0	39.2	78	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	46.8	94	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	49.9	100	54-118
129-00-0	LCS Pyrene	50.0	0.0	32.1	64	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	36.8	74	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	36.0	72	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	38.4	77	57-112
218-01-9	LCS Chrysene	50.0	0.0	39.5	79	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	34.7	69	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	36.0	72	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	36.7	73	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	38.0	76	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-1705

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1739302

Matrix: WATER

Lab Sample ID 1203971928

Instrument: MSD3.I

Analysis Date: 02/15/2018 18:42

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1739302

Inj. Vol: 1 uL

Batch ID: 1739303

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	LCS Indeno(1,2,3-cd)pyrene	50.0	0.0	43.7	87	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	44.5	89	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	42.4	85	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	23.3	47	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	39.3	79	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	36.1	72	44-102
1912-24-9	LCS Atrazine	50.0	0.0	44.2	88	60-131
92-87-5	LCS Benzidine	100	0.0	143	143	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	48.5	97	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	35.4	71	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1705

Sample Type: Matrix Spike

Client ID: CAWA-18-10MS

Matrix: W

Lab Sample ID 1203971929

Instrument: MSD3.I

Analysis Date: 02/15/2018 19:41

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1739302

Inj. Vol: 1 uL

Batch ID: 1739303

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	MS N-Methyl-N-nitrosomethylamine	118	0.00 U	66.7	57	25-106
110-86-1	MS Pyridine	118	0.00 U	69.4	59	24-93
62-53-3	MS Aniline	118	0.00 U	83.3	71	37-113
108-95-2	MS Phenol	118	0.00 U	54.5	46	23-82
111-44-4	MS bis(2-Chloroethyl) ether	118	0.00 U	86.9	74	39-114
95-57-8	MS 2-Chlorophenol	118	0.00 U	80.4	68	37-108
541-73-1	MS 1,3-Dichlorobenzene	118	0.00 U	74.8	64	27-97
106-46-7	MS 1,4-Dichlorobenzene	118	0.00 U	74.9	64	28-97
95-50-1	MS 1,2-Dichlorobenzene	118	0.00 U	76.9	65	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)ether	118	0.00 U	91.3	78	32-127
100-51-6	MS Benzyl alcohol	118	0.00 U	80.9	69	37-116
95-48-7	MS o-Cresol	118	0.00 U	79.9	68	34-109
65794-96-9	MS m,p-Cresols	118	0.00 U	89.4	76	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	118	0.00 U	94.2	80	42-118
67-72-1	MS Hexachloroethane	118	0.00 U	72.5	62	29-94
98-95-3	MS Nitrobenzene	118	0.00 U	86.4	73	38-123
78-59-1	MS Isophorone	118	0.00 U	85.7	73	43-120
88-75-5	MS 2-Nitrophenol	118	0.00 U	86.3	73	39-115
105-67-9	MS 2,4-Dimethylphenol	118	0.00 U	71.2	61	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	118	0.00 U	88.4	75	42-118
120-83-2	MS 2,4-Dichlorophenol	118	0.00 U	88.9	76	40-111
65-85-0	MS Benzoic acid	235	0.00 U	141	60	17-95

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1705

Sample Type: Matrix Spike

Client ID: CAWA-18-10MS

Matrix: W

Lab Sample ID 1203971929

Instrument: MSD3.I

Analysis Date: 02/15/2018 19:41

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1739302

Inj. Vol: 1 uL

Batch ID: 1739303

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS 4-Chloroaniline	118	0.00 U	118	100	44-138
87-68-3	MS Hexachlorobutadiene	118	0.00 U	80.6	69	26-98
59-50-7	MS Parachlorometa cresol 4-Chloro-3-methylphenol	118	0.00 U	94.4	80	41-122
91-57-6	MS 2-Methylnaphthalene	118	0.00 U	84.1	71	29-109
91-20-3	MS Naphthalene	118	0.00 U	83.6	71	31-108
90-12-0	MS 1-Methylnaphthalene	118	0.00 U	87.9	75	33-112
77-47-4	MS Hexachlorocyclopentadiene	118	0.00 U	53.5	45	26-79
88-06-2	MS 2,4,6-Trichlorophenol	118	0.00 U	85.9	73	39-124
95-95-4	MS 2,4,5-Trichlorophenol	118	0.00 U	85.0	72	42-120
91-58-7	MS 2-Chloronaphthalene	118	0.00 U	83.2	71	29-113
88-74-4	MS 2-Nitroaniline o-Nitroaniline	118	0.00 U	94.1	80	41-121
99-09-2	MS 3-Nitroaniline m-Nitroaniline	118	0.00 U	124	105	42-144
131-11-3	MS Dimethylphthalate	118	0.00 U	95.4	81	45-128
606-20-2	MS 2,6-Dinitrotoluene	118	0.00 U	93.8	80	46-124
121-14-2	MS 2,4-Dinitrotoluene	118	0.00 U	101	86	45-125
208-96-8	MS Acenaphthylene	118	0.00 U	89.1	76	35-120
83-32-9	MS Acenaphthene	118	0.00 U	96.3	82	35-117
51-28-5	MS 2,4-Dinitrophenol	118	0.00 U	101	86	27-122
132-64-9	MS Dibenzofuran	118	0.00 U	94.4	80	38-113
58-90-2	MS 2,3,4,6-Tetrachlorophenol	118	0.00 U	93.5	79	40-128
84-66-2	MS Diethylphthalate	118	0.00 U	102	86	43-127
100-02-7	MS 4-Nitrophenol	118	0.00 U	64.0	54	17-85

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-1705

Sample Type: Matrix Spike

Client ID: CAWA-18-10MS

Matrix: W

Lab Sample ID 1203971929

Instrument: MSD3.I

Analysis Date: 02/15/2018 19:41

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1739302

Inj. Vol: 1 uL

Batch ID: 1739303

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS Fluorene	118	0.00 U	96.2	82	39-117
7005-72-3	MS 4-Chlorophenylphenylether	118	0.00 U	98.7	84	39-121
100-01-6	MS 4-Nitroaniline	118	0.00 U	121	103	30-133
534-52-1	MS 2-Methyl-4,6-dinitrophenol	118	0.00 U	97.8	83	32-126
122-39-4	MS Diphenylamine	118	0.00 U	82.0	70	37-118
122-66-7	MS Azobenzene	118	0.00 U	78.6	67	38-120
101-55-3	MS 4-Bromophenylphenylether	118	0.00 U	85.9	73	39-121
118-74-1	MS Hexachlorobenzene	118	0.00 U	87.8	75	40-118
87-86-5	MS Pentachlorophenol	118	0.00 U	112	95	35-121
85-01-8	MS Phenanthrene	118	0.00 U	91.6	78	40-115
120-12-7	MS Anthracene	118	0.00 U	92.4	79	38-120
84-74-2	MS Di-n-butylphthalate	118	0.00 U	111	94	41-128
206-44-0	MS Fluoranthene	118	0.00 U	119	101	41-119
129-00-0	MS Pyrene	118	0.00 U	75.9	65	35-128
85-68-7	MS Butylbenzylphthalate	118	0.00 U	86.1	73	40-129
117-81-7	MS bis(2-Ethylhexyl)phthalate	118	0.00 U	85.2	72	38-131
56-55-3	MS Benzo(a)anthracene	118	0.00 U	89.8	76	39-120
218-01-9	MS Chrysene	118	0.00 U	92.5	79	41-124
117-84-0	MS Di-n-octylphthalate	118	0.00 U	80.4	68	37-134
205-99-2	MS Benzo(b)fluoranthene	118	0.00 U	84.4	72	31-122
207-08-9	MS Benzo(k)fluoranthene	118	0.00 U	85.7	73	33-123
50-32-8	MS Benzo(a)pyrene	118	0.00 U	89.8	76	32-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-1705

Sample Type: Matrix Spike

Client ID: CAWA-18-10MS

Matrix: W

Lab Sample ID 1203971929

Instrument: MSD3.I

Analysis Date: 02/15/2018 19:41

Dilution: 1

Analyst: JLD1

Prep Batch ID:1739302

Inj. Vol: 1 uL

Batch ID: 1739303

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	MS Indeno(1,2,3-cd)pyrene	118	0.00 U	103	87	27-121
53-70-3	MS Dibenzo(a,h)anthracene	118	0.00 U	105	89	30-125
191-24-2	MS Benzo(ghi)perylene	118	0.00 U	98.1	83	24-126
123-91-1	MS 1,4-Dioxane	118	0.00 U	70.8	60	24-110
930-55-2	MS N-Nitrosopyrrolidine	118	0.00 U	94.9	81	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	118	0.00 U	84.2	72	32-101
1912-24-9	MS Atrazine	118	0.00 U	99.1	84	42-129
92-87-5	MS Benzidine	235	0.00 U	326	138 *	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	118	0.00 U	114	97	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	118	0.00 U	83.4	71	26-102

Method Blank Summary

Page 1 of 1

SDG Number:	2018-1705	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1739302	Instrument ID:	MSD3.I	Data File:	s021518.s\s3b1510.D
Lab Sample ID:	1203971927	Prep Date:	02/15/2018 08:55	Analyzed:	02/15/18 18:12
Column:	DB-5ms				

This method blank applies to the following samples and quality control samples:

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1739302	1203971928	s021518.s\s3b1511.D	02/15/18	1842
02 CAWA-18-10MS	1203971929	s021518.s\s3b1513.D	02/15/18	1941
03 CAWA-18-10MSD	1203971930	s021518.s\s3b1514.D	02/15/18	2010
04 CAWA-18-16	443794002	s021518.s\s3b1520.D	02/15/18	2307
05 CAWA-18-51	443794006	s021518.s\s3b1521.D	02/15/18	2336

Quality Control Data

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203971927
Client Sample: QC for batch 1739302
Client ID: MB for batch 1739302
Batch ID: 1739303
Run Date: 02/15/2018 18:12
Prep Date: 02/15/2018 08:55
Data File: s021518.s\s3b1510.D

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.00	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene	U	3.00	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
122-66-7	Azobenzene	U	3.00	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
123-91-1	1,4-Dioxane	U	3.00	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.00	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol	U	3.00	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol	U	3.00	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol	U	3.00	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol	U	3.00	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol	U	5.00	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene	U	3.00	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene	U	3.00	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene	U	0.410	ug/L	0.410	1.00
95-57-8	2-Chlorophenol	U	3.00	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.00	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
88-75-5	2-Nitrophenol	U	3.00	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine	U	3.00	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether	U	3.00	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol	U	3.00	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.30	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether	U	3.00	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	U	3.00	ug/L	3.00	10.0
83-32-9	Acenaphthene	U	0.300	ug/L	0.300	1.00
208-96-8	Acenaphthylene	U	0.300	ug/L	0.300	1.00
62-53-3	Aniline	U	4.20	ug/L	4.20	10.0
120-12-7	Anthracene	U	0.300	ug/L	0.300	1.00
1912-24-9	Atrazine	U	3.00	ug/L	3.00	10.0
92-87-5	Benzidine	U	3.90	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene	U	0.300	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene	U	0.300	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene	U	0.300	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene	U	0.300	ug/L	0.300	1.00

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1705

Lab Sample ID: 1203971927

Client Sample: QC for batch 1739302

Client ID: MB for batch 1739302

Batch ID: 1739303

Run Date: 02/15/2018 18:12

Prep Date: 02/15/2018 08:55

Data File: s021518.s\3b1510.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.300	ug/L	0.300	1.00
65-85-0	Benzoic acid	U	6.00	ug/L	6.00	20.0
100-51-6	Benzyl alcohol	U	3.00	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate	U	3.00	ug/L	3.00	10.0
218-01-9	Chrysene	U	0.300	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate	U	3.00	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate	U	3.00	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene	U	0.300	ug/L	0.300	1.00
132-64-9	Dibenzofuran	U	3.00	ug/L	3.00	10.0
84-66-2	Diethylphthalate	U	3.00	ug/L	3.00	10.0
131-11-3	Dimethylphthalate	U	3.00	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine	U	3.00	ug/L	3.00	10.0
206-44-0	Fluoranthene	U	0.300	ug/L	0.300	1.00
86-73-7	Fluorene	U	0.300	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene	U	3.00	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene	U	3.00	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene	U	3.00	ug/L	3.00	10.0
67-72-1	Hexachloroethane	U	3.00	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.300	ug/L	0.300	1.00
78-59-1	Isophorone	U	3.50	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.00	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi-n-propylamine	U	3.00	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.00	ug/L	3.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
98-95-3	Nitrobenzene	U	3.00	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol	U	3.00	ug/L	3.00	10.0
85-01-8	Phenanthrene	U	0.300	ug/L	0.300	1.00
108-95-2	Phenol	U	3.00	ug/L	3.00	10.0
129-00-0	Pyrene	U	0.300	ug/L	0.300	1.00
110-86-1	Pyridine	U	3.00	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.00	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane	U	3.00	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether	U	3.00	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.00	ug/L	3.00	1.00

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203971927
Client Sample: QC for batch 1739302
Client ID: MB for batch 1739302
Batch ID: 1739303
Run Date: 02/15/2018 18:12
Prep Date: 02/15/2018 08:55
Data File: s021518.s\s3b1510.D

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.70	ug/L	3.70	10.0
99-09-2	3-Nitroaniline	U	3.00	ug/L	3.00	10.0
95-48-7	<i>m</i> -Nitroaniline o-Cresol	U	3.00	ug/L	3.00	10.0
88-74-4	2-Nitroaniline	U	3.00	ug/L	3.00	10.0
100-01-6	<i>o</i> -Nitroaniline 4-Nitroaniline <i>p</i> -Nitroaniline	U	3.00	ug/L	3.00	10.0

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	100	100	ug/L 100	(32%-124%)
2-Fluorobiphenyl	45.0	50.0	ug/L 90	(32%-112%)
2-Fluorophenol	53.5	100	ug/L 54	(15%-88%)
Nitrobenzene-d5	47.3	50.0	ug/L 95	(36%-115%)
Phenol-d5	33.7	100	ug/L 34	(15%-91%)
p-Terphenyl-d14	49.0	50.0	ug/L 98	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	2.296	5.84	ug/L	99	NJ

Semi-Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203971928
Client Sample: QC for batch 1739302
Client ID: LCS for batch 1739302
Batch ID: 1739303
Run Date: 02/15/2018 18:42
Prep Date: 02/15/2018 08:55
Data File: s021518.s\s3b1511.D

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		36.1	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		35.4	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		32.8	ug/L	3.00	10.0
122-66-7	Azobenzene		33.4	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		31.2	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		31.6	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		23.3	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		37.4	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		39.0	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		36.0	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		36.4	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		37.9	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		29.9	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		38.9	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		43.0	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		40.1	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		35.7	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		34.6	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		39.5	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		35.8	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		37.4	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		48.5	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		36.3	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		39.2	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		49.0	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		42.2	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		16.9	ug/L	3.00	10.0
83-32-9	Acenaphthene		40.8	ug/L	0.300	1.00
208-96-8	Acenaphthylene		38.3	ug/L	0.300	1.00
62-53-3	Aniline		34.4	ug/L	4.20	10.0
120-12-7	Anthracene		39.2	ug/L	0.300	1.00
1912-24-9	Atrazine		44.2	ug/L	3.00	10.0
92-87-5	Benzidine	E	143	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		38.4	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		38.0	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		36.0	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		42.4	ug/L	0.300	1.00

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203971928
Client Sample: QC for batch 1739302
Client ID: LCS for batch 1739302
Batch ID: 1739303
Run Date: 02/15/2018 18:42
Prep Date: 02/15/2018 08:55
Data File: s021518.s\s3b1511.D

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		36.7	ug/L	0.300	1.00
65-85-0	Benzoic acid		31.3	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		31.5	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		36.8	ug/L	3.00	10.0
218-01-9	Chrysene		39.5	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		46.8	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		34.7	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		44.5	ug/L	0.300	1.00
132-64-9	Dibenzofuran		40.2	ug/L	3.00	10.0
84-66-2	Diethylphthalate		44.2	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		41.3	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		34.9	ug/L	3.00	10.0
206-44-0	Fluoranthene		49.9	ug/L	0.300	1.00
86-73-7	Fluorene		41.2	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		37.4	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		33.3	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		21.1	ug/L	3.00	10.0
67-72-1	Hexachloroethane		29.7	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		43.7	ug/L	0.300	1.00
78-59-1	Isophorone		37.1	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		22.1	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi-n-propylamine		41.2	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		39.3	ug/L	3.00	10.0
91-20-3	Naphthalene		35.8	ug/L	0.300	1.00
98-95-3	Nitrobenzene		38.1	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		44.7	ug/L	3.00	10.0
85-01-8	Phenanthrene		38.9	ug/L	0.300	1.00
108-95-2	Phenol		14.3	ug/L	3.00	10.0
129-00-0	Pyrene		32.1	ug/L	0.300	1.00
110-86-1	Pyridine		23.3	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		40.9	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		38.5	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		39.1	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		36.0	ug/L	3.00	1.00

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203971928
Client Sample: QC for batch 1739302
Client ID: LCS for batch 1739302
Batch ID: 1739303
Run Date: 02/15/2018 18:42
Prep Date: 02/15/2018 08:55
Data File: s021518.s\s3b1511.D

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		32.9	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		51.9	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		31.2	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		40.6	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		51.5	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	95.7	100	ug/L	96	(32%-124%)
2-Fluorobiphenyl	33.2	50.0	ug/L	66	(32%-112%)
2-Fluorophenol	42.6	100	ug/L	43	(15%-88%)
Nitrobenzene-d5	36.9	50.0	ug/L	74	(36%-115%)
Phenol-d5	27.8	100	ug/L	28	(15%-91%)
p-Terphenyl-d14	35.3	50.0	ug/L	71	(36%-121%)

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203971929
Client Sample: QC for batch 1739302
Client ID: CAWA-18-10MS
Batch ID: 1739303
Run Date: 02/15/2018 19:41
Prep Date: 02/15/2018 08:55
Data File: s021518.s\s3b1513.D

Date Collected: 02/10/2018 09:35
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 425 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		84.2	ug/L	7.06	23.5
120-82-1	1,2,4-Trichlorobenzene		83.4	ug/L	7.06	23.5
95-50-1	1,2-Dichlorobenzene		76.9	ug/L	7.06	23.5
122-66-7	Azobenzene		78.6	ug/L	7.06	23.5
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		74.8	ug/L	7.06	23.5
106-46-7	1,4-Dichlorobenzene		74.9	ug/L	7.06	23.5
123-91-1	1,4-Dioxane		70.8	ug/L	7.06	23.5
90-12-0	1-Methylnaphthalene		87.9	ug/L	0.706	2.35
58-90-2	2,3,4,6-Tetrachlorophenol		93.5	ug/L	7.06	23.5
95-95-4	2,4,5-Trichlorophenol		85.0	ug/L	7.06	23.5
88-06-2	2,4,6-Trichlorophenol		85.9	ug/L	7.06	23.5
120-83-2	2,4-Dichlorophenol		88.9	ug/L	7.06	23.5
105-67-9	2,4-Dimethylphenol		71.2	ug/L	7.06	23.5
51-28-5	2,4-Dinitrophenol		101	ug/L	11.8	47.1
121-14-2	2,4-Dinitrotoluene		101	ug/L	7.06	23.5
606-20-2	2,6-Dinitrotoluene		93.8	ug/L	7.06	23.5
91-58-7	2-Chloronaphthalene		83.2	ug/L	0.965	2.35
95-57-8	2-Chlorophenol		80.4	ug/L	7.06	23.5
534-52-1	2-Methyl-4,6-dinitrophenol		97.8	ug/L	7.06	23.5
91-57-6	2-Methylnaphthalene		84.1	ug/L	0.706	2.35
88-75-5	2-Nitrophenol		86.3	ug/L	7.06	23.5
91-94-1	3,3'-Dichlorobenzidine		114	ug/L	7.06	23.5
101-55-3	4-Bromophenylphenylether		85.9	ug/L	7.06	23.5
59-50-7	Parachlorometa cresol		94.4	ug/L	7.06	23.5
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		118	ug/L	7.76	23.5
7005-72-3	4-Chlorophenylphenylether		98.7	ug/L	7.06	23.5
100-02-7	4-Nitrophenol		64.0	ug/L	7.06	23.5
83-32-9	Acenaphthene		96.3	ug/L	0.706	2.35
208-96-8	Acenaphthylene		89.1	ug/L	0.706	2.35
62-53-3	Aniline		83.3	ug/L	9.88	23.5
120-12-7	Anthracene		92.4	ug/L	0.706	2.35
1912-24-9	Atrazine		99.1	ug/L	7.06	23.5
92-87-5	Benzidine	E	326	ug/L	9.18	23.5
56-55-3	Benzo(a)anthracene		89.8	ug/L	0.706	2.35
50-32-8	Benzo(a)pyrene		89.8	ug/L	0.706	2.35
205-99-2	Benzo(b)fluoranthene		84.4	ug/L	0.706	2.35
191-24-2	Benzo(ghi)perylene		98.1	ug/L	0.706	2.35

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203971929
Client Sample: QC for batch 1739302
Client ID: CAWA-18-10MS
Batch ID: 1739303
Run Date: 02/15/2018 19:41
Prep Date: 02/15/2018 08:55
Data File: s021518.s\3b1513.D

Date Collected: 02/10/2018 09:35
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 425 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		85.7	ug/L	0.706	2.35
65-85-0	Benzoic acid		141	ug/L	14.1	47.1
100-51-6	Benzyl alcohol		80.9	ug/L	7.06	23.5
85-68-7	Butylbenzylphthalate		86.1	ug/L	7.06	23.5
218-01-9	Chrysene		92.5	ug/L	0.706	2.35
84-74-2	Di-n-butylphthalate		111	ug/L	7.06	23.5
117-84-0	Di-n-octylphthalate		80.4	ug/L	7.06	23.5
53-70-3	Dibenzo(a,h)anthracene		105	ug/L	0.706	2.35
132-64-9	Dibenzofuran		94.4	ug/L	7.06	23.5
84-66-2	Diethylphthalate		102	ug/L	7.06	23.5
131-11-3	Dimethylphthalate		95.4	ug/L	7.06	23.5
88-85-7	Dinoseb	U	7.06	ug/L	7.06	23.5
122-39-4	Diphenylamine		82.0	ug/L	7.06	23.5
206-44-0	Fluoranthene		119	ug/L	0.706	2.35
86-73-7	Fluorene		96.2	ug/L	0.706	2.35
118-74-1	Hexachlorobenzene		87.8	ug/L	7.06	23.5
87-68-3	Hexachlorobutadiene		80.6	ug/L	7.06	23.5
77-47-4	Hexachlorocyclopentadiene		53.5	ug/L	7.06	23.5
67-72-1	Hexachloroethane		72.5	ug/L	7.06	23.5
193-39-5	Indeno(1,2,3-cd)pyrene		103	ug/L	0.706	2.35
78-59-1	Isophorone		85.7	ug/L	8.24	23.5
62-75-9	N-Methyl-N-nitrosomethylamine		66.7	ug/L	7.06	23.5
924-16-3	N-Nitrosodi-n-butylamine	U	7.06	ug/L	7.06	23.5
55-18-5	N-Nitrosodiethylamine	U	7.06	ug/L	7.06	23.5
621-64-7	N-Nitrosodi-n-propylamine		94.2	ug/L	7.06	23.5
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		94.9	ug/L	7.06	23.5
91-20-3	Naphthalene		83.6	ug/L	0.706	2.35
98-95-3	Nitrobenzene		86.4	ug/L	7.06	23.5
608-93-5	Pentachlorobenzene	U	7.06	ug/L	7.06	23.5
87-86-5	Pentachlorophenol		112	ug/L	7.06	23.5
85-01-8	Phenanthrene		91.6	ug/L	0.706	2.35
108-95-2	Phenol		54.5	ug/L	7.06	23.5
129-00-0	Pyrene		75.9	ug/L	0.706	2.35
110-86-1	Pyridine		69.4	ug/L	7.06	23.5
108-60-1	bis(2-Chloro-1-methylethyl)ether		91.3	ug/L	7.06	23.5
111-91-1	bis(2-Chloroethoxy)methane		88.4	ug/L	7.06	23.5
111-44-4	bis(2-Chloroethyl) ether		86.9	ug/L	7.06	23.5
117-81-7	bis(2-Ethylhexyl)phthalate		85.2	ug/L	7.06	2.35

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1705	Date Collected: 02/10/2018 09:35	Matrix: W
Lab Sample ID: 1203971929	Date Received: 02/14/2018 09:30	
Client Sample: QC for batch 1739302	Client: ARSL004	Project: QC
Client ID: CAWA-18-10MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1739303	Inst: MSD3.I	Dilution: 1
Run Date: 02/15/2018 19:41	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 02/15/2018 08:55	Aliquot: 425 mL	Final Volume: 1 mL
Data File: s021518.s\s3b1513.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		89.4	ug/L	8.71	23.5
99-09-2	3-Nitroaniline		124	ug/L	7.06	23.5
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		79.9	ug/L	7.06	23.5
88-74-4	2-Nitroaniline		94.1	ug/L	7.06	23.5
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		121	ug/L	7.06	23.5
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	222	235	ug/L	95	(32%-124%)
2-Fluorobiphenyl	81.0	118	ug/L	69	(32%-112%)
2-Fluorophenol	132	235	ug/L	56	(15%-88%)
Nitrobenzene-d5	85.6	118	ug/L	73	(36%-115%)
Phenol-d5	108	235	ug/L	46	(15%-91%)
p-Terphenyl-d14	83.9	118	ug/L	71	(36%-121%)

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 1 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203971930
Client Sample: QC for batch 1739302
Client ID: CAWA-18-10MSD
Batch ID: 1739303
Run Date: 02/15/2018 20:10
Prep Date: 02/15/2018 08:55
Data File: s021518.s\3b1514.D

Date Collected: 02/10/2018 09:35
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 425 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		82.8	ug/L	7.06	23.5
120-82-1	1,2,4-Trichlorobenzene		79.9	ug/L	7.06	23.5
95-50-1	1,2-Dichlorobenzene		71.8	ug/L	7.06	23.5
122-66-7	Azobenzene		78.7	ug/L	7.06	23.5
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		70.2	ug/L	7.06	23.5
106-46-7	1,4-Dichlorobenzene		70.0	ug/L	7.06	23.5
123-91-1	1,4-Dioxane		63.1	ug/L	7.06	23.5
90-12-0	1-Methylnaphthalene		86.8	ug/L	0.706	2.35
58-90-2	2,3,4,6-Tetrachlorophenol		94.4	ug/L	7.06	23.5
95-95-4	2,4,5-Trichlorophenol		85.5	ug/L	7.06	23.5
88-06-2	2,4,6-Trichlorophenol		85.0	ug/L	7.06	23.5
120-83-2	2,4-Dichlorophenol		86.1	ug/L	7.06	23.5
105-67-9	2,4-Dimethylphenol		68.5	ug/L	7.06	23.5
51-28-5	2,4-Dinitrophenol		102	ug/L	11.8	47.1
121-14-2	2,4-Dinitrotoluene		102	ug/L	7.06	23.5
606-20-2	2,6-Dinitrotoluene		93.4	ug/L	7.06	23.5
91-58-7	2-Chloronaphthalene		81.6	ug/L	0.965	2.35
95-57-8	2-Chlorophenol		75.2	ug/L	7.06	23.5
534-52-1	2-Methyl-4,6-dinitrophenol		99.3	ug/L	7.06	23.5
91-57-6	2-Methylnaphthalene		83.4	ug/L	0.706	2.35
88-75-5	2-Nitrophenol		83.2	ug/L	7.06	23.5
91-94-1	3,3'-Dichlorobenzidine		111	ug/L	7.06	23.5
101-55-3	4-Bromophenylphenylether		87.1	ug/L	7.06	23.5
59-50-7	Parachlorometa cresol		94.8	ug/L	7.06	23.5
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		113	ug/L	7.76	23.5
7005-72-3	4-Chlorophenylphenylether		100	ug/L	7.06	23.5
100-02-7	4-Nitrophenol		65.5	ug/L	7.06	23.5
83-32-9	Acenaphthene		96.0	ug/L	0.706	2.35
208-96-8	Acenaphthylene		88.7	ug/L	0.706	2.35
62-53-3	Aniline		77.1	ug/L	9.88	23.5
120-12-7	Anthracene		93.1	ug/L	0.706	2.35
1912-24-9	Atrazine		99.8	ug/L	7.06	23.5
92-87-5	Benzidine	E	304	ug/L	9.18	23.5
56-55-3	Benzo(a)anthracene		89.8	ug/L	0.706	2.35
50-32-8	Benzo(a)pyrene		90.2	ug/L	0.706	2.35
205-99-2	Benzo(b)fluoranthene		86.7	ug/L	0.706	2.35
191-24-2	Benzo(ghi)perylene		86.2	ug/L	0.706	2.35

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 2 of 3

SDG Number: 2018-1705
Lab Sample ID: 1203971930
Client Sample: QC for batch 1739302
Client ID: CAWA-18-10MSD
Batch ID: 1739303
Run Date: 02/15/2018 20:10
Prep Date: 02/15/2018 08:55
Data File: s021518.s\s3b1514.D

Date Collected: 02/10/2018 09:35
Date Received: 02/14/2018 09:30
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 425 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		88.1	ug/L	0.706	2.35
65-85-0	Benzoic acid		146	ug/L	14.1	47.1
100-51-6	Benzyl alcohol		77.7	ug/L	7.06	23.5
85-68-7	Butylbenzylphthalate		86.6	ug/L	7.06	23.5
218-01-9	Chrysene		92.4	ug/L	0.706	2.35
84-74-2	Di-n-butylphthalate		111	ug/L	7.06	23.5
117-84-0	Di-n-octylphthalate		82.1	ug/L	7.06	23.5
53-70-3	Dibenzo(a,h)anthracene		93.4	ug/L	0.706	2.35
132-64-9	Dibenzofuran		94.0	ug/L	7.06	23.5
84-66-2	Diethylphthalate		103	ug/L	7.06	23.5
131-11-3	Dimethylphthalate		95.6	ug/L	7.06	23.5
88-85-7	Dinoseb	U	7.06	ug/L	7.06	23.5
122-39-4	Diphenylamine		82.2	ug/L	7.06	23.5
206-44-0	Fluoranthene		120	ug/L	0.706	2.35
86-73-7	Fluorene		97.0	ug/L	0.706	2.35
118-74-1	Hexachlorobenzene		88.2	ug/L	7.06	23.5
87-68-3	Hexachlorobutadiene		77.6	ug/L	7.06	23.5
77-47-4	Hexachlorocyclopentadiene		51.0	ug/L	7.06	23.5
67-72-1	Hexachloroethane		67.8	ug/L	7.06	23.5
193-39-5	Indeno(1,2,3-cd)pyrene		91.0	ug/L	0.706	2.35
78-59-1	Isophorone		83.6	ug/L	8.24	23.5
62-75-9	N-Methyl-N-nitrosomethylamine		61.2	ug/L	7.06	23.5
924-16-3	N-Nitrosodi-n-butylamine	U	7.06	ug/L	7.06	23.5
55-18-5	N-Nitrosodiethylamine	U	7.06	ug/L	7.06	23.5
621-64-7	N-Nitrosodi-n-propylamine		88.3	ug/L	7.06	23.5
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		92.7	ug/L	7.06	23.5
91-20-3	Naphthalene		79.6	ug/L	0.706	2.35
98-95-3	Nitrobenzene		81.2	ug/L	7.06	23.5
608-93-5	Pentachlorobenzene	U	7.06	ug/L	7.06	23.5
87-86-5	Pentachlorophenol		114	ug/L	7.06	23.5
85-01-8	Phenanthrene		92.4	ug/L	0.706	2.35
108-95-2	Phenol		50.8	ug/L	7.06	23.5
129-00-0	Pyrene		73.0	ug/L	0.706	2.35
110-86-1	Pyridine		61.5	ug/L	7.06	23.5
108-60-1	bis(2-Chloro-1-methylethyl)ether		83.6	ug/L	7.06	23.5
111-91-1	bis(2-Chloroethoxy)methane		85.1	ug/L	7.06	23.5
111-44-4	bis(2-Chloroethyl) ether		80.1	ug/L	7.06	23.5
117-81-7	bis(2-Ethylhexyl)phthalate		84.3	ug/L	7.06	2.35

**Semi-Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2018-1705	Date Collected: 02/10/2018 09:35	Matrix: W
Lab Sample ID: 1203971930	Date Received: 02/14/2018 09:30	
Client Sample: QC for batch 1739302	Client: ARSL004	Project: QC
Client ID: CAWA-18-10MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1739303	Inst: MSD3.I	Dilution: 1
Run Date: 02/15/2018 20:10	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 02/15/2018 08:55	Aliquot: 425 mL	Final Volume: 1 mL
Data File: s021518.s\s3b1514.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		84.9	ug/L	8.71	23.5
99-09-2	3-Nitroaniline		122	ug/L	7.06	23.5
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		75.4	ug/L	7.06	23.5
88-74-4	2-Nitroaniline		93.4	ug/L	7.06	23.5
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		120	ug/L	7.06	23.5
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	222	235	ug/L	95	(32%-124%)
2-Fluorobiphenyl	78.9	118	ug/L	67	(32%-112%)
2-Fluorophenol	122	235	ug/L	52	(15%-88%)
Nitrobenzene-d5	80.2	118	ug/L	68	(36%-115%)
Phenol-d5	102	235	ug/L	43	(15%-91%)
p-Terphenyl-d14	81.2	118	ug/L	69	(36%-121%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1705
Work Order #: 443794**

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: 1739916

Prep Batch Number: 1739915

Sample Analysis

Sample ID	Client ID
443794001	443794001 (CAWA-18-15)
443794005	443794005 (CAWA-18-50)
1203973628	Interference Check Sample (ICS)
1203973624	Method Blank (MB)
1203973625	Laboratory Control Sample (LCS)
1203973626	443786001(CAWA-18-9) Matrix Spike (MS)
1203973627	443786001(CAWA-18-9) 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.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

QC Sample Designation

Client sample 443786001 (CAWA-18-9) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

One or more of the required spiking analytes were not within the acceptance limits in 1203973626 (CAWA-18-9MS). The non-conforming recoveries are attributed to the background concentration of Perchlorate in the parent sample, 2018-1697 (CAWA-18-9).

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

QC 1203973625 (LCS) was re-analyzed due to non-conforming spike recoveries. The re-analysis met acceptance criteria and were reported.

Miscellaneous Information

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: 2018-1705 GEL Work Order: 443794

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 FEB 2018

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-15Date Received: 14-FEB-18GEL Job No (SDG): 2018-1705GEL Sample ID: 443794001Date Filtered: 16-FEB-18Injection 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	0.368	ug/L		1	16-FEB-18 20:53	per0216035a
	Perchlorate Isotope Ratio			2.86			1	16-FEB-18 20:53	per0216035a
14797-73-0	Perchlorate-101	.05	.2	0.379	ug/L		1	16-FEB-18 20:53	per0216035a
	Perchlorate-O(18)			0.468	ug/L		1	16-FEB-18 20:53	per0216035a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-50Date Received: 14-FEB-18GEL Job No (SDG): 2018-1705GEL Sample ID: 443794005Date Filtered: 16-FEB-18Injection 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	0.268	ug/L		1	16-FEB-18 21:01	per0216036a
	Perchlorate Isotope Ratio			3.21			1	16-FEB-18 21:01	per0216036a
14797-73-0	Perchlorate-101	.05	.2	0.245	ug/L		1	16-FEB-18 21:01	per0216036a
	Perchlorate-O(18)			0.473	ug/L		1	16-FEB-18 21:01	per0216036a

^ 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): 2018-1705

Extract Batch Code: 1739915

Date Filtered: 16-FEB-18

Matrix: WATER

Sample ID: 1203973625

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.196	ug/L	98		85 - 115
Perchlorate Isotope Ratio		3.03				-
Perchlorate-101	0.200	.19	ug/L	95		85 - 115
Perchlorate-O(18)		.485	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): 2018-1705

Extract Batch Code: 1739915

Date Extracted: 16-FEB-18

GEL MS/PS ID: 1203973626

Client ID: CAWA-18-9

GEL MSD/PSD ID: 1203973627

QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	0.588	ug/L	0.726	69 *	.787	99	8	30	75 - 125
Perchlorate Isotope Ratio	0	3.00		2.9		3.02		4		-
Perchlorate-101	0.200	0.576	ug/L	0.737	80	.764	94	4	30	75 - 125
Perchlorate-O(18)	0	0.497	ug/L	0.502		.484		4		-

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 16-FEB-18GEL Job No (SDG): 2018-1705GEL Sample ID: 1203973624Date Filtered: 16-FEB-18Injection 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	0.050	ug/L	U	1	16-FEB-18 19:10	per0216022a
	Perchlorate Isotope Ratio						1	16-FEB-18 19:10	per0216022a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	16-FEB-18 19:10	per0216022a
	Perchlorate-O(18)			0.481	ug/L		1	16-FEB-18 19:10	per0216022a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 16-FEB-18GEL Job No (SDG): 2018-1705GEL Sample ID: 1203973625Date Filtered: 16-FEB-18Injection 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	0.196	ug/L	J	1	19-FEB-18 15:48	per0216047a
	Perchlorate Isotope Ratio			3.03			1	19-FEB-18 15:48	per0216047a
14797-73-0	Perchlorate-101	.05	.2	0.190	ug/L	J	1	19-FEB-18 15:48	per0216047a
	Perchlorate-O(18)			0.485	ug/L		1	19-FEB-18 15:48	per0216047a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2018-1705GEL Sample ID: 1203973628Date Filtered: 16-FEB-18Injection 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	0.222	ug/L		1	16-FEB-18 19:26	per0216024a
	Perchlorate Isotope Ratio			3.18			1	16-FEB-18 19:26	per0216024a
14797-73-0	Perchlorate-101	.05	.2	0.205	ug/L		1	16-FEB-18 19:26	per0216024a
	Perchlorate-O(18)			0.483	ug/L		1	16-FEB-18 19:26	per0216024a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-9MSDate Received: 14-FEB-18GEL Job No (SDG): 2018-1705GEL Sample ID: 1203973626Date Filtered: 16-FEB-18Injection 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	0.726	ug/L		1	16-FEB-18 19:42	per0216026a
	Perchlorate Isotope Ratio			2.9			1	16-FEB-18 19:42	per0216026a
14797-73-0	Perchlorate-101	.05	.2	0.737	ug/L		1	16-FEB-18 19:42	per0216026a
	Perchlorate-O(18)			0.502	ug/L		1	16-FEB-18 19:42	per0216026a

^ 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: 1739915Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-9MSDDate Received: 14-FEB-18GEL Job No (SDG): 2018-1705GEL Sample ID: 1203973627Date Filtered: 16-FEB-18Injection 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	0.787	ug/L		1	16-FEB-18 19:50	per0216027a
	Perchlorate Isotope Ratio			3.02			1	16-FEB-18 19:50	per0216027a
14797-73-0	Perchlorate-101	.05	.2	0.764	ug/L		1	16-FEB-18 19:50	per0216027a
	Perchlorate-O(18)			0.484	ug/L		1	16-FEB-18 19:50	per0216027a

^ 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 #: 2018-1705
Work Order #: 443794**

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: 1739397

Prep Batch Number: 1739396

Sample Analysis

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

Sample ID	Client ID
443794003	CAWA-18-16
443794007	CAWA-18-51
1203972178	Method Blank (MB)
1203972179	Laboratory Control Sample (LCS)
1203972180	443786003(CAWA-18-10) Matrix Spike (MS)
1203972181	443786003(CAWA-18-10) 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 calibration verification standards (ICV or CCV) have not met requirements of 80-120% 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. 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 443786003 (CAWA-18-10) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

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

Sample	Analyte	Value
1203972181 (CAWA-18-10MSD)	2, 4-Diamino-6-nitrotoluene	133* (50%-121%)

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water. The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

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 2.0 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 Qtrap LC/MS/MS.

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: 2018-1705 GEL Work Order: 443794

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 22 FEB 2018

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-16

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 443794003

Sample Amount 920 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215074.wiff

Date Analyzed: 17-FEB-18 22:54

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.087	U	0.087	0.272
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.087	U	0.087	0.272
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.087	U	0.087	0.272
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.087	U	0.087	0.272
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.087	U	0.087	0.272
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.087	U	0.087	0.272
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.087	U	0.087	0.272
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.087	U	0.087	0.543
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.087	U	0.087	0.272
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.087	U	0.087	0.272
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.087	U	0.087	0.272
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.087	U	0.087	0.272
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.087	U	0.087	0.272
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-16

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 443794003

Sample Amount 920 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.087	U	0.087	0.272
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.087	U	0.087	0.272
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.0891	U	0.0891	0.272
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.109	U	0.109	0.543
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.163	U	0.163	0.543
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.326	U	0.326	1.09
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.326	U	0.326	1.09
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.326	U	0.326	1.09
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.543	U	0.543	2.72
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.543	U	0.543	2.72
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-51

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 443794007

Sample Amount 910 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215075.wiff

Date Analyzed: 17-FEB-18 23:30

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0879	U	0.0879	0.275
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.0879	U	0.0879	0.275
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.0879	U	0.0879	0.275
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.0879	U	0.0879	0.275
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.0879	U	0.0879	0.275
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0879	U	0.0879	0.275
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.0879	U	0.0879	0.549
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.0879	U	0.0879	0.275
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.0879	U	0.0879	0.275
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.0879	U	0.0879	0.275
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.0879	U	0.0879	0.275
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0879	U	0.0879	0.275
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.0879	U	0.0879	0.275
<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-18-51

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 443794007

Sample Amount 910 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	.0879	U	0.0879	0.275
99-65-0	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.0901	U	0.0901	0.275
88-72-2	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.11	U	0.110	0.549
78-11-5	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.165	U	0.165	0.549
99-99-0	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	.33	U	0.330	1.10
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.33	U	0.330	1.10
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.33	U	0.330	1.10
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.549	U	0.549	2.75
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.549	U	0.549	2.75
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	2.24		0.0879	0.275
121-82-4	<i>RDX</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2018-1705**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
443794003	CAWA-18-16	107	55 - 115	
443794007	CAWA-18-51	90	55 - 115	
1203972178	MB for batch 1739396	84	55 - 115	
1203972179	LCS for batch 1739396	84	55 - 115	
1203972180	CAWA-18-10MS	86	55 - 115	
1203972181	CAWA-18-10MSD	83	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) 2018-1705

Extract Batch Code: 1739396

Date Extracted: 15-FEB-18

GEL LCS ID: 1203972179

GEL LCSDUP ID: .

Analysis Date/Time: 17-FEB-18 14:01

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
TNX	5	3.39	68					51 - 110
Tetryl	5	4.35	87					55 - 122
m-Dinitrobenzene	5	4.78	96					74 - 117
m-Nitrotoluene	5	4.34	87					66 - 114
o-Nitrotoluene	5	4.38	88					64 - 115
p-Nitrotoluene	5	5.34	107					66 - 127
tris(o-cresyl) phosphate	5	3.37	67					43 - 104
1,3,5-Trinitrobenzene	5	4.93	99					70 - 110
2,4,6-Trinitrotoluene	5	4.57	91					69 - 113
2,4-Diamino-6-nitrotoluene	5	4.58	92					50 - 121
2,4-Dinitrotoluene	5	4.82	96					71 - 110
2,6-Diamino-4-nitrotoluene	5	4.08	82					53 - 127
2,6-Dinitrotoluene	5	5.04	101					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.78	96					70 - 112
3,5-Dinitroaniline	5	4.55	91					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.7	94					74 - 116
DNX	5	3.67	73					65 - 113
HMX	5	4.09	82					58 - 113
MNX	5	3.88	78					66 - 114
Nitrobenzene	5	4.82	96					64 - 115
PETN	5	3.85	77					57 - 126
RDX	5	4.02	80					64 - 117
TATB	3	2.41	80					47 - 135

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-18-10

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Extract Batch Code: 1739396

Date Extracted: 15-FEB-18

GEL Spike ID: 1203972180

GEL SpikeDup ID: 1203972181

Analysis Date/Time: 17-FEB-18 15:12

MSD Analysis Date/Time: 17-FEB-18 15:48

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
1,3,5-Trinitrobenzene	5.31915	.22	5.03	90	5.57	101	10	30	67 - 111
2,4,6-Trinitrotoluene	5.31915	0	4.63	87	5.21	98	12	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.31915	0	5.43	102	7.06	133 *	26	30	50 - 121
2,4-Dinitrotoluene	5.31915	0	5.24	98	5.78	109	10	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.31915	0	4.79	90	5.16	97	8	30	53 - 127
2,6-Dinitrotoluene	5.31915	0	4.79	90	5.1	96	6	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.31915	.111	5.07	93	5.44	100	7	30	67 - 115
3,5-Dinitroaniline	5.31915	.171	4.84	88	5.22	95	8	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.31915	.238	5.27	95	5.55	100	5	30	65 - 120
DNX	5.31915	.0766	4.25	78	4.24	78	0	30	53 - 124
HMX	5.31915	.987	5.18	79	4.86	73	6	30	44 - 128
MXN	5.31915	.0826	3.74	69	4.51	83	19	30	60 - 121
Nitrobenzene	5.31915	0	4.42	83	5.33	100	19	30	62 - 116
PETN	5.31915	0	4.34	82	4.9	92	12	30	51 - 131
RDX	5.31915	15	17.2	74	18.4	97	7	30	57 - 125
TATB	3.19149	0	3.05	95	3.35	105	9	30	38 - 149
TNX	5.31915	.135	4.17	76	4.05	74	3	30	46 - 120
Tetryl	5.31915	0	4.15	78	4.8	90	15	30	50 - 126
m-Dinitrobenzene	5.31915	0	5.04	95	5.42	102	7	30	74 - 117
m-Nitrotoluene	5.31915	0	4.24	80	4.68	88	10	30	59 - 120
o-Nitrotoluene	5.31915	0	4.16	78	5.02	94	19	30	56 - 119
p-Nitrotoluene	5.31915	0	5.25	99	5.65	106	7	30	61 - 129
tris(o-cresyl) phosphate	5.31915	0	3.62	68	4.01	75	10	30	38 - 105

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

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1739396

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 1203972178

Sample Amount 1000 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215058.wiff

Date Analyzed: 17-FEB-18 13:25

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.08	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.08	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.08	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.08	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.08	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.08	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.08	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.08	U	0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.08	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.08	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.08	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.08	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.08	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 1739396

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 1203972178

Sample Amount 1000 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.08	U	0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.08	U	0.080	0.250
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.082	U	0.082	0.250
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.1	U	0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.15	U	0.150	0.500
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.3	U	0.300	1.00
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.3	U	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.3	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.5	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.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 1739396

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 1203972179

Sample Amount 1000 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215059.wiff

Date Analyzed: 17-FEB-18 14:01

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.41		0.300	1.00
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	3.37		0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
13980-04-6	TNX	3.39		0.080	0.250
13980-04-6	TNX				
80251-29-2	DNX	3.67		0.080	0.250
80251-29-2	DNX				
78-11-5	PETN	3.85		0.100	0.500
78-11-5	PETN				
5755-27-1	MNX	3.88		0.080	0.250
5755-27-1	MNX				
121-82-4	RDX	4.02		0.080	0.250
121-82-4	RDX				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.08		0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
2691-41-0	HMX	4.09		0.080	0.250
2691-41-0	HMX				
99-08-1	m-Nitrotoluene	4.34		0.080	0.250
99-08-1	m-Nitrotoluene				
479-45-8	Tetryl	4.35		0.080	0.500
479-45-8	Tetryl				
88-72-2	o-Nitrotoluene	4.38		0.082	0.250
88-72-2	o-Nitrotoluene				
618-87-1	3,5-Dinitroaniline	4.55		0.300	1.00
618-87-1	3,5-Dinitroaniline				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1739396

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 1203972179

Sample Amount 1000 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	4.57		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.58		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</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>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.78		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.78		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	4.82		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
98-95-3	Nitrobenzene	4.82		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.93		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
606-20-2	2,6-Dinitrotoluene	5.04		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	5.34		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-10(443786003MS)MS

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 1203972180

Sample Amount 940 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215061.wiff

Date Analyzed: 17-FEB-18 15:12

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	3.05		0.319	1.06
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	3.62		0.319	1.06
78-30-8	tris(o-cresyl) phosphate				
5755-27-1	MNX	3.74		0.0851	0.266
5755-27-1	MNX				
479-45-8	Tetryl	4.15		0.0851	0.532
479-45-8	Tetryl				
88-72-2	o-Nitrotoluene	4.16		0.0872	0.266
88-72-2	o-Nitrotoluene				
13980-04-6	TNX	4.17		0.0851	0.266
13980-04-6	TNX				
99-08-1	m-Nitrotoluene	4.24		0.0851	0.266
99-08-1	m-Nitrotoluene				
80251-29-2	DNX	4.25		0.0851	0.266
80251-29-2	DNX				
78-11-5	PETN	4.34		0.106	0.532
78-11-5	PETN				
98-95-3	Nitrobenzene	4.42		0.0851	0.266
98-95-3	Nitrobenzene				
118-96-7	2,4,6-Trinitrotoluene	4.63		0.0851	0.266
118-96-7	2,4,6-Trinitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.79		0.532	2.66
59229-75-3	2,6-Diamino-4-nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.79		0.0851	0.266
606-20-2	2,6-Dinitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-10(443786003MS)MS

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 1203972180

Sample Amount 940 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
618-87-1	3,5-Dinitroaniline	4.84		0.319	1.06
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
99-35-4	1,3,5-Trinitrobenzene	5.03		0.0851	0.266
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	5.04		0.0851	0.266
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.07		0.0851	0.266
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
2691-41-0	HMX	5.18		0.0851	0.266
<i>2691-41-0</i>	<i>HMX</i>				
121-14-2	2,4-Dinitrotoluene	5.24		0.0851	0.266
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	5.25		0.160	0.532
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.27		0.0851	0.266
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.43		0.532	2.66
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	17.2		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-18-10(443786003MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 1203972181

Sample Amount 940 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0215062.wiff

Date Analyzed: 17-FEB-18 15:48

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	3.35		0.319	1.06
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	4.01		0.319	1.06
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
13980-04-6	TNX	4.05		0.0851	0.266
<i>13980-04-6</i>	<i>TNX</i>				
80251-29-2	DNX	4.24		0.0851	0.266
<i>80251-29-2</i>	<i>DNX</i>				
5755-27-1	MXN	4.51		0.0851	0.266
<i>5755-27-1</i>	<i>MXN</i>				
99-08-1	m-Nitrotoluene	4.68		0.0851	0.266
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
479-45-8	Tetryl	4.8		0.0851	0.532
<i>479-45-8</i>	<i>Tetryl</i>				
2691-41-0	HMX	4.86		0.0851	0.266
<i>2691-41-0</i>	<i>HMX</i>				
78-11-5	PETN	4.9		0.106	0.532
<i>78-11-5</i>	<i>PETN</i>				
88-72-2	o-Nitrotoluene	5.02		0.0872	0.266
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	5.1		0.0851	0.266
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.16		0.532	2.66
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.21		0.0851	0.266
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-10(443786003MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2018-1705

Matrix: WATER

GEL Sample ID: 1203972181

Sample Amount 940 mL

Date Received: 14-FEB-18

Moisture: .

Extraction Batch ID: 1739396

Extraction Type Sol Exchange

Date Extracted: 15-FEB-18

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
618-87-1	3,5-Dinitroaniline	5.22		0.319	1.06
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
98-95-3	Nitrobenzene	5.33		0.0851	0.266
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-65-0	m-Dinitrobenzene	5.42		0.0851	0.266
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.44		0.0851	0.266
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.55		0.0851	0.266
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	5.57		0.0851	0.266
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-99-0	p-Nitrotoluene	5.65		0.160	0.532
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5.78		0.0851	0.266
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	7.06		0.532	2.66
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	18.4		0.0851	0.266
<i>121-82-4</i>	<i>RDX</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-1705Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 15-FEB-18 18:40GEL Data File: EXP0215001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-1705Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 15-FEB-18 19:15GEL Data File: EXP0215002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 16-FEB-18 00:00

GEL Data File: EXP0215010.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 16-FEB-18 02:22

GEL Data File: EXP0215014.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 16-FEB-18 12:33

GEL Data File: EXP0215016.wiff

Instrument ID: LCMSMS5

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
Tetryl	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 16-FEB-18 13:09

GEL Data File: EXP0215017.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 16-FEB-18 14:20

GEL Data File: EXP0215019.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 16-FEB-18 20:51

GEL Data File: EXP0215030.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 16-FEB-18 22:02

GEL Data File: EXP0215032.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 17-FEB-18 00:59

GEL Data File: EXP0215037.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 17-FEB-18 03:57

GEL Data File: EXP0215042.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK11

Analysis Date: 17-FEB-18 05:08

GEL Data File: EXP0215044.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 17-FEB-18 11:03

GEL Data File: EXP0215054.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK13

Analysis Date: 17-FEB-18 12:14

GEL Data File: EXP0215056.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK14

Analysis Date: 17-FEB-18 16:23

GEL Data File: EXP0215063.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK15

Analysis Date: 17-FEB-18 18:45

GEL Data File: EXP0215067.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK16

Analysis Date: 17-FEB-18 19:56

GEL Data File: EXP0215069.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK17

Analysis Date: 17-FEB-18 21:43

GEL Data File: EXP0215072.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK18

Analysis Date: 17-FEB-18 22:18

GEL Data File: EXP0215073.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK19

Analysis Date: 18-FEB-18 00:05

GEL Data File: EXP0215076.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1705

Lab Code: GEL

Lab Sample ID: XIBLK20

Analysis Date: 18-FEB-18 01:16

GEL Data File: EXP0215078.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1705
Work Order #: 443794

Sample ID	Client ID
443794001	CAWA-18-15
443794002	CAWA-18-16
443794005	CAWA-18-50
443794006	CAWA-18-51
1203971710	Method Blank (MB) ICP
1203971711	Laboratory Control Sample (LCS)
1203971714	443786001(CAWA-18-9L) Serial Dilution (SD)
1203971712	443786001(CAWA-18-9D) Sample Duplicate (DUP)
1203971713	443786001(CAWA-18-9S) Matrix Spike (MS)
1203985768	443786001(CAWA-18-9PS) Post Spike (PS)
1203971725	Method Blank (MB) ICP-MS
1203971726	Laboratory Control Sample (LCS)
1203971729	443786001(CAWA-18-9L) Serial Dilution (SD)
1203971727	443786001(CAWA-18-9D) Sample Duplicate (DUP)
1203971728	443786001(CAWA-18-9S) Matrix Spike (MS)
1203972219	Method Blank (MB) CVAA
1203972220	Laboratory Control Sample (LCS)
1203972226	443794001(CAWA-18-15L) Serial Dilution (SD)
1203972222	443794001(CAWA-18-15D) Sample Duplicate (DUP)
1203972224	443794001(CAWA-18-15S) Matrix Spike (MS)

Sample Analysis

Samples 443794001,002,005 and 006 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1739215, 1739222, 1739409 and 1746508
Prep Batch :	1739214, 1739221 and 1739408
Standard Operating Procedures:	GL-MA-E-013 REV# 30, GL-MA-E-006 REV# 14, GL-MA-E-014 REV# 32, GL-MA-E-010 REV# 36 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 PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium and sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 443794001 (CAWA-18-15) and 443794005 (CAWA-18-50)-ICP.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

All continuing calibration blanks(CCB) bracketing the sample in this SDG did not meet the acceptance criteria for potassium and sodium. The samples bracketed by this CCB, however, contained the element with a concentration at least ten times greater than the concentration in the CCB. This indicates that any contribution to the concentration of these elements in the samples from potential laboratory contamination would be minimal. 443794001 (CAWA-18-15) and 443794005 (CAWA-18-50)-ICP.

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: 443786001 (CAWA-18-9)-ICP, ICP-MS and CVAA and 443794001 (CAWA-18-15)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1203971713 (CAWA-18-9MS)	Sodium	71.7* (75%-125%)

Post Spike (PS) Recovery Statement

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

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

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

Analyte	Sample	Value
Potassium	1203971714 (CAWA-18-9SDILT)	15.5 *(0%-10%)

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

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.

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.

Hardness = 2.497 (Ca) + 4.118 (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: 2018-1705 GEL Work Order: 443794

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 13 MAR 2018

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1705**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443794001**BASIS:** As Received**DATE COLLECTED** 10-FEB-18**CLIENT ID:** CAWA-18-15**LEVEL:** Low**DATE RECEIVED** 14-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/16/18 10:44	021618W2-5	1739409

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1705

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443794001

BASIS: As Received

DATE COLLECTED 10-FEB-18

CLIENT ID: CAWA-18-15

LEVEL: Low

DATE RECEIVED 14-FEB-18

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	560	ug/L		68	200	200	1	P	HSC	03/07/18 11:27	030718-2	1739215
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7440-38-2	Arsenic	2.36	ug/L	J	2	5	5	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7440-39-3	Barium	1520	ug/L		1	5	5	1	P	HSC	03/02/18 17:14	030218-1	1739215
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 17:14	030218-1	1739215
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	03/02/18 17:14	030218-1	1739215
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7440-70-2	Calcium	13800	ug/L		50	200	200	1	P	HSC	03/02/18 17:14	030218-1	1739215
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 17:14	030218-1	1739215
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	03/02/18 17:14	030218-1	1739215
7439-89-6	Iron	230	ug/L		30	100	100	1	P	HSC	03/02/18 17:14	030218-1	1739215
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7439-95-4	Magnesium	3670	ug/L		110	300	300	1	P	HSC	03/02/18 17:14	030218-1	1739215
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	03/02/18 17:14	030218-1	1739215
7439-98-7	Molybdenum	0.760	ug/L		0.2	0.5	0.5	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7440-02-0	Nickel	0.831	ug/L	J	0.6	2	2	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7440-09-7	Potassium	2420	ug/L		50	150	150	1	P	HSC	03/07/18 11:27	030718-2	1739215
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7631-86-9	Silica	30900	ug/L		53	213	213	1	P	HSC	03/02/18 17:14	030218-1	1739215
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7440-23-5	Sodium	11700	ug/L		100	300	300	1	P	HSC	03/07/18 11:27	030718-2	1739215
7440-24-6	Strontium	87.7	ug/L		1	5	5	1	P	HSC	03/07/18 11:27	030718-2	1739215
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	03/02/18 17:14	030218-1	1739215
7440-61-1	Uranium	0.067	ug/L	U	0.067	0.2	0.2	1	MS	BAJ	02/26/18 20:20	180226-4	1739222
7440-62-2	Vanadium	1.31	ug/L	J	1	5	5	1	P	HSC	03/02/18 17:14	030218-1	1739215
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	03/02/18 17:14	030218-1	1739215

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1705**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443794001**BASIS:** As Received**DATE COLLECTED** 10-FEB-18**CLIENT ID:** CAWA-18-15**LEVEL:** Low**DATE RECEIVED** 14-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	49.6	mg/L		0.453	1.24	1.24	1		TXT1	03/12/18 14:54		1746508

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739215	1739214	SW846 3005A	50	mL	50	mL	02/14/18	JXM8
1739222	1739221	SW846 3005A	50	mL	50	mL	02/14/18	JXM8
1739409	1739408	EPA 245.1/245.2 Prep	20	mL	20	mL	02/15/18	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1705**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443794002**BASIS:** As Received**DATE COLLECTED** 10-FEB-18**CLIENT ID:** CAWA-18-16**LEVEL:** Low**DATE RECEIVED** 14-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/16/18 10:56	021618W2-5	1739409

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739409	1739408	EPA 245.1/245.2 Prep	20	mL	20	mL	02/15/18	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1705**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443794005**BASIS:** As Received**DATE COLLECTED** 09-FEB-18**CLIENT ID:** CAWA-18-50**LEVEL:** Low**DATE RECEIVED** 14-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/16/18 10:58	021618W2-5	1739409

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1705

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 443794005

BASIS: As Received

DATE COLLECTED 09-FEB-18

CLIENT ID: CAWA-18-50

LEVEL: Low

DATE RECEIVED 14-FEB-18

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	3020	ug/L		68	200	200	1	P	HSC	03/07/18 11:30	030718-2	1739215
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7440-38-2	Arsenic	4.72	ug/L	J	2	5	5	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7440-39-3	Barium	16	ug/L		1	5	5	1	P	HSC	03/02/18 17:17	030218-1	1739215
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 17:17	030218-1	1739215
7440-42-8	Boron	25.2	ug/L	J	15	50	50	1	P	HSC	03/02/18 17:17	030218-1	1739215
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7440-70-2	Calcium	5420	ug/L		50	200	200	1	P	HSC	03/02/18 17:17	030218-1	1739215
7440-47-3	Chromium	3.08	ug/L	J	3	10	10	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	03/02/18 17:17	030218-1	1739215
7440-50-8	Copper	8.04	ug/L	J	3	10	10	1	P	HSC	03/02/18 17:17	030218-1	1739215
7439-89-6	Iron	1210	ug/L		30	100	100	1	P	HSC	03/02/18 17:17	030218-1	1739215
7439-92-1	Lead	2.38	ug/L		0.5	2	2	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7439-95-4	Magnesium	1830	ug/L		110	300	300	1	P	HSC	03/02/18 17:17	030218-1	1739215
7439-96-5	Manganese	34.7	ug/L		2	10	10	1	P	HSC	03/02/18 17:17	030218-1	1739215
7439-98-7	Molybdenum	6.32	ug/L		0.2	0.5	0.5	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7440-02-0	Nickel	2.73	ug/L		0.6	2	2	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7440-09-7	Potassium	2890	ug/L		50	150	150	1	P	HSC	03/07/18 11:30	030718-2	1739215
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7631-86-9	Silica	71300	ug/L		53	213	213	1	P	HSC	03/02/18 17:17	030218-1	1739215
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7440-23-5	Sodium	99300	ug/L		100	300	300	1	P	HSC	03/07/18 11:30	030718-2	1739215
7440-24-6	Strontium	31.9	ug/L		1	5	5	1	P	HSC	03/07/18 11:30	030718-2	1739215
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	03/02/18 17:17	030218-1	1739215
7440-61-1	Uranium	0.605	ug/L		0.067	0.2	0.2	1	MS	BAJ	02/26/18 20:23	180226-4	1739222
7440-62-2	Vanadium	4.07	ug/L	J	1	5	5	1	P	HSC	03/02/18 17:17	030218-1	1739215
7440-66-6	Zinc	42.4	ug/L		3.3	10	10	1	P	HSC	03/02/18 17:17	030218-1	1739215

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1705**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 443794005**BASIS:** As Received**DATE COLLECTED** 09-FEB-18**CLIENT ID:** CAWA-18-50**LEVEL:** Low**DATE RECEIVED** 14-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	21.1	mg/L		0.453	1.24	1.24	1		TXT1	03/12/18 14:54		1746508

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739215	1739214	SW846 3005A	50	mL	50	mL	02/14/18	JXM8
1739222	1739221	SW846 3005A	50	mL	50	mL	02/14/18	JXM8
1739409	1739408	EPA 245.1/245.2 Prep	20	mL	20	mL	02/15/18	AXS5

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1705**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 443794006**BASIS:** As Received**DATE COLLECTED** 09-FEB-18**CLIENT ID:** CAWA-18-51**LEVEL:** Low**DATE RECEIVED** 14-FEB-18**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	02/16/18 10:59	021618W2-5	1739409

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1739409	1739408	EPA 245.1/245.2 Prep	20	mL	20	mL	02/15/18	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2018-1705

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>
1203971710	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	54.5	ug/L	+/-150	J	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203971725	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203972219	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

*Analytical Methods:

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

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-1705 Client ID: CAWA-18-9S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 443786001 Spike ID: 1203971713

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Aluminum	ug/L	75-125	5230		338		5000	97.9		P
Barium	ug/L	75-125	936		502		500	86.9		P
Beryllium	ug/L	75-125	462		1	U	500	92.5		P
Boron	ug/L	75-125	485		15	U	500	94.1		P
Calcium	ug/L	75-125	20900		16600		5000	85.8		P
Cobalt	ug/L	75-125	458		1	U	500	91.5		P
Copper	ug/L	75-125	535		3	U	500	107		P
Iron	ug/L	75-125	4690		115		5000	91.5		P
Magnesium	ug/L	75-125	9360		4910		5000	89.1		P
Manganese	ug/L	75-125	517		2	U	500	103		P
Potassium	ug/L	75-125	7970		3090		5000	97.6		P
Silica	ug/L	75-125	49900		40700		10700	85.3		P
Sodium	ug/L	75-125	17900		14300		5000	71.7	N	P
Strontium	ug/L	75-125	569		111		500	91.5		P
Tin	ug/L	75-125	513		4.28	J	500	102		P
Vanadium	ug/L	75-125	533		2.14	J	500	106		P
Zinc	ug/L	75-125	467		3.3	U	500	93.4		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-1705 Client ID CAWA-18-9S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 443786001 Spike ID: 1203971728

<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>
Arsenic	ug/L	75-125	51.8		2.42	J	50	98.8		MS
Cadmium	ug/L	75-125	52.3		0.3	U	50	105		MS
Chromium	ug/L	75-125	53.7		3	U	50	104		MS
Lead	ug/L	75-125	50.4		0.5	U	50	100		MS
Molybdenum	ug/L	75-125	54		0.727		50	106		MS
Nickel	ug/L	75-125	54.7		1.11	J	50	107		MS
Selenium	ug/L	75-125	50.4		2	U	50	98.9		MS
Silver	ug/L	75-125	52		0.3	U	50	104		MS
Thallium	ug/L	75-125	47.4		0.6	U	50	94.7		MS
Uranium	ug/L	75-125	49.9		0.312		50	99.1		MS
Antimony	ug/L	75-125	50.2		1	U	50	99.9		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-1705 Client ID CAWA-18-15S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 443794001 Spike ID: 1203972224

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	1.69		0.067	U	2	84.7		AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-5a-

Spike Summary

SDG NO. 2018-1705 **Client ID:** CAWA-18-9PS**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 443786001 **Spike ID:** 1203985768

<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>
Sodium	ug/L	80-120	18600		14300		5000	86.8		P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-1705

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-18-9D

Matrix: WATER

Level: Low

Sample ID: 443786001

Duplicate ID: 1203971712

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-200	338		315		7.1		P
Barium	ug/L	+/-20%	502		502		.0299		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	16600		16800		1.24		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-100	115		108		6.82		P
Magnesium	ug/L	+/-20%	4910		4890		.394		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	3090		3150		1.96		P
Silica	ug/L	+/-20%	40700		40700		.0172		P
Sodium	ug/L	+/-20%	14300		14300		.049		P
Strontium	ug/L	+/-20%	111		109		2.18		P
Tin	ug/L		4.28 J		2.5 U		200		P
Vanadium	ug/L	+/-5	2.14 J		2.87 J		29.3		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-1705

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-18-9D

Matrix: WATER

Level: Low

Sample ID: 443786001

Duplicate ID: 1203971727

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	2.42 J		2.24 J		7.77		MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.727		0.696		4.36		MS
Nickel	ug/L	+/-2	1.11 J		1 J		9.68		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	0.312		0.312		0		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-1705**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA-18-15D**Matrix:** WATER**Level:** Low**Sample ID:** 443794001**Duplicate ID:** 1203972222**Percent Solids for Dup:** N/A

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2018-1705

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>
1203971711								
	Potassium	ug/L	5000	5060		101	80-120	P
	Silica	ug/L	10700	9840		91.9	80-120	P
	Sodium	ug/L	5000	4970		99.3	80-120	P
	Strontium	ug/L	500	475		95	80-120	P
	Tin	ug/L	500	464		92.7	80-120	P
	Vanadium	ug/L	500	482		96.4	80-120	P
	Zinc	ug/L	500	433		86.7	80-120	P
	Aluminum	ug/L	5000	5040		101	80-120	P
	Barium	ug/L	500	463		92.5	80-120	P
	Beryllium	ug/L	500	469		93.9	80-120	P
	Boron	ug/L	500	481		96.1	80-120	P
	Calcium	ug/L	5000	4950		98.9	80-120	P
	Cobalt	ug/L	500	478		95.5	80-120	P
	Copper	ug/L	500	486		97.1	80-120	P
	Iron	ug/L	5000	4730		94.6	80-120	P
	Magnesium	ug/L	5000	4850		97.1	80-120	P
	Manganese	ug/L	500	480		95.9	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2018-1705

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures

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>
1203971726								
	Antimony	ug/L	50	50.1		100	80-120	MS
	Arsenic	ug/L	50	53.4		107	80-120	MS
	Cadmium	ug/L	50	53.2		106	80-120	MS
	Chromium	ug/L	50	55.3		111	80-120	MS
	Lead	ug/L	50	52.9		106	80-120	MS
	Molybdenum	ug/L	50	52.8		106	80-120	MS
	Nickel	ug/L	50	56.6		113	80-120	MS
	Selenium	ug/L	50	52.4		105	80-120	MS
	Silver	ug/L	50	53.9		108	80-120	MS
	Thallium	ug/L	50	48.6		97.2	80-120	MS
	Uranium	ug/L	50	50.8		102	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2018-1705

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>
1203972220	Mercury	ug/L	2	2.1		105	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1705 Client ID: CAWA-18-9L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 443786001 Serial Dilution ID: 1203971714

<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	338		340	U	46.214			P
Barium	502		494		1.493		10	P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	16600		17200		3.461		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	115		150	U	29.97			P
Magnesium	4910		5180		5.615			P
Manganese	2	U	10	U				P
Potassium	3090		2610		15.452	E	10	P
Silica	40700		41100		.907		10	P
Sodium	14300		13700		3.952		10	P
Strontium	111		115		3.03		10	P
Tin	4.28	J	12.5	U	31.748			P
Vanadium	2.14	J	5.59	J	161.443			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1705

Client ID: CAWA-18-9L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 443786001

Serial Dilution ID: 1203971729

<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	2.42	J	10	U	54.545			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	.727		1	U	10.041			MS
Nickel	1.11	J	3	U	18.1			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.312		.335	U	7.051			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1705 **Client ID:** CAWA-18-15L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 443794001 **Serial Dilution ID:** 1203972226

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

*Analytical Methods:

AV EPA 245.1/245.2

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1705
Work Order #: 443794**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1739763

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
443794002	CAWA-18-16
443794006	CAWA-18-51
1203973203	Method Blank (MB)
1203973204	Laboratory Control Sample (LCS)
1203973206	443794002(CAWA-18-16) Sample Duplicate (DUP)
1203973209	443794002(CAWA-18-16) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 443794002 (CAWA-18-16) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The following sample 443794006 (CAWA-18-51) was diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	443794
	006
Total Organic Carbon Average	10X

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:	Cyanide and Total		
Analytical Batch:	1740052	Method:	WSP-CN(T)
Prep Batch :	1740051	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
443794002	CAWA-18-16
443794006	CAWA-18-51
1203974004	Method Blank (MB)
1203974005	Laboratory Control Sample (LCS)
1203974006	443786015(CAWA-18-46) Sample Duplicate (DUP)
1203974010	443786015(CAWA-18-46) 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# 21.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample 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 443786015 (CAWA-18-46) 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: Ion Chromatography

Analytical Batch: 1740419

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
443794001	CAWA-18-15
443794005	CAWA-18-50
1203974912	Method Blank (MB)
1203974913	Laboratory Control Sample (LCS)
1203974914	443786001(CAWA-18-9) Sample Duplicate (DUP)
1203974915	443786001(CAWA-18-9) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 443786001 (CAWA-18-9) 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 1203974914 (CAWA-18-9DUP), 1203974915 (CAWA-18-9PS) and 443794001 (CAWA-18-15) 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	443794
	001
Chloride	2X

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203974914 (CAWA-18-9DUP), 1203974915 (CAWA-18-9PS), 443794001 (CAWA-18-15) and 443794005 (CAWA-18-50) 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:	1740091	Method:	NH3
Prep Batch :	1740090	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
443794001	CAWA-18-15
443794005	CAWA-18-50
1203974091	Method Blank (MB)
1203974092	Laboratory Control Sample (LCS)
1203974093	443786014(CAWA-18-45) Sample Duplicate (DUP)
1203974095	443786014(CAWA-18-45) 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# 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.

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 443786014 (CAWA-18-45) was selected for QC analysis.

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

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

Analyte	Sample	Value
Nitrogen, Ammonia	1203974095 (CAWA-18-45MS)	111* (90%-110%)

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203974093 (CAWA-18-45DUP), 1203974095 (CAWA-18-45MS), 443794001 (CAWA-18-15) and 443794005 (CAWA-18-50) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported.

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1742072	Method:	TKN
Prep Batch :	1742071	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
443794002	CAWA-18-16
443794006	CAWA-18-51
1203978458	Method Blank (MB)
1203978459	Laboratory Control Sample (LCS)
1203978460	443786015(CAWA-18-46) Sample Duplicate (DUP)
1203978461	443786015(CAWA-18-46) 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# 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 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 443786015 (CAWA-18-46) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

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: 1740472

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
443794001	CAWA-18-15
443794005	CAWA-18-50
1203975070	Method Blank (MB)
1203975071	Laboratory Control Sample (LCS)
1203975072	443786001(CAWA-18-9) Sample Duplicate (DUP)
1203975074	443786001(CAWA-18-9) 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# 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+ 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 443786001 (CAWA-18-9) was selected for QC analysis.

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

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.

Analyte	Sample	Value
Nitrogen, Nitrate/Nitrite	1203975074 (CAWA-18-9PS)	121 * (90%-110%)

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The following samples 1203975072 (CAWA-18-9DUP) and 1203975074 (CAWA-18-9PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Sample Re-analysis

Sample 1203975071 (LCS) was 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:

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Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1740095	Method:	PO4
Prep Batch :	1740094	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
443794001	CAWA-18-15
443794005	CAWA-18-50
1203974103	Method Blank (MB)
1203974104	Laboratory Control Sample (LCS)
1203974106	443786001(CAWA-18-9) Sample Duplicate (DUP)
1203974108	443786001(CAWA-18-9) 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# 11.

Preparation/Analytical Method Verification

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

Calibration Information

The 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 443786001 (CAWA-18-9) 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: Solids and Total Dissolved

Analytical Batch: 1739392

Method: TDS

Sample Analysis

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

Sample ID	Client ID
443794001	CAWA-18-15
443794005	CAWA-18-50
1203972169	Method Blank (MB)
1203972170	Laboratory Control Sample (LCS)
1203972171	443794005(CAWA-18-50) 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 443794005 (CAWA-18-50) 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: 1740142 **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
443794001	CAWA-18-15
443794005	CAWA-18-50
1203974209	Laboratory Control Sample (LCS)
1203974210	443786014(CAWA-18-45) Sample Duplicate (DUP)
1203974211	443794005(CAWA-18-50) 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# 16.

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 Scientific Orion Star A212 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

Samples 443786014 (CAWA-18-45) and 443794005 (CAWA-18-50) were selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

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: 1739668 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
443794001	CAWA-18-15
443794005	CAWA-18-50
1203972901	Laboratory Control Sample (LCS)
1203972902	443549001(CAWA-18-3) 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# 23.

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 443549001 (CAWA-18-3) 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
1203972902 (CAWA-18-3DUP)	pH	Received 10-FEB-18, out of holding 08-FEB-18
443794001 (CAWA-18-15)	pH	Received 14-FEB-18, out of holding 10-FEB-18
443794005 (CAWA-18-50)	pH	Received 14-FEB-18, out of holding 09-FEB-18

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: 1739667 **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
443794001	CAWA-18-15
443794005	CAWA-18-50
1203972896	Laboratory Control Sample (LCS)
1203972897	443549001(CAWA-18-3) Sample Duplicate (DUP)
1203972899	443549001(CAWA-18-3) 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 443549001 (CAWA-18-3) 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: 2018-1705 GEL Work Order: 443794


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: 13 MAR 2018

Title: Analyst I

Sample Data Summary

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Certificate of Analysis

Report Date: March 13, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1705

Client Sample ID: CAWA-18-15
Sample ID: 443794001
Matrix: W
Collect Date: 10-FEB-18 11:08
Receive Date: 14-FEB-18
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	LXA2	02/20/18	0320	1740419	1
Fluoride		0.141	0.033	0.100	mg/L		1					
Sulfate		8.57	0.133	0.400	mg/L		1					
Chloride		12.9	0.134	0.400	mg/L		2	LXA2	02/20/18	1821	1740419	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0335	0.017	0.050	mg/L	1.00	1	KLP1	02/19/18	1249	1740091	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.278	0.017	0.050	mg/L		1	KLP1	02/21/18	1129	1740472	4
PO4 "As Received"												
Phosphorus, Total as P		0.0609	0.020	0.050	mg/L	1.00	1	KLP1	02/20/18	1145	1740095	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		144	3.40	14.3	mg/L			KLP1	02/15/18	1259	1739392	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		53.8	1.45	4.00	mg/L			RXB5	02/17/18	1313	1739667	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		173	1.00	1.00	umhos/cm		1	HXC1	02/20/18	1253	1740142	8
PH "As Received"												
pH at Temp 15.8C	H	7.16	0.010	0.100	SU		1	RXB5	02/17/18	1310	1739668	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/19/18	0734	1740090
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	02/20/18	0900	1740094

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Certificate of Analysis

Report Date: March 13, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1705

Client Sample ID: CAWA-18-15
Sample ID: 443794001

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: March 13, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1705

Client Sample ID: CAWA-18-16
Sample ID: 443794002
Matrix: W
Collect Date: 10-FEB-18 11:08
Receive Date: 14-FEB-18
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		1.71	0.330	1.00	mg/L		1	TSM	02/17/18	1556	1739763	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/19/18	1042	1740052	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.216	0.033	0.100	mg/L	1.00	1	KLP1	02/28/18	1348	1742072	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/19/18	0930	1740051
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	02/27/18	1000	1742071

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: March 13, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1705

Client Sample ID: CAWA-18-50
Sample ID: 443794005
Matrix: W
Collect Date: 09-FEB-18 14:36
Receive Date: 14-FEB-18
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	LXA2	02/20/18	0447	1740419	1
Chloride		3.02	0.067	0.200	mg/L		1					
Fluoride		0.133	0.033	0.100	mg/L		1					
Sulfate		15.9	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0807	0.017	0.050	mg/L	1.00	1	KLP1	02/19/18	1250	1740091	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.233	0.017	0.050	mg/L		1	KLP1	02/21/18	1130	1740472	3
PO4 "As Received"												
Phosphorus, Total as P		0.0978	0.020	0.050	mg/L	1.00	1	KLP1	02/20/18	1146	1740095	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		710	3.40	14.3	mg/L			KLP1	02/15/18	1259	1739392	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		82.2	1.45	4.00	mg/L			RXB5	02/17/18	1317	1739667	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		465	1.00	1.00	umhos/cm		1	HXC1	02/20/18	1254	1740142	7
PH "As Received"												
pH at Temp 16.6C	H	7.49	0.010	0.100	SU		1	RXB5	02/17/18	1314	1739668	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	02/19/18	0734	1740090
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	02/20/18	0900	1740094

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Certificate of Analysis

Report Date: March 13, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1705

Client Sample ID: CAWA-18-50
Sample ID: 443794005

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: March 13, 2018

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1705

Client Sample ID: CAWA-18-51
Sample ID: 443794006
Matrix: W
Collect Date: 09-FEB-18 14:36
Receive Date: 14-FEB-18
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		173	3.30	10.0	mg/L		10	TSM	02/19/18	1438	1739763	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	02/19/18	1044	1740052	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.360	0.033	0.100	mg/L	1.00	1	KLP1	02/28/18	1349	1742072	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	02/19/18	0930	1740051
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	02/27/18	1000	1742071

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: March 13, 2018

Page 1 of 6

Los Alamos National Laboratory
TA-00, SM1237, Rm104C
Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 443794

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1739763										
QC1203973206	443794002	DUP									
Total Organic Carbon Average		1.71		1.76	mg/L	2.83	^	(+/-1.00)	TSM	02/17/18	16:36
QC1203973204	LCS										
Total Organic Carbon Average	10.0			10.7	mg/L			107 (80%-120%)		02/17/18	11:11
QC1203973203	MB										
Total Organic Carbon Average			U	ND	mg/L					02/17/18	11:02
QC1203973209	443794002	PS									
Total Organic Carbon Average	10.0	1.71		13.1	mg/L			114 (75%-125%)		02/17/18	17:16
Flow Injection Analysis											
Batch	1740052										
QC1203974006	443786015	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	02/19/18	10:40
QC1203974005	LCS										
Cyanide, Total	50.0			48.8	ug/L			97.6 (90%-110%)		02/19/18	10:24
QC1203974004	MB										
Cyanide, Total			U	ND	ug/L					02/19/18	10:23
QC1203974010	443786015	MS									
Cyanide, Total	100	U	ND	105	ug/L			105 (90%-110%)		02/19/18	10:41
Ion Chromatography											
Batch	1740419										
QC1203974914	443786001	DUP									
Bromide		J	0.0692	J	0.0745	mg/L	7.38	^	(+/-0.200)	LXA2	02/20/18 00:27

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QC Summary

Workorder: 443794

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1740419										
Chloride		16.3		16.4	mg/L	0.166		(0%-20%)	LXA2	02/20/18	11:08
Fluoride		0.127		0.126	mg/L	0.872	^	(+/-0.100)		02/20/18	00:27
Sulfate		6.55		6.54	mg/L	0.163		(0%-20%)			
QC1203974913 LCS											
Bromide	1.25			1.19	mg/L		95.2	(80%-120%)		02/19/18	23:29
Chloride	5.00			4.71	mg/L		94.2	(80%-120%)			
Fluoride	2.50			2.43	mg/L		97	(80%-120%)			
Sulfate	10.0			9.60	mg/L		96	(80%-120%)			
QC1203974912 MB											
Bromide			U	ND	mg/L					02/19/18	23:00
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203974915 443786001 PS											
Bromide	1.25	J	0.0692	1.23	mg/L		93	(75%-125%)		02/20/18	00:56
Chloride	5.00		8.17	13.7	mg/L		111	(75%-125%)		02/20/18	11:36
Fluoride	2.50		0.127	2.43	mg/L		92.3	(75%-125%)		02/20/18	00:56
Sulfate	10.0		6.55	16.4	mg/L		98.9	(75%-125%)			

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QC Summary

Workorder: 443794

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1740091										
QC1203974093	443786014	DUP									
Nitrogen, Ammonia		U	ND	J	0.0461	mg/L	200		KLP1	02/19/18	12:47
QC1203974092	LCS										
Nitrogen, Ammonia	1.00				1.02	mg/L	102	(90%-110%)		02/19/18	12:48
QC1203974091	MB										
Nitrogen, Ammonia			U	ND	mg/L					02/19/18	12:13
QC1203974095	443786014	MS									
Nitrogen, Ammonia	1.00	U	ND		1.12	mg/L	111 *	(90%-110%)		02/19/18	12:48
Batch	1740095										
QC1203974106	443786001	DUP									
Phosphorus, Total as P			0.0757		0.0776	mg/L	2.48 ^	(+/-0.050)	KLP1	02/20/18	11:40
QC1203974104	LCS										
Phosphorus, Total as P	1.00				1.06	mg/L	106	(80%-124%)		02/20/18	11:20
QC1203974103	MB										
Phosphorus, Total as P			J	0.035	mg/L					02/20/18	11:19
QC1203974108	443786001	MS									
Phosphorus, Total as P	1.00		0.0757		1.10	mg/L	102	(63%-139%)		02/20/18	11:41
Batch	1740472										
QC1203975072	443786001	DUP									
Nitrogen, Nitrate/Nitrite			2.00		1.76	mg/L	12.5	(0%-20%)	KLP1	02/21/18	11:22
QC1203975071	LCS										
Nitrogen, Nitrate/Nitrite	1.00				1.07	mg/L	107	(90%-110%)		02/21/18	14:27
QC1203975070	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					02/21/18	11:13

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QC Summary

Workorder: 443794

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1740472										
QC1203975074	443786001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.399		1.61	mg/L		121 *	(90%-110%)	KLP1	02/21/18	11:23
Batch	1742072										
QC1203978460	443786015	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	02/28/18	13:47
QC1203978459	LCS										
Nitrogen, Total Kjeldahl	1.00			1.05	mg/L		105	(90%-110%)		02/28/18	13:43
QC1203978458	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					02/28/18	13:42
QC1203978461	443786015	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	1.02	mg/L		101	(90%-110%)		02/28/18	13:48
Solids Analysis											
Batch	1739392										
QC1203972171	443794005	DUP									
Total Dissolved Solids			710	687	mg/L	3.27		(0%-5%)	KLP1	02/15/18	12:59
QC1203972170	LCS										
Total Dissolved Solids	300			287	mg/L		95.7	(95%-105%)		02/15/18	12:59
QC1203972169	MB										
Total Dissolved Solids			U	ND	mg/L					02/15/18	12:59
Titration and Ion Analysis											
Batch	1739667										
QC1203972897	443549001	DUP									
Alkalinity, Total as CaCO3			49.6	50.4	mg/L	1.6		(0%-20%)	RXB5	02/17/18	12:44
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				

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QC Summary

Workorder: 443794

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1739667										
QC1203972896	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)	RXB5	02/17/18	12:33
QC1203972899	443549001	MS									
Alkalinity, Total as CaCO3	100	49.6		154	mg/L		105	(80%-120%)		02/17/18	12:45
Batch	1739668										
QC1203972902	443549001	DUP									
pH		H	7.75	H	7.74	SU	0.129	(0%-5%)	RXB5	02/17/18	12:41
QC1203972901	LCS										
pH	7.00			6.99	SU		99.9	(99%-101%)		02/17/18	12:24
Batch	1740142										
QC1203974210	443786014	DUP									
Conductivity		109		110	umhos/cm	0.917		(0%-10%)	HXC1	02/20/18	12:52
QC1203974211	443794005	DUP									
Conductivity		465		463	umhos/cm	0.409		(0%-10%)		02/20/18	12:55
QC1203974209	LCS										
Conductivity	1410			1400	umhos/cm		99.4	(95%-105%)		02/20/18	12:40

- Notes:**
- < Result is less than value reported
 - > Result is greater than value reported
 - B The target analyte was detected in the associated blank.
 - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
 - H Analytical holding time was exceeded
 - J Value is estimated
 - N/A RPD or %Recovery limits do not apply.
 - N1 See case narrative
 - ND Analyte concentration is not detected above the detection limit
 - NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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QC Summary

Workorder: 443794

Page 6 of 6

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

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1705
Work Order #: 443794**

Method/Analysis Information

Product: Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1739284

Sample ID	Client ID
443794002	CAWA-18-16
443794006	CAWA-18-51
1203971866	Method Blank (MB)
1203971868	Laboratory Control Sample (LCS)
1203971867	443786002(CAWA-18-10) 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-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in February 2018.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203971866 (MB) and 1203971868 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

Sample	Analyte	Value
1203971866 (MB)	Americium-241	Blank result > 1.65 CSU

Blank Decision Level

The blank (See Below) result is greater than the decision level but less than the MDC.

Sample	Analyte	Value
1203971866 (MB)	Americium-241	Blank result > DL

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443786002 (CAWA-18-10). The QC was from ARSL work order 443786.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Sample 1203971866 (MB) was recounted due to high carrier/tracer yield. The recount is reported.

Miscellaneous Information:

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: ISOPU
Analytical Method: HASL-300:ISOPU
Analytical Batch Number: 1739285

Sample ID	Client ID
443794002	CAWA-18-16
443794006	CAWA-18-51
1203971869	Method Blank (MB)
1203971871	Laboratory Control Sample (LCS)
1203971870	443786002(CAWA-18-10) 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-RAD-A-011 REV# 26.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in February 2018.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

Aliquots for samples 1203971869 (MB) and 1203971871 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank (See Below) result is greater than the decision level but less than the MDC.

Sample	Analyte	Value
1203971869 (MB)	Plutonium-238	Blank result > DL

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443786002 (CAWA-18-10). The QC was from ARSL work order 443786.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: **IsoU**
Analytical Method: HASL-300:ISOU
Analytical Batch Number: 1739286

Sample ID	Client ID
443794002	CAWA-18-16
443794006	CAWA-18-51
1203971872	Method Blank (MB)
1203971874	Laboratory Control Sample (LCS)
1203971873	443786002(CAWA-18-10) 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-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in February 2018.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203971872 (MB) and 1203971874 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

Sample	Analyte	Value
1203971872 (MB)	Uranium-233/234	Blank result > 1.65 CSU

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443786002 (CAWA-18-10). The QC was from ARSL work order 443786.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Manual Integration**

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: **Gammasec**

Analytical Method: EPA:901.1

Analytical Batch Number: 1739356

Sample ID	Client ID
443794002	CAWA-18-16
443794006	CAWA-18-51
1203972046	Method Blank (MB)
1203972048	Laboratory Control Sample (LCS)
1203972047	443786002(CAWA-18-10) 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-RAD-A-013 REV# 27.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in August 2017, December 2017 and November 2017.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443786002 (CAWA-18-10). The QC was from ARSL work order 443786.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Additional Identified Radionuclides

No additional radionuclides were added.

Miscellaneous Information:**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr90, liquid

Analytical Method: EPA:905.0

Analytical Batch Number: 1740247

Sample ID	Client ID
443794002	CAWA-18-16
443794006	CAWA-18-51
1203974510	Method Blank (MB)
1203974513	Laboratory Control Sample (LCS)
1203974511	443786015(CAWA-18-46) 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-RAD-A-004 REV# 19.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibration was performed in April 2016.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203974510 (MB) and 1203974513 (LCS) were changed to 1.0 per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443786015 (CAWA-18-46). The QC was from ARSL work order 443786.

Matrix Spike (MS) Recovery

The MS spike recoveries met acceptance limits.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

The matrix spike, 1203974512 (CAWA-18-46MS), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	WSP-GrossA/B
Analytical Method:	EPA 900.0/SW846 9310
Analytical Batch Number:	1740250

Sample ID	Client ID
443794002	CAWA-18-16
443794006	CAWA-18-51
1203974521	Method Blank (MB)
1203974525	Laboratory Control Sample (LCS)
1203974522	443786010(CAWA-18-20) Sample Duplicate (DUP)
1203974523	443786010(CAWA-18-20) Matrix Spike (MS)
1203974524	443786010(CAWA-18-20) Matrix Spike Duplicate (MSD)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 19.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibration was performed in December 2017.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203974521 (MB) and 1203974525 (LCS) were changed to 1.0 per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 443786010 (CAWA-18-20). The QC was from ARSL work order 443786.

Matrix Spike (MS) Recovery

The MS spike recoveries met acceptance limits.

Duplication Criteria between MS and MSD

The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) met the duplication acceptance criteria.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating, especially to a dull red heat. For this sample set, the prepared planchet was counted for beta activity before being flamed. After flaming, the planchet was counted for alpha activity.

Recounts

Sample 1203974522 (CAWA-18-20DUP) was recounted due to high MDC. The recount is reported. Sample 443794006 (CAWA-18-51) was recounted to verify sample results. Recount is reported.

Miscellaneous Information:**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

The matrix spike and matrix spike duplicate, 1203974523 (CAWA-18-20MS) and 1203974524 (CAWA-18-20MSD), aliquots were reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

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: 2018-1705 GEL Work Order: 443794

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- 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: Kate Gellatly

Date: 06 MAR 2018

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Report Date: March 6, 2018

Client Sample ID: CAWA-18-16
Sample ID: 443794002
Matrix: W
Collect Date: 10-FEB-18
Receive Date: 14-FEB-18
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Alpha Spec Analysis

Alphaspec Am241 Liquid "As Received"

Americium-241	U	0.00359	+/-0.00802	0.0303	0.0127	+/-0.00802	0.050	pCi/L			HAKB	02/19/18	1327	1739284	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	-0.00251	+/-0.00831	0.0435	0.0184	+/-0.00831	0.050	pCi/L			HAKB	02/17/18	1609	1739285	2
Plutonium-239/240	U	0.00501	+/-0.00709	0.0351	0.0141	+/-0.00709	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234	U	0.113	+/-0.0258	0.173	0.0809	+/-0.0266	1.00	pCi/L			HAKB	02/15/18	1915	1739286	3
Uranium-235/236	U	0.0316	+/-0.0156	0.0975	0.0416	+/-0.0157	1.00	pCi/L							
Uranium-238	U	0.0425	+/-0.0169	0.0883	0.0384	+/-0.0171	0.500	pCi/L							

Rad Gamma Spec Analysis

Gammasespec "As Received"

Cesium-137	U	0.262	+/-1.36	4.77	2.18	+/-1.36	8.00	pCi/L			BSW1	02/15/18	0918	1739356	4
Cobalt-60	U	2.38	+/-1.19	5.12	2.26	+/-1.31	8.00	pCi/L							
Neptunium-237	U	-1.49	+/-2.93	7.29	3.40	+/-2.95		pCi/L							
Potassium-40	U	-4.71	+/-15.2	56.4	25.2	+/-15.3		pCi/L							
Sodium-22	U	0.748	+/-1.18	4.59	2.01	+/-1.19		pCi/L							

Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	-0.0843	+/-0.134	0.489	0.226	+/-0.134	0.500	pCi/L			KSD1	02/21/18	1438	1740247	5
<i>WSP-GrossA/B "As Received"</i>															
Beta		3.33	+/-0.906	2.55	1.12	+/-0.949	3.00	pCi/L			BXG2	02/28/18	0843	1740250	6
Alpha		3.06	+/-0.723	1.75	0.712	+/-0.770	3.00	pCi/L			BXG2	02/28/18	1214	1740250	7

The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241 Liquid "As Received"	1739284	97.8	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1739285	69.8	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1739286	84.3	(50%-105%)

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-16

Sample ID: 443794002

Project: ESHL00114

Client ID: ARSL004

Report Date: March 6, 2018

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test								Batch ID	Recovery%	Acceptable Limits				
Strontium Carrier		GFPC, Sr90, liquid "As Received"							1740247	88.4	(50%-105%)				

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-51

Sample ID: 443794006

Matrix: W

Collect Date: 09-FEB-18

Receive Date: 14-FEB-18

Collector: Client

Report Date: March 6, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis															
<i>Alphaspec Am241 Liquid "As Received"</i>															
Americium-241	U	0.00	+/-0.0073	0.039	0.0164	+/-0.0073	0.050	pCi/L			HAKB	02/19/18	1327	1739284	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.00	+/-0.00967	0.0376	0.0159	+/-0.00967	0.050	pCi/L			HAKB	02/17/18	1609	1739285	2
Plutonium-239/240	U	-0.0151	+/-0.00891	0.0303	0.0122	+/-0.00891	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.551	+/-0.0586	0.223	0.104	+/-0.0675	1.00	pCi/L			HAKB	02/15/18	1915	1739286	3
Uranium-235/236	U	0.0542	+/-0.0223	0.126	0.0536	+/-0.0225	1.00	pCi/L							
Uranium-238		0.436	+/-0.0514	0.114	0.0494	+/-0.0576	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	-0.667	+/-1.20	4.10	1.80	+/-1.21	8.00	pCi/L			BSW1	02/15/18	0918	1739356	4
Cobalt-60	U	0.483	+/-1.10	4.11	1.69	+/-1.11	8.00	pCi/L							
Neptunium-237	U	-2.08	+/-2.05	7.08	3.25	+/-2.11		pCi/L							
Potassium-40	U	-18.6	+/-16.7	58.6	25.6	+/-17.3		pCi/L							
Sodium-22	U	-0.0395	+/-1.25	4.74	2.01	+/-1.25		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	-0.105	+/-0.129	0.480	0.221	+/-0.129	0.500	pCi/L			KSD1	02/21/18	1438	1740247	5
<i>WSP-GrossA/B "As Received"</i>															
Beta		8.11	+/-1.38	3.18	1.37	+/-1.55	3.00	pCi/L			BXG2	02/28/18	0843	1740250	6
Alpha		13.0	+/-1.94	5.36	2.51	+/-2.22	3.00	pCi/L			BXG2	02/28/18	1702	1740250	7

The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer		Alphaspec Am241 Liquid "As Received"	1739284	88.1	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1739285	77	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1739286	70.6	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1740247	58.1	(50%-105%)

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-51

Sample ID: 443794006

Report Date: March 6, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test											Batch ID	Recovery%	Acceptable Limits	

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

Quality Control Summary

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QC Summary

Report Date: March 6, 2018

Page 1 of 6

Client : Los Alamos National Laboratory
TA-00, SM1237, Rm104C

Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 443794

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1739284										
QC1203971867	443786002	DUP									
Americium-241	U	0.00491	U	0.00516	pCi/L	0.0123		(0-1)	HAKB	02/19/18	13:27
	Uncert:	+/-0.00491		+/-0.00516							
	TPU:	+/-0.00492		+/-0.00517							
**Americium-243 Tracer	2.62	2.66		2.52	pCi/L		96.3	(50%-105%)			
	Uncert:	+/-0.0652		+/-0.0669							
	TPU:	+/-0.127		+/-0.129							
QC1203971868	LCS										
Americium-241	1.97			1.99	pCi/L		101	(80%-120%)	HAKB	02/19/18	13:27
	Uncert:			+/-0.0513							
	TPU:			+/-0.0977							
**Americium-243 Tracer	2.10			2.10	pCi/L		99.9	(50%-105%)			
	Uncert:			+/-0.0523							
	TPU:			+/-0.102							
QC1203971866	MB										
Americium-241			U	0.015	pCi/L				HAKB	02/27/18	13:57
	Uncert:			+/-0.00561							
	TPU:			+/-0.00564							
**Americium-243 Tracer	2.10			2.11	pCi/L		101	(50%-105%)			
	Uncert:			+/-0.0532							
	TPU:			+/-0.103							
Batch	1739285										
QC1203971870	443786002	DUP									
Plutonium-238	U	0.0096	U	-0.0066	pCi/L	0.545		(0-1)	HAKB	02/19/18	13:27
	Uncert:	+/-0.00692		+/-0.00793							
	TPU:	+/-0.00693		+/-0.00793							
Plutonium-239/240	U	-0.00576	U	-0.0022	pCi/L	0.097		(0-1)			
	Uncert:	+/-0.00692		+/-0.0114							
	TPU:	+/-0.00692		+/-0.0114							
**Plutonium-242 Tracer	2.47	2.13		2.02	pCi/L		81.6	(50%-105%)			
	Uncert:	+/-0.0693		+/-0.0745							
	TPU:	+/-0.120		+/-0.126							
QC1203971871	LCS										
Plutonium-238			U	0.0169	pCi/L			(80%-120%)	HAKB	02/19/18	13:27
	Uncert:			+/-0.00669							
	TPU:			+/-0.00672							
Plutonium-239/240	1.98			1.91	pCi/L		96.6	(80%-120%)			
	Uncert:			+/-0.0545							
	TPU:			+/-0.0935							
**Plutonium-242 Tracer	1.98			1.85	pCi/L		93.4	(50%-105%)			
	Uncert:			+/-0.0556							
	TPU:			+/-0.0963							

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QC Summary

Workorder: 443794

Page 2 of 6

Parname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1739285										
QC1203971869	MB										
Plutonium-238			U	0.0181	pCi/L				HAKB	02/19/18	13:27
				Uncert:							
				+/-0.0115							
				TPU:							
				+/-0.0116							
Plutonium-239/240			U	0.00803	pCi/L						
				Uncert:							
				+/-0.00898							
				TPU:							
				+/-0.00899							
**Plutonium-242 Tracer	1.98			1.55	pCi/L		78.1	(50%-105%)			
				Uncert:							
				+/-0.0638							
				TPU:							
				+/-0.106							
Batch	1739286										
QC1203971873	443786002	DUP									
Uranium-234				0.215							
				0.233	pCi/L	0.112		(0-1)	HAKB	02/15/18	19:13
				Uncert:							
				+/-0.0363							
				TPU:							
				+/-0.0386							
Uranium-235/236		U	0.0127	U	0.0651	pCi/L	0.747	(0-1)			
				Uncert:							
				+/-0.0115							
				TPU:							
				+/-0.0115							
Uranium-238				0.159	pCi/L	0.235		(0-1)			
				0.191							
				Uncert:							
				+/-0.0298							
				TPU:							
				+/-0.0313							
**Uranium-232 Tracer	2.61			2.05	pCi/L		78.2	(50%-105%)			
				2.04							
				Uncert:							
				+/-0.117							
				TPU:							
				+/-0.192							
QC1203971874	LCS										
Uranium-234				2.89	pCi/L				HAKB	02/15/18	19:13
				+/-0.116							
				Uncert:							
				+/-0.210							
Uranium-235/236				0.153	pCi/L						
				+/-0.0318							
				Uncert:							
				+/-0.0331							
Uranium-238	2.70			2.79	pCi/L		103	(80%-120%)			
				+/-0.113							
				Uncert:							
				+/-0.204							
**Uranium-232 Tracer	2.09			1.83	pCi/L		87.4	(50%-105%)			
				+/-0.0999							
				Uncert:							
				+/-0.161							
QC1203971872	MB										
Uranium-234			U	0.0618	pCi/L				HAKB	02/15/18	19:13
				+/-0.020							
				Uncert:							
				+/-0.0204							
Uranium-235/236			U	0.0185	pCi/L						
				+/-0.0124							
				Uncert:							
				+/-0.0125							
Uranium-238			U	0.00637	pCi/L						
				+/-0.0096							
				Uncert:							
				+/-0.00961							

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QC Summary

Workorder: 443794

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1739286										
*Uranium-232 Tracer	2.09			1.68	pCi/L		80.6	(50%-105%)			
	Uncert:			+/-0.096							
	TPU:			+/-0.157							
Rad Gamma Spec											
Batch	1739356										
QC1203972047	443786002	DUP									
Cesium-137	U	0.170	U	0.204	pCi/L	0.00702		(0-1)	BSW1	02/15/18	12:31
	Uncert:	+/-1.12		+/-1.33							
	TPU:	+/-1.12		+/-1.33							
Cobalt-60	U	0.606	U	0.943	pCi/L	0.0638		(0-1)			
	Uncert:	+/-1.16		+/-1.46							
	TPU:	+/-1.17		+/-1.48							
Neptunium-237	U	1.67	U	0.674	pCi/L	0.117		(0-1)			
	Uncert:	+/-2.18		+/-2.05							
	TPU:	+/-2.22		+/-2.06							
Potassium-40	U	-12.2	U	31.1	pCi/L	0.62		(0-1)			
	Uncert:	+/-15.3		+/-19.3							
	TPU:	+/-15.6		+/-19.3							
Sodium-22	U	3.12	U	3.27	pCi/L	0.0286		(0-1)			
	Uncert:	+/-1.23		+/-1.22							
	TPU:	+/-1.43		+/-1.23							
QC1203972048	LCS										
Americium-241	34300			37700	pCi/L		110	(80%-120%)	BSW1	02/15/18	13:34
	Uncert:			+/-797							
	TPU:			+/-2380							
Cesium-137	12900			13300	pCi/L		103	(80%-120%)			
	Uncert:			+/-174							
	TPU:			+/-604							
Cobalt-60	10900			11500	pCi/L		106	(80%-120%)			
	Uncert:			+/-188							
	TPU:			+/-587							
Neptunium-237			U	53.4	pCi/L						
	Uncert:			+/-55.1							
	TPU:			+/-56.5							
Potassium-40			U	-120	pCi/L						
	Uncert:			+/-99.7							
	TPU:			+/-104							
Sodium-22			U	-28.1	pCi/L						
	Uncert:			+/-17.6							
	TPU:			+/-18.8							
QC1203972046	MB										
Cesium-137			U	0.323	pCi/L				BSW1	02/15/18	10:23
	Uncert:			+/-0.906							
	TPU:			+/-0.909							
Cobalt-60			U	0.975	pCi/L						
	Uncert:			+/-0.842							

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QC Summary

Workorder: 443794

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1739356										
Neptunium-237	TPU:			+/-0.873							
			U	-0.0874	pCi/L						
	Uncert:			+/-1.44							
Potassium-40	TPU:			+/-1.44							
			U	0.886	pCi/L						
	Uncert:			+/-15.2							
Sodium-22	TPU:			+/-15.2							
			U	0.696	pCi/L						
	Uncert:			+/-0.838							
	TPU:			+/-0.853							
Rad Gas Flow											
Batch	1740247										
QC1203974511	443786015	DUP									
Strontium-90	U	0.387	U	-0.164	pCi/L	0.963		(0-1)	KSD1	02/21/18	14:36
	Uncert:	+/-0.154		+/-0.129							
	TPU:	+/-0.157		+/-0.129							
**Strontium Carrier	4.30	3.80		3.80	mg		88.4	(50%-105%)			
QC1203974513	LCS										
Strontium-90	23.5			20.7	pCi/L		87.7	(80%-120%)	KSD1	02/21/18	14:37
	Uncert:			+/-0.634							
	TPU:			+/-1.77							
**Strontium Carrier	4.30			3.90	mg		90.7	(50%-105%)			
QC1203974510	MB										
Strontium-90			U	-0.317	pCi/L				KSD1	02/21/18	14:36
	Uncert:			+/-0.0703							
	TPU:			+/-0.0703							
**Strontium Carrier	4.30			4.40	mg		102	(50%-105%)			
QC1203974512	443786015	MS									
Strontium-90	236	U	0.387	197	pCi/L		83.5	(75%-125%)	KSD1	02/21/18	14:36
	Uncert:		+/-0.154	+/-5.84							
	TPU:		+/-0.157	+/-16.8							
**Strontium Carrier	4.30	3.80		4.30	mg		100	(50%-105%)			
Batch	1740250										
QC1203974522	443786010	DUP									
Alpha	U	1.03	U	0.779	pCi/L	0.111		(0-1)	BXG2	02/28/18	17:03
	Uncert:	+/-0.728		+/-0.375							
	TPU:	+/-0.733		+/-0.381							
Beta		4.74		3.53	pCi/L	0.329		(0-1)		02/28/18	08:44
	Uncert:	+/-0.896		+/-0.801							
	TPU:	+/-0.983		+/-0.854							
QC1203974525	LCS										
Alpha	12.1			11.5	pCi/L		95	(80%-120%)	BXG2	02/28/18	12:05
	Uncert:			+/-0.571							
	TPU:			+/-1.16							
Beta	47.1			47.3	pCi/L		101	(80%-120%)		02/28/18	08:44

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QC Summary

Workorder: 443794

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1740250										
				Uncert:							
				TPU:							
QC1203974521	MB										
Alpha			U	-0.0381	pCi/L				BXG2	02/28/18	12:11
				Uncert:							
				TPU:							
Beta			U	0.154	pCi/L					02/28/18	08:44
				Uncert:							
				TPU:							
QC1203974523	443786010	MS									
Alpha		483	U	1.03	504	pCi/L		104	(75%-125%)	BXG2	02/28/18
				Uncert:							
				TPU:							
Beta		1880		4.74	1940	pCi/L		103	(75%-125%)		02/28/18
				Uncert:							
				TPU:							
QC1203974524	443786010	MSD									
Alpha		483	U	1.03	426	pCi/L	0.414	88.2	(0-1)	BXG2	02/28/18
				Uncert:							
				TPU:							
Beta		1880		4.74	1760	pCi/L	0.276	93.4	(0-1)		02/28/18
				Uncert:							
				TPU:							

Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMF Result > MDC/CL and < RDL
- 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.

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QC Summary

Workorder: 443794

Page 6 of 6

Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
R	Sample results are rejected									
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.									
UI	Gamma Spectroscopy--Uncertain identification									
UJ	Gamma Spectroscopy--Uncertain identification									
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.									
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.									
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.									
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.

** Indicates analyte is a surrogate/tracer compound.

^ 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.

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.